



EUPHORIC

A EUROPEAN PROJECT



AN EVALUATION
OF HEALTH SYSTEMS
TO IMPROVE THE QUALITY
OF TREATMENT



“One of the European Commission's aims is to produce comparable information on health and health-related behaviour of the population, and on diseases and health systems. This information will be based on common indicators agreed Europe-wide on the definition, collection and use of such information”.

European Commission, Directorate-General Health and Consumer Protection

http://ec.europa.eu/health/ph_information/indicators/indic_data_en.htm

The EUPHORIC project, co-funded by the European Union covering the period 2003-2008, aims to improve information and knowledge in order to develop public health.

www.euphoric-project.eu

EDITORIAL COORDINATION

Eva Benelli, Camilla Di Barbora, Stefano Menna - Zadig, Italy
Marco Boscolo, Francesca Conti - Formicablu, Italy

SCIENTIFIC SUPERVISION

Marina Torre, Valerio Manno, Mascia Masciocchi - Istituto Superiore di Sanità, Italy
Danilo Fusco - Dipartimento di Epidemiologia, ASL Roma E, Italy

TRANSLATION

Christina Heine, Caterina Genua - united languages, Italy
Soslanguage, Italy

IMAGES

z.about.com
Surgery Associates NJ
Josep Cano - IMIM Hospital del Mar, Spain
Yarik Mission

GRAPHIC PROJECT

Catoni Associati, Italy



Measuring the quality of health care performance using objective criteria

European Union citizens pay careful attention to health issues: they wish to bring up their children in a healthy environment, they demand safety and hygiene in the workplace, they request protection against infection and disease, and they generally and rightfully expect to have access to efficient, high quality health services throughout Europe.

In fact, health is undoubtedly a priority for all European citizens.

Measuring the efficiency of the medical institutions is one of the ways by which the European Commission is contributing to higher quality of health care and to better safeguard and improve the health of citizens.

For that purpose, it is important to find a common platform that enables national health services and individual hospitals to evaluate their own effectiveness.

In order to respond to this need, the EUPHORIC (European Public Health Outcome Research and Indicators Collection) project has developed evaluation models that join together existing information on quality standards from different Member States and has also developed protocols to share information among the public health sectors.

The project is thus part of a well-known branch of research - outcome research - which analyzes the outcome of specific health treatments or interventions. We believe that the pursuit of these studies, and the results of the EUPHORIC project in particular, are an important contribution to the discussion and cooperation in the field of public health in the European Union.

Artur Furtado

Project and programme officer



Common European outcome indicators

In agreement with the ideas that foster the Community action programme for public health, the EUPHORIC project has developed standardized methodologies in order to calculate outcome indicators for individual pathology areas.

Outcome indicators provide an objective and reliable way of measuring the differences in the patient's state of health, before and after an operation or given therapy.

In order to respond to the need to find a common language, set down shared reference standards, and experiment new methodologies, the project has gathered previously existing outcome indicators from various European countries and from experience and commitment evolved at the national level.

Hence, it has verified the possibility of producing common indicators for all Europe with the continual and final aim of providing shared data in order to measure the quality of health services.

In its aim, limited to certain selected indicators, to harmonize and integrate the analyses, EUPHORIC has assisted in the development of indicators previously achieved by other European projects, such as ECHI (European Community Health Indicators), ECHI-2 and ECHIM (European Community Health Indicators Monitoring).

Marina Torre

EUPHORIC project leader

THE EUPHORIC PROJECT

EUPHORIC is a multidisciplinary project co-funded by the European Union. Moreover, it is a network, which at the conclusion of the project, included 15 institutions from 10 European countries and Israel as well as a technological partner (Consorzio interuniversitario per le Applicazioni di Supercalcolo per Università e Ricerca - CASPUR) and Zadig, an editorial and publishing company focusing on communication in the field of medicine and public health.

