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Measuring people's wellbeing: the BCFN Index

Measuring people's well-being: the BCFN Index

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people, environment, science, economy

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Dear Reader,

In these first two years of its work, the Barilla Center for Food and Nutrition (BCFN) has tackled a series of issues linked to diet and nutrition which, by their very nature, whether directly or indirectly, have a tangible effect on the well-being of people. At the same time, we have also delved fully into the effects that lifestyles and diet can have on the environment surrounding us, which are responsible for the absorption and depletion of natural resources (from the emission of greenhouse gases to soil depletion and the usage and pollution of water). Not to mention those aspects linked to food which are more closely connected to the social sphere and interpersonal relationships (conviviality, socializing, etc.).

From the experience of the BCFN Advisory Board, the results obtained from the work that has been done and positive reactions to it from policy makers, opinion leaders and the scientific community, it was decided to take part in the current debate on indicators for measuring well-being by offering an innovative and specific contribution focused on food choices and lifestyles.

The debate regarding the need to expand the range of indicators for governing society and the economy, in particular for measuring the Gross Domestic Product (GDP), has been ongoing for some time now and has triggered a broad-ranging series of considerations. It is a well-established fact that economic analyses based exclusively on GDP are often misleading. For example, in the years immediately preceding the recent economic crisis, GDP was unable to differentiate between "healthy" and "artificial" growth.

Within this context, there is increasingly-growing awareness that all-round personal well-being depends on a number of variables–including some aspects linked to lifestyle, food choices, healthcare and environmental protection, etc.–which are not based exclusively on economic and material aspects generally taken into consideration when making policy choices.

Although there is now a widely-held belief that indicators of an exclusively material nature are **unsuitable for offering "all-round" measurement of the real situation** of a country or a given area, the difficulties involved in devising a measurement system are such that to-date it has not yet proven possible to find a satisfactory solution to the various methodological needs underlying its construction.

The goal of the work undertaken in this context by the Barilla Center for Food and Nutrition has been, therefore, to insert the **component tied to diet and lifestyle** into a multi-dimensional index that measures and compares the level of well-being of people in a selected group of developed countries.

In presenting this document, we wish to announce that we are embarking on a process focused on the desire to make a contribution to this ambitious goal, in line with our own particular perspective which starts first and foremost from the study and knowledge of dietary issues. Along the way, this process will involve the professionalism, skills, intelligence and willingness of all those who feel they can provide a constructive contribution.

The form we need to give to our work is that of the **open "platform"**, which will combine the work of analysis and study by the technical groups made up of experts and members of institutions with the willingness to take the suggestions of all those interested in being involved in this task.

We realize that it will be a long and difficult undertaking, but we are convinced that the road towards a fairer world also involves having the tools to understand situations that are better suited to recording phenomena. Tools more appropriate to the situations we all encounter in our daily lives.

Enjoy!

Guido Barilla

1. Well-being and how to measure it

The Gross National Product does not allow for the health of our families, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our family values, the intelligence of our public debate or the integrity of our public officials.

Skip Brown/National Geographic Image Collection

Justin Guariglia/National Geographic Image Collection

Defining and measuring the well-being of man in a way that is as inclusive, widely-shared and relevant as possible, is not just a fascinating challenge for social scientists, but also a fundamental step towards defining better political and economic choices and therefore, what should be a better world.

1.
Well-being and how to measure it

There is no one single dimension of well-being, but rather a number of possible dimensions, which together contribute to defining the overall meaning. It involves economic as well as more social aspects, environmental and political aspects and significant personal elements linked to health and the way of life of societies and individuals. However long, a detailed list of the possible factors able to affect any dimension of individual well-being would of course be incomplete, as there are so many aspects–even just theoretical ones–that go to make up a complete definition.

Briefly put, **there does not exist a single definition of well-being**. The complexity of the phenomenon is such that, strictly speaking, it does not seem possible to arrive at a "definitive" measurement. Nonetheless, it is possible to make a rough calculation, as has often been attempted throughout the course of history with the help of instruments made available through progress.

This evidence leads to the first methodological choice we made, also based on the most advanced experience in this field: that of attempting to consider the **largest number of factors**, avoiding definitions which emphasize one particular aspect or element to the detriment of others. Well-being is, therefore, primarily the result of an objective situation in which there is a balanced occurrence of a very broad set of positive–or at least not negative–phenomena.

Not only is it difficult to offer a complete framework for the "well-being" phenomenon: we must also indicate the research approach. Choosing to adopt the individual as the focal point of study poses a further, fundamental problem linked to the logic for choosing, measuring and weighting the various factors that help define individual well-being. In fact, when the perspective is that of a human being, there are as many **objective factors** as there are **subjective well-being factors**. On one hand, the approach used is that of measuring the factual elements of the existence of people, which are gathered and assessed objectively because they are disassociated from a partial, personal view. On the other, the logic is that of the assessment individuals make of their own lives, the census of the interpretation of objective phenomena formulated subjectively by each person. It is the great, irresolvable distance between what exists and what is perceived.

How then can we fill the gap between **objective measurement** and **subjective perception**? One way is to ask individuals to evaluate the latter. This would make quantifying individual well-being more complete, and bring it closer to truly assessing the quality of life of people. Nonetheless, this process would involve highly subjective elements in measuring well-being, making comparisons between individuals and different countries very complex. The other way is to remain within the framework of objective measurements, expanding the range of phenomena deemed to co-determine well-being. The aim here is to arrive asymptotically at a measurement of well-being which is as close as possible to the "real" one.

This second course, however is **not totally without pitfalls**. Firstly, although statistical measuring techniques provide the foundation, their methodology involves major simplifications and a set of necessary conventions. Secondly, they involve a basic trade-off. On one side, a smaller number of variables observed and estimated has the advantage of focusing and limiting the potential distortions involved in the multiple calculation of the end effect on the phenomenon being analyzed in the survey. This can be caused by the inclusion of different interpretations and variables within the model itself, even if they are linked by the fact that they partly register the same phenomenon needed for the purpose of the survey. On the other hand, the choice of a limited number of variables necessarily pays the price with a very "approximate" description of the scenario. It creates the risk of not considering a set of elements that can play a truly significant role, a risk that increases as we get closer to phenomena where it is the individual that is the focus of interest.

In any case, the version of the index presented in this document is of an **objective nature**. Despite this, we are aware of the need to **introduce subjective measuring elements**, linked at least to the definition of the weighting system which constitutes its framework.

As can be seen, measuring individual well-being is complex and, in some respects, does not provide a definitive solution. Despite all the difficulties, however, as effectively recalled by Fitoussi, Sen and Stiglitz in the final report of the Commission on the Measurement of Economic Performance and Social Progress, "*What we measure influences what we do*", defining and measuring the well-being of man in a way that is as inclusive, widely-shared and relevant to the complexities of the situation in question as possible, is not just a fascinating challenge for social scientists, but also a fundamental step towards defining **better political and economic choices** and therefore, what should be a **better world**.

2. The BCFN approach to this issue

However long, a detailed list of the possible factors able to affect any dimension of individual well-being would of course be incomplete, as there are so many aspects–even just theoretical ones–that go to make up a complete definition.

Stephen St. John/National Geographic Image Collection

It is a well-established fact that economic analyses based exclusively on GDP are often misleading.

Stacy Gold/National Geographic Image Collection

2. The BCFN approach to this issue

The debate regarding the need to expand the range of indicators for governing society and the economy, in particular for measuring the Gross Domestic Product (GDP),[1] has been ongoing for some time now, and recently, both abroad and in Italy, it has triggered a series of considerations.

It is a well-established fact that economic analyses based exclusively on GDP are often misleading. For example, in the years immediately preceding the recent economic crisis, GDP was unable to differentiate between "healthy" and "artificial" growth"; or that in the event of a natural catastrophe, the GDP increases thanks to reconstruction expenditure, while the cost of the catastrophe itself is not accounted for, and social well-being certainly does not improve. Although GDP remains a good index of economic growth, it is not suited to grasping those **aspects tied to the advancement and well-being of people**. In fact, it does not take into account goods that do not have a market. It does not consider negative external factors–i.e., costs generated by manufacturing (pollution, unsustainable exploitation of resources, loss of biodiversity, etc.), the quality of public expenditure, and so forth.

Robert F. Kennedy's comment on the inadequacy of GDP, delivered at the University of Kansas on March 18, 1968, is still relevant:

"*We will find neither national purpose nor personal satisfaction in a mere continuation of economic progress, in an endless amassing of worldly goods. We cannot measure national spirit by the Dow Jones Average, nor national achievement by the Gross National Product. For the Gross National Product includes air pollution and advertising for cigarettes, and ambulances to clear our weekend highway carnage. It counts special locks for our doors, and jails for the people who break them. It includes television programmes that glorify violence to sell violent goods to our children. It increases with the production of napalm, missiles and nuclear warheads, and it also includes research for improving dissemination of the bubonic plague. It increases with the equipment the police uses to put down riots, and does nothing but increase when slums are built on their ashes. The Gross National Product does not allow for the health of our families, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our family values, the intelligence of our public debate or the integrity of our public officials. It fails to take account of justice in our courts, nor fairness in relations between us. The gross national product measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile; and it can tell us everything about America except whether we are proud to be Americans*".

As early as 1934, the "father" of GDP, Simon Kuznets,[2] declared before the Congress of the United States that well-being and GDP are two separate things: "The well-being of a nation [...] cannot easily be deduced from a national income index."

In economic literature, it is possible to find **many examples of descriptive multi-dimensional indicators** created for the purpose of **measuring the well-being and quality of life** for a given nation, region, city, etc. This measurement is made by combining a number of indicators which focus on crucial aspects; whether directly or indirectly, these influence the quality of life of individuals and communities, and indeed determine them. By way of example, they can include education and training indicators, or others regarding employment, the environment, energy, health, human rights, available income, infrastructure, public and private safety, recreational and cultural activities, and so forth. What follows is a brief list (for illustrative purposes only and should not be considered complete) with a short description of some of the main contributions recently made to this topic, elaborated by economists and leading national and international institutions.

it is necessary to have long-term indicators of the sustainability of well-being, which chiefly involve problems linked to the environment.

Index of Sustainable Economic Welfare

An alternative economic index to GDP, the Index of Sustainable Economic Welfare (ISEW) was developed by economists William Nordhaus and James Tobin and was presented in the 1990s in their study, *Measure of Economic Welfare*. The method for calculating this "economic welfare" index proposes the introduction of a number of corrections to traditional national accounting measurements in order to take into consideration a number of factors which, although without direct impact on measuring GDP, do influence economic well-being. This involves, for example, the depletion of natural resources, the economic "cost" associated with the degradation of the environment or, from a positive standpoint, the economic value of individual leisure time (in terms of personal well-being), the economic and social value of homemaking (although unpaid, not extraneous to the well-being of people and nations).

The innovation proposed by Tobin and Nordhaus regarding the measurement of economic welfare generated by national economies represented an important point of reflection for many subsequent studies, including some of those presented in the course of this paper.

Genuine Progress Indicator (GPI)

The Genuine Progress Indicator (GPI) is one of the main results of the development of the theoretical and methodological approach of the Sustainable Economic Welfare Index towards "improving" the representativeness of GDP through the integration of additional indicators which take into account social-economic phenomena that GDP is not able to reflect.

This indicator (also known as the Genuine Progress Indicator), was developed to highlight the net effect on the welfare of people living in a given country, compared with an increase in the production of goods and services, while taking into account that some elements with a net positive effect on GDP actually have a negative impact on personal well-being (for example, the economic cost of crime).

According to this approach, GPI is calculated in a similar way as occurs in companies which, starting from profits, calculate net real profits by subtracting costs. From this standpoint, therefore, GPI will be zero if, everything else being equal, the financial costs of crime, pollution, post-earthquake reconstruction, etc., are equal to the financial benefits from the production of goods and services.

The method for calculating the Genuine Progress Indicator calls for the identification, on the level of national accounts, of a number of "positive" expenditures (which increase well-being) and a number of negative expenditures (with a negative impact on the well-being of individuals, such as the cost of crime, pollution, road accidents, etc.).

GPI is therefore calculated as the difference, the balance between "positive" and "negative" expenditures (thus going beyond the GDP approach that includes all expenditure as positive and does not take into consideration those activities which, although they generate monetary flows and create wealth, do not contribute to increasing the welfare

1 *The GDP is the sum calculated with the market value of all goods and services produced in a country within a given period of time, which is generally one year. When examined in terms of population (per capita GDP), it makes it possible to compare different countries, regions or other sub-national units over time and space. Generally speaking, it is the first indicator used for diagnosing the economic and social situation and making comparisons between different contexts. As a growth rate, it represents the main indicator for assessing the long-term performance of a country or region.*

2 *American economist and Nobel economics prize winner.*

of a society). In addition, among the expenditures and activities classified as "positive" is also included an evaluation of services not transacted on the market (e.g., volunteer services or homemaking activity). Once again, an aspect not "intercepted" by GDP..

Human Development Index (HDI)

The Human Development Index (HDI) is a macroeconomic development indicator created by Pakistani economist Mahbub ul Haq in 1990. Today, this indicator is regularly utilized and published by the United Nations as a supplement to GDP, in order to evaluate the quality of life of member countries. This indicator is a summary index created for each country by taking into consideration aspects such as crime, promotion of human rights, improvement of public education, environmental protection, sustainable development of national resources, weakening of the social fabric, pollution, spread of certain types of diseases (such as HIV/AIDS), etc.

Italy's position reflects some decidedly positive performances, such as for average life expectancy and average life expectancy in good health, second only to the figures for Japan, and a generally "high" level of well-being connected to the psychological sphere of the population.

The index is expressed in thousandths and can range from 0 (minimum) to 1 (maximum). On the basis of this indicator, the United Nations subdivides member countries into:

- High Human Development (HDI between 0.800 and 1.000);
- Medium Human Development (HDI between 0.500 and 0.799);
- Low Human Development (HDI between 0 and 0.499).

The 20th report, H*uman Development Report 2010*, was released on November 4, 2010.

Contribution of the New Economics Foundation

The New Economics Foundation (NEF) is an independent organization based in the United Kingdom whose mission is to investigate into the actual nature of individual well-being, as opposed to economic well-being. The goal of the NEF is to improve the quality of life of individuals through the promotion of innovative solutions in evaluating well-being which go beyond traditional, mainstream economic thought to introduce analysis and evaluation of environmental and social aspects that impact on the well-being of people. NEF was founded in 1986 by a number of leaders of The Other Economic Summit (TOES). In addition to being an institution of reference on an international level and working to guide formulation of policies that are the most suitable possible for improving individual well-being, the NEF constantly works on developing innovative methods to measure development through analyzing impacts on well-being and from the standpoint of environmental sustainability.

The foundation's work in terms of measuring well-being is focused on identifying what should be defined as "social value" and as such, measured. Towards this, the NEF has created a conceptual framework for the development of a "National Accounts of Well-being" that makes it possible to generate:

- an innovative method for evaluating the measurement of society's progress through a **subjective survey** of the level of well-being that individuals in countries around the world perceive in terms of their own lives;
- an across-the-board approach to the various components of well-being and social development to allow a more accurate definition of policies of national governments that go beyond the logic of maximization of economic efficiency in order to also offer decision-makers more appropriate tools for evaluating the actual impact of their decisions on the lives of individuals;
- improvement in the relationship between governments and their populations by giving governments the opportunity to improve their relations with their citizens through offering more direct involvement in the process of formulating strategies for the country, thus contributing to reduce the "democratic deficit" which many European countries are facing today.

The NEF also prepares an indicator to measure the level of well-being of the world's populations. It is called "**The Happy Planet Index (HPI)**" and was created to discover, on one hand, what individuals consider to be important for living a long, happy and meaningful life, and on the other, what is important for our planet in terms of resource consumption.

FEEM Sustainability Index

From the standpoint of Italy, a major scientific contribution in terms of innovative methods in the measurement of well-being, can be found in the work of the Fondazione ENI Enrico Mattei which this year published its 15th FEEM Index (www.feemsi.org), constructed on the basis of an aggregate of variables with the goal of examining and measuring the environmental and social sustainability of economic development.

This indicator is created through the aggregation of a series of variables that measure development sustainability and is elaborated using specially-defined weightings assigned to the variables and combinations of variables. This provides a unified summary index of performance called the FEEM Sustainability Index (SI).

In addition to the significant structure of quantitative analysis on which the index is calculated, the special aspect of the methodological approach adopted for calculating the FEEM Sustainability Index (SI) lies in the ability to develop forecasts for the future and to make international comparisons on the basis of this indicator.

"Il Sole 24 Ore" Quality of Life Index

Once again from the standpoint of Italy, it should be noted that for the last fifteen years, *Il Sole 24 Ore*, the country's leading economic and financial newspaper, has been publishing an annual classification of the "livability" of the 103 Italian provinces.

Joel Sartore/National Geographic Image Collection

This classification is prepared on the basis of an aggregation of a set of 36 indicators grouped according to the following dimensions:

- Public order (reported thefts, robberies, etc.);
- Population (percentage with college degrees, immigration, etc.);
- Leisure time (number of theater and concert events, index of books read, etc.);
- Standard of living (bank deposits per resident, avg. cost per m2 of housing);
- Business and employment (registered companies, unemployment, etc.);
- Services, environment and healthcare (index of available infrastructure, technical advance on an annual basis).

"Beyond GDP" initiative

Over the last few years, the European Parliament, European Commission, OECD and the Club of Rome have been involved in a project entitled "**Beyond GDP**"[3] in collaboration with the WWF.

The psycho-physical well-being of individuals may be influenced in large part by personal behavior and lifestyles (diet, lifestyle, sports activity, etc.).

In November 2007, the European Commission, together with the joint task force comprised of the European Parliament, Club of Rome, OECD and the WWF, organized and hosted a top-level conference entitled "Beyond GDP", held in Brussels, with the principal objective of discussing and clarifying what the most appropriate indices could be to measure the progress and well-being of nations and how these indices could be better integrated into processes of formulating economic and social policies and be properly taken into account in public debate on major strategic issues.

The conviction underlying this conference is–in light of what has been said previously–that economic indicators such as GDP are not designed to represent across-the-board measurement of personal well-being. This gives rise to the need to develop complementary indicators which, although with the same clarity as seen in GDP, are able to broaden the field of measurement to other aspects of well-being that go beyond the economic dimension of this aspect (particularly in terms of environmental and social problems).

What are required today are indicators more suitable than Gross Domestic Production to take on some of the most demanding global challenges facing humanity, such as climate change, poverty, resource depletion and health, to name just some.

The "Beyond GDP" conference brought together over 650 people, including politicians, experts and decision-makers who, together, undertook a critical and task-oriented examination of the issues up for discussion. Even before the main conference itself, a seminar for a number of selected experts was held in which the current availability and utilization of indicators in the measurement of progress and well-being was discussed.

As a follow-up to the 2007 conference, in 2009 the European Commission announced the progress that had been made in the work surrounding the "Beyond GDP" theme, outlining a detailed roadmap in five major areas of study and/or key initiatives to guide the continuation of work in this area. The five key initiatives identified by the European Commission are, briefly:

- The Commission undertakes to propose in the short-term a methodology for calculating a "pilot" index for measuring the progress of nations in the area of environmental policy (this index should include, for example, CO_2 emissions into the atmosphere, protection of areas of natural beauty, air quality, pollution, water consumption, waste disposal, etc.).
- The Commission undertakes to intensify efforts in the construction and diffusion of data to be used in measuring environmental and social aspects of individual well-being. To-date, in fact, this data is released from European bodies with a several-year delay (while "traditional", purely economic indicators are released just weeks after they are compiled). The goal is to make available to policy makers, in real time, a set of information to be used to nurture the decision-making process in formulation of policy on issues that go beyond economic development.
- The European Commission will work towards preparing a set of indicators involving income distribution and inequities, in order to facilitate the drawing up of policies involving economic and social cohesion.
- The European Commission will create a balanced score-card constructed on the basis of already-existing sustainable development indicators which will be published in order to permit analysis and comparison in measuring well-being between European countries and on-going monitoring of best practices on an international level.
- The Commission will work towards integration of national accounting indicators (GDP, investment, consumption, public spending, etc.) with indicators constructed on the basis of what will be defined as "environmental and social accounting".

The process initiated in 2007 and continued in 2009 is still underway and represents one of the most significant contributions in the study of systems of measuring the well-being of populations that go "beyond GDP".

Michael Melford/National Geographic Image Collection

3 *For additional information, consult the website: www.beyond-gdp.eu*

Stiglitz-Sen-Fitoussi Commission

In addition to the national and international examples offered above (to which could be added others that have not been included for space reasons[4]), the significant contribution to the debate on measuring well-being provided recently by a **commission** comprised of around thirty international economists[5] must also be mentioned. The commission was presided over by Nobel prize winners Joseph **Stiglitz** and Amartya **Sen** and French economist Jean-Paul Fitoussi[6] and was charged by French president Nicolas Sarkozy to study and propose alternatives to GDP.

The commission did not identify a new summary indicator, but it did draft a series of **recommendations**[7] which are summarized below. They are useful for understanding the many facets of social well-being:

- Material well-being should be assessed in terms of **family nucleus**, taking into consideration **income** and **consumption** rather than production. Moreover, greater emphasis should be placed on the **distribution of income**, consumption and wealth: an average increase in income does not necessarily correspond to an increase for everyone;
- It is also necessary to develop measurements and statistics for **non-market activities**, as well-being also depends on activities that do not give rise to market exchanges, such as services provided directly between individuals (for example activities and services provided within the family, looking after the sick and the elderly, etc.);
- It is necessary to take into consideration the **multi-dimensional nature of the measurement of well-being**, which not only touches on economic conditions, but also on **education**, **health**, the quality of **democracy**, **social networks**, the **environment** and **security**;
- Attention should be dedicated to **environmental sustainability** in order to measure growth including the destruction of resources and the risks of climate change;
- The **services offered by the State** should not be measured according to their costs, as currently occurs with the GDP, but based on their **impact on the well-being of citizens**.

Moreover, regarding the non-material dimension of well-being, it is necessary to remember the importance of leisure time and the need to measure social relations, political "voice" and the security or vulnerability of individuals.

Finally and more generally, it notes that **both objective and subjective measures** should be taken into consideration, and that it is necessary to have long-term indicators of the sustainability of well-being, which chiefly involve problems linked to the environment.

Approach of the Barilla Center for Food and Nutrition

In these first two years of its work, the **Barilla Center for Food and Nutrition** (BCFN) has tackled a series of **issues linked to diet and nutrition** which, by their very nature have a direct or indirect **tangible effect on the well-being of people**. First and foremost, the effects that dietary choices have on the **health** of children and adults, whether in negative (direct cause or risk factors in the onset of certain serious illnesses) or positive terms (protective effect against certain illnesses). It has also delved fully into the effects that lifestyles and diet can have on the **environment** surrounding us, which are responsible for the absorption and depletion of natural resources (from the emission of greenhouse gases to soil depletion and water use and pollution). Not to mention those aspects linked to food which are more closely linked to the **social sphere and interpersonal relationships** (conviviality, socializing, time spent in preparing and eating food, etc.).

The considerations formulated by the Advisory Board of the BCFN and the evidence collated in the studies it has published–bringing together the most interesting points to come out of the scientific debate regarding the need for new instruments to measure the wealth and well-being of nations, first and foremost among these the Stiglitz-Sen-Fitoussi report mentioned above–have resulted in the conviction that **a sizeable amount of the overall well-being of individuals is linked to the diet and lifestyles they adopt**, first and foremost because of the spin-off effects they have on human health and environmental sustainability.

From the experience of the BCFN Advisory Board, the results obtained from the work that has been done and positive reactions to it from policy makers, opinion leaders and the scientific community, **it was decided to take part in the current debate on indicators for measuring well-being by offering an innovative and specific contribution** focused on food choices and lifestyles.

The goal has been, therefore, to insert the **component tied to diet and lifestyle into a multi-dimensional index that measures and compares the level of well-being of people in a selected group of developed countries**.

The aim of this study is to provide a **proposal that contributes to the scientific debate currently underway**, introducing **an original standpoint** which we have **yet to come across in other similar experiences**. Indeed, the innovative nature of our approach consists of gauging **factors linked to diet and lifestyles of people** along with the elements that are taken into account; as said before, these have a sizeable effect on the well-being of people.

This document outlines the first draft of **work still in progress**, which in the coming months will benefit from further technical and scientific contributions, as well as additional material resulting from work to perfect proprietary survey instruments (interviews and questionnaires). These results will be combined with the official institutional statistics used to-date (obtained from databases of organizations such as the OECD, WHO, IMF, IEA, World Bank, etc.). **In this way the objective factors for measuring well-being will be combined with more subjective elements for gauging the way people perceive well-being**. The latter represents a pivotal point, as people's perception often differs significantly from data found in official statistics.

To conclude, in order to ensure the scientific credibility of this study, we have tried to comply with two fundamental criteria:

- to pay particular attention to the **authoritativeness of the sources**, selecting exclusively data produced by institutions and individuals known for the quality of their data processing;
- to ensure the maximum **transparency** in our methods and calculations, furnishing all the information necessary for clear comprehension of the work done and the results obtained. Our commitment to transparency will take the form of publishing this document which contains all the statistical details required in defining the index.

4 *Among these are:*
- the Index of Economic Well-Being (IEWB) defined by the Centre for the Study of Living Standards;
- the Index of Social Health (ISH) defined by Fordham University;
- the Index of Living Standards (ILS) defined by the Fraser Institute;
- the Canadian Index of Wellbeing (CIW) defined by the Institute of Wellbeing;
- the Quality of Life Index (QOL) drafted by Ed Diener of the University of Illinois;
- the Index of Social Progress (ISP) drafted by Richard Estes of the University of Pennsylvania;
- the BC Stats Index of Regional Indicators;
- the Oregon Benchmarks created by the Oregon Progress Board.
- the Urban Ecosystem report prepared by Legambiente in conjunction with Ambiente Italia and ***Il Sole 24 Ore****.*

5 *For Italy, the commission included the participation of Enrico Giovannini, Chairman of ISTAT, the National Institute of Statistics.*

6 *Professor of Economics and President of the Scientific Committee of the Institut d'Etudes Politiques de Paris; President of the Observatoire Français des Conjonctures Economiques. Professor Fitoussi is also a member of the Advisory Board of the Barilla Center for Food and Nutrition.*

7 *Professor Joseph E. Stiglitz, Chair, Columbia University; Professor Amartya Sen, Chair Adviser, Harvard University; Professor Jean-Paul Fitoussi, Coordinator of the Commission, IEP, "Report by the Commission on the Measurement of Economic Performance and Social Progress".*

3. BCFN Index

What are required today are indicators more suitable than GDP to take on some of the most demanding global challenges facing humanity, such as climate change, poverty, resource depletion and health.

Mark Thiessen/National Geographic Image Collection

A sizeable amount of the overall well-being of individuals is linked to the diet and lifestyles they adopt, first and foremost because of the spin-off effects they have on human health and environmental sustainability.

Catherine Karnow/National Geographic Image Collection

3.1 Methodology

As already mentioned in the section above, analysis of the scientific reference literature, suggestions made by the Advisory Board of the Barilla Center for Food and Nutrition and research carried out by the working group of The European House-Ambrosetti have guided the development of an ***ad hoc* methodology** for **quantitative measurement** of the comparative level of **well-being** starting from a sampling of **reference countries**.

The methodological process adopted has made it possible to construct a multidimensional summary index for the quantitative measurement of the well-being of countries. This indicator has been named the **BCFN Index**.

What follows is a description of the method adopted in constructing the index and the main evidence gathered through its application (subsequent sections).

In order to guarantee maximum **coherence** and **scientific rigor** for the methodological system of the BCFN Index, the starting point used was the work done by **Stiglitz**, **Sen** and **Fitoussi**. This involves analyzing **a wide range of differing variables** (such as income, health, education, extent of social networks and quality of democracy, etc.) in order to assess a variety of aspects (**dimensions**) **of well-being** contemporaneously.

For the international comparison, **10 benchmark countries** were chosen:
- Three countries representing **Mediterranean Europe**: **Italy**, **Spain** and **Greece**;
- Two countries representing **Continental Europe**: **France** and **Germany**;
- Two countries representing **Scandinavia**: **Denmark** and **Sweden**;
- the **United Kingdom**;
- the **United States**;
- and **Japan**.

The identified boundary of analysis does not include any of the so-called "**emerging countries**" (Brazil, India, Russia, China, etc.) as it was felt that the **differences still existant** in the social-economic development stage compared with developed countries would render the **construction of an index to measure well-being** conceived in this manner **and the formulation of relevant policy indications somewhat insignificant**.

The calculation of the BCFN index is based on **41 KPIs** (Key Performance Indicators) for measuring the national performance of the **seven dimensions considered**. These are:
- **"Psycho-physical well-being";**
- **"Behavioral well-being";**
- **"Material well-being";**
- **"Environmental well-being";**
- **"Educational well-being";**
- **"Social well-being";**
- **"Political well-being".**

Each KPI was selected with the specific goal of measuring one or more aspects provided for in the methodology utilized for each of the reference countries. In some cases, as it is not possible to take precise measurements of the phenomenon to be gauged owing to a lack of available figures and/or owing to the nature of the phenomenon itself, approximations (**proxies**) were used to ensure the phenomenon was measured nonetheless.

