Coordination of national environment and

health research programmes

ERA-ENVHEALTH

Overview of environment and health programmes and projects including synthesis and recommendations

Report on E&H projects and programmes landscape and Framework for joint activities related to E&H research within the partner countries

February 2010

SEVENTH FRAMEWORK PROGRAMME

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Task 1.2: Information collection and description of current programmes & projects

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CONTENTS

The ERA-ENVHEALTH project is co-funded by the European Commission under the 7th Framework Programme.

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LIST OF TABLES

The ERA-ENVHEALTH project is co-funded by the European Commission under the 7th Framework Programme.

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LIST OF FIGURES

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LIST OF ABBREVATIONS

ADEME	French Environment and Energy Management Agency
AFSSET	French Agency for Environmental and Occupational Health Safety
AgBB	Committee for Health-related Evaluation of Building Products
ANR	French National Research Agency
BE	Belgium
BelSPO	Belgian Science Policy
BfN	Federal Agency for Nature Conservation (Germany)
BfR	Federal Institute for Risk Assessment (Germany)
BMBF	Federal Ministry of Education and Research (Germany)
BVOC	Biogenic Volatile Organic Compounds
CEHAPE	Children's Environment and Health Action Plan for Europe (WHO)
CNR	National Research Council (Italy)
DBU	Deutsche Bundesstiftung Umwelt (Environmental Foundation, Germany)
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DE	Germany
Defra	Department for Environment, Food and Rural Affairs (United Kingdom)
DFG	German Research Foundation
DH	Department of Health (United Kingdom)
E&H	Environment and Health
EA	Environment Agency for England and Wales (United Kingdom)
EC	European Commission
EEA	European Environment Agency
EHF	Environment and Health Fund (Israel)
EIONET	European Environment Information and Observation Network (EEA)
EMF	Electromagnetic Field
ENHIS	European Environment and Health Information System
EPA	Environmental Protection Agency (Ireland)
EU	European Union
FPS	Federal Public Service Health, Food Chain Safety and Environment (Belgium)
FR	France
FRB	Foundation for Scientific Cooperation in Biodiversity Research (France)

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FSA	Food Standards Agency (United Kingdom)
GFS	German Federal States
GIS	Geographic Information System
HBM	Human Biomonitoring
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
HPA	Health Protection Agency (United Kingdom)
HSE	Health and Safety Executive (United Kingdom)
IE	Ireland
IL	Israel
IPPC	Integrated Pollution Prevention and Control
ISPRA	National Institute for Environmental Protection and Research (Italy)
IT	Italy
LIFE	EU's financial instrument supporting environmental and nature conservation projects
MEEDDM	Ministry of Ecology, Energy, Sustainable Development and the Sea
MoEP	Ministry of Environmental Protection (Israel)
MoH-SK	Ministry of Health of the Slovak Republic
MUNLV	Ministry of the Environment and Conservation, Agriculture and Consumer Protection of the State of North Rhine-Westphalia
NERC	Natural Environment Research Council (United Kingdom)
NGO	Non-Governmental Organisation
NIOM	Nofer Institute of Occupational Medicine (Poland)
NL	The Netherlands
NOx	Nitrogen Oxide
NP	Nonylphenol
NPs	Nanoparticles
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCR	Polymerase Chain Reaction
PFC	Perfluorinated Compounds
PFT	Fluorosurfactants
PL	Poland
PM	Particulate Matter
PM_{10}	Particles of 10 micrometers or less in aerodynamic diameter

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$PM_{2.5}$	Particles less than 2.5 micrometers in aerodynamic diameter
POP	Persistent Organic Pollutant
Q	Question
RIVM	National Institute for Public Health and the Environment (The Netherlands)
SAS	Slovak Academy of Sciences
SE	Sweden
SK	Slovak Republic
Sniffer	Scottish and Northern Ireland Forum for Environmental Research (UK)
Swedish EPA	Swedish Environmental Protection Agency
THM	Trihalomethane
UBA	Federal Environment Agency (Germany)
UFP	Ultrafine Particles of less than 100 nm
UK	United Kingdom
UM	Ministry of the Environment of Baden-Württemberg (Germany)
UVZ	Public Health Authority of the Slovak Republic
VOC	Volatile Organic Compounds
VROM	Ministry of Housing, Spatial Planning and the Environment (The Netherlands)
WHO	World Health Organisation

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EXECUTIVE SUMMARY

The main aim of this Final Report was to give an overview of the European Environment and Health (E&H) research landscape based on the description of programmes and their related projects owned or managed by the consortium partners and in a wider scope within the Member States. Further goals were to describe the structures available for funding of transnational research among countries participating within the ERA-ENVHEALTH project, to identify the main authorities in the field of E&H, to obtain information on programme managing practices in particular countries (mechanisms for priorities identification, preparation and launch of programmes, implementation, quality assurance, communication, propagation and reporting) and to provide recommendations for effective funding of E&H research and effective arrangements for cooperation (see section 2).

To reach these aims two questionnaires were developed: a first one on “Research Programmes – National programmes and projects related to E&H within the partner countries” and a second one on the “Framework for joint activities relating to E&H research within the partner countries”. The 1st questionnaire was answered by the ERA-ENVHEALTH partners and other relevant organisations. Its information was collected in the ERA-ENVHEALTH research database, which was the basis for writing this Final Report. The 2nd questionnaire was intended for the ERA-ENVHEALTH partners only. Its information also served to complete this report (see section 3).

It can be highlighted that the participating organisations showed a great interest in exchanging information within the ERA-ENVHEALTH network and in future cooperation within the field of E&H. By September 2009, 38 organisations (including the 16 ERA-ENVHEALTH partners) from 11 countries gathered and entered data on 49 E&H funding programmes and 461 associated projects. This information is a strong basis for analysing the research in the field of E&H in the participating countries. It reflects the diversity of the participating countries, their different cultures and structures for research and administration as well as their similarities. The large amount of information gathered stresses the high interest in further cooperation and also the need for future collaboration in this area.

The most important results of this Final Overview can be summed up as follows:

- The number of the **E&H programme managing organisations** per country varies – probably due to different research and administration structures as well as federal structures in certain countries. Most of these organisations are ministries, policy-oriented agencies and other public bodies. The majority of them are mainly competent for environment issues (see section 4.1).
- The general **objectives of the E&H funding programmes** indicate that most of the programmes have the aim to support scientific research with the intention to provide support for policy-makers, to protect the environment and human health, to improve cooperation among experts and authorities as well as to exchange information and inform the public (see section 4.2).

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- The **budget of the programmes** which could serve as an indicator for their importance ranges from 0.1 M€ to 160 M€ yearly. This wide range of financial conditions could partly be due to different research and administration structures. The poor response rate (less than half of the managing organisations answered to this question) is probably due to the fact that some of these programmes have a wide range of objectives and do not only fund E&H research. That makes it difficult to clearly distinguish which part of the funding relates to E&H research only (see section 4.3).
- The most frequently stated **programme topics** are "Outdoor air quality", "Other chemical agents", "Biological agents & Microorganisms" as well as "Exposure Assessment" and "Health Impact Assessment". These topics have been recorded by 30 or more out of the 49 programmes and can therefore be considered as being the most important and/or most established ones for the majority of the programme management organisations. Also, cross-national overlap can therefore be expected for these topics (see section 4.4).
- 15 topics were selected by less than 15 out of the 49 programmes, e.g. "Green Space", "Transport" and "Electromagnetic fields". The fact that certain topics only got selected a few times might be due to different reasons: they fall outside the remit of the majority of the programme management organisations, they are considered to be not important for most of the involved organisations, they are quite old or just upcoming (see section 4.4).
- The **outcomes of the 49 E&H programmes** mainly range from science research support to recommendations for policy-makers with regards to E&H protection. 35 E&H programmes indicated outputs which refer to "Science (scientific publications)", 32 programmes referred to "Policy (recommendations for policy-makers)" and 30 of them to "Publicly available information". 25 programmes indicated outcomes which were focused on "Public (information)". Particular outputs of the E&H programmes evaluated in this Final Overview are available in the ERA-ENVHEALTH research database via the links to the programme web pages (see section 4.5).
- The **near future priorities of the E&H programmes** most often relate to the themes "Climate change", "Indoor air quality" and "Outdoor air quality", to the agent "Nanomaterials/Nanoparticles", to the human health effect "Endocrine disruptors", to the methodologies "Epidemiology/Epidemiological studies", "Exposure assessment" and "Human biomonitoring". Each of them has been indicated by four to seven of the ten programmes having answered this question (see section 4.6).
- 461 **projects** were entered into the database by September 2009. 78% of them are conducting "applied research" and 17% "policy-orientated research" (see section 5.1). The analysis of the projects budget can be found in section 5.2.
- When looking at the **topics of the 461 E&H projects**, it can be stated that the distribution of the selected themes is generally very similar to the one of the

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programmes. This is not surprising as the projects that have been entered in the database were mostly selected as being representative of their funding programme (see section 5.3). Information about the objectives, methodologies, outputs and scientific outcomes of the projects can be found in section 5.4.

- When looking at the **national priorities of E&H activities** (2nd questionnaire) as much as eight topics were indicated by all participating countries as being "current governmental priorities": "Outdoor air quality", "Other chemical agents", "Particulate matter", "Asthma", "Respiratory diseases" as well as "Modelling", "Health impact assessment" and "Epidemiological studies". In addition, roughly three quarters of the topics were stated by more than half of the countries as being of priority, e.g. "Climate Change", "Indoor air quality", "Biological agents & microorganisms", "Exposure Assessment" and "Vulnerable groups" (see section 6.1-a).
- Regarding the **planned and most important E&H research activities of the ERA-ENVHEALTH partner organisations** most partners recorded the themes "Indoor air quality", "Climate change" and "Outdoor air quality", the agents "Nanomaterials" and "Particulate Matter", the human health effects "Respiratory diseases", "Allergies", "Cardiovascular diseases" and "Cancer", the methodologies "Human biomonitoring" and "Health impact assessment" and the social aspects "Children's health" and "Vulnerable groups" (see section 6.1-b).
- The **funding structures of the ERA-ENVHEALTH partner organisations** show a large heterogeneity, which probably can be traced back to the different budget and funding laws of the different countries. The most frequently preferred funding structure is the "virtual common pot"; it exists for nine, partly exists for two and is possible for six out of 14 partner organisations. Due to the diverse research and administrative structures in the different countries and the experience of the 1st call the ERA-ENVHEALTH partner organisations should find a pragmatic and practical solution applicable for the 2nd call (see section 6.2).
- The **drivers for national E&H activities and priorities** are very similar in the ERA-ENVHEALTH partner countries. All countries are driven by legislation and policy objectives and most of them by international commitments (like WHO CEHAPE and EU Environment and Health Action Plan). Differences are likely to occur in the different structures and ways of formal and informal actions of the relevant driving forces. Surprisingly and, to some extent unlikely, the role of "NGO/public/media" as a driver is apparently negligible in most of the countries (see section 6.3).
- Concerning the **programme management** in the partner countries there are a lot of similarities, e.g. in nearly every country the competent authorities for the initiation and priorisation of E&H research are ministries together with their agencies. Regarding the preparation (process and procedures) and implementation (call and proposal) of E&H research the answers vary a lot, probably due to the diverse research and administrative structures in the countries. With respect to quality assurance and to

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communication, dissemination and reporting mainly similarities can be identified. It can be highlighted that on all levels – organisations, programmes and projects – a big effort is done not only to communicate scientific results to the scientific community and policy-makers but also to a broader public (see section 6.4).

- The answers to the **governance** questions differ a lot. Between and within the different countries there are various ways for research results to make their way from science into policy (see section 6.5).
- The analysis **of the priorities of the 1st and the 2nd questionnaire** indicates that there are topics which have been, are and – in the near future – will be important and recognized, such as the themes “Indoor air quality” and “Transport”, the agents “Particulate matter” and “Other chemical agents”, the human health effects “Allergies”, “Cancer”, “Cardiovascular diseases” and “Respiratory diseases” and the methodology “Health impact assessment”. Topics that are recorded as planned and most important E&H activities of the consortium partners (future state) but not as current programme topics and governmental priorities (actual state) can indicate research gaps, i.e. quite new areas where research activities are necessary. This might be the case for the themes “Climate change”, “Nanomaterials” and “Noise” and the methodology “Human biomonitoring” (see section 6.6).

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KEYWORDS

ERA-ENVHEALTH, environment and health, environment and health research programme, environment and health research project, environment and health research funding, database.

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1. INTRODUCTION

“Environment and health” (E&H) is a term with a wide range of meanings and has become increasingly important in the past few decades. Understanding the relationship between environmental risk factors and human health effects is essential for improving prevention and public health protection. Interdisciplinarity is the key to assessing adverse environmental effects and implementing public health protection actions, requiring the implication of experts involved in environmental science, human health protection, socio-economic aspects and the policy-making process. The platform supporting their joint effort leading to improving environment and health is to network experts, scientific organisations, public authorities and decision-makers and provide tools for mutual information, sharing experience and scientific results.

ERA-ENVHEALTH is a European project aimed at enhancing the coordination of E&H research programmes. The objective of the project is to bring together European organisations that finance and plan research programmes in the field of E&H and to establish a lasting cooperation in this area. This objective is to be achieved by analysing the E&H research landscape, defining common priority areas and responding to these through joint activities and transnational calls for research projects.

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2. AIM OF THIS REPORT

The purpose of this report is to define and analyse the E&H programmes implemented in Europe and particularly within the ERA-ENVHEALTH partner organisations.

The aims of this Final Overview on E&H programmes can be defined as follows:

- describe the European E&H research landscape based on the description of programmes and projects owned or managed by the consortium partners, and on a wider scope within other organisations if possible;
- describe the structures available for funding of transnational E&H research among the countries participating within the ERA-ENVHEALTH project;
- identify the main authorities in the field of E&H;
- obtain information on programme managing practices in particular countries (mechanisms for priorities identification, preparation and launch of programmes, implementation, quality assurance, communication, propagation and reporting, etc.); and
- provide recommendations for effective funding of E&H research and effective arrangements for cooperation.

Another outcome of the Final Overview, as well as the activities undertaken in the ERA-ENVHEALTH project as a whole, will be finding a way to better support research in the field of E&H and in particular to better support research looking at reducing adverse environmental impacts on human health in order to improve human health protection and prevention.

This Final Overview takes into account information provided by all ERA-ENVHEALTH partners as well as other relevant programme managers in Member States to provide an overview of the activities in this field in Europe as widespread as possible.

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3. DATA PROCESSING METHODOLOGY AND EVALUATION

The production of the Final Overview was preceded by the "Draft overview of E&H programmes" within the ERA-ENVHEALTH partner organisations which was completed in April 2009 and approved by all partners and by the Steering Committee on 12th May 2009.

This first Draft Overview of E&H programmes was prepared and produced on the basis of an analysis of partner data focusing on the description of their organisations, their E&H programmes and the number of projects funded. Necessary information was collected through a 1st questionnaire. Consequently the online ERA-ENVHEALTH research database (http://era-envhealth.stis.fgov.be/) was used for further data collection. Additionally a 2nd questionnaire was created only for ERA-ENVHEALTH partners focusing on the funding structures, research priorities and the drivers for their E&H research activities.

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3.1 DATA AND INFORMATION GATHERING

3.1.1 First questionnaire

The 1st questionnaire entitled **"Research Programmes – National programmes and projects related to Environment and Health within the partner countries"** aimed to gather information on national programmes, funded projects, and research priorities from 2006 to 2009 in the field of E&H among the ERA-ENVHEALTH consortium partner countries. The questionnaire was dedicated to providing the basic facts on research programmes in order to help understand the overall portfolio of research being funded and to facilitate mutual knowledge and systematic exchange on information concerning research programming in E&H.

This questionnaire served as a basic structure for the set-up of the research database, which is an information management tool used to structure information and facilitate access, analysis and exchange. It provides a common template for the collection of information and is searchable (see section 3.1.2). The database also provides some information from organisations other than ERA-ENVHEALTH partners.

The questionnaire was divided into three sections:

- SECTION A: The programme manager's organisation
- SECTION B: The E&H research programme
  - B. 1. Overall information on the programme
  - B. 2. Output of the programme
  - B. 3. Future priorities of the programme
- SECTION C: Relevant projects funded by this E&H programme

There were 27 questions. The persons asked to complete the questionnaire were preferably the programme managers rather than the funding organisations (programme owners, if different from the programme managers).

The Draft Overview was based on the evaluation of the first nine questions. These questions were answered by 13 ERA-ENVHEALTH partners that provided information on 18 E&H programmes. Additional evaluation of the 1st questionnaire as a whole was completed via the online ERA-ENVHEALTH research database and created a basis for the Final Overview. For this Final Overview, the answers of 38 E&H managing organisations concerning 49 E&H funding programmes were analysed. For more information about the data gathering via the 1st questionnaire, see the questionnaire template in Annex 1.

3.1.2. ERA-ENVHEALTH research database

The database aims to facilitate information collection and the description of E&H programmes and projects. The structure of the database is based on the structure of the 1st questionnaire. For the Final Overview, only the information provided in the ERA-ENVHEALTH research database and complementary information from the 2nd questionnaire

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were used. The database was launched online in April 2009. Subsequently it was completed with information relevant to E&H programmes and projects ended in 2006 or later or which are ongoing. The database is permanently open for data updating and providing more information on new programmes and projects, by authorised persons. With regard to the Final Overview only the data uploaded to the ERA-ENVHEALTH research database **by the 3rd of September 2009** was considered.

The ERA-ENVHEALTH research database is accessible through the ERA-ENVHEALTH website: www.era-envhealth.eu.

3.1.3. Second questionnaire

In addition to the 1st questionnaire, a 2nd questionnaire entitled **"Framework for joint activities relating to environment and health research within the partner countries"** was developed, which aimed to describe the structure available for funding of transnational research in the field of E&H among the ERA-ENVHEALTH partners. Therefore, it was focused on the funding structures in partner organisations and the drivers for their E&H research activities. Other aims were to identify the principal accountabilities in the science to policy chain and to get some information about programme management. That included the mechanisms for initiation and prioritisation, preparation, implementation, quality assurance as well as communication, dissemination and reporting. This information will be used to analyse the feasibility and prepare a second joint call for research projects within the ERA-ENVHEALTH consortium.

The 2nd questionnaire was divided into five sections:

1. National E&H priorities
2. Funding Structure
3. Drivers for E&H research activities and priorities
4. Programme Management
5. Governance

The questionnaire was sent to the ERA-ENVHEALTH partners in April 2009.

The assessment of its information was made based on the responses sent by the partners. The ERA-ENVHEALTH research database was not used for this purpose. The responses of the partners to the 2nd questionnaire were integrated in the Final Overview, but not in the ERA-ENVHEALTH research database.

For more information about the data gathering via the 2nd questionnaire, see the questionnaire template in Annex 2.

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3.2 DEFINITIONS AND GENERAL INFORMATION

3.2.1. Environment and Health (E&H)

The WHO working definition identifies E&H as comprising those aspects of human well being, health and disease that are determined by factors in the environment. It also relates to the theory and practices of assessing and controlling factors in the environment that potentially affect health or well being.

The working definition of E&H used for ERA-ENVHEALTH project purposes is:

"**Environment and health is concerned with aspects of human health and disease that are determined by factors in the natural and built environment**. It includes both the direct pathological effects of chemical, physical and some biological agents, and the effects (often indirect) on health and well-being of the broad physical, psychological, social, and aesthetic environmental factors. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations."

Therefore the E&H programmes covered by this Final Overview mean programmes that promote and finance projects aiming at supporting scientific research, cooperation and policy development in the wide areas of the above mentioned E&H definition. The programmes implemented by the ERA-ENVHEALTH partner organisations were taken under consideration in this survey.

3.2.2 Respondents

The information for the Final Overview was provided by all ERA-ENVHEALTH partners as well as some other relevant programme managers in Europe in order to try to provide a widespread overview of the activities in this field. Nevertheless, widening the scope of the report to non ERA-ENVHEALTH partners is dependant on the willingness of non-partners to cooperate and the timescale was very tight. On the other hand, the E&H database is not closed and actions to increase and extend the information entered into the database are continuously being implemented.

The respondents who were asked to provide initial information for the Draft Overview were only the ERA-ENVHEALTH partner organisations. The scope of respondents was enlarged in the second phase for this Final Overview as all ERA-ENVHEALTH partners were also asked to contact other national and regional E&H research programme managers to help to complete the ERA-ENVHEALTH research database (1st questionnaire). Known contacts in other countries were also invited to complete information in the database.

All respondents are E&H programme managing organisations.

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3.2.3. Time period covered in the Final Overview

The programmes and projects investigated in this Final Overview are the on-going programmes, the programmes to be launched and the programmes that ended between 2006 and 2009. Therefore the Final Overview aims to gather information on national E&H programmes, projects and research priorities in this period.

The data processed in the Final Overview corresponds to data contained in the ERA-ENVHEALTH research database prior to the 3rd of September 2009.

The evaluation of the framework for joint activities relating to E&H research within the partner countries from the point of view of transnational research structures was produced according to the information of the 2nd questionnaire which was collected from April to August 2009.

3.2.4. Programme budgets

Financial sources for E&H programmes, for the purpose of this Final Overview show the resources that financially secured the implementation of the E&H programmes.

The information about the budget of the programmes has to be considered as only approximate. Average figures have been used and these figures change depending on the projects and other priorities in scientific programmes. Most of the programmes had not ended at the time of the production of this report and their total or yearly budget can be only assumed. Also a case had occurred where it was not possible to define which part of the particular programme is used only for research funding. This is because the budgets of some programmes cannot clearly distinguish between research funding and other activities related to the implementation of the whole programme.

As a result of the above and because of the absence of a uniform methodology used to calculate the budget spent within programmes (developing such methodology was not the objective of this "Final Overview") as well as the conversion of national currency to euro using a nominal exchange rate, the overview of funding results is not completely accurate.

For the purpose of this Final Overview, the information on the duration of the programmes and the budget types (total, yearly, spent until now) was taken into consideration in order to calculate and compare the approximate yearly and total budgets of all E&H programmes (independently of data provided by different types of budgets).

The method of calculation of the E&H programme total budget (TB) is:

a) In the case where the E&H programme total budget was provided:
   - The provided total budget was used for comparisons.

b) In the case where the yearly budged (YB) was provided:
   - The budget per month (Bm) was calculated by using the data provided for the yearly budget (Bm = YB / 12).

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- The duration of the programme in months (Nm) was calculated. In the case of open programmes (without planned date of termination) the date 31.12.2013 was assumed as the closing date. The date 31.12.2013 was chosen for this calculation because the last programmes will terminate in this year.
- The total budget (TB) per whole programme duration was calculated by using information about the budget per month and information about the programme duration in months (TB = Bm x Nm).

c) In the case where budget spent until now (BS) was provided:

- The duration of the programme in months (Nm) was calculated. In the case of open programmes (without planned date of termination) the date 31.12.2013 was assumed as a closing date. The date 31.12.2013 was chosen for this calculation evaluation because the last programmes will terminate in this year.
- The number of months “until now” (Nmnow), i.e. from the beginning of the programme to 31.12.2008 (B) was calculated. The date 31.12.2008 was chosen for this evaluation because the initial information on programmes was collected in the beginning of 2009 and the common date defined as “until now” for all programmes had to be chosen.
- The budget per month (Bm) was calculated (Bm = BS / Nmnow).
- The total budget (TB) per whole programme duration was calculated by using the data provided for the budget spent per month and the duration of the programme in months (TB = Bm x Nm).

The budget of EC programmes (LIFE, FP7) was not taken into consideration for programme budget calculations in order to avoid double counting under EC funding programmes as well as particular Member States programmes funded by the EC programmes mentioned before.

The method of calculation of the E&H programme yearly budget (YB) is:

a) In the case where the E&H programme total budget (TB) was provided:

- The duration of the programme in months (Nm, number of months) was calculated. In the case of open programmes (without planned date of termination) the date 31.12.2013 was assumed as a closing date. The date 31.12.2013 was chosen for this calculation because the last programmes will terminate in this year.
- The budget per month (Bm) was calculated by using the data provided for total budget and information on the duration of programme in months (Bm = TB / Nm).
- The yearly budget (YB) was calculated by using the data on budget per month and the duration of programme in months (YB = Bm x Nm).

b) In the case where the yearly budged (YB) was provided:

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- The provided yearly budget was used for comparisons.

c) In the case where the budget spent until now (BS) was provided:

- The number of months "until now" (Nmnow), i.e. from beginning of the programmes to 31.12.2008 (B) was calculated. The date 31.12.2008 was chosen for this evaluation because the initial information on programmes was collected in a beginning of the 2009 and the common date defined as "until now" for all programmes had to be chosen.
- The budget per month (Bm) was calculated (Bm = BS / Nmnow).
- The yearly budget (YB) was calculated by using the data on the budget spent per month (YB = Bm x 12).

As it was stated, the calculation carried out according to the method described above has only informative value for making at least very rough comparisons of financial sources among the E&H programmes evaluated in this Final Overview.

3.2.5. Project budgets

Data on the projects budgets were collected using the following structure:

- Total budget: less than 100.000 Euro
  between 100.000 and 500.000 Euro
  between 500.000 and 1.000.000 Euro
  more than 1.000.000 Euro
- Yearly budget: less than 100.000 Euro
  between 100.000 and 500.000 Euro
  between 500.000 and 1.000.000 Euro
  more than 1.000.000 Euro
- Budget spent: less than 100.000 Euro
  between 100.000 and 500.000 Euro
  between 500.000 and 1.000.000 Euro
  more than 1.000.000 Euro

3.2.6. Number of projects

The number of projects financed by the E&H programmes means the number of projects funded since 2006 (included) to the end of 2008. (The year 2008 was chosen because the overview was carried out in 2009 and the projects with a start date beginning of 2009 could not be included in the overview.) It is the total (estimated) number of projects and not the number of projects entered into the database (for the results see Table 3).

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3.2.7. Topics of the E&H programmes

The topics of the E&H programmes are very broad. They include the issues of environmental protection, prevention and protection of human health but also social and economic aspects of development in human society.

E&H programmes topics were classified in the following categories:

- Themes related to human health aspects
- Agents
- Human health effects
- Methodologies
- Social aspects of E&H

3.2.8. Programme outcomes

The following categories of E&H programme outcomes were collected through the 1st questionnaire or the ERA-ENVHEALTH research database:

- Science (science publications)
- Policy (recommendations for policy makers)
- Public (information)
- Information available publicly

Outcomes of the E&H programmes, in the form of titles of their reports or websites, are available in the ERA-ENVHEALTH research database.

3.2.9. Research themes of the projects

As for the programmes, E&H projects were classified in the following categories:

- Themes related to human health aspects
- Agents
- Human health effects
- Methodologies
- Social aspects of E&H

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3.2.10. Funding structures

The following information related to funding structure of E&H programmes was collected through the 2nd questionnaire:

- National E&H research (at the country level)
- Funding structure (at the organisation level)
    - Simple model
    - National calls within a joint programme
    - Virtual common pot
    - Joint funding with a real common pot
- Drivers for E&H research activities and priorities (at the country level)
- Programme management mechanisms for E&H research activities (at the country level)
- Governance (at the country level)

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3.3 NUMBER OF COUNTRIES, PROGRAMME MANAGING ORGANISATIONS, E&H PROGRAMMES AND PROJECTS

Data and information from the following sources were collected by the 3rd of September 2009:

Number of countries:	11 (10 of them belonged to ERA-ENVHEALTH partners, one (Poland) was as an additional country from a consultative organisation)
Number of managing organisations:	38 (16 of them belonged to the ERA-ENVHEALTH consortium, others were additional managing organisations, including European programmes such as FP7)
Number of E&H programmes:	49 (19 of them belonged to ERA-ENVHEALTH partner organisations)
Number of E&H projects:	461 (249 of them belonged to programmes managed by ERA-ENVHEALTH partner organisations)

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3.4 WHAT IS NEW COMPARED TO THE PREVIOUS "DRAFT OVERVIEW OF PROGRAMMES"

The "Final overview of programmes and projects including synthesis and recommendations" is a second and final report produced to provide basic information on the number and objectives of E&H programmes and projects in European countries.

The Final Overview is based on findings from the previous "**Draft overview of programmes – Survey of national research programmes related to Environment and Health within the ERA-ENVHEALTH partner countries based on the analysis of data collected via a questionnaire**", which was prepared in April 2009.

In comparison with the Draft Overview, the scope of the Final Overview is extended to:

- a larger number of countries, including countries not belonging to the ERA-ENVHEALTH partners (from 9 to 11 countries);
- a larger number of E&H programme managing organisations (from 14 to 38);
- more E&H programmes described (from 14 to 49 – The Draft Overview list of E&H programmes consisted of 18 E&H programmes. The update for the Final Overview has merged one programme into another and three programmes revised as projects. Therefore the update number of programmes listed in Draft Overview has been modified from 18 to 14);
- the description of 461 E&H projects which were not covered at all in the Draft Overview (the Draft Overview was not focused on projects at all because this issue was intended to be discussed in the Final Overview);
- the description of structures available for the funding of transnational research in the field of E&H in ERA-ENVHEALTH partner organisations (the Draft Overview was not focused on funding structure evaluation because this issue was intended to be presented in the Final Overview); and
- the provision of a synthesis and recommendations for effective funding of E&H research activities.

14 organisations of the ERA-ENVHEALTH consortium provided information about 14 E&H programmes for the Draft Overview.

38 organisations provided information on 49 E&H programmes which were analysed for the Final Overview. 16 ERA-ENVHEALTH partners were involved and therefore, the range of organisations included in the E&H programmes assessment was extended by 22 other cooperating organisations, including one international organisation (the European Commission). Among the new organisations most are ministerial institutions. Foundations and international organisations are new types of organisations in comparison with the Draft Overview.

The Final Overview covers 35 programmes more than the Draft Overview.

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The new programmes are mostly focused on assessing the impact on human health of “Outdoor air quality”, “Water quality & supply” and “Local/living environment”. From the “Agents” point of view, the new programmes in the Final Overview are oriented towards “Biological agents”, “Other chemical agents”, and “Pesticides & biocides”. New E&H programmes often deal with “Cardiovascular diseases”, “Respiratory diseases” and “Allergies”. “Exposure assessment”, “Health impact assessment” and “Epidemiological studies” are often “Methodologies” mentioned within these new programmes. Regarding the “Social aspects of E&H”, the new programmes are most often oriented towards “Vulnerable groups”, “Behaviour of individuals and groups” and “Children’s health”.

The total budgets of the 14 programmes evaluated in the Draft Overview represented about 58 M€. The total budget of the 35 new programmes cannot be calculated, because only data for the budgets of 14 new programmes was provided. The value of the total budget invested in the years 2006 to 2008 by these 14 new programmes was estimated at 1,428 M€.

An updated of description of all 38 programme managing organisations and all 49 E&H programmes is provided in section 4.

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4. ANALYSIS OF THE E&H PROGRAMMES – RESULTS

4.1 PROGRAMME MANAGING ORGANISATIONS – DESCRIPTION, ROLES, TYPES (Q 1-3)

Programme managing organisations represent organisations which own or manage E&H research programmes and provide financial support to E&H research projects.

The Final Overview describes 38 E&H programme managing organisations in 11 countries (see Figure 1 and Table 1).

Figure 1: Number of E&H programme managing organisations entered into the database per country

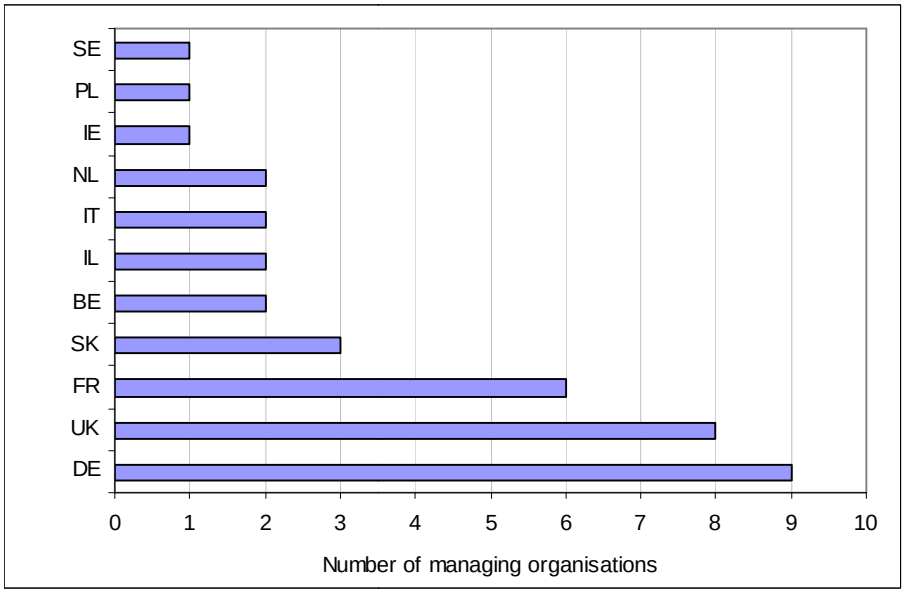

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Table **1**: List of E&H programme managing organisations entered into the database[1]

	E&H programme managing organisations					
	Name	**Abbre-viation**	**Country**	**Type of organisation**	**Competencies**	**Role**
1.	**Belgian Science Policy**	**BelSPO**	**Belgium**	Ministry	Scientific research in general	- support for research
2.	**Federal Public Service Health, Food Chain Safety and Environment**	**FPS**	**Belgium**	Ministry	E&H	- policy-making - support for research
3.	**French Environment and Energy Management Agency**	**ADEME**	**France**	Public Body	Mostly environment	- support for policy-making - support for research
4.	**French Agency for Environmental and Occupational Health Safety**	**AFSSET**	**France**	Public Body	E&H	- support for policy-making - support for research - human health protection
5.	**Ministry of Ecology, Energy, Sustainable Development and the Sea**	**MEEDDM**	**France**	Ministry	Mostly environment	- policy-making
6.	French National Research Agency	ANR	France	Public Body	Scientific research in general	- support for research
7.	Foundation for scientific cooperation in biodiversity research	FRB	France	Non-profit Organisation	Mostly environment	- promoting projects
8.	Conseil Regional Nord Pas de Calais	Nord-Pas Calais	France	Regional Agency	Scientific research in general	- support for research
9.	**Federal Environment Agency**	**UBA**	**Germany**	Federal Agency	E&H	- support for policy-making - support for research - execution of research activities - human health protection
10.	Federal Agency for Nature Conservation	BfN	Germany	Federal Agency	Mostly environment	- support for research - nature protection
11.	Federal Institute for Risk Assessment	BfR	Germany	Federal Agency	Mostly health	- support for policy-making

[1] ERA-ENVHEALTH project partners are marked in bold.

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	E&H programme managing organisations					
	Name	**Abbre-viation**	**Country**	**Type of organisation**	**Competencies**	**Role**
						- ensuring safety of food, substances and products
12.	Federal Ministry of Education and Research	BMBF	Germany	Federal Ministry	Scientific research in general	- promote research
13.	Deutsche Bundesstiftung Umwelt	DBU	Germany	Foundation	Mostly environment	- promote projects
14.	German Research Foundation	DFG	Germany	Foundation	Scientific research in general	- promote research
15.	German Federal States	GFS	Germany	Federal Ministries and Agencies[2]	E&H	- policy-making - support for research
16.	Ministry of the Environment and Conservation, Agriculture and Consumer Protection of the State of North Rhine-Westphalia	MUNLV	Germany	Regional Ministry	Mostly environment	- policy-making
17.	Ministry of the Environment of Baden-Württemberg	UM	Germany	Regional Ministry	Mostly environment	- policy-making
18.	**Environmental Protection Agency**	**EPA**	**Ireland**	Federal Agency	Mostly environment	- support for policy-making - support for research - protection of environment
19.	**Ministry of Environmental Protection**	**MoEP**	**Israel**	Ministry	Mostly environment	- policy-making
20.	Environment and Health Fund	EHF	Israel	Non-profit Organisation	E&H	- funding
21.	**National Research Council**	**CNR**	**Italy**	Research Organisation	Scientific research in general	- promote research
22.	**National Institute for Environmental Protection and Research**	**ISPRA**	**Italy**	Public Body	Mostly environment	- support for policy-making - support for research

[2] "German Federal States" is not one single organisation. It summarises ministries and agencies in the 16 German Federal States which fund E&H research outside specific E&H programmes. As North-Rhine Westphalia and Baden-Württemberg have specific E&H programmes, they are listed separately.

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	E&H programme managing organisations					
	Name	**Abbre-viation**	**Country**	**Type of organisation**	**Competencies**	**Role**
						- protection of environment
23.	Nofer Institute of Occupational Medicine	NIOM	Poland	Research Organisation	E&H	- support for policy-making - support for research
24.	**Public Health Authority of the Slovak Republic**	**UVZ**	**Slovakia**	Public Body	Mostly health	- support for policy-making - support for research
25.	Ministry of Health of the Slovak Republic	MoH-SK	Slovakia	Ministry	Mostly health	- policy-making - support for research
26.	Slovak Academy of Sciences	SAS	Slovakia	Non-profit Organisation	E&H	- execution of research
27.	**Swedish Environmental Protection Agency**	**Swedish EPA**	**Sweden**	Public Body	Mostly environment	- support for policy-making
28.	**National Institute for Public Health and the Environment**	**RIVM**	**The Netherlands**	Research Organisation	E&H	- support for policy-making - support for research - execution of research
29.	**Ministry of Housing, Spatial planning and the Environment**	**VROM**	**The Netherlands**	Ministry	Mostly environment	- policy-making
30.	**Environment Agency for England and Wales**	**EA**	**United Kingdom**	Public Body	Mostly environment	- support for policy-making - support for research
31.	**Natural Environment Research Council**	**NERC**	**United Kingdom**	Public Body	Mostly environment	- funding
32.	Department for Environment, Food and Rural Affairs	Defra	United Kingdom	Ministry	Mostly environment	- policy-making - ensuring of healthy environment
33.	Department of Health	DH	United Kingdom	Ministry	Mostly health	- policy-making
34.	Food Standards Agency	FSA	United Kingdom	Public Body	Mostly health	- protection of public health
35.	Health Protection Agency	HPA	United Kingdom	Public Body	Mostly health	- support for policy-making - protection of the public health

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	E&H programme managing organisations					
	Name	**Abbre-viation**	**Country**	**Type of organisation**	**Competencies**	**Role**
36.	Health and Safety Executive	HSE	United Kingdom	Public Body	Mostly health	- protection of public health
37.	Scottish and Northern Ireland Forum for Environmental Research	Sniffer	United Kingdom	Non-profit Organisation	Mostly environment	- protection of environment
38.	European Commission	EC	International	International Organisation	-	- -

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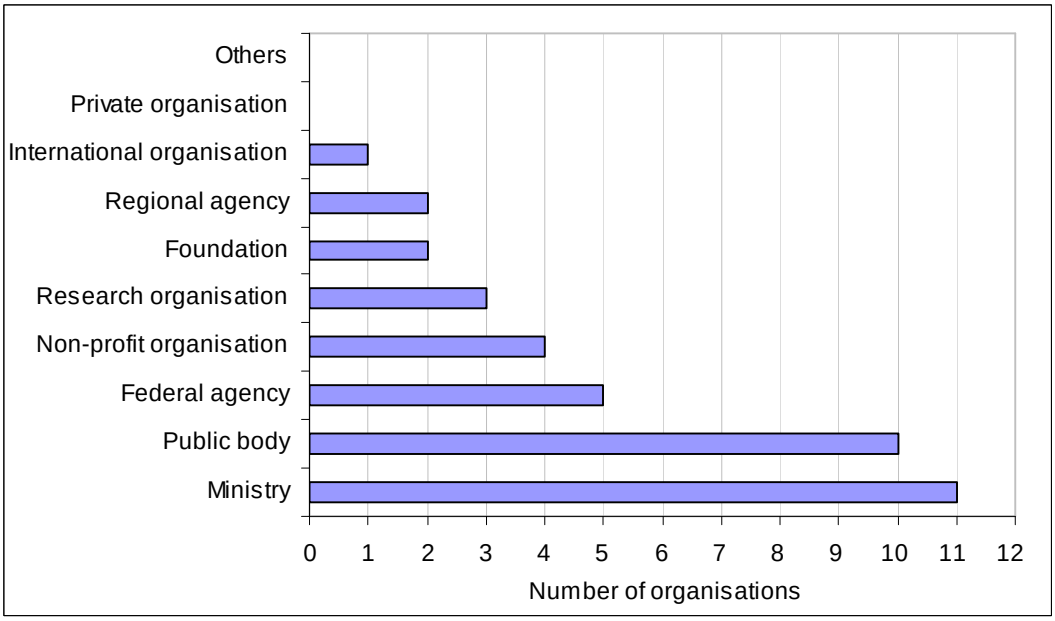
With respect to the **"Type of organisation",** most of the E&H programmes managing organisations mentioned in the ERA-ENVHEALTH research database are characterised as "Ministry" (11 organisations) and "Public body" (10 organisations). Organisations of the type "Federal agency" (5 organisations), "Non-profit organisation" (4 organisations), "Research organisation" (3 organisations), "Foundation" (2 organisations) and "Regional agency" (2 organisations) are a minority. There is one "International organisation" (European Commission) and no "Private organisation" in the ERA-ENVHEALTH research database (see Figure 2 and Table 1).

Because all ministries (national and federal) as well as the federal and regional agencies are in fact public bodies they could be counted together and it could be said that 74% of the organisations covered under the Final Overview (i.e. 28 organisations) act as public bodies.

Figure 2: Type of E&H programme managing organisations



The **"Description of the organisation and its role"** is available for 24 participating programme managing organisations including 11 ERA-ENVHEALTH partners in the ERA-ENVHEALTH research database (www.era-envhealth.eu) via the search for funding programmes.