Participants:

Austria

- Arthroplasty Register Tyrol
- EFORT/EAR Verein zur Unterstützung der Tätigkeit von nationalen Endoprothesenregistern
- Ludwig Boltzmann Institut Health Technology Assessment

Bulgaria

- National Center of Public Health Protection

Finland

- Sosiaali- ja terveystieteiden tutkimus- ja kehittämiskeskus

France

- French Society of Orthopaedic and Trauma Surgery

Germany

- BQS Bundesgeschäftsstelle Qualitätssicherung gGmbH

Greece

- National and Kapodistrian University of Athens

Israel

- Israel Society for the Prevention of Heart Attacks at NCRI

Italy

- ASL RM E, Dipartimento di Epidemiologia
- Istituto Superiore di Sanità (project coordinator)

Slovak Republic

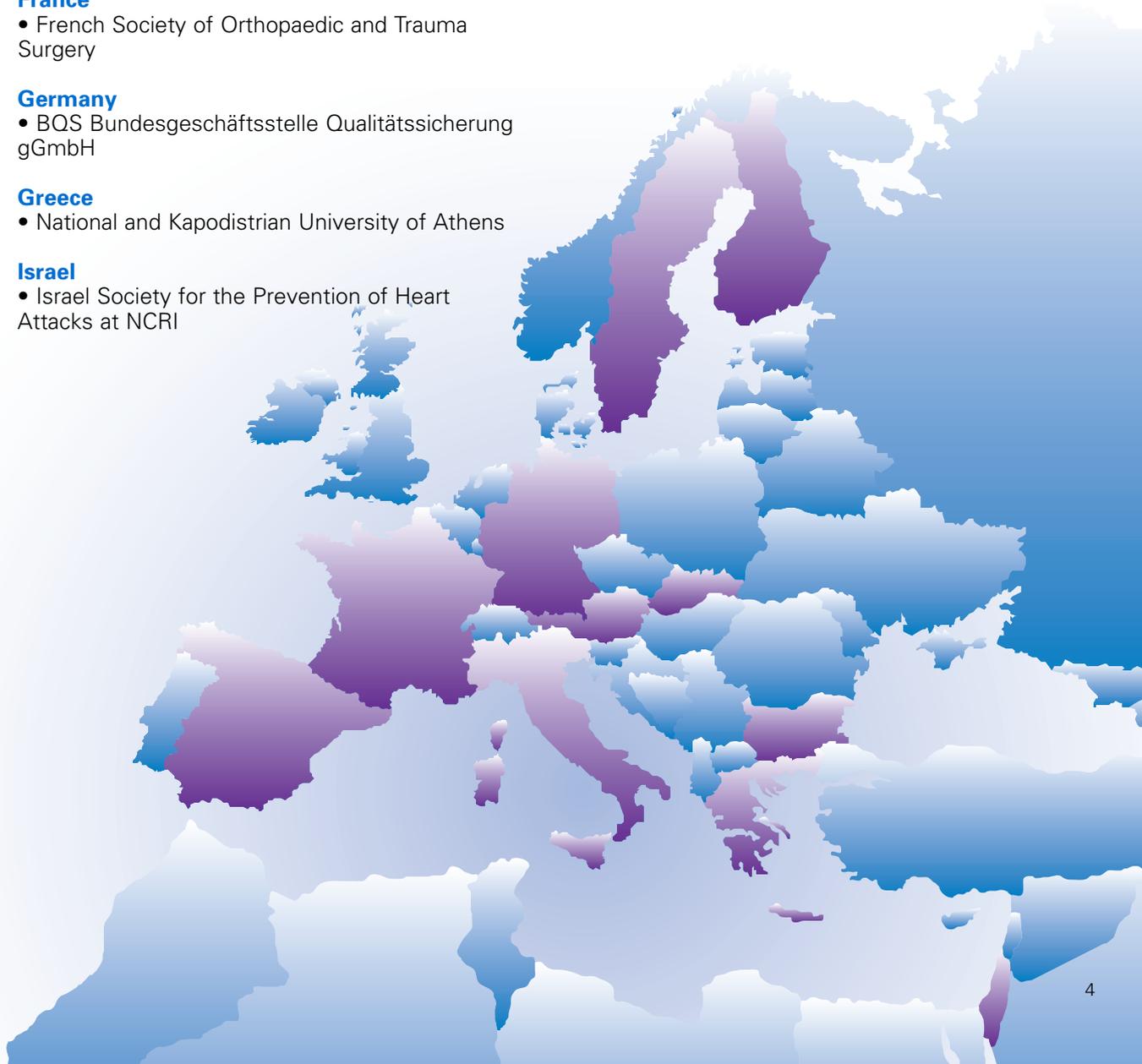
- Slovak Arthroplasty Register

Spain

- Catalan Agency for Health Technology Assessment and Research
- Institut Municipal d'Assistència Sanitària

Sweden

- Karolinska Institutet



Project's aims

EUPHORIC integrates field experiences with the existing knowledge from the participating countries of the project in order to:

1. verify the possibility of developing **common outcome indicators** in the health field for all Europe
2. evaluate quantitatively the outcome indicators regarding selected medical practices, therefore developing a **standardized methodology** by gathering detailed information on outcome indicators and studying the validity of routinely collected data
3. provide high quality **objective and clear information** that is easily accessible by users
4. **share information** on standard quality, on better practices and on the effectiveness of public health
5. identify the elements which are common to all of the European Union so as to create a **shared platform** that promotes access to **better practices** for all European citizens

The three phases of the project

SURVEY

The first phase regarded the creation of a shared inventory of the studies on outcome research and outcome indicators in the participating countries. Consequently, a list of 54 indicators (see pages 8-9) was created in order to focus on the tools and operative conditions to be implemented and tested in the second phase of the project.

