microorganism in these waters, although not specified in the Directive. Tests were also done for hydrocarbons and anionic detergents. The results were evaluated according to month, tides, winds, precipitation and distance from pollution sources.

Results

It was observed a statistical significant association between the microbiological indicators and the monitored parameters. The results for hydrocarbons and anionic detergents were below the recommended maximum. *Salmonella* spp. was detected on 23 samples including beaches classified as Excellent by the new Directive, which compromises the idea of an absolute association between indicators and pathogens.

Conclusions

This study emphasized the importance of Public Health in the assessment of bathing water quality, suggesting that routine sampling according to EU recommendations should be revised, defining health hazard indicators and implementing strategies on a beach-to-beach basis that strengthen public health surveillance systems and public information in order to enhance health prevention.

6.2. Workshop: Genomic literacy in the era of complex diseases—a challenge for European policies on Public Health Genomics

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"Human Ecology and Public Health" is the main theme of this Second European Public Health Conference. Human ecology explores not only the influence of humans on their environment but also the influence of the environment on human behaviour as well as human adaptive strategies to understand those influences better. Thus, human ecology is an interdisciplinary applied field that uses a holistic approach to help people to solve their problems and enhance potential within their near environments and closed ecologic systems. In this context, genomic literacy in the era of complex diseases plays an important role, since the complexity of diseases can only be understood by the close interaction between genomic and environmental factors including social factors. Furthermore, we nowadays know that our genomes are permanently changed by environmental factors (epigenomics) and that at the same time genomic factors are influencing our behaviour.

The workshop of the EUPHA section Public Health Genomics will (1) give an overview of the current state of knowledge in genomic research on chronic complex diseases and hereditary monogenetic disorders as well as their consequences for public health and health care practice, (2) contrast the rapidly increasing research findings with the limited genomic literacy of health care professionals and the general public, (3) underscore the importance of translating the findings from genomic research into health policies and health care applications, (4) describe the role of genomic literacy in the context of personalized health care being one of the biggest future challenges all European health systems have to face.

Genomic literacy of research

Nicole Probst-Hensch

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Issue/Problem

In the past genetic research was dominated by monogenetic disorders, i.e. diseases caused by highly penetrant, single gene mutations with a limited role of environmental factors. The predictive power of genetic testing for risk-associated mutations on the individual level is usually high for monogenic disorders. Genetic testing for these disorders is routinely applied in health care practice by medical geneticists.

Description of the project

In recent years, the main focus of genomic research has been on complex disorders, which are due to multiple genetic and environmental risk factors. Examples are coronary heart disease, asthma and diabetes. Currently identified genetic variants for most complex diseases only explain a small proportion of the disease burden. The power of testing for high-risk genetic variants to predict the risk of complex diseases on the individual level is therefore very low.

Lessons learned

As recent technical advances have made testing of multiple genetic variants affordable, the transfer of new knowledge on susceptibility to complex diseases to everyday medical practice is an important issue. At the same time, direct-to-consumer genetic testing for a wide range of low-penetrance variants associated with complex diseases is available through internet-based companies despite the low predictive value of these tests, the absence of proper evaluation of their clinical utility and often without appropriate genetic counseling.

Conclusions

The first part of the workshop will contrast the status of knowledge on genetic testing for complex versus monogenetic diseases, illustrate the relevance to health care practice based concrete examples, and present direct-to-consumer approaches on the market.

Genomic literacy of health care professionals and the general public

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Issue/Problem

The efficient translation of genomic knowledge on common chronic diseases into everyday clinical practice and public health represents an important challenge. It is expected that genetic tests will soon help diagnose, and predict the risk of complex diseases. As a consequence, most health care professionals will be asked about genetic testing by their patients. This new situation poses the difficult question of genomic literacy, not only of health care professionals, but also of the general public. The need for the lay people to understand genetic concepts in the framework of complex diseases is underscored by the growing availability of direct-to-consumer genetic testing.

Description of the project

Genomic literacy includes knowing about benefits, risks, and limitations of genetic screening and testing, as well as the implications of genetic information. This implies knowledge about the terminology and technologies of modern genomics, the social and psychological implications of genetic testing on the individual being tested as well as on family members.

