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ORIGINAL ARTICLE

European community health monitoring: the EUPHIX-model

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Abstract

Aims: On 20 June 2008, the EUPHIX website (www.euphix.org) was officially launched. EUPHIX aims to provide policy relevant health information, data and knowledge for policy makers, public health experts and educated lay people in the European Union (EU). The project was carried out by a partnership of European health reporting experts. **Methods:** The conceptual structure of EUPHIX resembles the one used for the ECHI-indicator framework, but adds health policies. EUPHIX includes texts (EUphacts) next to indicator data, as well as links to organizations, data and literature. Other contributions, called EUphocus, address broader agenda issues, such as mental health and health inequalities. Some EUphocus contributions contain summarized outcomes of EU projects. In this sense, EUPHIX has a European platform function as well. Behind the surface of the EUPHIX website lies a complex internet application, including databases, i.e. for indicator data, for internal and external web links and for references and definitions. This back-office contains a Content Management System that guides an editorial process allowing the differentiation of the roles of authors, reviewers and content editors. User oriented functionalities include different ways to interactively manipulate data for personal presentation needs. Some EUphacts are linked to the Health-EU Portal. **Results:** EUPHIX is drawing increasing numbers of visitors and has the potential to become the nucleus of a health monitoring system for the EU. However, current financing practice puts serious limits to its sustainability. **Conclusions:** **The conclusion is that the EUPHIX model launched in June 2008 is integrating data, information and knowledge into a new type of Health Information System. The EUPHIX model is proposed to be the future model for EU health reporting.**

Key Words: Health monitoring, health reporting, European Union, public health policy, public health, policy relevance, benchmarking, best practices

Background

The Maastricht Treaty of 1991 (article 129) followed by the Amsterdam Treaty of 1998 (article 152) have increased the competence of the European Union in the area of health protection and public health. In 1993 the Commission presented a Communication on the Framework for Action in the Field of Public Health as an initial strategy document to develop work on public health. On this basis, eight action programmes were agreed, i.e. on cancer, drug dependence, AIDS and other communicable diseases, rare diseases, accidents and injuries, pollution-related diseases, on health promotion, and on health monitoring. These eight programmes were replaced by the Public Health Programme (2003–8) and next by the Health

Programme (2008–13). In the meantime, in 1999, the Directorate of Health and Consumer Protection (DG Sanco) was established to stimulate and coordinate actions and policies in the public health area.

The Health Monitoring Programme had as its objective “to contribute to the establishment of a Community health monitoring system”, in order to:

1. Measure health status, its determinants and the trends therein throughout the Community;
2. Facilitate the planning, monitoring and evaluation of Community Programmes and actions;
3. Provide Member States with appropriate health information to make comparisons and support their national health policies.

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In similar wording, the 2008–13 Health Programme highlights the “Development of a sustainable health monitoring system with mechanisms for the collection of comparable data and information, with appropriate indicators”. In order to establish a structure for all this, the ECHI (European Community Health Indicators) projects [6] have proposed the framework and shortlist for the ECHI indicators, in cooperation with many other EU-funded projects.

The logical next step now is to link these EU indicators to a health reporting function. National practice, however, is moving from paper reports to web-based health reporting, e.g. in Norway, Germany and the Netherlands [5]. For the EU context, comprehensive paper reports on the health situation were published in 1995 [2] and 2003 [3], as required by the Public Health programmes. The next one, to be produced by the EUGLOREH project [4], is due for 2008. But now, a web-based health monitoring and reporting system for the EU appears the next logical step.

Methods and design

To develop a web-based health monitoring and reporting system, a project proposal for the development of EUPHIX (European Public Health Information and Knowledge System) was submitted to, and granted by, the EU. As partners for the project team, a group of representatives from public health organizations (see Table I) got together and combined their experience in supranational, national and regional health monitoring, and activity in indicator development at the EU level. Based on

Table I. Partner institutes for EUPHIX.