The "Description of the organisation and its role" shows that the roles of the management organisations, classified by the types defined in the 1st questionnaire and listed in Figure 2, very often complement, overlap, interlink or substitute each other, mainly in the case of public institutions. Ministries depend on the state budget and are policy-making/-orientated organisations. Most of the public bodies are linked to their relevant ministries and therefore also do policy-orientated work or research. Federal agencies are doing and analysing research and are giving scientific advice to environment and health ministries. So this scientific work is to a certain extent orientated towards policy. In this sense the E&H programme managing organisations can be regrouped in 11 **"Ministries"**, 19 **"policy-oriented organisations"** (i.e. public bodies, agencies and policy-oriented research

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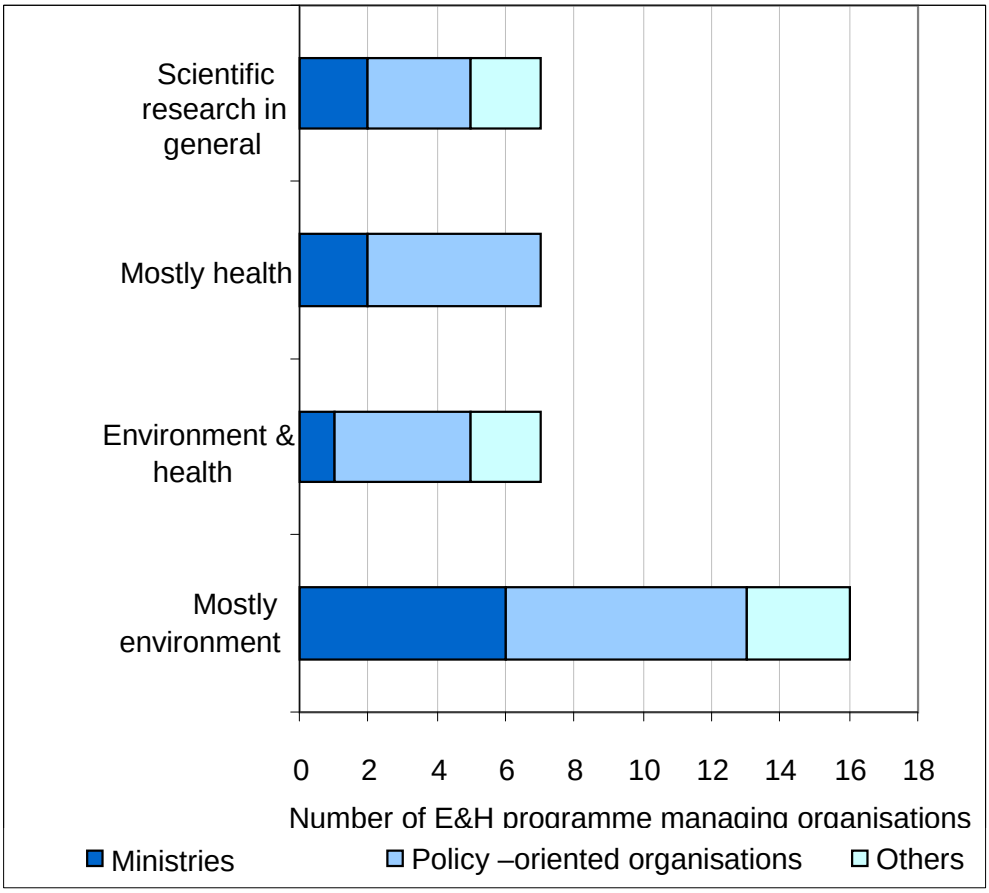
organisations: CNR/Italy and RIVM/The Netherlands) and seven **"Others"** (i.e. independent research institutions, non-profit organisations and foundations).

Further, according to the description of the programme managing organisations provided by ERA-ENVHEALTH research database, questionnaires or websites it can be assumed which of the organisations are competent authorities for **"Mostly environment"** (16 organisations) **"Environment AND health"** (7 organisations) and **"Mostly health"** (7 organisations). Among the participating organisations there are also some which support **"Scientific research in general"** (7 organisations), because they focus not only on environment and/or health issues but also on many other areas of scientific research (see Figure 3 and Table 1).

Figure 3: Environment and/or health competencies of the E&H programme managing organisations



A short description of the organisations (available in the ERA-ENVHEALTH research database for 23 organisations and available through the 1st questionnaire or their websites for the rest of the organisations) regrouped as **"Ministries"**, **"Policy-oriented organisations"** and **"Others"** is provided below.

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a) "Ministries"

The E&H programme managing organisations acting as "Ministries" are policy-making bodies. Their tasks are:

- to adopt policy decisions and create legislation aiming to protect the environment and/or public health in a sustainable way; and
- to support research and fund scientific institutions.

In this context **VROM/The Netherlands** – the Ministry of Housing, Spatial planning and the Environment – states that its activities are focused on "preparing memoranda formulating the views of VROM, establishing legislation in co-operation with social partners, inspections aimed at making sure that rules are observed, supplying organisations and individuals with subsidies". The Government Department in the United Kingdom **Defra/UK** – the Department for Environment, Food and Rural Affairs – states that its challenge is "to secure a healthy environment in which we and future generations can prosper".
The aim of "Ministries" is also to support science policy and scientific institutions and fund research. This is represented by the federal administration **BelSPO/Belgium** – the Belgian Science Policy – whose mission is "1/ the preparation, execution and evaluation of science policy and its extensions, 2/ in particular, on Belgian Government instructions, the implementation of scientific and technical means in support of Federal Authority competences, 3/ the development of a permanent knowledge resource within scientific and technical spheres at the service of the Federal Authority, 4/ to support the ten Federal Scientific Institutions under the control of the Federal Science Policy, and also support the STIS (Scientific and Technical Information Service) and Belnet[3], for the administrative, financial and material management, the coordination and valorisation of research activities and activities as scientific public service". **FPS/Belgium** – the Federal Public Service Health, Food Chain Safety and Environment – is an organisation which "funds research in response to specific public policy questions concerning health and/or environment and plays a major role in the health-environment Federal Policy and management planning". Actions aiming at developing research are also undertaken by **MEEDDM/France** – the Ministry of Ecology, Energy, Sustainable Development and the Sea. **MoH/Slovakia** – the Ministry of Health of the Slovak Republic – supports "health research on a broad basis" including a "funding programme targeted towards environmental and public health".

Six "Ministries" have competencies for **"Mostly environment"**. It is the case of **MEEDDM/France** which focuses its actions on two main areas: 1/ "preserving and protecting spaces and species: this includes the prevention of pollution and of major risks, nature conservation, protection of landscape and […] water resources", 2/" developing research, improving knowledge of the state of the environment". **VROM/The Netherlands** specified that its "area of policy is Spatial Planning and Development, Housing and Urban Development, Environment, Integration and Communities". Other major components of VROM's policy are the "Memorandum on the Implementation of the Climate Policy, the

[3] Belgian national research network

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Memorandum Living in the 21st century, and the Fifth Memorandum on Spatial Planning as well as the National Environmental Policy Plan No. 4". **Defra/UK** deals with "environmental risks […], sustainable society and a healthy environment". The federal state ministries of Germany – **MUNLV/North Rine Westphalia (Germany)**, **UM/ Baden-Württemberg** (**Germany)** – and **MoEP/Israel**, are also oriented towards "Mostly environment" as it is stated in the name of the organisation.

One "Ministry" has competencies specifically for **"Environment AND health"**. This is the case for **FPS/Belgium** which funds research concerning health and/or environment. Its "two main strategic objectives are to develop a sustainable, ethical and science based policy along the axis Health-Food-Environment dedicated to the citizen and the society; and collaborate in a transparent and integrated way on an international, a national and a regional level".

Two "Ministries" have competencies for **"Mostly health":** the **DH/UK** and the **MoH/Slovakia** which "supports health research" and also has a "funding programme aimed at environmental and public health".

Two more "Ministries" (**BelSPO/Belgium** and **BMBF/Germany**), support different areas of **"Scientific research in general"** without a clear specification for only E&H programmes and projects.

b) "Policy-oriented organisations"

E&H programme managing organisations acting as **"Policy-oriented organisations**" are usually public bodies reporting to the appropriate ministries. Their tasks cannot be clearly grouped to exact categories because they deal with different combinations of the following tasks:

- to support the decision-making process;
- to support and fund research projects and scientific activities;
- to monitor the state of the environment and/or the state of public health and/or the interaction of health determinants in environment and public health";
- to protect the environment and public health;
- to coordinate expertise in assessing risks;
- to act as a contact point for international organisations or conventions (e.g. **ISPRA/Italy** and **UBA/Germany** are National Reference Centre for Environment & Health for EIONET and **UBA/Germany** is a contact point for the World Health Organisation); and
- to provide information for ministries, relevant public bodies and the general public and raise awareness.

All of the organisations that are in the ERA-ENVHEALTH research database are E&H programme managing organisations which fund or finance different E&H projects. Their other roles and tasks are shortly described below:

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AFSSET/France – the French Agency for Environmental and Occupational Health Safety – "is a public body reporting to the French Ministers for ecology, for health and for employment. […] The AFSSET can be called on by government departments, public bodies or registered associations. […] It can also provide incentive-raising funding via environmental and occupational health research programmes". **ANR/France** – the French National Research Agency – is a "public institution for the management of administrative issues […] and is a funding agency for research projects. Its aim is to increase the number of research projects issued from the entire scientific community, and to provide funding based on calls for proposals and peer review selection processes". **ADEME/France** – the French Environment and Energy Management Agency – is a "public institution of an industrial and commercial nature. […] Within the frame of public policies defined by the government, the Agency's mission is to stimulate, animate, coordinate, facilitate and perform operations aiming at the environment protection and energy management. […] ADEME helps design and implement programmes at the national, regional and local levels […], and they support "research and technological developments, promote sound decision-making in the environmental and energy-management fields, support investment in emerging and specialised fields and in pilot sustainable development programmes, favour a regional approach, inform companies, local communities and the general public and raise their awareness". **Nord-Pas Calais/France** – Conseil Regional Nord Pas de Calais – is a district council in the field of research and technology which "reserves financial aids for the private and public communities or agencies whose actions meet general aims. The council can create poles of research, innovation and transfer centres and allocate grants".

UBA/Germany – the Federal Environment Agency – is "Germany's largest environmental authority. Together with the Federal Nature Conservation Agency (BfN) and the Federal Office for Radiation Protection (BfS), it forms the scientific base of Germany's environment policy. It is also the contact point for citizens in environment and health protection. […] The most important functions of UBA are: 1/ scientific support for the Federal Government (Federal ministries of environment, health, research, transport, building and urban development, among others), 2/ implementation of important environmental legislation, 3/ informing the public. The UBA sees itself as a kind of early-warning system that identifies and assesses potential future adverse impacts on humans and the environment in a timely manner […]. UBA is the German partner and contact point for international organisations such as the World Health Organisation (WHO) and National Reference Centre for Environment & Health for EIONET". **BfN/Germany** – the German Federal Nature Conservation Agency – is "Germany's central scientific authority for both national and international nature conservation. The Agency reports to the German Environment Ministry and has key enforcement functions under international species conservation agreements, marine conservation law, the Antarctic Treaty and the German Genetic Engineering Act". **BfR/Germany** – the Federal Institute for Risk Assessment – is a federal agency which "has the statutory remit of providing information on possible, identified and assessed risks which foods, substances and products may entail for consumers. […]. With its work the Institute makes a major contribution to ensuring that food, substances and products become safer. […] The characteristic feature of BfR's work is its scientific, research-driven approach. […]

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The BfR results and recommendations are an important decision-making aid for measures for all interested circles". In the ERA-ENVHEALTH research database **GFS/Germany** – as a general term for the German Federal States – is also mentioned. GFS/Germany summarises ministries and agencies in the 16 German Federal States which fund E&H research outside specific E&H programmes and its inclusion to the database can help to get information on other E&H programmes and projects implemented in Germany.

ISPRA/Italy – the National Institute for Environmental Protection and Research – is a "national public government body, under the vigilance of the Ministry of the Environment, Territory and Sea. […] ISPRA is the competent government authority for all tasks and scientific activities of national interest for the protection of the environment and sustainable development, supporting regulatory activities of the Ministry of Environment, Land and Sea. […] Many activities are established by law including regular reporting on state of environment and waste policies". ISPRA hosts the National Focal Point and National reference Centre for Environment & Health of EIONET – the European environment information and observation network of the European Environment Agency. ISPRA's active participation in scientific and technical activities is "basically aimed to provide and gather sound research evidence to be transformed into appropriate and consistent tools supporting the decision-making process, risk management, stakeholder communication and information, environmental data and monitoring, analysis procedures, assessment methodologies, exposure assessment, environmental issues integration with other policy sector". **CNR/Italy** – the National Research Council – is "a public organisation; its duty is to carry out, promote, spread, transfer and improve research activities in the main sectors of knowledge growth and of its applications for the scientific, technological, economic and social development. […] From the financial point of view, the main resources come from the State, but also from the market".

EPA/Ireland – the Environmental Protection Agency – is "an independent public body set up under legislation with the sponsorship of Department of Environment Heritage and Local Government. Its mission is "to promote and implement the highest practicable standards of environmental protection and management that embrace the principles of sustainable and balanced development". EPA primary responsibilities include "Environmental licensing, Enforcement of environmental law, Environmental planning, education and guidance, Environmental research development".

The research organisation **RIVM/The Netherlands** – The National Institute for Public Health and the Environment – is "a recognised leading centre of expertise in the fields of health, nutrition and environmental protection" which works mainly for the Dutch government". The results of RIVM's "research, monitoring, modelling and risk assessment are used to underpin policy on public health, food, safety and the environment. […] The main sponsor of RIVM is VROM/The Netherlands therefore RIVM is not the owner of programmes, but a programme manager, and can be considered "as an extension of VROM with respect to E&H activities and research".

UVZ/Slovakia – the Public Health Authority of the Slovak Republic – is "non-profit state organisation leaded by Chief Hygienist of the Slovak Republic. UVZ is linked with its financial relations to the budget of the Ministry of Health of the Slovak Republic". The mission of UVZ

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is “to monitor the relation of health determinants and public health”. UVZ/Slovakia also drafts “proposals of elementary directions and priorities of state health policy in the sector of public health, participates in the solution of national and international programs significant for public health and carries out scientific research in this field”.

Swedish EPA/Sweden – the Swedish Environmental Protection Agency – is a national agency. “Funded by central government the Swedish EPA is independent authority acting on the basis of a government ordinance that defines its terms of relevance. […] Its key tasks are “to present proposal for environmental policy and legislation to the Swedish Government and ensure that environmental policy decisions are implemented.

EA/UK – the Environment Agency within England and Wales – is “non-departmental public body sponsored by UK Government’s DEFRA/UK. It is a primary public body for environmental regulation within England. EA and its offices across England and Wales “working on carrying out Government policy, inspecting and regulating businesses and reacting when there is an emergency such as a floods or pollution incidents. […] The Agency chairs the Environment Research Funders Forum, which is a network of the major funders of environmental science research throughout the UK, spanning the research spectrum from academic to apply”. **FSA/UK** – the Food Standards Agency – is an independent Government department set up by legislation „to protect the public's health and consumer interests in relation to food”. FSA “provides advice and information to the public and Government on food safety from farm to fork, nutrition and diet. It also protects consumers through effective food enforcement and monitoring”. **HPA/UK** – the Health Protection Agency – ”is an independent UK organisation that was set up by the government […] to protect the public from threats to their health from infectious diseases and environmental hazards. It does this by providing advice and information to the general public, to health professionals such as doctors and nurses, and to national and local government”. **NERC/UK** – the Natural Environment Research Council – is the “UK's main agency for funding and managing research, training and knowledge exchange in the environmental sciences“. The NERC invests in “different types of research from 'responsive research', through a range of directed research, to strategic research and survey work that is more applied or long-term and may underpin national and international needs”.

Competencies for **“Mostly environment”** are related to seven “Policy-oriented organisations”. It is the case for **ADEME/France** focusing on “1/ preventing and controlling air pollution, 2/ reducing waste production and managing waste disposal, recovery and conversion, 3/ developing clean and economical technologies, 4/ fighting noise pollution”. ADEME/France also plays a role in sustainable development and the fight against climate change. Fields of **ISPRA/Italy** activities include “natural resources protection, sustainable development and environmental tools (EMAS[4], Ecolabel), air and water quality, waste data and policies, hydrogeological risk, nuclear and industrial risks, electromagnetic fields, noise, impact assessment of projects and plans (EIA[5], SEA[6]) of national relevance, technical

[4] Eco-Management and Audit Scheme
[5] Environmental Impact Assessment

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support to the Integrated Environmental Authorisation under IPPC Directive, environmental emergency management, metrology with own labs and experts, communication and training, information system and reporting, environment and health". "Mostly environment" competencies are also found in **BfN/Germany**, **Swedish EPA/Sweden** which is a "national agency for environmental protection and nature conservation as well as outdoor recreation and hunting issues", **EA/UK** with its main objective to provide better environment for England and Wales and contribute to achieving the goals of sustainable development", and **NERC/UK** whose funding covers "the full range of atmospheric, earth, terrestrial and aquatic sciences – from the depths of the oceans to observing the Earth from satellites in space". **EPA/Ireland** is "at front line of environmental protection and policing" and supports projects "funded by the programme with a strong health impact including: Environmental impact on drinking water quality, Endocrine disrupting substances in the Irish aquatic environment, Air quality including particular mater, Eutrophication from agriculture sources, Health impact assessment, Health effects of climate changes".

Four "Policy-oriented organisations" declare competencies for **"Environment AND health".** As **AFSSET/France** pointed out, its missions are to "1/ Contribute to ensuring health safety in all types of surroundings, including occupational environments, 2/ Assess environmental health risks, and more specifically within occupational environment, 3/ Coordinate environmental health and occupational health expertise, 4/ Use all means to provide the government with the expertise and scientific and technical support needed to develop and implement legislation and regulations, 5/ Inform the public and contribute to the public debate. While AFSSET focuses particularly on coordinating expertise in assessing risks related to chemical substances, its activities encompass a wide scope of topics, from chemicals to electromagnetic fields, from environmental to noise pollution, and occupational exposure".

UBA/Germany is the scientific environmental authority in Germany. UBA "provides scientific support for the Federal Ministries of environment and health and others. UBA acts as partner and Germany's contact point for many international organisations such as the World Health Organization (WHO) and is National Reference Centre for Environment & Health for EIONET. It also provides the public with information about environment protection as well as environmental health protection". The German Federal States' organisations covered under **GFS/Germany** fund or implement programmes related to environment as well as health issues. The research organisation **RIVM/The Netherlands** is dealing with "expertise in the fields of health, nutrition and environmental protection".

Five "Policy-oriented organisations" show competencies for **"Mostly health".** It is the case for **UVZ/Slovakia** whose mission is "to monitor the relation of health determinants and public health, to collect basic data in the field of public health protection, to monitor the health condition of the population and its groups in relation to living conditions and working condition, lifestyle and work and the health consciousness of people and to carry out the identification of health risks as well as to monitor optimal health management of children and

[6] Strategic Environment Assessment

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adolescents, of nutrition, at radiation protection, epidemiology of infectious and non-infectious diseases, medical microbiology, health promotion and medical statistics". The work of **BfR/Germany** is focused on "people as consumers. […] The institute makes a major contribution to ensuring that food, substances and products become safer. In this way BfR helps to protect the health of consumers". "Mostly health" activities are also dealt with by **FSA/UK** which "provides advice and information to the public and Government on food safety from farm to fork, nutrition and diet and also protects consumers through effective food enforcement and monitoring", **HPA/UK** whose aim is "to protect the public from threats to their health from infectious diseases and environmental hazards" and **HSE/UK** whose aim is "to prevent death, injury and ill-health to those at work and those affected by work activities".

The purpose of the following two public organisations is to support **"Scientific research in general"** without any clear specification only for E&H programmes and projects. This is the case for the regional agency **Nord-Pas Calais/France** and the research organisation **CNR/Italy**. CNR's research areas "concern several sectors: biotechnology, medicine, materials, environment and land, information and communications, advanced systems of production, judicial and socio-economic sciences, classical studies and arts".

c) "Others"

E&H programme managing organisations acting as independent research organisations, non-profit organisations and foundations (for this purpose called **"Others"**) have the following tasks:

- to provide background research and expertise and to serve as advisory bodies,
- to promote and improve research activities and projects,
- to provide post-graduate training, editorial activities, and regulatory activities.

The "Research organisation" **NIOM/Poland** – Nofer Institute of Occupational Medicine – is an "independent complex research and development centre with activities covering various areas of occupational and environmental health. […] The primary task of the Institute is to conduct research and development activities and provide expertise on health hazards arising from occupational and environmental exposure to noxious agents. […] Presently, NIOM provides background research and expertise to the Ministry of Health and serves as an advisory body to the Ministry of Environmental Protection and numerous governmental agencies, including State Sanitary Inspectorate and State Labour Inspectorate, and also to local administration, trade unions and industry. NIOM also provides "post-graduate training, editorial activities, and regulatory activities with respect to occupational safety and health and environmental health hazards". Research is also carried out by the "Non-profit organisation" **SAS/Slovakia** – the Slovak Academy of Sciences.

In the case of "Foundations" and other "Non-profit organisations", their aim is to fund projects and relevant research activities. **FRB/France** – the Foundation for Scientific Cooperation in Biodiversity Research – "was set up by the Ministers for Ecology and Research. It brings together public research bodies, staff from the corporate sector involved in biodiversity management, environmental organisations and business. […] The mission of the FRB is to

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encourage on the national, community and international levels development, backing and promotion of research activities in biodiversity and their utilisation in the biological, socio-economic and legal fields, and of the associated activities of training, raising awareness and dissemination of results". The aim of **Sniffer/UK** – the Scottish and Northern Ireland Forum for Environmental Research – is "to increase knowledge to help protect our environment and improve quality of life". The central self-governing research funding organisation in Germany, **DFG/Germany** – German Research Foundation – "promotes research at universities and other publicly financed research institutions in Germany. The DFG serves all branches of science and the humanities by funding research projects and facilitating cooperation among researchers". Also one of Europe's largest foundations, **DBU/Germany** – Deutsche Bundesstiftung Umwelt – "promotes innovative and exemplary environmental projects in line with principles of sustainable development".

With respect to competencies, three organisations (**FRB/France**, **DBU/Germany** and **Sniffer/UK**) report competencies for **"Mostly environment",** two for **"Environment AND health"**: **NIOM/Poland** whose activities cover "various areas of occupational and environmental health" and environmental protection" and **EHF/Israel** - Environment and Health Fund. Competencies for **"Mostly health"** were not pointed out by any "other" organisation. Two public organisations: the "Foundation" **DFG/Germany** and the "Non-profit organisation" **SAS/Slovakia**, support or provide **"Scientific research in general"** without any clear specification only for E&H programmes and projects.

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4.2 OVERALL INFORMATION AND GENERAL OBJECTIVES OF THE E&H PROGRAMMES (Q 4-5)

4.2.1. Overall information

The Final Overview of E&H programmes and projects shows that since 2006 to the day of processing of the data (September 2009), 38 programme managing organisations have implemented 49 different E&H programmes. A list of implemented E&H programmes and their related information is available in the ERA-ENVHEALTH research database (www.era-envhealth.eu). The list contains the E&H programmes shown in Table 2.

Table 2: List of E&H programmes (included in the research database before the 3rd of September 2009)[7]

	E&H Programme			Country
	Name	Acronym	Managing organisation	
1.	**National Environment and Health Action Plan**	**NEHAP**	**FPS**	**Belgium**
2.	**Science for Sustainable Development – Biodiversity**	**SSD/BD**	**BelSPO**	**Belgium**
3.	**Science for Sustainable Development – Atmosphere, terrestrial and marine ecosystems**	**SSD/AT-TE**	**BelSPO**	**Belgium**
4.	**Science for Sustainable Development – Agrofood**	**SSD/AF**	**BelSPO**	**Belgium**
5.	**Science for Sustainable Development – Health and Environment**	**SSD/HE**	**BelSPO**	**Belgium**
6.	EU LIFE	LIFE	EC	European Union
7.	Seventh Framework Programme	FP7	EC	European Union
8.	**French National Research Programme on Endocrine Disruptors**	**PNRPE**	**AFSSET, MEEDDM**	**France**
9.	**National Environmental and Occupational Health Research Programme**	**PNR EST**	**AFSSET**	**France**
10.	**Inter-organism national research programme for better air quality**	**Primequal**	**ADEME,**	**France**

[7] Programmes owned or managed by ERA-ENVHEALTH project partners are marked in bold.

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	E&H Programme			Country
	Name	**Acronym**	**Managing organisation**	
	at the local and regional scale		**MEEDDM**	
11.	Nord Pas de Calais RECHERCHE EN SANTÉ – ENVIRONNEMENT 2009	RSE 2009 (NPdC)	Nord-Pas Calais Nord-Pas Calais	France
12.	Call for projects FRB	FRB	FRB	France
13.	Contaminants, Ecosystems, Health	CES	ANR	France
14.	**Action Programme Environment and Health**	**APUG**	**UBA**	**Germany**
15.	**Environment & Health / Umweltforschungsplan**	**U&G/UFOPLAN**	**UBA**	**Germany**
16.	**Environment Specimen Bank**	**ESB (UPB)**	**UBA**	**Germany**
17.	Action Programme Environment and Health NRW	APUG NRW	MUNLV	Germany
18.	Baden-Württemberg Programme Livelihood Environment and its Protection	BWPLUS	UM	Germany
19.	BMBF / Health Research – Research for People	BMBF/HR	BMBF	Germany
20.	BMBF / Research for Sustainability	BMBF/fona	BMBF	Germany
21.	Deutsche Bundesstiftung Umwelt / Scholarship	DBU Scholarship	DBU	Germany
22.	Federal Agency for Nature Conservation / Umweltforschungsplan	BfN/UFOPLAN	BfN	Germany
23.	Federal Institute for Risk Assessment / Umweltforschungsplan	BfR/UFOPLAN	BfR	Germany
24.	German Federal States Funding[8]	GFSF	GFS	Germany
25.	German Research Foundation Funding	DFG Funding	DFG	Germany

[8] "German Federal States" summarises ministries and agencies in 14 German Federal States which fund E&H research outside specific E&H programmes. North-Rhine Westphalia and Baden-Württemberg have specific E&H programmes and are listed separately (see also footnote 2)

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	E&H Programme			Country
	Name	**Acronym**	**Managing organisation**	
26.	Other Funding[9]	OF	Other organisations	Germany
27.	**Science Technology & Innovation for the Environment**	**STRIVE**	**EPA**	**Ireland**
28.	Environmental Health Fund Project 2008	EHF	EHF	Israel
29.	Ministry of Environmental Protection Projects 2000	MoEP	MoEP	Israel
30.	**Environment and Health Interdepartmental Project**	**PIAS CNR**	**CNR**	**Italy**
31.	**Environment and Health Unit**	**E&H Unit**	**ISPRA**	**Italy**
32.	**Physical Agents Service**	**AGF Unit**	**ISPRA**	**Italy**
33.	National Centre for Research and Development	NCBiR	NIOM	Poland
34.	Polish Ministry of Science and Higher Education	MNi SzW	NIOM	Poland
35.	Polish Ministry of Science and Higher Education- Nofer Institute of Occupational Medicine statutory allocation	MNi Sz- IMP	NIOM	Poland
36.	**National Environment and Health Action Plan III**	**NEHAP III**	**UVZ**	**Slovakia**
37.	Environmental and Public Health Research	EPHR	MoH-SK	Slovakia
38.	Scientific Grant Agency of Ministry of Education of SR and Slovak Academy of Science	VEGA	SAS	Slovakia
39.	**Swedish Environmental Research Appropriation**	**none defined**	**Swedish EPA**	**Sweden**
40.	**The Emissions Research Programme**	**EMFO**	**Swedish EPA**	**Sweden**
41.	**Policy support with regard to the living space and environment**	**BMR**	**VROM**	**The Netherlands**

[9] "Other funding" was created as a fictive programme in order to be able to enter university, EU and WHO projects into the database.

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	E&H Programme			Country
	Name	**Acronym**	**Managing organisation**	
42.	**Environment and Human Health (Environment Agency)**	**EHH (EA)**	**EA**	**United Kingdom**
43.	**Environment and Human Health (NERC)**	**EHH (NERC)**	**NERC**	**United Kingdom**
44.	Defra R&D Programme	Defra R&D	Defra	United Kingdom
45.	Department of Health	DH	DH	United Kingdom
46.	Health and Safety Executive Science Programme	HSE Science	HSE	United Kingdom
47.	Health Protection Agency Research Programme	HPA R&D	HPA	United Kingdom
48.	Research Programme at Food Standards Agency	Research at FSA	FSA	United Kingdom
49.	Scottish and Northern Ireland Forum For Environmental Research – R&D Programme	Sniffer R&D	Sniffer	United Kingdom

In terms of the evaluation time schedule it can be stated that the starting date for 27 of the 49 programmes was before 2006, two programmes ended before 2009, five will be completed in 2009 and 42 programmes will continue after 2009. The duration of the 19 programmes with a fixed start and fixed end date ranges from three to 192 months (average 58 months).

The frequencies of the programmes were: annual (11 programmes), biannual (3 programmes), every 5 years (6 programmes), and for 29 programmes the frequency was not specified.

The nature of the programme was mostly “Permanent” (20 programmes). “Policy-oriented” nature of programme was marked for 9 programmes and “Exceptional” for 6 programmes. Information about the nature of the other 14 programmes was not available in the research database. In the Draft Overview the programme nature of the type “time-limited” (EHH/UK) was also identified.

In practice, it is possible that sometimes the programmes aimed at funding E&H projects are prematurely closed. The projects running under such programmes can be transferred to other kinds of programmes; however they do not have to focus exactly on one E&H topic. Cross-cutting themes across other programmes rather than a specific E&H programme can also be applied. That was the case for the EHH programme in England and Wales which was transferred to one of the six new programmes (“Climate Change”, “Modern Regulation”, “Integrated Catchment Science”, “Flood Risk Science”, “Resource Efficiency” and “Innovation for Efficiency”).

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4.2.2. General objectives

Descriptions of the **"General objectives of the E&H programmes"** are provided for 32 programmes collected in the ERA-ENVHEALTH research database.

Two programmes are managed by the European Commission and four programmes are action programmes or action plans.

The "General objectives" (when available) of the E&H programmes managed by the European Commission are:

- "The Seventh Framework Programme" (**FP7/EC/EU**): "is designed to support a wide range of participants: from universities, through public authorities to small enterprises and researchers in developing countries. […] The section of the CORDIS[10] FP7 service is intended to provide an introduction to the EU's next research Framework Programme tailored to the questions of key groups of potential participants and interested parties – starting with: Private companies, Public organisations, Individual researchers, Researchers and organisations outside the European Union – whether from Candidate Countries, Associated States, developing countries, emerging economies or industrial nations".
- LIFE (**LIFE/EC/EU**): "is the EU's financial instrument supporting environmental and nature conservation projects throughout the EU, as well as in some candidate, acceding and neighbouring countries".

The "General objectives" (when available) of the E&H programmes defined as action programmes or action plans are:

- "The Belgian National Environment and Health Action Plan" (**NEHAP/FPS/Belgium**): "was created in a political context marked by the awareness of the importance of the environment and its connection with health, and following various World Health Organisation initiatives". NEHAP/FPS/Belgium follows the principles of "National Environment and Health Action Plans" initiated by the WHO-Europe ministerial conference on the environment and health, organised in 1994 in Helsinki.
- "Action Programme Environment and Health" (**APUG/UBA/Germany**): The purpose of the APUG/UBA/Germany "is to forge closer links between environmental protection and health protection and thereby provide improved protection of health against environmental influences. A special focus in the Action Programme is health protection for children and adolescents. The key areas of the programme are: 1/ Information – the public is to be provided with more information about environmental health risks and eating habits, 2/ Research - research projects examining the exposure and sensitivity of children and adolescents to pollutants […] or chemical or biological pollution of indoor environments or aspects of noise, radiation and environmental medicine, are in progress to study environmentally induced health risks and ensure even better protection of children, adolescents and adults from

[10] Authoritative point of access to FP7 calls for proposals

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health risks arising from environmental influences, 3/ Children and adolescents – children and adolescents may display particularly sensitive reactions to certain environmental influences. The growing body therefore requires special concern. Measures that protect children also help protect the population as a whole. In this sense the Action Programme supports a policy of sustainable development". The activities of the programme are "mainly realised by the funds of the Environment Research Plan (UFOPLAN) of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety as well as the funds of the other involved federal ministries and authorities."

- "Action Programme Environment and Health NRW" (**APUG NRW/MUNLV/Germany**): the "General objectives" of APUG NRW/MUNLV/Germany are: "1/ improving environmental health protection, 2/ minimising environmental health risks, 3/ explaining the relationship between environmental pollution and health, 4/ raising the awareness of decision-making bodies in politics and administration for the relationship between environment and health, 5/ improving the decision-making competence of the people, 6/ promoting new forms of cooperation and information exchange."
- "National Environment and Health Action Plan III" (**NEHAP III/UVZ/Slovakia**): The main objective is "to reduce risk arising from unfavourable impact from the environment. A team of professionals in the field of public health has laid down following priorities: food safety, soil, air pollution, drinking water quality, healthy working environment and healthy work conditions – establishment of work health services, housing, environmental health services, communication with public and NGOs, public awareness in environmental health (cooperation with public and NGOs, education and promotion towards environmental health), impacts of climate change on health, information systems (for environmental and health indicators). The NEHAP III has implemented four Regional Priority Goals of CEHAPE aimed on children's health: a) reduction of child morbidity and mortality caused by gastrointestinal disorders due to insufficient quality of drinking water, b) prevention and reduction of health outcomes in children caused by accidents and injuries, c) prevention and reduction of respiratory diseases in children caused by unfavourable outdoor and indoor air quality, d) reduction of risks of diseases and invalidity in children caused by exposure to dangerous chemical substances and biological agents".

In general it can be stated that a common "General objective" for all 32 E&H programmes is to better understand the relationship between environmental hazards and risks to human health and thereafter adopt appropriate actions and measures for improved health protection against adverse environmental impacts as well as measures for environmental protection. Knowledge of cause-consequence interactions between the environment and public health is a basic step towards the effective prevention of human health effects and diseases caused by different factors in the natural and built environment. The priorities concern for example: food safety, soil, air pollution, drinking water quality, healthy working environment and healthy work conditions, housing, impacts of climate change on health, exposure to

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electromagnetic, magnetic and electric fields, hazardous chemicals, epidemiological studies, clinical research, medical treatment, genetic resources, infections, burden of disease and health economics, data analysis, information systems, communication with public and public awareness in environmental health and many others. An evaluation of the "Topics of the E&H programmes" is also available in section 4.4.

The "General objectives of the E&H programmes" can be grouped into the following categories:

a) Supporting scientific research

b) Providing support for policy-makers

c) Environment and human health protection

d) Improving cooperation among experts and authorities

e) Information exchange and informing the public

Descriptions of the "General objectives of the E&H programmes" which were entered in the ERA-ENVHEALTH research database are provided in the following section. This description is strictly based on the quotations available in the ERA-ENVHEALTH research database. This does not exclude the possibility of other objectives for the E&H programmes, which are not stated in the database. It is more than likely that the objectives of most of E&H programmes also support scientific research as well as policy-making and/or environmental and health protection and/or cooperation and/or information exchange.

a) Supporting of scientific research

Promoting and supporting of scientific research is clearly indicated as a "General objective" for 23 of the 32 programmes. For nine programmes this "General objective" relates to "Mostly environment" research, for ten programmes to "Environment & health" research, for two programmes to "Mostly health" research and two programmes support "Scientific research in general".

"Mostly environment" issues are subjects of the "French Inter-organism National Research Programme for Better Air Quality at Local and Regional Scale" (**PRIMEQUAL/ADEME/ France**). In particular this programme aims to support research relating to "indoor and outdoor air quality". The "BMBF – Health Research – Research for People" programme (**BMBF/fona/BMBF/Germany**) supports research for a "better understanding of the complex interactions between human interventions and natural processes and the global dimension of environment and development" based on the sustainable development principles. Its research for sustainability is aimed at: "1/ Society – developing strategies for social action with the goal of meeting fundamental needs while minimising the risks for the long-term stability of nature and society, 2/ Economy – gearing globalised value chains and production systems to sustainability and at the same time securing the long-term competitiveness of the German economy, 3/ Regions – shaping regional development with the goal of improving the quality of human life and at the same time stabilising the natural, social and economic bases of this quality of life on a long-term basis, and 4/ Resources – managing natural resources

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with the goal of maintaining their functions on a long-term basis and at the same time preserving and fostering their regeneration capacity as much as possible". Another programme, the "Environment Specimen Bank" (**UPB/UBA/Germany**) is a "monitoring instrument of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The UPB is managed by the Federal Environment Agency (UBA) and operated by contracted research institutes and university groups with special competencies in the particular fields (e.g., sampling of human, biological, and abiotic material, trace analysis of pollutants, cryobank operation)". Within the UPB the "Human specimens are taken annually from students at four German universities and are archived as individual samples. Environmental specimens are also taken annually from representative marine, fresh water and terrestrial ecosystems. […] After two decades of operation the UPB provides now a continuous historical record of the state of the environment in Germany in this period. It allows the retrospective monitoring of pollutants to identify temporal trends and spatial load differences". Application-orientated environmental research projects are also funded by the "Baden-Württemberg Programme Livelihood Environment and its Protection" (**BWPLUS/UM/Germany**). The "General objectives" of the "Science Technology & Innovation for the Environment" programme (**STRIVE/EPA/Ireland**) is "to protect and improve the natural environment by addressing key environmental management issues through the provision of world-class scientific knowledge generated through a vibrant, competitive programme of research supported and co-ordinated by the EPA". The "Swedish Environmental Research Appropriation" programme **(Swedish Environmental Research Appropriation/Swedish EPA/Sweden)** funds "research supporting the operations of the Swedish EPA and accompanying efforts to achieve the environmental quality objectives". The aim of the "Emissions Research Programme" (**EMFO/Swedish EPA/Sweden**) "is to give industry and authorities access to the knowledge required to develop vehicles and vehicle components in a sustainable direction. EMFO covers emissions that arise when vehicles use public roads as well as emissions from tractors and other heavy working vehicles. Emissions in this context refer to both air pollutants and noise". The "Science for Sustainable Development – Biodiversity" programme (**SSD/BD/BelSPO/Belgium**) and the "Science for Sustainable Development – Atmosphere, terrestrial and marine ecosystems" programme (**SSD/AT-TE/BelSPO/Belgium**) which is part of the "Science for Sustainable Development" programme, promote "Scientific research in general".

"Environment & Health" issues are covered in the call for projects of the "Contaminants, Ecosystems, Health" programme (**CES/ANR/France**). This call aims to "contribute to the production of scientific knowledge through basic and finalised research on the links between the environment and human and animal health". The objectives of another "Call for projects FRB" (**FRB/FRB/France**) are mainly: "1/ to allow to test or consolidate novel 'risky' projects and 2/ to prepare the teams to the setting-up of projects of a greater scale". The projects "can concern biological disciplines as well as human and social sciences and can deal with domestic or wild, marine or terrestrial, current or past biodiversity. Research themes related to genetic resources are eligible". The "National Environmental and Occupational Health Research Programme" (**PNR EST/AFSSET/France**) aims to "promote excellent research in environmental and occupational health. The call for proposals is launched every year and

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aims to lead scientific communities to develop new methods and tools in all stages of health risk assessments on subjects which need decisions to be taken by risk managers and policy-makers. […] The programme has four axes: 1/ characterisation of hazards and exposure estimation, 2/ linking exposure to health effects, 3/ modelling and health risk assessment, 4/ study of the link between risk and society". The "Action Programme Environment and Health" (**APUG/UBA/Germany**) supports "research projects examining the exposure and sensitivity of children and adolescents to pollutants, for example, or chemical or biological pollution of indoor environments or aspects of noise, radiation and environmental medicine, are in progress to study environmentally induced health risks and ensure even better protection of children, adolescents and adults from health risks arising from environmental influences". Concerning the E&H programme of "Physical Agents Service" (**AGF Unit/ISPRA/Italy**), the "General objectives" are: "1/ to promote research activities and technical scientific experimentation with regard to the electromagnetic, magnetic and electric fields exposure, and also 2/ to promote long term programme about epidemiological study and experimental research about cancer insurgence in order to study in depth the dangers related to exposure of low and high frequency electromagnetic fields". Support for environmental and public health research is also provided by the "Environmental and public health research" programme (**EPHR/MoH SR/Slovakia**). "Increasing scientific knowledge regarding environment and human health issues" is also one of the "General objectives" for the "Environment and Human Health programme (NERC)" (**EHH/NERC/UK**). The "General objective" of the "Environment and Health Interdepartmental Project" (**PIAS/CNR/Italy**) is the "promotion of an integrated research of the CNR Institutes on Environment and on Health, in particular to develop: 1/ knowledge on linkages among pollution and health effects, 2/ instruments and methods to examine interaction between environment and health; 3/ instruments and methods for risk management and decision-making in complex situations. The objective is to be achieved through: Call for project ideas and proposal, […] Organisation of working groups, […] Support to: project identification, funding identification, project drafting, and identification of foreign partners, Communication and dissemination of results". Again, within the "Environment & Health" issues, the "Science for Sustainable Development – Health and Environment" programme (**SSD/HE/BelSPO/ Belgium**) and the "Science for Sustainable Development –Agrofood" programme (**SSD/AT-TE/BelSPO/Belgium**) which is part of the "Science for Sustainable Development" programme, promote "Scientific research in general". The research covered by SSD/HE relating to E&H issues is "focused on two axes and is limited to the comprehension of the risks, their emergences, their cumulative effects on health, and the development of the evaluating methods, management, regulation, and reduction of risk. It is 1/ risks related to the exposure to chemical, physical and biological risk factors and 2/ workplace health risks (including organisational risks at work)".

"Mostly health" issues are subjects of the "BMBF – Health Research – Research for People" programme (**BMBF/HR/BMBF/Germany**). The aim of health research funded by this programme is "to provide improved medical treatment in order to enhance people's quality of life. […] The prime objectives of this government programme are: "1/ to fathom the causes of diseases and develop effective methods of treatment, 2/ to improve prevention and prophylaxis, 3/ to improve the transfer of research results to the health system, 4/ to

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strengthen the research base and 5/ to contribute towards ensuring an efficient and competent health system. […] The BMBF's funding activities will attach priority to clinical research. There are also great hopes for fighting diseases using genome research. The focus 'Practical Research', which examines how patients are cared for under everyday conditions, has been introduced to help patients to benefit better from research. Medical technology is a further new key area. The new 'Action Programme: Medical Technology' pools the BMBF's activities in three broad fields of action. The Medical Technology Innovation Competition is part of these activities". The research strategy emphasised by the "Health Protection Agency Research Programme" (**HPA R&D/HPA/UK**) is "focused on five generic cross-cutting science areas: 1/ Advanced diagnostics, detection and assessment of exposure and risk, 2/ Optimal data capture, analysis, surveillance, modelling and prediction, 3/ Interventions vaccines, behaviour change and technical actions, 4/ Burden of disease and health economics and policy analysis, 5/ Chemical, biological, radiological and nuclear (CBRN) threats. These will be covered by 14 science themes: 1/ Chemical, biological, radiological and nuclear threats, 2/ Antimicrobial resistance, 3/ Healthcare acquired infections, 4/ Gastrointestinal infections, 5/ Blood-borne infections, 6/ Sexually transmitted diseases, 7/ Vaccine development, 8/ Respiratory infections, 9/ Hazardous chemicals and poisons, 10/ Radiation hazards, 11/ Diagnostics and detection, 12/ Burden of disease and health economics, 13/ Behavioural science, 14/ Surveillance development and data analysis".