Figure 1 - Summary of the 41 KPIs used for calculating the BCFN Index for the 10 countries examined

			Relative weighting
Psycho-physical well-being	1	Life expectancy	10%
	2	Healthy life expectancy	30%
	3	Mortality rate for circulatory diseases	15%
	4	Mortality rate for malignant neoplasms	15%
	5	Mortality rate for diabetes mellitus	10%
	6	Mortality rate for suicides	10%
	7	Consumer expenditure on anti-depressants	10%
Behavioural well-being	8	Obese and overweight adult population	20%
	9	Obese and overweight youth population	10%
	10	Physical activity	20%
	11	Consumer expenditure on fruit and vegetables	10%
	12	Adult population smoking daily	20%
	13	Alcohol consumption	5%
	14	Average consumption of calories	10%
	15	Eating time on average day	5%
Material well-being	16	Real median income	50%
	17	Net wealth of households	30%
	18	Gross fixed capital formation	20%
Environmental well-being	19	Adjusted Net Saving	25%
	20	Ecological Footprint	5%
	21	Water Footprint	5%
	22	Contribution of renewables to energy supply	15%
	23	CO_2 emissions from fuel combustion	20%
	24	PM10 country levels	15%
	25	Municipal waste	15%
Educational well-being	26	P.I.S.A. score	20%
	27	Average annual number of new graduates	35%
	28	Foreign students enrolled in the university system	15%
	29	Unemployment rate of university graduates	10%
	30	Annual number of daily newspapers published	10%
	31	Fixed broadband subscribers	10%
Social well-being	32	At risk of poverty rate	25%
	33	Inequality of income distribution	10%
	34	Number of weekly hours of children care	5%
	35	Unemployment rate	25%
	36	Unemployment rate among young people	10%
	37	Old-age dependency ratio	5%
	38	National Institution Index	10%
	39	Interpersonal Trust Index	10%
Political well-being	40	The Economist Intelligence Unit's Index of Democracy	75%
	41	Corruption Perceptions Index	25%

Source: The European House-Ambrosetti, 2010

In turn, the seven dimensions of well-being were aggregated into **three reference clusters**, for which **three sub-indices** were calculated:

- **Lifestyle sub-index (15 KPIs)**:
  - "Psycho-physical well-being" (7 KPIs)
  - "Behavioral well-being" (8 KPIs)
- **Wealth and Sustainability sub-index (10 KPIs)**:
  - "Material well-being" (3 KPIs)
  - "Environmental well-being" (7 KPIs)
- **Social and Interpersonal sub-index (16 KPIs)**:
  - "Educational well-being" (6 KPIs)
  - "Social well-being" (8 KPIs)
  - "Political well-being" (2 KPIs)

Figure 2 - Schema of the methodological system used: the BCFN Index and its components

BCFN Index		Relative weighting
35% **Lifestyle sub-index**	**"Psycho-physical" well-being** *(Health)*	**20%**
	"Behavioral" well-being *(Diet and lifestyles)*	**15%**
35% **Wealth and Sustainability sub-index**	**"Material" well-being** *(Income, investments and assets)*	**20%**
	"Environmental" well-being *(Environmental sustainability and quality)*	**15%**
30% **Social and Interpersonal sub-index**	**"Educational" well-being** *(Instruction and culture)*	**10%**
	"Social" well-being *(Welfare, family, society and institutions)*	**10%**
	"Political" well-being *(Democracy and individual freedom)*	**10%**

Source: The European House-Ambrosetti, 2010

The performances of the countries in the various KPIs were rendered homogeneous through the use of a point system. For each KPI, points were assigned as follows: **10 points** to the country with the **best performance** and **1 point** to the country with the **worst performance** among those examined. The remaining countries were assigned a score between 1 and 10 proportionate to the absolute value of the indicator, on a scale obtained using the following formula:

SCALE *= (maximum value - minimum value) / (maximum score - minimum score)*

After determining the scale, the scores for each country were calculated as follows:

SCORE *= [(country value - minimum value) / scale] + 1*

This method made it possible to obtain uniform scores between 1 and 10 for each of the KPIs; these scores can be **compared** and **combined** in summary indicators.

In addition, the attribution of a "**relative weighting**" for each KPI, each aspect of well-being and each of the three sub-indices (as shown in the previous figure) made it possible

(through a simple weighted average) to calculate the partial summary indicators for each of the seven well-being aspects, along with the three sub-indices considered and the final summary indicator, called the **BCFN Index** (which combines the results of the three sub-indices).

Where necessary, the KPIs were relativized using a specific denominator, in order to increase their significance within the context of the national comparison. The data regarding consumption rates, for example, seem more significant (in this context) if compared and expressed in percentage of the available national income with equal purchasing power. By the same token, data regarding obesity or the propensity of a population to do regular exercise can only be compared if expressed in percentage of the overall population, and so forth.

The sections which follow outline the results that emerged from the comparisons between the ten countries examined, the seven dimensions of well-being, the three sub-indices (Lifestyle sub-index, Wealth and sustainability sub-index and Social and interpersonal sub-index) and the BCFN Index. For summary purposes, detailed data for each of the 41 KPIs will not be provided, although they have been included in the partial indices and final index.

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3.2 Lifestyle sub-index

The Lifestyle sub-index is the first taken into consideration in the construction of the BCFN Index. It refers to two specific dimensions of individual well-being: the first involves **health** (referred to as "Psycho-physical well-being") while the other involves **diet** and **lifestyles** (called "Behavioral well-being").

Figure 3 - The Lifestyle sub-Index within the methodological system utilized, with its two dimensions highlighted

BCFN Index		Relative weighting
35% **Lifestyle sub-index**	**"Psycho-physical" well-being** *(Health)*	**20%**
	"Behavioral" well-being *(Diet and lifestyles)*	**15%**
35% **Wealth and Sustainability sub-index**	**"Material" well-being** *(Income, investments and assets)*	**20%**
	"Environmental" well-being *(Environmental sustainability and quality)*	**15%**
30% **Social and Interpersonal sub-index**	**"Educational" well-being** *(Instruction and culture)*	**10%**
	"Social" well-being *(Welfare, family, society and institutions)*	**10%**
	"Political" well-being *(Democracy and individual freedom)*	**10%**

Source: The European House-Ambrosetti, 2010

Analysis of the Lifestyle sub-index is based on a total of **15 KPIs**. Specifically, seven KPIs were considered for "Psycho-physical well-being", and eight KPIs for measuring "Behavioral well-being".

3.2.1 Psycho-physical well-being

"Psycho-physical well-being" is the first of the two dimensions comprising the Lifestyle sub-index. The indicators taken into consideration are:

- **Life expectancy** at birth (number of years);
- **Life expectancy in good health** at birth (number of years);
- **Standardized mortality rate** from **heart disease**, measured as the number of deaths per 100,000 people;
- **Standardized mortality rate** from **tumors**, measured as the number of deaths per 100,000 people;
- **Standardized mortality rate** from **diabetes mellitus**, measured as the number of deaths per 100,000 people;
- **Standardized mortality rate** from **suicides**, measured as the number of deaths per 100,000 people;
- **Expenditure on antidepressants** and mood stabilizers, measured as total sales per person per year.

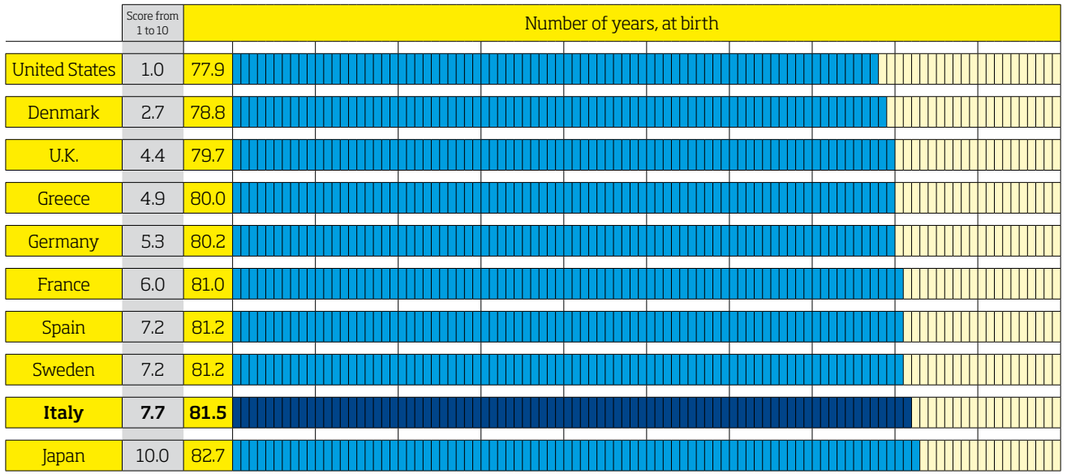
In accordance with the methodology illustrated above, for each of the aforementioned indicators, a ranking was created, giving each country a score from 1 (relative "worst" performance) to 10 (relative "best" performance).

Life expectancy at birth

Life expectancy is the statistically **expected number of years of life remaining at a given age**, in this case, at birth. Here, the life expectancy at birth for each of the ten countries under examination was considered.

Life expectancy was included among the indicators selected for creating the Lifestyle sub-index and BCFN index because it represents a **summary parameter** directly connected to the well-being of populations from a psycho-physical standpoint. Life expectancy is influenced, in fact, by a number of environmental factors, whether context- or lifestyle-related (including diet, health, availability and quality of medical care, criminality, climate, etc.), that are directly connected to the state of "well-being" (from many points of view) in which people live.

Figure 4 - Average life expectancy at birth in 2008, expressed in number of years



Source: The European House-Ambrosetti re-elaboration of data from the World Health Organization and OECD, 2010

Observing the results obtained through creating the indicator in question, it can be seen that life expectancy at birth varies between the ten countries examined. Although they represent a selection of countries that are among the "richest" in the world and all highly socially and economically developed, average life expectancy for the residents of these countries varies, up to as much as five years if the difference between the "best performer" country (Japan) and the lowest-ranked country (the United States) is considered. The variation in this parameter even between nations that are substantially homogeneous from the standpoint of wealth and economic development, represents further confirmation of the impact of behavioral and psycho-physical factors (such as those considered in the BCFN Index methodology) on the well-being of people and unquestionably tied to the length of the lives of these individuals.

In terms of this indicator, Italy is the no. 2 nation among those considered, with an average life expectancy of 81.5 years, followed by Sweden, Spain, France, Germany and Greece, which also had average life expectancy of over 80 years.

Life expectancy in good health

The high levels of average life expectancy presented above are primarily due to the progressive reduction in recent years in the nations examined of death rates of the elderly. In terms of gauging individual well-being, the increase in life expectancy for people to an

age which only fifty or a hundred years ago would have been inconceivable, sparks debate about the quality of life of individuals in their later years. For this reason, analysis was extended to include data for life expectancy in good heath and this, at least to a certain extent, resolves this question. The World Health Organization (WHO) gathers the parameter of average life expectancy in good health for the populations of many nations in the world, and defines this variable as "the average number of years a person can expect to live in 'full health', taking into account all periods affected by diseases and/or convalescence from bodily injury". It is a parameter strongly tied to the psycho-physical well-being of individuals and, for this reason, the relative weight assigned to it is 30%, the highest among the seven indicators considered for measuring psycho-physical well-being.

Figure 5 - Average life expectancy in good health at birth in 2007, expressed in number of years

	Score from 1 to 10	Number of years, at birth
United States	1.0	70.0
Denmark	4.0	72.0
Greece	4.0	72.0
U.K.	4.0	72.0
Francia	5.5	73.0
Germany	5.5	73.0
Italy	**7.0**	**74.0**
Spain	7.0	74.0
Sweden	7.0	74.0
Japan	10.0	76.0

Source: The European House-Ambrosetti re-elaboration of data from the World Health Organization, 2010

Observing the data in the figure above, it can be seen that, for all countries, values are lower than for overall life expectancy (in fact, in this case, only the average number of years the citizens of the countries examined can live in full health are taken into consideration). However, there is no significant change in the ranking of each country compared with the previous indicator (average life expectancy).

On average, the Japanese population can "count" on enjoying 76 years of good health, while Americans live, on average, for 70 years of their lives in good health. Italy, Spain and Sweden are equal, with an average life expectancy in good health of 74 years, while this drops to 73 for Spain and Germany. Greece and Denmark share a value of 72 years.

Mortality rate from heart disease

Diseases of the cardiovascular system[1] are the **no. 1 cause of death in all developed countries**; these pathologies are often disabling and their spread is destined to grow because of the continued rise in life expectancy (as seen above). The main proven **risk factors** are tied above all to **improper lifestyles**, however, since it involves problems linked to the psycho-physical sphere of individuals and their well-being, from a methodological standpoint, the indicator for these diseases was considered as part of the calculation of psycho-physical well-being. Behavioral factors (such as lifestyles) which impact on the well-being of people were measured through the KPI set selected to calculate the behavioral aspect of well-being (which, together with psycho-physical well-being, comprises

1 *For example, heart attack, hypertension, thrombosis, aneurism, stroke, etc.*

Ed Kashi/National Geographic Image Collection

Data from the World Health Organization[2] indicate that in 2005, worldwide, there were **17.5 million deaths due to cardiovascular disease, 30% of all deaths**. Of these, 7.6 million were due to coronary problems and 5.7 million to stroke. By **2015**, it is calculated that the number of deaths caused by cardiovascular disease on a global level will rise to **20 million individuals**, becoming the no. 1 cause of death in the world.

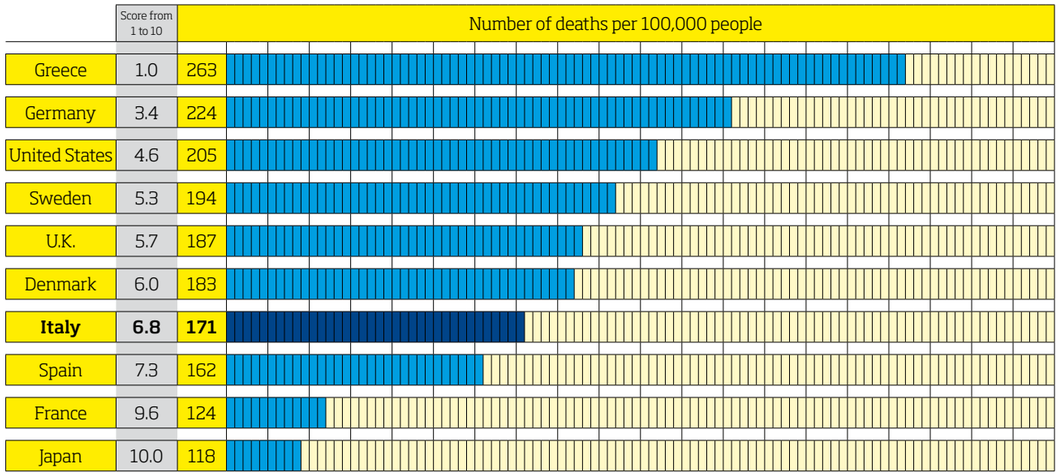
For the year 2006 in the United States, it is estimated that 80 million people were affected by one or more cardiovascular pathologies. Deaths for the year 2005 indicate, however, that over 864,000 people died following cardiovascular disease (35.3% of the total, i.e., one out of every 2.8 deaths), with coronary pathologies being the primary cause of death overall (445,000 deaths). In the United States, the number of deaths caused by cardiovascular disease is much higher than the sum of deaths due to cancer (559,000), accidents (117,000) and HIV/AIDS (12,000).[3]

For the European continent, on the other hand, cardiovascular pathologies are responsible for 4.3 million deaths each year (2 million within the European Union).[4] Coronary pathologies represent the disease responsible for the largest number of deaths (1.9 million deaths in all Europe and more than 741,000 in member states of the European Union).

The following chart offers the results of the indicator selected for the standardized mortality rate for heart disease.

2 *Source: "Cardiovascular diseases", Fact sheet no. 317, February 2007, World Health Organization*
3 *Source: "Heart Disease & Stroke Statistics. 2009 Update at-a-glance", American Heart Association, 2009*
4 *Source: "European cardiovascular disease statistics 2008", British Heart Foundation; Health Promotion Research Group, Department of Public Health, University of Oxford; Health Economics Research Centre, Department of Public Health, University of Oxford, 2009*

Figure 6 - Standardized mortality rate from heart disease, measured as the number of deaths per 100,000 people, 2006



Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

As can be seen in the chart, within the comparison of the boundary of analysis under consideration, the nation with the highest mortality rate due to heart disease is Greece, followed by Germany and the United States. Japan, on the other hand, has the lowest heart disease mortality rate, with an average of 118 deaths annually per 100,000 people. Italy, with 171 deaths per 100,000 people, has an incidence of heart disease that is higher than only those of Spain, France and Japan.

Mortality rate from tumors

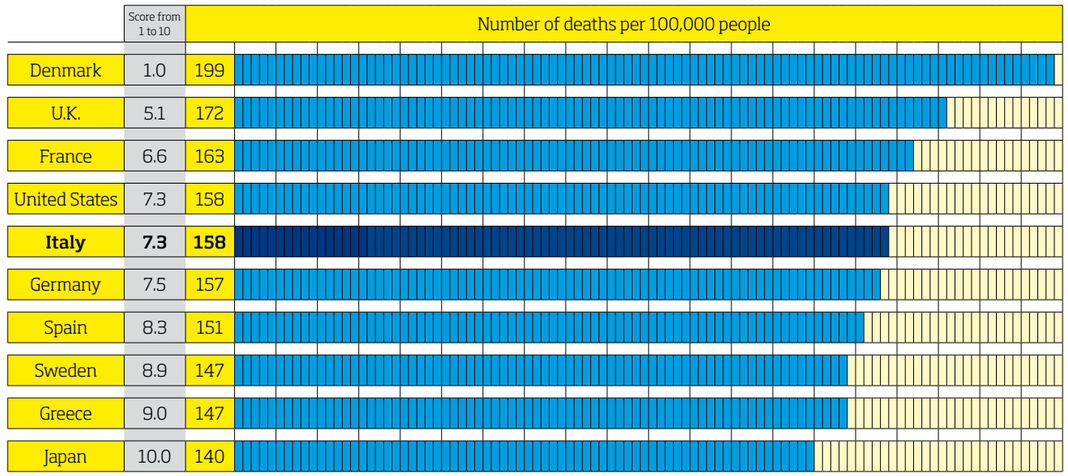
Tumors are the second cause of death in the world, in Europe and in Italy. In addition, it is a **pathology which continues to rise** and with a strong negative impact on the psycho-physical condition of the individual during the course of the disease (generally prolonged, even in the event of positive treatment results). Because it is a pathology which generally affects people later on in years, as already noted in relation to incidence of heart disease, the lengthening of average life span is an important factor in their growing spread. In 2007, it was estimated that there were 12 million new cases of tumors in the world.[5]

The types of tumors that cause the greatest number of deaths on a world level are lung tumors (1.3 million deaths per year), stomach tumors (803,000 deaths per year), colon-rectal tumors (639,000 deaths per years), liver tumors (610,000 deaths per year) and breast tumors (519,000 deaths per year). Estimates for the future indicate a growth worldwide in deaths caused by tumors, up to a level of **9 million in 2015** and **11.4 million in 2030**, the net majority of which will be in medium-to-low income countries.

Given the major impact this type of disease, unfortunately, has on individual well-being, the mortality rate for tumors expressed as the number of deaths per 100,000 people accounts for a relative weight of 15% in psycho-physical well-being, equal to the weight assigned for the mortality rate due to heart disease.

5 *Source: "Global Cancer Facts&Figures 2007", American Cancer Society*

Figure 7 - Standardized mortality rate from tumors, measured as the number of deaths per 100,000 people, 2006



Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

As clearly seen in the chart, the country with the lowest rate of deaths from tumors per 100,000 people is Japan (as was also seen in relation to deaths from heart disease). It is followed by Greece and Sweden (with the same rate), Spain and Germany. Italy, with an annual average of 158 deaths per 100,000 people, is fifth out of the ten countries considered, followed by the United States, France, the United Kingdom and Denmark.

Aside from the direct impact on individual psycho-physical well-being, the incidence of tumors is directly connected to the lifestyle behavior (diet, physical activity, etc.) of people. Also for this reason, as will be seen below, in measuring behavioral well-being, included were a number of indicators related to those behavioral models that can have greatest influence on the development of tumors or, on the other hand, make it possible to lower the risk factors for this type of disease. It is estimated, in fact, that approx. 40% of tumor deaths could be prevented by working on risk factors of this pathology that can be modified. First on the list is smoking, far and away the most significant risk (21%), **alcohol abuse** (5%) and **low consumption of fruit and vegetables** (5%).

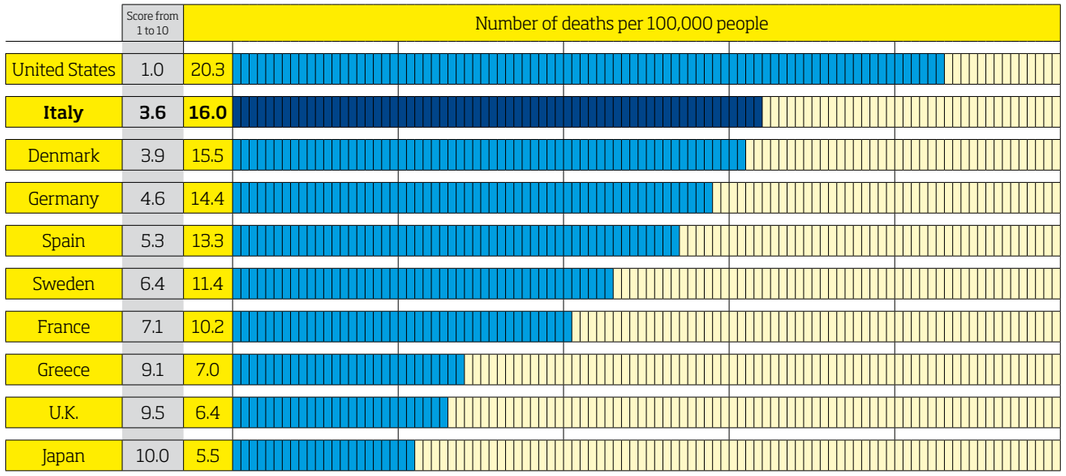
Mortality rate from diabetes

Diabetes is one of the **most common chronic pathologies throughout the world**, especially in highly-industrialized countries and is one of the most significant and costly social diseases of our day. Especially because it is a chronic disease and tends to create complications over the long-term, this pathology can have a major impact on the psycho-physical well-being of people. In addition to problems the disease itself generates for the health and well-being of an individual (for example, complications related to this disease cause cardiovascular and kidney ailments, as well as vision problems), it is estimated that diabetes reduces average life expectancy in patients from 5 to 7 years. In addition, although diabetes is a pathology that appears above all in later years, it is expected that there will be a gradual increase in the spread of this disease among relatively young individuals.

Once again in the case of diabetes, the causes of the onset of the disease can be found in a number of behavioral factors (which will be discussed further on), including the proliferation of improper eating habits, growth in the number of overweight/obese individuals, spread of increasingly-sedentary lifestyles, etc.

Using the year 2007 as a point of reference, among people between 20 and 79 years of age, it is estimated that the prevalence[6] of this disease worldwide is 5.9%,[7] which is 246 million patients for an increase of approx. 27% over 2003 (when it was estimated that 194 million people were affected by this disease). Each year around the globe more than 7 million new cases of diabetes are reported (one every 5 seconds).[8] Forecasts for 2025 indicate a significant increase in prevalence which will reach 7.1% of the population, involving 380 million people throughout the world, for an increase of 54.5% over 2007. In terms of Italy, ISTAT has estimated that in 2008, there was a prevalence of diabetes in the population of 4.8%[9] (higher for women, 5.2%, compared with men, 4.4%). On the basis of this data, the number of people in Italy with diabetes is approximately 2.8 million.

Figure 8 - Standardized mortality rate from diabetes mellitus, measured as the number of deaths per 100,000 people, 2006



Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

As can be seen from the analysis of the results of this indicator (see chart), the US population has the highest incidence of deaths from diabetes (approx. 20 deaths per year per 100,000 people), although it could be noted that in absolute terms, this mortality rate is significantly lower than values for heart disease or tumors. Also for Italy, mortality rates due to diabetes are among the highest for the ten countries examined in this study. Once again, Japan is the most "virtuous" country from this standpoint (in fact, as has been seen, Japan has the best performance in all indicators presented above).

Mortality rate from suicide

Measurement of the psychological sphere of individual well-being, part of the psycho-physical well-being indicator, was carried out through the use of two indicators, one of which was the standardized mortality rate from suicide expressed as the average number of deaths from suicide per year per 100,000 people.

Suicide as a phenomenon represents the extreme manifestation of serious situations of psychological malaise that can be the result of a series of external and internal factors (cultural, environmental, social, familial, etc.).

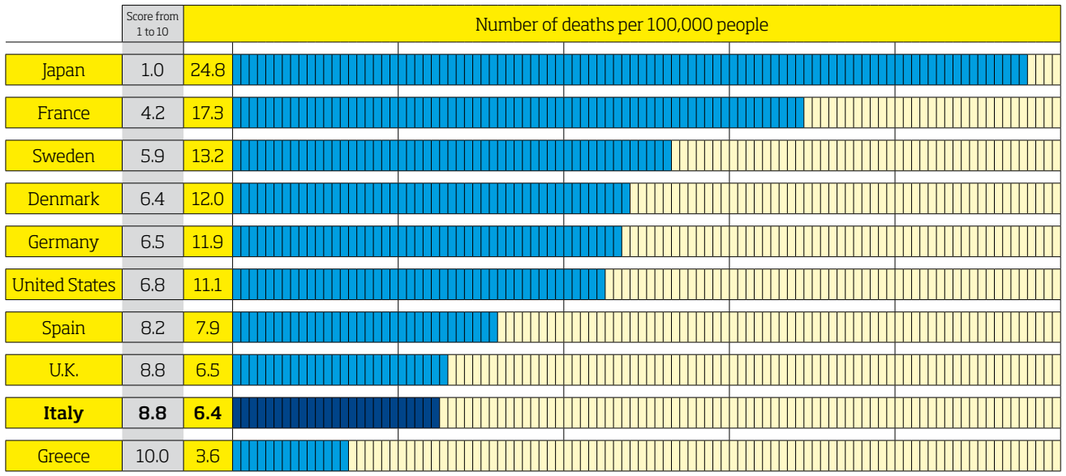
6 *Prevalence measures the number of individuals (in a population) affected by a particular disease at that given moment.*
7 *The vast majority of cases (85-95%) involve type 2 mellitus diabetes, or non-insulin dependent diabetes.*
8 *Source: "Diabetes Atlas", International Diabetes Federation, 2009 (http://www.eatlas.idf.org/)*
9 *According to the International Diabetes Federation, the level is 5.8%*

The World Health Organization estimates that there are nearly one million suicides per year throughout the world, with a "global" mortality rate of 16 deaths per 100,000 people (which translates into one death every 40 seconds). In the last 45 years, suicide rates have increased 60% on a worldwide level. In some countries, suicide is among the main causes of death for individuals between 15 and 44 years of age, and the second cause of death for those between 10 and 24. Added to these figures should also be those for attempted suicide which it is estimated could be 20 times more frequent than successful suicides.

Mental disorders (in particular depression and disturbances related to alcohol abuse) are the primary risk factor for suicide in Europe and North America, while in Asian countries (again according to the WHO), cultural factors and impulse seem to play a very important role.

The data gathered for the ten countries examined are given in the chart below.

Figure 9 - Standardized mortality rate from suicide, measured as the number of deaths per 100,000 people, most recent year available for each country



Source: The European House-Ambrosetti re-elaboration of data from the World Health Organization, 2010

James L. Stanfield/National Geographic Image Collection

As can be seen from the chart, the statistics show that, in some cases, psychological well-being and physical well-being may be diametrically opposed. For example, Greece is the country with the lowest rate of suicide among those examined, from which it could be deduced that there is greater psychological well-being among the population, despite the fact that the indicators used to quantify physical well-being often put this country low in the rankings. On the contrary, Japan, which was no. 1 in all the indicators involving physical well-being examined, would appear in this case to be the country with the highest mortality rate from suicide.

In terms of the other countries studied, Italy has a relatively low suicide rate (although almost double that of Greece), followed by the United Kingdom, Spain and the United States. In addition to Japan, the other countries with the highest suicide mortality rates are France, Sweden and Denmark.

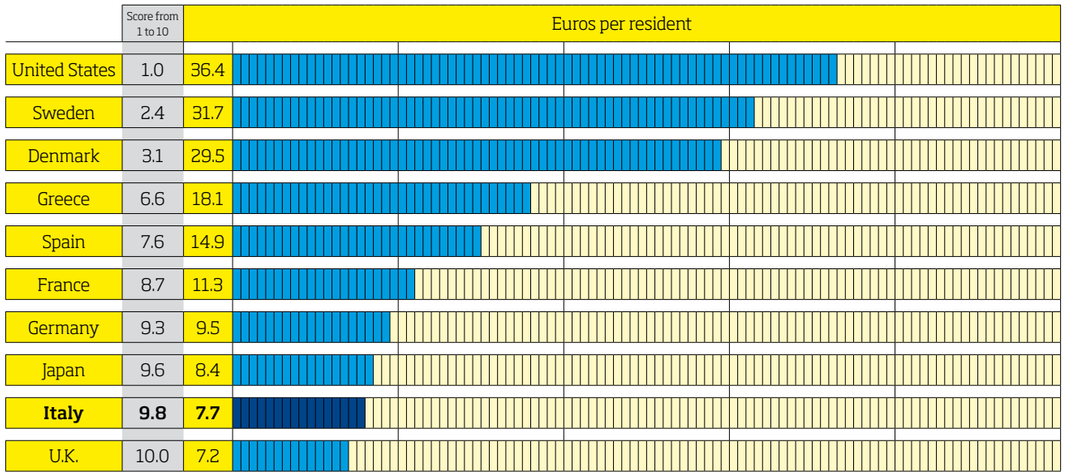
In terms of suicide prevention, the World Health Organization maintains that a strategy of limiting access to common methods of suicide, such as firearms and toxic substances, has had some efficacy. Nonetheless, the WHO adamantly stresses that action to reduce suicide rates must be carried out on a number of fronts using a range of levels and modes of intervention. For example, there is convincing evidence that prevention and treatment of depression and alcohol abuse can reduce suicide rates in a population, as can long-term psychological assistance for those who have attempted suicide.

Expenditure on antidepressants and mood stabilizers

The second indicator utilized to measure the "psychological" aspect of psycho-physical well-being of individuals is average annual per capita expenditure for the purchase of antidepressant and mood stabilizing drugs. This indicator was selected because it is fairly representative of the overall level of "psychological malaise" of a population.

The chart below provides a summary of the analysis results for this indicator.

Figure 10 - Annual per capita expenditure on antidepressant and mood stabilizing drugs, euros per inhabitant, 2010



Source: The European House-Ambrosetti re-elaboration of IMS Health Spa data

From the results presented in the chart, it can be seen that the populations of the United States and Scandinavian countries in Europe consume significantly higher amounts of antidepressants and mood stabilizers than other countries examined. The United Kingdom, Italy and Japan, on the other hand, are the countries with the lowest per capita expenditure on antidepressants compared with the other countries in the study.