<ul style="list-style-type: none"> • National Institute for Public Health and the Environment (RIVM) – The Netherlands • London School of Hygiene & Trop. Medicine - United Kingdom • Norwegian Institute of Public Health - Norway • TÁRKI Social Research Institute - Hungary • National Institute of Public Health - Denmark • Robert Koch Institute (RKI) - Germany • FNORS - France • National Institute for Public Health (KTL) - Finland • Scientific Institute of Public Health - Belgium • Institute of Public Health NRW (LOEGD) - Germany • OEBIG - Austria • Centre for Epidemiology, National Board of Health and Welfare - Sweden • World Health Organization – European Region – established in Denmark

their experience, the EUPHIX project was designed in 2003 to develop a prototype of a web-based health reporting system or, more precisely, to develop a “prototype for a sustainable, structured web-based health information and knowledge system for the European Union”. The system aimed at providing policy-relevant data, information and knowledge on Public Health across the EU and was designed to be integrated in the Health-EU Portal. Key-essentials of the system are:

- regularly filled with new information;
- easy-to-browse knowledge and data;
- functional tables, graphs and maps;
- interactive references and links;
- developed and reviewed by public health experts.

The EUPHIX project focused on various target audiences: policy makers at European, national and regional level, including the Commission’s services; public health professionals and academia; the media and the better informed general public.

A web-based information system, however, only makes sense if it is maintained and updated in a sustainable way. Therefore, all methodological and design issues have been worked out to support such sustainable maintenance. These include the development of the web application, the design of the content structure, the editorial process necessary to ensure the quality of the delivered content, and the establishment of an expert network to deliver the content.

EUPHIX project organization

The project coordinator, the Dutch National Institute for Public Health (RIVM), has taken care of the project management, the technical development and hosting of the website, and the development of the content structure. Much of this was based on the experience with the web-based Dutch Public Health Information System “National Compass Public Health”.

The entire project team of 13 international partners convened twice a year, in total six times. Prior to each meeting, a new release of the website was launched, including all newly added content and technical features. The team members contributed by commenting and discussing the new releases and the proposals by the RIVM team. They also contributed by reviewing content. In some meetings DG SANCO presented their expectations and views on the system. Increasingly, external authors and reviewers contributed content to EUPHIX.

EUPHIX web application

The EUPHIX website has been based on the IT-framework used for the Dutch “National Compass Public Health”. This applies especially to the Content Management System (CMS) “Netwriter” which is developed at RIVM for this type of web applications.

The Netwriter CMS is unique in that it allows editors to implement textual and other contributions into the application, also on-line from remote locations; it allows for the organization of a workflow from first drafts to authorized end product to be published in a next release; it allows for the easy presentation of graphs and maps, including commercial products such as Instant-Atlas; finally it allows for easy internal links to underlying databases containing literature, abbreviations and data, and external links to other relevant websites and international databases.

Another feature of EUPHIX is the underlying database connected to the interactive graphical display. After the introduction of selected data sets from e.g. Eurostat or WHO-HFA, interactive graphical presentations can be generated.

EUPHIX content design

The EUPHIX content structure was designed with the aim to comply with criteria for policy-relevant health monitoring and reporting (Table II). These criteria have been developed by an EU project that concerned itself with the evaluation of national and regional public health reports [5].

Applying a conceptual approach is one of the key features of policy-relevant health monitoring and reporting. The model that is used for EUPHIX is somewhat similar to the famous Lalonde model [7], similar to the model used in making the Dutch Public Health Status and Forecasts reports [9] and

Table II. Criteria for policy relevant health reporting.

-
- Conceptual approach – use conceptual model in stead of being data-driven
 - Comprehensiveness – aiming for coverage of all different health issues
 - Structured approach – to presentation of information
 - Policy orientation – provide support for health policy development
 - Integrative approach – interrelation of different health issues
 - Prospective approach – identification of trends, health targets and future aspects
 - Include relevant data – aim for data quality, comparability, validity
-

Source: [5]

very similar to the one developed and used in the ECHI-1, ECHI-2 projects. In the ECHI-model [6] the EU health indicators are being divided into several general areas, including health status, determinants of health, health systems and demographic and socio-economic factors (Table III). EUPHIX also uses this structure to organise its content areas, and has added the area of ‘health policies’ as a special area of interest to policy makers. By filling all these content areas, the EUPHIX system will attain the desired comprehensiveness. Integration is achieved, for example, by appropriate cross-links both within and between text and data components. Trends are identified, if possible, and much attention is being paid to data quality and comparability. This approach requires qualitative information, i.e. texts explaining epidemiological relations, next to indicator data as part of a monitoring and reporting system.