Support for "Scientific research in general" is provided by the "Science for Sustainable Development" programme **(SSD/BelSPO/Belgium**). This programmes deals with different areas of research like a Health and Environment (SSD/HE), Agrofood (SSD/AF), Biodiversity (SSD/BD) and Atmosphere, terrestrial and marine ecosystems (SSD/AT-TE) described above. Its "General objectives" concerning research are mainly defined as the following: "1/ to preserve and develop the scientific potential in various strategically important areas, with the objective of reducing scientific uncertainties and anticipating future needs for knowledge, 2/ to contribute to developing scientific knowledge and instruments (models, concepts, indicators, etc.) aiming to the analysis of processes, the study of impacts, the development, follow-up, and evaluation of (existing and/or future) policy measures, and 3/ to encourage interdisciplinary research so as to offer support to decision-making of the issues concerned". "Scientific research in general" is also supported through the "Deutsche Bundesstiftung Umwelt – Scholarship" (**DBU Scholarship/DBU/Germany**): which offers two different scholarship programmes: 1/ Doctoral Scholarship Programme, 2/ International Scholarship Programme" and through the "Polish Ministry of Science and Higher Education – Nofer Institute of Occupational Medicine statutory allocation" (**MNi Sz- IMP/NIOM/Poland**).

b) Providing support for policy-makers

Providing support for policy-makers is clearly indicated as a "General objective" for 12 of the 32 programmes. This "General objective" for four programmes relates to "Mostly environment" issues, for eight programmes it relates to "Environment & health" issues. For none of the programmes it relates to "Mostly health" issues or to supporting "Scientific research in general" (except for sub-programmes of the SSD programmes/BelSPO/Belgium).

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With respect to **"Mostly environment"** issues, it is the case for the **SSD-BD/BelSPO/ Belgium** and **SSD-AT-TE/BelSPO/Belgium,** two sub-programmes of the **SSD/BelSPO/ Belgium**. Its two main objectives are: 1/ "to offer the authorities of the country the scientific support required for the preparation, implementation, and follow-up of a supranational, federal, regional, or local policy in and between these areas" as well as 2/ to offer them "scientific support required for the vertical and horizontal policy integration oriented towards a sustainable development". The **PRIMEQUAL/ADEME/France** "provides decision-makers and environmental managers with the scientific bases and necessary tools to monitor and improve indoor and outdoor air quality". Also the research results supported by the **Swedish Environmental Research Appropriation/Swedish EPA/Sweden** "will benefit the need for evidence based knowledge at central, regional and local authorities".

With respect to **"Environment & health"** issues, it is the case for the **SSD-HE/BelSPO/ Belgium** and **SSD-AF/BelSPO/Belgium,** two other sub-programmes of the **SSD/BelSPO/ Belgium**. The objective of the **PNR EST/AFSSET/France**) also "expects the production of knowledge directly useful for producing prevention policies and which will be useful for their assessment". One of the "strategic objectives indicated for the "Nord Pas de Calais RECHERCHE EN SANTÉ – ENVIRONNEMENT 2009" programme (**RSE 2009 (NPdC)/ Nord-Pas Calais/France**) is "to identify preventive actions, recommendations and to structure and qualify the networks of actors invested in the field of prevention and public decision-making". Two of the "General objectives" of the "Action Programme Environment and Health NRW" (**APUG NRW/MUNLV/Germany**) are: 1/"raising the awareness of decision-making bodies in politics and administration for the relationship between environment and health" and 2/ improving the decision-making competence of the people in NRW". The expertise relating to the "Relationship between environment and public health" and "Environmental emergencies" performed by RIVM/The Netherlands under the "Policy support with regard to the living space and environment" programme (**BMR/VROM/The Netherlands**) "is essential in advising the Dutch government on the risks to public health and in underpinning appropriate actions and measures to counter adverse environmental impacts". Supporting the decision-making authorities is indicated also in the case of the **E&H Unit/ISPRA/Italy**) and **EHH/NERC/UK**.

c) Environment and human health protection

Environment and human health protection as a "General objective" is clearly indicated for seven of 32 programmes. This "General objectives" for one programme relates to "Mostly environment" issues, for five programmes to "Environment & health" issues and for one programme to "Mostly health" issues.

With respect to **"Mostly environment"** issues, the protection and improvement of the environment is defined as the objective for the **STRIVE/EPA/Ireland**.

With respect to **"Environment & health"** issues, it is the objective for the following action programmes/plans: **APUG/UBA/Germany, APUG NRW/MUNLV/Germany**, and **NEHAP III/UVZ/Slovakia**. The other programmes which indicated environment and health protection

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as one of their "General objectives" are the **RSE 2009/Nord-Pas Calais/France** (via identifying preventive actions) and the **E&H Unit/ISPRA/Italy.**

With respect to **"Mostly health"** issues, it is one of the "prime objectives" of the **BMBF/HR/BMBF/Germany** which aims to "improve prevention and prophylaxis".

d) Improving cooperation among experts and authorities

Improving cooperation among experts and authorities is clearly indicated as a "General objective" for seven of the 32 programmes. This "General objectives" for two programmes relates to "Mostly environment" issues and for five programmes to "Environment & health" issues. None of the programmes link it to "Mostly health" issues.

One of the common objectives of the four sub-programmes of the **SSD/BelSPO/Belgium** is "to promote dialogue and information exchange between scientists, decision-makers, and other involved actors". "Promoting new forms of cooperation and information exchange" is one of the "General objectives" of the **APUG NRW/MUNLV/Germany**. Objectives and outputs of the **EHH/NERC/UK** have the aim of "developing a community of researchers who can undertake multi- and inter-disciplinary work" and "to increase in scientific knowledge regarding environment and human health issues". The **PIAS/CNR/Italy** promotes cooperation via the "organisation of working groups to develop contacts among Institutes working on a specific topic".

e) Information exchange and informing the public

Information exchange or informing the public is clearly indicated as a "General objective" for two of the 32 programmes. This "General objective" for these two programmes relates to "Environment & health" issues: **APUG/UBA/Germany** (informing the public) and **APUG NRW/MUNLV/Germany** (information exchange).

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4.3 FUNDING OF E&H PROGRAMMES (Q 6-8)

Type of funding sources for the E&H programmes

Data on the "Type of funding sources for the E&H programmes" is not available for 17 programmes. 26 of the programmes evaluated within the ERA-ENVHEALTH project are funded by "National/Federal" sources. Five of the programmes are funded by "Regional/Subnational" funding sources and one programme is funded through "European" sources. No programmes are funded by "International" sources or through "Donations by individuals".

Total budget of the E&H programmes in Euros for the 2006-2008 period

The information about the budget of the programmes has to be considered as only approximate because there was no common exact methodology for the calculation of total or yearly budgets among the programme managing organisations (developing such methodology was not the objective of this overview).

Data on programme budget is available for 24 out of the 49 programmes and only these 24 programmes have been used for the statistics presented in this section.

Most of the programmes have not ended yet (46 out of 49 programmes, by the beginning of September 2009) and their total or yearly budget can be only assumed. Also, there are cases where it is not possible to define which part of the particular programme is used only for funding research because the budgets of some programmes cannot clearly distinguish between research funding and other activities related to the whole programme implementation (e.g. NEHAP III/UVZ/Slovakia).

Therefore, the funding results presented in this section can be distorted and their value is only illustrative and serves only for the purpose of this Final Overview, to at least make a simple comparison of budgets among the different E&H programmes.

The results of this simple calculation show that the total financial sources invested in the years 2006-2008 for the 24 evaluated E&H programmes represent 1.604 M€. During this period approximately 407 projects were funded (data available only for 12 out of the 24 evaluated programmes). 2.162 M€ are planned to be invested from 2009 until the end of 2013. Yearly investments in E&H research programmes range from 0.1 M€ to 160 M€ – that means 24 M€ on average annually.

Number of projects funded through the E&H programmes from 2006 to date

The "Number of projects funded through the E&H programmes since 2006 to date" (to the end of 2008) is missing for half of the 24 evaluated programmes. So the number of projects "407" presented in the Table 3 is underestimated.

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Table 3: Yearly budgets of the E&H programmes and number of projects funded from 2006 to date

	Programme name	Programme acronym	Approx. yearly budget (M€)	Frequency of the programme	Number of projects (from 2006 to 2008)	Country
1.	National Environment and Health Action Plan	NEHAP	0.1	every 5 years	7	Belgium
2.	Science for Sustainable Development – Biodiversity	SSD/BD	0.7	every 5 years	NA[11]	Belgium
3.	Science for Sustainable Development – Atmosphere, terrestrial and marine ecosystems	SSD/AT-TE	1.0	every 5 years	NA	Belgium
4.	Science for Sustainable Development-Agrofood	SSD/AF	0.6	every 5 years	7	Belgium
5.	Science for Sustainable Development-Health and Environment	SSD/HE	0.7	every 5 years	6	Belgium
6.	Appel à projets FRB	FRB	3.0	NA	NA	France
7.	French National Research Programme on Endocrine Disruptors	PNRPE	0.5	biannual	22	France
8.	National Environmental and Occupational Health Research Programme	PNR EST	2.0	annual	104	France
9.	Nord Pas de Calais RECHERCHE EN SANTÉ – ENVIRONNEMENT 2009	RSE 2009 (NPdC)	158.4	annual	NA	France
10.	Action Programme Environment and Health / Environment Research Plan	APUG/ UFOPLAN	1.2	annual	40	Germany
11.	BMBF/Health Research – Research for People	BMBF/HR	160.0	NA	NA	Germany
12.	BMBF/Research for Sustainability	BMBF/ona	160.0	NA	NA	Germany
13.	Deutsche Bundesstiftung Umwelt – Scholarship	DBU Scholar-ship	3.0	annual	100	Germany
14.	Environment Specimen Bank	UPB	4.3	NA	15	Germany

[11] NA – Information was not available at the time of entry into the database.

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	Programme name	**Programme acronym**	**Approx. yearly budget (M€)**	**Frequency of the programme**	**Number of projects (from 2006 to 2008)**	**Country**
15.	Science Technology & Innovation for the Environment	STRIVE	14.4	annual	NA	Ireland
16.	Environment and Health Interdepartmental Project	PIAS CNR	0.1	biannual	6	Italy
17.	Environment and Health Unit	E&H Unit	0.2	NA	7	Italy
18.	Physical Agents Service	AGF Unit	0.2	biannual	6	Italy
19.	Polish Ministry of Science and Higher Education – Nofer Institute of Occupational Medicine statutory donation	MNi Sz – IMP	0.7	annual	87	Poland
20.	National Environment and Health Action Plan III	NEHAP III	36.4	every 5 years	NA	Slovakia
21.	Swedish Environmental Research Appropriation	none defined	8.3	annual	NA	Sweden
22.	The Emissions Research Programme	EMFO	2.4	NA	NA	Sweden
23.	Policy support with regard to the living space and environment	BMR	4.5	annual	NA	The Netherlands
24.	Environment and Human Health (NERC)	EHH (NERC)	3.0	annual	NA	United Kingdom
Total			**565.7**		**407**	**10**

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4.4 TOPICS OF THE E&H PROGRAMMES (Q 9)

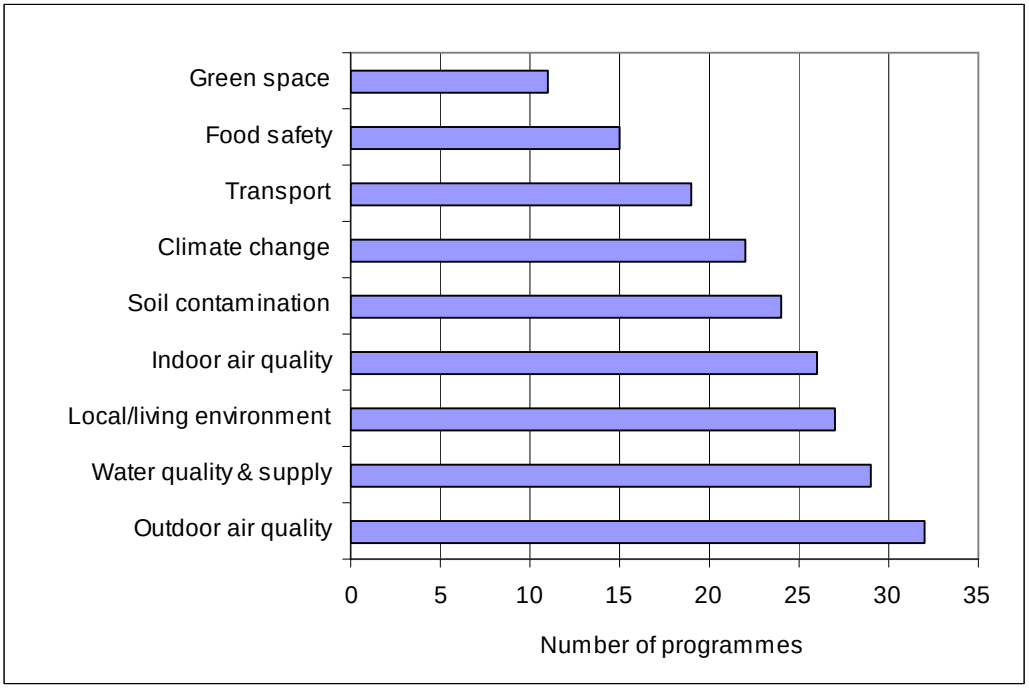
Most of the E&H programmes are built on a very wide scope and create conditions for funding and supporting research on very different problems and issues, which would result in recommendations and adoption of steps leading to improvement of the public health status.

4.4.1. Topics of all programmes entered to the database

Themes related to human health aspects

The 49 programmes included in the Final Overview show that, from the point of view of "Themes related to human health aspects", most attention is devoted to assessing the effects of "Outdoor air quality" (32 programmes), "Water quality & supply" (29 programmes), "Local/living environment" (27 programmes) and "Indoor air quality" (26 programmes). A rather high contribution is recorded also for "Soil contamination" (24 programmes) and "Climate change" (22 programmes). The frequency of other topics is noticed in the following order: "Transport" (19 programmes), "Food safety" (15 programmes) and "Green space" (11 programmes) (see Figure 4).

Figure 4: Number of E&H programmes focusing on selected "Themes related to human health aspects"



Agents

From the "Agents" point of view most of the programmes deal with "Other chemical agents" (32 programmes) and "Biological agents & Microorganisms" (32 programmes), followed by "Particulate matter" (27 programmes) and "Pesticides & biocides" (27 programmes), "Noise"

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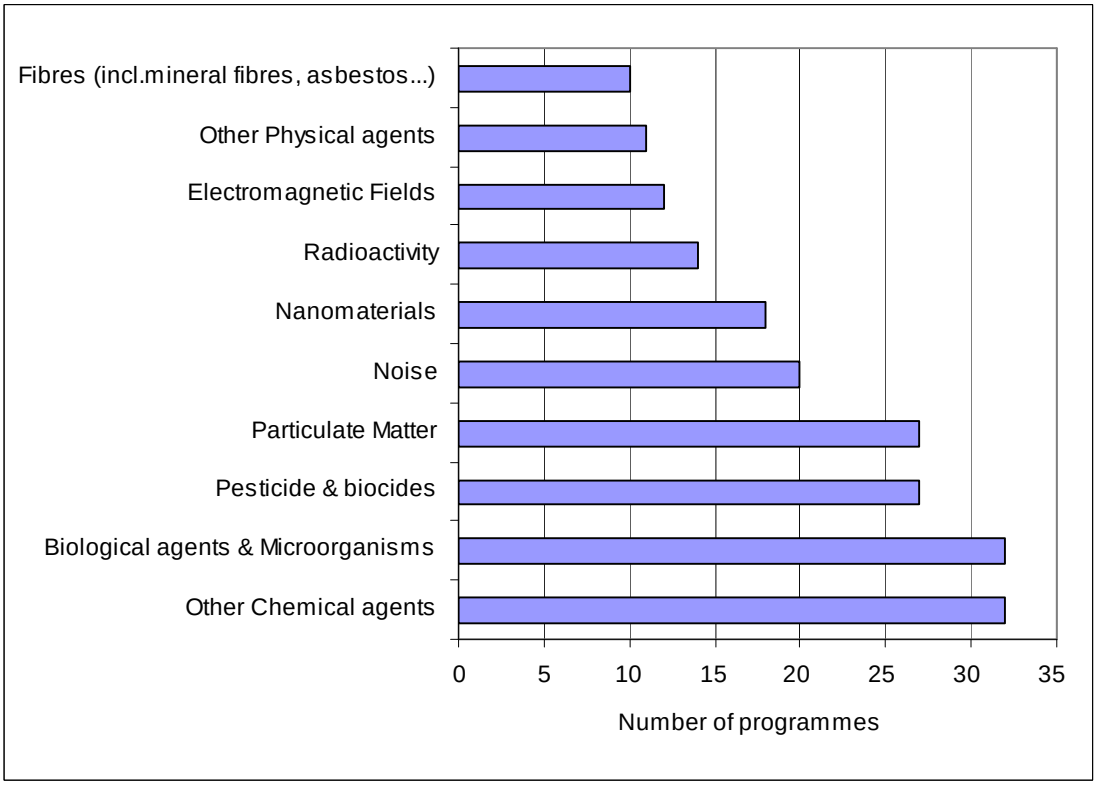
(20 programmes) and "Nanomaterials" (18 programmes). To a lesser extent, the programmes focus on "Radioactivity", "Electromagnetic fields", "Other physical agents" and "Fibres" (see Figure 5). Others agents such as "Human pharmaceuticals (active ingredients)", "Emerging pollutants", "Pathogens" and "Flooding" are stated too.

Figure 5: Number of E&H programmes focusing on selected "Agents"



Human health effects

With regard to "Human health effects", the E&H programmes mostly deal with "Respiratory diseases" (27 programmes), "Cardiovascular diseases" (26 programmes), "Asthma" (24 programmes), and "Allergies" (24 programmes), followed by "Cancer" (21 programmes), "Endocrine disruption" (18 programmes), "Reprotoxic & developmental disruption" (17 programmes), "Infectious diseases" (17 programmes), "Well-being/(risk perception) (15 programmes)", "Emerging diseases" (15 programmes), "Sleeping disorders" (14 programmes), "Vector borne diseases" (13 programmes) and "Hearing loss" (13 programmes). Finally, "Epigenomic changes" (9 programmes) and "Ocular disorders" (9 programmes) are stated (see Figure 6). Also, a new topic of human health effects is mentioned: "Sensitisation against indoor mould fungi effects" (1 programme).

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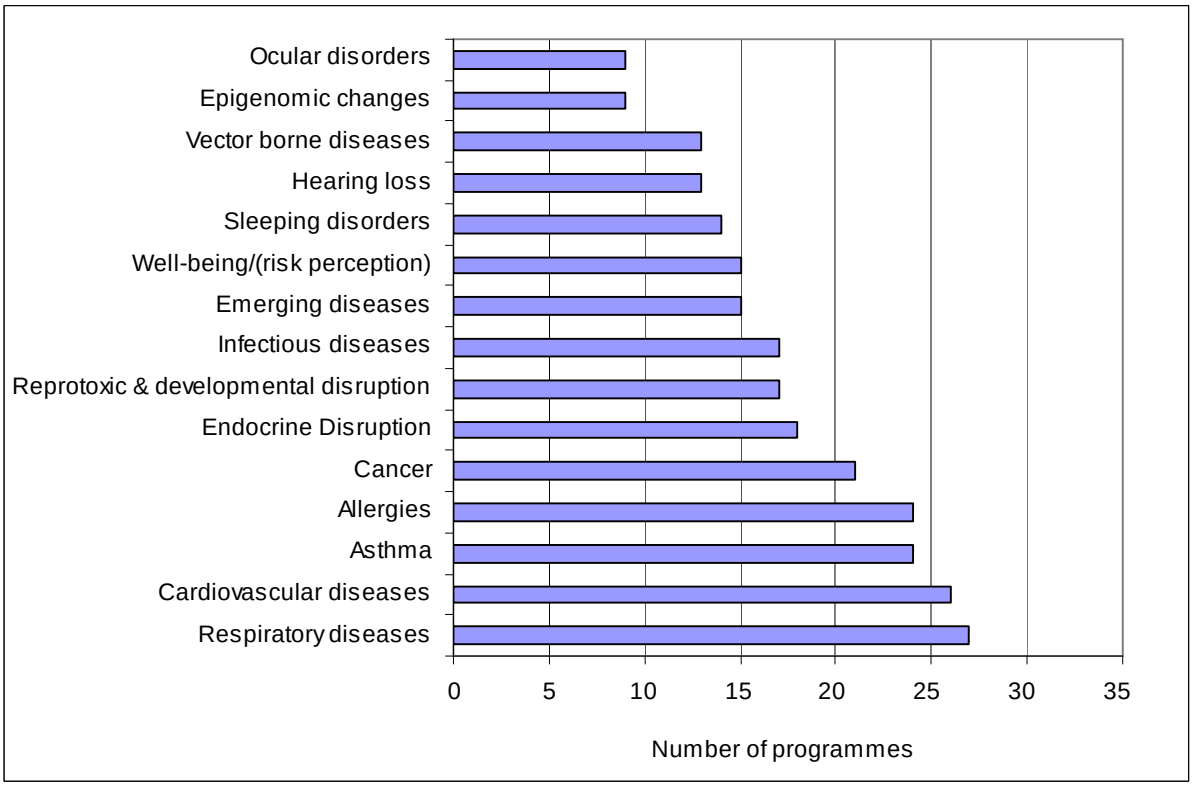
Figure 6: Number of E&H programmes focusing on selected "Human health effects"



Methodologies

The most commonly used "Methodologies" to assess impacts of the environment on human health are "Exposure assessment" (33 programmes), "Health impact assessment" (30 programmes), "Epidemiological studies" (27 programmes) and "Modelling" (25 programmes), followed by "Integrated risk assessments" (21 programmes), "Human biomonitoring" (20 programmes), "Risk communication" (19 programmes) and "Effect monitoring" (18 programmes). Less frequent methodologies used in E&H programmes are "Standardisation/Harmonisation" (14 programmes), "Quality assurance & management" (13 programmes), "Biomedical technology" (11 programmes) and "Cost/benefit analysis in E&H" (11 programmes) (see Figure 7). "Storage of specimens and retrospective monitoring", as well as "Social-history" are also recorded as "Other methodologies" in the questionnaire.

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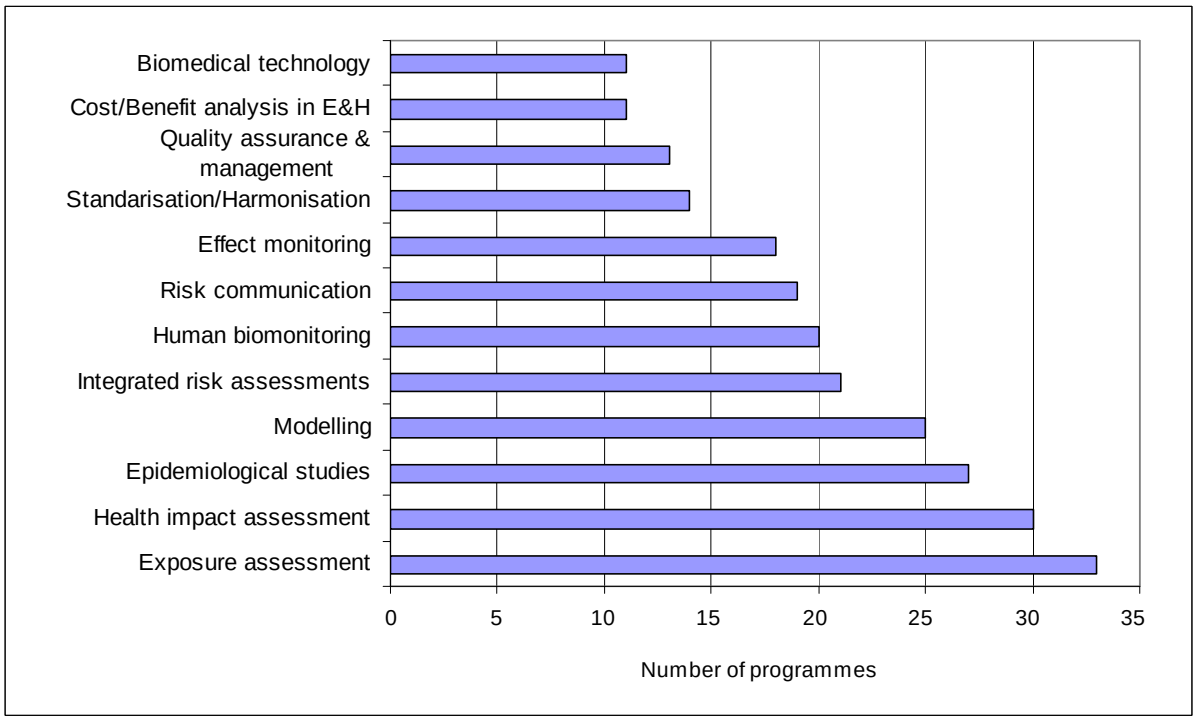
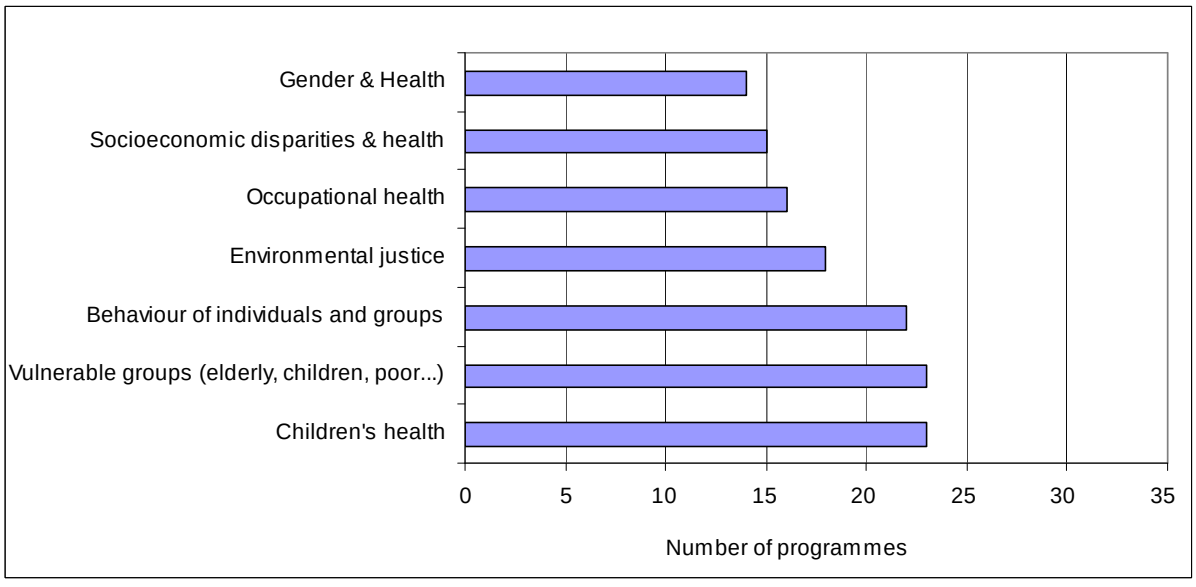
Figure 7: Number of E&H programmes focusing on selected "Methodologies"



Social aspects of E&H

The "Social aspects of E&H" in the E&H programmes are most often related to "Children's health" (23 programmes), "Vulnerable groups" (23 programmes) and "Behaviour of individuals and groups" (22 programmes), followed by "Environmental justice" (18 programmes), "Occupational health" (16 programmes), "Socioeconomic disparities & health" (15 programmes) and "Gender & health" (14 programmes) (see Figure 8). "Public policy-making", "Agenda setting" and the "Socio-history" are also recorded as "Other social aspects" in the questionnaire.

Figure 8: Number of E&H programmes focusing on selected "Social aspects of E&H"



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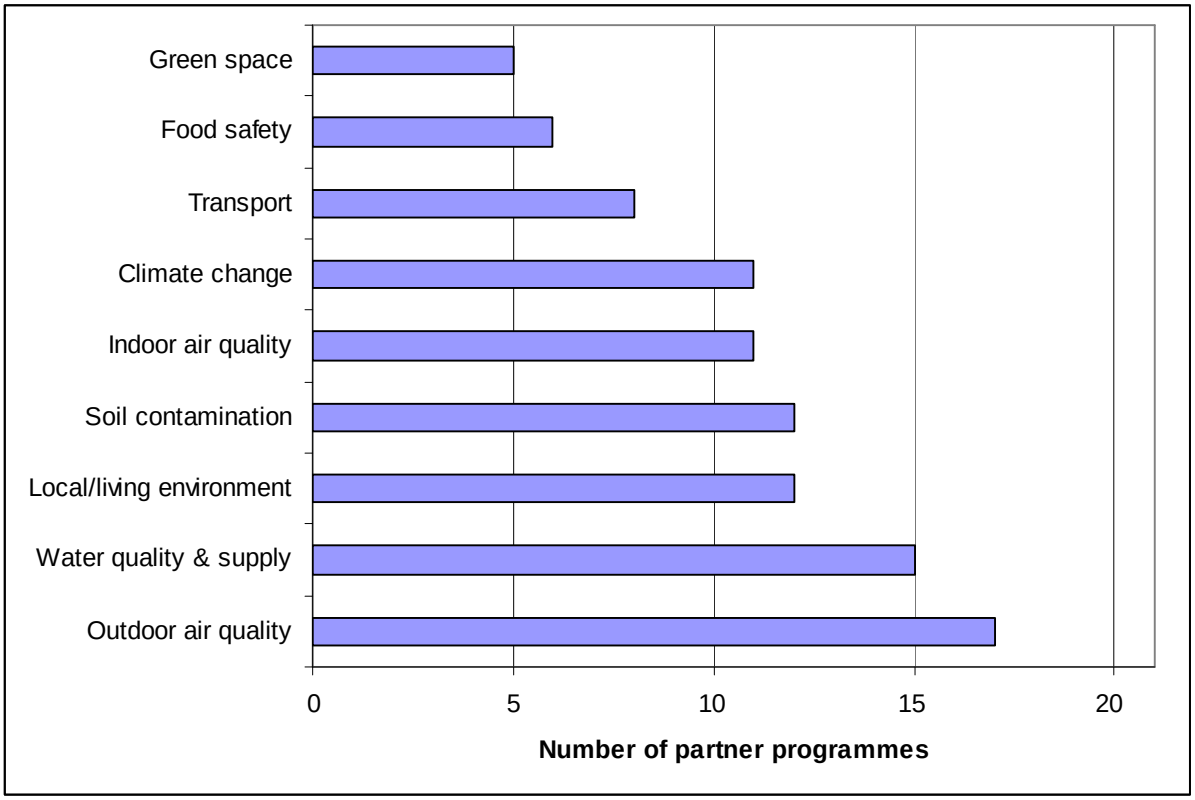
4.4.2 Topics of the programmes owned or managed by the 16 ERA-ENVHEALTH partners

As future cooperation between the ERA-ENVHEALTH partners and their relevant programmes is one of the main goals of this project, a closer look was taken at the E&H programmes owned by the consortium partners.

Themes related to human health aspects

The 21 programmes managed by the ERA-ENVHEALTH partners, show that, from the point of view of the "Themes related to human health aspects", most attention is paid to assessing the effects of "Outdoor air quality" (17 programmes) and "Water quality & supply" (15 programmes). A rather high contribution is recorded also for "Soil contamination" (12 programmes), "Local/living environment" (12 programmes), "Climate change" (11 programmes) and "Indoor air quality" (11 programmes). The frequency of other topics is noticed in the following order: "Transport" (8 programmes), "Food safety" (6 programmes) and "Green space" (5 programmes) (see Figure 9).

Figure 9: Number of the ERA-ENVHEALTH partner E&H programmes focusing on selected "Themes related to human health aspects"



Compared to the results for the entirety of the programmes entered into the database (see Figure 4), there are only minor differences, e.g. a slightly bigger fraction deals with the first three subjects "Outdoor air quality", "Water quality & supply" and "Soil contamination". In contrast, partner programmes seem to pay a little less attention to "Indoor air quality".

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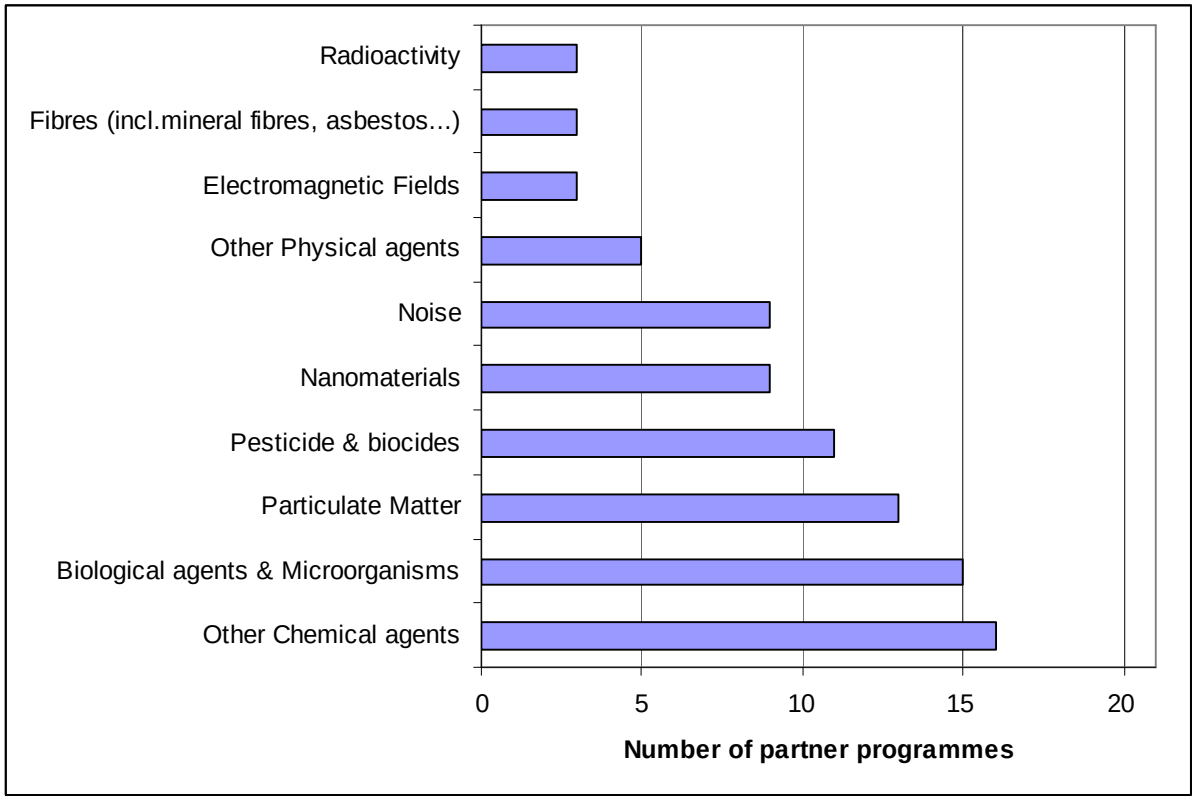
Agents

From the “Agents” point of view, most of the programmes cover “Other chemical agents” (16 programmes), followed by “Biological agents & Microorganisms“ (15 programmes), ”Particulate matter” (13 programmes), “Pesticides & biocides” (11 programmes), “Noise” (9 programmes) and “Nanomaterials” (9 programmes). To a lesser extent, the programmes focus on “Other physical agents” (5 programmes), “Radioactivity”, “Electromagnetic fields”, and “Fibres” (3 programmes each) (see Figure 10).

Figure 10: Number of the ERA-ENVHEALTH partner E&H programmes focusing on selected “Agents”



Compared to the results for the entirety of the programmes entered in the database (see Figure 5), there are only minor differences, e.g. a slightly bigger fraction deals with the first three subjects “Other chemical agents”, “Biological agents & Microorganisms” and “Particulate matter” as well as with “Other physical agents”. In contrast, partner programmes seem to deal a little less with the last three themes “Radioactivity”, “Electromagnetic fields”, and “Fibres”.

Human health effects

With regard to “Human health effects”, the E&H programmes mostly look at “Respiratory diseases” (16 programmes), “Asthma” (15 programmes), “Allergies” (13 programmes) and “Cardiovascular diseases” (12 programmes), followed by “Cancer” (9 programmes), “Endocrine disruption” (9 programmes), “Reprotoxic & developmental disruption” (7 programmes), “Emerging diseases” (7 programmes), “Infectious diseases” (6 programmes),

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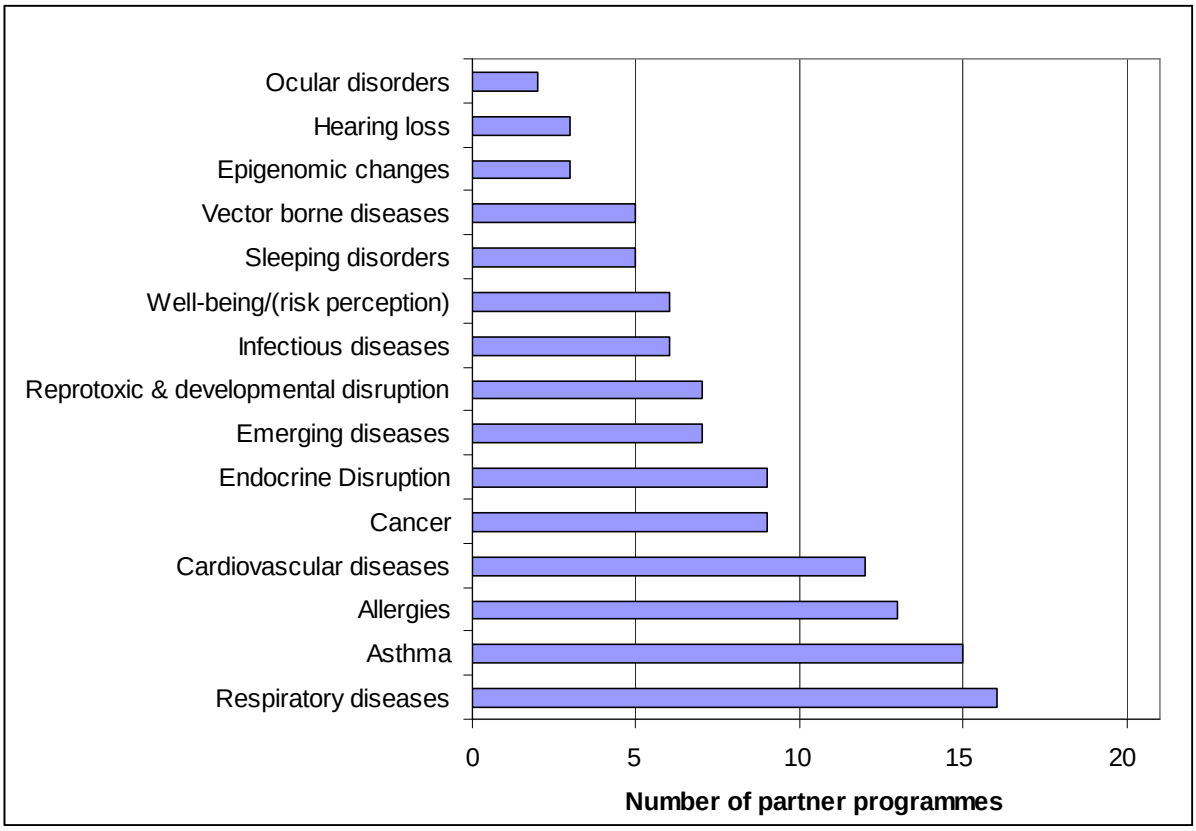
"Well-being / (risk perception)" (6 programmes), "Sleeping disorders" (5 programmes) and "Vector borne diseases" (5 programmes). Finally "Hearing loss" (3 programmes), "Epigenomic changes" (3 programmes) and "Ocular disorders" (2 programmes) are stated (see Figure 11).

Figure 11: Number of the ERA-ENVHEALTH partner E&H programmes focusing on selected "Human health effects"



Compared to the results of the entirety for the programmes entered in the database (see Figure 6), the differences are more distinct than for the above themes. The fraction of the partner programmes covering the first three subjects "Respiratory diseases", "Asthma" and "Allergies" is bigger than that for all programmes in the database. As a result, "Cardiovascular diseases" move from rank two (all) to rank four (ERA-ENVHEALTH partner programmes) even though the partner programmes do not deal less with this issue. Similarly to the other themes, ERA-ENVHEALTH partner programmes seem to deal a little less with the subjects at the bottom end of the ranking.