PILOT

The following phase allowed the testing of some selected indicators. The work was based on the results obtained in the first phase and the most recent available population registers were used. Aim: define a standardized methodology to develop and calculate the indicators so as to allow a comparison of the outcomes of the selected pathologies and procedures in the participating countries. In particular, this meant creating two pilot studies to develop methodologies to calculate certain selected indicators in the cardiovascular and orthopaedic areas, which were chosen for their high clinical interest and impact on public health. Furthermore, a specific "Risk Adjustment and Statistics" work group was formed to support the two pilot studies in order to evaluate the sources of information available in the participating countries.

DISSEMINATION

EUPHORIC's history and results are available in several languages and through several features directly from the project's website: www.euphoric-project.eu. It was decided to render the data accessible to the public, authorities, institutions and health care workers. EUPHORIC's research agenda was made known to the scientific community by means of published articles in specialized journals, workshops and international conferences that will also be planned for the future.

WHAT ARE OUTCOME INDICATORS



Indicators are tools used to measure phenomena. In particular, outcome indicators in the health field allow the measurement of the effects that medical treatments and procedures have on the health of a population or a single patient. For this reason, they are an indispensable tool in evaluating the effectiveness of assistance offered to the public.

A good outcome indicator has these characteristics:

MEASURABLE

easily detected and can be easily reproduced even within different contexts

IMPORTANT

pertinent to the phenomenon that needs to be measured

SIMPLE

clear and simple

USEABLE

accurate and complete (better if accompanied by threshold or standard values)

SOLVEABLE

relates to a problem that is possible to solve with the available resources

ACCEPTABLE

by the person who has to detect it and apply it

Good examples of outcome indicators identified by EUPHORIC are mortality rate 30 days following myocardial infarction or 30 days after hip fracture or the revision rate of an orthopaedic prosthetic implant.

THE IMPORTANCE OF OUTCOME INDICATORS

Outcome indicators allow the comparison between medical institutions and the measurement of the effectiveness of treatments and procedures. The deep that comparing the services provided by individual medical institutions permits the identification of weak points and constitutes a stimulus to improve their own services, is also shared by the European Union through its actions undertaken in the health field.

Self evaluation of health systems

The experiences gained from this sector in the last fifteen years and learnt through the media, show how the main effect of this type of comparison is to help medical personnel, at every level, improve their services.

At the same time, a lively debate began regarding the opportunity to make the results obtained from each institution known to the public. The position taken by each member state varies and not one single opinion exists to this day. EUPHORIC's contribution was to make a reliable and objective tool for self evaluation available to personnel and medical institutions.

Institutional decision makers and outcome indicators

Data collected by EUPHORIC and from other similar projects also provide valid tools for institutional decision makers to make choices in planning and using the available resources. In line with the European Union's general idea, the effort made by EUPHORIC's partners lies in providing an objective basis to be able to make knowledgeable choices and promote an homogeneous improvement in health care services to all European citizens.

A tool for the public and for medical institutions alike

The information that emerges from the EUPHORIC project is freely accessible to all European citizens from the website: www.euphoric-project.eu

Especially hospitals and medical institutions can obtain the most benefit from the website, thanks to the possibility of adopting tools that allow them to compare their performance with other quality institutions and the reference values for each medical procedure. Self assessment on the part of health care world allows to simply and clearly improve health services to all European citizens.