EUpfact and EUpfocus

The EUPHIX system has two kinds of textual content: EUpfacts and EUpfocus contributions (Figure 1). A EUpfact basically corresponds to one ECHI (shortlist) indicator, but may be wider in its scope. Each EUpfact contains information that is structured in a systematic and consistent way, thus allowing comparisons between diseases or risk factors. EUpfacts on diseases, e.g., contain a short summary, a text with definition and scope, followed by texts on occurrence, i.e. incidence and prevalence, on mortality, on consequences for individual and society, on causes and risk factors, and finally on interventions for those diseases (Figure 2).

Table III. Conceptual categories for the ECHI framework.

-
- 1 Demographic and socioeconomic situation
 - 1.1 Population
 - 1.2 Socioeconomic factors
 - 2 Health status
 - 2.1 Mortality
 - 2.2 Morbidity, disease-specific
 - 2.3 Generic health status
 - 2.4 Composite health status measures
 - 3 Determinants of health
 - 3.1 Personal and biological factors
 - 3.2 Health behaviours
 - 3.3 Living and working conditions
 - 4 Health systems
 - 4.1 Prevention, health protection and health promotion
 - 4.2 Health care resources
 - 4.3 Health care utilization
 - 4.4 Health expenditures and financing
 - 4.5 Health care quality/performance
-