If the figure for Japan is compared to the results for the indicator for suicide mortality rates, the two data could seem to contradict each other. Nonetheless, it is possible that, in this case, it could reflect cultural differences between the countries, on the basis of which individuals in Japan could be driven to suicide for cultural reasons under specific situations, without necessarily being depressed or subject to other forms of psychological malaise.

Psycho-physical well-being summary indicator

"**Psycho-physical well-being**" is an **innovative**, **distinctive contribution** of the BCFN Index compared to other existing indices for measuring well-being. From the analysis of international scientific literature and on the basis of suggestions which emerged during the meetings of the Advisory Board, weightings were assigned to every component analyzed.

The specific weightings utilized for measuring are the following:

- **Life expectancy** at birth (number of years) - Relative weighting: **10%**;
- **Life expectancy in good health** at birth (number of years) - Relative weighting: **30%**;
- **Standardized mortality rate** from **heart disease**, measured as the number of deaths per 100,000 people - Relative weighting: **15%**;
- **Standardized mortality rate** from **tumors**, measured as the number of deaths per 100,000 people - Relative weighting: **15%**;
- **Standardized mortality rate** from **diabetes mellitus**, measured as the number of deaths per 100,000 people - Relative weighting: **10%**;
- **Standardized mortality rate** from **suicides**, measured as the number of deaths per 100,000 people - Relative weighting: **10%**;
- **Expenditure on antidepressants** and mood stabilizers, measured as total sales per person per year - Relative weighting: **10%**.

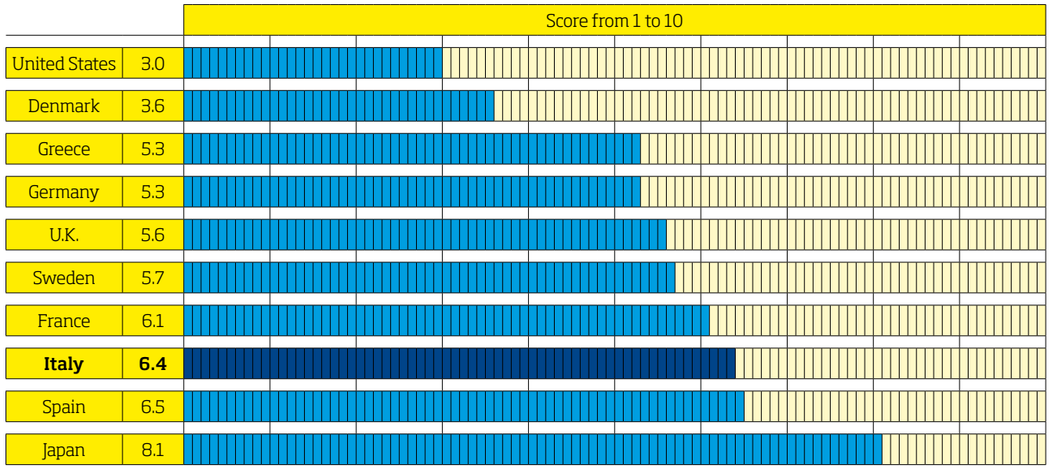
As can be seen, a higher weighting was assigned the KPIs related to life expectancy in good health and mortality rates for chronic diseases.

In accordance with the methodology illustrated previously, for each of the aforementioned indicators, a ranking was created, giving each country a score from 1 (relative "worst" performance) to 10 (relative "best" performance).

Sarah Leen/National Geographic Image Collection

Assigning a score to each of the countries for the 7 KPIs and their weighting based on the assigned weightings, made it possible to obtain a provisional summary index regarding the dimension of "psycho-physical well-being".

Figure 11 - Ranking for "Psycho-physical well-being"



Source: The European House-Ambrosetti, 2010

As is clear from the chart, Japan is the country with the highest psycho-physical well-being index within the benchmark perimeter taken into consideration, obtaining an overall score of 8.1 points on a scale of 1 (minimum) to 10 (maximum). Japan's position at the top of the ranking is the result of the country's high performance in indicators related to physical well-being, including the highest average life expectancy and lowest mortality rates (within the ten countries examined) for chronic diseases (heart disease, tumors and diabetes), which compensate for its very high mortality rate from suicide.

Italy is ranked third for psycho-physical well-being, with a score similar to that of Spain (second in the psycho-physical well-being index) and France (in fourth place). Italy's position reflects some decidedly positive performances, such as for average life expectancy and average life expectancy in good health, second only to the figures for Japan, and a generally "high" level of well-being connected to the psychological sphere of the population as seen from a low rate of suicide and average low annual per capita expenditure for antidepressants and mood stabilizers.

Sweden, the United Kingdom, Germany and Greece, with relative scores between 5.3 and 5.7, are mid-way in the ranking, while Denmark and the United States are the countries with the lowest psycho-physical well-being index among those examined. The US, in particular, is the country with the lowest average life expectancy, about five years less than Japan (and this increases to six if life expectancy in good health is taken into consideration). In addition, the United States has a very high level of consumption of antidepressants and mood stabilizers compared with the other countries in this study, as well as a significant incidence of chronic diseases among the main causes of death of the population.

As mentioned previously, the psycho-physical well-being of individuals may be influenced in large part by personal behavior and lifestyles (diet, lifestyle, sports activity, etc.). For this reason, analysis of the so-called "Lifestyle sub-index" (with a weighted impact of 35% within the BCFN Index overall) was supplemented by a set of 8 KPIs selected to measure behavioral well-being. These are presented in the section which follows.

3.2.2 Behavioral well-being

Measurement of "Behavioral well-being" is the **innovative** and **distinctive aspect** of the BCFN Index compared to other existing indices for measuring well-being.

This component has been included in the model because, based on the results of BCFN research, the comments of the BCFN Advisory Board and the scientific debate on the theme of measuring well-being of countries, the conviction emerged that a part of individual well-being also depends on **lifestyle and dietary choices** and, as a result, the overall state of health.

Accordingly, the term "Behavioral well-being" refers to the analysis of those variables relating to diet and lifestyle which, on the basis of the leading scientific studies analyzed by the BCFN,[10] have a significant influence on the general well-being of individuals.

Specifically, the indicators used for measurement are:

- **Obese and overweight adult population** (IMC>25kg/m^2), measured as a percentage of the adult population;
- **Obese and overweight youth population** (11-15 years) (IMC>25Kg/m^2), measured as a percentage of the population aged between 11 and 15 years;
- **Physical activity**, measured as the portion of the population declaring to be involved in regular physical activity;
- **Expenditure on fruit and vegetables** in terms of the percentage of available income:
- **Percentage of adult smokers**, measured against the total adult population;
- **Average alcohol consumption**, measured as the average number of liters consumed per adult;
- **Average daily calorie intake per person**;
- **Average time spent on meals**.

In our opinion, these **8 KPIs**, seem to provide good ***proxies* regarding the adequacy of the diet and lifestyle adopted**. Given below is a detailed explanation of their inclusion in the "behavioral well-being" indicator.

Obese and overweight members of the adult population

The percentage of the adult population which is obese and overweight is an aspect correlated to the lifestyle and diet adopted. In fact, numerous studies show that **overweight and obesity have a positive correlation with the risk of contracting chronic diseases** (heart disease, diabetes and tumors).

As shown in recent studies, including that of Franz et al. (2002),[11] overweight and obesity in the population is so detrimental that an average reduction of body weight by around 7% can have a positive and significant impact on reducing the possibility of developing type 2 diabetes.

In addition, the International Agency for Research on Cancer[12] has indicated overweight and obesity as factors that augment the risk of colorectal cancer. On a worldwide level, the rates of colorectal cancer are ten times higher in developed countries than in developing countries, and this is due, in large part, to obesity and overweight. Only in the United States where the percentage of obese and overweight people is very high does colorectal

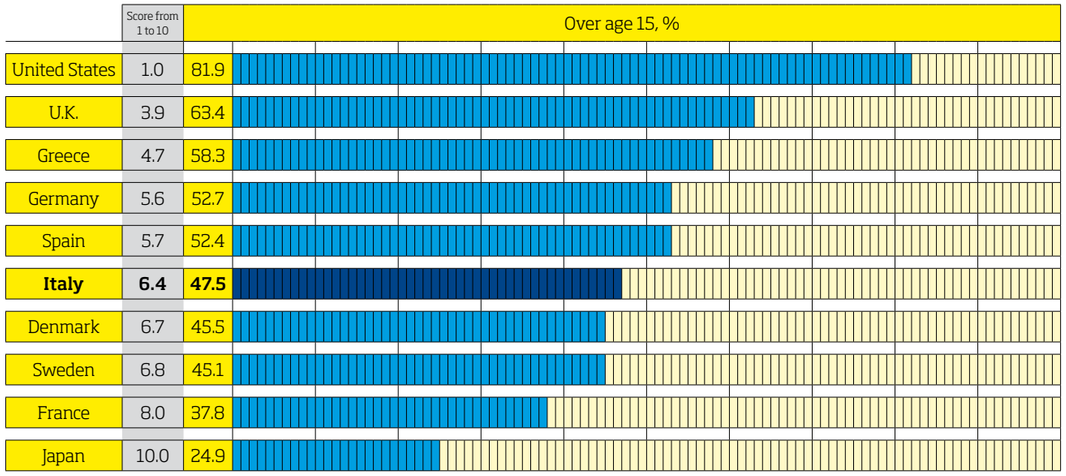
10 *For more information, please refer to the "Alimentazione e Salute" Position Paper published by the Barilla Center for Food & Nutrition in 2009*

11 *Franz MJ, Bantle JP, Beebe CA, Brunzell JD, Chiasson JL, Garg A, Holzmeister LA, Hoogwerf B, Mayer-Davis E, Mooradian AD, Purnell JQ, Wheeler M: Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications. Diabetes Care 25:148-198, 2002*

12 *Overweight and lack of exercise linked to increased cancer risk. In: Weight control and physical activity. Lyon, International Agency for Research on Cancer, (IARC Handbooks of Cancer Prevention, Vol. 6), 2002*

cancer represent the second most prevalent cause of cancer deaths.[13] Overweight and obesity also increase the risk of adenocarcinoma of the esophagus,[14] as well as risk factors for pancreatic tumors,[15] especially if coupled with high consumption of meat and low percentage of vegetables in the diet. Radimer,[16] Trentham-Dietz,[17] Carmichael[18] and Stephenson[19] have noted that overweight, especially in adulthood, represents an increased factor of risk in developing breast cancer, while Amant[20] and Bergstrom[21] have shown that the risk of uterine cancer is approximately three times higher in obese women as opposed to those of normal weight.

Figure 12 - Obese and overweight adult population (IMC > 25kg/m²), measured as a percentage of the adult population



Source: The European House-Ambrosetti re-elaboration of Euromonitor, WHO, Eurostat data, 2010

On a general level, as noted by the WHO, obesity is the cause of nearly 3 million deaths each year. The most recent estimates indicate that in Western Europe and the United States, approximately half a million people die each year for diseases tied to obesity. WHO forecasts for 2020 indicate a significant increase in the number of deaths due to obesity which are expected to reach 5 million deaths per year in the absence of corrective action to change diet and lifestyle.

Statistics regarding obesity and overweight in the United States–as well as in Western Europe–are alarming. Over 8 US adults out of 10 are overweight or obese, in the United Kingdom approx. 6.4 out of 10 and the average in continental Europe is around 5 overweight or obese adults out of 10. Japan is the country with the lowest incidence of adult overweight and obesity, with a percentage under 25%. This data makes it possible to deduce the lifestyles and diets adopted by the populations examined: these results show that, on average, the American and English diet is less-balanced than that in continental Europe or Japan.

13 Jemal A, Siegel R, Ward E, Cancer statistics, CA Cancer J Clin 2006;56:106-130, 2006
14 Brown LM, Adenocarcinoma of the esophagus: role of obesity and diet. Journal of the National Cancer Institute, 87:104–109, 1995. Adenocarcinoma is a malign tumor developed from epithelial cells organized into gland-like structures
15 Michaud DS, Physical activity, obesity, height, and the risk of pancreatic cancer. Journal of the American Medical Association, 286:921-1632, 2001
16 Radimer KL, Ballard-Barbash R, Miller JS, Weight change and the risk of late-onset breast cancer in the original Framingham cohort. Nutr Cancer, 49:7-13, 2004
17 Trentham-Dietz A, Newcomb PA, Egan KM, Weight change and risk of postmenopausal breast cancer (United States). Cancer Causes Control, 11:533-542, 2000
18 Carmichael AR, Bates T. Obesity and breast cancer: a review of the literature. Breast, 13, 2004
19 Stephenson GD, Rose DP. Breast cancer and obesity: an update. Nutr Cancer, 45:1-16, 2003
20 Amant F, Moerman P, Neven P, Endometrial cancer. Lancet, 366:491-505, 2005
21 Bergstrom A, Overweight as an avoidable cause of cancer in Europe. International Journal of Cancer, 91:421-430, 2001

Obese and overweight members of the youth population

For the particularly negative consequences in social, healthcare and economic terms, not only was the percentage of the adult obese and overweight population analyzed, but attention was also focused on the percentage of the youth population that is obese or overweight.

For a child, overweight and obesity can cause a series of physical and psychological consequences that can be so serious that they manifest themselves in childhood (precocious consequences), as well as (often more serious) problems that may be more easily encountered in adulthood (late consequences). The most frequent precocious consequences of childhood obesity are both metabolic (insulin resistance, dyslipidemia, glucose intolerance, high blood pressure) and non-metabolic in nature, such as osteoarticular (valgis of the lower limbs, articular pain, reduced mobility, flat feet), cutaneous (stretch marks, Acanthosis nigricans), hepatic (fatty liver), respiratory (desaturation and nocturnal apnea) and psychological pathologies (poor body image, eating disorders, depression).

In addition, **obesity involves emotional, social and psycho-social consequences that are significant for children and adolescents**.[22] Among these are bullying at school, associated in turn with the risk of depression and anxiety. In general, overweight children have lower self-esteem and are more likely to be excluded by playmates and classmates (a critical aspect for their social and psychological development). And finally, given their lower self-esteem, they are more susceptible to behavior with a negative health impact, such as drinking and smoking.[23]

Karen Kasmauski/National Geographic Image Collection

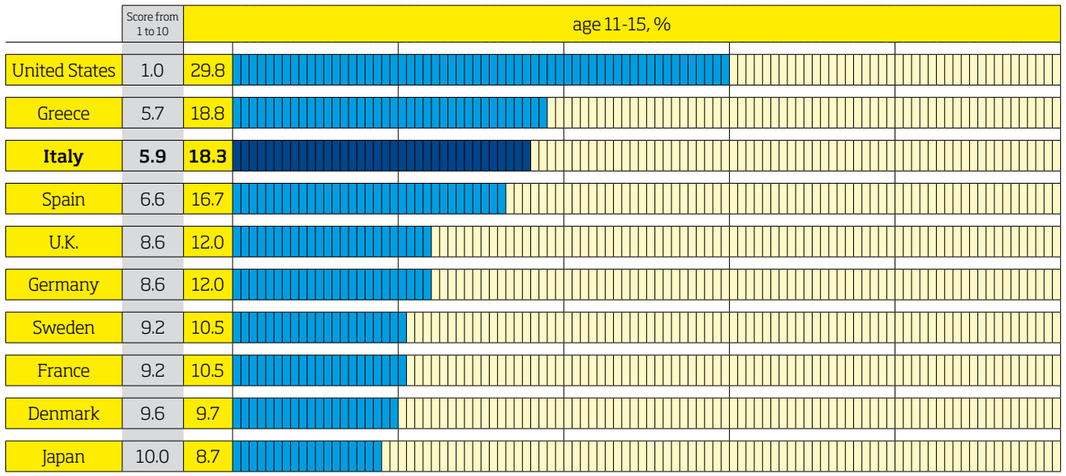
22 Cortese S, et al., "The relationship between body size and depression symptoms in adolescents", J Pediatr. 2009
23 Lobstein T., Baur L., Uauy R., "Obesity in children and young people: a crisis in public health", Obesity Reviews, 2004

The most common of the **consequences** of childhood obesity is **continuation of obesity into adulthood**: approx. **70% of obese adolescents remain so even as adults**.[24]

As a result, information and data regarding the percentage of the youth population that is overweight or obese provide information about whether and in what way obesity persists in adulthood and, therefore, whether and in what way improper lifestyle and unbalanced dietary choices persist, aspects with a direct correlation to increased risk of the onset of chronic diseases.

Individuals who have been overweight/obese when young are more susceptible to cardio-circulatory (high blood pressure, heart disease), muscular-skeletal (early development of arthritis due to static-dynamic stress on spine and lower limb joints most subject to supporting weight) and metabolic pathologies (mellitus diabetes, hypercholesterolemia, hypertriglyceridemia, etc.).

Figure 13 - Obese and overweight youth population (11-15 years) (IMC>25Kg/m^2), measured as a percentage of the population aged between 11 and 15 years



Source: The European House-Ambrosetti re-elaboration of OECD, Eurostat and Japan Statistic Bureau and Statistic Center, 2010

A study published in the *New England Journal of Medicine*[25] which monitored nearly 5,000 American children born between 1945 and 1984, concludes that **childhood obesity** involves a **more than double probability of death by the age of 55** due to the increased risk of developing metabolism-related pathologies, heart disease, high blood pressure, etc.

As with the previous indicator, even in terms of young people, the United States is the country with the highest level of overweight and obese individuals. Almost 3 children out of 10 in the US are obese or overweight, while this value is nearly 2 out of 10 in Greece and Italy, 1.8 out of 10 in Spain and 1.2 out of 10 in the United Kingdom and Germany. Japan, with less than 9%, is once again the country with fewer obese and overweight youth in terms of the total population.

24 Whitaker R.C., et al., "Predicting obesity in young adulthood from childhood and parental obesity", New England Journal of Medicine, 1997
25 Franks P. W. et al., "Childhood Obesity, Other Cardiovascular Risk Factors, and Premature Death", The New England Journal of Medicine, Volume 362:485-493, February 11, 2010

Analysis of the overall question of obesity, including both youth and adults, shows that the relative standings of the countries are more or less the same. Japan is the country with the least number of obese and overweight people in both age brackets, while the United States has the greatest number of obese and overweight individuals in both groups.

For Italy, a disturbing fact is that the country is in sixth place in the ranking of obese and overweight adults, while it is in third place–just behind Greece in second place–in the ranking of percentage of obese and overweight youth. Given the close connection between obesity in childhood and when adult, this could highlight the fact that, in the future in Italy, the percentage of obese or overweight individuals is destined to increase.

Physical activity

Studies show that **regular physical activity**, normally 30 minutes per day almost every day of the week, is **one of the most important factors, if not the most important one, in preventing chronic disease**.

Adopting a lifestyle with adequate physical activity is correlated to an inverse risk of cardiovascular disease, especially coronary disease. Studies by Manson et al. (1992),[26] Kriska et al. (1993),[27] Helmrich et al. (1991),[28] and McAuley et al. (2002)[29] showed that physical activity has positive effects on the risk of the onset of type 2 diabetes.

And finally, the International Agency for Research on Cancer[30] has indicated overweight and physical inactivity as the factors which account for between 20% and 35% of cases in the onset of breast, colon, renal and esophageal cancer.

Generally, worldwide, it is estimated that 1.9 million deaths each year can be linked to physical inactivity.[31] There is manifold scientific evidence that demonstrates how regular physical activity promotes healthy living with noteworthy benefits for overall individual health. Among the positive aspects is the possibility of reducing the risk of developing cardiac disease, cancer and diabetes by up to 50%.

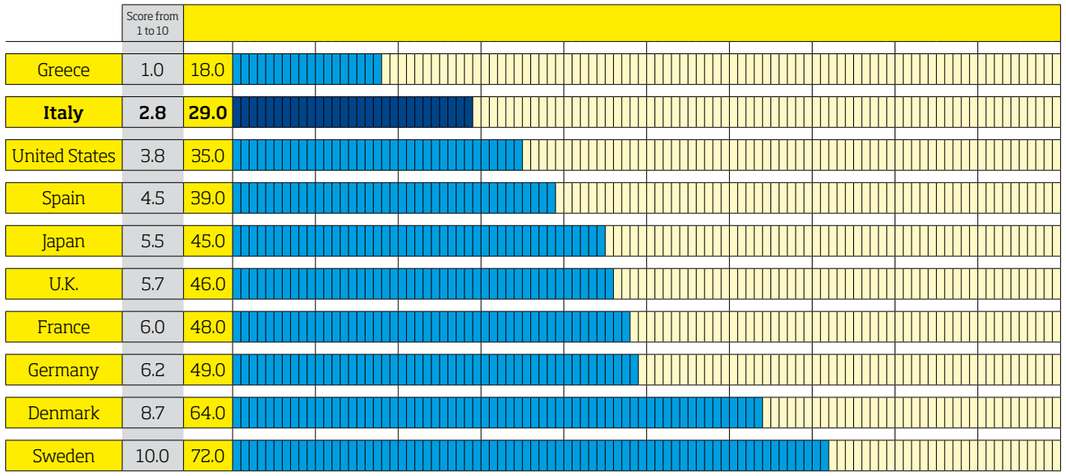
The importance of engaging in regular physical activity is also confirmed by national health programs. In the United States, for example, the "Healthy People 2010" program indicates physical activity as one of the main goals for the country.

Through its "Public Health Programme (2003-2008)", the European Union proposes projects to support and promote physical activity. In Italy, the National Health Plan 2003-2005 stressed the importance to health of physical activity and the subsequent National Health Plan 2006-2008 took on the issue of a sedentary lifestyle, especially from the point of view of the causes of diabetes. The importance of engaging in regular physical activity is also confirmed by national health programs. In the United States, for example, the "*Healthy People 2010*" program indicates physical activity as one of the main goals for the country.

26 Manson JE et al. A prospective study of exercise and incidence of diabetes among US male physicians. Journal of the American Medical Association, 1992, 268:63-67
27 Kriska AM et al. The association of physical activity with obesity, fat distribution and glucose intolerance in Pima Indians. Diabetologia, 1993, 36:863-869
28 Helmrich SP et al. Physical activity and reduced occurrence of non-insulin dependent diabetes mellitus. New England Journal of Medicine, 1991, 325:147-152
29 McAuley K.A., Williams S.M., Mann J.I., et al.: Intensive lifestyle changes are necessary to improve insulin sensitivity: a randomised intervention trial. Diabetes Care 25: 445, 2002.
30 Weight control and physical activity. Lyon, International Agency fo Research on Cancer, (IARC Handbooks of Cancer Prevention, Vol. 6), 2002
31 Source: World Health Organization, "Diet and physical activity: a public health priority"

In conformity with these findings, in order to measure physical activity, *ad hoc* surveys were utilized, the objective of which was to profile the level of average physical activity of people of the countries examined.

Figure 14 - Physical activity, measured as the portion of the population declaring to be involved in regular physical activity



Source: The European House-Ambrosetti re-elaboration of Eurobarometro, American Time Use Survey and Japan Statistic Bureau and Statistic Center data, 2010

From the data, it can be seen that Greece, with 18% who declare they engage in regular physical activity, has a significantly lower level than other countries. Italy is in penultimate place with less than 30% of the population declaring it engages in regular physical activity, while Spain is ranked fourth from the bottom. In general, residents of Scandinavian countries declare on average to engage in regular physical activity in a percentage more than double that of Mediterranean countries (Greece, Italy and Spain).

Expenditure on fruit and vegetables

As demonstrated by numerous studies, there is an **inverse relationship between the consumption of fruit and vegetables and the onset of chronic diseases**[32]. In the absence of statistics on the consumption of fruit and vegetables, **expenditure for fruit and vegetables was used as a proxy for their consumption**. More in particular, expenditure for fruit and vegetables was calculated as a percentage of available income, in order to normalize the data with respect to the income earned.

More specifically, Ness[33], Liu[34], Joshipura[35] and Gilman[36] have discovered that there is a very strong protective relationship between the consumption of fruit and vegetables and the risk of cardiovascular disease. According to the International Agency for Research on Cancer[37] approximately 60% of tumors of the oral cavity are likely to be correlated with a lack of micronutrients, due to a diet with a low fruit and vegetable content. Moreover, the results of medical/scientific studies indicate that the consumption of fruit and vegetables also reduces the onset of colorectal cancer. Analyzing risk factors for stomach tumors, Gonzalez[38], discovered that the consumption of fruit and vegetables is a protective factor against stomach cancer, while Bandera[39] proved that a diet containing high quantities of fruit and vegetables reduces the risk of endometrial cancer. Many studies[40] have also demonstrated that fruit and vegetables also play a protective role against lung cancer.

Generally speaking, it is estimated that as many as 2.7 million deaths a year are attributable to a low intake of fruit and vegetables[41]. It has been proved that, in order to preserve health as much as possible, certain vitamins and nutritional substances contained in fruit and vegetables should be an integral part of the human diet.

Figure 15 - Expenditure on fruit and vegetables as a percentage of available income

Source: Re-elaborations of The European House-Ambrosetti using Eurobarometer data, as well as estimates on data from the United State Department of Agriculture and the Japan Statistic Bureau and Statistic Center, 2010

The graph above shows that, in this particular case the Mediterranean countries, i.e. Greece, Spain and Italy, are those with the highest expenditure on fruit and vegetables out of total available income. Also in this case, the United States comes last, as it does in the ranking for adult and youth obesity, with an expenditure for fruit and vegetables of around 0.7%, thereby distinguishing itself as the only country in the world with a value below 1%.

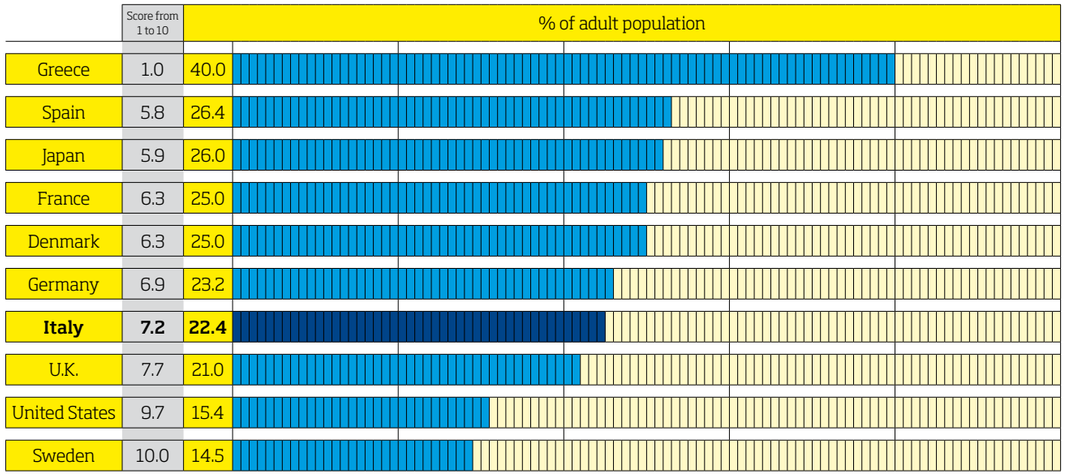
32 *Ness AR, Powles JW. Fruit and vegetables, and cardiovascular disease: a review. International Journal of Epidemiology, 26:1–13, 1997.*
33 *Ness AR, Powles JW. Fruit and vegetables, and cardiovascular disease: a review. International Journal of Epidemiology, 26:1–13, 1997.*
34 *Liu S, Fruit and vegetable intake and risk of cardiovascular disease: the Women's Health Study. American Journal of Clinical Nutrition, 72:922–928, 2000.*
35 *Joshipura KJ, Fruit and vegetable intake in relation to risk of ischemic stroke. Journal of the American Medical Association, 282:1233–1239, 1999.*
36 *Gilman MW et al. Protective effect of fruits and vegetables on development of stroke in men. Journal of the American Medical Association, 273:1113–1117, 1995.*
37 *Cancer: causes, occurrence and control. Lyon, International Agency for Research on Cancer, IARC, 1996; Food, nutrition and the prevention of cancer: a global perspective. Washington, DC, World Cancer Research Fund/American Institute for Cancer Research, 1997.*
38 *Gonzalez CA. Vegetable, fruit and cereal consumption and gastric cancer risk. IARC Sci Publ, 156:79–83, 2002.*
39 *Bandera EV, Kushi LH, Considine DM, The association between food, nutrition, physical activity and the risk of endometrial cancer and underlying mechanisms. In support of the Second WCRF/AICR Report on Food, Nutrition, Physical Activity and the Prevention of Cancer, 2007.*
40 *American Cancer Association, American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention: Reducing the Risk of Cancer With Healthy Food Choices and Physical Activity, 2006.*
41 *Source: World Health Organization, "Diet and physical activity: a public health priority"*

Percentage of adult smokers

The studies conducted have revealed that approx. 30-32% of the responsibility for cancer can be attributed to tobacco consumption[42]. In other words, almost one-third of all tumors is caused by tobacco smoke.

Medical/scientific research has demonstrated that smokers are 30 times more likely to contract tumor-related lung diseases[43] and that tobacco smoke is, in 80% of cases, the element responsible for lung tumors in developed countries[44]. It is also one of the main risk factors for cancer of the mouth, larynx and esophagus. The combination of tobacco smoke with high blood pressure and high cholesterol levels triggers more than three-quarters of the cardiovascular diseases throughout the world which are, in turn, the world's primary cause of death[45].

Figure 16 - Percentage of adult smokers out of the total adult population



Source: The European House-Ambrosetti re-elaboration of OECD data and Japan Statistic Bureau and Statistic Center data, 2010

Nowadays, tobacco smoke accounts for approx. 5 million deaths worldwide and the estimates for 2020 forecast an increase to 9 million deaths, if corrective action is not taken.

Overall, the studies conducted show how tobacco causes or contributes to the onset of cancer in the mouth, throat and lungs, damage to the skin, psoriasis, cardiac disease, gastric ulcers, wrinkles, osteoporosis, cataracts, diabetes, Alzheimer's disease, leukemia, sexual dysfunction, infertility and gum disease.

The results obtained show that, in Greece, 40% (maximum value) of adult citizens are smokers, while in Sweden only 14.5% are smokers (minimum value). Italy ranks fourth with approx. 22% of smokers among its citizens, a score that is lower - albeit only marginally - than that of Germany, France and Spain.