OUTCOME INDICATORS OF THE EUPHORIC PROJECT

The work carried out by all the partners of the EUPHORIC project led to the creation of a list of 54 outcome indicators, divided in 9 categories. The compiling of the list is based on evaluation criteria, such as data availability, clinical relevance of the indicator and its importance to the international scientific community. The indicators were identified on the basis of the data available in the first phase of the project, in particular covering 2004-2005

The 54 indicators of the EUPHORIC project

Category	N.	Indicator
Cardiovascular disease and surgery	A1	Emergency readmission to hospital following treatment for a stroke
	A2	Death within 30 days of admission to hospital with a stroke
	A3	In-hospital deaths following Coronary Artery Bypass Graft (CABG) operation
	A4	Death within 30 days of Coronary Artery Bypass Graft (CABG) operation
	A5	In-hospital deaths following Percutaneous Transluminal Coronary Angioplastic (PTCA) operation
	A6	Death within 30 days of Percutaneous Transluminal Coronary Angioplastic (PTCA) operation
	A7	Death within 6 months of Percutaneous Transluminal Coronary Angioplastic (PTCA) operation
	A8	Death within 12 months of Percutaneous Transluminal Coronary Angioplastic (PTCA) operation
	A9	In-hospital deaths following admission to hospital with Acute Myocardial Infarction (AMI)
	A10	Death within 30 days of admission to hospital with Acute Myocardial Infarction (AMI)
	A11	Death within 30 days of admission to hospital with Congestive Heart Failure (CHF)
	A12	Hospital admission for Congestive Heart Failure (CHF)
	A13	In-hospital deaths and neurological complications following carotid stenting procedures
	A14	Deaths and neurological complications within 30 days from carotid stenting procedures
Cancer	B1	Breast cancer relative survival
	B2	Lung cancer relative survival
	B3	Colon cancer relative survival
Infectious diseases	C1	Emergency admissions to hospital of children with lower respiratory infections
	C2	AIDS survival
	C3	Death within 30 days of admission to hospital with pneumonia
	C4	Hospital admissions for paediatric gastroenteritis
	C5	Hospital admissions for influenza
	C6	Hospital admissions for tuberculosis
Other chronic diseases	D1	Hospital admissions for uncontrolled diabetes
	D2	Hospital admissions for short term complications of diabetes
	D3	Hospital admissions for long term complications of diabetes

A starting point

Identifying outcome indicators, which can be applied in different health contexts, requires constant updating. Only in this way can it be guaranteed that the differences among countries are not underestimated but rather they are included and codified so as to improve the evaluation tools and compare the results. Neither can the most recent terminology be omitted as it is in continual evolution in relation to the new procedures and standards being introduced. Therefore, the list of indicators identified by the EUPHORIC project is not the definitive end point but the starting point of a path to constantly improve the quality of health assistance offered to European citizens.

Category	N.	Indicator
	D4	Hospital admissions for lower extremity amputations in patients with diabetes
	D5	Hospital admissions for adult asthma
	D6	Hospital admissions for paediatric asthma
	D7	Hospital admissions for senile asthma
Orthopaedics	E1	Emergency readmission to hospital following treatment for a fractured hip
	E2	Death within 30 days of admission to hospital with a fractured hip
	E3	In-hospital death following admission with a fractured hip
	E4	Returning home following hospital treatment for fractured hip
	E5	In-hospital waiting time for femur fracture surgery
	E6	Total hip replacement in-hospital mortality rate
	E7	Partial hip replacement in-hospital mortality rate
	E8	Revision rate
	E9	Revision burden rate
Transplantations	F1	Medulla ossium graft relative survival
	F2	Liver transplantation relative survival
	F3	Heart transplantation relative survival
	F4	Lung transplantation relative survival
	F5	Kidney transplantation relative survival
Emergency	G1	Emergency admissions to hospital
	G2	Emergency readmissions to hospital within 28 days
	G3	Emergency hospital admissions for alcohol related pathologies
Neonatal/ Maternal	H1	Maternal mortality rate
	H2	Neonatal / Infant mortality rate
	H3	Perinatal mortality rate
	H4	Perinatal intensive care mortality rate
	H5	Percentage of births carried out by caesarean section
Miscellanea	I1	Death within 30 days of surgery (elective and non-elective admissions)
	I2	Hospital admissions for alcohol related pathologies