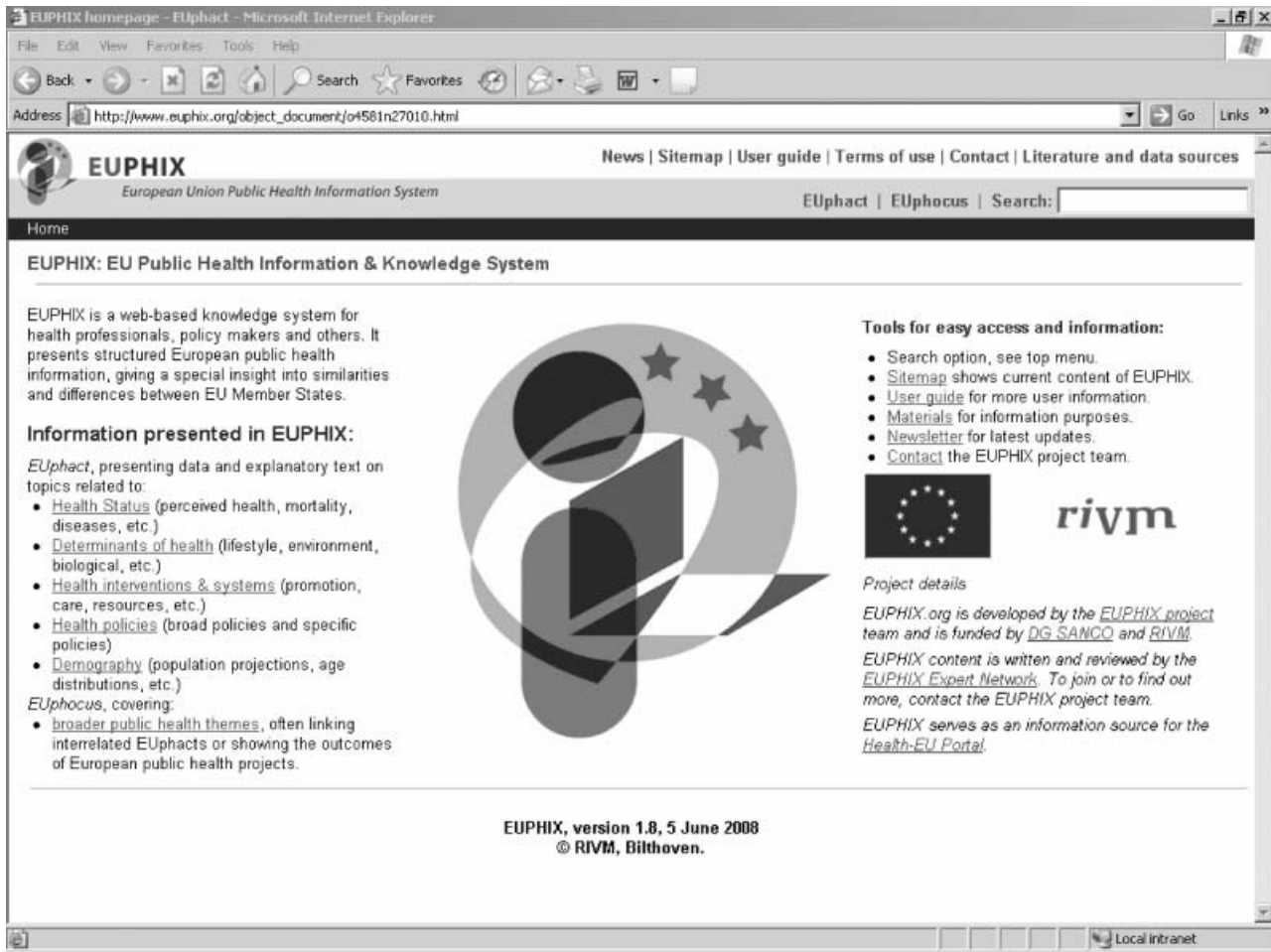


Figure 1. Homepage of EUPHIX.

EUphacts on risk factors have a similar consistent content structure. EUphacts on policies focus on EU policies and strategies, policies by intergovernmental organisations such as WHO, followed by texts on evidence for effective policy, on policies to reduce socio-economic differences and on national policies and strategies in EU Member States.

In the current prototype stage of EUPHIX a series of EUphacts has been worked out in two different ways. The first way is a full EUphact containing structured texts as well as indicator data sets, the latter in the form of tables and/or maps and/or in various forms of 'flexible graphics'. Graphic tools have been introduced to provide optimal and flexible possibilities for presenting a personal selection of the data (Figures 3 and 4). The EUphact texts also contain links to references, data sources, projects and relevant organisations. The second way in which EUphacts are presented is in the form of providing just indicator data, linked to the ECHI indicator list.

EUphocus contributions are aiming for policy relevance and are generally concerned with broader

public health issues, often political agenda issues. In the 'launch-version' of EUPHIX examples of such areas are 'mental health' and 'health inequalities'. A EUphocus may also contain the outcomes of important international and EU projects. 'Health inequalities' is a good example of a project related EUphocus containing elements of the final report of the EUROTHINE project [8]. In this way EUPHIX may function as a platform for future EU project outcomes in specific EUphocus contributions.

EUPHIX editorial process

In any reporting exercise, quality control is a crucial issue. For a system like EUPHIX, this includes, for each EUphact or EUphocus, the selection of adequate and valid data, the generation of appropriate text, and the consistency of each contribution within the entire context of the website. Again, the EUPHIX project has used the experience from the Dutch National Compass Public Health. During the project period, the process of generating and