*42 Doll R, Peto R, "**The causes of cancer**", Oxford Medical Publications, 1981*
43 Biesalski HK, Bueno de Mesquita B, Chesson A, Eur Consensus Statement on Lung Cancer: risk factors and prevention. Lung Cancer Panel. CA Cancer J Clin, 48:167-176,1998.
44 Reducing Tobacco Use: A Report of the Surgeon General. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2000
45 Source: World Health Organization, "The World Health Report 2002 - Reducing risks, Promoting Healthy Life"

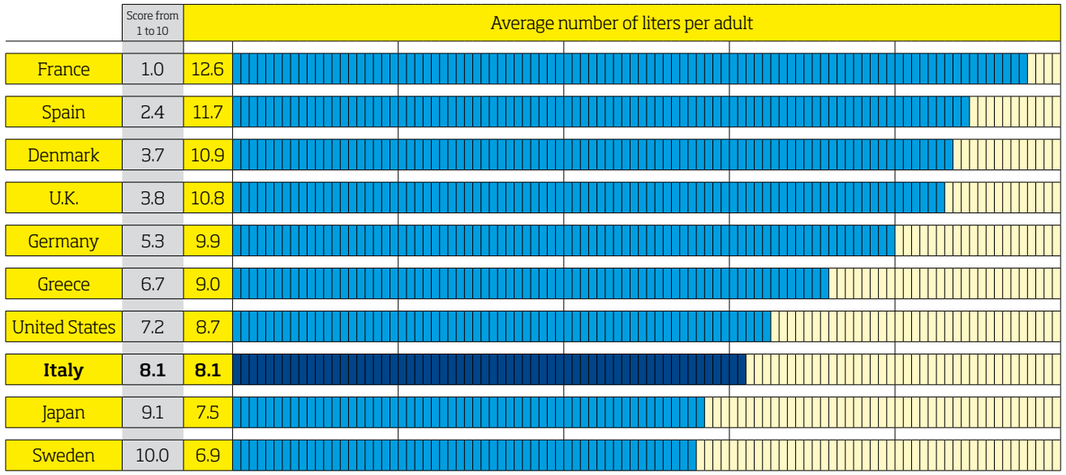
Average consumption of alcohol and alcoholic drinks

Excessive consumption of alcohol is associated with an increase in cardiovascular diseases and is, therefore, not recommended. Some studies have, nonetheless, highlighted that moderate consumption of alcohol can reduce the onset of coronary disease, although agreement to this effect is not unanimous. With reference to cardiovascular diseases, the scientific evidence produced until now does not seem to offer conclusive data on the consumption of alcohol[46].

In this context and in the face of such evidence, negative for excessive consumption of alcohol and conflicting for its consumption in moderate quantities, the recommendations offered by all the leading international scientific associations is to avoid consumption of alcohol and alcoholic drinks.

Proceeding to the relationship between tumors and alcohol, on the other hand, the results appear clearer and more significant. McKillop[47], for example, demonstrated that alcohol consumption is a risk factor for the onset of hepatic cancer, probably through the development of cirrhosis of the liver. Smith-Warner[48] demonstrated how an increase in the daily consumption of alcohol increases the risk of breast cancer. Last but not least, Giovannucci[49], in a number of studies on alcohol found that the consumption of alcoholic drinks is associated with a greater risk of colorectal cancer.

Figure 17 - Consumption of alcohol measured as the average number of liters consumed per adult



Source: The European House-Ambrosetti re-elaboration of OECD 2010 data

As the graph shows, France, with 12.5 liters, comes first in the ranking for the average consumption of alcohol per person per year. Japan, once more, proves itself to be one of the best countries as regards "behavioral well-being".

46 Kerr D., Macdonald I.A., Heller S.R., Tattersall R.B.: Alcohol causes hypoglycaemic unawareness in healthy volunteers and patients with Type 1 (insulin dependent) diabetes. Diabetologia 33: 216, 1990.
47 McKillop I, Schrum L., Alcohol and Liver Cancer, Department of Biology, University of North Carolina at Charlotte, Charlotte, 2005
48 Smith-Warner SA, Alcohol and breast cancer in women: a pooled analysis of cohort studies. Journal of the American Medical Association, 279:535–540, 1998..
49 Giovannucci E, Alcohol, low-methionine, low-folate diets, and risk of colon cancer in men. Journal of the National Cancer Institute, 87:265–273, 1995.

Average daily calorie intake per person

Aware of the differences that can exist between individuals from the same country, or between citizens from different countries, in terms of build and physical activity, a high calorie intake can produce negative effects on body weight and is therefore positively correlated with increased risk of cardiovascular disease.

The combination of foods and nutrients consumed must also be taken into consideration. An individual could, for example, have a correct calorie intake while consuming unhealthy foods or products with high sugar and salt concentrations. So, in addition to the quantity, the calorie combination is also extremely important for human health.

Having said this, some studies[50] have demonstrated that a 5-7% reduction in calories per day in an adult can considerably reduce (60%) the risk of type 2 diabetes.

The general goal, for a healthy diet, is to consume, at most, 10% of daily calorie intake in saturated fats; trans fatty acids (hydrogenated fats) should be limited to less than 1% of a person's daily calorie intake, while polyunsaturated fatty acids should account for between 6% and 10% of the daily calorie requirement. In general, fats should account for between 15% and 30% of the total daily calorie intake. Carbohydrates should account for between 45% and 60%, and proteins between 10% and 20% of the daily calorie intake.

Current trends, particularly in the Western world, point to a continual and constant increase in daily calorie intake together with a tendency to consume foods that are rich in calories.

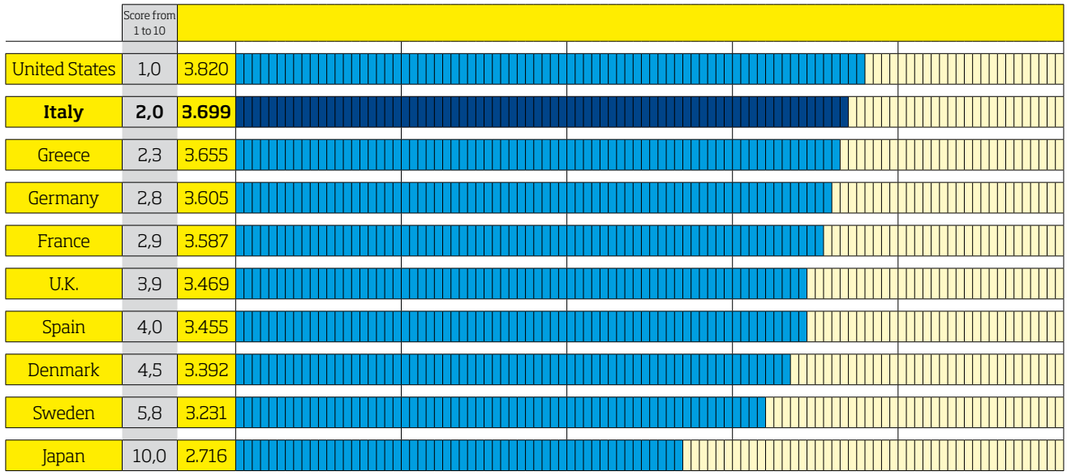
For example, over the past 30 years the calories consumed per day by the average American have risen by 25%, and this increase has been accompanied by an increase in the consumption of foods with a high sugar and fat content. As a consequence of this change in dietary habits, around 65% of Americans are now overweight, a percentage that is substantially higher than that recorded in the Eighties, which was 46% of the population[51].

In conclusion, given the differences in terms of physical build, physical activity and the combination of foods consumed, the indicator for the average quantity of calories consumed by the population may be used as a proxy for the level of overeating that has - and will have in the future - an impact on body weight and, hence, also on the incidence of cardiovascular disease.

50 Ramachandran A, Snehalatha C, Mary S, Mukesh B, Bhaskar AD, Vijay V. The Indian Diabetes Prevention shows that lifestyle modification and metformin prevent type 2 diabetes in Asian Indian with Impaired Glucose Tolerance (IDPP-1). Diabetologia 2006;49:289-97

51 National Institute of Health, Strategic Plan for NIH obesity research, 2004

Figure 18 - Average daily calorie intake



Source: The European House-Ambrosetti re-elaboration of the UN Food and Agriculture Organisation, FAOSTAT, 2010 data

The United States ranks first for daily calorie intake with an average value of over 3,800. Despite being the mother countries of the Mediterranean diet, Italy and Greece hold second and third place. They are followed by Germany and France. Japan is the country with the lowest daily calorie intake: over 1,000 less that those consumed by the Americans which corresponds to approx. 25% less. In other words, the daily calorie intake of the Japanese today is similar to that of the Americans in the 1980s.

Average time spent on meals

The average time spent on meals is a very important factor as regards socialization and the conviviality of sharing meals with family and with friends[52], but even more from the health perspective.

According to a recent study conducted by the Laiko General Hospital in Athens, rushing meals prevents the release of a number of intestinal hormones that trigger the feeling of satiety. So the faster a person eats, the more hungry they feel, since eating quickly leads to a reduction in the release of the satiety hormones which would function correctly if the person were to eat slowly[53].

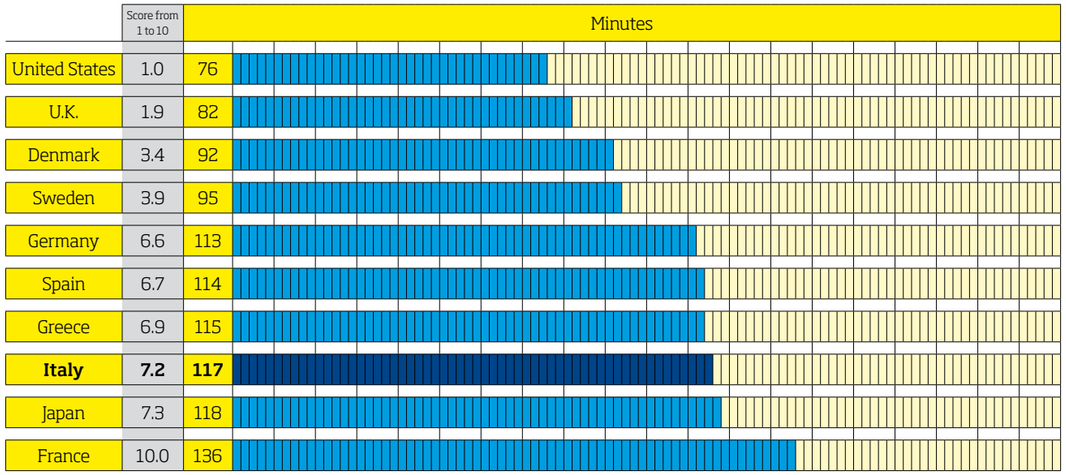
The result is that the body does not receive the signal that it is time to stop eating, and this can lead to overeating. Additionally, the study explains that it takes 12 minutes for satiety signals to reach the brain of thin people and at least 20 minutes for them to reach the brain of obese people.

In addition to this result, the study has also demonstrated that eating slowly can be a way of eating healthy portions.

52 BCFN, Food For Culture, 2009.

53 Kokkinos A., Eating Quickly Is Associated with Overeating, Journal of Clinical Endocrinology & Metabolism (JCEM), 2009.

Figure 19- Average time spent on meals, in minutes



Source: The European House-Ambrosetti re-elaboration of OECD 2010 data

The United States come last from this perspective too, while France gains first place, dedicating two and a quarter hours a day to meals. Japan, Italy, Greece, Spain and Germany spend around two hours per day on meals.

As already mentioned, the BCFN Index distinguishes itself from other already existing well-being indices through the **innovative contribution** offered by "Behavioral well-being". From an analysis of international scientific literature and in compliance with the guidelines developed in the course of the Advisory Board meetings, weightings have been attributed to each component analyzed.

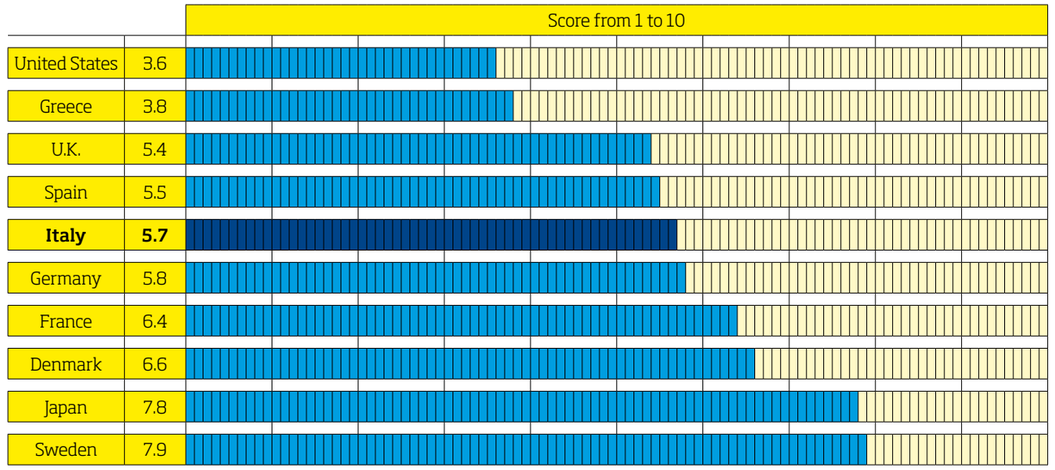
The specific weighting values used in measuring are the following:

- **Obese and overweight adult population (BMI>25kg/m²), measured as a percentage of the adult population** - Relative weighting: **20%**;
- **Obese and overweight youth population (11-15 years) (BMI>25Kg/m²), measured as a percentage of the population aged between 11 and 15 years** - Relative weighting: **10%**;
- **Physical activity, measured as the portion of the population declaring to be involved in regular physical activity** - Relative weighting: **20%**;
- **Expenditure for fruit and vegetables** as a percentage of available income - Relative weighting: **10%**;
- **Percentage of adult smokers, measured against the total adult population** - Relative weighting: **20%**;
- **Average alcohol consumption**, measured as the average number of liters consumed per adult - Relative weighting: **5%**;
- **Average daily calorie intake per person** - Relative weighting: **10%**;
- **Average time spent on meals**, in minutes - Relative weighting: **5%**.

Clearly, greater weighting has been attributed to the KPIs for physical activity, overweight/obesity and smoking, in compliance with the results emerging from key medical and scientific studies.

The results show that Sweden and Japan are the two countries with the best performance from the "behavioral well-being" perspective, while the United States and Greece are the worst. Italy ranks sixth, as it was hampered by the results on physical activity and on the incidence of obesity and overweight in young people.

Figure 20 - Ranking for "Behavioral well-being"

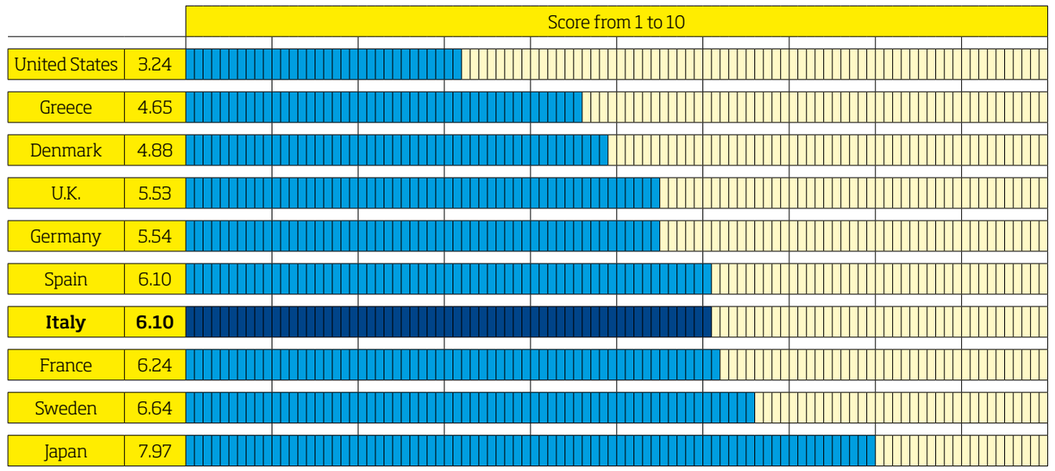


Source: The European House-Ambrosetti, 2010

3.2.3 Summary results of the Lifestyle sub-index

After calculating the summary indicator for "Psycho-physical well-being" and for "Behavioral well-being", the table below shows the ranking of the Lifestyle sub-index obtained, as already indicated, from the weighted average of the two previous summary indicators.

Figure 21 - Ranking of the Lifestyle sub-index



Source: The European House-Ambrosetti, 2010

As the graph shows, Japan gains first place with a score of 7.97, followed, at a certain distance, by Sweden and France. Italy ranks 4th together with Spain, with an average score of 6.10, while the United States comes last with a score of 3.24.

The results show that as regards behavior connected with **health**, **nutrition** and, more in general, lifestyle, the **Japanese** are the citizens who adopt the most **virtuous** choices among the countries considered. In contrast, the **citizens of the United States** are at the opposite extreme. All things considered, the Italians are in a fairly good position, with a score that is practically double that of the United States and not too far from the top positions.

3.3 Other components of the BCFN Index

The Wealth and Sustainability sub-index is the second sub-index considered for the construction of the BCFN Index. This indicator refers to two particular dimensions of the well-being of individuals: the first concerns the sphere of wealth and economic resources (defined "Material well-being"), while the second concerns the quality of the environment and the ecological impact and environmental sustainability of the socio-economic model adopted ("Environmental well-being").

Figure 22 - The Wealth and Sustainability sub-index within the methodological system adopted, showing the two dimensions of which it is formed

BCFN Index		Relative weighting
35% Lifestyle sub-index	"Psycho-physical" well-being *(Health)*	20%
	"Behavioral" well-being *(Diet and lifestyles)*	15%
35% Wealth and Sustainability sub-index	"Material" well-being *(Income, investments and assets)*	20%
	"Environmental" well-being *(Environmental sustainability and quality)*	15%
30% Social and Interpersonal sub-index	"Educational" well-being *(Instruction and culture)*	10%
	"Social" well-being *(Welfare, family, society and institutions)*	10%
	"Political" well-being *(Democracy and individual freedom)*	10%

Source: The European House-Ambrosetti, 2010

The analysis relative to the **Wealth and Sustainability sub-index** considered the countries' performance in **10 KPIs**, utilizing the latest figures available from the statistical sources used. Three and seven performance indicators were employed for calculating "Material well-being" and "Environmental well-being", respectively.

3.3.1 Wealth and Sustainability sub-index

Material well-being

"Material well-being" is the first of the two dimensions making up the Wealth and Sustainability sub-index. The indicators taken into consideration and the weighting values used in measuring are the following:

- **Level of available average *per capita* income**, measured in euros at purchasing power parity;
- **Net household wealth**[54], measured as a percentage of families' available net income;
- ***Per capita* gross fixed investments**, measured as the overall sum of the investments made in the country in proportion with the population.

Following the method described earlier, for each of the aforementioned indicators a partial classification was created, attributing to each country a score of between **1** ("worst" relative performance) and **10** ("best" relative performance).

By way of example, the analyses relative to the two indicators attributed the greatest weighting within "Material well-being" dimension are reported in detail.

Level of available median per capita income

Per capita income is often used to measure the degree of well-being of the population of a country compared to other countries. Generally speaking, it is one of the most widely employed indicators for analyzing the material wealth of a population or a country, *per capita*.

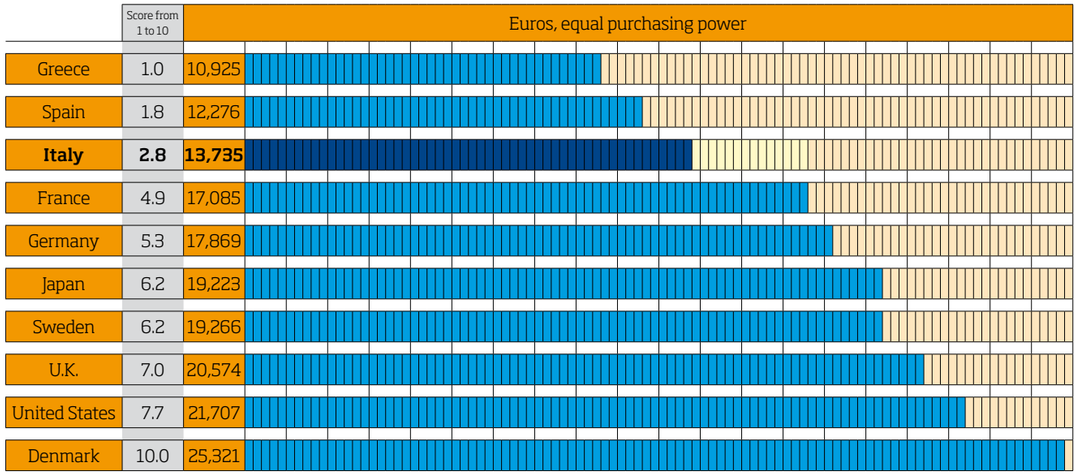
In order to compare the various levels of income recorded in the various countries, the income must be expressed in a leading international currency: the Euro or the Dollar.

In any case, since the *per capita* income does not reveal the distribution of the income within a country, a small group of very wealthy people could increase the average income of the entire population. So, in order to gain a clearer picture of the average wealth of a country, instead of using the average *per capita* income, the available median *per capita* income was used, i.e. the income positioned exactly at the center of the distribution of wealth, in other words the income that divides the sample in half.

Lastly, since the different currencies of the various countries converted into an internationally recognized currency (Euro or Dollar) do not always accurately reflect the real purchasing power of the currencies, the data were taken from a series already normalized for purchasing power.

54 Also for this indicator, as was possible for the previous one, it would have been more correct to use the median value rather than the average one. In any case, data do not exist for all of the countries under examination.

Figure 23 - Level of available median per capita income, calculated in euros at purchasing power parity



Source: The European House-Ambrosetti using OECD data, 2010

As the graph shows, the first three positions are occupied by Denmark, the United States and the United Kingdom, the only countries with an available median *per capita* income greater than 20,000 Euros per year. France, Germany, Japan and Sweden are positioned in the bracket ranging from approx. 17,000 to 19,200 Euros. Italy ranks third-last with a value of approx. 13,700 Euros, a gap of almost 3,300 Euros from France, which is equivalent to 20% less than the French available median *per capita* income. Greece, in last place, with little more than 11,000 euros, has an available median *per capita* income that is less than half that of Denmark.

Net household wealth

Net household wealth is a very important indicator for assessing the "Material wealth" of a country.

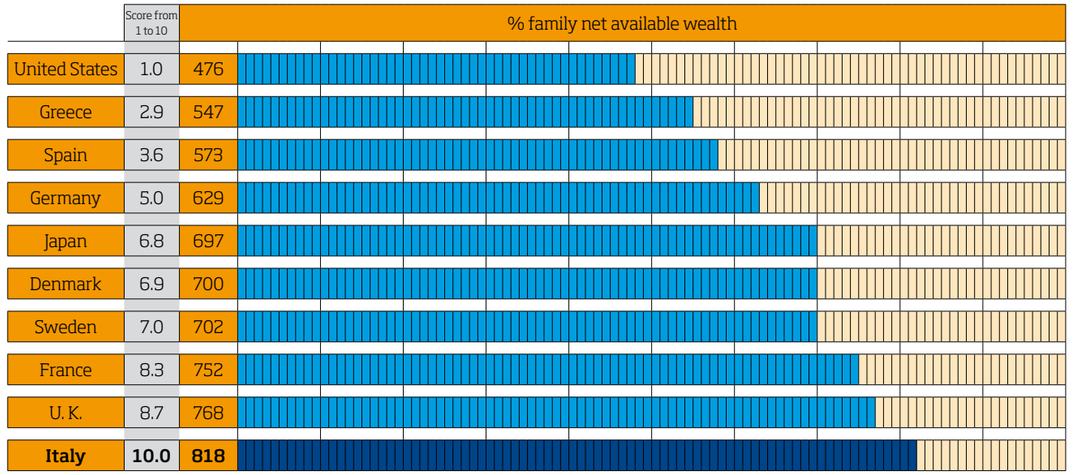
In addition to the traditional income indicators, it is useful also to consider the indicators of the stock of wealth existing in a country, since "material well-being" is obtained from the sum of the two components.

Income, in fact, corresponds to the economic value of the goods and services produced in a year by the citizens of a country and distributed among them in the form of salaries and wages. Wealth, on the other hand, is the stock of activities relating to property (houses and land) and finance (shares, bonds and cash) accumulated over time by the citizens resident in a country.

In tangible terms, the calculation of wealth in the form of stock is an aspect to be considered in economic analyses, as it touches upon an issue that is far from being marginal. a family is rich not only because it currently earns a certain income but because it has a history of accumulation, i.e. judicious management of the assets passed down from generation to generation.

The greater a family's wealth base, the more its well-being will be determined by capital gain, as opposed to income.

Figure 24 - Net household wealth, calculated as a percentage of the families' available net income



Source: The European House-Ambrosetti using OECD data, 2010

From the data analyzed, Italy emerges as the number one country for net household wealth, while the United States - which ranks second for median *per capita* income - comes last.

It is interesting to note that Italy, notwithstanding the difficulties of the last ten years in increasing production levels - and hence, income - is a country that is becoming increasingly wealthier in terms of stock of accumulated income.

An interesting aspect which deserves reflection is that over the last ten years - a period judged to be extremely critical for the Italian economy - the growth rate of wealth in Italy (determined by the flows of savings plus the increase in the net value of the activities) has shown an increase in current value of over 6% per year.

According to an analysis of the Bank of Italy, if every Italian family were to invest (like a Foundation) its assets in a series of property and finance activities, receiving in the long term a real interest rate corresponding to the average growth rate of the world economy, it could count on an average capital income of 18,000 Euros per year, equivalent to 1,500 Euros per month for twelve months. Clearly, in order to calculate wealth, an indicator of this type is absolutely indispensable.

From an analysis of the indices for calculating well-being at an international level and in compliance with the guidelines developed in the course of the Advisory Board meetings, weightings have been attributed to each component analyzed

The specific weighting values used in measuring are the following:

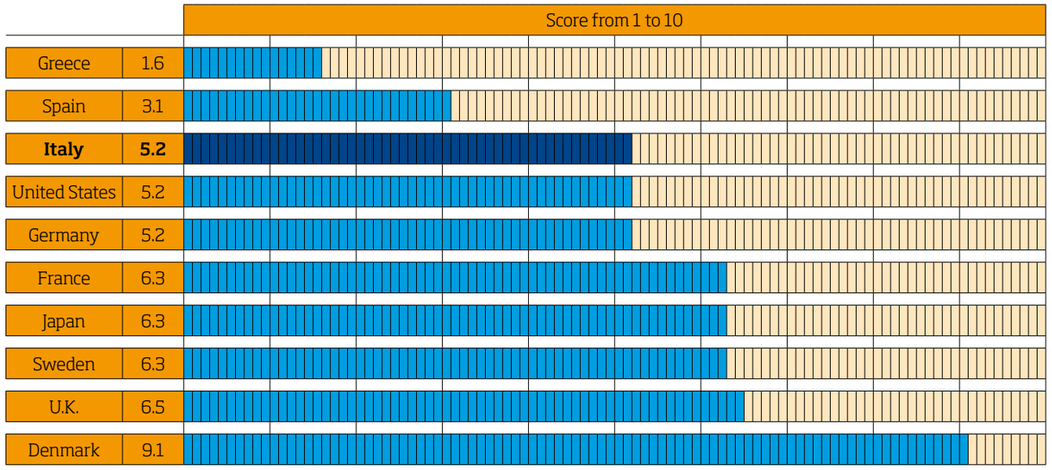
- **Average per capita income level available**, measured in euros at purchasing power parity - Relative weighting: **50%**;
- **Net household wealth**[55], measured as a percentage of the families' available net income - Relative weighting: **30%**;
- ***Per capita* gross fixed investments**, measured as the overall sum of the investments made in the country in proportion with the population - Relative weighting: **20%**.

55 Also for this indicator, as was possible for the previous one, it would have been more correct to use the median value rather than the average one. In any case, complete data do not exist for all of the countries under examination.

Following the method described earlier, for each of the aforementioned indicators a partial classification was created, attributing to each country a score of between **1** ("worst" relative performance) and **10** ("best" relative performance).

The awarding of a score to each country for each of the 3 KPIs analyzed and the weighting of the results obtained with the percentages shown above enabled the calculation of an intermediate summary index for the "Material well-being" dimension. The ranking thus obtained is represented in the figure below.

Figure 25 - Ranking for "Material well-being"



Source: The European House-Ambrosetti, 2010

In the final and summary classification, Denmark gains first place, followed by a group of countries in joint second place composed of the United Kingdom, Sweden, Japan and France. Italy, Germany and the United States all have the same score, while Spain and Greece rank second-last and last, respectively.

Environmental well-being

The second dimension of the *Wealth and Sustainability sub-index* is entitled "Environmental well-being". This component has been included with a view to assessing the current "environmental health" status of a country, together with the environmental sustainability of the socio-economic model of reference.

The indicators taken into consideration and weighting values used in measuring "Environmental well-being" are the following:

- ***Adjusted Net Saving***, i.e. net saving rate, the sustainability indicator calculated by the World Bank which measures the real saving in an economy, while also taking into account the negative externalities deriving from the consumption of natural resources and pollution;
- ***Ecological Footprint*** *per capita*, i.e. the area of the earth's surface required to absorb the pollution generated by the country, measured in *equivalent* global hectares;
- ***Water Footprint*** *per capita*, i.e. the quantity of water absorbed to sustain the national socio-economic model (production of goods and services and personal consumption), measured in cubic meters (virtual);
- **Contribution of renewable sources to the national energy supply, measured as a percentage of the total primary energy supply**;
- **CO^2 emissions deriving from the use of fossil fuels, measured in Kg per person**;
- **Levels of PM10 generated, measured in micrograms per cubic meter**;
- **Urban waste produced, measured in Kg per person**.

The first four indicators refer, in particular, to the **environmental sustainability** dimension, and the next three to the current **quality of the environment**.