ORTHOPAEDIC AREA



A good result: 50% reduction in failures

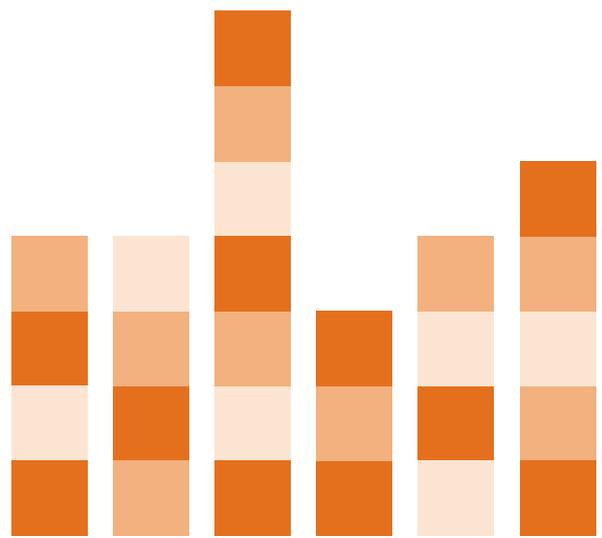
«The outcome indicators used in the orthopaedic pilot phase are currently being used in the main arthroplasty registers of the world. Initially introduced in Scandinavia, they are also now being used in the projects launched in many countries of the European Union in the last years with the aim of setting up national or regional registers. Initiated in 2002, the European Arthroplasty Register project (EAR) of the European Federation of National Associations of Orthopaedics and Traumatology (EFORT) has been supporting or coordinating most of them. Developing outcome indicators that are common to all of the European Union is important because it allows us to compare the performance of every hospital and of each health system. It was possible to **reduce the failure rate by 50%** in six years in countries like Sweden where these evaluation tools have been used for a long time. This improvement also had an immediate impact on an economic level by permitting, each year, **savings of euro 14 million** against an investment of euro 450,000 to maintain the register».

Gerold Labek

Coordinator of the EUPHORIC orthopaedic pilot

Specific Aims

- Develop outcome indicators for orthopaedic prosthetic surgery based on the results from existing national projects according to the guidelines of the European Commission projects.
- Identify the main issues and consolidate the results from existing projects.
- Define best practice procedures for the development and creation of registers concerning orthopaedic prosthetic surgery.
- Validate the potential contribution of different methods used in outcome measurement and quality monitoring of medical devices (e.g. register data analysis, meta-analyses of clinical studies, orthopaedic implant failure monitoring systems by public health systems) for a structured outcome measurement and quality control system at the European Union level.
- Present a detailed description of the registers and other outcome evaluation tools adopted by Sweden and Finland. Actually, of the European Union countries, these two nations have had a long established and advanced system of studying the organization and the way the outcome and quality monitoring system functions at a national level



CARDIOVASCULAR AREA

Specific aims

- Define a set of indicators to evaluate the quality of health care for patients affected by myocardial infarction who underwent a coronary bypass, coronary angiography or percutaneous revascularization.
- Apply the indicators to data gathered from previously available information and evaluate hospitals and each country in order to produce information that is useful to: medical and administrative personnel, decision makers, politicians and the public
- Create an outcome indicators monitoring system for cardiovascular pathologies in Europe.
- Develop and update a systematic review of the literature on the efficacy of GPIIb-IIIa inhibitors in percutaneous coronary intervention.

Acute coronary syndrome was chosen because it always requires patient hospitalization, therefore, permitting the easy monitoring of hospital surgery as well as its outcome. Furthermore, many currently functioning population registers exist in all European countries.



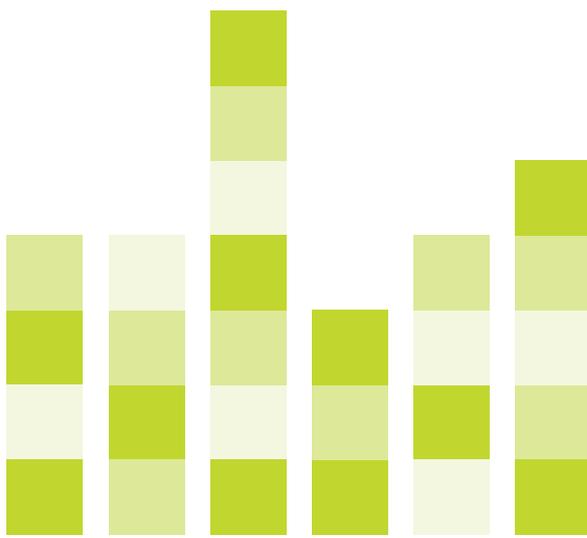
Comparing hospital performance in Europe

«In the third year of the EUPHORIC project, the cardiovascular pilot study developed a preliminary version of a **software** that will permit European hospitals to assess their own performance in the general management of two cardiovascular pathologies (i.e. myocardial infarction and unstable angina), and three related procedures (i.e., thrombolysis, coronary angiography and percutaneous interventions). The software allows the user to compare their performance in terms of in-hospital mortality with that of the average of 285 European hospitals with similar characteristics and is, in consequence, an important “self-benchmarking” tool. This tool is based on a mathematical model that includes a certain number of standard variables, but always takes into account the country’s characteristics as well as those of the hospital being studied. The only data required to test the observed mortality in a hospital are those related to the characteristics of the patients hospitalized, and those of the hospital itself.