Methodologies

The most commonly used "Methodologies" to assess impacts of the environment on human health are "Exposure assessment" (18 programmes), "Health impact assessment" (17 programmes), and "Modelling" (16 programmes), followed by "Epidemiological studies" (13 programmes), "Integrated risk assessments" (13 programmes), "Risk communication" (11 programmes), "Effect monitoring" (10 programmes) and "Human biomonitoring" (10 programmes). Less frequent methodologies used in E&H programmes are "Quality

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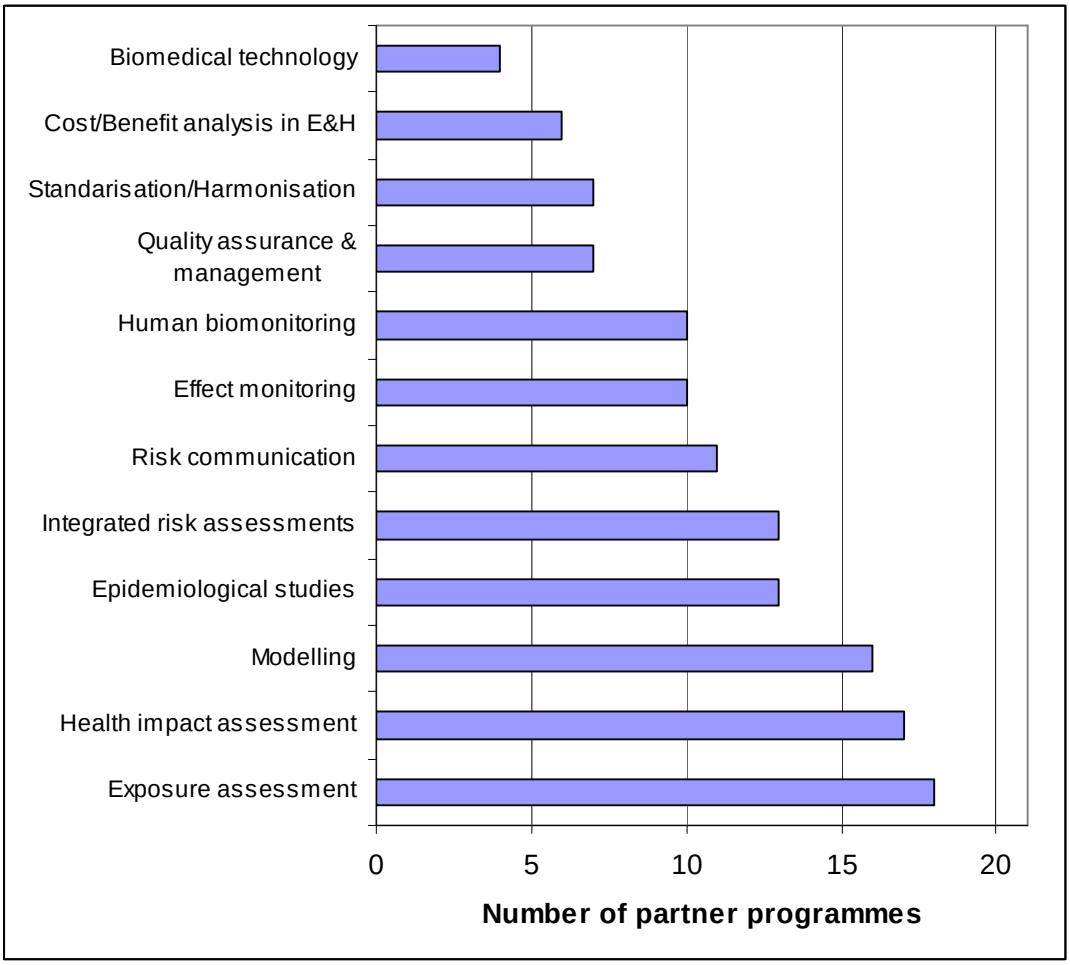
assurance & management" (7 programmes), "Standardisation/Harmonisation" (7 programmes), "Cost/benefit analysis in E&H" (6 programmes) and "Biomedical technology" (4 programmes) (see Figure 12).

Figure 12: Number of the ERA-ENVHEALTH partner E&H programmes focusing on selected "Methodologies"



Compared to the results for the entirety of the programmes entered in the database (see Figure 7), the partner programmes indicated to a higher extent that they deal with almost all the selected research methodologies. The only exception is "Biomedical technology". The ranking itself is approximately the same.

Social aspects of E&H

As for the "Social aspects of E&H" in the E&H programmes, they are most often related to "Vulnerable groups" (13 programmes), "Children's health" (12 programmes) and "Behaviour of individuals and groups" (11 programmes), followed by "Environmental justice" (9 programmes), "Socioeconomic disparities & health" (8 programmes), "Occupational health" (5 programmes) and "Gender & health" (5 programmes) (see Figure 13).

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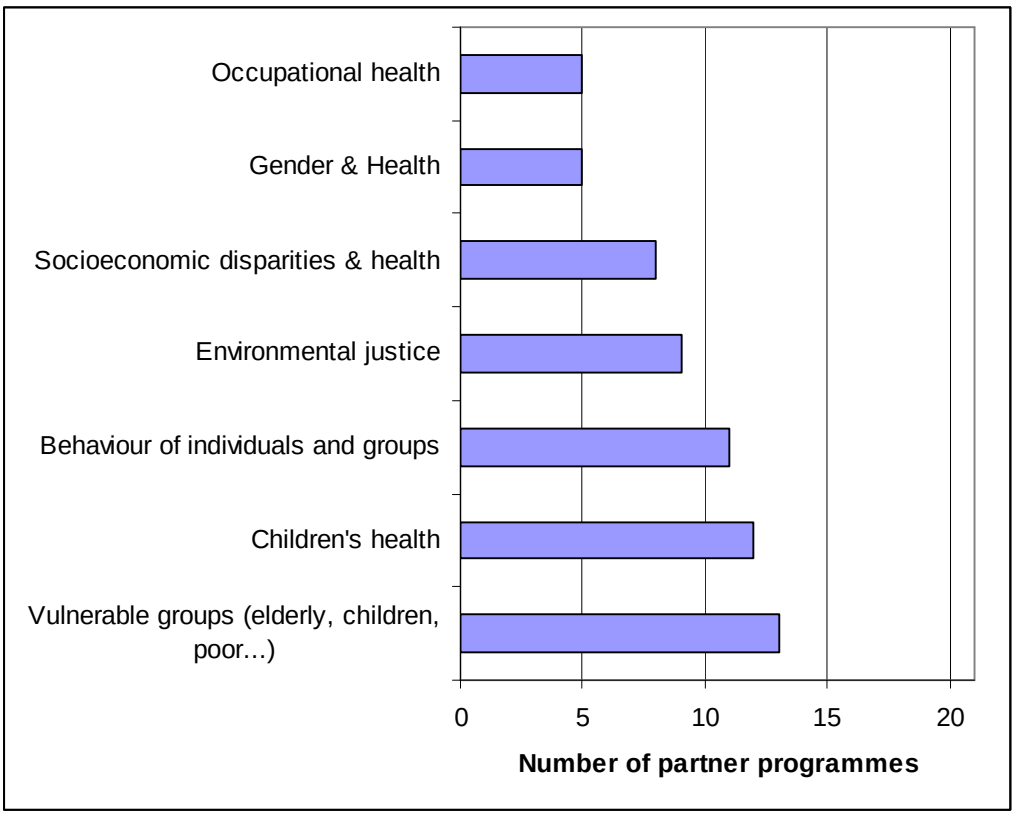
Figure 13: Number of the ERA-ENVHEALTH partner E&H programmes focusing on selected "Social aspects of E&H"



Compared to the results for the entirety of the programmes entered into the database (see Figure 8), there are some little differences. A bigger fraction of the partner programmes deals with the first five subjects. On the contrary, partner programmes seem to deal a little less with the last two subjects "Occupational health" and "Gender & health".

With regards to future international cooperation between ERA-ENVHEALTH partners and their relevant programmes, it is not only relevant how many programmes cover a certain subject, but also from how many partners and countries these programmes come from. So, the four initial themes discussed for the first call and initially selected for the ERA-ENVHEALTH Expert Database were chosen for closer inspection ("Indoor air quality", "Climate change and Health", "Cost/Benefit analysis" and "Children's health"). In the following pie charts, all partner organisations situated in the same country are of the same colour, even if they manage different programmes independently. These charts enable a quick overview on how many partners from how many countries deal with a certain subject. This may facilitate collaboration between the partners in those fields of interest.

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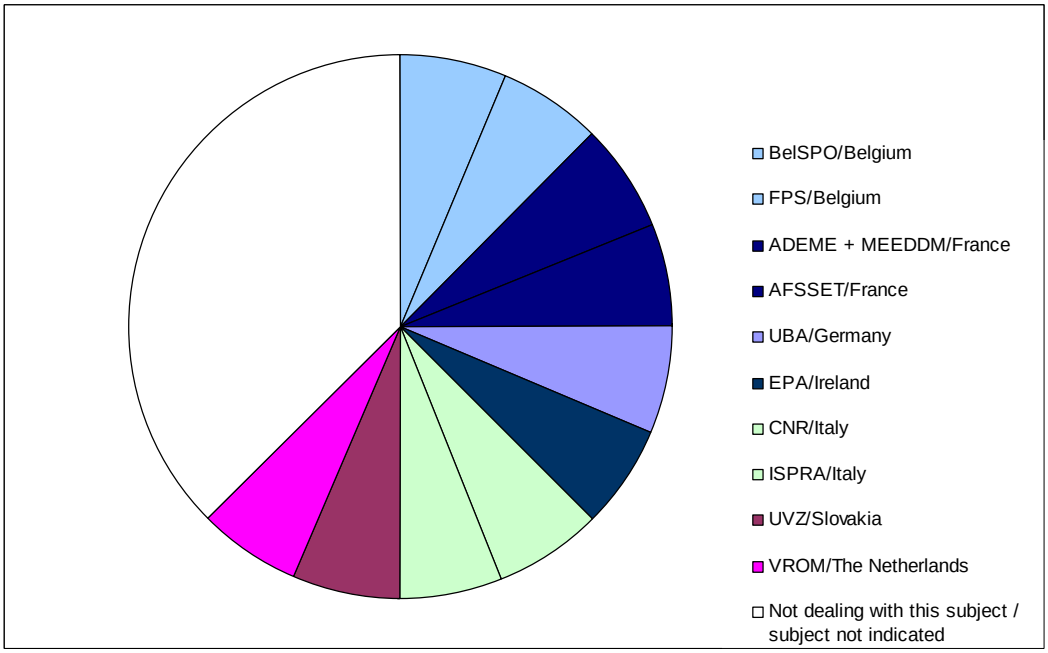
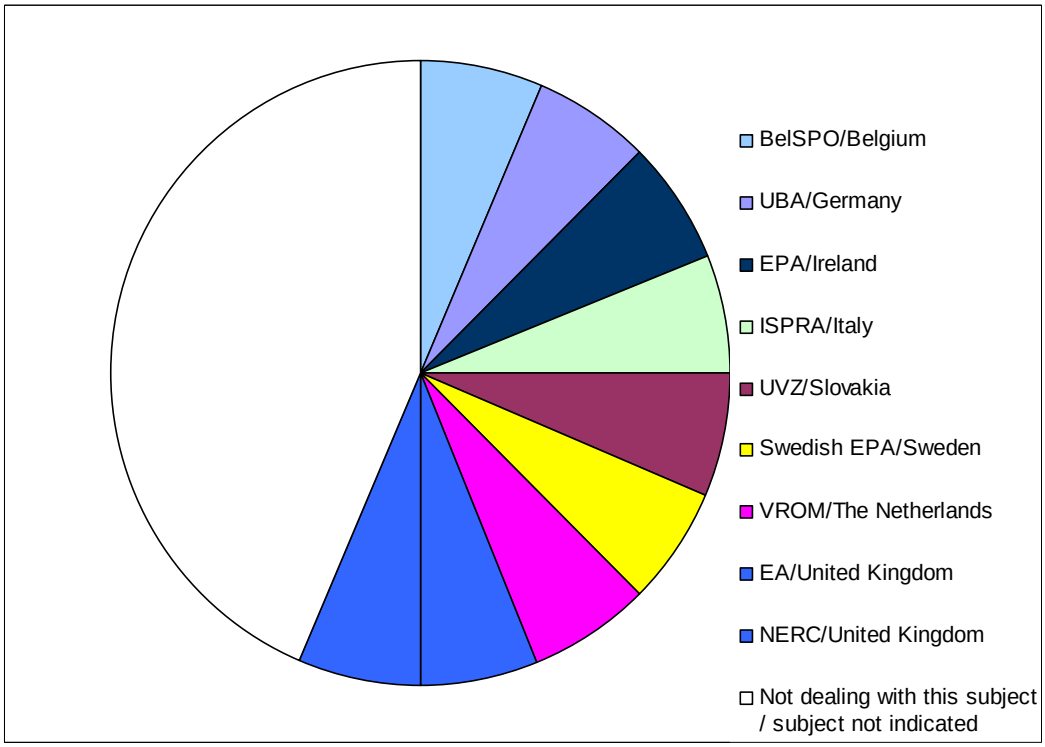
Figure 14: Partners dealing with "Indoor air quality"



Out of the 16 ERA-ENVHEALTH partners, ten partners in seven countries indicated that they cover “Indoor air quality” (see Figure 14).

Figure 15: Partners dealing with "Climate change & Health"



Out of the 16 ERA-ENVHEALTH partners, nine partners in eight countries indicated that they cover “Climate change & Health” (see Figure 15).

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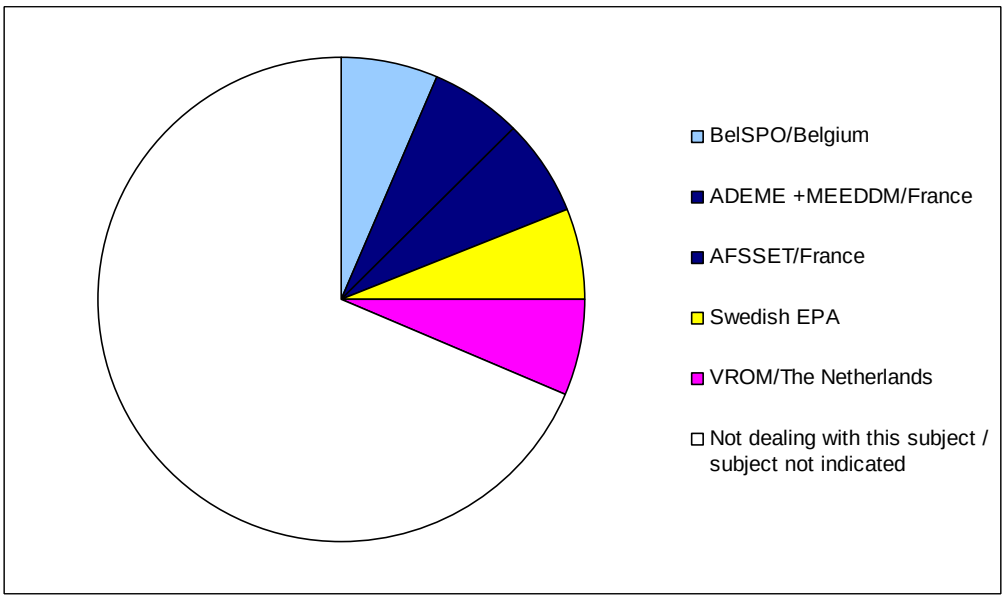
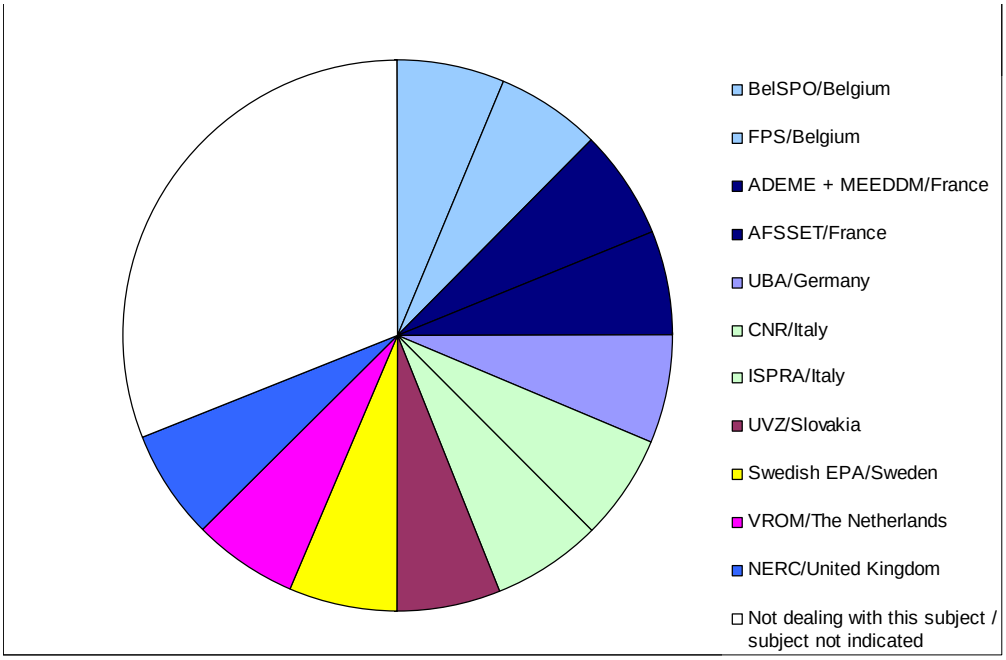
Figure 16: Partners dealing with "Cost/Benefit-Analysis"



Out of the 16 ERA-ENVHEALTH partners, five partners in four countries indicated that they deal with “Cost/Benefit-Analysis” (see Figure 16).

Figure 17: Partners dealing with "Children's health"



Out of the 16 ERA-ENVHEALTH partners, eleven partners in eight countries indicated that they deal with “Children's health” (see Figure 17).

For a full overview on the themes covered by the partner programmes, please consult Table 4 on the following page.

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Table 4: Themes of the partner's programmes

	Country	Belgium					France			Germany			Ireland	Italy			Slovakia	Sweden		The Netherlands	United Kingdom		
	Acronym of the partner	Belspo				FPS	ADEME/ME.	Afsset	Afsset/ME.	UBA			EPA	CNR	ISPRA		UVZ SR	Swedish EPA		VROM/RIVM	EA	NERC	Total
	Acronym of the programme	SSD/HE	SSD/AF	SSD/BD	SSD/AT-TE	NEHAP	PRIMEQUAL	PNR EST	PNRPE	APUG	UPB	U&G	STRIVE	PIAS	E&H Unit	AGF Unit	NEHAP III	n/a	EMFO	BMR	EHH/EA	EHH/NERC	
Themes related to human health aspects	Indoor air quality	1				1	1	1		1		1	1	1	1		1			1			11
	Outdoor air quality	1			1	1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	17
	Climate change			1	1					1		1	1		1		1	1		1	1	1	11
	Food safety		1								1	1		1			1			1			6
	Green space			1						1		1	1							1			5
	Local/living environment	1					1	1		1		1	1	1	1	1	1	1		1			12
	Soil contamination		1					1	1	1	1		1	1			1	1		1	1	1	12
	Transport	1					1			1		1					1	1	1	1			8
	Water quality & supply			1	1			1	1	1	1	1	1	1	1		1	1		1	1	1	15
Agents	Biological agents & Microorganisms	1	1	1	1		1	1		1		1	1	1	1		1			1	1	1	15
	Electromagnetic Fields									1						1				1			3
	Fibres (incl.mineral fibres, asbestos...)							1						1							1		3
	Nanomaterials	1				1		1		1			1					1	1		1	1	9
	Noise							1		1		1	1		1		1	1	1	1			9
	Other Chemical agents		1			1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	16
	Other Physical agents						1	1									1			1		1	5
	Particulate Matter	1			1	1	1	1		1		1	1	1	1		1	1		1			13
	Pesticide & biocides		1				1	1	1	1	1	1		1				1		1		1	11
	Radioactivity									1		1								1			3
Human health effects	Allergies	1		1	1	1	1	1		1		1		1	1		1	1		1			13
	Asthma	1			1	1	1	1		1		1	1	1	1		1	1	1	1	1		15
	Cancer	1				1	1	1		1		1				1		1			1		9
	Cardiovascular diseases	1			1	1	1	1		1		1		1	1			1	1		1		12
	Emerging diseases			1			1	1		1		1			1							1	7
	Endocrine Disruption						1	1	1	1		1	1	1				1				1	9
	Epigenomic changes							1		1		1											3
	Hearing loss							1		1		1											3
	Infectious diseases		1	1				1		1							1			1			6
	Ocular disorders							1				1											2
	Reprotoxic & developmental disruption						1	1		1		1		1				1		1			7
	Respiratory diseases	1			1	1	1	1		1		1	1	1	1		1	1	1	1	1	1	16
	Sleeping disorders						1	1		1		1								1			5
	Vector borne diseases			1				1					1							1		1	5
	Well-being/(risk perception)		1					1		1		1		1						1			6
Methodologies	Biomedical technology								1							1		1				1	4
	Cost/Benefit analysis in E&H	1					1	1										1	1	1			6
	Effect monitoring			1	1			1	1	1	1	1		1						1		1	10
	Epidemiological studies	1					1	1	1	1		1	1	1		1	1	1	1	1			13
	Exposure assessment	1	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		18
	Health impact assessment	1	1	1		1	1	1	1	1		1	1	1	1		1	1	1	1		1	17
	Human biomonitoring	1				1		1		1	1	1	1	1			1					1	10
	Integrated risk assessments	1			1		1	1	1	1	1	1	1	1				1		1	1		13
	Modelling			1	1		1	1	1	1		1	1	1	1	1		1	1	1	1	1	16
	Quality assurance & management		1				1			1	1	1		1						1			7
	Risk communication					1	1	1		1	1	1		1			1	1		1		1	11
	Standarisation/Harmonisation						1			1	1	1		1						1	1		7
Social aspects of E&H	Behaviour of individuals and groups	1					1	1	1	1		1		1		1	1	1				1	11
	Children's health	1				1	1	1		1		1		1	1		1	1		1		1	12
	Environmental justice						1	1	1	1		1	1	1				1			1		9
	Gender & Health							1		1		1		1								1	5
	Occupational health	1						1	1					1		1							5
	Socioeconomic disparities & health	1					1	1		1		1		1			1				1		8
	Vulnerable groups (elderly, children, poor)	1	1	1			1	1	1	1	1	1		1			1	1		1			13

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4.5 OUTPUTS OF THE E&H PROGRAMMES (Q 10-12)

Particular outputs of the E&H programmes evaluated in this Final Overview are available in the ERA-ENVHEALTH research database via the links to the programme web pages where the outputs of some particular programmes are described in detail.

The **"Outcome of the programme"** is indicated for 40 out of the 49 programmes. Outcomes range from science research support to recommendations for policy-makers with regards to E&H protection and more objectives can be indicated within the particular programme. According to the assessment which took into account the following types of "Outcomes of the programmes": "Science (scientific publications)", "Policy (recommendation for policy-makers)", "Public (information)" and "Publicly available information" it can be stated that 35 E&H programmes (71%) expected or indicated outputs which refer to "Science (science publications)". Outputs of 32 E&H programmes (65%) refer to "Policy (recommendations for policy-makers)" and 30 programmes (61%) referred "Publicly available information". 25 programmes (51%) available in the ERA-ENVHELATH research database provide outcomes which are focused on "Public (information)".

"Relevant Reports or information on the results or outcome of the programmes" are available in ERA-ENVHEALTH research database for five programmes as references for websites, publications and meetings.

The **"Recommendations"** resulting from the E&H programmes can be summarised as follows from the outputs and recommendations of the programmes mentioned below:

- Outputs of the **UPB/UBA/Germany** show that "specimen allow 1/ the description of temporal trends in human exposure with emerging substances and 2/ to follow the efficacy of political or voluntary reduction measures."
- Recommendations of the **APUG NRW/MUNLV/Germany** call for "cooperation between different levels and sectors" and for "participation of all relevant stakeholders at a very early stage" which is needed for "starting processes to improve the situation of environment and health". Programme recommendations also indicate that "the coordination between different programmes and initiatives […] and "the dialogue between science, politics, authorities, business sector and public should be improved."
- Considerations of the **PIAS/CNR/Italy** also show that the "the coordination activity is crucial to develop complex and multidisciplinary research programmes, the network of experiences adds a growing knowledge and builds new competencies, the organisation of thematic groups with a dedicated funded fellowship, working in parallel is very productive". As a related requirement it is added that "appropriate funds allocation is crucial, to be devoted in particular to: coordination, information production and sharing, web design". Moreover the following constraints are indicated: "The problems of different cultures and languages of experts in E&H have to be addressed. The solution can be found: promoting dialogue, dedicating sufficient time, experimenting in practical fields/issues".

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4.6 FUTURE PRIORITIES OF THE E&H PROGRAMMES (Q 13-16)

4.6.1. Near future priorities of the E&H programmes (Q 13)

ERA-ENVHEALTH partners were asked to provide information on the "Future priorities of their E&H programmes and areas for new or further cooperation" (below as "Near future priorities"). This kind of information was collected from ten ERA-ENVHEALTH partners (**BelSPO/Belgium, FPS/Belgium, ADEME/France, AFSSET/France, UBA/Germany, EPA/Ireland, CNF/Italy, MOH/Slovakia, UVZ/Slovakia** and **Swedish EPA/Sweden**). The ten ERA-ENVHEALTH partners defined the "Near future priorities" for their 13 E&H programmes (**SSD/BelSPO/Belgium, NEHAP/FPS/Belgium**, **Primequal/ADEME/France, PNRPE/AFSSET/France**, **PNR EST/AFSSET/France, APUG/UBA/Germany, UPB/UBA/Germany, PIAS/CNR/Italy, STRIVE/EPA/Ireland, EPHR/MOH/Slovakia, NEHAP III/UVZ/Slovakia, Swedish Environmental Research Appropriation/Swedish EPA/Sweden** and **EMFO/Swedish EPA/Sweden**).

In summary, regarding the "Topics of the E&H programmes" defined in the 1st questionnaire (Q 9), it can be stated that the "Near future priorities" of the E&H programmes most often relate to "Climate change",, "Exposure assessment" (stated for 6 programmes) and "Indoor air quality" (stated for 5 programmes). "Near future priorities" also often relate to "Outdoor air quality" and "Human biomonitoring" topics (each of them were stated for 4 programmes) or "Nanomaterials", "Endocrine disruptors", Nanoparticles and "Epidemiology (each of them were stated for 3 programmes).

In particular, the ten ERA-ENVHEALTH partners indicated the following specific "Near future priorities" for their E&H programmes:

BelSPO/Belgium is preparing a new research programme focusing on the effects of climate change which will replace the actual **SSD programme**. This programme is scheduled to be completed by the summer of 2010. As the programme is still in preparation BelSPO can report that "one of the themes of this programme is impacts of climate change on human health. […] The key questions being addressed by this theme – climate change and human health – are the following:

- What are the potential human health effects of global environmental change?
- What climate, socioeconomic, and environmental information is needed to assess the cumulative health risk: Environmental health risk assessment?
- What are/is the adaptations/mitigation in the provision of public health and health care interventions?"

FPS/Belgium stated that "two priorities within the frame of the **NEHAP** programme are:

- to improve the comprehension of E&H in the last two years of high school and
- to implement a course E&H in the education of health professionals, which are, by definition, not strict research projects.

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The national cell sees the assessment of multiple exposure stressors and corresponding combined effects on human health as an important future priority".

FPS/Belgium also stressed the following areas as "Near future priorities":

- "Air pollution – indoor / outdoor […] – with a focus on indoor pollution in schools and with a focus on the chemical composition and physical characteristics of particulate matter.
- Nanoparticles – Within the framework of the Belgian NEHAP, a project will be launched in 2010 to make an inventory of available information on the presence, distribution and exposure and effects of commercial and industrial nanoparticles in Belgium".

ADEME/France is managing the E&H programme **Primequal**. ADEME identified the "Near future priorities" of this programme as:

- "Indoor air quality (in particular in tertiary sector buildings and in low-energy houses),
- Particulate air pollution (in particular nanoparticles),
- Socio-economical and geographical inequalities regarding environmental health impacts,
- Impacts of renewable energy emissions (in particular biomass, biofuels),
- Cost-benefit analyses regarding transport policies".

AFSSET/France pointed out that "Recommendations for further research in AFSSET's 2009 expertise reports, which addressed various types of risks, concern three axes in particular:

- developing knowledge in particular to reduce uncertainties and improve knowledge in terms of diseases, pathologies and exposures,
- developing standardised tools and methodologies in particular for measurements, modelling and analysing the interactions between environment and health,
- Acquiring data: exposure parameters, toxicological data, and epidemiological data".

From AFSSET's point of view "it is necessary to strengthen the major areas of research and the priorities for the prediction and assessment of environmental hazards and risks, in particular on diseases which are increasing in prevalence and incidence, and on emerging risks.

Major areas of research:

- Epidemiology for environmental and occupational health.
- Toxicology, ecotoxicology and exposure science (through analytical and measurement tools).
- Socio-economic approaches should be introduced more often.

Support research on diseases with increasing prevalence and incidence rates:

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- Reinforce research on Carcinogenic Mutagenic and Reprotoxic (CMR) substances and in particular promote innovation for substitution.
- Develop research on interactions between the quality of environmental media (indoor and outdoor air, water, soil) and population health, taking into account particular susceptibilities linked to age or certain pathologies.
- Develop research on certain diseases associated with the increasing population exposure to environmental pollutants: allergies, respiratory pathologies, cancers, neurological pathologies…
- Reinforce research 1/ on potential links between occupational exposure to pesticides and cancers and neurodegenerative diseases and 2/ to improve the efficiency of collective and personal protective equipment as well as on the work process to limit exposure.
- Improve knowledge on (re)emerging pathologies (EMF hypersensitivity…).

Support research on emerging risks:

- Reinforce research on risks linked to nanomaterials or products derived from nanotechnologies and support the development of analytical and measurement tools.
- Improve knowledge on the biological effects of EMFs.
- Reinforce research on risks linked to climate change, in particular on the health impact of climate change with regards to evolutions in atmospheric pollution and water quality; risks linked to the emergence or re-emergence of infectious and parasitic diseases…
- Reinforce research on endocrine disruptors. Epidemiological surveillance must be reinforced in this area".

UBA/Germany defined "Near future priorities" for two programmes.

Regarding the **APUG** the UBA pointed out the following "Near future priorities":

- Determination of links between environment and health considering all diseases and health outcomes which increase and for which environment might have an influence (like, inter alia, cancer, ADHD[12], decrease of fertility, dementia, Alzheimer's disease, allergies),
- Climate change and health (allergies, non-infectious diseases),
- Indoor air quality and its effects on human health; harmonisation of labelling schemes of building products at European level,
- Development of new analytical HBM methods to assess exposure of the general population on a representative basis and to improve the HBM assessment schemes

[12] Attention Deficit Hyperactivity Disorder

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- Environmental burden of disease,
- Particulate matter,
- Environmental contaminants in food,
- Risk communication,
- Evaluation of anthropogenic trace compounds and their mixtures in drinking water.

Regarding the **UPB** programme, UBA stated the following "Near future priorities":

- Human biomonitoring; current and past exposure of humans with emerging pollutants.

CNR/Italy defined "Near future priorities" for the **PIAS CNR** programme as:

- Polluting substances' fate,
- Monitoring integrated systems for soil and water pollution,
- Outdoor/indoor air pollution and health,
- Human biomonitoring,
- Environment and health surveillance systems,
- Food quality and health,
- Endocrine disruptors and health,
- Nanoparticles and cardio-pulmonary diseases.

The **EPA/Ireland** is managing the E&H programme **STRIVE. EPA/Ireland** and sees the "Near future priorities" for its E&H programme in the following areas:

Nanomaterials

- Potential health impacts of engineered nanomaterials – including predicting the behaviour of nanoparticles, during usage, handling and disposal.

Health Impact Assessment

- Development of decision support system or similar methodologies for the review of HIA (Health Impact Assessment) in the context of environmental regulation,
- Assessment of health impacts of environmental factors arising from specific sectors including transport, domestic heating etc.,
- Integrated risk assessment models combining environment and human health risk assessment.

Population Health and the environment

- Selection and application of suitable indicators for monitoring health and environment status and trends,

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- Analysis of protection afforded by environment-health relevant policies to people at high risk, such as children, other vulnerable groups,
- Cost-benefit analysis of health issues associated with current (and proposed) environmental policy-actions,
- Development of GIS based exposure assessment tools for Ireland, in the context of providing exposure-reduction strategies,
- Characterisation of air exposure in small towns.

Climate Change & Human Health

- Potential impacts for Ireland from changes in range and seasonality of vector-borne diseases due to climate change and consequent altered weather patterns,
- Health impacts from predicted increased intensities of floods and storms including more frequent & intense winter storms, coastal flooding from rising sea levels and river flooding from more heavy rainfall events,
- Expected health-relevant impacts on air quality (in particular ground-level ozone and particulate matter) arising from predicted climate change to include direct impacts and indirect impacts through responses and reactions to climate change,
- Potential effects of climate change on phytoplankton behaviour and altered phytoplankton dynamics in coastal waters leading to increased incidence of Harmful Algal Blooms / Red Tides.

Water Quality, Aquatic Environment & Human Health

- Water safety plans as a means of protecting water supplies (from catchment to tap),
- Formulation of epidemiological data analysis and databases of the distribution and levels of micro-organisms of public health concern in water with a view to establishing cause-effect relationships,
- Development of model risk assessment approach for sanitary authorities/regulatory authorities to assess the impact of faecal contamination and pathogenic organisms from wastewater treatment plant effluent into receiving waters,
- Potential health impacts associated with current sewage sludge management practices,
- Potential health impacts of single house waste water treatment systems".

MOH/Slovakia is managing the E&H programme **EPHR MOH/Slovakia** and recommends that "research activities during the period 2008 – 2011 should be oriented towards three main areas:

- environmental health
- occupational health
- epidemiology of infectious diseases and non-infectious diseases with high incidence"

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In general, the main objective of environmental health research funded by the MOH/Slovakia is "to establish relationships between exposures and health in the population, with an emphasis on susceptible subgroups, such as children, pregnant women, those in occupational settings with unique exposures, and the elderly. MOH/Slovakia is "supporting research projects targeted at understanding the mutagenic, carcinogenic, and immunomodulatory properties of xenobiotics, their capability to induce allergies and atopies, and their role as endocrine disrupters. In particular, programmes aiming at the following are priorities:

- changes in gene expression related to environmental exposures, including epigenetic mechanisms leading to altered gene expression,
- individual susceptibility, its temporal changes and modifications by certain genes and environmental factors,
- studying how genome determines the response of the organism to environmental stressors by using genomic and protein technologies in environmental medicine (i.e. toxicogenomics) with the objective of identifying biomarkers of exposure to toxic matters and their effect,
- role of free oxygen radicals in pathogenesis of chronic degenerative diseases, mechanisms of DNA damage and reparation in relation of pathogenesis and prevention of diseases,
- toxicokinetics of important environmental and occupational contaminants".

As for the **NEHAP III** programme, **UVZ/Slovakia** states the following "Near future priorities":

- Health impact assessment – its implementation in the act as important political tool in decision-making process,
- Coordination of activities on human biomonitoring at national level towards the human biomonitoring in Europe,
- Indoor air quality: assessment of exposure to aeroallergens and an educational campaign on the risk factors for asthma and allergies, with special attention to indoor environments and ways to reduce indoor exposure to risk factors.

Swedish EPA is managing two E&H programmes "**Swedish Environmental Research Appropriation**" and **EMFO**. Swedish EPA indicates "Near future priorities" for transnational research funding within ERA-ENVHEALTH as:

- "Health impact from specific air pollution sources. One important area to focus on for joint activities within ERA-ENVHEALTH is emissions from ships […] in particular the impact of ship emissions on health, both short term and long-term effects […].
- Combined exposures to environmental stressors. There is an urgent need to obtain a scientifically based approach to risk assessment of exposure of chemicals both in mixtures and via different exposure routes […].

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- Emissions from goods and materials. There is a lack of knowledge concerning which chemicals are present in goods and in what amounts they are released to air, water and when in contact with the human body. We need to improve the understanding of emissions of organic substances from articles and to clarify and determine the magnitude of the effects on environment and health. This also includes i.e. quantifying the amounts of hazardous substances released from goods and relating the problem to other emission sources. It also includes developing a registry for chemicals present in goods.
- Health impacts of a changing climate. Climate change will affect human health by various routes. Research aiming at preparedness to meet this is needed […]".

4.6.2. Other subjects which the E&H programmes should be dealing with (Q 14)

For three E&H programmes **(APUG/UBA/Germany, PIAS/CNR/Italy and NEHAP III/UVZ/Slovakia)**, the ERA-ENVHEALTH partners specified other subjects which the programmes should be dealing with in general:

- "Identification of oxidative transformation products from drinking water treatment" (APUG/UBA/Germany),
- "Clarification of the relation between environmental burden and health effects; combination impact" (APUG/UBA/Germany),
- "Human biomonitoring and REACH" (APUG/UBA/Germany),
- "Advanced methods to investigate risk perception and communication" (PIAS/CNR/Italy)
- "Advanced methods to promote participation of subjects involved in the research, from the design of research to the use of results" (PIAS/CNR/Italy),
- "E&H surveillance using human biomonitoring for improving exposure assessment"(PIAS/CNR/Italy),
- "Environment and health information system" (NEHAPIII/UVZ/Slovakia),
- "Human health implications of exposure to chemical residues in the environment" (NEHAPIII/UVZ/Slovakia).

4.6.3. Future cooperation with other partners (Q 15, Q 16)

ERA-ENVHEALTH partners identified the "Areas of research for future cooperation with other partners" mostly within the scope of the future priorities of their E&H programmes and areas for new or further cooperation (see section 4.7.1).

Two ERA-ENVHEALTH partners (**UBA/Germany** and **UVZ/Slovakia**) provided additional descriptions of "Areas of research for future cooperation with other partners" for three E&H

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programmes **(APUG/UBA/Germany**, **UPB/UBA/Germany** and **NEHAP III/UVZ/Slovakia**). With respect to the "Future priorities of E&H programmes" none of the ERA-ENVHEALTH partners made "Additional comments" (see 1st questionnaire, Q 16) except BelSPO which provided references to certain websites for more information.

With regards to the **APUG,** the **UBA/Germany** specified the following areas for cooperation:

- New toxic endpoints and their molecular mechanisms of action,
- Traffic-caused environmental burden,
- Climate change and health,
- Indoor air hygiene,
- Link between an EU-wide HBM and an EU-wide health-survey,
- Implementation of an EU-wide cohort "Environment and Health.

Regarding the **UPB** the area for cooperation specified by **UBA/Germany** is Human biomonitoring.

Regarding the **NEHAP III** the **UVZ/Slovakia** sees following areas as areas for new or further cooperation:

- Climate change and health,
- Review of NEHAP III in 2010-2011 with respect to outputs and recommendations from Fifth Ministerial Conference on Environment and Health in Parma 2010 with relevant partners. Emphasis is also on better cooperation with NGOs and their involving in process of NEHAP's updating.

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5. ANALYSIS OF THE E&H PROJECTS – RESULTS

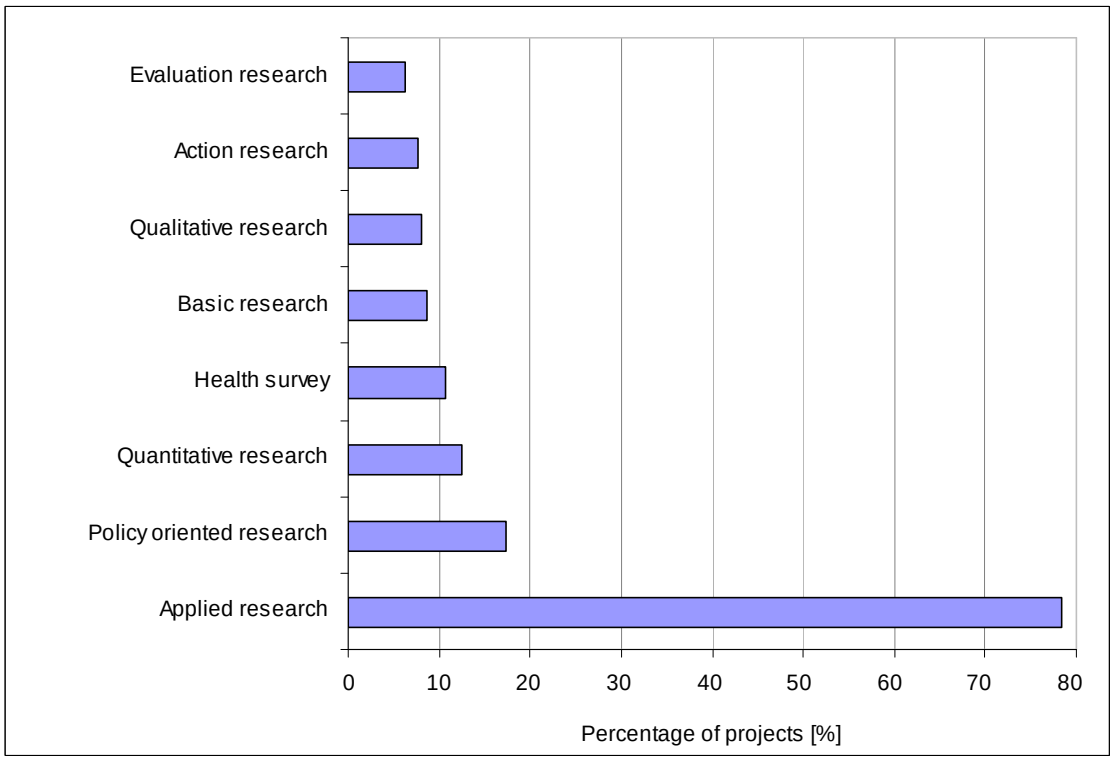
5.1 GENERAL INFORMATION ON PROJECTS – NUMBER, TYPES, ORIENTATION (Q 17-19)

Within the 49 E&H programmes implemented by the 38 organisations of the ERA-ENVHEALTH consortium and cooperating institutions, 461 projects were funded from 2006 until September 2009.

From the **"Type of projects"** point of view for almost all projects the orientation towards "Applied research" (361 projects, i.e. 78% of the 461 projects) was typical. "Policy-oriented research" was designated for 80 projects (17%), followed by "Quantitative research" (58 projects, 13%) and "Health survey" (49 projects, 11%). Other types of projects were identified for less than 10% of the projects, i.e. "Basic research" (40 projects, 9%), "Action research" (35 projects, 8%) and "Evaluation research" (29 projects, 6%) (see Figure 18).

Information on **"Project orientation"** was provided for 205 projects. "Top-down" orientation was specified for 21 projects (i.e. 10% of the 205 projects for which this kind of data was provided), 30 projects (15%) belong to "Bottom-up" orientation and "Both" ("Bottom-up" and "Top-down") orientation was identified for almost all projects (154 projects i.e. 75% of the 205 projects for which this kind of data was provided).