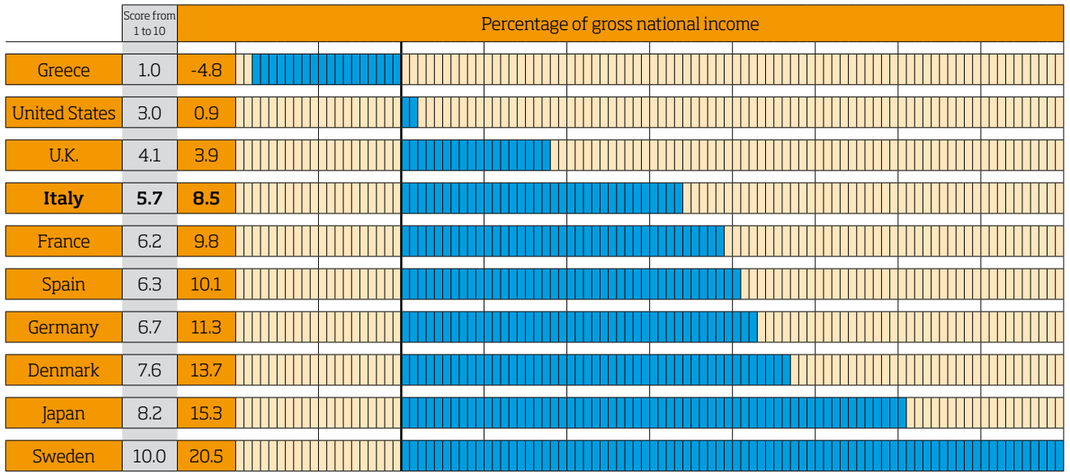
Adjusted net saving

Adjusted net saving is an economic sustainability indicator calculated by the World Bank which measures saving in an economy, considering as negative elements the (negative) externalities deriving from the consumption of natural resources and pollution.

Externalities arise when the action of a party or an activity creates (positive or negative) third party spill over effects for which no compensation is paid in monetary terms, i.e. without a defined price being paid through free market negotiation.

A typical example of negative externalities are those linked to pollution. If the production process of an economic activity releases harmful or polluting substances into the atmosphere, this value is not calculated in the selling price of the good produced from this activity. So, for corporate accounting purposes and at a national level, the income and the wealth produced by the activity is considered, but not the damage wreaked on the environment.

Figure 26 - Adjusted Net Saving



Source: The European House-Ambrosetti using World Bank data, 2010.

Sweden is at the top of the list, followed by Japan and Denmark. Italy ranks fourth before the United Kingdom and the United States, the latter scoring practically zero. Greece, in last place, is the only country with a negative adjusted net saving (net of negative externalities). In other words, the sum of the negative externalities produced are greater than the saving generated.

CO_2 emissions deriving from the use of fossil fuels

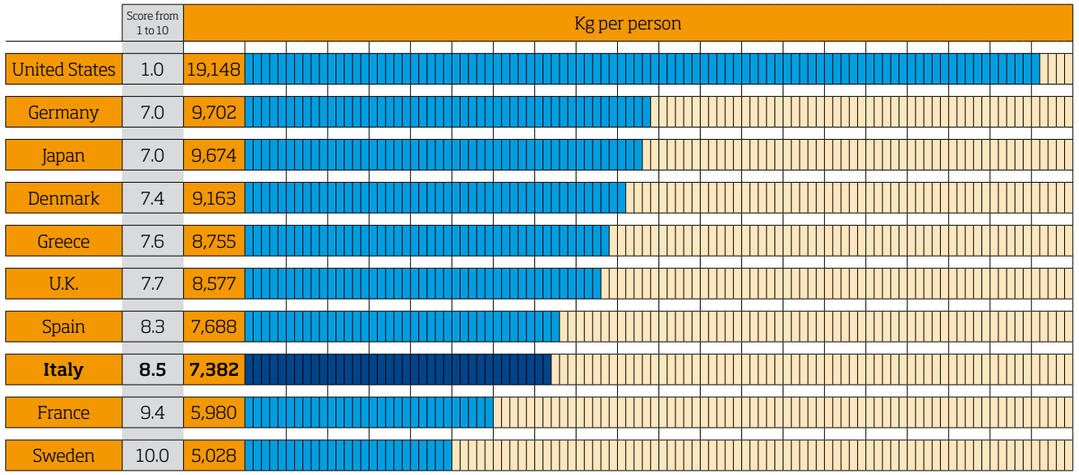
CO_2 emissions represent a very important statistic in the assessment of environmental well-being, as the carbon dioxide (CO_2), naturally present in the ecosystems as a funda-

mental substance in the vital processes of plants and animals, is deemed - in excessive quantities - to be one of the chief causes for the greenhouse effect on the planet.

The global warming theory is based on the increase in the quantity of carbon dioxide in the atmosphere which, generating the greenhouse effect, contributes to an increase in the average temperature of the planet, to which the ecosystems do not have the necessary time to adapt.

The extent of this effect is still under discussion, but the widespread conviction that the Earth's climate is undergoing a generalized warming process has led to the signing of the Kyoto protocol by many countries throughout the world. This protocol is an agreement in which the countries undertake to limiting and reducing carbon dioxide emissions, so that its concentrations remain below established acceptable threshold levels.

Figure 27 - CO_2 emissions deriving from the use of fossil fuels, measured in Kg per person



Source: The European House-Ambrosetti using OECD data, 2010

Normalizing this data per number of persons, the United States has the highest carbon dioxide emissions in kilograms per person of all the countries considered, and therefore it occupies the last place. The average quantity of CO_2 emitted by an American is 20 tons, against the 5 tons (approx.) emitted by a Swede.

Germany (second-last) and Japan (third-last) emit an average quantity of 9.7 tons of CO_2 per person, half the amount of the United States; Italy ranks third with emissions of approx. 7.4 tons, behind France, which gains second place with almost 6 tons of CO_2 emissions per person.

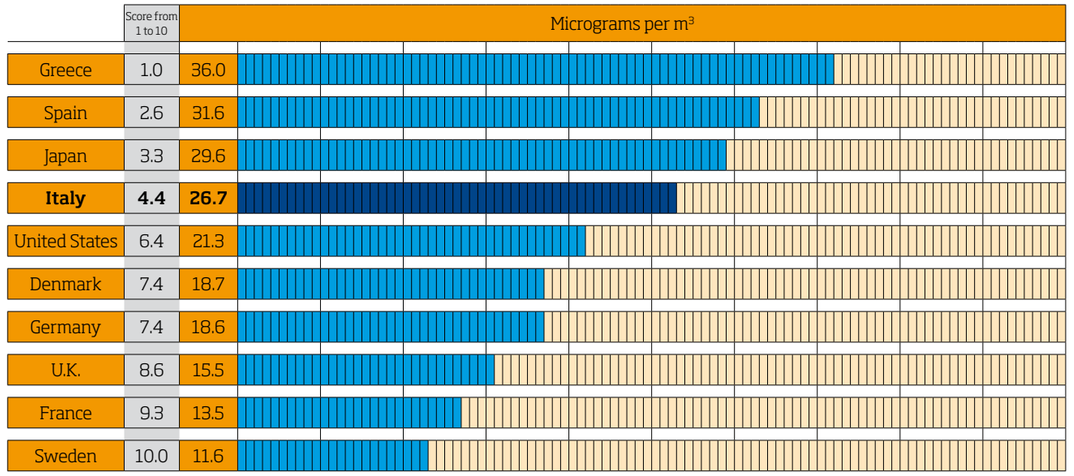
Levels of PM10

In recent years, among the main atmospheric pollutants, special attention has been dedicated to the PM10 concentration in the atmosphere, as evidence has emerged demonstrating the extent to which these particles are hazardous to human health.

PM10 is an acronym which indicates the dust particles present in the atmosphere that have an aerodynamic diameter of less than 10 µm (10 thousandths of a millimeter). These dust particles have the power to penetrate the lower respiratory tract as far as the thorax (bronchi and lungs), causing irritations of the primary respiratory tract and effects of varying gravity such as inflammations and worsening of chronic respiratory diseases.

For these reasons, the quantities of PM10, calculated in micrograms per m^3, were calculated in the countries under examination.

Figure 28 - Levels of PM10 generated, measured in micrograms per cubic meter



Source: The European House-Ambrosetti using World Bank data, 2010

Also in this case, Sweden ranks first with 11.6 micrograms of PM10 per m^3, while Greece ranks last with 36 micrograms of PM10 per m^3, 300% more than the former country. Italy, with 26.7 micrograms of PM10 per m^3, is fourth-last, after the United States, Denmark, Germany, the United Kingdom and France.

From an analysis of the indices for calculating well-being at an international level and in compliance with the guidelines developed in the course of the Advisory Board meetings, weightings have been attributed to each component analyzed.

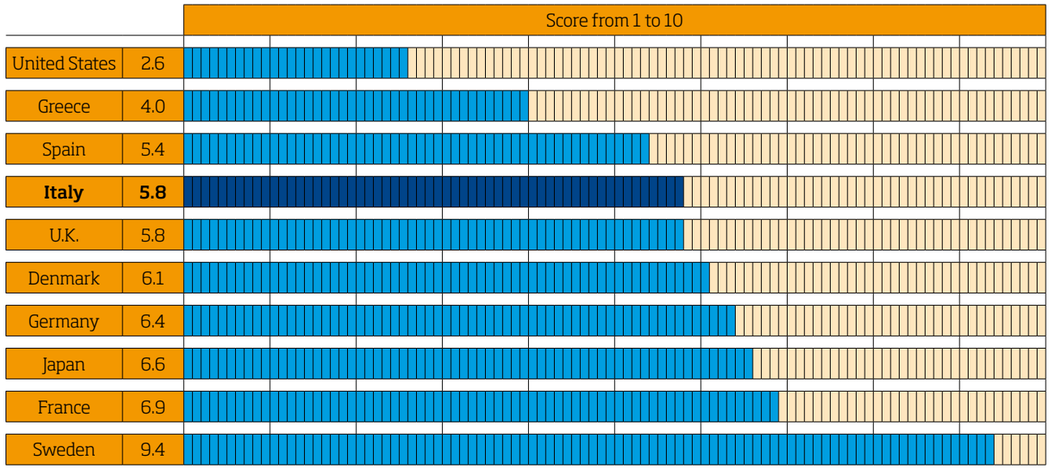
The specific weighting values used in measuring are the following:

- ***Adjusted Net Saving***, i.e. the net saving rate, the sustainability indicator calculated by the World Bank which measures the real saving in an economy, also considering the negative externalities deriving from the consumption of natural resources and pollution - Relative weighting: **25%**;
- ***Ecological Footprint*** *per capita*, i.e. the area of the earth's surface required to absorb the pollution generated by the country, measured in **equivalent** global hectares - Relative weighting: **5%**;
- ***Water Footprint*** *per capita*, i.e. the quantity of water absorbed to sustain the national socio-economic model (production of goods and services and personal consumption), measured in cubic meters (virtual) - Relative weighting: **5%**;
- **Contribution of renewable sources to the national** energy supply, measured as a percentage of the total primary energy supply - Relative weighting: **15%**;
- **CO_2 emissions deriving from the use of fossil fuels, measured in Kg per person** - Relative weighting: **20%**;
- **Levels of PM10 generated, measured in micrograms per cubic meter** - Relative weighting: **15%**;
- **Urban waste produced, measured in Kg per person** - Relative weighting: **15%**.

Following the method described earlier, for each of the aforementioned indicators a partial classification was created, attributing to each country a score of between **1** ("worst" relative performance) and **10** ("best" relative performance).

The awarding of a score to each country for each of the 7 KPIs analyzed and the weighting of the results obtained with the percentages shown above enabled the calculation of an intermediate summary index for the "Environmental well-being" dimension. The ranking thus obtained is represented in the figure below.

Figure 29 - Ranking for "Environmental well-being"

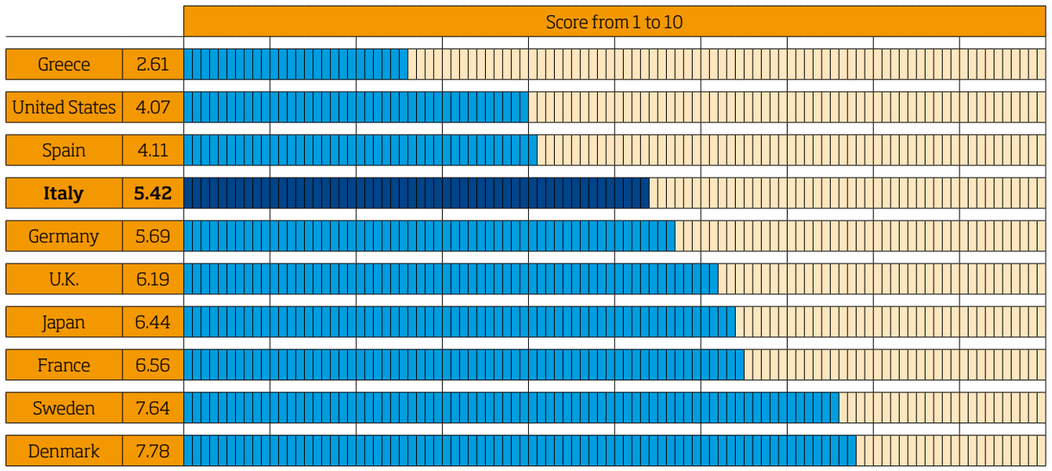


Source: The European House-Ambrosetti, 2010

Summary results of the Wealth and Sustainability sub-index

"Material well-being" and "Environmental well-being" are the two dimensions composing the Wealth and Sustainability sub-index, obtained from the totaling of the points scored by each country in the 10 KPIs selected.

Figure 30 - Ranking for the Wealth and Sustainability sub-index



Source: The European House-Ambrosetti, 2010

As shown in the graph, **Italy** ranks seventh, with a score of 5.42 points, very close to Germany.

The classification is headed by **Denmark** (7.78 points), with Sweden on its heels. France and Japan are next, followed, at a slight distance, by the United Kingdom. The ranking closes with the **United States** (hampered, in particular, by the score obtained for "Environmental well-being") and **Greece** (hampered, in particular, by the score obtained for "Material well-being").

3.3.2 Social and Interpersonal sub-index

The Social and Interpersonal sub-index is the third sub-index considered for the construction of the BCFN Index. This indicator derives from the integration of the three personal well-being dimensions: one for the **education and culture sphere** (entitled "Educational well-being"), one for the **welfare**, **family**, **society and institutions sphere** (entitled "Social well-being") and one for the **democracy** and **individual freedom** sphere (entitled "Political well-being").

Figure 31 - The Social and Interpersonal sub-index within the methodological system adopted, showing the three dimensions of which it is formed

BCFN Index		Relative weighting
35% **Lifestyle sub-index**	**"Psycho-physical" well-being** *(Health)*	**20%**
	"Behavioral" well-being *(Diet and lifestyles)*	**15%**
35% **Wealth and Sustainability sub-index**	**"Material" well-being** *(Income, investments and assets)*	**20%**
	"Environmental" well-being *(Environmental sustainability and quality)*	**15%**
30% **Social and Interpersonal sub-index**	**"Educational" well-being** *(Instruction and culture)*	**10%**
	"Social" well-being *(Welfare, family, society and institutions)*	**10%**
	"Political" well-being *(Democracy and individual freedom)*	**10%**

Source: The European House-Ambrosetti, 2010

The analysis relative to the Social and Interpersonal sub-index is based on **16 KPIs**. Specifically, 6 KPIs have been developed for measuring "Educational well-being", 8 KPIs for "Social well-being" and 2 KPIs for "Political well-being", respectively.

Educational well-being

"Educational well-being" is one of the three dimensions composing the *Social and Interpersonal sub-index*. As already mentioned, educational well-being refers to the educational and cultural dimensions of personal well-being, in line with the theory that these aspects represent two fundamental qualifying factors for the happiness of the population.

The 6 KPIs considered for the construction of the summary indicator for educational well-being are the following:

- **P.I.S.A. score** (*Programme for International Student Assessment*), calculated as the number of students assessed at levels 4,5 or 6;
- **Average annual number of university graduates and research doctorates** (average over the last ten years, values per 100,000 people)
- Foreign **students enrolled in the national university system** (per 100,000 people);
- **Rate of unemployment among university graduates**;
- **Average number of daily newspapers sold**[56] **per day** (values per 100 people);
- Diffusion of **broadband internet connections** (number of subscribers per 100 people).

By way of example, the paragraphs below list the evidence emerging from an analysis of some of the most significant KPIs that were measured and that contribute to the calculation of the final score for each country within the limits of the international comparison. For details on each of the indicators considered, please refer to the statistical appendix.

Percentage of national students classified at levels 4,5,6 according to the P.I.S.A. (*Programme for International Student Assessment*) classification

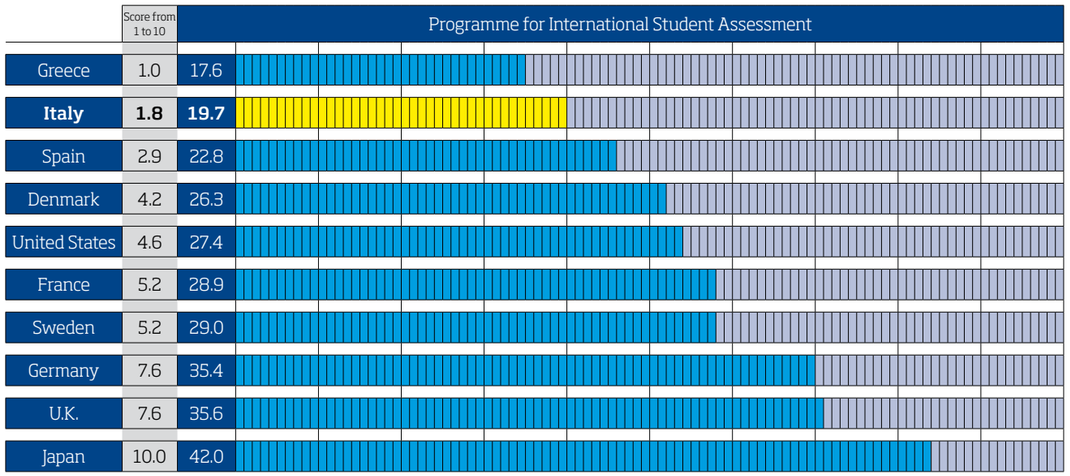
The Programme for International Student Assessment - PISA is an international survey promoted by the OECD to assess the skills of young school-goers. The PISA project involved 57 countries, including all thirty OECD member countries and twenty-seven partner countries.

Each phase of the survey focuses on a particular area: the first phase (PISA 2000) dealt with reading, the second (PISA 2003) with mathematics, while the main area of investigation of PISA 2006 was science. The P.I.S.A. assessment awards students scores from 1 to 6, where 6 is the maximum and 1 is the minimum. The six levels of the P.I.S.A. assessment, relative to the last survey (2006), are summarized as follows:

- **Level 6**. Students should be able to consistently identify, explain, and apply scientific knowledge and knowledge about science in a variety of complex life situations. They should be able to link different information sources and explanations and use evidence from those sources to justify decisions. They should be able to clearly and consistently demonstrate advanced scientific thinking and reasoning, and be willing to use their scientific understanding in support of solutions to unfamiliar scientific and technological situations. Students at this level should be able to use scientific knowledge and develop arguments in support of recommendations and decisions that center on personal, social, or global situations.
- **Level 5**. Students should be able to identify the scientific components of many complex life situations; apply both scientific concepts and knowledge about science to these situations; and should be able to compare, select, and evaluate appropriate scientific evidence for responding to life situations. Students at this level should be able to use well-developed inquiry abilities, link knowledge appropriately, and bring critical insights to these situations. They should be able to construct evidence-based explanations and arguments based on their critical analysis.
- **Level 4**. Students should be able to work effectively with situations and issues that may involve explicit phenomena requiring them to make inferences about the role of science or technology. They should be able to select and integrate explanations from different disciplines of science or technology and link those explanations directly to aspects of life situations. Students at this level should be able to reflect on their actions and communicate decisions using scientific knowledge and evidence.
- **Level 3**. Students should be able to identify clearly described scientific issues in a range of contexts. They should be able to select facts and knowledge to explain phenomena and apply simple models or inquiry strategies. Students at this level should be able to interpret and use scientific concepts from different disciplines and apply them directly. They should be able to develop short communications using facts and make decisions based on scientific knowledge.
- **Level 2**. Students have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations. They should be capable of direct reasoning and making literal interpretations of the results of scientific inquiry or technological problem solving.
- **Level 1**. Students have such a limited scientific knowledge that it can only be applied to a few familiar situations. They should be able to present scientific explanations that are obvious and follow concretely from given evidence.

The results emerging for the countries considered in the P.I.S.A. survey are shown below.

Figure 32 - Percentage of national students classified at levels 4,5,6 according to the evaluation method of the Programme for International Student Assessment



Source: The European House-Ambrosetti re-elaboration of P.I.S.A - OECD data, 2010

For the construction of the indicator presented here, the three highest levels (4,5,6) were taken into account, as they were judged to be representative of students with high cultural and analytical skills. This indicator was included among the KPIs selected as it was considered an approximation of the level of cognitive and intellectual skill developed by individuals during their educational path (as well as an index of the effectiveness of the education system).

It emerges clearly from the results presented in the figure above, that Italy has one of the lowest percentages worldwide of students classified at the highest levels of the P.I.S.A. assessment (19.7%) (only Greece has a lower score for this indicator). This evidence reveals a critical situation in Italy as regards the education system, which has a negative impact on the calculation of the dimension entitled "educational well-being".

The nation that gains the highest score is Japan, which has a percentage of 42% students at the highest P.I.S.A. score levels. It is followed by the United Kingdom and Germany which have similar scores (35.6% and 35.4% respectively), Sweden (29%), France (28.9%), the United States (27.4%), Denmark (26.3%), Spain (22.8%), Italy (19.7%) and Greece (17.6%).

56 *Due to the lack of reliable data for some of the countries under examination, it was not possible to include among the KPIs of this area the average number of books read or sold.*

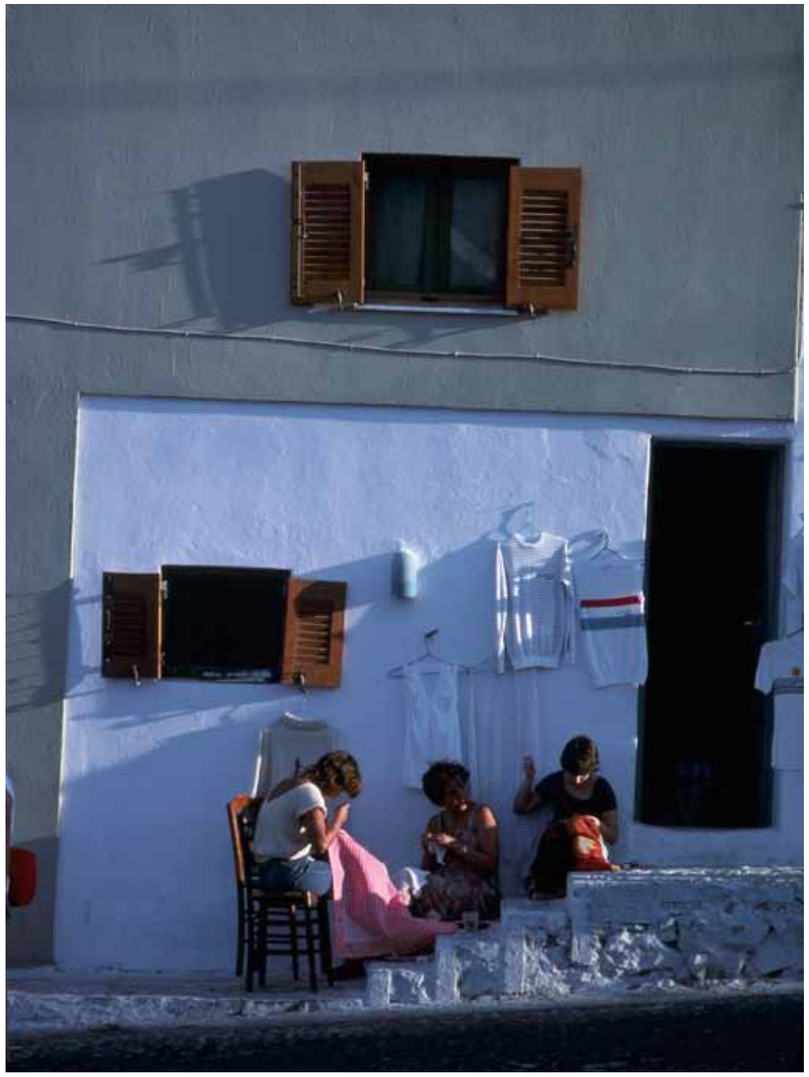
This indicator impacts on the calculation of the summary indicator for educational well-being with a relative weighting of 20%.

Average annual number of university graduates and research doctorates

Another indicator used for measuring "educational well-being" in the countries under examination is the average annual number of university graduates and research doctorates, which impacts on the summary indicator with a weighting of 35%.

The indicator was constructed calculating the average, in the time frame of the last 10 years, of the number of students that finish the ISCED 5 and 6 study cycles. [57]

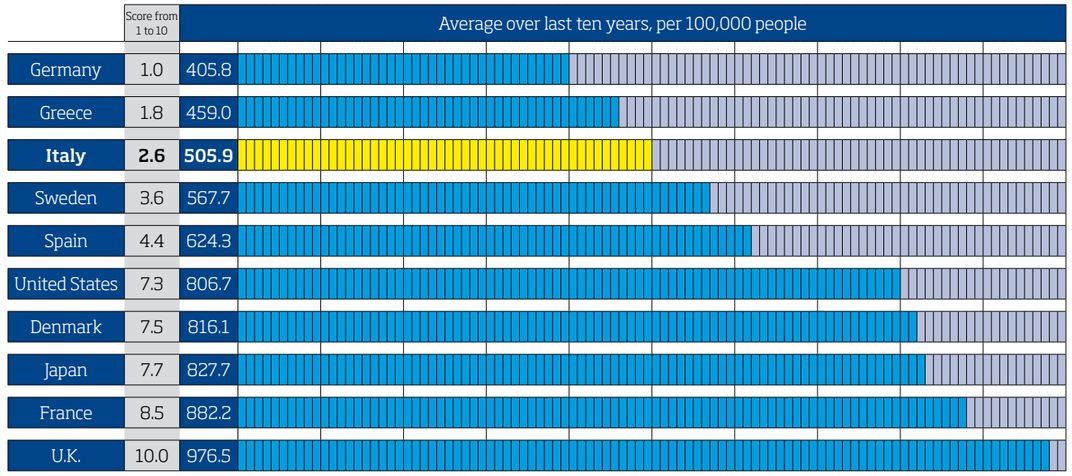
This indicator was included in the set of KPIs selected as the general level of dissemination of culture and education in a population was thought to be linked to the rate at which



Ira Block/National Geographic Image Collection

new university graduates and research doctorates are generated (ISCED Level 6, in the case of Italy) in the national tertiary education system. With a view to preventing a polarization of the indicator towards the more densely populated countries (which, all other things being equal, would be able to generate a higher absolute number of graduates than the others), the annual average of new university graduates was related to the national population and expressed in units per 100,000 people.

Figure 33 - Average annual number of new university graduates and research doctorates, 1999-2009



Source: The European House-Ambrosetti elaboration of Eurostat data, 2010

The evidence shows a dispersion of the results recorded for the 10 countries which is quite significant. In fact, the results span from an average of approx. 400 new university graduates per 100,000 people in Germany to over 976 new university graduates per 100,000 people in the United Kingdom (which scores 10 for this indicator).

Italy ranks third-last, ahead of Greece and Germany, with an average of around 500 new university graduates and research doctorates in the reference period.

Summary indicator of Educational well-being

From an analysis of the indices for calculating well-being at an international level and in compliance with the guidelines developed in the course of the Advisory Board meetings, weightings have been attributed to each component analyzed.

The specific weighting values used in measuring are the following:

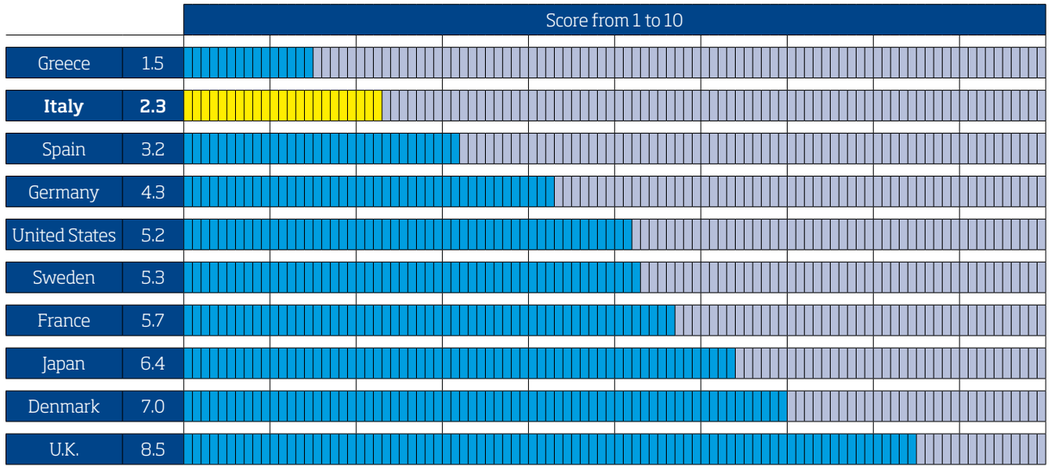
- **P.I.S.A. score** (*Programme for International Student Assessment*), calculated as the number of students assessed at levels 4,5 or 6 - Relative weighting: **20%**;
- **Average annual number of university graduates and research doctorates** (average over the last ten years, values per 100,000 people) - Relative weighting: **35%**;
- **Foreign students enrolled in the national university system** (per 100,000 people) - Relative weighting: **15%**;
- **Rate of unemployment among university graduates** - Relative weighting: **10%**;
- **Average number of daily newspapers sold[58] per day** (values per 100 people) - Relative weighting: **10%**;

58 Due to the lack of reliable data for some of the countries under examination, it was not possible to include among the KPIs of this area the average number of books read or sold.

- Diffusion of **broadband internet connections** (number of subscribers per 100 people) - Relative weighting: **10%**.

The awarding of a score to each country for the 6 KPIs, on the basis of the weightings attributed, enabled the calculation of an intermediate summary index for the "Educational well-being" dimension, which is shown in the figure below.

Figure 34 - Ranking for "Educational well-being"



Source: The European House-Ambrosetti, 2010

As the graph representing the Educational well-being index for the 10 countries under examination shows, Italy has a fairly low total score for this set of indicators, in which the United Kingdom, Denmark and Japan take the lead.