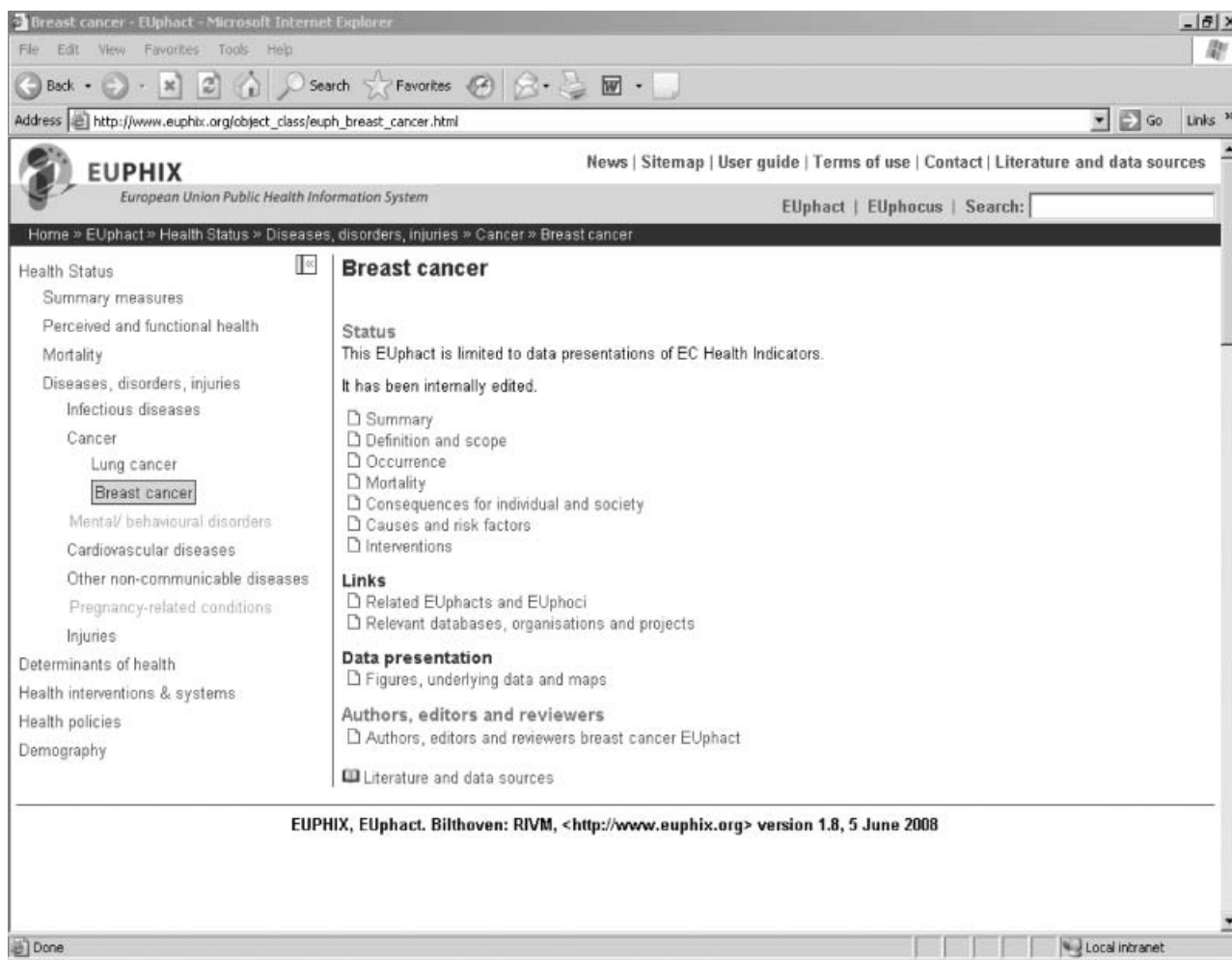


Figure 2. Page view of EUPHIX on breast cancer.

editing content has been developed to include the following roles:

- Editor; responsible for a specific EUPHIX or EUPHOCUS; selects the author and guides him/her concerning the desired format; places the contribution into the website's CMS; takes care of appropriate external reviewing. During the current project period, about eight persons within the RIVM team have served as editors. As the working procedures have been established now, it is envisaged in the future to work with an editorial board consisting of partners in a consortium of public health institutes throughout the EU.
- Author; expert in the area; responsible for selecting "best" data, working together with the editor for the website's internal consistency and standards for data presentation; produces text according to current scientific knowledge. For the first pilot EUPHIXs, members of the RIVM team have served as authors. After that, external experts have

been approached, often as being involved in specific projects carried out under the EU Public Health Programme. Examples are the EUPHIXs on ischaemic heart disease, airborne particulate matter and social support, and the EUPHOCUS on environment and health, on health inequalities and on diabetes prevention and care.

- Reviewer; external expert responsible for checking the validity and scientific quality of the contribution. Reviewers have often been selected on the basis of their involvement in relevant international networks or organizations.
- Content coordinator; allocates the tasks to the editors; checks on adequate progress of the work; carries out a final consistency and language check.

EUPHIX expert network

For the maintenance, updating and quality check of the EUPHIX system, a group of committed external experts has gradually been established, currently