Figure 18: Types of projects evaluated for the 461 projects entered into the database



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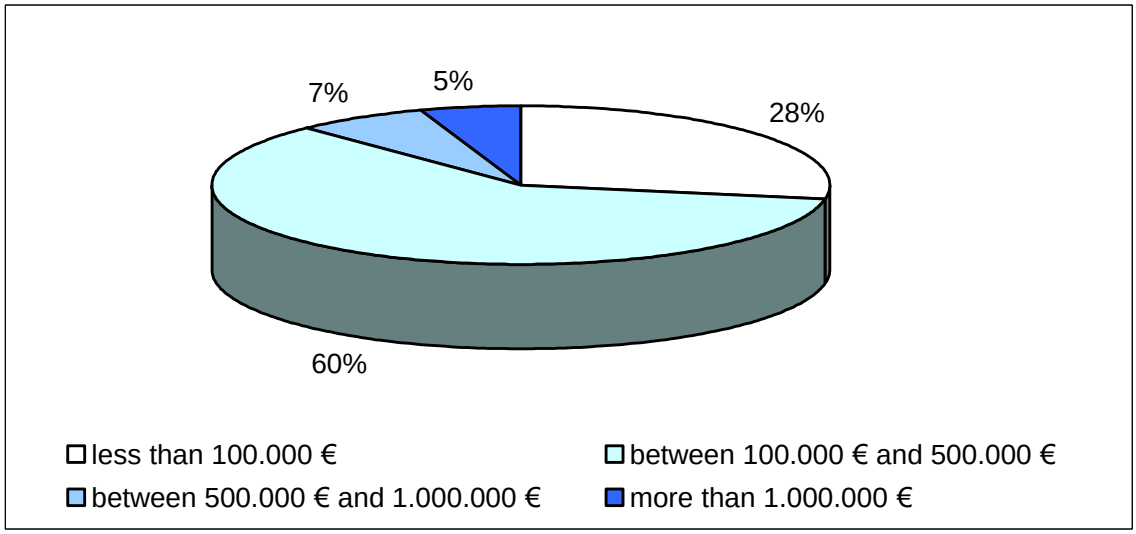
5.2 BUDGETS PROVIDED BY THE FUNDING PROGRAMMES FOR THE PROJECTS (Q 23)

Information on the **"Budget provided by the funding programme for the project"** evaluated on the basis of 388 (84%) projects for which the data on the total budget was provided. For most of the projects (233 projects, i.e. 60% of the 388 evaluated projects) the total budget ranged from "100.000 € to 500.000 €". Very few projects (20 projects, i.e. 5% of the 388 evaluated projects) exceeded the total budget of "1.000.000 €" (see Figure 19).

Figure 19: Percentage of the 388 evaluated projects according to the particular total budget categories



Within the projects working on "Themes related to human health aspects", the funds provided in the range of "100.000 to 500.000 €" were invested most often in projects researching "Outdoor air quality" and "Local/living environment" issues. The highest number of projects with highest budgets ("more than 1.000.000 €") was recorded for projects looking at "Outdoor air quality" issues but also for projects looking at "Climate change", "Indoor air quality", "Transport" and "Food safety" issues (see Figure 20).

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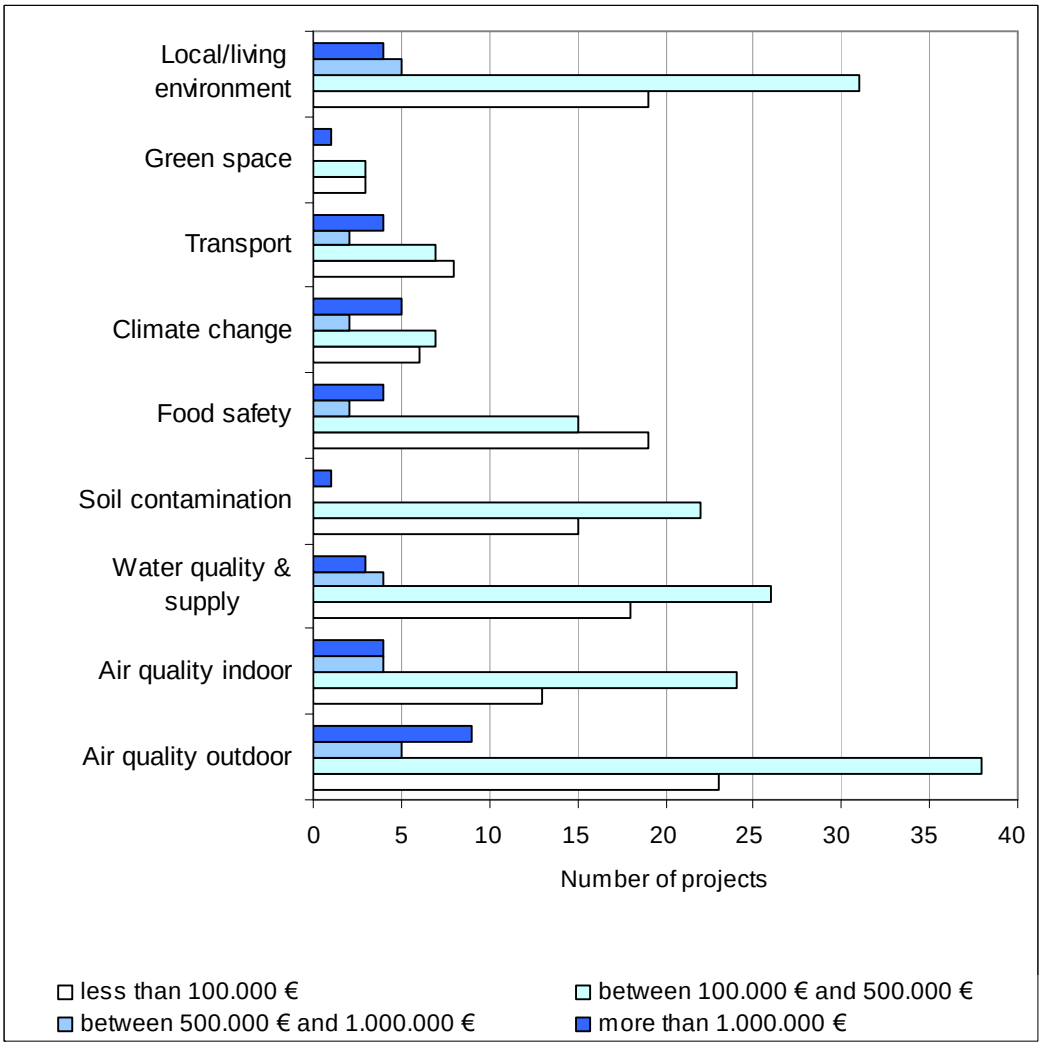
Figure 20: Total budget of the 388 evaluated projects divided according to the "Themes related to human health aspects"



From the "Agents" point of view the highest financial sources were invested in projects related to "Other Chemical agents" and "Biological agents & Microorganisms". The most highly funded projects (with a total budget of more than 1.000.000 € per project) are projects relating to "Other chemical agents" again but also projects relating to "Particulate matter". The lowest financial sources are provided for projects looking at "Fibres", "Other physical agents" and "Electromagnetic fields" issues (see Figure 21).

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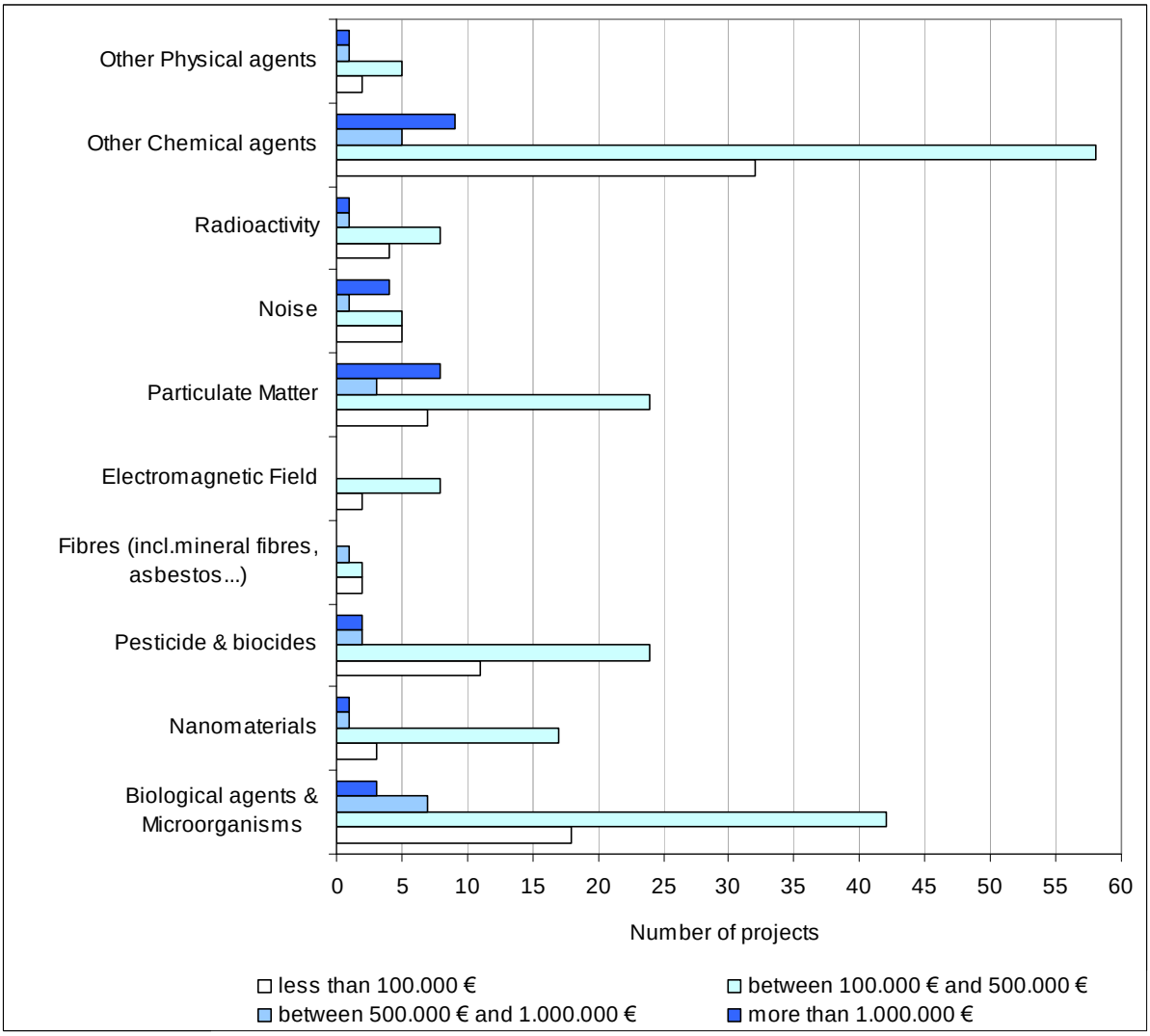
Figure 21: Total budget of the 388 evaluated projects divided according to the "Agents"



Cancer is the issue to which professionals and the public pay the most attention. This fact is also reflected in the amount of invested funds in projects related to “Human health effects”. Most projects with a total budget between “100.000 € and 500.000 €” focus on “Cancer”, followed by “Respiratory diseases”, “Endocrine disruption” and “Asthma”, themselves followed by “Cardiovascular diseases” and “Allergies”. “Asthma”, “Cardiovascular diseases” and “Allergies” are human health effect for which there is the highest number of projects with a total budget “higher than 1.000.000 €”. The least funds are provided for projects on “Ocular disorders”, “Hearing loss” and “Epigenomic changes” (see Figure 22).

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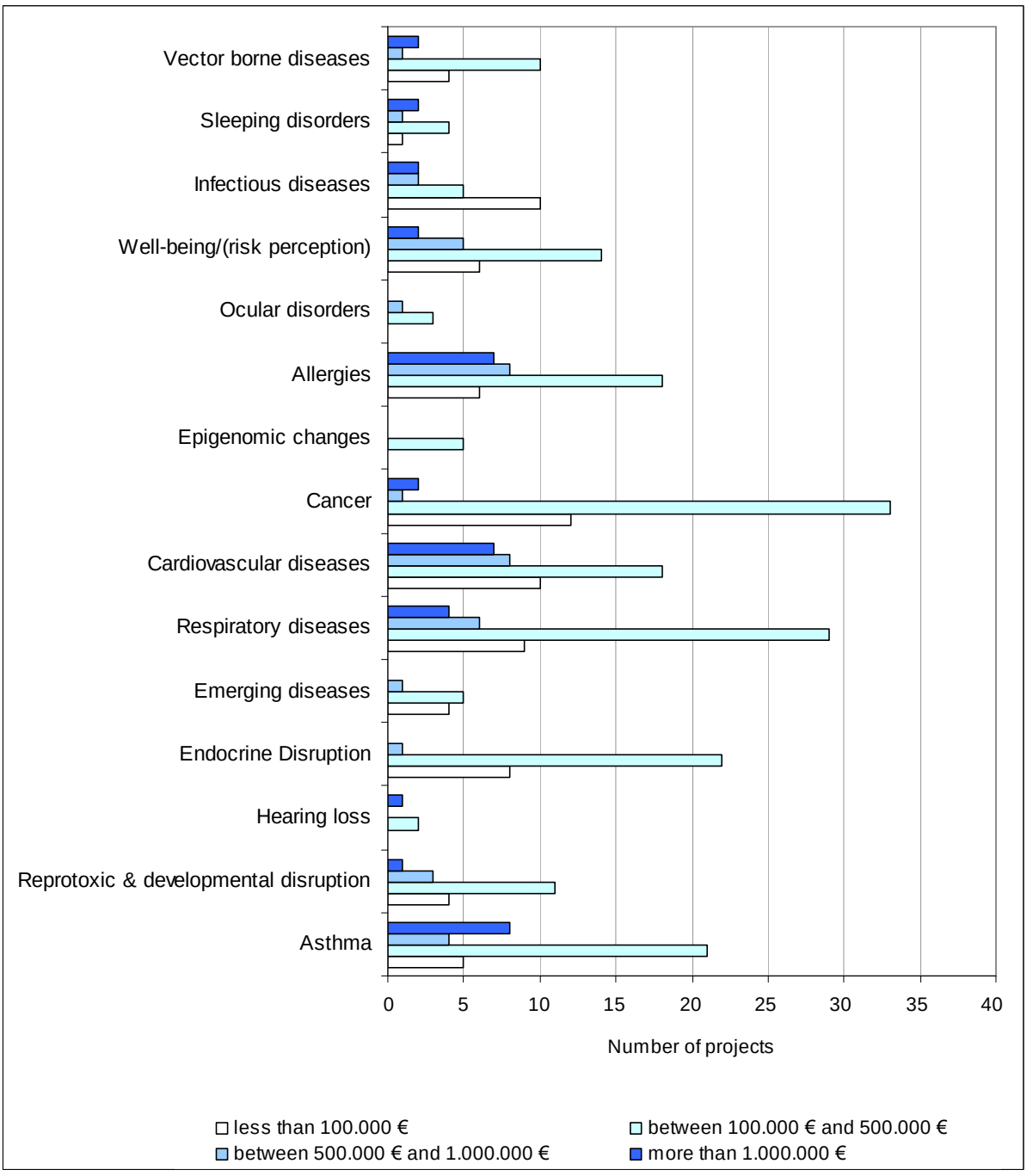
Figure 22: Total budget of the 388 evaluated projects divided according to the "Human health effects"



With respect to “Methodologies” the highest number of projects with a total budget “between 100.000 € and 500.000 €” are related to “Exposure assessment”, “Epidemiological studies” and “Human biomonitoring” (see Figure 23).

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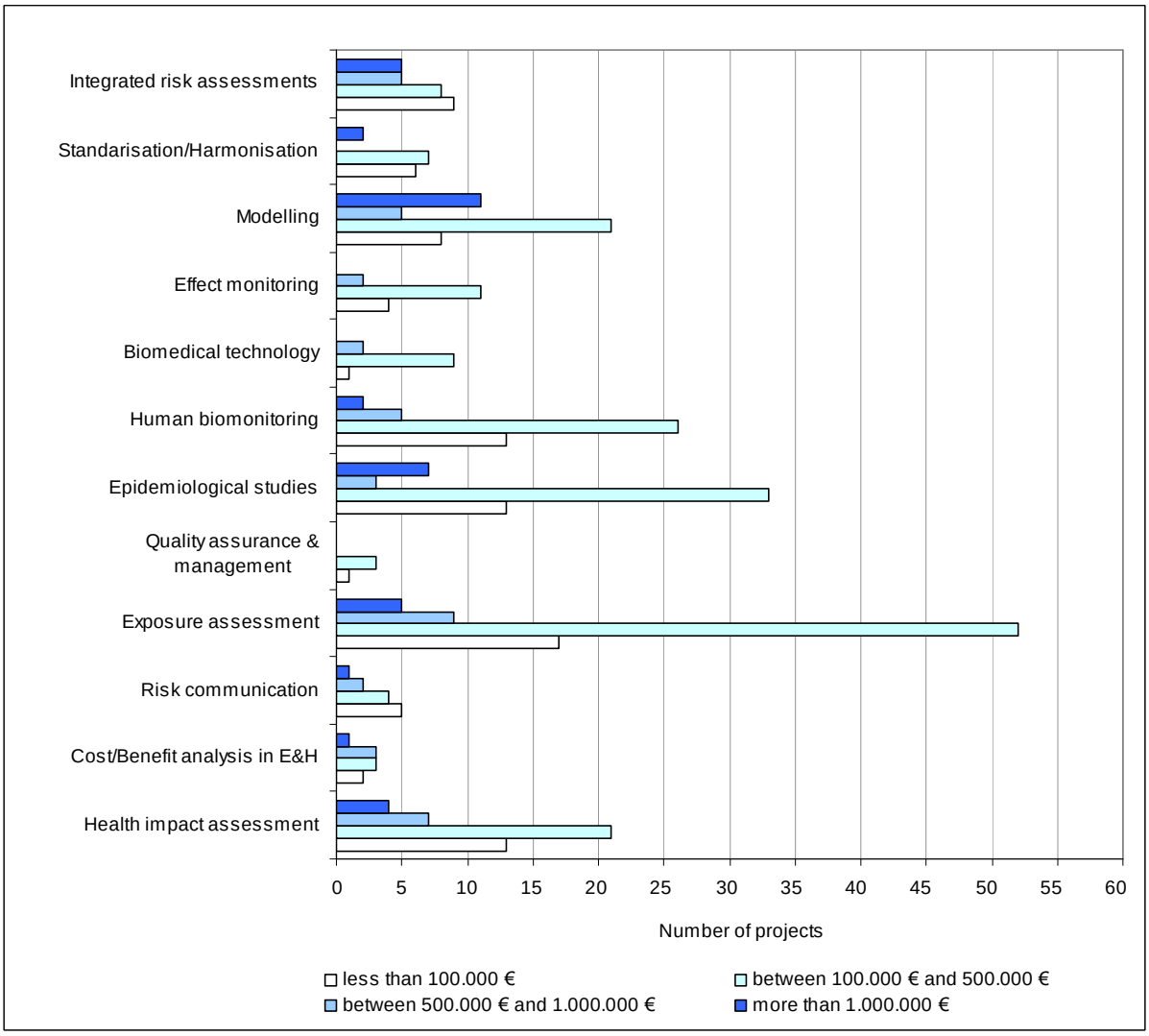
Figure 23: Total budget of the 388 evaluated projects divided according to the "Methodologies"



As for the “Social aspects of E&H” the highest number of projects with a total budget of “between 100.000 € and 500.000 €” tend to focus on “Gender & health”, “Occupational health” and “Children’s health”. The most highly funded projects (with a total budget “higher than 1.000.000 €”) were recorded for projects looking at “Children’s health” issues (see Figure 24).

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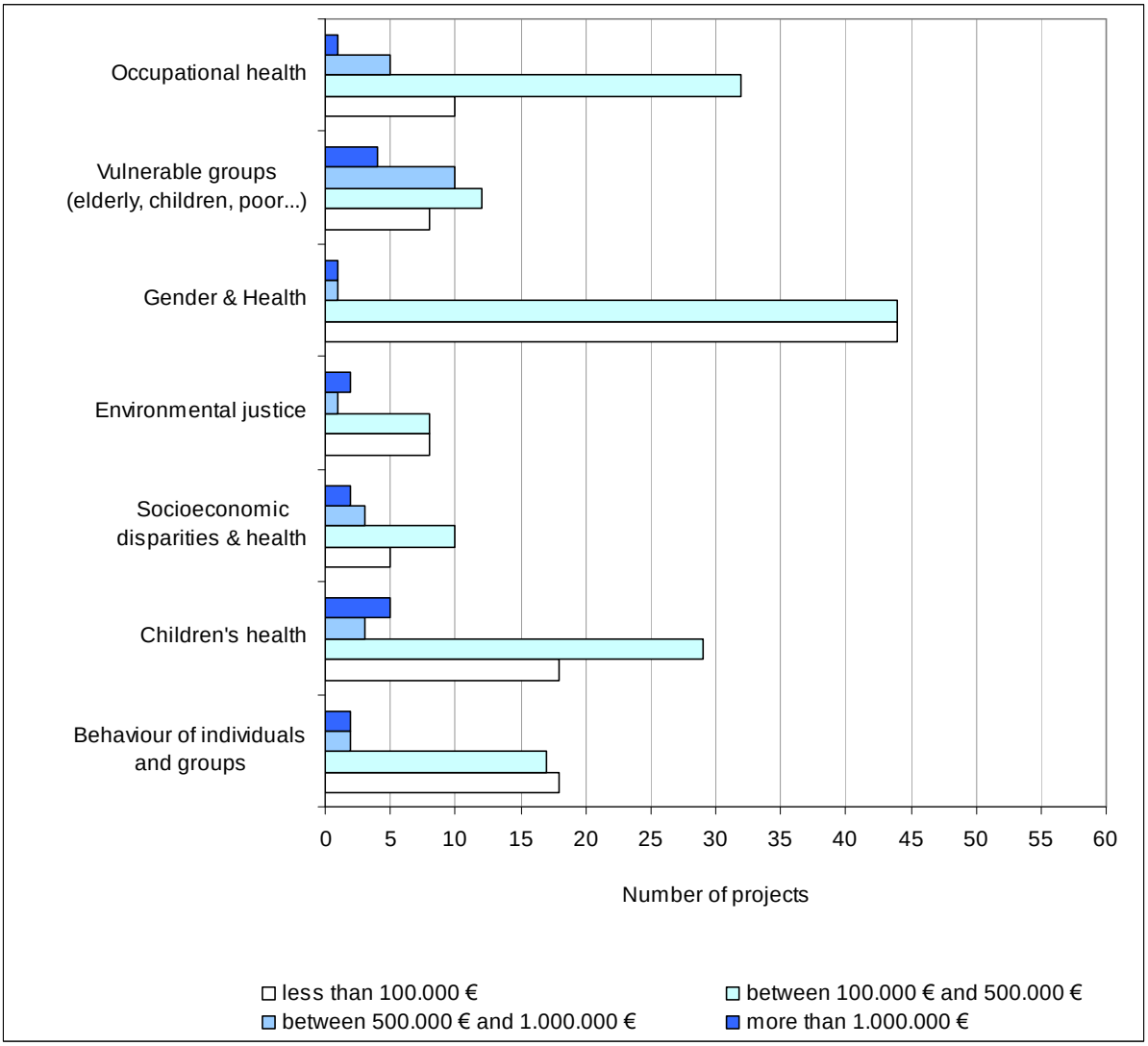
Figure 24: Total budget of the 388 evaluated projects divided according to the "Social aspects of E&H"



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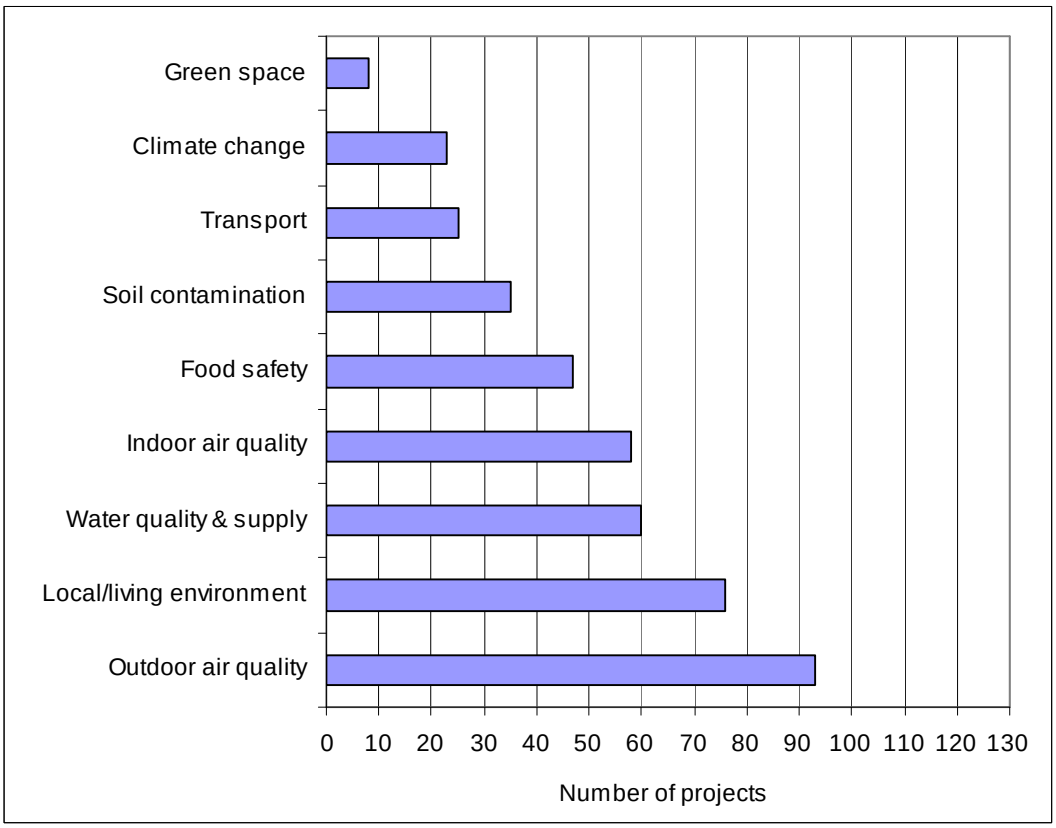
5.3 RESEARCH THEMES OF THE PROJECTS (Q 25)

E&H is a challenging issue that extends to the wide range of research themes related to the multidirectional links and relationships between the state of environment and public health.

Themes related to human health aspects

From the "Themes related to human health aspects" point of view, the most frequently recorded themes for E&H research activities are "Outdoor air quality" (93 projects, i.e. 20% of responses for all 461 projects) and "Local/living environment" (76 projects, 16%). Next are the themes "Water quality & supply" (60 projects, 13%), "Indoor air quality" (58 projects, 13%), "Food safety" (47 projects, 10%) and "Soil contamination" (35 projects, 8%). The less frequently recorded themes for research activities are "Transport" (25 projects, 5%), "Climate change" (23 projects, 5%) and "Green space" (8 projects, 2%) (see Figure 25).

Figure 25: Number of E&H projects focusing on selected "Themes related to human health"



Agents

"Other chemicals" are the dominant "Agents" as subjects of the research activities of the projects funded, as it was stated for 129 projects (i.e. 28% of responses for all 461 projects). These "Other chemicals" are followed by "Biological agents & Microorganisms" (80 projects, 17%), "Particulate matter" (51 projects, 11%) and "Pesticides & biocides" (48 projects, 10%). The lowest percentage (5% and less) is recorded for "Nanomaterials" (24 projects, 5%), "Noise" (18 projects, 4%), "Radioactivity" (16 projects, 3%), "Electromagnetic fields" (13

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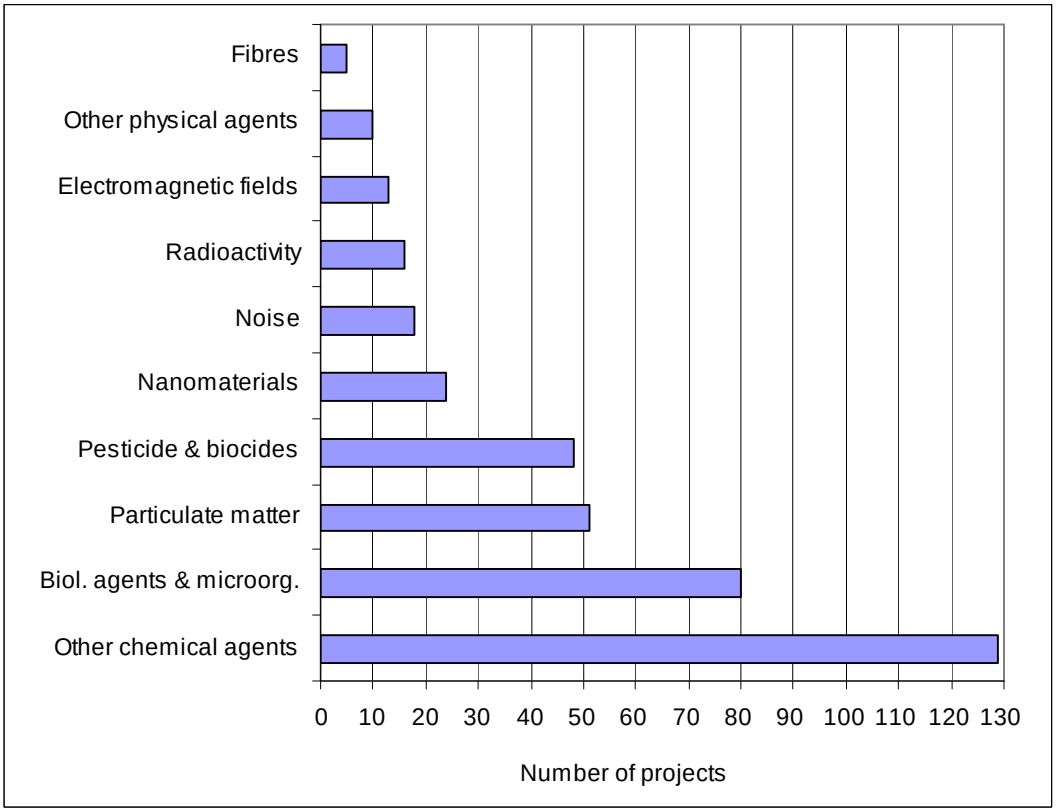
projects, 3%), “Other physical agents” (10 projects, 2%) and “Fibres” (5 projects, 1%) (see Figure 26).

Figure 26: Number of E&H projects focusing on selected "Agents"



Human health effects

The most researched issues from the “Human health effects” point of view are “Respiratory diseases” (51 projects, 11% of responses for all 461 projects), “Cancer” (51 projects, 11%), “Allergies” (47 projects, 10%), “Cardiovascular diseases” (46 projects, 10%), “Asthma” (44 projects, 10%) and “Endocrine disruption” (38 projects, 8%). Other effects are recorded for less than 7% of responses (see Figure 27).

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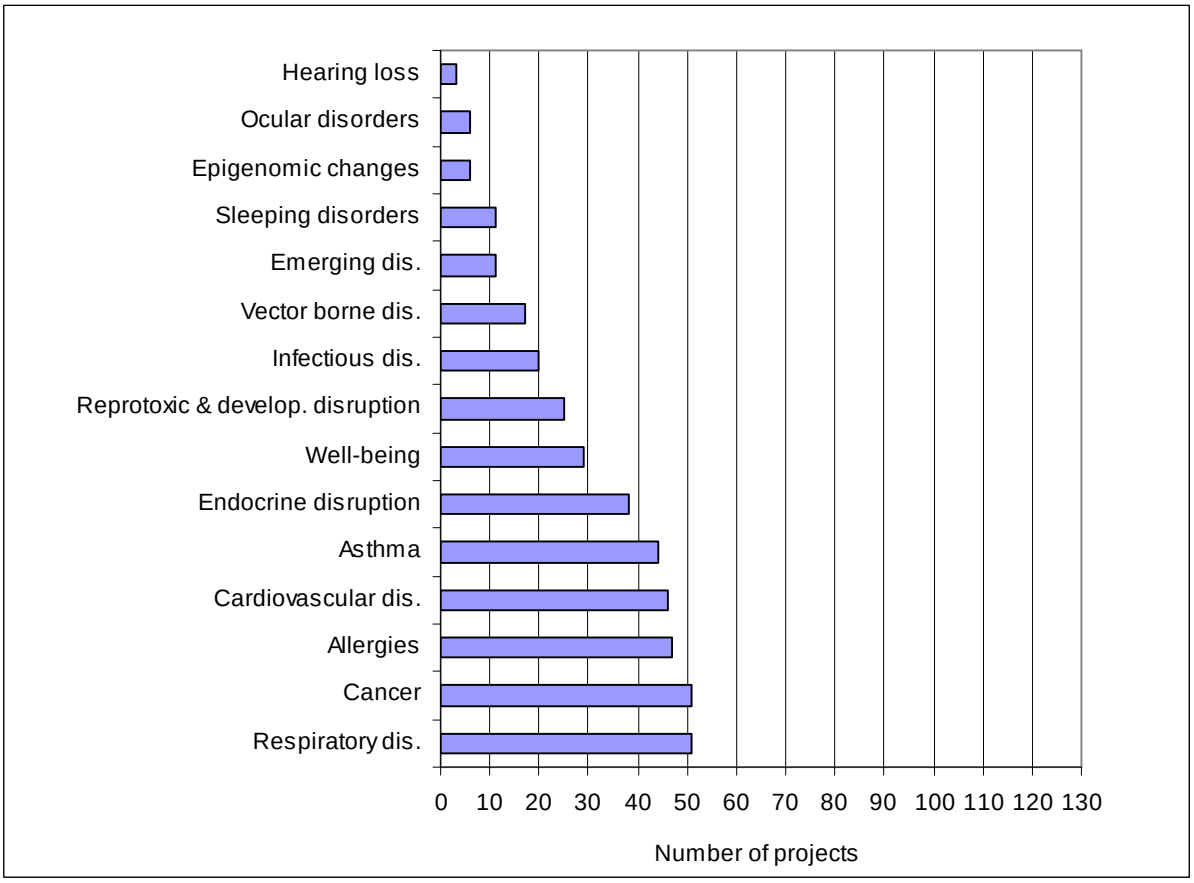
Figure 27: Number of E&H projects focusing on selected "Human health effects"



Methodologies

The most commonly stated “Methodology” to assess the impacts of the environment on human health in the research projects is methodologies concerning “Exposure assessment” (107 projects, 23% of responses for all 461 projects) followed by “Epidemiological studies” (66 projects, 14%), “Human biomonitoring” (56 projects, 12%), “Modelling” (51 projects, 11%) and “Health impact assessments” (50 projects, 11%). Other methodologies are used in less than 5% (see Figure 28).

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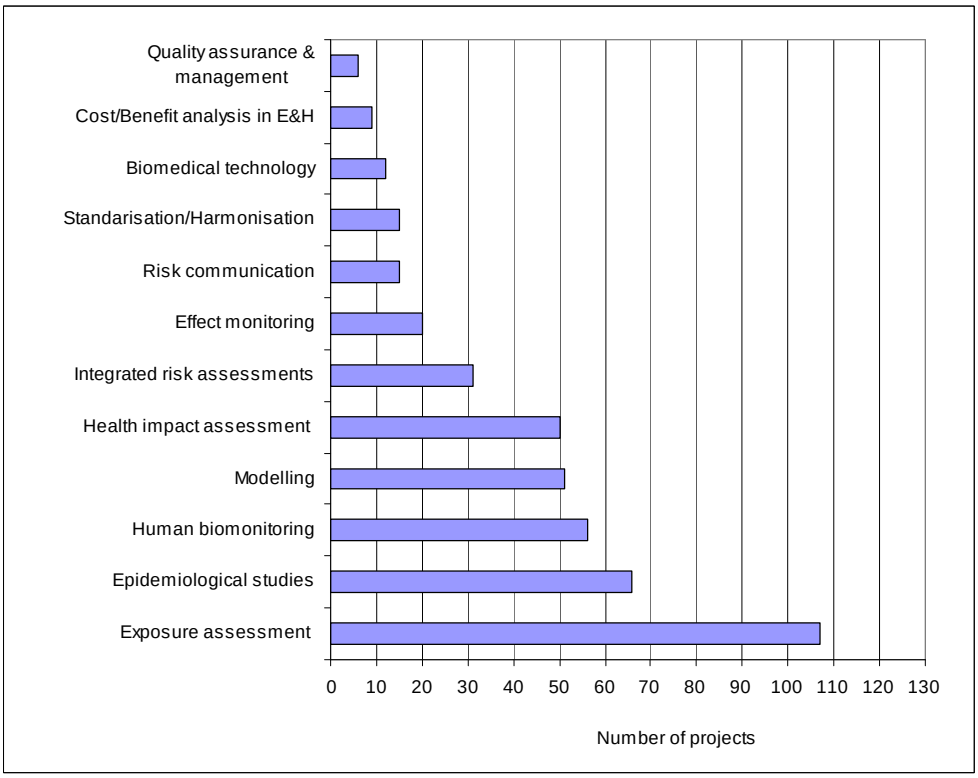
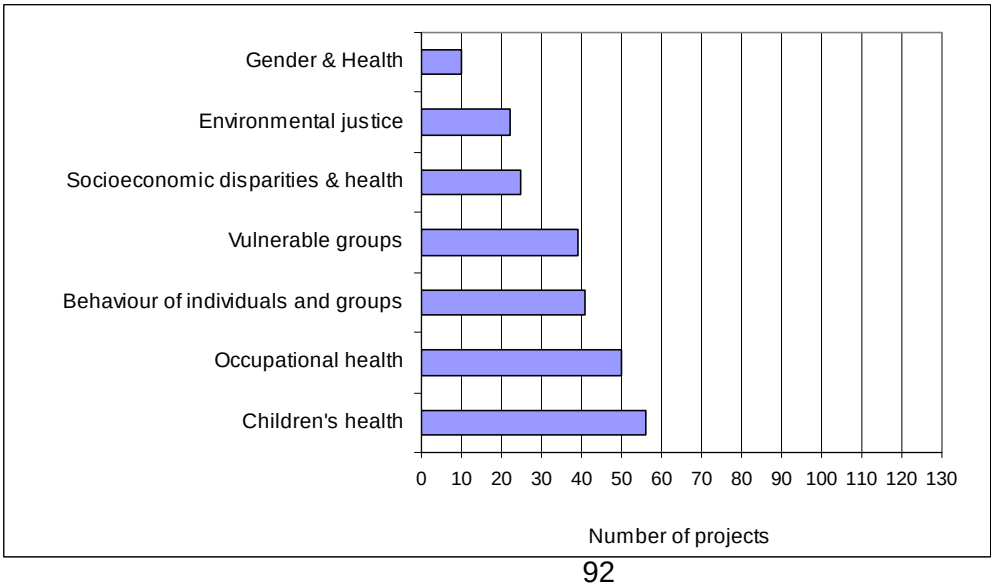
Figure 28: Number of E&H projects focusing on selected research "Methodologies"



Social aspects of E&H

With regard to **"Social aspects of E&H"**, the E&H research activities mostly deal with "Children's health" (56 projects, i.e. 12% of responses for all 461 projects), "Occupational health" (50 projects, 11%), "Behaviour of individuals and groups" (41 projects, 9%) and "Vulnerable groups" (39 projects, 8%). Other social aspects are recorded in a lower frequency, the lowest is "Gender & health" (10 projects, 2%) (see Figure 29).

Figure 29: Number of E&H projects focusing on selected "Social aspects of E&H"



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5.4 PROJECT OBJECTIVES, METHODOLOGIES, OUTPUTS AND SCIENTIFIC OUTPUTS (Q 20-22, Q 24)

In the same way as for the E&H programmes, the **"Specific objectives of the projects"** funded under these E&H programmes are very wide and related to environmental as well as health issues. The objectives of the projects are analysed together within the themes.

The **"Methodologies"** used within the projects vary depending on the project themes as well as the outputs of the projects. Descriptions of used "Methodologies" (see 1st Questionnaire, Q 21) are available for 309 projects in the ERA-ENVHEALTH research database. These descriptions are not presented in a uniform format and therefore it is difficult to make an objective comparison within the particular projects. Because of that only short examples of methodologies and methods used within the projects are provided in the next section. Further numerical and graphical comparisons are made for methodologies that have been selected as a specific topic of the projects (see 1st Questionnaire, Q 25.4). These comparisons can also help to provide an overview of the methodologies which the projects are dealing with.

Information about the various types of **"Scientific outputs of the projects"** is available for 139 of the 461 E&H projects in the ERA-ENVHEALTH research database. The majority is presented as examples (70 projects). In the case of 41 projects, the outputs are defined as reports. References for websites are provided for 20 and references for publications for eight projects.

The research theme "Themes related to human health aspects" was chosen as an example for the evaluation of the "Specific objectives of the projects", the "Methodologies" and the "Scientific outputs of the projects" because most projects deal with these themes. The results are presented according to the number of E&H projects focusing on selected "Themes related to human health aspects" (see Figure 25).

Outdoor air quality theme

The objectives of the projects related to the **"Outdoor air quality"** theme include the analysis of the impact of outdoor air pollution on human health, measurement of the exposure to air pollution and development of new tools and techniques for improved health protection against air pollution.

Examples of the **"Specific objectives"** of the projects in the outdoor air quality theme are:

- to collate, evaluate and summarise information on tools available for modelling ozone (O_3) formation and assessing impacts on human health and ecosystems,
- to investigate experimentally the physico-chemical determinants of nanomaterials toxicity in order to provide guidelines for the design, production and control of safer and sustainable industrial products,

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- to place information into a regulatory context including determining which bioaerosol components should be monitored to adequately assess potential impact of waste treatment activities,
- to identify the knowledge gaps and recommendations for further research,
- to evaluate the exposure to air pollution for cyclists compared to car users,
- to develop Environment Assessment Levels (EALs) for priority organic chemicals in ambient air for the protection of human health for use within H1 IPPC guidance[13] and permitting,
- to provide a comprehensive assessment of the likely health impacts of substances released to the environment from a range of combustion processes including burning a range of virgin and waste fuels,
- to carry out a review of the health impacts of the developments in waste management practices brought about by the implementation of the Landfill Directive and Waste Management Strategies,
- to derive screening thresholds or Environment Assessment Levels (EALs) for human health for use within guidance, covering the range of substances that could be encountered in PPC (Pollution Prevention Control) applications,
- to estimate the effect of daily changes in air pollution levels on morbidity,
- to evaluate the role of the synoptic conditions on NO_x concentration,
- to review recent landfill-related exposure assessment research and measure and assess the exposure to those emissions of people living and working nearby,
- to produce guidelines for the minimisation of air quality exposure impacts on areas of social deprivation,
- to analyse the prenatal and postnatal influence of exposure to environment contaminants (POPs, PFC, endocrine disruptors) on development of children,
- to analyse the combined effects of noise and air pollutants,
- to test whether increases specific lung inflammation markers and lung permeability alternation may be documented in response to acute ozone exposure,
- to identify the phenotypic and genotypic characteristics of the infectious form of *Pneumocystis sp.* and to determine the air fungal burden that can represent a risk of acquisition of the fungus by susceptible hosts
- to investigate the short-term effects of particulates and ozone using sensitive endpoints of cardiovascular abd respiratory responses in two susceptible segments of the population (children and elderly),

[13] IPPC Horizontal Guidance Note for Environmental Assessment and Appraisal of BAT

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- to explore the component-specific toxicity of particulates in association with meteorological conditions,
- to characterise the influence of male and female exposure to atmospheric pollutants, and on particular from road-traffic, on the probability of pregnancy of the couples (fecundability) and on the characteristics of the menstrual cycle,
- to investigate the consequences of exposure to irritating factors such as ozone (which is responsible for increasingly frequent pollution peaks) on the mechanisms of neurotransmission in the nucleus tractus solitarii (NTS),
- to clarify the attributable part of air pollutants emitted by the industrial sector,
- to build on the initial collaboration between bio-medical and environmental analytical sciences begun by Pearson and Tilby, by extending this further into toxicology and human health risk.