Creating this system of indicators, which are common to all of Europe, represents a great challenge in this research field. There has been a lot of discussion regarding this point because we believe that this instrument – that needs some fine-tuning – may be very important for public health stakeholders in the European Union».

Jaume Marrugat

Coordinator of the EUPHORIC cardiovascular pilot



RISK EVALUATION METHODS



Comparing heterogeneous data

«When comparing hospitals and medical institutions, non-uniform data often surface that can give rise to incorrect evaluations. As well as taking into consideration the disease or treatment, there is also a set of factors to be faced, such as the patients' advanced age, the type and the coexistence of other pathologies. For example, if in one hospital 10 patients die out of 1,000 admitted for myocardial infarction and 20 die in another hospital, this does not always mean that the second hospital takes less care of its patients. There may be many reasons: the second hospital may admit a greater number of patients with diabetes, the elderly, obese or with tumours. All these factors help increase mortality without implying lesser treatment. The "Risk Adjustment" pilot served to improve defining the seriousness of the patients' illness by developing and standardizing statistical methods regarding **heterogeneous patient characteristics**. Therefore, it was possible to obtain correct results that were capable of avoiding misleading conclusions when outcome evaluations of several hospitals are compared. Particularly, a **standard methodology** was developed to allow the com-

The ever-increasing need to compare outcome in health requires the development and diffusion of epidemiology research, the ability to correct analyses, and interpret the results. In order to evaluate hospitals and national health systems, data are used which are routinely collected from medical institutions for administrative reasons, above all from discharge records.

The main task of the "Risk Adjustment" pilot was to coordinate the work in the cardiovascular and orthopaedic fields so as to define the best standardized methodology to calculate indicators. Consequently, it was possible to compare the outcome for the selected pathologies and the related procedures in all the participating countries in the project.

Specific aims

- Describe the general quality and verify the possibility of standardizing the categories and the variables of the data collected for EUPHORIC using hospital or population registers, research and clinical trials included in the two pilots and health assistance information systems.
- Test a standardized methodology to calculate the chosen indicators, compare the outcomes of the selected pathologies and procedures in individual hospitals within each European country by using information gathered from health care registers.

parison of data that come from different sources, thereby minimizing the risk of error. The protocol developed allows the comparison of the outcome of pathologies and selected procedures among the participants of the EUPHORIC project».

Danilo Fusco

Leader of the EUPHORIC Risk Adjustment pilot

OUTCOME INDICATORS TO MAKE BETTER CHOICES

The EUPHORIC project embraces efforts made by the European Union and contributes to improving health services in the Member States by providing a common platform to evaluate outcomes at the Community level and clear and accessible information that gathers together all of the project's scientific results and technical documents.

Most European countries are aware of the increasing importance of successfully evaluating health services by the **objective quantification of the results**. Adopting a system which is capable of comparing quantitative and qualitative indicators at the Community level on the basis of existing studies and **the results achieved is one of the roads to take**.

EUPHORIC's scientific approach, outcome research, **allows the measurement of the quality in health assistance**. This evaluation can be used to measure the outcome of a specific procedure as well as evaluate the variability of the outcomes in relation to specific characteristics of the population being studied, such as socio-economic level, income, or resident in a determined geographical area.

This means being able to make **better choices from an effectiveness point of view**, thanks to the possibility of drawing upon shared and common knowledge so as to eliminate the differences between the countries and between the many stratas of the European population.