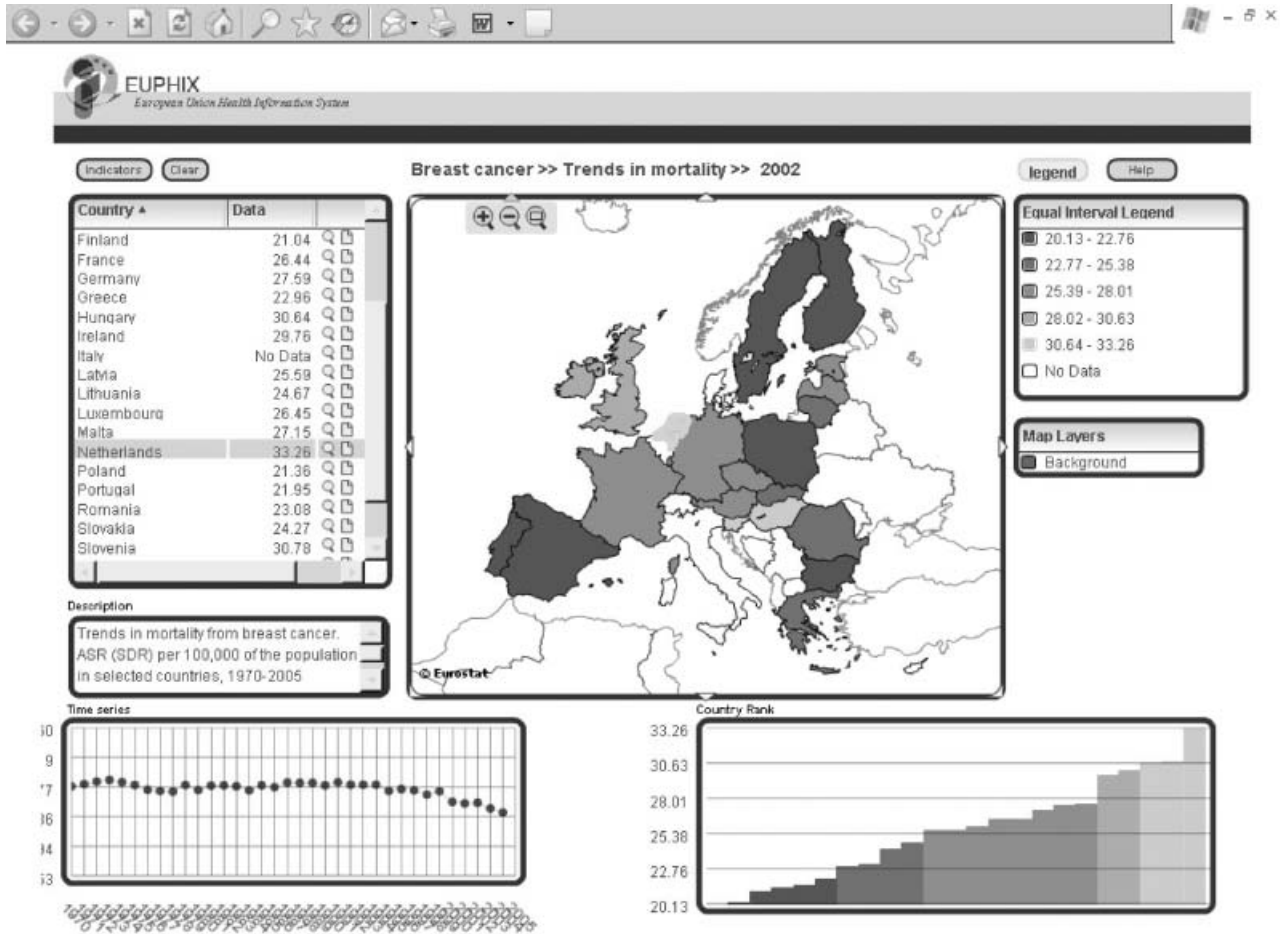


Figure 3. Page view of dynamic map using Instant-Atlas.

consisting of the authors and reviewers of contributions, as well as representatives of specialized institutes, networks or EU projects. At present these include:

- The EMCDDA, Lisbon, EU Drug Agency
- WHO European Centre for Environment and Health
- European Health Expectancy Monitoring Unit (EHEMU)
- The EUGLOREH project (2008 European health report)
- The EUCID project (for diabetes prevention and care)
- The EUROCISS project (for cardiovascular diseases)
- The ALPHA project (assessing levels of physical activity and fitness)
- The MINDFUL project (for issues in mental health)

Members of the EUPHIX Expert Network will be consulted for updates in their own field, but they are

also invited to comment at their own initiative. When the content of EUPHIX is to be expanded, this expert network will have to be expanded as well.

Dissemination and first evaluation of EUPHIX

Within the duration of the project, i.e. between July 2004 and June 2008, a publicly accessible prototype has been established (www.euphix.org). At the start of the project, a second website was set up to inform participants and interested professionals on the project progress: the EUPHIX Work-in-Progress (WiP)-site.