The examples of **"Methodologies"** and methods described for 53 "Outdoor air quality" projects are: samplings, measurements, detections, chemical analyses, analysis of synoptic conditions, statistical analysis, Fourier transform infrared (FTIR) spectroscopy, UV-Visible Multi-Axis Differential Optical Absorption Spectroscopy (MAXDOAS) and Brewer spectroscopy), emission model (MOHYCAN, CANopy), atmospheric dispersion modelling, global chemistry-transport model of the atmosphere, ambient modelling, assessment of the emission contamination, Environment Assessment Levels, environmental exposure, toxicology, measurements on young model trees in controlled conditions, health related environmental burden analyses, exposure assessment, toxicological assessment, assessing the potential for toxic effects on people, human biomonitoring, environmental epidemiology, population screening, evaluations of the medical condition, collections of medical and socio-economic records, environmental-medical epidemiological cross-sectional studies, dermatological tests (epicutanious test, Prick-test, judgement of the skin), allergological tests (blood parameter), lung function tests, regression analyses, questionnaires studies, random studies, statistical verification, literature reviews, consultations. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: Health impact assessment", "Exposure assessment", "Epidemiological studies", "Human biomonitoring", "Effect monitoring", "Modelling" and "Risk assessments".

From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Outdoor air quality" projects there is a prevalence of "Exposure assessment" methodology (used 32 times – 26%), the second most common is "Health impact assessment" (used 20 times – 16%) and the third most common is "Modelling" (used 19 times – 15%). Other frequent methodologies are "Epidemiological studies" and "Human biomonitoring". Less frequent methodologies used in "Outdoor air quality" projects are "Integrated risk assessments", "Standardisation/Harmonisation", "Effect monitoring", "Biomedical technology", "Cost/Benefit analysis in E&H" and "Risk communication". "Quality assurance & management" methodology is not a theme for any project (see Figure 30).

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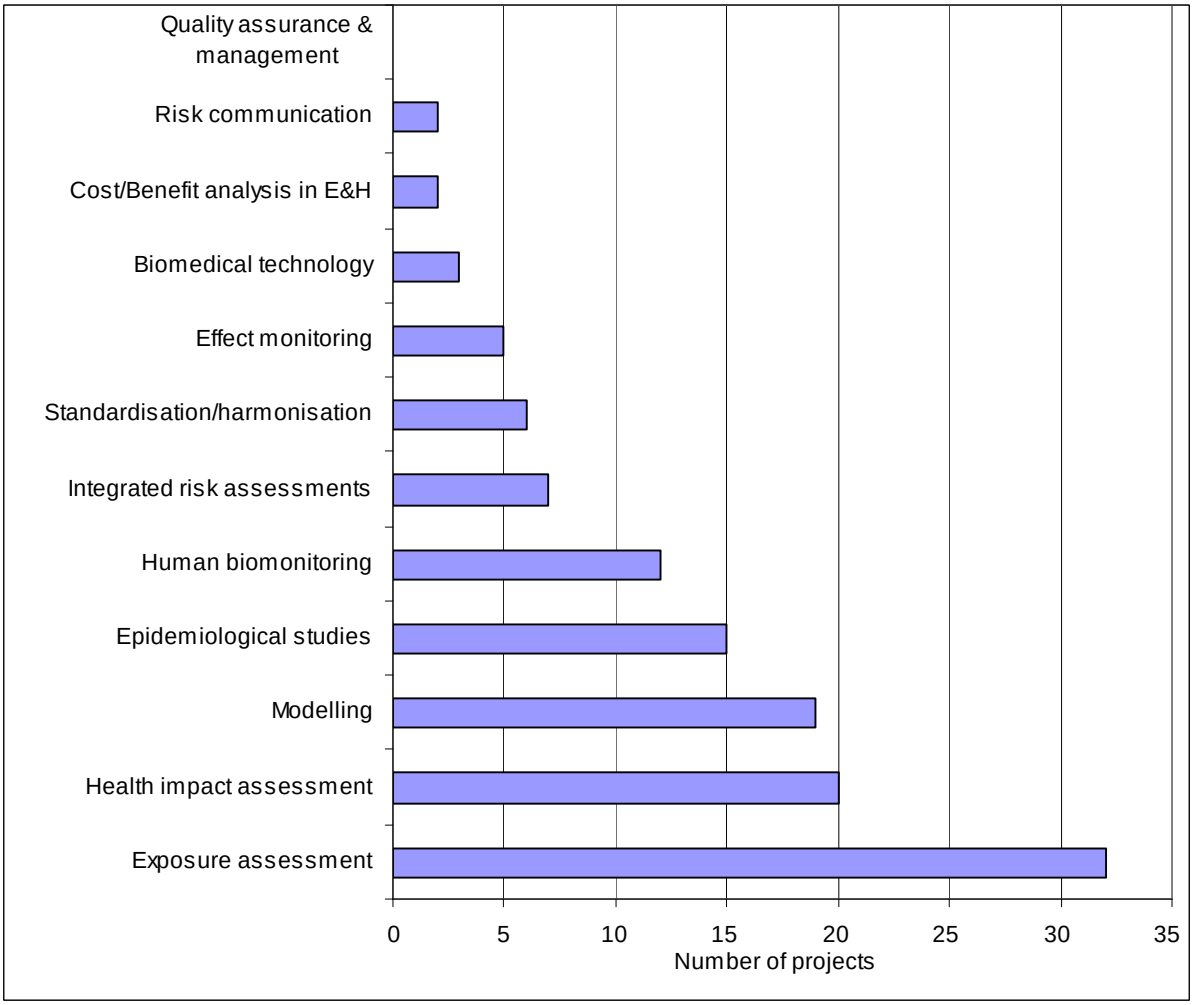
Figure 30: Number of "Outdoor air quality" projects according to the research theme "Methodologies"



Examples of the **"Specific outputs"** of "Outdoor air quality" projects are:

- the analysis of the influence of atmospheric pollutants due to road traffic on couples' fecundity,
- the identification of the pertinent markers of lung function perturbations in response to air pollutants and occupational exposure,
- the understanding of the mechanisms of ozone-induced lung inflammation detection,
- the extension of findings in epidemiological studies objective of which will be the follow-up of specific markers in exposed population,
- the lineation of the risk of *P.jirovecii* transmission and improvement of the rules of human pneumocystosis prophylaxis,
- the development of a website for Structure-Activity Relationships (SARs) which includes pedagogical tools, a discussion of the methods, the chemical kinetic datasets as well as their statistical analysis,

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- the assessment of the toxicological levels related to $PM_{2.5}$ harbour emissions, which are in transit to Cobh[14],
- the establishment of the existence of a link between poor air quality and high deprivation,
- the evaluation of the association between daily variation of UFPs and other air pollutants and respiratory and cardiovascular effects,
- three separate classification schemes for each of the air quality issues human health, eco-systems and amenities,
- the study of environmental exposure to dioxins and polychlorinated biphenyls and their negative impact on levels of gonadal hormones in newborns,
- distinct set of policy options that can be used to promote a modal shift to cycling and substantially improve public health in a cost-efficient manner while taking in account the physical capabilities of different groups and spatial constraints in different regions,
- various chemical data sets, results of data analyses/interpretation, modelling results of fine particle and biogenic aerosol formation and growth, new particulate oxidation products from BVOCs useful for source apportionment, assessment of the contribution from BVOCs to the organic aerosol,
- experience with Health Impact Assessment (HIA).

Examples of **"Scientific outputs"** of "Outdoor air quality" projects are:

- The project "SEQAP study: air quality perception and representation by the French population" concludes that "objective pollutant measures and PAQ[15] score are linked, suggesting a pretty good coherence between real and perceived pollution".
- The initial ICP-MS (inductively coupled plasma mass spectrometry) analysis carried out by the project "Modelling and measurement of Cd exposure and pathology in human volunteers living in proximity to a smelter source" demonstrates "increased metal concentration (e.g. Fe, Mg, Mn, Ti, Ni, Cu, Zn) with increasing particle size category with the exception of Pb and Cr where concentrations were highest in the smallest size fraction".
- The project "Endotoxin emissions from commercial composting activities" predicts the concentrations of fungi, bacteria and endotoxins around the facility using a dispersion model and states that "the 250m risk assessment threshold is conservative for endotoxins but not stringent enough for *Aspergillus*".
- The project "Physico-chemical characterisation and biological effects of fine and ultra fine airborne particulate fractions of the urban aerosol" shows that "the biometrologic analysis of ultrafine particles found in lungs of urban people revealed that they

[14] Seaport town in County Cork / Ireland
[15] Patient-Answered Questionnaire

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exhibited similar form features and mean surface than ultrafine particles sampled in air".

- The project "Health burden caused by chrome and nickel in the airborne particles in stainless steelwork environments" states that "the incorporation of nickel via breathable air shows a significant coherence with the inner nickel contamination and the sensitisation towards nickel, single allergic symptoms and respiratory diseases. Even the contribution of the atmospheric contamination towards the increase of the inner nickel contamination is small (compared to the food contamination), the contribution still can be identified".

Local/living environment theme

The objectives of the projects related to the **"Local/living environment"** theme include the investigation of the impacts of different environmental factors on human health, identification of relationships between environmental factors and human health and quantification of the various exposures.

Examples of **"Specific objectives"** of projects in the "Local/living environment" theme are:

- to determine whether a dose-response relationship exists between vibration and the human response when exposed to it in a residential data and social study information,
- to test and extend national and international test methods in order to appraise building products according to the assessment scheme of the Committee for Health-related Evaluation of Building Products (AgBB scheme),
- to assess the associations between the school environment and child respiratory health and to make recommendations to improve the quality of the school environment,
- to draw together the literature that addresses how the state of the environment affects human health,
- to explore the connections between the environment and the human health interface,
- to investigate the health effects associated with the atmospheric degradation of polycyclic aromatic hydrocarbons (PAHs),
- to determine the yield of Secondary Organic Aerosol (SOA) produced from the atmospheric degradation of PAHs,
- to identify policy relevant information on exposure to environmental hazards, its determinants and health effects, as well as information for policy evaluation,
- to practically test the existing odour measurement procedure and to integrate it into the AgBB-scheme,

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- to examine the prevalence of MRSA[16]-ST398 by residents of pig and fowl mast grounds for the first time,
- to document the extent, the distribution, and the determinants of exposure to environmental pollutants,
- to determine the exposure of the general population to glycols and glycol ethers and some exposure routes,
- to quantify the daily personal exposure to particulate air pollutants of individuals living and working in different areas of Dublin and in its satellite towns,
- to identify the species of causative agents of imported parasitic diseases, based on causative agents, which are able to spread also under the Slovak conditions,
- to evaluate the processes related to genotoxic and non-genotoxic on cancerogenesis into mammalian cellular cultures exposed to EMFs used in cellular telephony,
- to analyse the impacts of airborne contact allergens (TYP IV-allergens) on the emergence of contact dermatitis,
- to quantify the health damages from air pollution using the Cost Of Illness (COI) and Contingent Valuation Method (CVM) among school children,
- to examine the relevance of isotopic analysis at a large scale and for various situations,
- to determine chlorinated organic compounds (PCB, DDT, DDE, HCHs, HCB) in serum samples of the French general population,
- to initiate a special radiation protection measure for the staff of a radio-iodine therapy station.

The examples of **"Methodologies"** and methods described for 38 "Local/living environment" projects are: samplings, chemical analyses, measurements, detections and standardisations of pathogens by PCR from the biological material, determinations of immune parameters, occupational exposure assessments, assessments of toxicity, populations classification using the Index of Multiple Deprivation, pulmonary function measurements, exposures of animals to fibre dusts, cigarette smoke, controlled human exposures, patients physical examinations, clinical and biochemical analytical methods, immunochemical analysis, analysis of health, epidemiological analysis, cohort studies, epidemiology, immunology, case studies, cross-sectional studies, using of Geographical Information System, literature reviews, telephone surveys, questionnaires studies, statistical verifications, consultations. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Health impact assessment", "Exposure assessment", "Epidemiological studies", "Human biomonitoring", "Effect monitoring", "Modelling" and "Risk assessments".

[16] Methicillin-resistant *Staphylococcus aureus*

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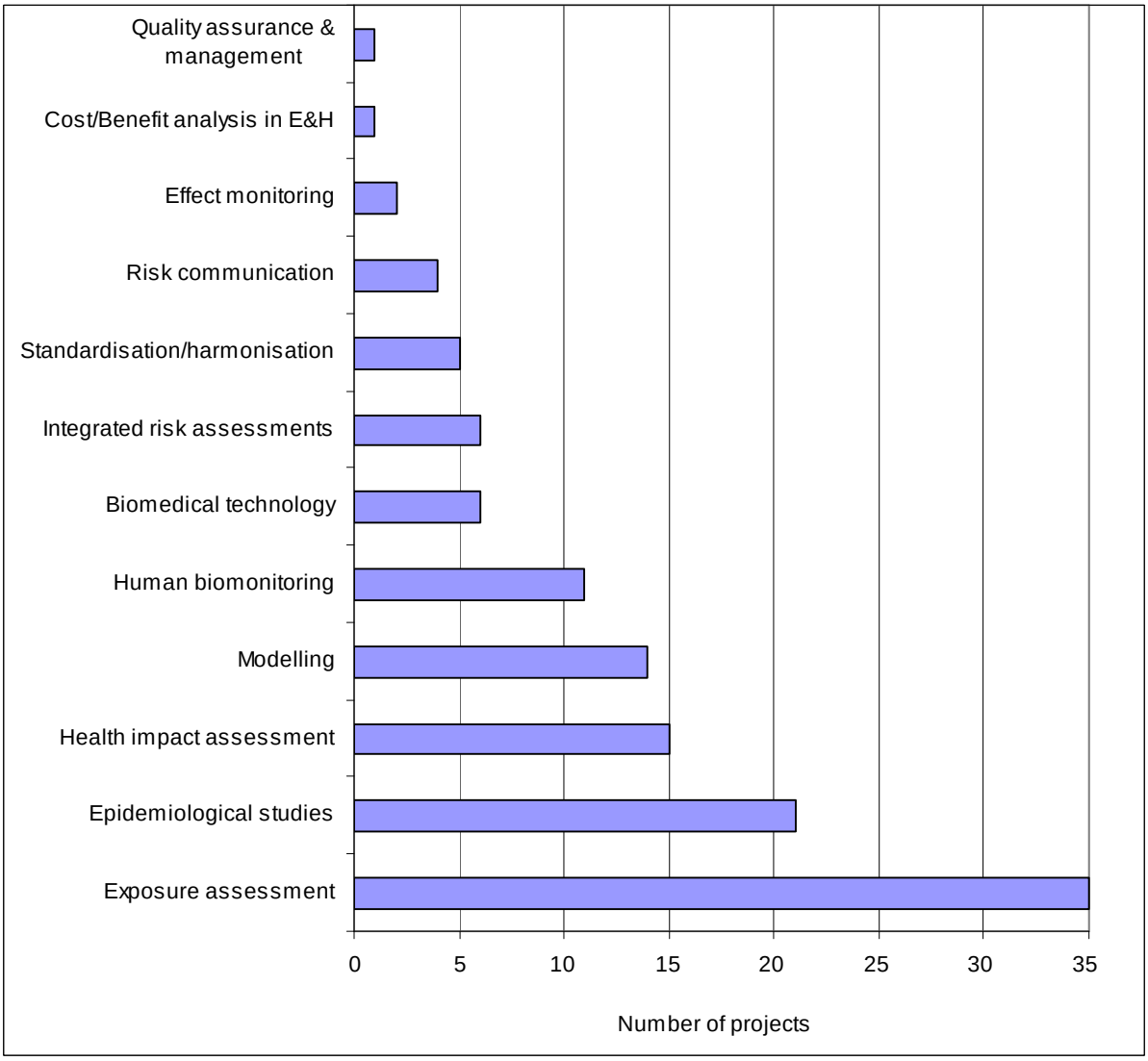
From the “Research themes of the projects – Methodologies” point of view it can be stated that in the case of “Local/living environment” projects there is a prevalence of “Exposure assessment” methodology (used 35 times – 29%), the second most common methodology is “Epidemiological studies” (used 21 times – 17%) and the third most common methodology is “Health impact assessment” (used 12 times – 12%). Other frequent methodologies are “Modelling” and “Human biomonitoring”. Less frequent methodologies are “Biomedical technology”, “Integrated risk assessments”, “Standardisation/Harmonisation”, “Risk communication”, “Cost/Benefit analysis in E&H” and “Quality assurance & management” (see Figure 31).

Figure 31: Number of “Local/living environment" projects according to the research theme “Methodologies”



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Examples of **"Specific outputs"** for "Local/living environment" projects are:

- a tool for the definition of public policies in the domain of primary lead poisoning prevention, in particular for the definition zones where surveillance should be reinforced,
- the guidance and examples of health impact assessments, showing the potential health benefits of policy actions and interventions aimed at reducing exposure to environmental risk factors
- the high number of publications,
- the perceptions and attitudes of residents and local stakeholders,
- learning what works from existing initiatives targeting areas of disadvantage,
- the information on web sites,
- the information sheet with environmental risk factors,
- the workshop at the end of the project,
- the core set of indicators, selected on the basis of relevance and availability of data, describing environmental exposures, health effects and policy measures for these issues,
- country information for the 53 Member States of the WHO European Region,
- an overview of policies on core issues, at both national and international level, and topic-based comparative policy assessments across 18 countries,
- methodological guidance on the core set of indicators, to facilitate harmonisation and dissemination of methods used within ENHIS and validated by international experts,
- the analysis of 53 questionnaires completed by people at Sutcliffe Park, an urban green space in Greenwich, clearly show how the environmental enhancements provide health benefits.

The examples of **"Scientific outputs"** for "Local/living environment" projects are:

- The project "Labelling of building materials – a combination of emission tests with odour tests" finds out that "the sensed odour intensity of the tested materials in the CLIMPAQ[17] is rated higher than in the Tedlar-containers. It was noticed that in the CLIMPAQ which was used until know the perfusion was irregular. The perfusion was optimised with the help of a laminarisator in the inflow area. In two out of four samples the CLIMPAQ-values showed by trend a smaller concentration than the 23-liter-chamber-values".
- According to the "German Environmental Survey for Children (GerES IV)", the most important result are: "the extent, the distribution, and the determinants of exposure of

[17] Chamber for Laboratory Investigation of Materials, Pollutions and Air Quality (test chamber)

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children to environmental pollutants is documented; spatial and temporal differences in population exposure have been shown; the contribution of different environmental compartments (air, water, food) to the body burden (blood, urine) was examined. Data served as a basis to derive reference values and to generate information for the development of strategies to prevent and reduce exposure".

- The project "Exposure and effects of the general population to acrylamide and aromatic amines" states that this exposure "is detectable by biological monitoring. The comparison of biological monitoring data and questionnaire discovered the inability of a correct estimation of dietary acrylamide intake by questionnaires".
- The project "Exposure of the general population to glycols and glycol ethers" states that this exposure "is detectable by biological monitoring. The indoor exposure in rooms cleaned with glycol ether containing cleansing agents could be a relevant source of this exposure".
- With regards to the project "The role of moulds in the development of environmental and occupational airway allergy", it is stated that "the association between exposure to fungi at flats and the development of fungal allergy has not been documented in our study. The incidence of allergy to α-amylase increases with the duration of exposure. Hypersensitivity to common allergens, especially to moulds is a risk factor of occupational allergy to α-amylase. The obtained results confirm that skin prick tests to common allergens especially to moulds should be performed in bakers before starting occupational exposure and subjects with positive results of that tests should be considered as a group of high risk of occupational allergy".

Water quality & supply theme

The objectives of the projects related to the **"Water quality & supply"** theme include the analysis of the impact of agents in drinking water on human health, the assessment of health effects of bathing water according to agents contained in bathing waters and the development of tools and practices for better water management.

Examples of the **"Specific objectives"** of projects in the "Water quality & supply" theme are:

- to investigate the association between drinking water hardness and cardiovascular mortality in areas that had experienced a stepped change in water hardness, calcium or magnesium levels,
- to analyse bathing waters regarding the five most important blue-green algae toxins and other relevant water quality parameters,
- to evaluate the health effects on bathing people and the use of the waters as bathing waters,
- to test the hypothesis that the concentration of THM in drinking water supplies correlates with the rate of adverse pregnancy outcomes,

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- to develop the cooperative and precautionary management strategies for reducing the contamination of water bodies with pharmaceuticals for human use,
- to quantify the impact of climate change on high-/low-level of groundwater table,
- to review existing data on concentrations of iodinated DBPs (Dibutyl phthalates) in drinking water, identifying any key factors that give rise to high concentrations of iodinated DBPs,
- to analyse the exposure of anglers to perfluorinated compounds after the consumption of fishes from lakes and rivers,
- to monitor the inhabitants after consumption of PFT-contaminated drinking water,
- to evaluate the survival of *Cryptosporidium (C.) spp.* oocysts in aquifers and environmental recreational water,
- to propose analytical tools to the stakeholders of water management which could identify the origin (human or animal) of faecal contamination,
- to use cyanobacteria to develop biosensors that can detect and quantify the bioavailability of various substances in water bodies, especially phosphate and nitrate in order to develop, in the long term user-friendly kits for measurement of various substances on the natural environment,
- to develop techniques for the tracing of faecal contaminations and for the characterisation of the dissolved organic matter and in order to propose an operational tool usable to differentiate pollution sources, from their point of emission until the final receiving medium constituted by the littoral environment,
- to identify by both external measurements (in French rivers and treated waters that produce drinking water) and internal measurements (in breast milk and in adipose tissue) the human exposure of chlorinated BPA (Bisphenol A) and NP,
- to explore the impact of UV-irradiation on the short - and long-term concentrations of disinfection by-products,
- to develop a chemical multi-sensor, able to detect low levels of chlorine, chloramines and chloroform contents in air and to discriminate between the various pollutants,
- to identify the transformed products which could reach the distribution networks of drinking water and to characterise those which cause the most concern for human health,
- to estimate the risk of human leptospirosis associated with the presence of coypus in wetlands,
- to increase the general knowledge on the modification that will experience the Nanoparticles (NPs) in aquatic systems and soils for a better understanding of their potential harmful effects on organisms,

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- to assess such a microbiological-risk by developing biological tools for studying the water microorganisms changes under the pressure of organic pollutants,
- to analyse the prenatal and postnatal influence of exposure to environment contaminants (POPs, PFC, endocrine disruptors) on development of children,
- to monitor the *V. vulnificus* at coastal bathing sites.

The examples of **"Methodologies"** and methods described for 40 "Water quality & supply" projects are: samplings, chemical analyses, measurements, detections, membrane filtrations, isolations on TCBS-Agar[18], identification of different vibrios, molecular analysis, in vitro toxicity testing with fish cells, teledetections, spatial and geographical analysis in order to study the interaction between hosts, disease and the environment, assessments of the impact of waste water treatment plant effluent, risk assessments, human health risks from contaminated tap water assessment, exposure assessments, toxicological analysis, epidemiological studies, population screening, human biomonitoring, epidemiology, environmental epidemiology, birth cohort, literature review. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Health impact assessment", "Exposure assessment", "Epidemiological studies", "Human biomonitoring", "Effect monitoring", "Modelling" and "Integrated risk assessments".

From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Water quality & supply" projects there is a prevalence of "Exposure assessment" methodology (used 16 times – 24%), the second most common is "Human biomonitoring" (used 9 times – 14%) and the third most common are "Epidemiological studies" and "Health impact assessment" (used 8 times – 12%). Other frequent methodologies are "Modelling" and "Integrated risk assessments". Less frequent methodologies are "Risk communication", "Standardisation/Harmonisation", "Cost/Benefit analysis in E&H", "Effect monitoring" and "Quality assurance & management". "Biomedical technology" methodology is not a research theme for this group of projects (see Figure 32).

[18] Thiosulfate-citrate-bile salts-sucrose agar is a type of blood agar culture plate that is used in microbiology labs to isolate *Vibrio spp.*

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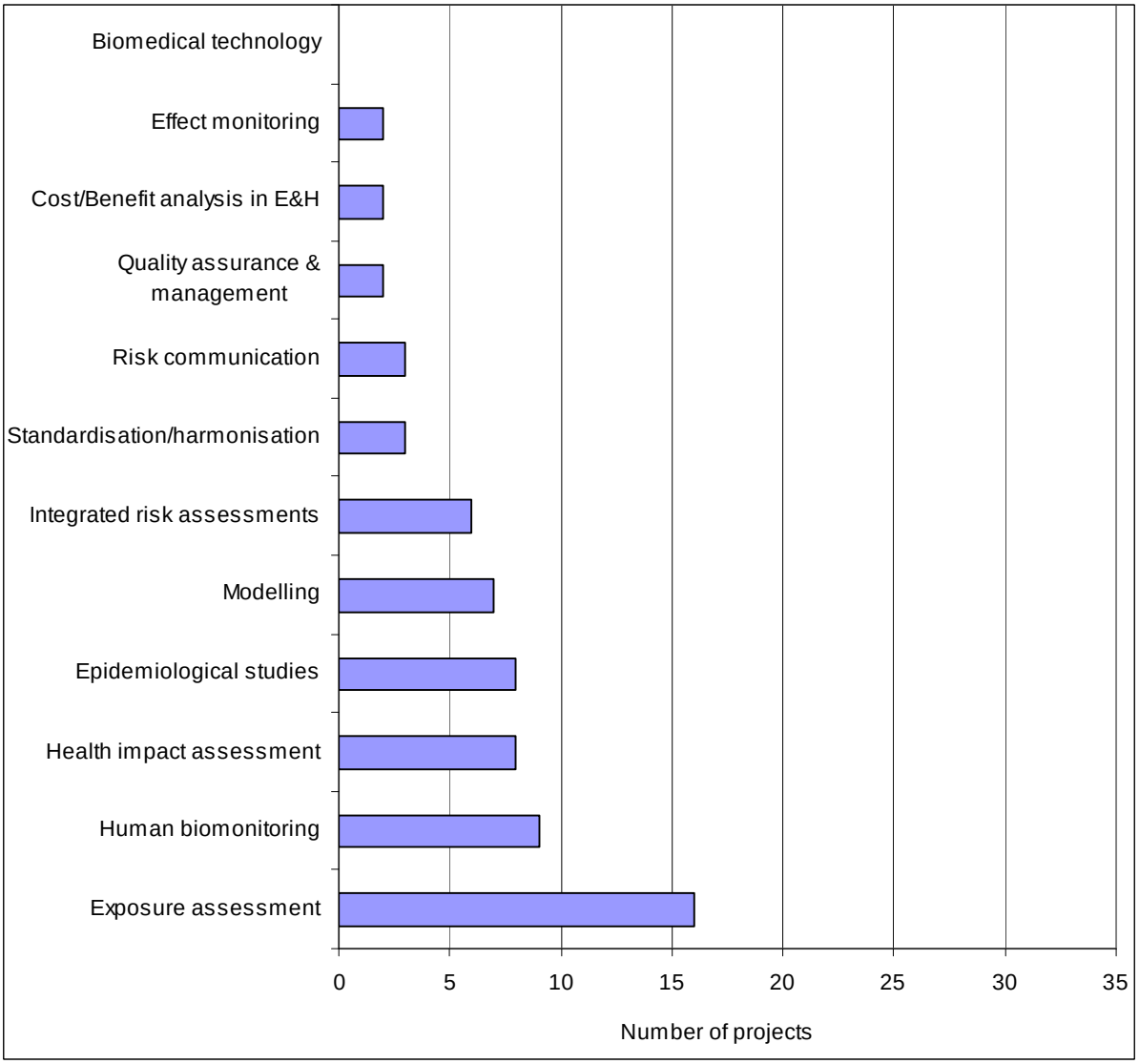
Figure 32: Number of "Water quality & supply" projects according to the research theme "Methodologies"



Examples of the **"Specific outputs"** of "Water quality & supply" projects are:

- toxicological studies which indicate that BMAA (beta-Methylamino-L-alanine) is a neurotoxin, although some experiments indicate that it has only a weak effect on systems concerned with the neurotransmitter glutamate,
- little evidence for a relationship between THM concentrations in drinking water and risk of congenital anomalies,
- user-friendly kits and information for better management of the environment according to the presence and the quantities of various toxic products,
- a better knowledge of oocyst survival at the level of aquifers and recreational waters, that will provide significant insight on the modes of human contamination and invaluable help for designing microbiological risk management,

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- tool for the management of catchment areas in France or within the European Union,
- a chemical multi-sensor, able to detect low levels of chlorine, chloramines and chloroform contents in air,
- interaction studies with major phases of soils and aquatic suspended matter, clay minerals, iron oxides and organic matter, to estimate the role of theses phases in the fate of the NPs,
- the number of publications,
- annual report of the NLGA[19] 2007.

The examples of **"Scientific outputs"** of "Water quality & supply" projects are:

- The project "Management Strategies for Pharmaceutical Residues in Drinking Water" brought following results: "first systematic exploration of options of action for reducing the contamination of water bodies with pharmaceuticals for human use, development of a transferable method for a systemic risk analysis, overview of the current contamination of waters with active pharmaceutical ingredients, empirical knowledge about the disposal behaviour of the population with regard to unused or expired medicinal products and subjective risk perception, development of a first general concept for a sustainable pharmacy, concepts for a problem specific risk communication".
- The project "Detection of enteropahtogenic viruses in surface waters" shows that "a laboratory method for detection of *Adenovirus* in surface waters was established. The detection limit is around 10000 Virusparticles per 10 l. Recovery rates vary strongly. They seem to depend on suspended particles and other unknown factors. A mean recovery rate of 30 % was achieved".
- The project "Identification and evaluation of selected pharmaceuticals and their metabolites in the water cycle" shows that "mammalian metabolites from pharmaceuticals may undergo transformations into hitherto unknown substances either by environmental metabolism or by oxidation during drinking water ozonation. The project investigated but only a few, however important pharmaceuticals".

Indoor air quality theme

The objectives of the projects related to the **"Indoor air quality"** theme include the analysis of the relationship between indoor air quality and human health and improvement of knowledge about the link between them, measurement of indoor exposure and development of new tools and techniques, which can help improve impacts of low indoor air quality.

Examples of the **"Specific objectives"** of the projects in the "Indoor air quality" theme are:

- to define and validate new tools for qualitative and quantitative risk assessment, concerning healthcare workers exposed to airborne transmitted infectious agents,

[19] Governmental Institute of Public Health of Lower Saxony

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- to strengthen the scientific basis of actual personal protective equipment recommendations and improve theses recommendations,
- to evaluate whether prenatal exposure and indoor exposure are environmental risk factors,
- to assess the associations between the school environment and child respiratory health and to make recommendations to improve the quality of the school environment,
- to measure the part only owed to transport when the francilien[20] moves between residence and workplace during the most critical daily periods which are the rush hours,
- to practically test the existing odour measurement procedure and to integrate it into the AgBB-scheme (for the evaluation of constructing materials),
- to develop a biomolecular technique to detect contaminations of moulds in indoor rooms by using DNA-aptameres in biosensor or assays,
- to initiate a special radiation protection measure for the staff of a radio-iodine therapy station
- to determine the exposure of the general population to glycols and glycol ethers and some exposure routes,
- to analyse the lead exposure of the amateur marksmen and of cofactors,
- to analyse the exposure of the general population to alkylating agents,
- to analyse the impact of airborne contact allergens (TYP IV-allergens) on the emergence of contact dermatitis,
- to assess the exposure to selected pesticides of member of families working in agriculture and their children,
- to provide information about indoor air pollutants in hospital (biological and chemical contaminants) regarding patients and workers,
- to improve knowledge about the link between moulds contamination in houses and the health of their occupants (respiratory health, allergic and irritating symptoms),
- to measure indoor air concentration of more than 30 pollutants in 500 dwellings representative of 24 millions main residences in mainland France,
- to characterise link by a toxicological way, through searching and analysing inflammatory response in human cells relevant of respiratory system (epithelial cells and macrophages) in vitro exposed to formaldehyde,

[20] Resident of the “Ile de France” Region in France

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- to investigate chronic exposures of the human population by biocides substances by means of real-time monitoring of these products in a controlled environment simulating an indoor atmosphere,
- to measure the atmospheric concentrations (particulate and gas phases) of endocrine disruptors in the Ile-de-France area (PBDE's[21]/ TBBPA[22], PCB's, PAH's, Phthalates, Bisphenol A, Alkylphenols) and then to assess their biologic activities with a culture cell assay (cell line MELN),
- to set up a network to monitor individual exposures to carcinogenic substances in occupational field thanks to exposure indicators measurements, both in the atmospheric and in biological samples, in order to better estimate sanitary impacts in populations and to decrease the incidence of cancers linked with environmental factors
- to estimate the prevalence and the severity of COPD[23] (among others the GOLD[24] criteria will be used) using a questionnaire and spirometry,
- to estimate the exposure to air pollutants of adults living in rural environment,
- to study the relation between the concentration of contaminants inside homes and at work with COPD and intermediate phenotypes,
- to gain from each partners specific experience in various fields (measurements in specific living settings, controlled enclosure experiments, exposure assessment).

The examples of **"Methodologies"** and methods described for 40 "Indoor air quality" projects are: samplings, chemical analyses, measurements, detections, determination of immune parameters, cultivation and cultivation-independent methods, real time monitoring, methodologies from social epidemiology, health services research, social psychology, modelling ambient and indoor air quality, multilevel modelling, testing of building products, biological monitoring of environmental exposure, exposure of animals to fibre dusts, cigarette smoke, personal exposure, exposure assessments, occupational exposure assessment, human biomonitoring, population-based survey, epidemiological analysis, cross-sectorial epidemiological study, random study, comparative studies, policy interviews, questionnaires studies, literature review. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Health impact assessment", "Exposure assessment", "Epidemiological studies", "Human biomonitoring", "Biomedical technology", "Effect monitoring", "Modelling" and "Integrated risk assessments".

From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Indoor air quality" projects there is a prevalence of "Exposure assessment" methodology (used 35 times – 35%), the second most common is "Human biomonitoring" (used 13 times – 13%) and the third most common are "Epidemiological

[21] Polybrominated diphenyl ethers
[22] Tetrabromobisphenol A
[23] Chronic obstructive pulmonary disease
[24] Global Initiative for Chronic Obstructive Lung Disease

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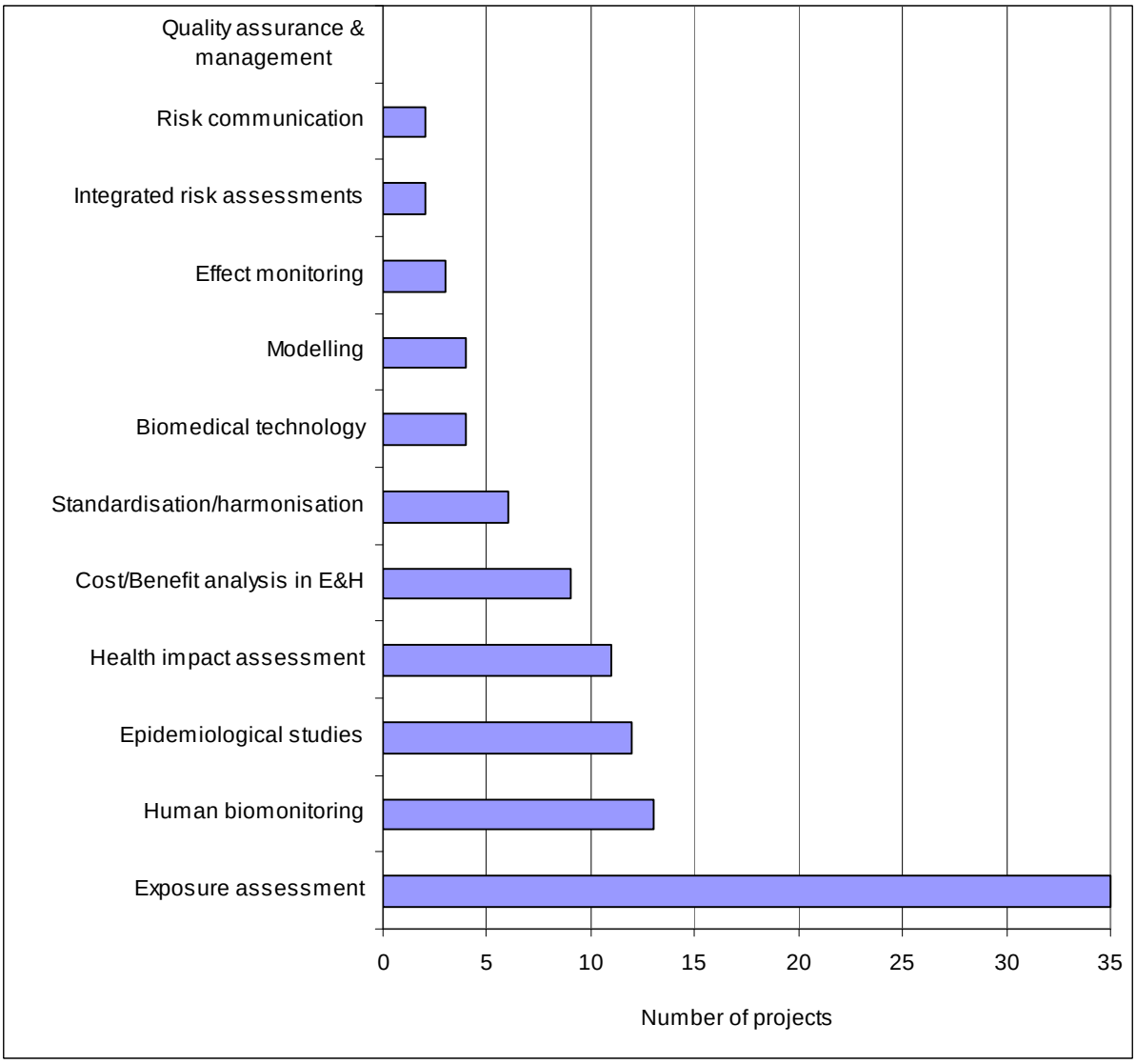
studies" (used 12 times – 12%). Other frequent methodologies are "Health impact assessment" and "Cost/Benefit analysis in E&H". Less frequent methodologies are "Standardisation/Harmo-nisation", "Biomedical technology", "Modelling", "Effect monitoring", "Integrated risk assessments" and "Risk communication". "Quality assurance & management" methodology is not a research theme for this group of projects (see Figure 33).

Figure 33: Number of "Indoor air quality" projects according to the research theme "Methodologies"



Examples of **"Specific outputs"** for "Indoor air quality" projects are:

- the forthcoming study, which will lead to the definition of a new risk-assessment strategy for airborne bacteria in the hospital environment and will bring some scientific basis for the use of PPE (Personal protective equipment) for healthcare workers,

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- the study, which will allow investigating multi-exposures to variables doses of air contaminants,
- the development of a fungal aerosols collection and analysis tool which could be used for epidemiological investigations,
- improvement of knowledge of the bond between the indoor fungal contamination and the health of the occupants,
- data intended to provide a sound basis for estimating in future steps people's exposure to nanoparticles,
- publications of the development of the various aspects of the model (Indoor Modelling; Outdoor Modelling; Activity Based Modelling; GIS Modelling),
- evaluation of the association between daily variation of UFPs and other air pollutants and respiratory and cardiovascular effects,
- toxicological arguments in favour of a contribution of formaldehyde to inflammatory lung diseases,
- the study, which is a part of a larger ambitious research programme "HOSPITAL AIR"

Examples of **"Scientific outputs"** for "Indoor air quality" projects are:

- The "National survey of indoor air quality in French dwellings - the French Indoor Air Quality Observatory" indicates that "volatile organic compounds are detected in 2.3% (2-butoxy-ethylacetate) to 100% (acetaldehyde, formaldehyde, hexaldehyde, toluene, m/p xylene) of dwellings. Concentrations inside 50% of dwellings are less than 20 µg/m³. Several maximum values exceed 100 µg/m³ or even 1 000 µg/m³ (two maximum values are greater than 4 000 µg/m³). The percentage of French dwellings in which contents of VOCs (apart from glycol ethers) are higher inside the dwelling than outdoors varies between 68.4% (trichloroethylene) and 100% (formaldehyde and hexaldehyde) […] Aldehydes are among the most frequent and most concentrated molecules in dwellings. Thus, these compounds are observed in 99.4 to 100% of dwellings depending on the compound, acetaldehyde, formaldehyde and hexaldehyde are observed in all dwellings. Concentrations in 50% of dwellings exceed values varying from 1.1 µg/m³ (acrolein) to 19.6 µg/m³ (formaldehyde). Indoor concentrations in 5% of dwellings are greater than values varying from 3.4 µg/m³ (acrolein) to 50.1 µg/m³ (hexaldehyde) […] Hydrocarbons are frequent (detection in 83 to 100% of dwelling depending on the compounds), and two hydrocarbons (toluene and m/p xylene) are observed in all dwellings. Concentrations in 50% of dwellings are higher than values varying from 1 µg/m³ (styrene and trichloroethylene) to 12.2 µg/m³ (toluene) […] Glycol ethers are relatively infrequent (detection in 2.3 to 85% of dwellings depending on the compound). Concentrations in at least 50% of dwellings are less than detection limits for 2-butoxyethylacetate and 1-methoxy-2-propylacetate. Indoor concentrations in 50% of dwellings are higher than 1.6 µg/m³ for 2-butoxyethanol and 1.9 µg/m³ for 1-methoxy-2-propanol. […] Contents of cat

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allergens (Fel d 1) and dog allergens (Can f 1) are less than the quantification limit in 50% of dwellings. […] For dust mite allergens, 50% of dwellings have contents higher than 1.6 and 2.2 µg/g for Der p 1 and Der f 1 respectively. […] Contents of particulate matter are higher than 19.1 µg/m³ for $PM_{2.5}$ and 31.3 µg/m³ for PM_{10} in 50% of dwellings. 5% of dwellings have concentrations higher than 133 µg/m³ for $PM_{2.5}$ and 182 µg/m³ for PM_{10}. 50% of dwellings have radon contents higher than 31 Bq/m³ in bedrooms and higher than 33 Bq/m³ in other rooms (with or without correction for seasonal variations). […] Gamma radiation is higher than 0.062 µSv/h in 50% of French dwellings and exceeds 0.1 µSv/h in 5% of dwellings".