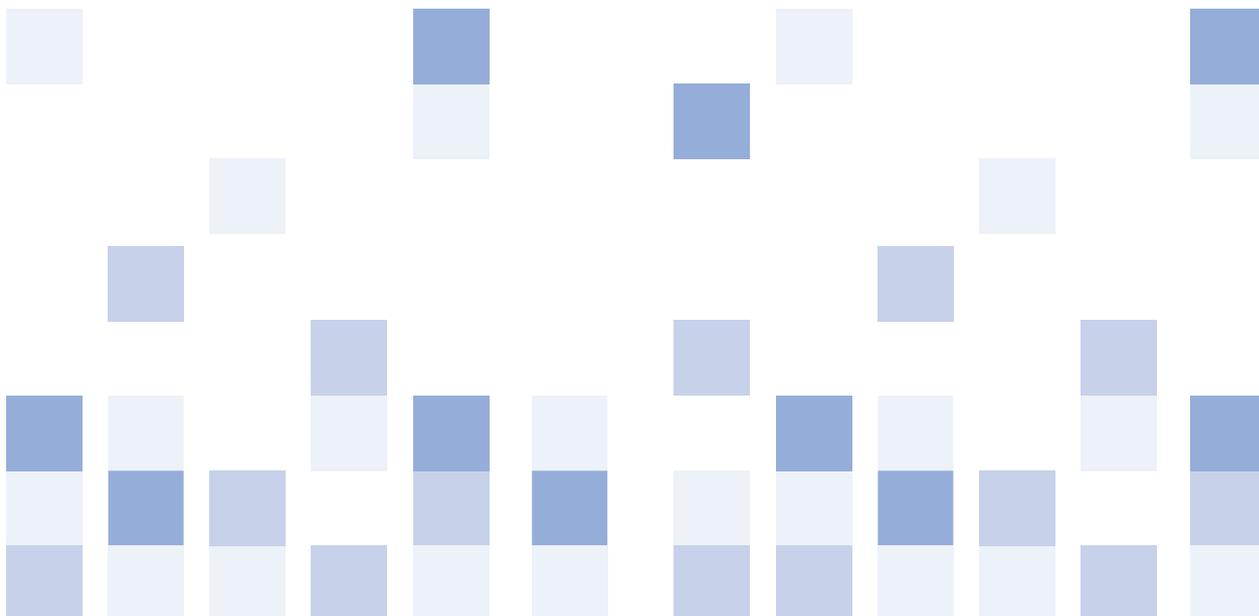
From the efficiency point of view, this means **better administration of the available resources** by identifying weaknesses and gaps. The EUPHORIC platform offers the opportunity to compare every medical institution which promotes assuming greater responsibility for the choices made.



"Europe for Patients"

The European health programme is vast and well-structured and is involved on many fronts. The European Union's aim is to always actively involve its citizens in the knowledge that participation is a fundamental point in improving the actions taken. In addition, public involvement is decisive in improving lifestyle and preventing and curing disease. An example of participation and intervention on a vast scale in health is the information campaign "Europe for patients", which states the initiatives and informs the public on its website:

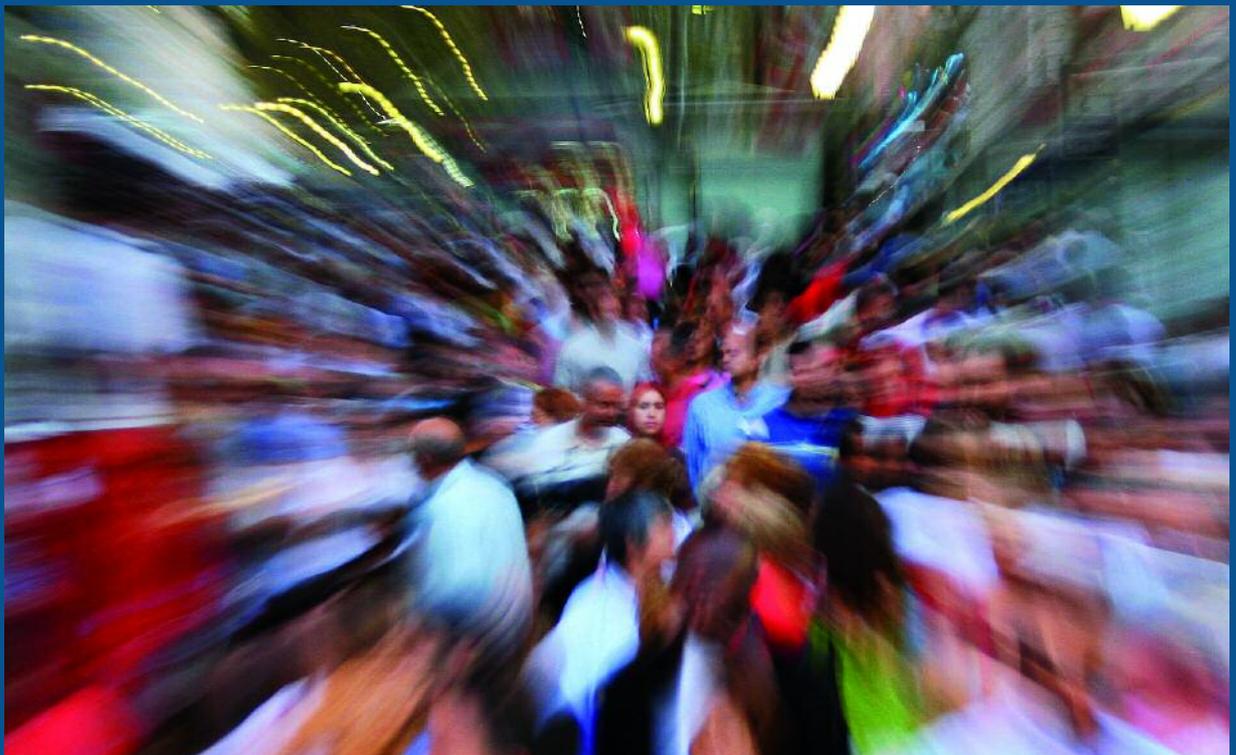
http://ec.europa.eu/health-eu/europe_for_patients/index.html