From June 2007, the "real" EUPHIX website was considered sufficiently implemented to be made accessible for a broader audience and was put permanently on-line. But already before that, the first project results were demonstrated at conferences, including EUPHA, e-Health conferences and, finally, at the WHO Ministerial Conference in Tallinn, June 2008. A newsletter was distributed to a growing number of subscribers at each of the

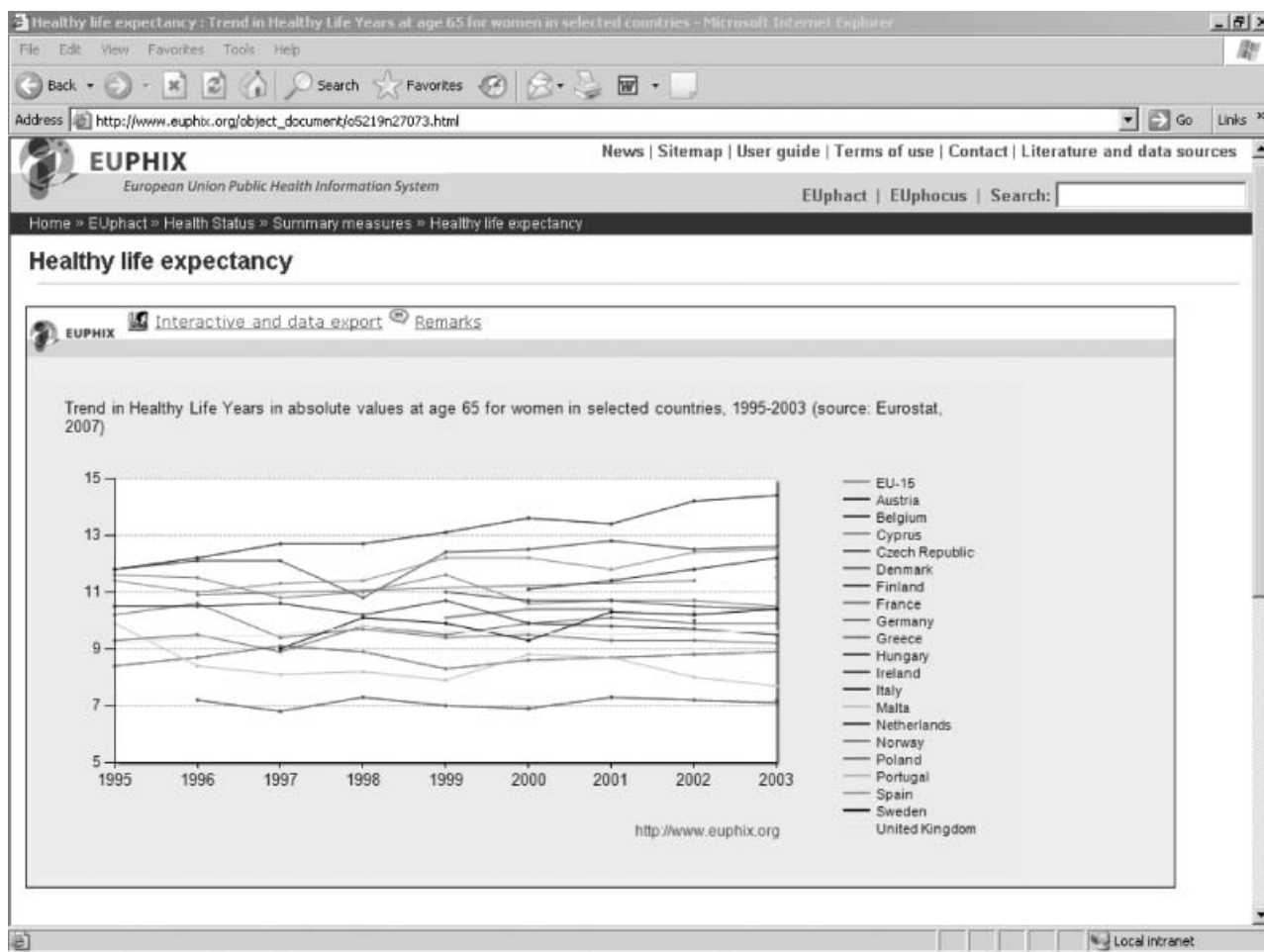


Figure 4. Page view of interactive graph.

half-yearly releases and flyers were distributed at various meetings.

In the spring of 2007, specific links were developed to access EUPHIX from the Health-EU Portal. In relevant pages of the Portal, under the heading European Health Information, one can now click to reach EUPHIX documents. Other organizations have been asked to put links to EUPHIX on their websites.