- The "German Environmental Survey for Children (GerES IV)" shows that with respect to irritation of the eyes and the upper respiratory tracts in children "more than 20% of the children suffered from irritation of eyes, nose or throat within the last year. Indoor TVOC (total volatile organic compounds) level and living on a busy road were significantly associated with the occurrence of frequent symptoms". With respect to sensitisation against indoor mould fungi "8.3% of the children were tested positive for a sensitisation against at least one of the considered indoor fungi. Four of these fungi are not part of commercial test kits. 40% of these children did not show a sensitisation against allergens that are part of commercial allergen test kits. Spore counts and extent of visible mould were significantly correlated".
- The results of the "Investigation of the presence and potential health hazard of bacteria in indoor environments" demonstrate that "after moisture damage construction materials may have high concentration (between 1.8 x 10^4 to 7,6 x10^7 CFU/g[25]) of a diverse range of actinomycetes. Species belonging to the genera of *Streptomyces, Amycolatopsis, Nocardiopsis, Nocardia, Pseudonocardia, Saccharopolyspora* and *Promicromonospora* were most frequently isolated. However, *Streptomyces* were clearly the most frequently isolated genera of all of them".
- The output of the project on "Exposure and effects of the general population to acrylamide and aromatic amines" is that "the exposure of general population to arcylamide and aromatic amines is detectable by biological monitoring. The comparison of biological monitoring data and questionnaire discovered the inability of a correct estimation of dietary acrylamide intake by questionnaires".

Food safety theme

The objectives of the projects related to the **"Food safety"** theme include the analysis of relationship between food and human health and improvement of knowledge about the link between them, measurement of the exposure and exploration of the food allergy factors.

The examples of the **"Specific objectives"** of the projects in the "Food safety" theme are:

- to strengthen the area of environmental and food virology,

[25] Colony forming units per gram

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- to facilitate integrated approaches for tackling existing issues regarding food and environmental transmission of viral pathogens,
- to develop an integrated control strategy for two selected allergens, namely hazelnut and soy,
- to contribute to the risk assessment linked to the consumption of dietary supplements, para-pharmacy products and functional foods,
- to identify associations between factors of prenatal development and incidence of chronic degenerative diseases in population of adult age and to contribute to their efficient prevention,
- to assess the environmental exposure to methyl mercury within three groups of people with different levels of fish consumption,
- to continue in activities of the already established specimen banking as an important tool in medical and environmental research,
- to study the exposure of the adult human population to persistent polychlorinated dibenzodioxins, dibenzofurans and other compounds with dioxin-like toxicity,
- to study molecular mechanisms which play an important role in the development of food allergy in atopic children and the role of genetic polymorphism in genes for atopy,
- to identify possible associations between atopy and aberrant expression of selected cytokines,
- to analyse the exposure of the general population to alkylating agents,
- to exposure of the general population of North Rhine-Westphalia to perfluorinated compounds,
- to identify the incorporation of PFT after the consumption of PFT-contaminated fish,
- to determine the population-based exposure data for DEHP[26] and DINP[27], identify the relevant sources and exposure pathways for phthalates and clarify the human DEHP toxicokinetic,
- to follow the route of contamination and to find the source and the natural reservoir of the water associated pathogen *V. Vulnificus*,
- to gain greater knowledge about the quantity and the quality of the inclusion of arsenic compounds from pastry especially in meat and milk,
- to determine the exposure of the general population to glycols and glycol ethers and some exposure routes,

[26] Bis(2-ethylhexyl)phthalate
[27] Diisononyl phthalate

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- to determine the exposure of children in Germany to bisphenol A and phthalates,
- to quantify the level of *Norovirus* found in sewage influent, intermediate stages and effluent in a secondary treatment Waste Water Treatment Plant and identify the extent of *Norovirus* removal during sewage treatment,
- to determine the relative contribution of storm overflow discharges and continuous treated sewage inputs to *Norovirus* contamination in shellfisheries,
- to continue in activities of the already established specimen banking as an important tool in medical and environmental research,
- to bring together international experts from the fields of agriculture, plant science, toxicology, soil science, food science, health and risk perception to share knowledge and set the agenda for future multidisciplinary health-environment related research,
- to conduct an in-depth analysis and synthesis of the health risks and benefits of producing and consuming your own food in urban areas.

The examples of **"Methodologies"** and methods described for 27 "Food safety" projects are: samplings, measurements, detections, vapor atomic absorption spectrometry, biochemical and chemical analyses, extraction methods, clinical analyses, expertises relating to the whole environment-health cycle associated with urban food production and consumption, epidemiological evaluations, epidemiological studies, toxico-kinetic-survey, cohort studies, standardised methods, in vitro models, exposition modelling, exposure assessment, human biomonitoring, risk assessment, quantitative microbial risk assessment, in vitro model, risk assessment, modelling, hazard assessment, immunology, clinical examinations, human biomonitoring, population screening, epidemiology, reevaluation of data sets, questionnaires studies, literature review, communication. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Health impact assessment", "Exposure assessment", "Epidemiological studies", "Human biomonitoring", "Effect monitoring", "Modelling" and "Integrated risk assessments".

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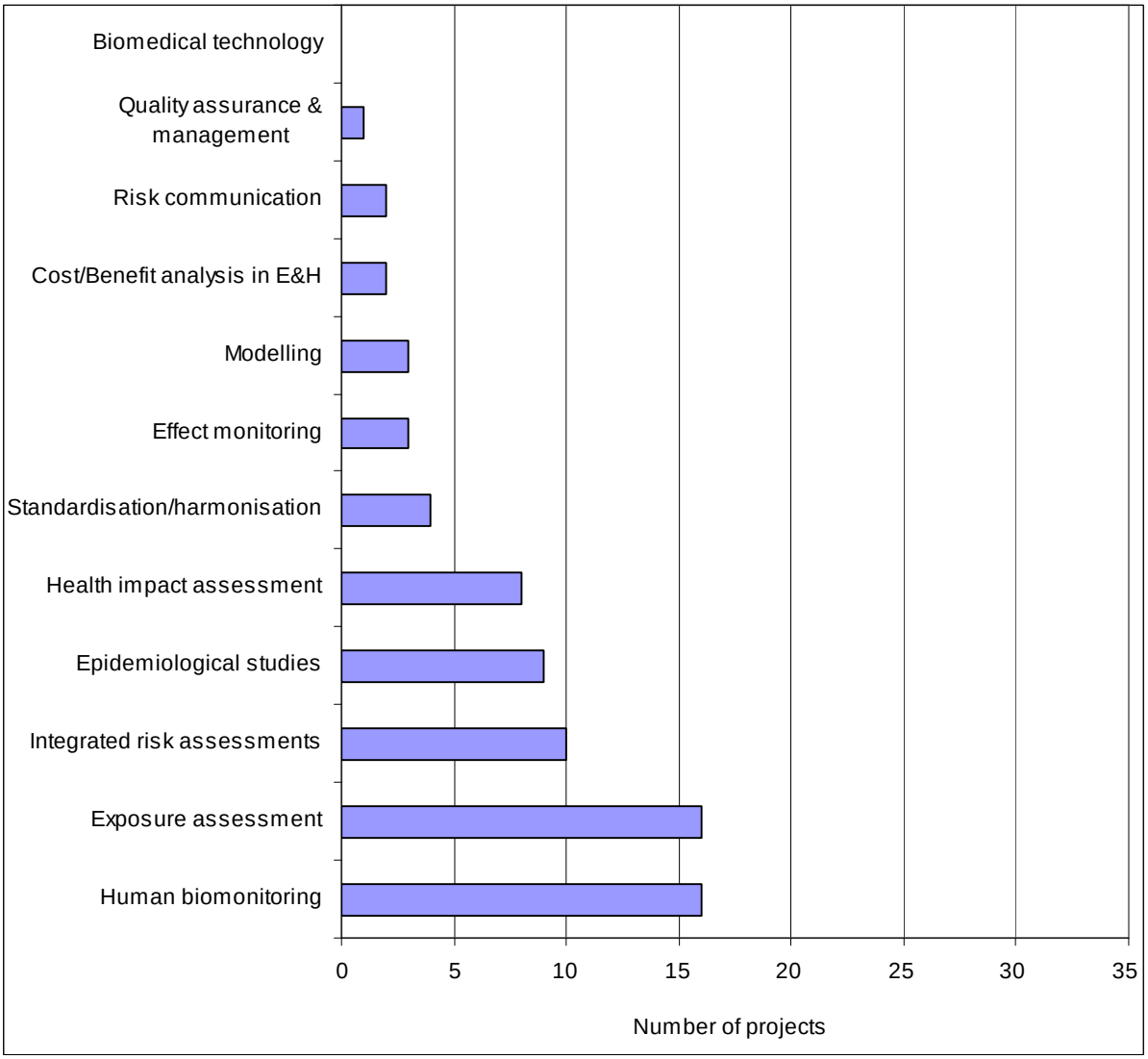
Figure 34: Number of "Food safety" projects according to the research theme "Methodologies"



From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Food safety" projects there is a prevalence of "Exposure assessment" and "Human biomonitoring" methodology (used 16 times – 22%), the second most common is "Integrated risk assessment" (used 10 times – 14%) and the third most common is "Epidemiological studies" (used 9 times – 12%). Another frequent methodology is "Health impact assessment". Less frequent methodologies are "Standardisation/Harmonisation", "Effect monitoring", "Modelling", "Cost/Benefit analysis in E&H", "Risk communication" and "Quality assurance & management". "Biomedical technology" methodology is not a research topic for this group of projects (see Figure 34).

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Examples of **"Specific outputs"** of "Food safety" projects are:

- a sensitive and robust real-time RT-PCR method for the detection of the acknowledged GGI[28] and GGII strains,
- the development of a network to identify the most important sources of NV and to present existing potential for emerging recombinant types,
- the determination of critical control points in the food producing plants,
- a database with exhaustive listing of dietary supplements, contaminants, food components and para-pharmacy products (their toxicology and beneficial effects),
- the evaluation of models for predicting plant uptake of chemicals from soil,
- a high number of publications,
- a report providing the first data set on NoV survival during sewage treatment and in the marine environment in an Irish setting.

Examples of **"Scientific outputs"** of "Food safety" projects are:

- The key findings of the project entitled "Environmental impact on health benefits of organic food production" are that "despite clear evidence of benefit from increased consumption of long chain n-3 fatty acids (EPA/DHA[29]) in relation to reduced risk of coronary heart disease, improved cognitive performance etc. there are very few data available to allow a direct comparison of the effects of organic versus conventional foods. There is evidence that organic milk and dairy products may have modestly higher α-linolenic acid contents but the effect is likely to be due to the increased use of forage in the diets of these animals, rather than organic production methods per se. In any event α-linolenic acid is poorly converted in the body to the bioactive n-3 EPA and DHA. Similarly with the trace element selenium, and despite its importance, there was a lack of data to allow a direct comparison of the effects of organic versus conventional foods. In relation to plant phytochemicals there is little indication of any meaningful differences in composition between organic and conventional foods. Dietary exposure to synthetic pesticides, herbicides and nitrates is likely to be significantly lower in organic foods compared with conventional foods, but the levels of most contaminants in both systems of production are more highly dependent on agronomic and other environmental factors. Furthermore there is little evidence that the concentrations of these contaminants commonly observed in conventional foods are associated with any adverse health effects. Thus conclusive evidence to support the claim that organic foods with lower concentrations of contaminants than conventional foods will result in better health is lacking. Similarly, comparisons of the amounts of mycotoxins in organic versus conventional foods gave inconsistent results. It was of particular note that nitrate in foods has often been regarded as toxic

[28] Genogroup I and II of *Norovirus*
[29] Eicosapentaenoic acid / Docosahexaenoic acid

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yet good evidence of a benefit to health of dietary nitrate was presented. Organic vegetables are often lower in nitrate than conventional counterparts".

- Key findings of "Grow your own - health risks and benefits of producing and consuming your own food in urban areas" show that "current risk assessment methods exaggerate risks of urban soil pollution (especially heavy metals and arsenic) and are based on soil contamination thresholds that are poor predictors of human exposure to toxins through own-grown food. Compelling evidence of major health benefits of fruit and vegetable consumption, physical activity and outdoor interaction with 'greenspace' in urban areas have emerged over the past few decades - all of which combine to give major potential health benefits from 'grow-your-own' (GYO). However, current risk assessments of GYO lack any consideration of these health benefits (which will often more than fully compensate the minor risks). The health and wider societal benefits of 'grow-your-own' reveal a fundamental flaw in risk assessment methodologies such as the Contaminated Land Exposure Assessment (CLEA) Model which is an inherently biased and over-cautious mechanism, causing unnecessary scares that negatively impact the general public (disproportionately to the real risk) and result in local authority allotments being closed or having to receive extremely expensive remediation treatments".
- The project "UK Network for Environmental and Food Virology" has strengthened the commitment to cooperative activity amongst key UK experts in the various disciplines involved (collaborative proposals have already been prepared by Network participants). Building this capacity will help to meet the challenges posed by pathogenic viruses which can be transmitted via the environment and by food.

Soil contamination theme

The objectives of the projects related to the **"Soil contamination"** theme include the analysis of the effects of toxic agents in soil on human health, measurement of various agents in soil and the development of new models for soil contamination studies.

The examples of the **"Specific objectives"** of the projects in the "Soil contamination" theme are:

- to study the toxic effects of NPs on bacteria, algae and cells, especially the problem of the fate of transformation of these NPs in soils or aquatic media,
- to assess the hazard/risk of chemicals to derive standards and assessment levels to support regulatory activities,
- to conduct an in-depth analysis and synthesis of the health risks and benefits of producing and consuming food in urban areas,
- to construct and validate an in vitro model of the human gastrointestinal tract capable of generating relevant bioaccessibility data on soil contaminants (both heavy metals and organic pollutants) within the intestinal tract,

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- to measure current environmental cadmium concentrations around the study site in soils, air, house dust and home grown vegetables for application within and validation of human exposure assessment models,
- to contribute to the development of a new test necessary for toxicity and teratogenicity determination of chemicals potentially harmful to humans,
- to determine the metabolites of organophsphates, chlorinated organic compounds and pyrethroids in urine samples of the general population,
- to analyse the exposure of the general population to alkylating agents,
- to review the available models for the accumulation of organic chemicals via the aquatic food chain and the soil food chain,
- to continue the development of tools to enable regulators in the Environment Agencies and local authorities, and others to evaluate whether the levels of a contaminant in soil pose a significant risk to human health for the current or intended land-use,
- to analyse the dynamics of the parasite in soil and water,
- to control the explosion of antibiotic resistances,
- to increase the general knowledge on the modification that will experience the NPs in aquatic systems and soils for a better understanding of their potential harmful effects on organisms,
- to clarify if the limit of the Drinking Water Ordinance, the WHO drinking water conductance, the toxicological evaluation of the BBodSchV values (Federal Ordinance on Soil Protection and Contaminated Sites) and the toxicological justified insignificance level for ground water are also adequately protected from the effects of the arsenic,
- to produce an updated version of the booklet Communicating Understanding of Contaminated Land Risks,
- to discover potential antibiotic resistances and their genetic environment within the genome and as a function of soil usage.

The examples of **"Methodologies"** and methods described for 18 "Soil contamination" projects are: samplings, measurements, detections, in vitro toxicity testing, in-vivo real-time imaging systems, multidisciplinary exploratory studies, epidemiological evaluation, disease ecology/epidemiology, biomedicine, microbiology, modelling, genomics and mathematical modelling, assessing the potential for toxic effects on people, exposure assessment, risk assessments, environmental assessment, consultancy review, literature review, communication. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Health impact assessment", "Exposure assessment", "Epidemiological studies", "Effect monitoring", "Modelling" and Risk assessment.

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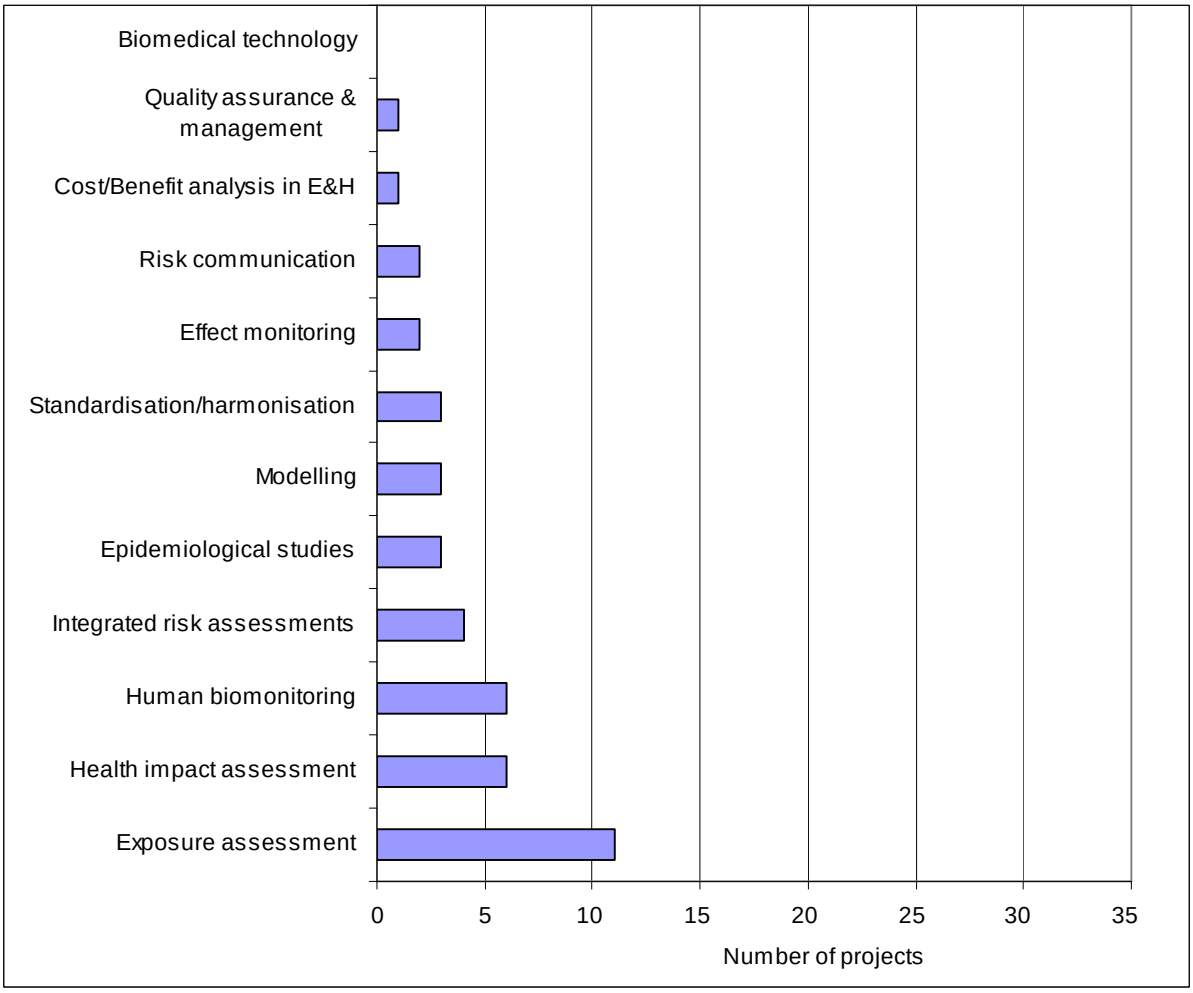
From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Soil contamination" projects there is a prevalence of "Exposure assessment" methodology (used 11 times – 26%), the second most common are "Human biomonitoring" and "Health impact assessment" (used 6 times – 14%) and the third most common are "Integrated risk assessments" (used 4 times – 10%). Less frequent methodologies are "Standardisation/Harmonisation", "Modelling", "Epidemiological studies", "Effect monitoring", "Risk communication", "Cost/Benefit analysis in E&H" and "Quality assurance & management". "Biomedical technology" methodology is not a research theme in this group of projects (see Figure 35).

Figure 35: Number of "Soil contamination" projects according to the research theme "Methodologies"



The examples of the **"Specific outputs"** of "Soil contamination" projects are:

- a predictive model for the local contamination of soils,
- knowledge about the transformation and fate of the NPs in soils and aquatic systems,

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- knowledge about the role of the environment in the emergence and dispersion of antibiotic resistance in order to manage the development of bacteria with multi-antibiotic resistance,
- inter-laboratory comparison of in vitro bio accessibility measurements for arsenic, lead and nickel in soil,
- human health toxicological assessment of contaminants in soil,
- number of publications,
- guidance booklet.

The examples of **"Scientific outputs"** of "Soil contamination" projects are:

- Findings of the project "Modelling and measurement of Cd exposure and pathology in human volunteers living in proximity to a smelter source" show that "measurements by ICP-MS (inductively-coupled-plasma mass-spectrometry) indicated the smelter as a major source of metal pollution of the rural soil (collected over 15 km grid) and the urban soil and house dust (collected over 3 km grid). A significant correlation was found between modelled Cd deposition and measured Cd concentrations in both soils. Metal concentration in house-dust were correlated with metal concentration in garden soils from the same households, although high variation suggested an additional Cd source for dust (probably smoking)". The results also suggest that "Cd affects carbon utilisation via the mitochondria resulting in the development of oxidative stress associated pathology. While smoking (and associated Cd exposure) could explain some of the observed metabolite changes, some biomarker responses were significantly correlated with urinary Cd exposure even when the effects of smoking was accounted for. This is the first time, to our knowledge, that effects of environmental exposure on health indicators have been demonstrated in human cohort".

Transport theme

The objectives of the projects related to the **"Transport theme"** include the analysis of factors connected with transport on human health, calculation models concerning environment and traffic and the study of different means of transport in connection with human health.

The examples of the **"Specific objectives"** of the projects in the "Transport" theme are:

- to analyse the risks and benefits of a modal shift from passenger cars to cycling,
- to measure the part only owed to the transport when the francilien[30] moves between residence and workplace during the most critical daily periods,
- to contribute new information that can be used for quantitative risk assessment regarding air pollution,

[30] Resident of the "Ile de France" region in France

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- to extend and verify the existing calculation models, which is supposed to give information about the effectiveness of active noise control measures by the use of larger forest areas,
- to realise a common calculation model regarding the topic environment and traffic (main focus: road traffic), which can take into account current and future issues in this area and which offers a mutual base for all relevant application areas,
- to analyse the exposure-response relationship of the association between traffic noise and cardiovascular diseases,
- to analyse the combined effects of noise and air pollutants,
- to analyse the hypertension and exposure to noise near airports,
- to develop and apply the method for ambient and biological monitoring of tricresylphosphates to pilots and plane service staff,
- to compile the current state of knowledge on the social distribution of environmental exposure in Germany,
- to analyse the exposure of the general population to alkylating agents,
- to quantify health damages in the Tel Aviv metropolitan area from air pollution among school children,
- to identify policy relevant information on exposure to environmental hazards, its determinants and health effects, as well as information for policy evaluation.

The examples of **"Methodologies"** and methods described for seven "Transport" projects are: sampling, analytical chemistry, radiation dosimetry, biochemical and immunological and genetic analysis, species identification of selected parasites from foreigners and native citizens coming from tropical and sub-tropical or other countries (coprodiagnosis, smears, staining methods), environmental exposure of the general population, epidemiological evaluation, epidemiology, population screening, human biomonitoring, literature review. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Human health assessment", "Exposure assessment", "Epidemiological studies", "Modelling", "Human biomonitoring", and Risk assessment.

From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Transport" projects there is a prevalence of "Exposure assessment" and "Epidemiological studies" methodologies (used 8 times – 19%), the second most common is "Health impact assessment" (used 7 times – 17%) and the third most common is "Human biomonitoring" (used 6 times – 14%). Other methodologies used are "Modelling", "Integrated risk assessments", "Risk communication", "Biomedical technology", "Cost/Benefit analysis in E&H", "Effect monitoring" and "Standardisation/Harmonisation". "Quality assurance & management" methodology is not a research theme in these projects (see Figure 36).

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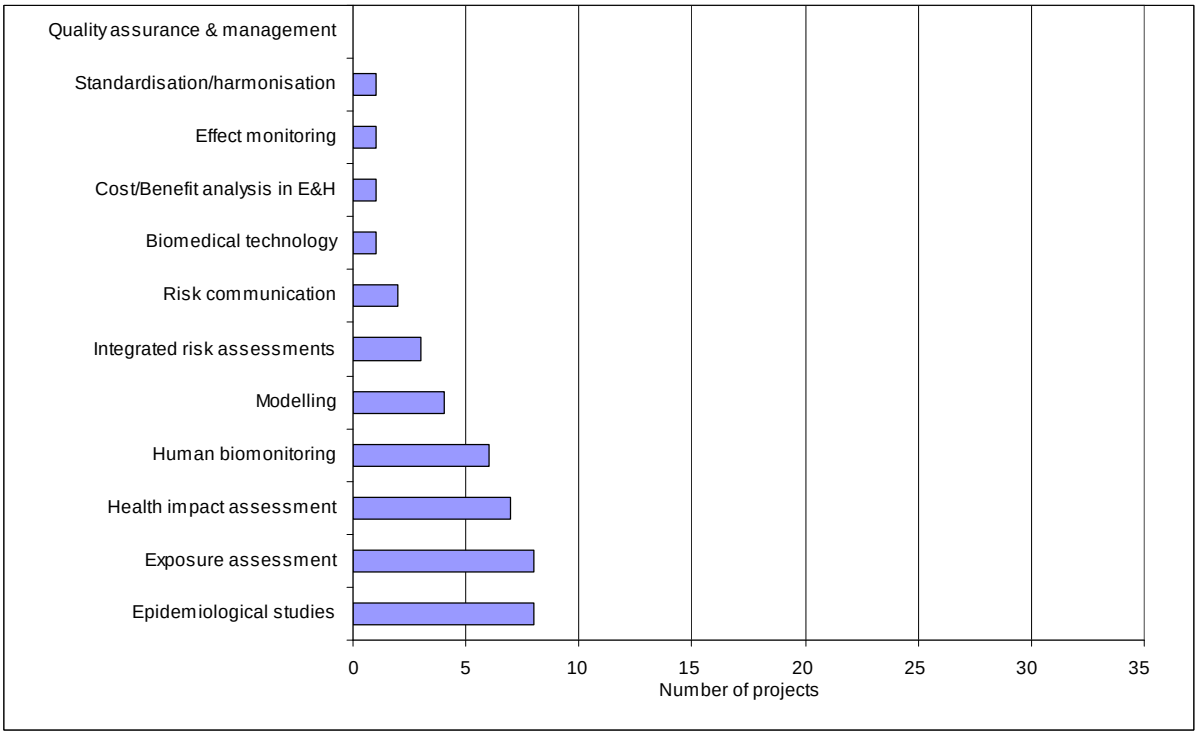
Figure 36: Number of "Transport" projects according to the research theme "Methodologies"



The examples of the **"Specific outputs"** of "Transport" projects" are:

- the results for individuals considering giving up sedentary transport in favour of cycling by providing clear insights in the individual health benefits such as a decreased risk for cardiovascular disease, hypertension, obesity, a better overall physical condition and risks encountered,
- the results for policy-makers promoting cycling to prevent chronic diseases in an aging population, to reduce air pollution by cars and to reduce CO_2 emissions by highlighting non-marginal changes (e.g. infrastructure),
- the tools for the management of catchment areas within the European Union,
- number of publications,
- set of indicators, selected on the basis of relevance and availability of data, describing environmental exposures, health effects and policy measures for these issues,
- a series of indicator-based assessments, providing an analysis of core issues across the Region,
- country information for the 53 Member States of the WHO European Region an overview of policies on core issues, at both national and international level, and topic-based comparative policy assessments across 18 countries
- methodological guidance on the core set of indicators, to facilitate harmonisation and dissemination of methods used within ENHIS and validated by international experts

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- guidance and examples of health impact assessments, showing the potential health benefits of policy actions and interventions aimed at reducing exposure to environmental risk factors,
- set of policy options that can be used to promote a modal shift to cycling and substantially improve public health in a cost-efficient manner while taking in account the physical capabilities of different groups and spatial constraints in different regions.

The examples of **"Scientific outputs"** of "Transport" projects" are:

- In the case of "Environmental justice in Berlin – development and implementation of an applicable conception to analyse the (urban-)territorial spreading of environmental burden" it can be shown that "because of the GIS-supported methodology there is the possibility to small-scale regionalise the different data sets of the single topics or rather bring them together on a shared territorial reference".
- the project "Analyses of the contributions of environmental policy and ecological modernisation to the improvement of quality of life in Germany and further development of the conception of ecological justice" indicates that "the exposure to traffic-related air pollution is higher in socially deprived people in Germany. The subjective annoyance by noise and especially by traffic noise in the residential area is higher in persons of lower social position".

Climate change theme

The objectives of the projects related to the **"Climate change"** theme include the investigation of elements in the atmosphere and their impact on human health, the assessment of these health impacts and the identification of possible responds to the risk of climate change impact on the increase of diseases.

The examples of the **"Specific objectives"** of the projects in the "Climate change" theme are:

- to detect ticks as a transmitter of so called natural source infections at selected sites and by analysing the climatic means identify the correlation with it,
- to evaluate adaptation measures across sections and protected properties from an economic point of view and to prioritise adaptation measures with the help of a cost-benefit-analysis,
- to evaluate the role of the synoptic conditions on NO_x,
- to assess likely environmental changes, based on the climate projections, along with measures of uncertainty,
- to measure how stakeholders and other end-users may respond to the risk of future climate change on disease and to develop a discussion document of climate change impacts on chemical and pathogen risks,

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- to assess the impact of terpenes on tropospheric ozone and organic aerosols at the global scale,
- to determine the impact of the reactions of organic oxygenated compounds in the upper troposphere,
- to characterise BVOC emissions at the global stand level during different phenological periods in the growing season, and
- to explore the potential for analysing ozone and heat effects by spatio-temporal disaggregation of mortality data linked to similarly resolved pollution and meteorological data,
- to do survey on climate change induced health-related adaptation measures,
- to detect FSME-viruses in ticks and calculate the prevalence in a non-risk area with particular autochthonal human FSME-infections,
- to change of cognition of nature conservation within the pubic and policy as well as improvement and acceptance of nature conservation,
- to integrate nature conservation aspects within the health sector and the other way round,
- to study of the formation mechanisms of secondary organic aerosol (SOA) from isoprene and other BVOCs, assessing their role in particle formation and growth, examining the relative importance of homogeneous photo-oxidation and multi-phase processes, and modelling of the processes involved,
- to identify particulate-phase oxidation products of isoprene and other BVOCs, which can be used as indicator compounds for source apportionment, and development/deployment of novel analytical techniques thereby,
- to determine the contribution from the BVOCs to the organic aerosol for various sites in Europe,
- to assess the potential impacts of climate change on the risks of agricultural pathogens and contaminants to human health
- to quantify the impact of climate change on high-/low-level of groundwater table,
- to reveal capabilities and limitations of groundwater management to counterbalance the impact of climate change on groundwater resources,
- to develop strategies for action in regional water management because of alterations in groundwater table and resources due to climate change.

The examples of **“Methodologies”** and methods described for 19 “Climate change” projects are: sampling, measurements, determinations, species identification of selected parasites from foreigners and native citizens coming from tropical and sub-tropical or other countries (coprodiagnosis, smears, staining methods), climate change models, climate scenarios; water balance modelling and unsteady groundwater modelling, global chemistry-transport

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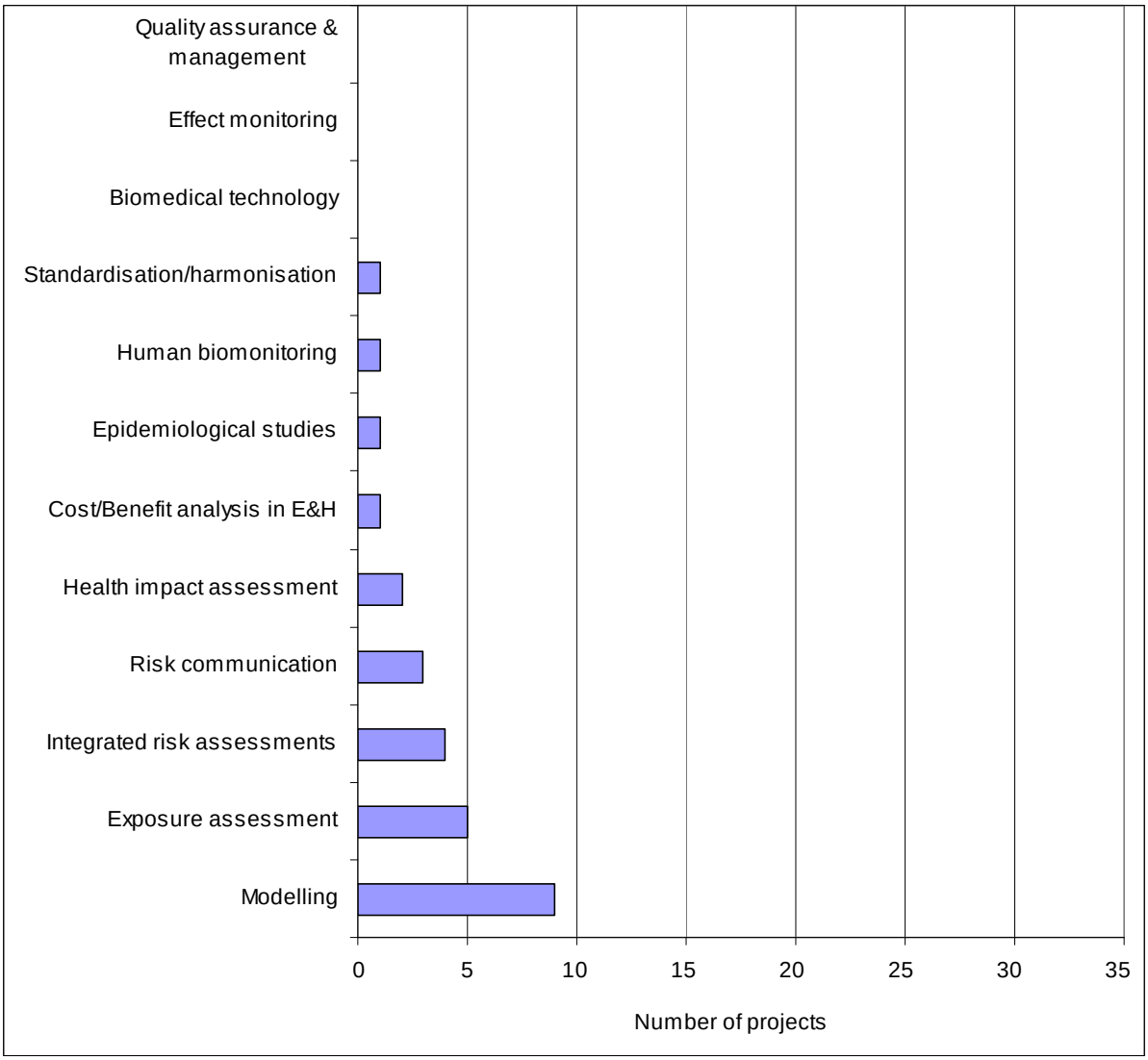
model of the atmosphere, spatial distribution models, model trees kept in growth chambers, cost-effective monitoring, testing of children and adults for the sensitisation to allergens, risk assessment of the impact of climate change on human health and well-being, cross-sectional field surveys, socio-scientific analysis, statistical analysis, compilation and publication of results, data search, literature review. In summary, these methodologies and methods are close to the following "Methodologies" defined in the 1st questionnaire: "Human health assessment", "Exposure assessment", "Epidemiological studies", "Modelling", "Human biomonitoring", and Risk assessment.

Figure 37: Number of "Climate change" projects according to the research theme "Methodologies"



From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Climate change" projects the methodologies, as a research theme of projects within "Climate change" projects are different to those mentioned in air quality projects. There is a prevalence of "Modelling" methodology (used 9 times – 33%), the second most common is "Exposure assessment" (used 5 times – 19%) and the third most common is

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"Integrated risk assessments" (used 4 times – 15%). Less frequent methodologies are "Risk communication", "Health impact assessment", "Standardisation/Harmonisation", "Cost/benefit analysis in E&H", "Epidemiological studies" and "Human biomonitoring". "Biomedical technology", "Effect monitoring" and "Quality assurance & management" methodologies are not research themes in this group of projects (see Figure 37).

Examples of **"Specific outputs"** for "Climate change" projects are:

- the provision of data on the distribution of endemic and invasive mosquitoes and their population status,
- the original and advanced data-sets of the target parameters, playing an important role in tropospheric chemistry, climate, or air quality,
- various chemical data sets, results of data analyses/interpretation, modelling results of fine-particle and biogenic aerosol formation and growth, new particulate oxidation products from BVOCs useful for source apportionment and assessment of the contribution from BVOCs to the organic aerosol,
- number of publications,
- web sites,
- final reports.

Examples of **"Scientific outputs"** for "Climate change" projects are:

- The output of the project "Climate change and human health surveillance systems in Germany" is a compilation of current systems and acting institutions.
- The project "Influence of climatic factors as well as their past and expected alterations concerning the increase of the sensitisation by the example of ragweed pollen" shows that "*Ambrosia* particularly spreads in the region of the Rhine rift. In the state of Baden Wuerttemberg, the problem of the *Ambrosia* pollen rather derived from long-distance transportation than from its local presence. Because of the high cross-reaction between allergens of pollen of *Ambrosia* and allergens of other pollen but also with food allergens, the general health risk of *Ambrosia* can currently not be determined".

Green space theme

The objectives of the projects related to the **"Green space"** theme include the analysis of the impact of environmental factors on human health, the investigation of the interrelations between environmental quality and human health and the documentation of the exposure to different environmental pollutants.

The examples of the **"Specific objectives"** of the projects in the "Green space" theme are:

- to review recent and current research relating to the links between green space and a range of life quality issues,

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- to document the extent, the distribution, and the determinants of exposure to environmental pollutants,
- to document spatial and temporal differences in population exposure,
- to evaluate the contribution of different environmental compartments (air, water, food) to the body burden (blood, urine),
- to establish a database to derive reference values,
- to generate information for the development of strategies to prevent and reduce exposure,
- to investigate the attitudes and perspectives of residents and other local stakeholders towards poor quality environments,
- to determine chlorinated organic compounds (PCB, DDT, DDE, HCHs, HCB) in serum samples of the French general population,
- to identify the interrelations between environmental quality, health and social structure,
- to build an understanding of the social and economic human health benefits of the Agency's activities, delivered through environmental improvements,
- to develop Agency policy, process and practice as appropriate to take account of health benefits, delivering environmental outcomes.

The examples of **"Methodologies"** and methods described for four "Green space" projects are: sampling, chemical analyses, environmental burden analyses, case studies, interviews, literature review. In summary, these methodologies and methods are close to the "Exposure assessment" methodology defined in the1st questionnaire.

From the "Research themes of the projects – Methodologies" point of view it can be stated that in the case of "Green space" projects only two types of methodologies are mentioned as research: "Human biomonitoring" (used 3 times – 75%) and "Modelling" (used 1 time – 25%) (see Figure 38).

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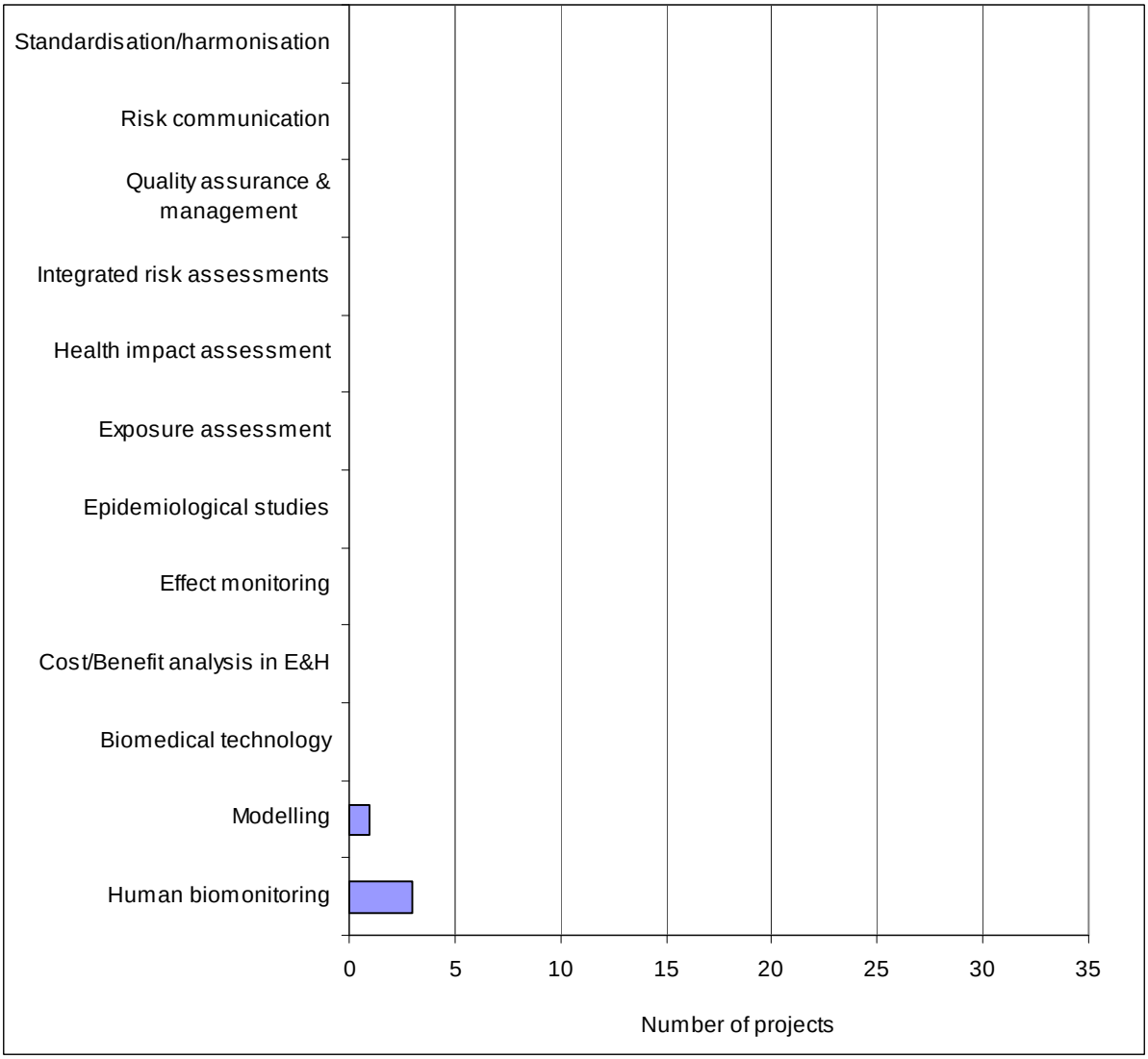
Figure 38: Number of "Green space" projects according to the research theme "Methodologies"



Examples of **"Specific outputs"** of "Green space" projects are:

- the high number of publications,
- a tool to identify the poorest environments,
- developing and spreading good practice in improving poor environments,
- a programme for improving poor environments supported by a framework for learning and spreading good practice,
- the analysis of 53 questionnaires completed by people at Sutcliffe Park, an urban green space in Greenwich, clearly show how the environmental enhancements provide health benefits,
- perceptions and attitudes of residents and local stakeholders,
- a tool to identify the poorest environments,

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- good practice in improving poor environments,
- the review commissioned by greenspace Scotland in partnership with SNIFFER and Scottish Natural Heritage.