The poor positioning of Italy is mainly due - in addition to the low numbers of new university graduates and research doctorates and of students classified at the highest levels of the P.I.S.A. system - to insufficient internationalization of the university system (almost ten times less than the United Kingdom, the number one country for this indicator) and to insufficient diffusion of Internet technology among the population (which, nowadays, is a channel for communication and dissemination of knowledge and culture).

Social well-being

"Social well-being" is another of the three dimensions composing the Social and Interpersonal sub-index. Social well-being refers to the component concerning the relations of the individual with society, i.e. the component defined as "social well-being" is therefore generated by the attitude of individuals in the building of fruitful and mutually supportive relations with the society in which they live (welfare, family etc.). Social well-being derives, therefore, from parameters that are external to the individual, connected with the type of society (such as for example the possibility to carry out a working activity that provides sufficient income to guarantee self-sufficiency and self-realization, or faith in other members of society or towards the institutions governing it), but also from parameters that are within the control of the individual, such as for example the value ascribed to the family, as an institution, the propensity to contribute actively to the collective well-being etc.

On the basis of this reflection, the indicators taken into consideration "Social well-being" are the following:

- **Percentage of people at risk of poverty**[59];
- **Income distribution inequality rate,** calculated as the ratio between the total income of 80% of the poorest segment of the population and the overall income of the 20% of the richest segment;
- **Average number of hours dedicated to child care** (weekly average, children aged between 0 and 12 years of age);
- **Average unemployment rate**;
- Average **unemployment** rate **among young people**;
- **Rate of dependence of the elderly,** calculated as a ratio between the population aged over 65 years and the working-age population (25-64 years);
- ***National Institution Index***[60], calculation of trust in the institutions;
- ***Interpersonal Trust Index***[61].

By way of example, the paragraphs below list the evidence emerging from an analysis of some of the most significant KPIs that were measured and that contribute to the calculation of the final score for each country within the limits of the international comparison. For details on each of the indicators considered, please refer to the statistical appendix.

Percentage of people at risk of poverty

This is an indicator that was constructed by the European Commission (department of statistics, *Eurostat*) for the EU countries and for a number of leading non-European countries. This indicator was calculated as the percentage of individuals that have an income equal to, or less than, 60% of the median value of the national *per capita* income. According to this logic, therefore, if the annual median *per capita* income of a hypothetical country were equivalent to 10,000 Euros, the threshold under which an individual would be considered at risk of poverty would be 6,000 Euros.

The percentage of people at risk of poverty is considered an effective indicator of the quality of interaction, in economic terms, between individuals and society. It may, in fact, be conjectured that the highest numbers of people at risk of poverty reflect the least virtuous social mechanisms, at least from the perspective of the generation and distribution of income and of remuneration for work on the basis of purchasing power.

With regard to this indicator, 5 countries out of ten (United States, Greece, Spain, Italy and the United Kingdom) present an average number of people at risk of poverty (in 2008) of between 19% and 20% of the population. For the more virtuous countries, this percentage drops to 12-15%. This is the case of Sweden (12%), Denmark (12%), France (13%) and Germany (15%). The figure below shows a summary of the results obtained from the 10 countries considered in relation to this indicator.

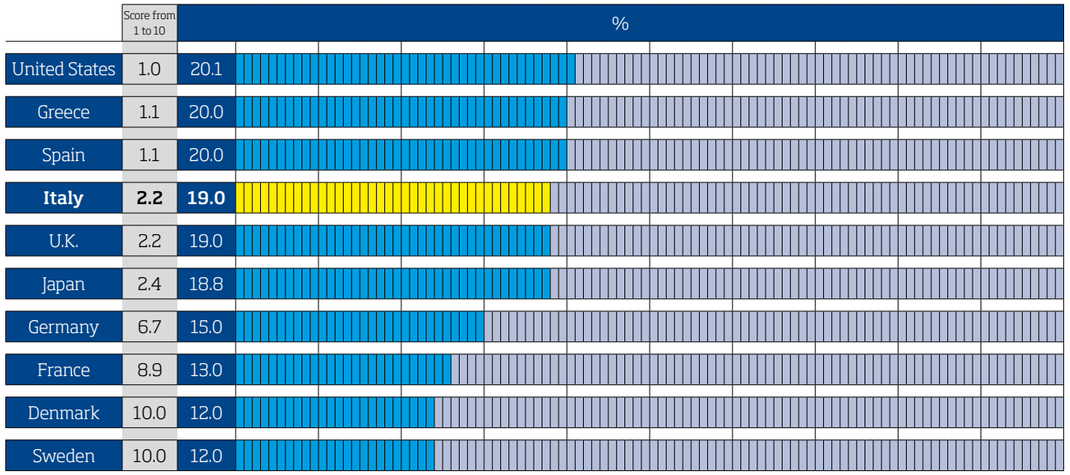
This indicator has a 25% impact on the calculation of the summary indicator for social well-being.

*59 The poverty threshold is set at an income equal or lower than 60% of the median **per capita** income, including social security transfers.*

60 Carried out by the Gallup company through the International surveys entitled Gallup Word Poll, this index measures the level of trust that citizens have in the key institutions of their own country, such as national government, the law and the courts, the army etc., and in the correctness of election procedures.

61 This is an indicator calculated by the World Values Survey (WVS), commonly used to compare the level of interpersonal trust in the various countries. The calculation is made by asking interviewees whether they generally feel that they can trust their fellow citizens and counting the number of responses of those who declare that they trust most people.

Figure 35 - Percentage of people classified as being "at risk of poverty", 2008

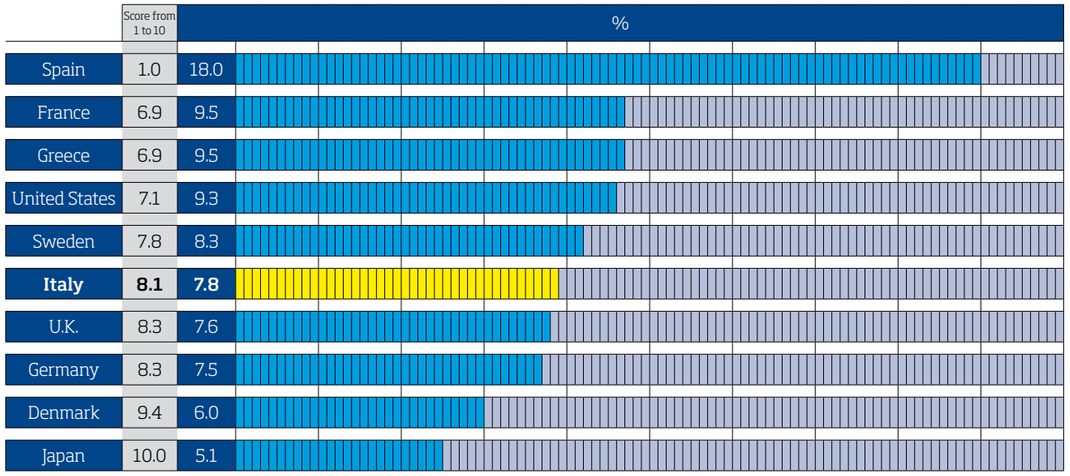


Source: The European House-Ambrosetti elaboration of Eurostat data, 2010

Average rate of unemployment

The main mechanism of interaction between the individual and society is work, which is, in itself, a fundamental element for the social structure of the countries themselves. On the basis of this assumption, the average rate of unemployment has been included in the calculation method of the BCFN-Index as it is held to be a valid expression of what has been defined as the "social well-being" of the individual. Given the extreme pertinence of the indicator with the object being measured, this KPI has an impact of 25% in the summary indicator for social well-being (the same as the percentage of people classified as being "at risk of poverty").

Figure 36 - Average annual rate of unemployment, 2009



Source: re-elaborations of The European House-Ambrosetti on Eurostat data, 2010

Spain is the country with the highest rate of unemployment among the countries under examination, with around 18% of the country's potentially available workforce without jobs. Although an interpretation of the results of this indicator cannot but take into account the tremendous impact that the economic and financial crisis of the last two years has generated on the leading world economies, considering the global character of the crisis itself (which struck all of the countries under examination) the results presented earlier should, in any case, be considered representative of the phenomenon that is the object of the measurements.

The country that has the lowest rate of unemployment is Japan, with a figure of around 5%, while the other countries belonging to the European area and the United States of America have unemployment rates of between 5% and 9.5%.

Summary indicator of Social well-being

From an analysis of the indices for calculating well-being at an international level and in compliance with the guidelines developed in the course of the Advisory Board meetings, weightings have been attributed to each component analyzed.

The specific weighting values used in measuring are the following:

- **Percentage of people at risk of poverty**[62] - Relative weighting: **25%**;
- **Income distribution inequality rate,** calculated as the ratio between the total income of 80% of the poorest segment of the population and the overall income of the 20% of the richest segment - Relative weighting: **10%**;
- **Average number of hours dedicated to child care** (weekly average, children aged between 0 and 12 years of age) - Relative weighting: **5%**;
- **Average rate of unemployment** - Relative weighting: **25%**;
- Average rate **of unemployment among young people** - Relative weighting: **10%**;
- **Rate of dependence of the elderly,** calculated as a ratio between the population aged over 65 years and the working-age population (25-64 years) - Relative weighting: **5%**;
- ***National Institution Index***[63], calculation of trust in the institutions - Relative weighting **10%**;
- ***Interpersonal Trust Index***[64] - Relative weighting **10%**.

Following the method described earlier, for each of the aforementioned indicators a partial classification was created, attributing to each country a score of between **1** ("worst" relative performance) and **10** ("best" relative performance).

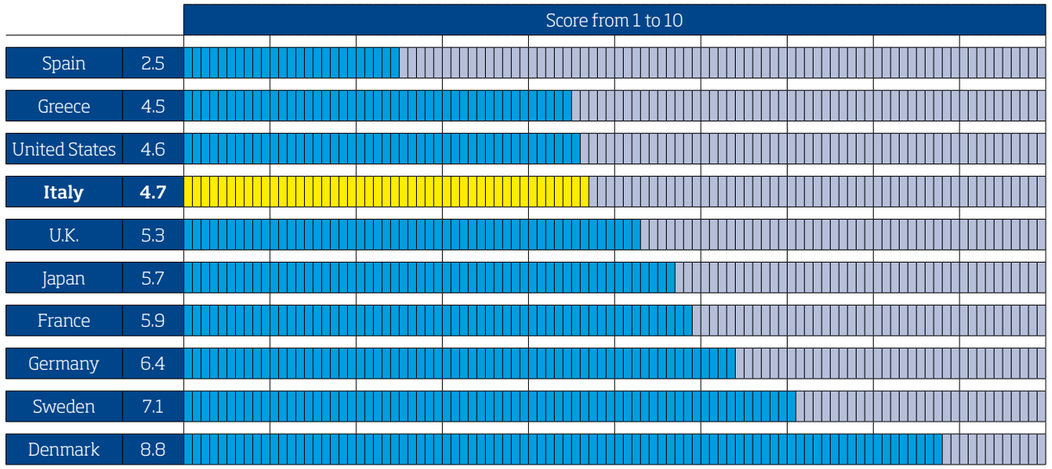
The awarding of a score to each country for the 8 KPIs, on the basis of the weightings attributed, enabled the calculation of an intermediate summary index for the "Social well-being" dimension, which is shown in the figure below.

62 *The poverty threshold is set at an income equal or lower than 60% of the median* ***per capita*** *income, including social security transfers.*

63 *Carried out by the Gallup company through the International surveys entitled Gallup Word Poll, this index measures the level of trust that citizens have in the key institutions of their own country, such as national government, the law and the courts, the army etc., and in the correctness of election procedures.*

64 *This is an indicator calculated by the World Values Survey (WVS), commonly used to compare the level of interpersonal trust in the various countries. The calculation is made by asking interviewees whether they generally feel that they can trust their fellow citizens and counting the number of responses of those who declare that they trust most people.*

Figure 37 - Ranking for "Social well-being"



Source: The European House-Ambrosetti, 2010

As the graph shows, Italy - with a total score of 4.7 points - ranks fourth-last out of the 10 countries under examination, followed by the United States, Greece and Spain (severely penalized by a very high rate of unemployment, not only at a general level but also considering that among young people alone). Denmark, on the other hand, gains first place in this index, particularly on the strength of its extremely low rate of unemployment, the small number of families considered at risk of poverty, the high number of hours dedicated to child care and high scores in the indices measuring interpersonal trust and trust in public institutions (calculated by Gallup Word Poll and World Values Survey-WVS, respectively).

The country with the second-highest score in the Social well-being index is Sweden, also part of Scandinavia, which has gained its position on the basis of performances similar to that of Denmark. Germany, France and the United Kingdom, on the other hand, score between 6.4 (Germany) and 5.3 (United Kingdom).

Political well-being

Lastly, the third dimension of the Social and Interpersonal sub-index is "Political well-being". This dimension refers to the well-being generated in the interaction between the individual and the political institutions and political-institutional framework of the country.

For this area, two indicators have been selected[65], constructed by international reference institutions on the basis of a series of parameters and then added together. These are, specifically:

- ***The Economist Intelligence Unit's index of democracy***[66];

65 *A third indicator selected, entitled Freedom in the World published by Freedom House each year ever since 1972, which assesses levels of civil liberties and political rights, has been excluded from this analysis as it analyses 193 countries throughout the world, including third world and developing countries, that have much lower levels of civil liberties and political rights compared to Western countries. For this reason, the 10 countries included in our analysis, although presenting differences in terms of "Political well-being", tend to have similar scores in the Freedom in the World index.*

66 *The Economist Intelligence Unit Index of Democracy is a summary index that measures the quality of democracy in 167 countries throughout the world, on an annual basis. It involves the assessment of five elements: electoral process and pluralism, civil liberties, functioning of government, political participation and political culture.*

- ***Corruption Perceptions Index***[67].

As an example, the figure below provides a summary of the evidence emerging from an analysis of the indicator which had the greatest impact on the calculation of the summary index for the Political well-being component (with a relative weighting of 75%), entitled "*The Economist Intelligence Unit's Index of democracy*". For details on the second indicator considered, please refer to the statistical appendix.

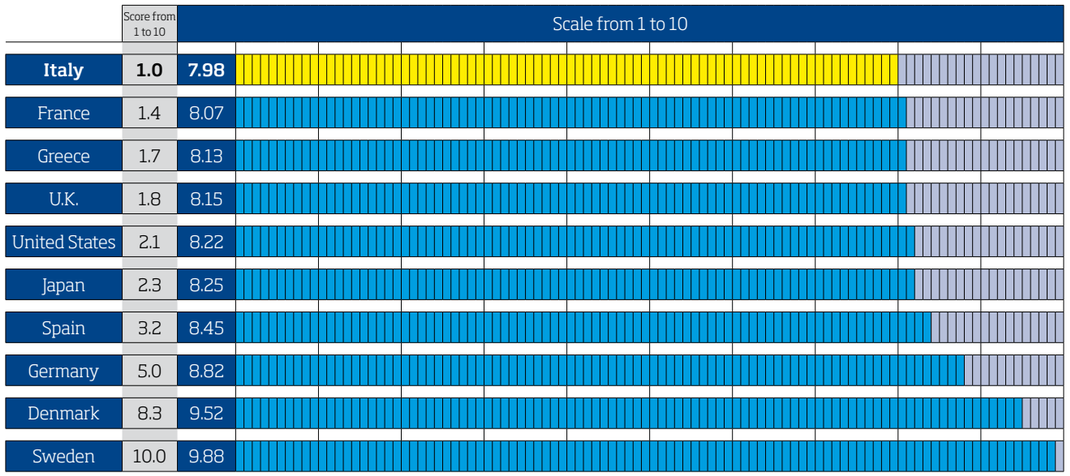
The Economist Intelligence Unit's index of democracy

The Economist Intelligence Unit Index of Democracy is a summary index developed by the Economist, and it is a summary indicator that measures the state of democracy in 167 countries throughout the world, on an annual basis. Specifically, the Economist Intelligence Unit Index of Democracy comprises 4 sub-indices:

- electoral process and pluralism;
- civil liberties;
- functioning of government;
- political participation and political culture.

The sum total of the aforementioned indicators creates the democracy index (expressed by means of a brief judgment from 1 to 10), the results of which are shown in the graph below, for the 10 countries under examination.

Figure 38 - Score assigned by the Economist Intelligence Unit Index of Democracy to the nations subjected to international comparison (on a scale from 1 to 10), 2009



Source: The European House-Ambrosetti, 2010

Sweden ranks first in the global classification and as a result also gains first place among the countries under consideration. Denmark, in second place, also gains a score of over 9 points, while the remaining countries considered, with the exception of Italy, all score between 8 and 9 points. Italy, on the other hand, scores only 7.98 points on this index, the lowest value of the 10 countries under examination.

67 *The Corruption Perceptions Index is an index that has been calculated each year since 1995 by the Transparency International agency, which classifies numerous countries on the basis of the degree of corruption existing in the public and political sectors, as perceived by the country's own citizens. The term "corruption" refers to abuse of power for personal gain.*

Summary indicator of Political well-being

From an analysis of the indices for calculating well-being at an international level and in compliance with the guidelines developed in the course of the Advisory Board meetings, weightings have been attributed to each component analyzed.

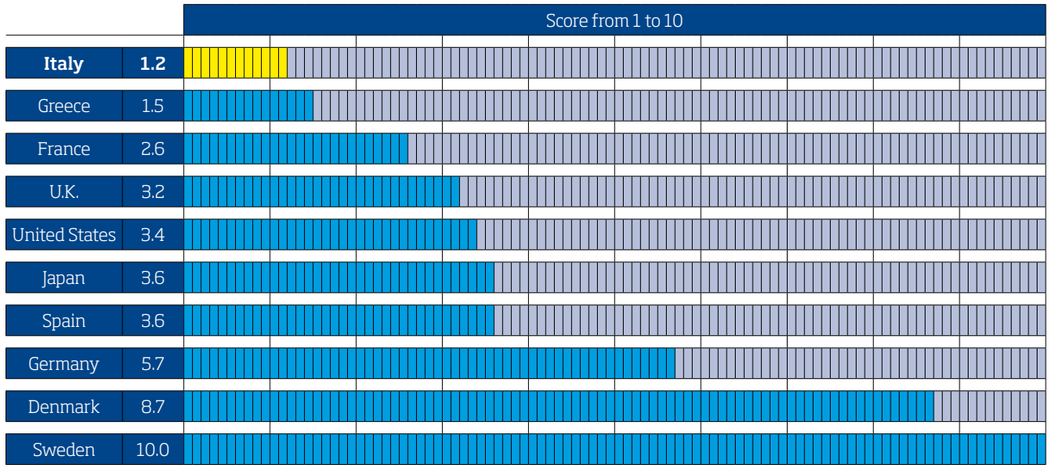
The specific weighting values used in measuring are the following:

- ***The Economist Intelligence Unit's index of democracy***[68] - Relative weighting: ***75%***;
- ***Corruption Perceptions Index***[69] - Relative weighting: **25%**.

In accordance with the method explained earlier, a partial classification has been constructed for each of the aforementioned indicators, attributing to each country a score of between **1** ("worst" relative performance) and **10** ("best" relative performance).

The awarding of a score to each country for the 2 KPIs, on the basis of the weightings attributed, enabled the calculation of an intermediate summary index for the "Political well-being" dimension, which is shown in the figure below.

Figure 39 - Ranking for "Political well-being"



Source: The European House-Ambrosetti, 2010

Since Political well-being has only been assessed on the basis of 2 indicators (which are, in turn, the expression of the sum of a series of specific indicators) with an "unbalanced" weighting towards The Economist Unit Index of Democracy (to which a weighting of 75% has been attributed), the summary index relative to this dimension of well-being substantially follows the classification of KPI number 40.

68 *The Economist Intelligence Unit Index of Democracy is a summary index that measures the quality of democracy in 167 countries throughout the world, on an annual basis. It involves the assessment of five elements: electoral process and pluralism, civil liberties, functioning of government, political participation and political culture.*

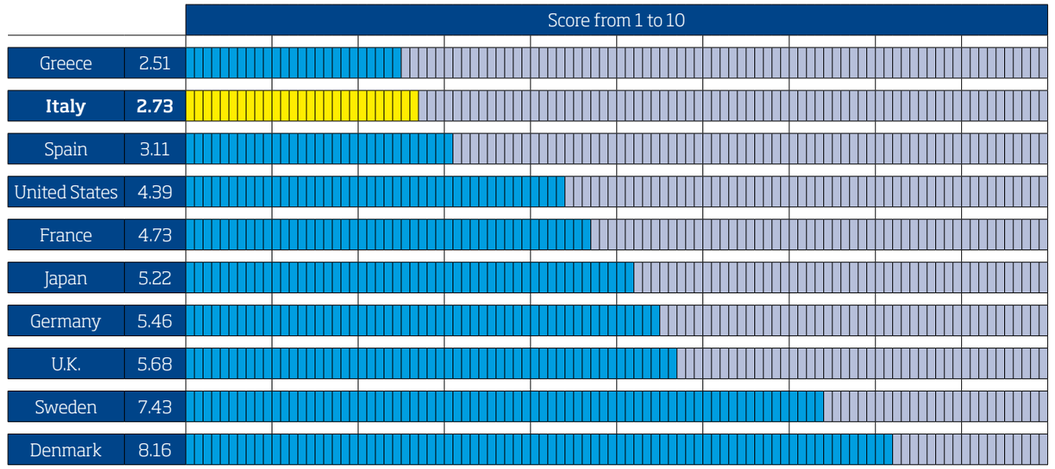
69 *The Corruption Perceptions Index is an index that has been calculated each year since 1995 by the Transparency International agency, which classifies numerous countries on the basis of the degree of corruption existing in the public and political sectors, as perceived by the country's own citizens. The term "corruption" refers to abuse of power for personal gain.*

The Scandinavian area of Europe clearly tops this indicator, with Sweden and Denmark dominating the relative classification, while Italy is the country that scores the lowest for this dimension.

Summary results of the Social and Interpersonal sub-index

After having calculated the summary indicators for "Educational well-being", "Social well-being" and "Political well-being", it is possible to obtain the Social and Interpersonal sub-index, represented in the following figure.

Figure 40 - Ranking for the Social and Interpersonal sub-index



Source: The European House-Ambrosetti, 2010

As shown by the graph, **Denmark** gains first place once more with a score of 8.16, followed by the other Scandinavian country, **Sweden**, with 7.43. The United Kingdom, Germany and Japan, at a substantial distance from the first two, form a trio with scores of between 5.2 and 5,7. They are followed by France and the United States with scores of over 4, and then, after another gap, by Spain, **Italy** and Greece (in last place).

The results show that the socioeconomic model of the Scandinavian countries is the one that integrates the dimensions relative to **education**, **welfare**, the **family** and **social** spheres, **democracy** and **personal freedom** in the most balanced way. In contrast, the Mediterranean countries such as Greece, Italy and Spain have difficulty as regards these aspects of national well-being.

3.4 The BCFN Index: main evidence

As already mentioned, the **BCFN Index** is a comparative analysis tool developed for the purpose of making **international comparisons** concerning the **level of well-being** (in the broad sense of the term) "enjoyed" by the inhabitants of each country.

The **innovative** and **distinctive contribution** of the BCFN Index lies in the **measuring of the psycho-physical and behavioral well-being of people**. These components have an extremely strong impact on the well-being of citizens, as they concern two dimensions related to the spheres of **health** (psycho-physical well-being) and **diet** and **lifestyle** (behavioral well-being). For this reason, within the construction of the overall well-being index, significant weight has been attributed to these components.

The Lifestyle sub-index, which is one of the three sub-indices used for the calculation of the BCFN Index, as explained above, contributes to the overall well-being of people by around 35%. The same weighting – i.e. 35% - has been attributed to material and environmental well-being, while 30% has been attributed to educational, social and political well-being.

Obviously, overall well-being depends on many factors such as, for example, perceived income, household wealth, environmental sustainability, level of education, the welfare system of a population, etc. and, in calculating the BCFN Index, these components have, of course, been taken into account.

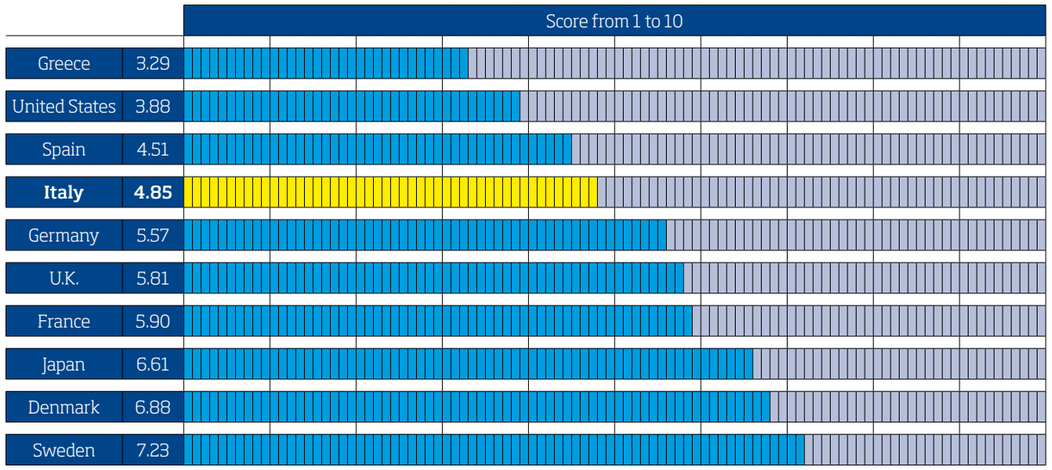
However, since the main goal was to contribute to the development of indices for measuring the overall well-being of people, through the contribution supplied by the part concerning lifestyle and diet, the overall well-being index (the BCFN index) was calculated, attributing considerable weight to this latter component.

With a view to providing a coherent and wide-ranging view of the work carried out, the analysis was not merely limited to the innovative and specific part of the BCFN Index alone, but – using the main findings emerging from literature and analyzing the surveys conducted by the OECD and by internationally-recognized institutions which publish indices relative to the measuring of overall well-being – it also considered variables relative to other dimensions of well-being (material, environmental, social and political, etc.).

By and large, the three sub-indices presented in the above paragraphs provided the basis for the construction of the BCFN Index.

In fact, by totaling the scores calculated for the 10 countries, in the three sub-indices, using a simple weighted average with the weightings shown in Figure 2, the BCFN Index – illustrated in the figure below – is obtained.

Figure 41 – Ranking of the BCFN Index



Source: The European House-Ambrosetti, 2010

The classification of the BCFN Index, which totals the final results for the 10 countries selected in relation to seven types of "wellbeing", is led by **Sweden**, with 7.23 points, followed at a short distance by the other Scandinavian country, **Denmark**, with 6.88 points. **Japan** gains third place with 6.61 points.

It is followed by a trio of countries with a similar final score, consisting of **France** (5.90 points, the **U.K.** (5.81 points) and **Germany** (5.57 points).

Italy is in seventh place with 4.85 points, some distance from **Germany** but ahead of **Spain**, which is eighth with 4.51 points.

Surprisingly, the **United States** occupy the next to last place in the classification with just 3.88 points, only better than **Greece** (in last place with 3.29 points). This result is explained by the fact that they are greatly hampered in comparison with the other countries when factors such as environmental sustainability, health and lifestyle - which have a very important role in the BCFN Index – are considered.

The importance of this type of analysis is not so much the identification of the relative position of each country, which also depends on the historical, social and economic factors peculiar to each nation, but rather the existence of a more or less balanced situation in relation to the different dimensions of well-being identified and analyzed, and hence the possibility to identify specific areas for improvement within the various areas with a view to increasing the overall well-being of people.

3.4.1 Sensitivity analysis on the BCFN Index

In line with the methodology adopted, to calculate the BCFN Index and the three sub-indices of which it is composed, "relative weightings" have been allocated to the 7 dimensions of well-being analyzed.

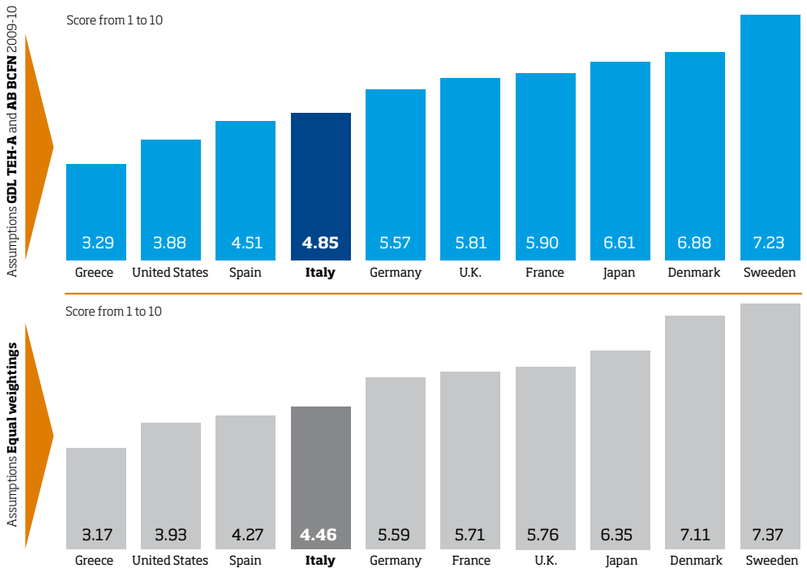
The allocation of weighting coefficients linked to each dimension being measured was made on the basis of the conclusions reached by The European House-Ambrosetti working group, under the supervision of the **Advisory Board** of the **Barilla Center for Food & Nutrition** in the course of the last year.

Nonetheless, despite the scientific approach adopted, a slightly "arbitrary" aspect inevitably remains in the allocation of the relative weightings[70].

In order to verify the statistical solidity, i.e. lower sensitivity due to the presence of different/anomalous values in the sample, a sensitivity analysis was carried out. **This assumed equal weightings for all seven dimensions considered**, in order to evaluate the effects in terms of variation of **the end result**. **The results of this sensitivity analysis are shown in the figure that follows**.

70 This problem is potentially resolvable (at least in part) by carrying out a specific survey on a representative sample of the population in the countries considered, which would be asked directly to express the importance of each dimension of wellbeing with respect to overall individual well-being.