In order to arrange for a user-oriented evaluation, a Target Panel was established. The members have received a questionnaire asking whether they found the website “met their expectations”, was “generally policy-relevant”, and was “valid and up-to-date” for a number of specific topics. Seven respondents valued the various issues between seven and nine on a ten-point scale, and added recommendations for some improvements. All of these activities led to an increase in the number of visitors to around 140 per day, from March 2008.

The status of EUPHIX by June 2008

At the start of the project, the following three deliverables were foreseen:

1. A structured information content on selected public health issues;
2. A functioning prototype for a web application;
3. A plan for maintaining the system, using expert networks.

On 20 June 2008, the EUPHIX project was launched officially during a meeting in Leiden, the Netherlands. By that time these deliverables had been realized, some even beyond expectation.

In terms of the “structured content”, 39 EUphacts had been implemented and five EUphoci. Of these 39 EUphacts, 16 were completed according to the full format; the remaining 23 were restricted to data presentations with relevant remarks and still are waiting for extension into the

full format. In this way a major part of the items on the ECHI shortlist has been filled.

The website is fully operational now. This includes the features used by the editors to fill the system as well as the user-oriented features such as different modes of data presentation, cross-links within the site, and reference links to other websites and to information sources.

Yet, there are still issues for improvement, which are brought up by project partners, target panel members and other users.

Future perspective of EUPHIX

The future of EUPHIX is uncertain, however. What needs to be done next is the actual implementation of the following actions in a sustainable way:

- Expand the managing network that will be working with the publishing protocols and using the full guidelines for the process of writing, editing, reviewing, selection of data, and its implementation into the Content Management System.
- Maintain and adapt the Content Management System, including the underlying databases, and maintaining the technology to implement fully the publishing protocols and version control procedures for the editorial management.
- Expand and enforce the managing and expert networks. The current EUPHIX Expert Network will be instrumental in future work on updating and expanding the content. Besides that, a consortium of 22 public health institutes in 21 Member States has been established, that is ready to be engaged in future work to enlarge and update the EUPHIX website content. A mapping exercise is needed to expand and enforce the expert network of authors and peer reviewers.

Discussion and conclusion

A comprehensive picture of population health and its proximal and wider determinants is essential to feed into EU health policy and to provide a basic starting point for developing a new EU Health Strategy in the near future. This can be done by occasional “comprehensive” health reports, every four or five years, such as is currently done in the EUGLOREH project [4].

The added value of the EUPHIX concept is that health reporting becomes more flexible and user-oriented. More, but layered, information, such as background details and data as well as relevant meta-information can be included without disturbing the quick reading process.

Updating a web-based system is less complex and more flexible than updating a book. The concept takes advantage of the flexibility and linking options provided by internet and allows simultaneous interactive presentation of its results to a very broad audience.

The process of filling and updating EUPHIX with relevant, high-quality, peer reviewed and policy relevant content and data for the EU and its Member States has now been outlined as a feasible enterprise. Its financial sustainability, however, remains a challenge. A central form of organization, i.e. a coordinating centre for health monitoring would seem an essential element of any sustainable effort and such a centre could become the “owner” of the EUPHIX system. This would be in line with previous recommendations by EU experts [1] to set up a health observatory for the EU. Joint Actions and EU projects could also deliver major input to such an observatory.

The EUPHIX system can be viewed as a new concept for health reporting that actually works and provides high quality content and data. In order for EUPHIX to survive in the EU context, it has to be recognized, however, as a central element in the “public health monitoring and reporting system” as envisaged by the EU Health Programme. It can also add more valuable information to the Health-EU portal and function as a platform for EU project outcomes.

For all this to be realized, EUPHIX needs to be recognized as something that is by nature a structurally maintained activity needing structural financing. At the date of writing this article, two proposals for future work contain elements of continuation of EUPHIX. The first is the proposal for a “Joint Action on ECHIM”, which involves the further implementation of the ECHI shortlist in EU Member States. The second is the project proposal “IN-EUPHIX” (Intelligence Network for EUPHIX), meant to further build the editorial and intelligence capacity to expand and update the textual content of EUPHIX for a period of two years.

The conclusion is that the EUPHIX model launched in June 2008 is integrating data, information and knowledge into a new type of Health Information System. The EUPHIX model is proposed to be the future model for EU health reporting.

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