THE FUTURE OF THE EUPHORIC PROJECT

The EUPHORIC experience ended in December 2008 after four years of networking, which in the meantime had extended to 15 institutions from 10 different European countries as well as Israel. The hope of those who have worked on this project is that EUPHORIC can be a starting point for other research projects in this sector that are aware of the necessity of continual monitoring of the results and of the constant need to update procedures, methodologies and the public health requirements. EUPHORIC's scientific effort is available to all those who must make decisions regarding public health.

Far from being solely a technical, scientific and professional challenge, EUPHORIC has above all been a cultural and political challenge. For this reason, the many contacts with other projects promoted by the European Union must be taken into account. Furthermore, the value of this project lies in its dimension at the Community level, though often obstacles were encountered due to the differences among the Member States. However, it is precisely this point that the European Union and projects such as EUPHORIC can and must insist on in order to create a homogeneous health service for all EU citizens.



OTHER EUROPEAN PROJECTS

ECHIM

A three-year project of the Community Action Programme in the field of Public Health (2003-2008) in the European Union. ECHIM continues with the work of ECHI and ECHI-2 to develop and implement monitoring health using indicators.

www.echim.org

eHID

Funded by the Community Action Programme in the field of Public Health (2003-2008), eHID operated in the sector indicators taken from electronic records in primary care.

ec.europa.eu/health/ph_projects/2003/action1/action1_2003_19_en.htm

EUnetHTA

European network for health technology assessment.

www.eunethta.net

EUGLOREH

Funded by the Community Action Programme in the field of Public Health (2003-2008), EUGLOREH produced a report (Report on Health in the European Union) that gathered together European experiences and data starting from 1998. www.eugloreh.it

OCSE

The Organisation for Economic Co-operation and Development (OECD) unites the experiences of governments from all over the world that are committed to the principles of democracy and free market economy.

www.oecd.org

HDP e HDP2

The Hospital Data Project was funded by the European Health Monitoring Programme (HMP) under the auspices of DG Sanco with two key objectives: 1) the preparation of a detailed and practical methodology for the collection of comparable hospital activity data in Europe; 2) the production of a pilot dataset according to the agreed methodology and, with a view to its future implementation within the European Union's Public Health information Network (EUPHIN). The aim of the HDP2 project was to build on the work of HDP based on the identified priority areas.

http://ec.europa.eu/health/ph_projects/2004/action1/action1_2004_32_en.htm

European Patients' Forum

Pan-European organization of patient organizations that is active in the field of public health.

www.eu-patient.eu

MATTONI Project

MATTONI is an Italian project with the aim of identifying and creating a common language at the national level in order to guarantee the comparison of shared information in the new health information system.

www.mattoni.ministerosalute.it

PERFECT Project

PERFECT is a Finnish project for the development of methods to measure the cost-effectiveness of health treatments and create a database to compare hospitals, hospital districts, regions and population groups.

info.stakes.fi/perfect/EN/index.htm

MARQuIS

Funded in 2005 as part of the "Scientific Support to Policies" component of the 6th FP of the European Union, the Methods for Assessing Response to Quality Improvement Strategies project (MARQuIS) aimed at contributing to the assessment of different quality strategies and at providing information on cross-country mobility. www.marquis.be

SImpatIE

Funded in the context of the Programme of Community Action in the field of Public Health (2003-2008), the Safety Improvement for Patients In Europe project (SImpatIE) was aimed at using Europe-wide networks of organizations, experts, professionals and other stakeholders to establish a common European set of vocabulary, indicators, as well as internal and external instruments to improve safety in the field of health care.

www.simpatie.org

www.euphoric-project.eu