Figure 42 - Results of the sensitivity analysis carried out on the BCFN Index, assuming equal weightings for all seven well-being dimensions considered



Source: The European House-Ambrosetti, 2010

It is easy to deduce by observing the previous figure that the **results clearly demonstrate the "solidity"** of the methodological system adopted with regard to a variation in the weightings. In fact the final ranking **does not present relevant variations, assuming equal weightings for each dimension of well-being. *In fact, the scores obtained by the various countries registered minimum variations and there was only one inversion in the positions of two countries (France and United Kingdom) at the center of the ranking*. This confirms the validity** of the set of indicators selected and reliability of the methodological system used, showing that even when the weightings of certain indicators are changed, the results do not undergo radical variations. The solidity and reliability of the model is, therefore, confirmed inasmuch as the indications that emerge are not modifiable simply by changing the weightings of the set of indicators.

Winfield Parks/National Geographic Image Collection

4. Conclusions and next steps

The socioeconomic model of the Scandinavian countries is the one that integrates the dimensions relative to education, welfare, the family and social spheres, democracy and personal freedom in the most balanced way. In contrast, the Mediterranean countries such as Greece, Italy and Spain have difficulty as regards these aspects of national well-being.

William Albert Allard/National Geographic Image Collection

A part of individual well-being also depends on lifestyle and dietary choices and, as a result, the overall state of health.

Sisse Brimberg/National Geographic Image Collection

4. Conclusions and next steps

The process of defining an index for measuring collective well-being that is capable of guiding economic and overall government decisions towards a state of greater widespread "happiness" is extremely complex. Although there is now a widely-held belief that indicators of an exclusively material nature are unsuitable for offering "all-round" measurement of the real situation of a country or a given area, the difficulties involved in devising a measurement system are such that to-date it has not yet proven possible to find a satisfactory solution to the various methodological needs underlying its construction.

Yet the need to guide the policies of the world's countries and macro-regions towards sustainability in all its facets is now more urgent than ever. But to do so, indicators able to pinpoint the information that is really relevant for measuring phenomena in a multidimensional key are required. Awareness of the fact that this historic move towards more modern policy making and institutional government processes on a global scale **can no longer be postponed** marks the starting point of our work.

In presenting this document, we wish to announce that we are embarking on a process focused on the desire to make a contribution to this ambitious goal, in line with our own particular perspective which starts first and foremost from the study and knowledge of dietary issues. Along the way, this process will involve the professionalism, skills, intelligence and willingness of all those who feel they can provide a constructive contribution. In particular, we wish to emphasize the importance of dietary issues in terms of impact on social well-being, health and the environment.

To sum up, we are right behind the call to action launched by the French Government when it set up the "Sen, Stiglitz, Fitoussi" Commission, thereby not only contributing to increasing awareness of the need to tackle well-being issues from a new angle, but also providing a possible operational solution to the many problems that need addressing. The form we need to give to our work is that of the **open "platform"**, which will combine the work of analysis and study by the technical groups made up of experts and members of institutions with the willingness to take the suggestions of all those interested in being involved in this task.

We realize that it will be a long and difficult undertaking, but we are convinced that the road towards a fairer world also involves having the tools to understand situations that are better suited to recording phenomena. Tools more appropriate to the situations we all encounter in our daily lives.

Ted Spiegel/National Geographic Image Collection

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Tino Soriano/National Geographic Image Collection

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Statistical appendix

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Psycho-physical well-being

Average life expectancy at birth in 2008, expressed in number of years

	Score from 1 to 10	Number of years, at birth
United States	1.0	77.9
Denmark	2.7	78.8
U.K.	4.4	79.7
Greece	4.9	80.0
Germany	5.3	80.2
France	6.0	81.0
Spain	7.2	81.2
Sweden	7.2	81.2
Italy	**7.7**	**81.5**
Japan	10.0	82.7

Source: The European House-Ambrosetti re-elaboration of data from the World Health Organization and OECD, 2010

Average life expectancy in good health at birth in 2007, expressed in number of years

	Score from 1 to 10	Number of years, at birth
United States	1.0	70.0
Denmark	4.0	72.0
Greece	4.0	72.0
U.K.	4.0	72.0
Francia	5.5	73.0
Germany	5.5	73.0
Italy	**7.0**	**74.0**
Spain	7.0	74.0
Sweden	7.0	74.0
Japan	10.0	76.0

Source: The European House-Ambrosetti re-elaboration of data from the World Health Organization, 2010

Standardized mortality rate from heart disease, measured as the number of deaths per 100,000 people, 2006

	Score from 1 to 10	Number of deaths per 100,000 people
Greece	1.0	263
Germany	3.4	224
United States	4.6	205
Sweden	5.3	194
U.K.	5.7	187
Denmark	6.0	183
Italy	**6.8**	**171**
Spain	7.3	162
France	9.6	124
Japan	10.0	118

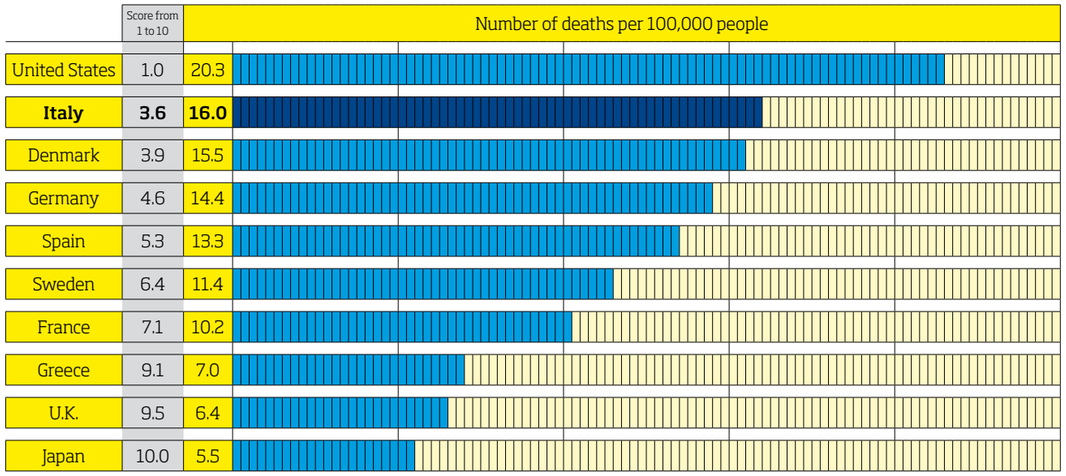
Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

Standardized mortality rate from tumors, measured as the number of deaths per 100,000 people, 2006

	Score from 1 to 10	Number of deaths per 100,000 people
Denmark	1.0	199
U.K.	5.1	172
France	6.6	163
United States	7.3	158
Italy	**7.3**	**158**
Germany	7.5	157
Spain	8.3	151
Sweden	8.9	147
Greece	9.0	147
Japan	10.0	140

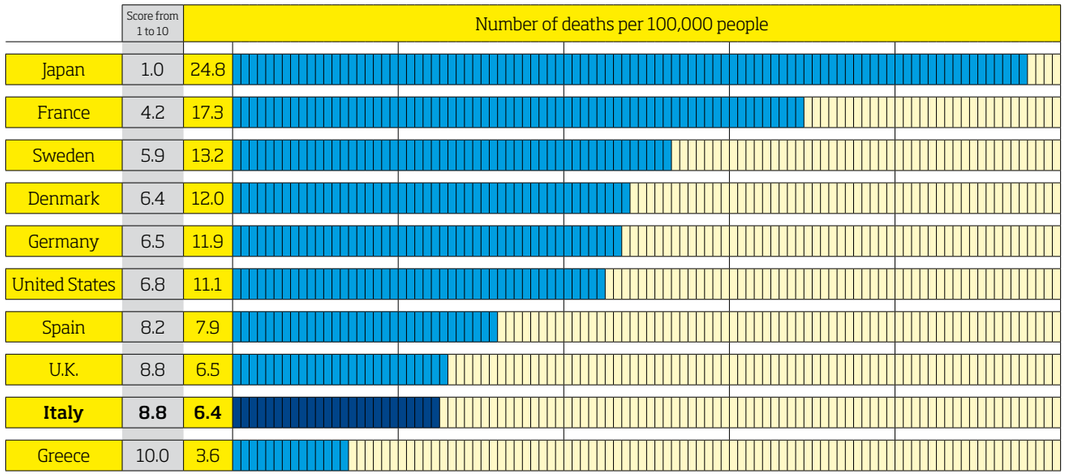
Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

Standardized mortality rate from diabetes mellitus, measured as the number of deaths per 100,000 people, 2006



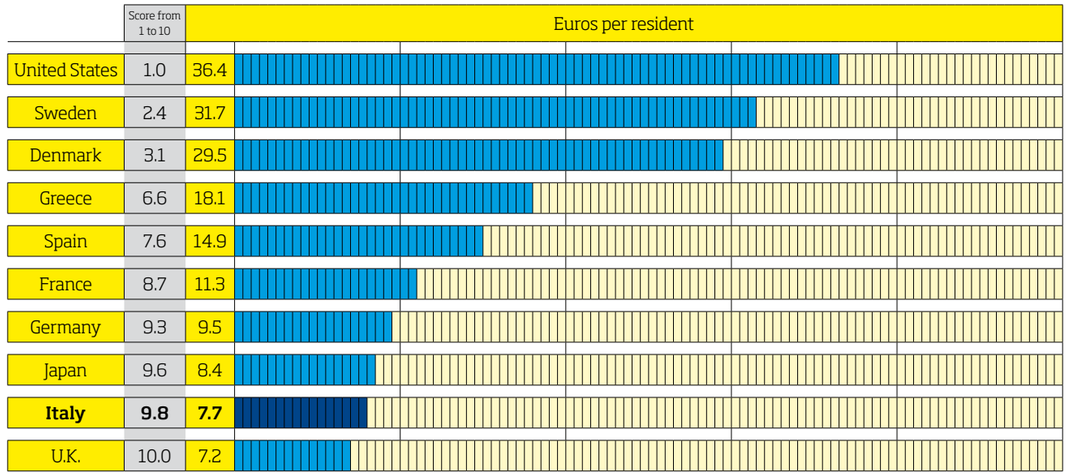
Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

Standardized mortality rate from suicide, measured as the number of deaths per 100,000 people, most recent year available for each country



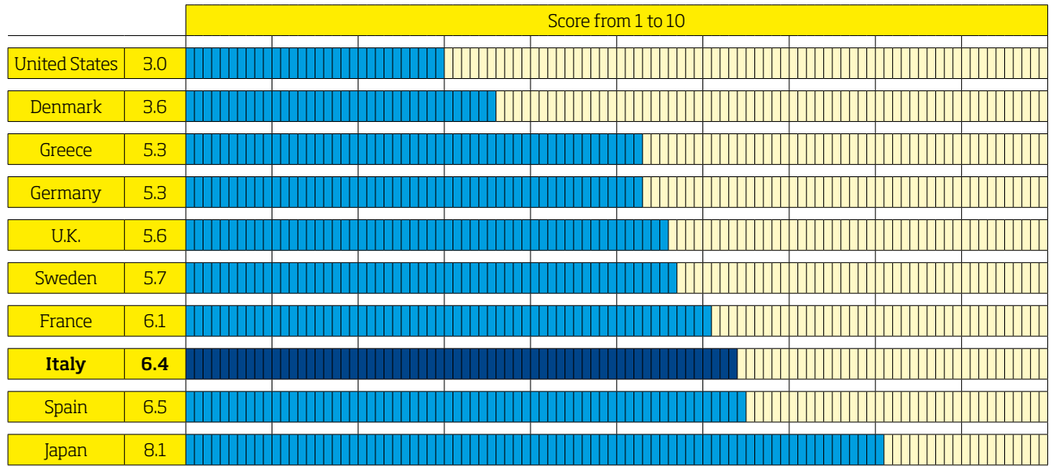
Source: The European House-Ambrosetti re-elaboration of data from the World Health Organization, 2010

Annual per capita expenditure on antidepressant and mood stabilizing drugs, euros per inhabitant, 2010



Source: The European House-Ambrosetti re-elaboration of IMS Health Spa data

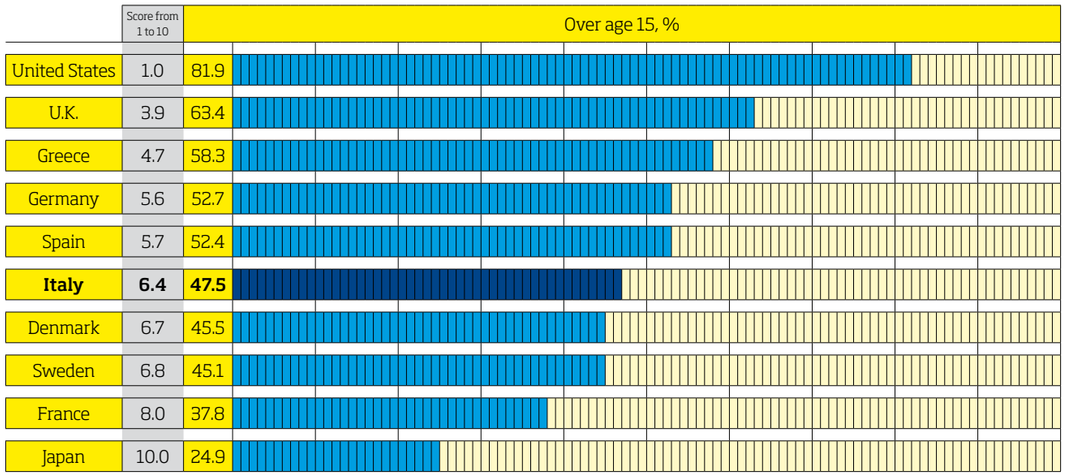
Ranking for "Psycho-physical well-being"



Source: The European House-Ambrosetti, 2010

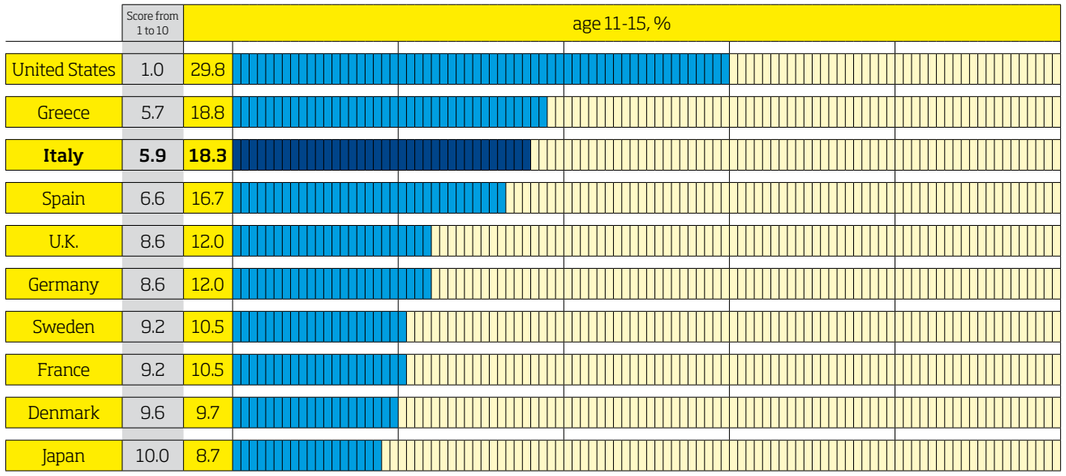
Behavioral well-being

Obese and overweight adult population (IMC>25kg/m^2), measured as a percentage of the adult population



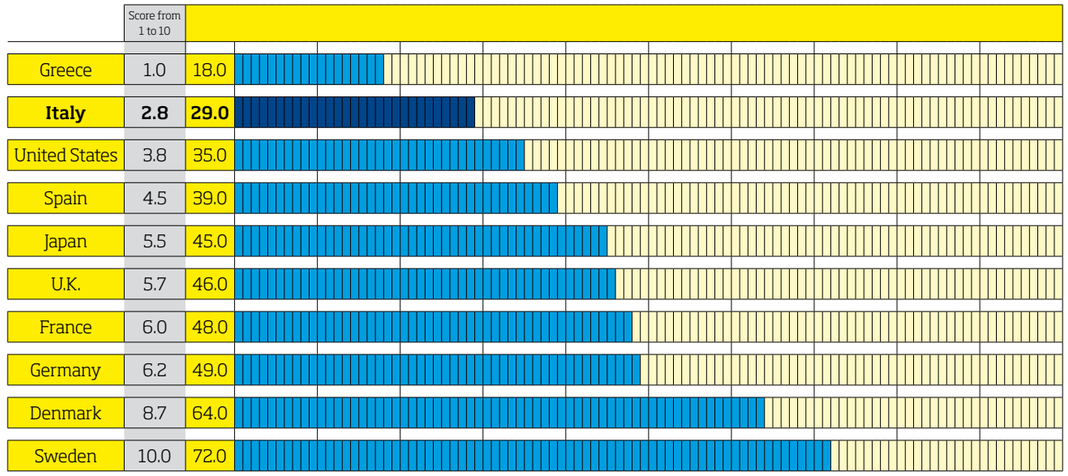
Source: The European House-Ambrosetti re-elaboration of Euromonitor, WHO, Eurostat data, 2010

Obese and overweight youth population (11-15 years) (IMC>25Kg/m2), measured as a percentage of the population aged between 11 and 15 years



Source: The European House-Ambrosetti re-elaboration of OECD, Eurostat and Japan Statistic Bureau and Statistic Center, 2010

Physical activity, measured as the portion of the population declaring to be involved in regular physical activity



Source: The European House-Ambrosetti re-elaboration of Eurobarometro, American Time Use Survey and Japan Statistic Bureau and Statistic Center data, 2010

Expenditure on fruit and vegetables as a percentage of available income

Source: Re-elaborations of The European House-Ambrosetti using Eurobarometer data, as well as estimates on data from the United State Department of Agriculture and the Japan Statistic Bureau and Statistic Center, 2010

Percentage of adult smokers out of the total adult population

	Score from 1 to 10	% of adult population
Greece	1.0	40.0
Spain	5.8	26.4
Japan	5.9	26.0
France	6.3	25.0
Denmark	6.3	25.0
Germany	6.9	23.2
Italy	**7.2**	**22.4**
U.K.	7.7	21.0
United States	9.7	15.4
Sweden	10.0	14.5

Source: The European House-Ambrosetti re-elaboration of OECD data and Japan Statistic Bureau and Statistic Center data, 2010

Consumption of alcohol measured as the average number of liters consumed per adult

	Score from 1 to 10	Average number of liters per adult
France	1.0	12.6
Spain	2.4	11.7
Denmark	3.7	10.9
U.K.	3.8	10.8
Germany	5.3	9.9
Greece	6.7	9.0
United States	7.2	8.7
Italy	**8.1**	**8.1**
Japan	9.1	7.5
Sweden	10.0	6.9

Source: The European House-Ambrosetti re-elaboration of OECD 2010 data

Average daily calorie intake

	Score from 1 to 10	
United States	1,0	3.820
Italy	**2,0**	**3.699**
Greece	2,3	3.655
Germany	2,8	3.605
France	2,9	3.587
U.K.	3,9	3.469
Spain	4,0	3.455
Denmark	4,5	3.392
Sweden	5,8	3.231
Japan	10,0	2.716

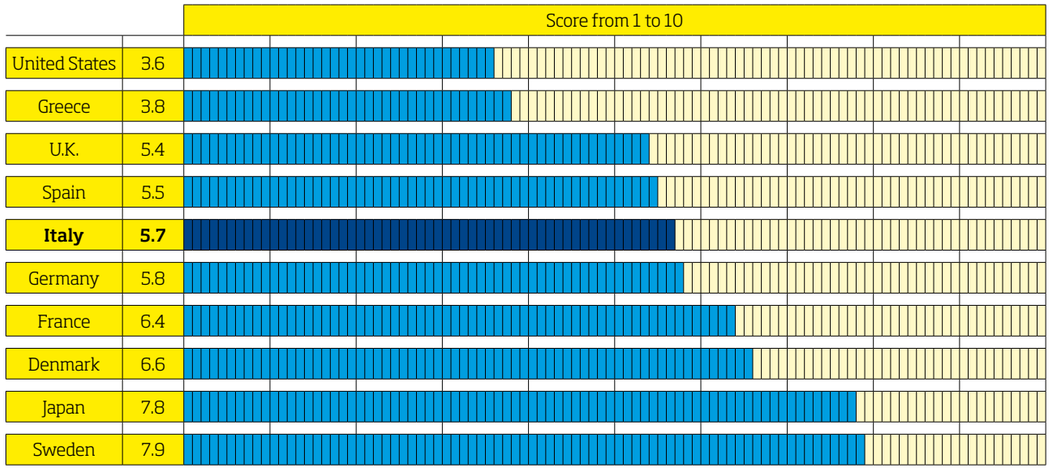
Source: The European House-Ambrosetti re-elaboration of the UN Food and Agriculture Organisation, FAOSTAT, 2010 data

Average time spent on meals, in minutes

	Score from 1 to 10	Minutes
United States	1.0	76
U.K.	1.9	82
Denmark	3.4	92
Sweden	3.9	95
Germany	6.6	113
Spain	6.7	114
Greece	6.9	115
Italy	**7.2**	**117**
Japan	7.3	118
France	10.0	136

Source: The European House-Ambrosetti re-elaboration of OECD 2010 data

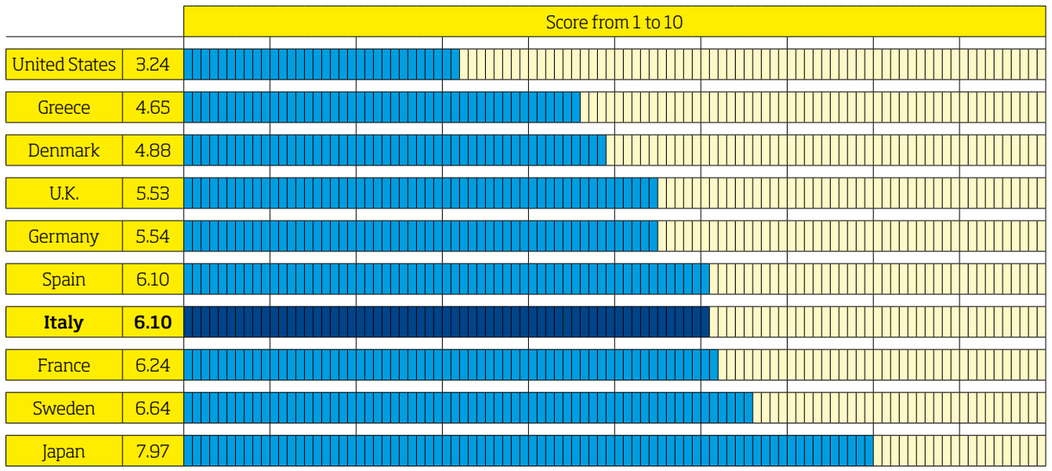
Ranking for "Behavioral well-being"



Source: The European House-Ambrosetti, 2010

Lifestyle sub-index

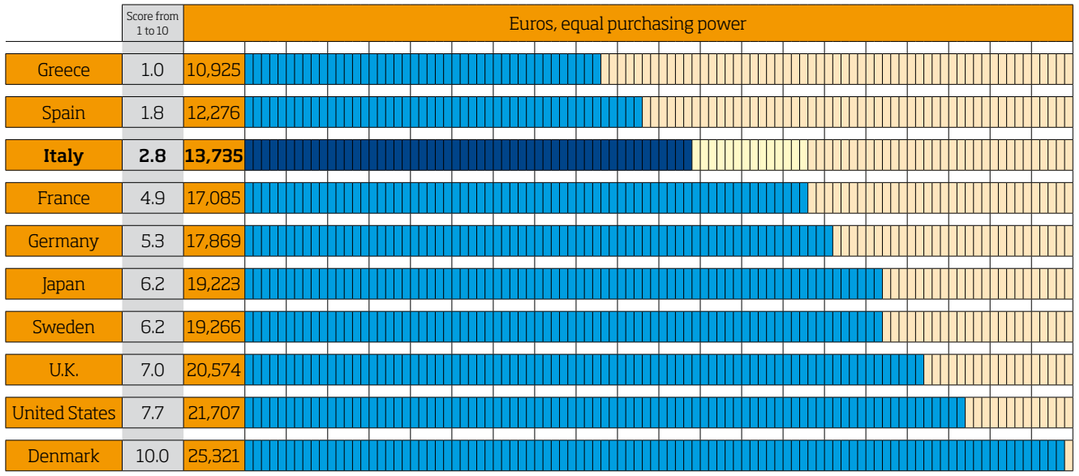
Ranking of the Lifestyle sub-index



Source: The European House-Ambrosetti, 2010

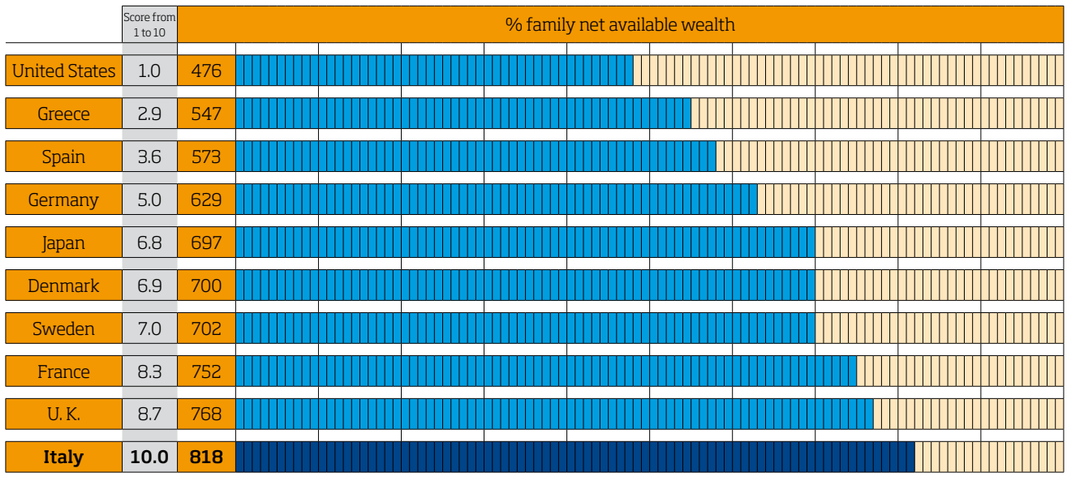
Material well-being

Level of available median per capita income, calculated in euros at purchasing power parity



Source: The European House-Ambrosetti using OECD data, 2010

Net household wealth, calculated as a percentage of the families' available net income



Source: The European House-Ambrosetti using OECD data, 2010

Gross per capita investment, 2009

	Score from 1 to 10	Euros
Greece	1,0	3.500
U.K.	1,7	3.800
Italy	**3,9**	**4.800**
Germany	5,1	5.300
United States	5,1	5.300
Spain	5,7	5.600
Sweeden	5,7	5.600
Japan	6,0	5.700
France	6,9	6.100
Denmark	10,0	7.500

Source: The European House-Ambrosetti re-elaboration of Eurosat, 2009

Ranking for "Material well-being"

	Score from 1 to 10
Greece	1.6
Spain	3.1
Italy	**5.2**
United States	5.2
Germany	5.2
France	6.3
Japan	6.3
Sweden	6.3
U.K.	6.5
Denmark	9.1

Source: The European House-Ambrosetti, 2010

Environmental well-being - Environmental sustainability

Adjusted Net Saving

	Score from 1 to 10	Percentage of gross national income
Greece	1.0	-4.8
United States	3.0	0.9
U.K.	4.1	3.9
Italy	**5.7**	**8.5**
France	6.2	9.8
Spain	6.3	10.1
Germany	6.7	11.3
Denmark	7.6	13.7
Japan	8.2	15.3
Sweden	10.0	20.5

Source: The European House-Ambrosetti using World Bank data, 2010.