The piece of information that health professionals need to convey is not only highly complex, but also rapidly changing as new research findings accumulate.

Lessons learned

Yet, most health care professionals are not prepared to integrate the new insights from genomic research and the general public is not prepared to make informed decisions on such testing.

Conclusions

The presentation will provide an overview on the status of genomic literacy in the health care community and the general public, identify and discuss relevant gaps in knowledge about, and methods for the assessment of genomic literacy.

Genomic literacy from a public health perspective

Angela Brand

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Issue/Problem

The role of genomic variants in complex diseases demands an assessment of genomic evidence in a systematic approach to close the gap between current genomic research and genomic literacy in health care and the general public.

Description of the project

Two barriers need to be overcome to initiate the process of knowledge transfer. First, the high predictive power attributed to genetic data not only by the public, but also by many health care professionals, is not justified for complex diseases. Information on low-penetrance genomic variants could be treated in the same way as environmental and behavioural factors such as social status, smoking, nutrition, etc. To efficiently transfer genome-based information and technologies into public health, a change in public perception of genomic data is needed. Second, the methodologies and frameworks applied to investigate complex diseases such as epigenomics and systems biology is hard to understand.

Lessons learned

Findings from genomic research and concepts like personalized health care need to be translated into a frame accessible to health care professionals and the general public.

Conclusions

In Europe, the need for an ongoing evaluation and processing of genome-based information and technologies has led to the establishment of an European and international Public Health Genomics network. The two networks have the task to evaluate the role of genomics in health information, the ethical, legal, economic and social implications, the policies needed as well as training of health care professionals. This part of the workshop will present the European and international efforts in translating genome-based knowledge and technologies into health policies and health care systems.

Genomic literacy in the context of personalized health care

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Issue/Problem

To combat with complex diseases, the focus is on promoting health and quality of life in aging populations, prevention, effective treatment and prevention of their complications. As a result, there is a paradigm shift in health care and medicine, from acute disease oriented approach towards increasing health status of individuals in the long term.

Description of the project

Personalized health care concept is a continuum of this paradigm shift, trying to make health promotion, disease prevention, early detection and treatment in the most effective way. It utilizes genome-based knowledge, combined with the advent of health information technology.

Lessons learned

In personalized health care the health risks and diseases of an individual can be assessed and managed with a holistic approach. The practice model developed by the GENAR Institute is an best practice example for it. As the models utilizing genome-based knowledge enter clinical practice, it is crucial for health professionals and the individuals to understand what is personalized health care and how information is utilized in it. This requires not only genomic literacy but also a new understanding of health literacy that enables individuals understand how they are developing complex diseases.

Conclusions

More complex assessment algorithms are required. Decision or management support systems utilizing information technologies will be one of the main assistants of health care practitioners in assessment and management or risks and diseases. Thus, in order to prepare health care practitioners and public for this kind of medical practice, literacy on information technologies will also be important.

6.3. Outpatient care

Implementing innovation in Primary Care: an Italian experience

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Background

Since 2000, in Italy the General Practitioner (GP) Contract with the National Health Service has been changing towards increased participation of GPs in health care management to improve professional collaboration with other practitioners such as nurses and social workers. In Emilia Romagna (ER), a region in northern Italy, the Primary Care System has been reorganized with the institution of ''Primary Care Units'' (NCP) as main centres where GPs, nurses and other practitioners work together to deliver comprehensive health care outside the hospital. The aim of this study is to analyse number, function and organization of NCPs in ER 2 years after the introduction of this new model in 2006.

Methods

A web-based questionnaire was administered to Primary Care coordinators in the 11 Local Health Authorities. The questionnaire explored the NCPs development in terms of GP participation, clinical organization, integration with other health care practitioners and chronic disease management.

Results

On 30 June 2008 there were 214 NCPs and 94% of total GPs (3013 on 3215) joined them; each NCP is composed of an average number of 15 GPs. In 159 NCPs, the GPs meet periodically for training courses and strategic planning. Only in 62 NCPs are clinical activities performed in a unique place, while other GPs continue to see patients in their own offices.