Ecological Footprint, 2005

	Score from 1 to 10	Global hectares per person
United States	1,0	9,4
Denmark	3,4	8,0
Greece	7,1	5,9
Spain	7,4	5,7
U.K.	8,1	5,3
Sweden	8,4	5,1
France	8,8	4,9
Japan	8,8	4,9
Italy	**9,0**	4,8
Germany	10,0	4,2

Source: The European House-Ambrosetti re-elaboration of Global Footprint Network, 2008

Water Footprint, media 1997-2001

	Score from 1 to 10	m^3 per person
United States	1.0	2,483
Greece	1.6	2,389
Italy	**2.0**	**2,332**
Spain	2.1	2,325
France	5.1	1,875
Sweden	6.8	1,621
Germany	7.3	1,545
Denmark	8.1	1,440
U.K.	9.4	1,245
Japan	10.0	1,153

Source: The European House-Ambrosetti re-elaboration of Water Footprint Network, 2008

Contribution of renewable sources to energy supply, 2007

	Score from 1 to 10	% total primary energy supply
U.K.	1.0	2.3
Japan	1.3	3.1
United States	1.9	5.0
Greece	1.9	5.2
France	2.5	6.9
Germany	2.6	7.2
Italy	**2.6**	**7.2**
Spain	2.6	7.2
Denmark	5.7	16.8
Sweden	10.0	30.0

Source: The European House-Ambrosetti re-elaboration of OECD data, 2010

CO_2 emissions from use of fossil fuels, 2007

	Score from 1 to 10	Kg per person
United States	1.0	19,148
Germany	7.0	9,702
Japan	7.0	9,674
Denmark	7.4	9,163
Greece	7.6	8,755
U.K.	7.7	8,577
Spain	8.3	7,688
Italy	**8.5**	**7,382**
France	9.4	5,980
Sweden	10.0	5,028

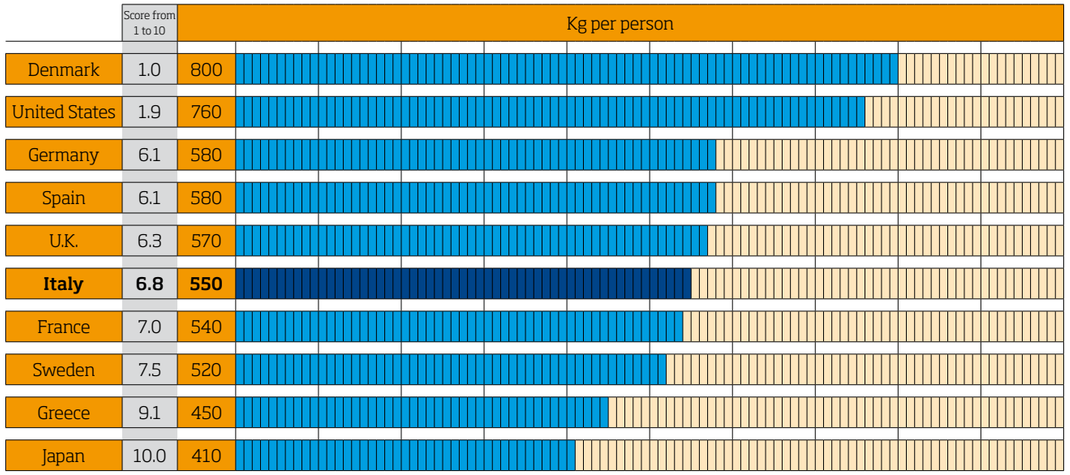
Source: The European House-Ambrosetti of OECD data, 2010

Levels of PM10, 2006

	Score from 1 to 10	Micrograms per m^3
Greece	1.0	36.0
Spain	2.6	31.6
Japan	3.3	29.6
Italy	**4.4**	**26.7**
United States	6.4	21.3
Denmark	7.4	18.7
Germany	7.4	18.6
U.K.	8.6	15.5
France	9.3	13.5
Sweden	10.0	11.6

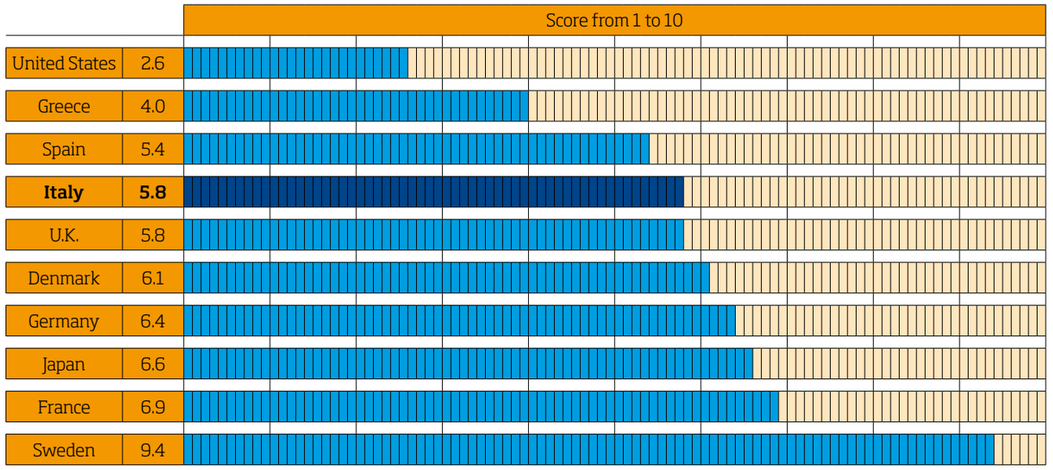
Source: The European House-Ambrosetti re of World Bank data, 2010

Urban waste, 2007 or most recent year available



Source: The European House-Ambrosetti of OECD data, 2010

Ranking for "Environmental well-being"

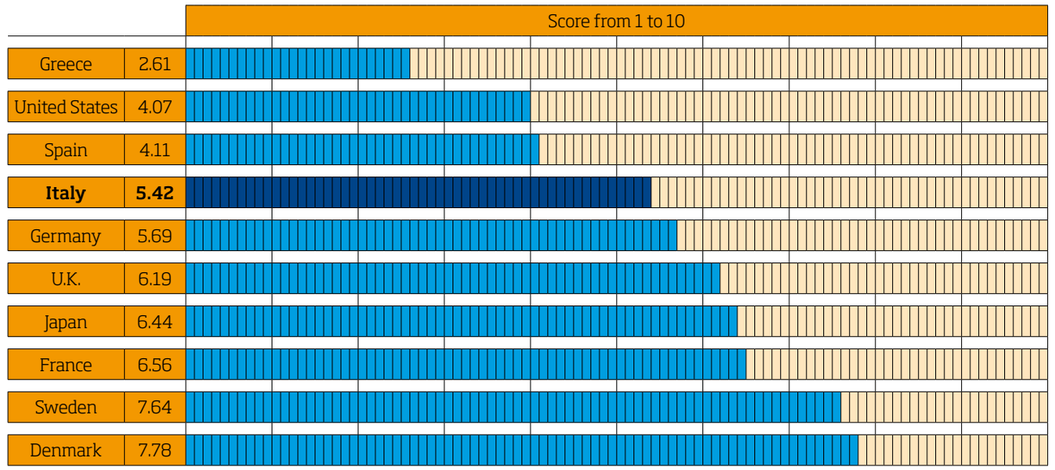


Source: The European House-Ambrosetti, 2010

Wealth and Sustainability sub-index

Wealth and Sustainability sub-index

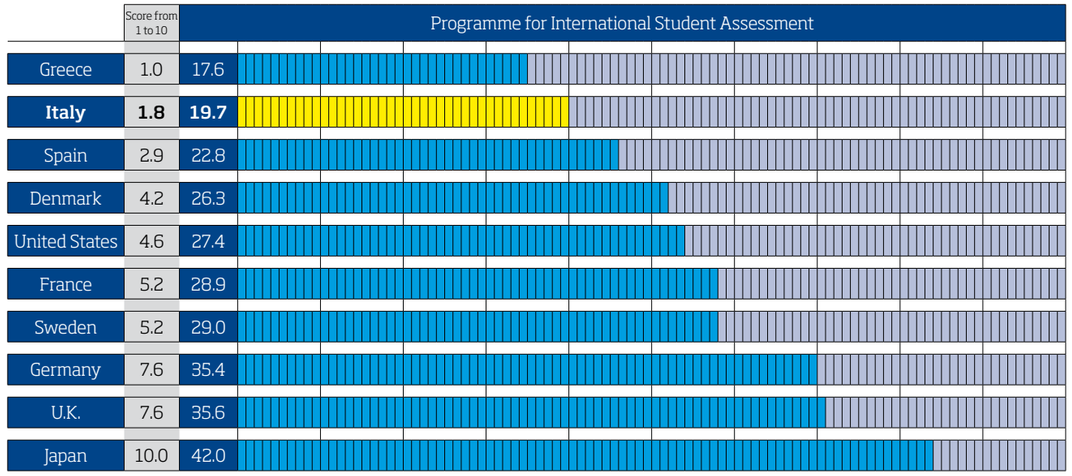
Figure 30 - Ranking for the Wealth and Sustainability sub-index



Source: The European House-Ambrosetti, 2010

Educational well-being

P.I.S.A. ranking: percentage of students in levels 4, 5, 6, 2009



Source: The European House-Ambrosetti re-elaboration of OECD, PISA data, 2010

Average annual university graduates, 2009

	Score from 1 to 10	Average over last ten years, per 100,000 people
Germany	1.0	405.8
Greece	1.8	459.0
Italy	**2.6**	**505.9**
Sweden	3.6	567.7
Spain	4.4	624.3
United States	7.3	806.7
Denmark	7.5	816.1
Japan	7.7	827.7
France	8.5	882.2
U.K.	10.0	976.5

Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2010

Foreign students registered in the national university system, 2009

	Score from 1 to 10	Per 100,000 people
Italy	**1.0**	**95.4**
Japan	1.0	98.6
Spain	1.5	130.5
Greece	2.3	187.9
United States	2.4	196.0
Germany	4.0	315.3
Denmark	4.9	378.3
France	5.0	383.2
Sweden	7,5	567.7
U.K.	10.0	746.3

Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2010

Unemployment among university graduates, 2007

	Score from 1 to 10	%
Greece	1.0	5.47
France	1.4	5.34
Spain	3.7	4.51
Italy	**4.8**	**4.10**
Germany	5.0	4.03
United States	6.9	3.33
Sweden	7.1	3.28
Denmark	8.0	2.96
Japan	8.9	2.62
U.K.	10.0	2.23

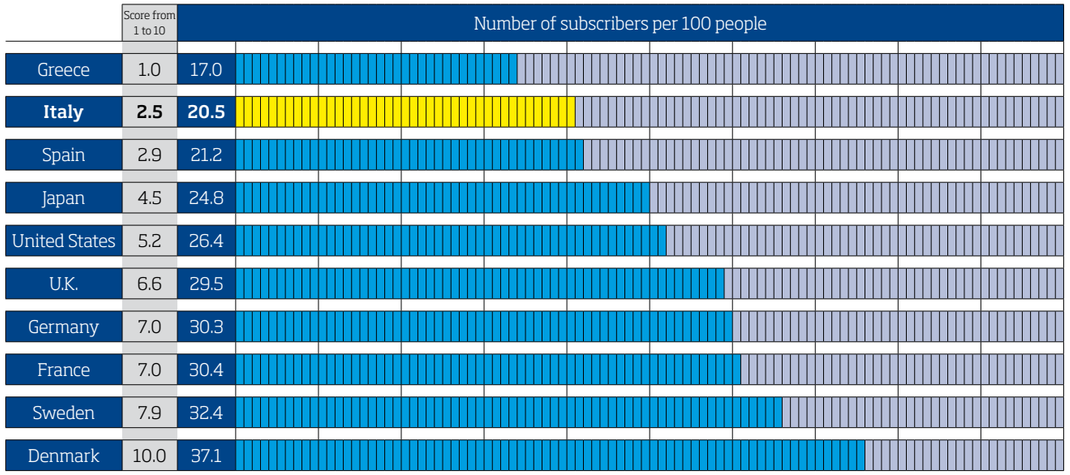
Source: The European House-Ambrosetti re-elaboration of OECD Science, Technology and Industry Scoreboard data, 2009

Average number of newspapers sold daily, 2009

	Score from 1 to 10	Per 100 people
Greece	1.0	14.2
Italy	**1.1**	**17.1**
France	1.4	22.8
Spain	1.8	31.8
United States	2.8	31.9
Japan	2.7	51.8
U.K.	3.6	70.6
Sweden	3.6	70.9
Germany	6.6	136.7
Denmark	10.0	212.5

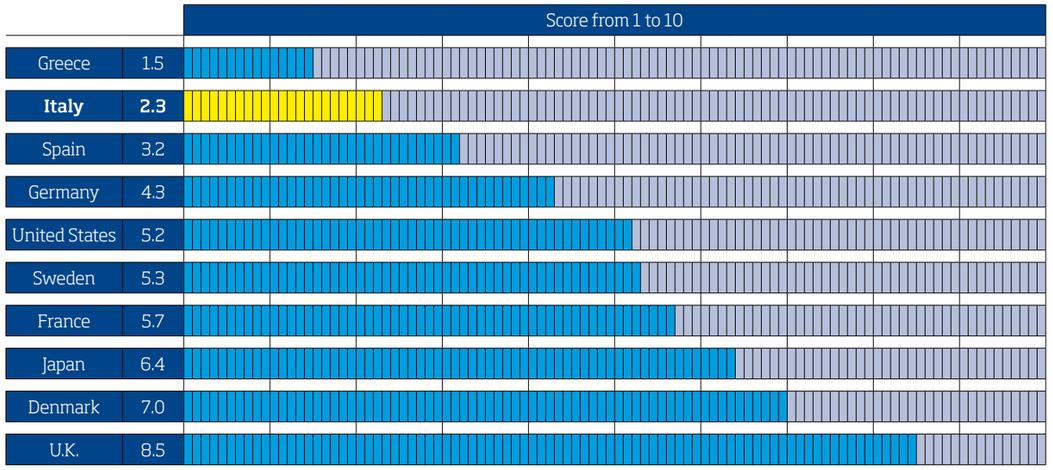
Source: The European House-Ambrosetti re-elaboration of Euromonitor data, 2010

Broadband internetconnections, 2009



Source: The European House-Ambrosetti re-elaboration of OECD Broadband Statistics data, 2010

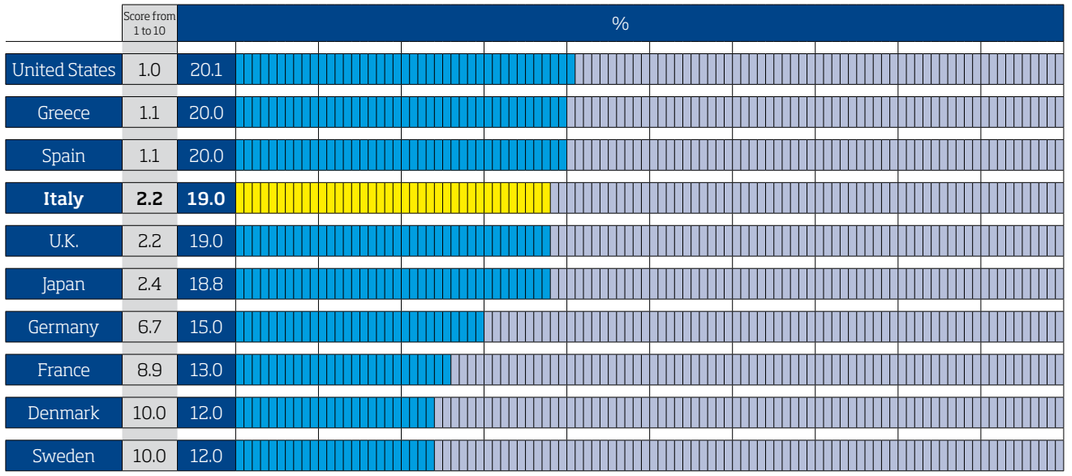
Educational well-being



Source: The European House-Ambrosetti re-elaboration, 2010

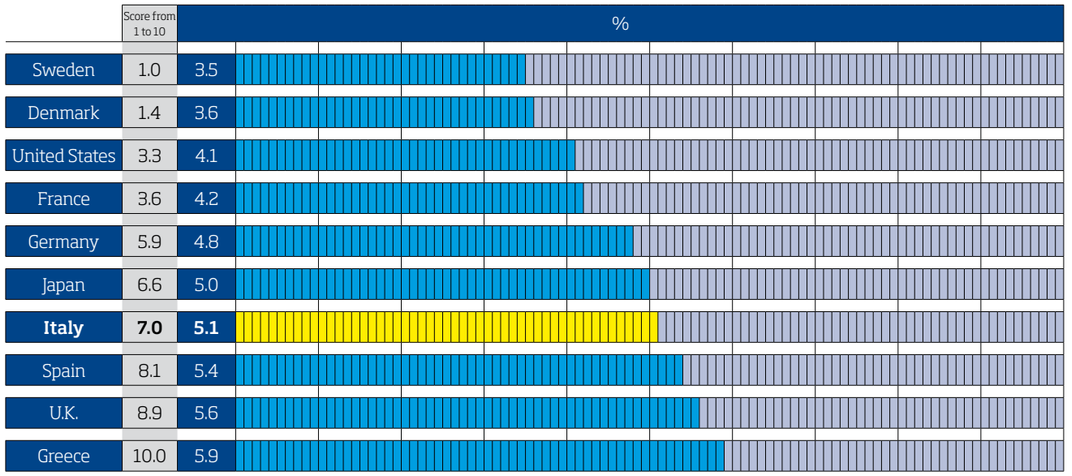
Social well-being

Percentage of people on the poverty line, 2008



Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2008

Level of income distribution inequality, 2009



Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2009

Average number of hours dedicated to looking after own children

	Score from 1 to 10	Weekly average, children age 0-12
U.K.	1.0	16.8
United States	2.1	18.4
Greece	2.8	19.6
Germany	5.0	22.9
Japan	5.2	23.2
Spain	6.0	24.5
France	6.7	25.6
Italy	**7.2**	**26.2**
Sweden	8.8	28.7
Denmark	10.0	30.5

Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2008

Average annual unemployment rate, 2009

	Score from 1 to 10	%
Spain	1.0	18.0
France	6.9	9.5
Greece	6.9	9.5
United States	7.1	9.3
Sweden	7.8	8.3
Italy	**8.1**	**7.8**
U.K.	8.3	7.6
Germany	8.3	7.5
Denmark	9.4	6.0
Japan	10.0	5.1

Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2009

Average annual youth unemployment rate, 2009

	Score from 1 to 10	%
Spagna	1.0	37.8
Grecia	4.8	25.8
Italia	**4.9**	**25.3**
Svezia	5.0	25.0
Francia	5.5	23.3
Regno Unito	6.9	19.1
Stati Uniti	7.3	17.6
Danimarca	9.3	11.2
Germania	9.6	10.4
Giappone	10.0	9.1

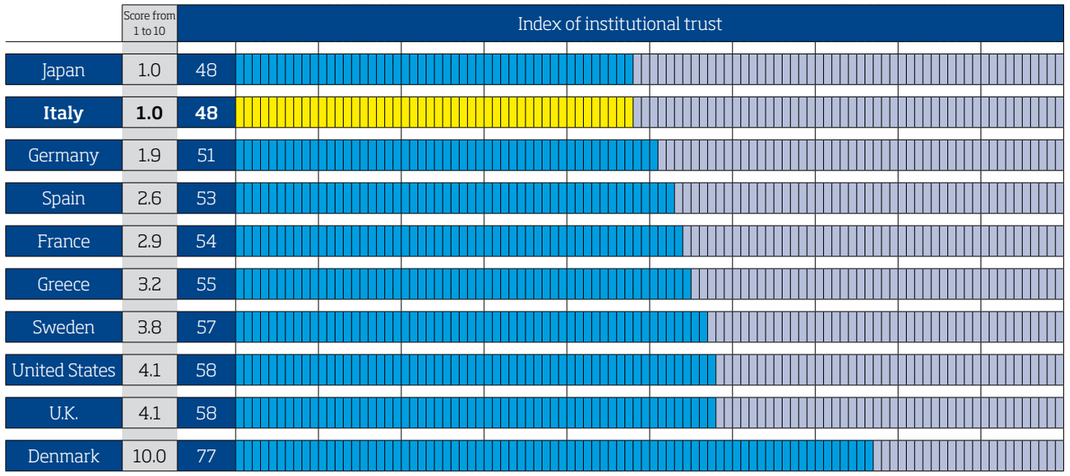
Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2009

Level of old age dependency, 2009

	Score from 1 to 10	
Japan	1.0	0.51
Germany	3.3	0.46
Italy	**3.4**	**0.46**
Sweden	4.3	0.44
France	5.7	0.41
Greece	6.0	0.40
U.K.	6.6	0.39
Denmark	7.6	0.37
Spain	7.8	0.37
United States	10.0	0.32

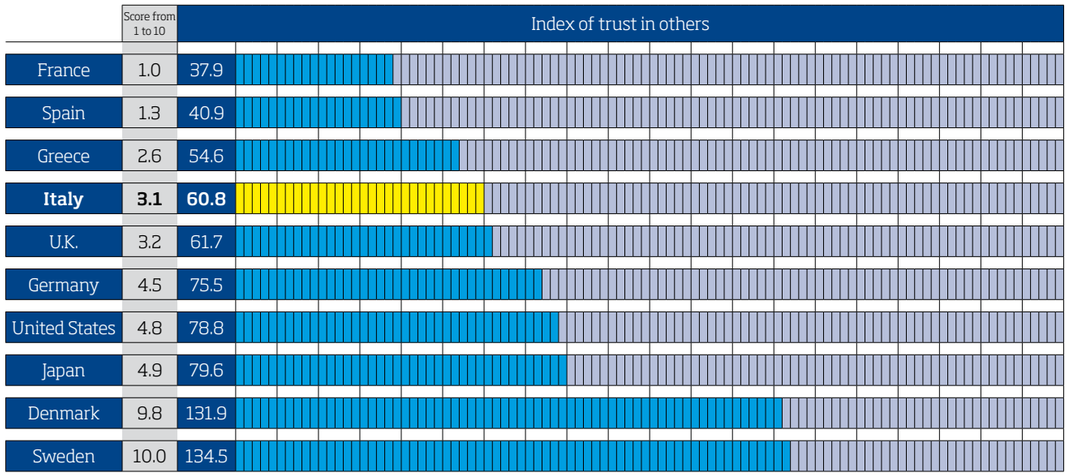
Source: The European House-Ambrosetti re-elaboration of Eurostat data, 2009

National Institution Index, 2007



Source: The European House-Ambrosetti re-elaboration of Gallup World Poll data, Year 2007

Interpersonal Trust Index, 2008 or most recent year available



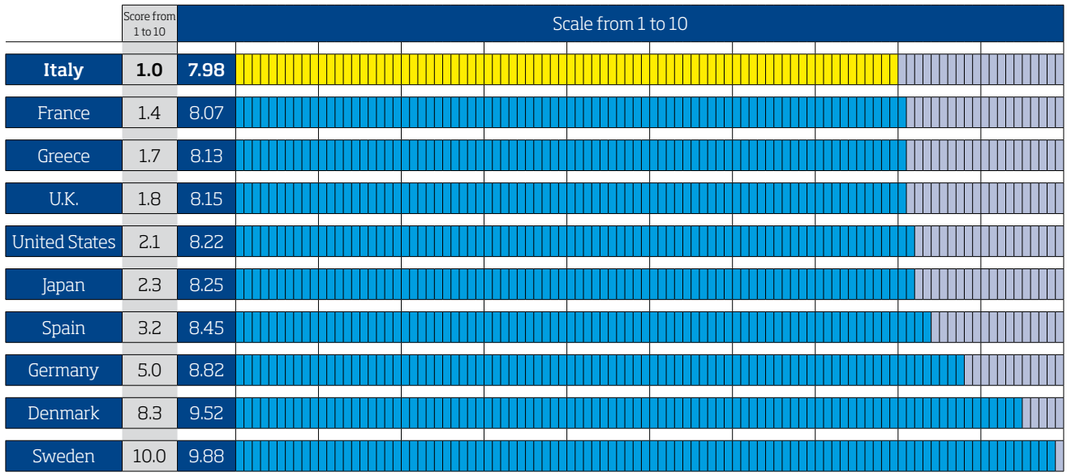
Source: The European House-Ambrosetti re-elaboration of World Value Survey, wave data, wave 2005-2008

Social well-being - Summary indicator

Fonte: The European House-Ambrosetti, 2010

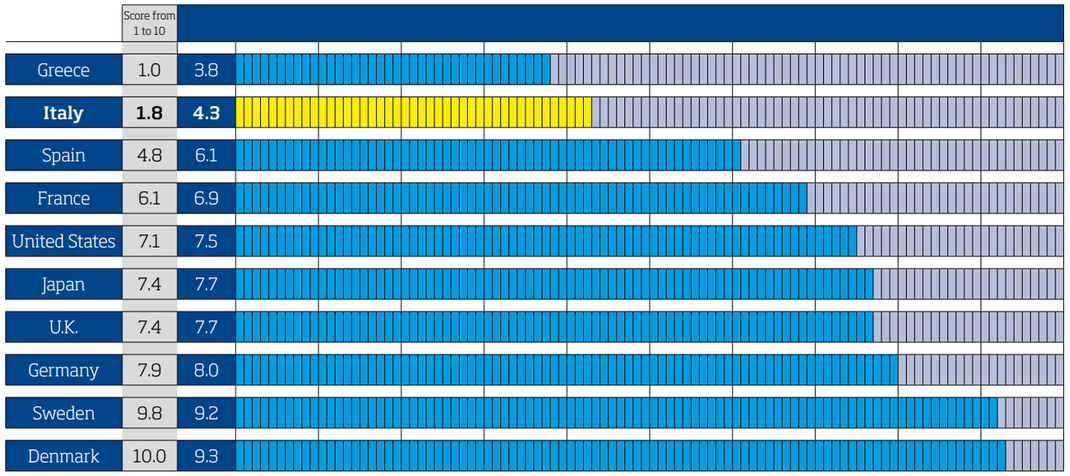
Political well-being

The Economist Intelligence Unit's index of democracy, 2009



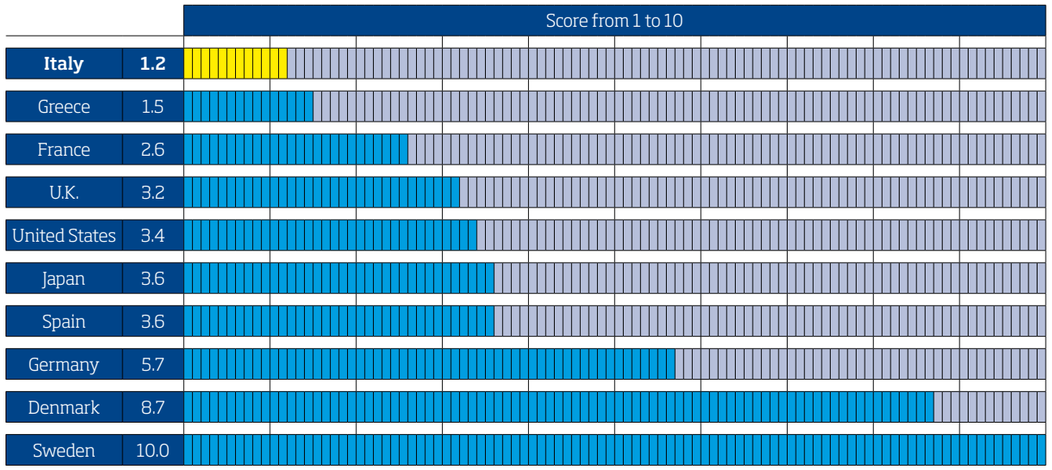
Source: The European House-Ambrosetti re-elaboration of Economist data, 2010

Corruption Perceptions Index, 2009



Source: The European House-Ambrosetti re-elaboration of Transparency International data, 2010

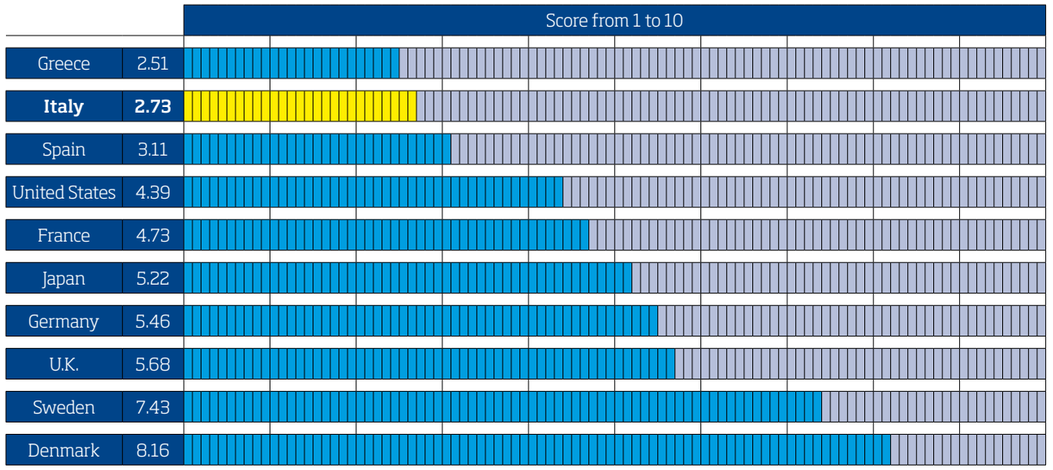
Political well-being - Summary indicator



Source: The European House-Ambrosetti re-elaboration, 2010

Social and Interpersonal sub-index

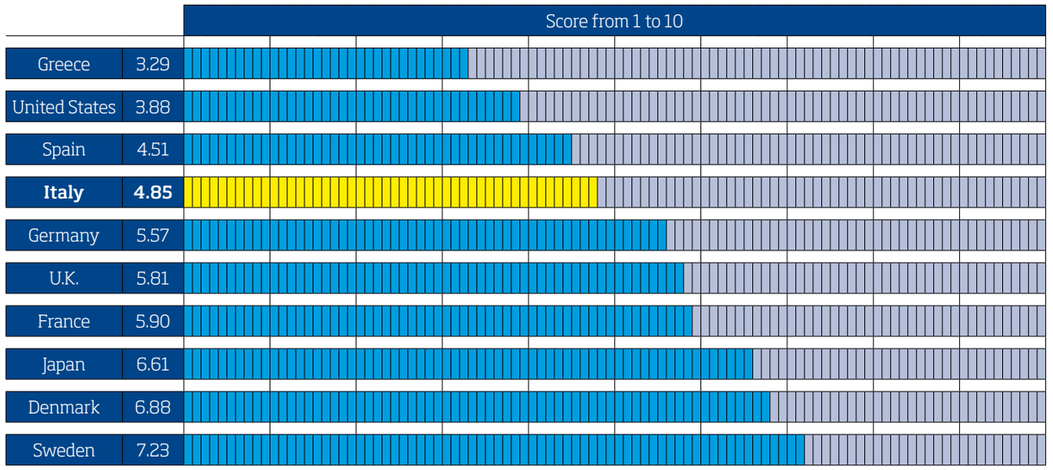
Social and Interpersonal sub-index



Source: The European House-Ambrosetti, 2010

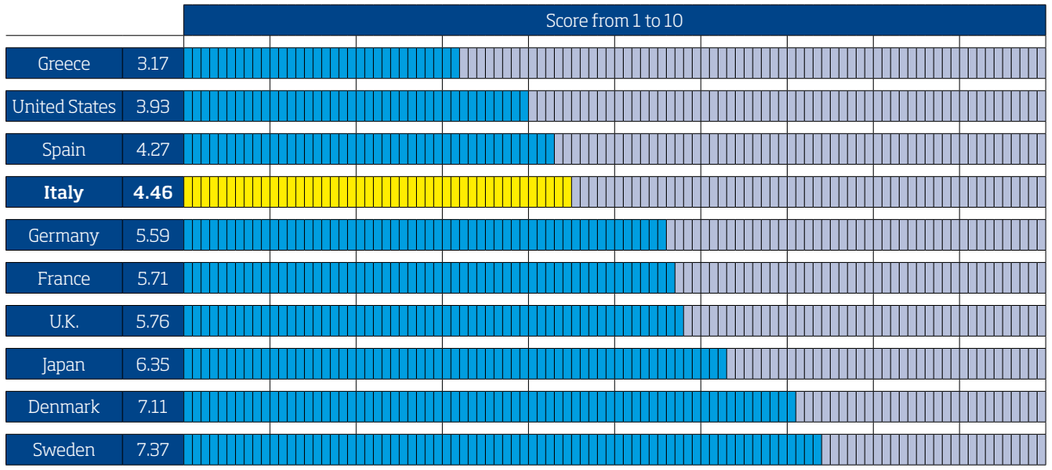
BCFN Index

BCFN Index



Source: The European House-Ambrosetti, 2010

BCFN Index Sensitivity



Source: The European House-Ambrosetti, 2010