Examples of **"Scientific outputs"** for "Green space" projects are provided for two projects "Environmental justice in Berlin – development and implementation of an applicable conception to analyse the (urban-) territorial spreading of environmental burden" and "National survey of indoor air quality in French dwellings - the French Indoor Air Quality Observatory". Their "Scientific outputs" have already been described as examples for "Indoor air quality" projects and "Transport" projects.

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6. ANALYSIS OF THE FRAMEWORK FOR JOINT ACTIVITIES RELATING TO E&H RESEARCH WITHIN ERA-ENVHEALTH PARTNERS COUNTRIES (2ND QUESTIONNAIRE)

For more specific information on funding mechanisms and research priorities in E&H an additional 2nd questionnaire was created and was completed by the following ERA-ENVHEALTH partners (see section 3.1.3 and Table 5):

Table 5: List of the partners who completed the 2nd questionnaire

Country (abbreviation)	Managing organisation abbreviation	Name of managing organisation
Belgium (BE)	BelSPO	Belgian federal Science Policy Office
	FPS	Federal Public Service Health, Food Chain Safety and Environment
France (FR)	ADEME	French Environment and Energy Management Agency
	AFSSET	French Agency for Environmental and Occupational Health Safety
	MEEDDM	Ministry of Ecology, Energy, Sustainable Development and the Sea
Germany (DE)	UBA	Federal Environment Agency
Ireland (IE)	EPA	Environment Protection Agency
Israel (IL)	MOH-IL	Ministry of Health of Israel
Italy (IT)	CNR	National Research Council
Netherlands (NL)[31]	VROM	Ministry of Housing, Spatial Planning and the Environment
Slovakia (SK)	UVZ	Public Health Authority of the Slovak Republic
Sweden (SE)	Swedish EPA	Swedish Environmental Protection Agency
Unit Kingdom (UK)	EA	Environment Agency
	NERC	Natural Environment Research Council

[31] RIVM/Netherlands (National Institute for Public Health and the Environment) did not hand in the 2nd questionnaire separately but jointly with VROM/Netherlands.

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6.1 NATIONAL E&H PRIORITIES

To answer the questions on national E&H priorities, the ERA-ENVHEALTH partners could tick boxes to select the appropriate topics from the categories “Themes related to human health aspects”, “Agents”, “Human health effects”, “Methodologies” and “Social aspects of E&H”. These topics are the same as the ones the partners agreed on to describe the E&H research programmes and projects in the 1st questionnaire.

All of the above-mentioned partners answered question 1 except Swedish EPA. According to Swedish EPA the reason for this is that the way in which the questions are divided / structured is not applicable to the Swedish organisation: “E&H is not an existing specified area when it comes to governmental priorities of research activities. The Swedish structure and organisation is described in the other parts of the questionnaire (e.g. 3a and 4b)”.

In case of the UK the answer is similar to Sweden in that there is not a specified area in which priorities have been identified but they have made an assumption about priorities based on the number of projects, and their budgets, that have been funded in order to answer the question.

For the assessment of the cases where more than one partner per country answered – which was the case for Belgium, France, Israel, Slovakia and the United Kingdom – the answers were added and counted as one national answer (without considering a rating).

UVZ/Slovakia had handed the questionnaire to eleven relevant partners in Slovakia – ministries, public health authorities, universities as well as scientific institutes (feedback 70%) – and had rated the answers. For the assessment of the national priorities this rating could not be taken into account. Rather every rated answer was considered as one national answer.

a) What are the current governmental priorities of E&H research activities in your country?

Themes related to human health effects

With respect to “Themes related to human health effects” all nine countries identified the topic “Outdoor air quality” as a national priority. Eight countries identified the topic “Climate change” and seven “Indoor air quality”. The topics “Food Safety”, “Soil contamination”, “Transport” and “Water quality & supply” were chosen by six countries. Five countries selected “Local/living environment” and three countries “Green space” (see Figure 39 and Table 6).

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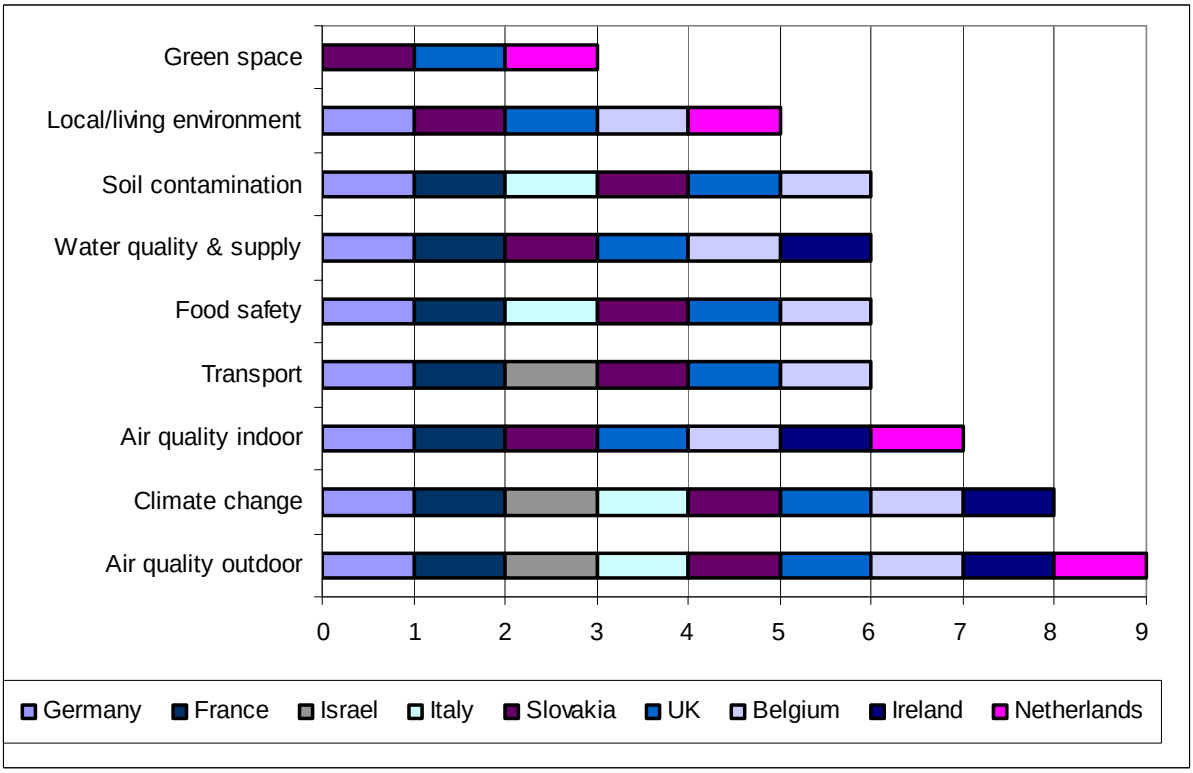
Figure 39: Frequency of answers to question 1a) "Themes related to human health effects"



Germany additionally specified "Nature Conservation".

Table 6: Matrix of answers to question 1a) "Themes related to human health effects"

Themes related to human health effects										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Outdoor air quality	X	X	X	X	X	X	X	X	X	**9**
Climate change	X	X	X	X	X	X		X	X	**8**
Indoor air quality	X	X	X	X			X	X	X	**7**
Transport	X	X	X		X			X	X	**6**
Food safety	X	X	X			X		X	X	**6**
Water quality & supply	X	X	X	X				X	X	**6**
Soil contamination	X	X	X			X		X	X	**6**
Local/living environment	X		X				X	X	X	**5**
Green space							X	X	X	**3**

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Agents

With respect to "Agents" all nine countries identified "Particulate matter" and "Other chemical agents" as national priorities. "Biological agents" were identified by eight, "Nanomaterials", "Noise", "Pesticides & biocides" and "Radioactivity" by six countries. Four countries picked "Electromagnetic fields" and "Other physical agents" (see Figure 40 and Table 7).[32]

Figure 40: Frequency of answers to question 1a) "Agents"

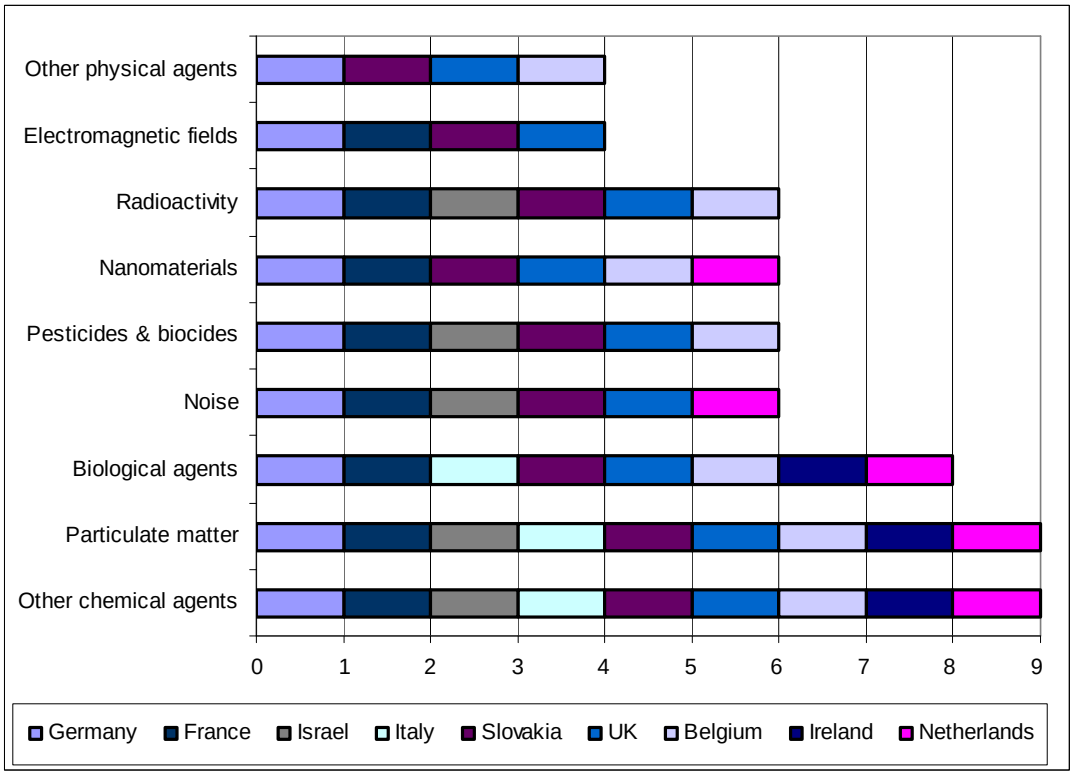

Table 7: Matrix of answers to question 1a) "Agents"

Agents										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Other chemical agents	X	X	X	X	X	X	X	X	X	**9**
Particulate Matter	X	X	X	X	X	X	X	X	X	**9**
Biological Agents	X	X	X	X		X	X	X	X	**8**
Noise		X	X		X		X	X	X	**6**
Pesticides & biocides	X	X	X		X			X	X	**6**
Nanomaterials	X	X	X				X	X	X	**6**
Radioactivity	X	X	X		X			X	X	**6**
Electromagnetic fields		X	X					X	X	**4**
Other physical agents	X		X					X	X	**4**

[32] EA/UK stated that in the United Kingdom all of the above agents "will be priorities for different organisations and [it is] not possible to highlight one more than the other." Therefore for the United Kingdom every single agent was considered as a national priority.

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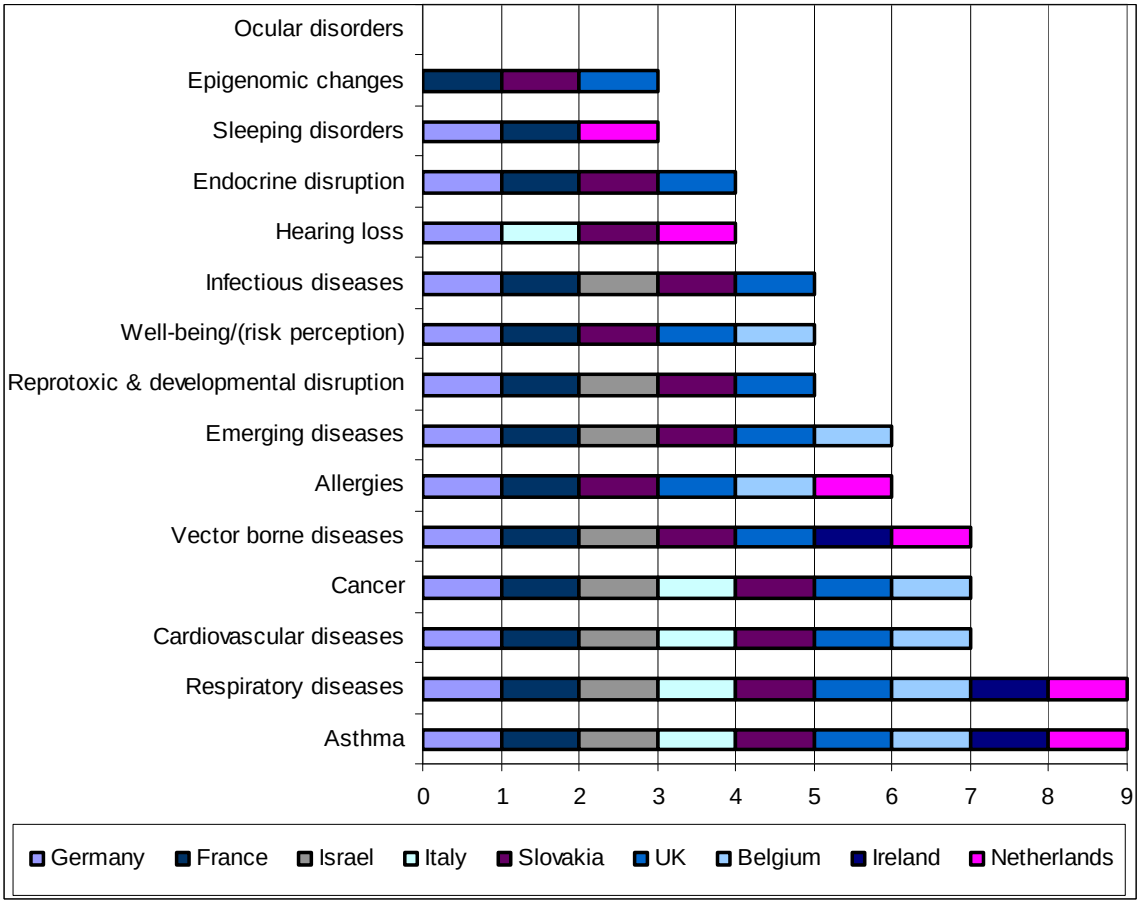
Belgium additionally specified “Ozone troposphere” and “Heatwave-coldwave” as national priorities, and the United Kingdom “Effects of multiple stressors including pollutant mixtures”.

Human health effects

The top two of the national priorities with regards to ”Human health effects” are “Asthma” and “Respiratory diseases”; these effects were picked by all nine countries. “Cancer”, “Cardiovascular diseases” and “Vector borne diseases” were identified by seven and “Allergies” and “Emerging diseases” by six countries. Five countries chose “Infectious diseases”, “Reprotoxic & development disruption” and “Well-being/ (risk perception)” as a national priority, four countries “Endocrine disruption” and “Hearing loss”, three countries “Epigenomic changes” and “Sleeping disorders” and no one stated “Ocular disorders”(see Figure 41 and Table 8).[33]

Figure 41: Frequency of answers to question 1a) “Human health effects”



[33] EA/UK specified that the “effects are generally secondary to the drivers of the research such as the particular part of the environment or the agents. Those effects ticked are those which are more likely to be effects of the driver i.e. cancer as a consequence of exposure to pesticides.” NERC/UK specified that the “specific health effects are not normally the main drivers of the research we fund – our researchers will look at whatever effects emerge in relation to the environmental aspect that they are investigating such as climate and environmental change or the underlying biological, chemical and environmental processes that cause disease to spread, pollutants to disperse in soil, water and air etc.”

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Table 8: Matrix of answers to question 1a) "Human health effects"

Human health effects										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Asthma	X	X	X	X	X	X	X	X	X	**9**
Respiratory diseases	X	X	X	X	X	X	X	X	X	**9**
Cardiovascular diseases	X	X	X		X	X		X	X	**7**
Cancer	X	X	X		X	X		X	X	**7**
Vector borne diseases		X	X	X	X		X	X	X	**7**
Allergies	X	X	X				X	X	X	**6**
Emerging diseases	X	X	X		X			X	X	**6**
Reprotoxic & developmental disruption		X	X		X			X	X	**5**
Well-being/ (risk perception)	X	X	X					X	X	**5**
Infectious diseases		X	X		X			X	X	**5**
Hearing loss			X			X	X	X		**4**
Endocrine disruption		X	X					X	X	**4**
Sleeping disorders		X	X				X			**3**
Epigenomic changes		X						X	X	**3**
Ocular disorders										**0**

Belgium additionally identified "Tropical diseases" as a national priority in the field of "Human health effects".

Methodologies

"Epidemiological studies", "Health impact assessment" as well as "Modelling" were identified as the prevalent "Methodologies" by all nine countries. "Exposure assessment" was identified by eight, "Integrated risk assessment" by seven and "Risk communication" by six countries. "Human biomonitoring" and "Standardisation/harmonisation" were ticked by five countries; four countries chose "Cost-benefit analysis in E&H", "Effect monitoring" and "Quality assessment & management" and three "Biomedical technology" (see Figure 42 and Table 9).[34]

[34] EA/UK specified that the ticked methodologies do not come from "an agreed list for the UK priorities but they appear to be more frequently studied".

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Figure 42: Frequency of answers to question 1a) "Methodologies"

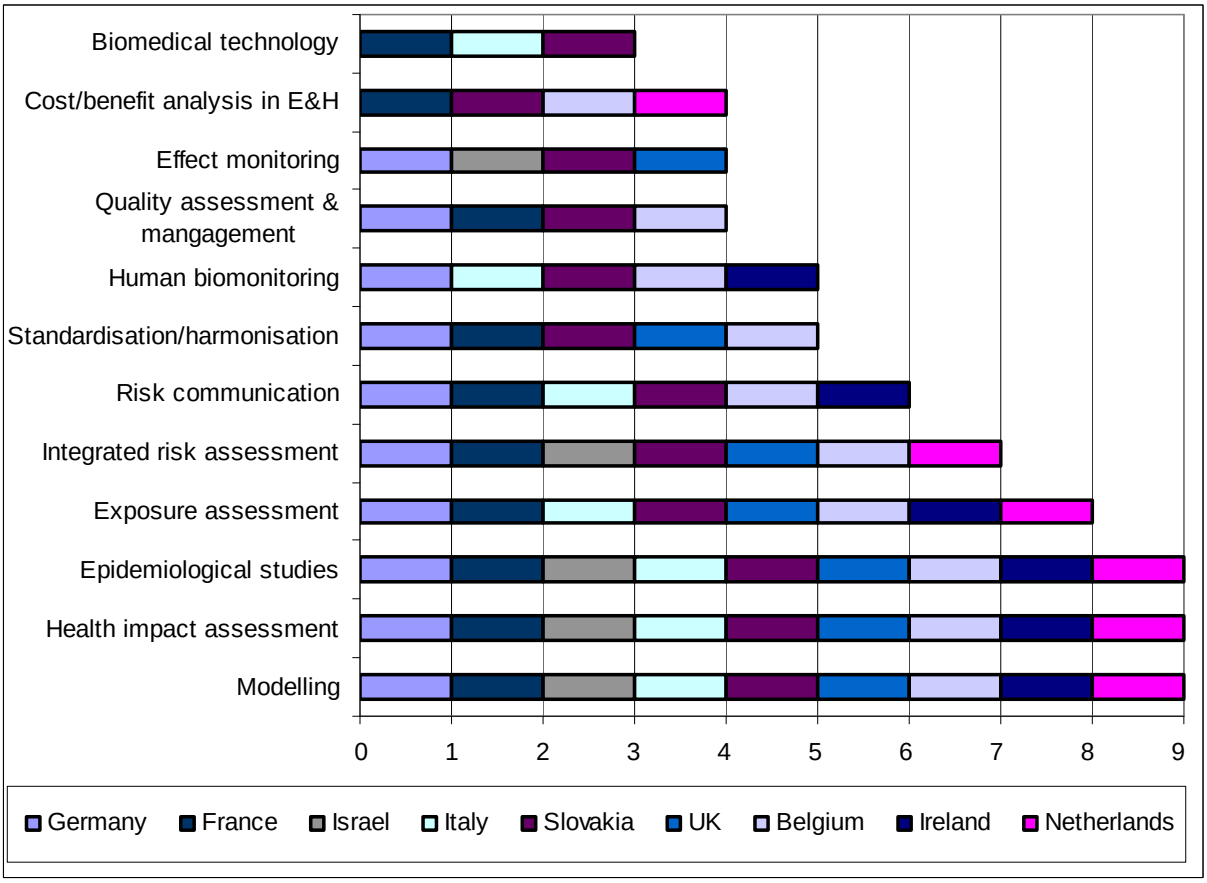

Table 9: Matrix of answers to question 1a) "Methodologies"

Methodologies										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Modelling	X	X	X	X	X	X	X	X	X	**9**
Health impact assessment	X	X	X	X	X	X	X	X	X	**9**
Epidemiological studies	X	X	X	X	X	X	X	X	X	**9**
Exposure assessment	X	X	X	X		X	X	X	X	**8**
Integrated risk assessment	X	X	X		X		X	X	X	**7**
Risk communication	X	X	X	X		X		X		**6**
Standardisation/Harmonisation	X	X	X					X	X	**5**
Human biomonitoring	X		X	X		X		X		**5**
Quality assessment & management	X	X	X					X		**4**
Effect monitoring			X		X			X	X	**4**
Cost/benefit analysis in E&H	X	X					X	X		**4**
Biomedical technology		X				X		X		**3**

Belgium additionally specified "Cost of action/inaction" as a national priority. And Slovakia added: "New EU methodology concerning public drinking water safe supply (monitoring, evaluation all aspects in terms of population health, impact of climate changes, emergency, terrorism, etc.)."

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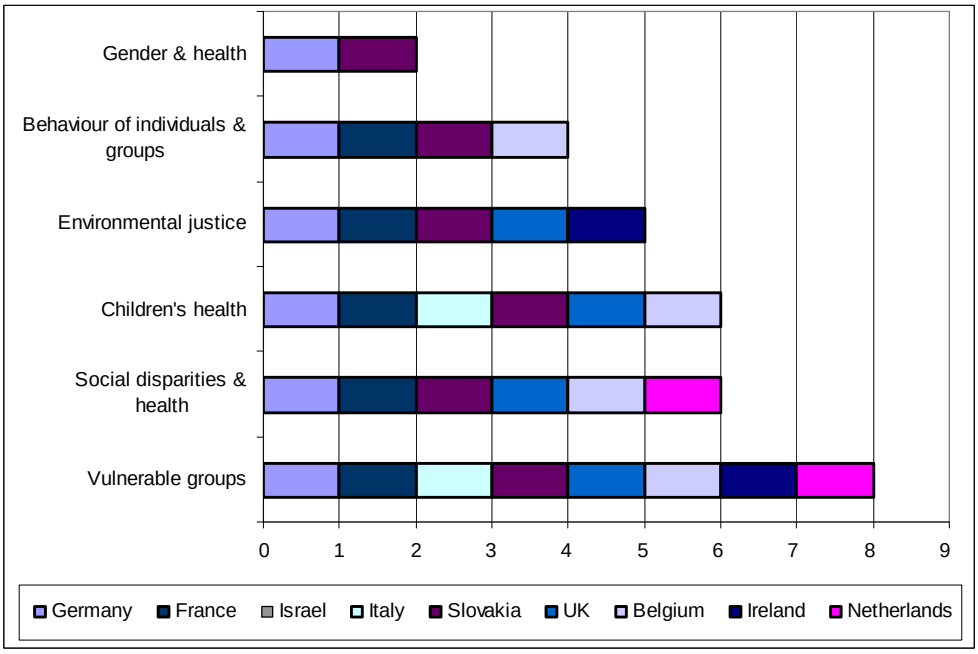
Social Aspects of E&H

With regard to "Social Aspects of E&H" eight countries identified "Vulnerable groups" as a national priority, six countries "Children's health" and "Social disparities & health", five "Environmental justice", four "Behaviour of individuals & groups" and two "Gender & health" (see Figure 43 and France additionally specified "Occupational health" as a national priority in the field of "Social aspects of E&H".

Table 10). France additionally specified "Occupational health" as a national priority in the field of "Social aspects of E&H".

Figure 43: Frequency of answers to question 1a) "Social aspects of E&H"



France additionally specified "Occupational health" as a national priority in the field of "Social aspects of E&H".

Table 10: Matrix of answers to question 1a) "Social aspects of E&H"

Social aspects of E&H										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Vulnerable groups	X	X	X	X		X	X	X	X	**8**
Social disparities & health	X	X	X				X	X	X	**6**
Children's health	X	X	X			X		X	X	**6**
Environmental justice		X	X	X				X	X	**5**
Behaviour of individuals & groups	X	X	X					X		**4**
Gender & health			X					X		**2**

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b) In the next one to three years what E&H research activities are planned and which of the topics stated above in question 1a) are most important for your organisation?

Themes related to human health effects

With respect to "Themes related to human health effects" the ERA-ENVHEALTH partners in eight countries considered "Climate change" and "Indoor air quality" as very important themes, where research activities are planned in the next one to three years. In seven countries partners identified "Outdoor air quality", six "Transport" and "Water quality & supply", three "Soil contamination" and "Local/living environment", two "Food safety" and one country identified "Green space" (see Figure 44 and Table 11).

Figure 44: Frequency of answers to question 1b) "Themes related to human health effects"

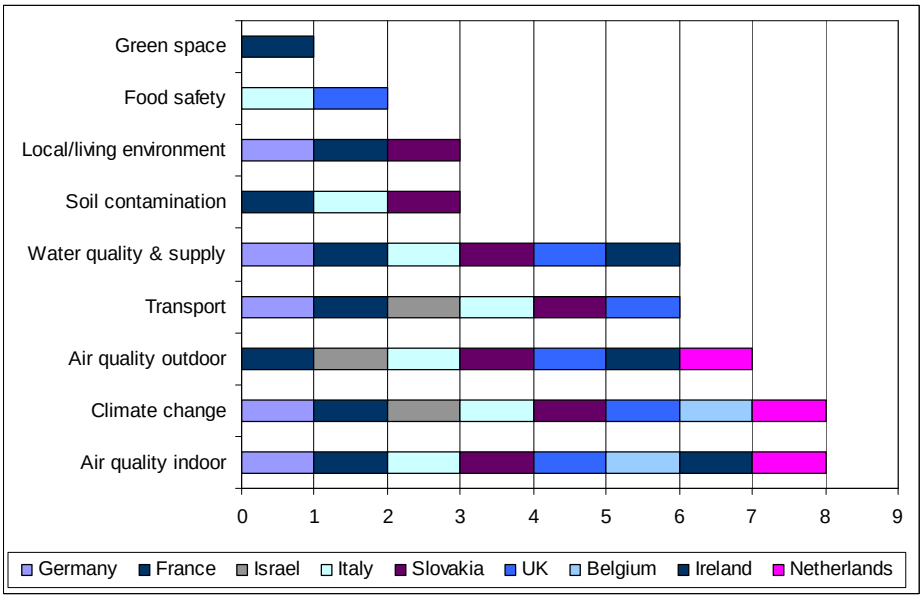

Table 11: Matrix of answers to question 1b) "Themes related to human health effects"

Themes related to human health effects										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Indoor air quality	X	X	X	X		X	X	X	X	**8**
Climate change	X	X	X		X	X	X	X	X	**8**
Outdoor air quality		X		X	X	X	X	X	X	**7**
Transport		X	X		X	X		X	X	**6**
Water quality & supply		X	X	X		X		X	X	**6**
Soil contamination		X				X		X		**3**
Local/living environment		X	X					X		**3**
Food safety						X			X	**2**
Green space		X								**1**

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Germany additionally identified “Nature Conservation” as a very important theme.

With regard to “Climate change” Belgium specified “impacts, effects, mitigation and adaptation”. With regards to the “Indoor air quality indoor” theme, Germany specified “mould” and “PFC (perfluorinated compounds)” and with regards to the “Water quality & supply” theme “bathing waters”. Ireland added that – besides indoor and outdoor air quality – “drinking water quality will remain a significant issue in Ireland in short-medium-term”. And Slovakia additionally mentioned “renewable energy sources (water power stations, geothermal waters etc.)”.

EA/UK specified the following: “Risk assessment associated with contaminated land, nanoscience, air quality – uncertainties in current risk models, particulates and bioaerosols from industrial/landfill/composting sources etc. Another challenge is source apportionment e.g. industrial versus transport and options for intervention. Then [there also is] the need to build in Climate Change scenarios. Other big challenges are around human health indicators resulting from environment exposure (versus indoor, food, water etc.) – fundamental issues around pathogen sources/survival and impacts (swine flue, avian flue, zoonotics etc.).”

And NERC/UK stated that they “have a call for large-scale consortia to investigate the fate, behaviour, exposure and toxicity of Nanoparticles (this relates mainly to modelling, risk, and ecotoxicology, with some smaller aspects relating to human health). The call closes in August [2009] and the Programme is due to run until 2013. We are also planning two other calls directly related to human health, investigating 1) Pollutants and Exposure, and 2) Environmental and Social Ecology of Infectious Diseases. These Programmes are expected to be launched in 2009, and run for three till four years. We also have several other Programmes which will run over the next three years with aspects that relate to E&H: 1) Ecosystem Services and Poverty Alleviation, 2) Urban Atmospheric Science, and 3) Living with Environmental Change.”

Agents

With respect to “Agents” partners in five countries considered “Nanomaterials” and “Particulate matter” as very important agents, where research activities are planned in the next one to three years. Partners in four countries identified “Other chemical agents”, partners in three countries “Noise”, partners in two countries “Biological agents”, “Electromagnetic fields” and “Pesticides & biocides” and partners in one country “Radioactivity” and “Other physical agents” (see Figure 45 and Table 12).

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Figure 45: Frequency of answers to question 1b) "Agents"

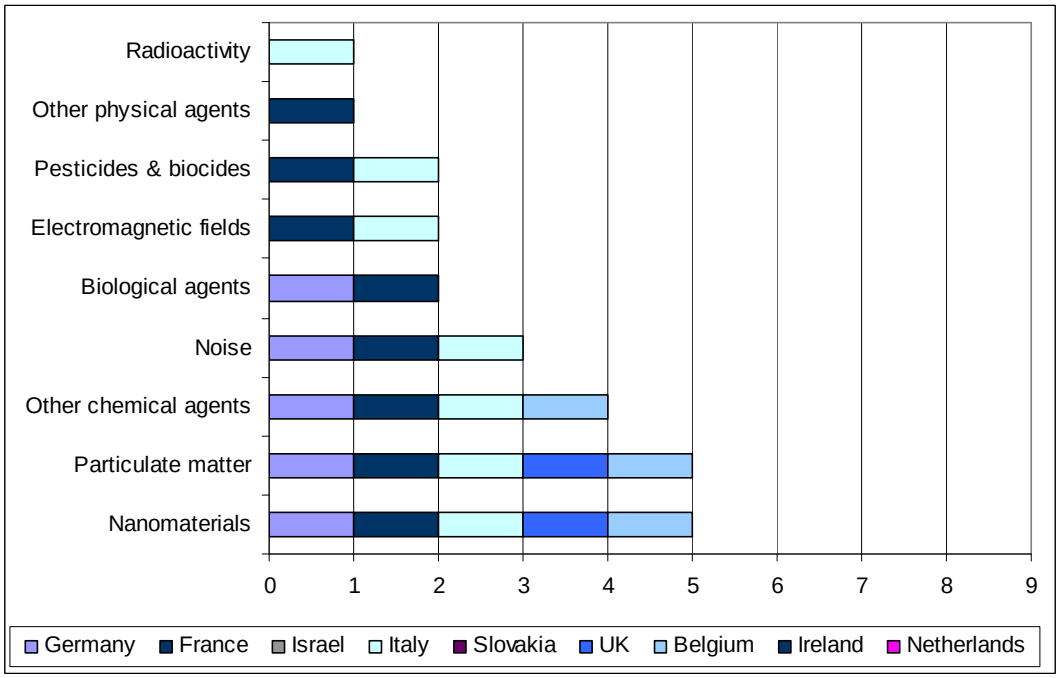

Table 12: Matrix of answers to question 1b) "Agents"

Agents										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Nanomaterials	X	X	X			X			X	**5**
Particulate Matter	X	X	X			X			X	**5**
Other chemical agents	X	X	X			X				**4**
Noise		X	X			X				**3**
Biological agents		X	X							**2**
Electromagnetic fields		X				X				**2**
Pesticides & biocides		X				X				**2**
Other physical agents		X								**1**
Radioactivity						X				**1**

Human health effects

With respect to "Human health effects" partners in three countries considered "Respiratory diseases" as very important, where research activities are planned within the next one to three years. Two identified "Allergies", "Cancer", "Cardiovascular diseases" and "Reprotoxic & developmental disruption". "Asthma", "Endocrine disruption", "Epigenomic changes", "Infectious diseases", and "Well being/(risk perception)" were ticked once. "Emerging

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diseases", "Hearing loss", "Ocular disorders", "Sleeping disorders" and "Vector borne diseases" were not identified at all (see Figure 46 and Table 13).

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Figure 46: Frequency of answers to question 1b) "Human health effects"

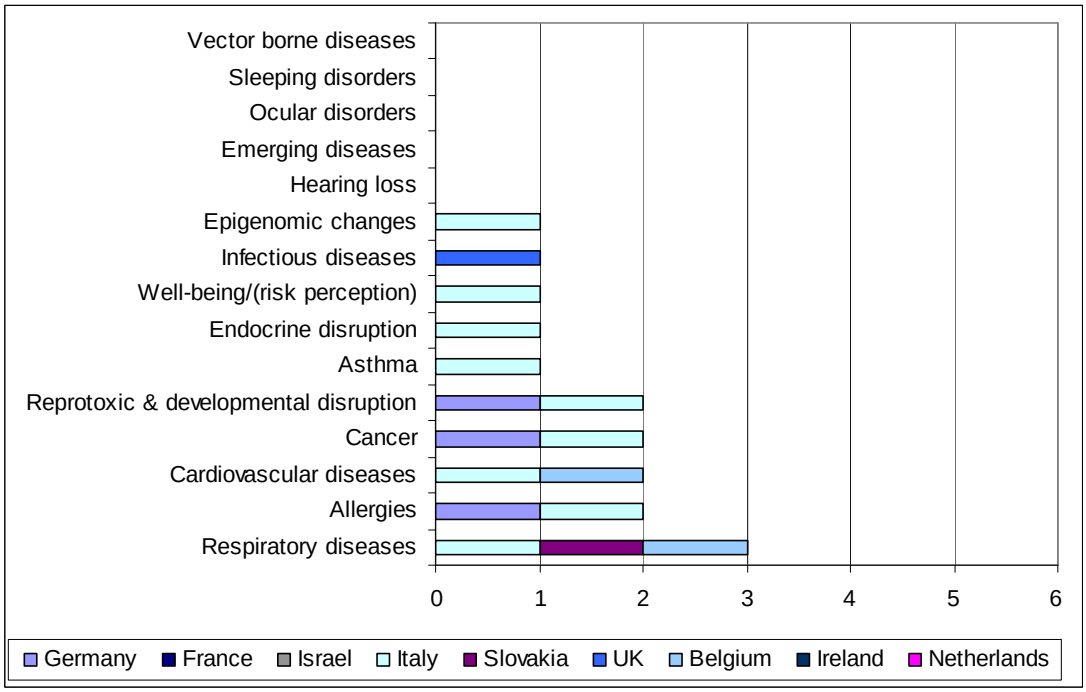

Table 13: Matrix of answers to question 1b) "Human health effects"

Human health effects										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Respiratory diseases	X					X		X		**3**
Allergies			X			X				**2**
Cardiovascular diseases	X					X				**2**
Cancer			X			X				**2**
Reprotoxic & developmental disruption			X			X				**2**
Asthma						X				**1**
Endocrine disruption						X				**1**
Well-being/(risk perception)						X				**1**
Infectious diseases									X	**1**
Epigenomic changes						X				**1**
Hearing loss										**0**
Emerging diseases										**0**
Ocular disorders										**0**
Sleeping disorders										**0**
Vector borne diseases										**0**

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Methodologies

With respect to “Methodologies” partners in four countries considered “Human biomonitoring” as very important, where research activities are planned within the next one to three years. Partners in three countries identified “Health impact assessment” and “Exposure assessment”, partners in two countries “Epidemiological studies”, “Integrated risk assessment”, “Modelling” and “Risk communication”, respectively. Partners in one country identified “Biomedical technology”, “Cost/benefit analysis in E&H”, “Effect monitoring”, “Standardisation/harmonisation” as well as “Quality assessment & management” (see Figure 47 and Table 14).

Figure 47: Frequency of answers to question 1b) “Methodologies”

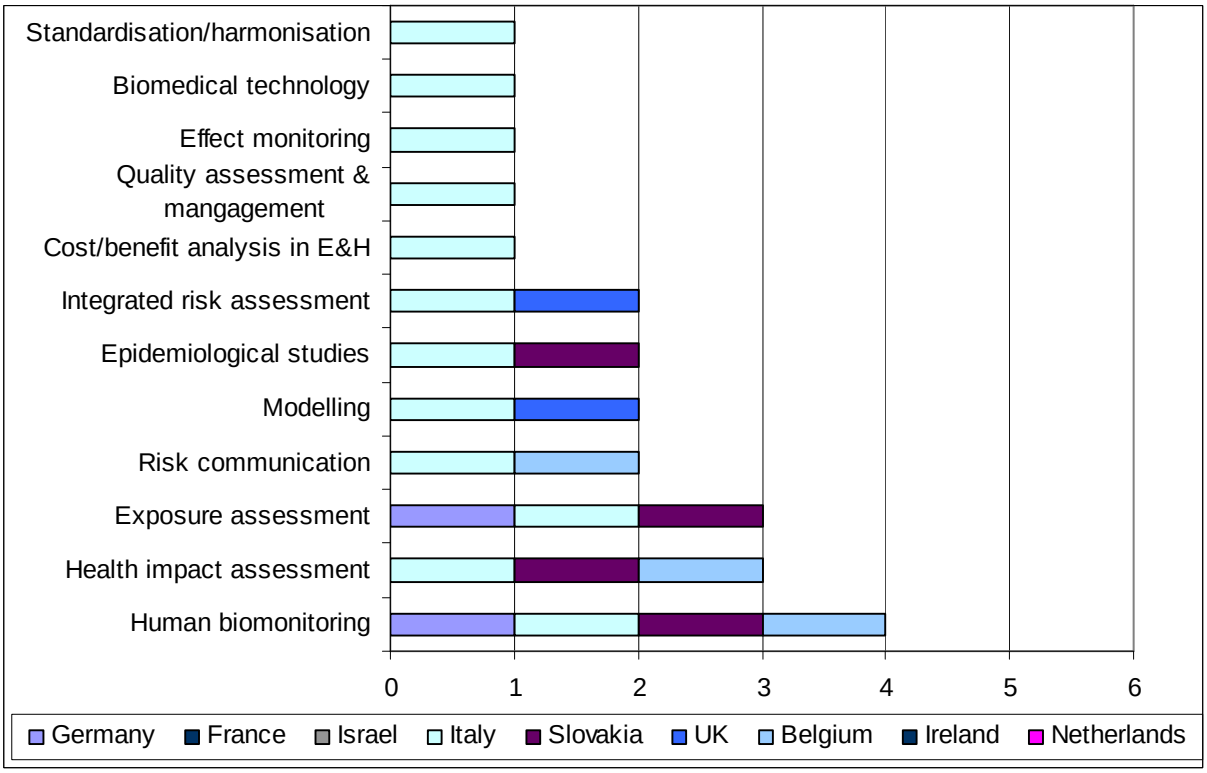

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Table 14: Matrix of answers to question 1b) "Methodologies"

Methodologies										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Human biomonitoring	X		X			X		X		**4**
Health impact assessment	X					X		X		**3**
Exposure assessment			X			X		X		**3**
Risk communication	X					X				**2**
Modelling						X			X	**2**
Epidemiological studies						X		X		**2**
Integrated risk assessment						X			X	**2**
Cost/benefit analysis in E&H						X				**1**
Quality assessment & management						X				**1**
Effect monitoring						X				**1**
Biomedical technology						X				**1**
Standardisation/harmonisation						X				**1**

Social aspects of E&H

With regards to "Social aspects of E&H" partners in four countries identified "Children's health" as very important, where research activities are planned within the next one to three years. Partners in three countries identified "Vulnerable Groups", partners in two countries "Environmental justice" and "Social disparities & health". Respectively partners in one country identified "Behaviour of individuals & groups" and "Gender & health" (see Figure 48 and Table 15).

Figure 48: Frequency of answers to question 1b) "Social aspects of E&H"

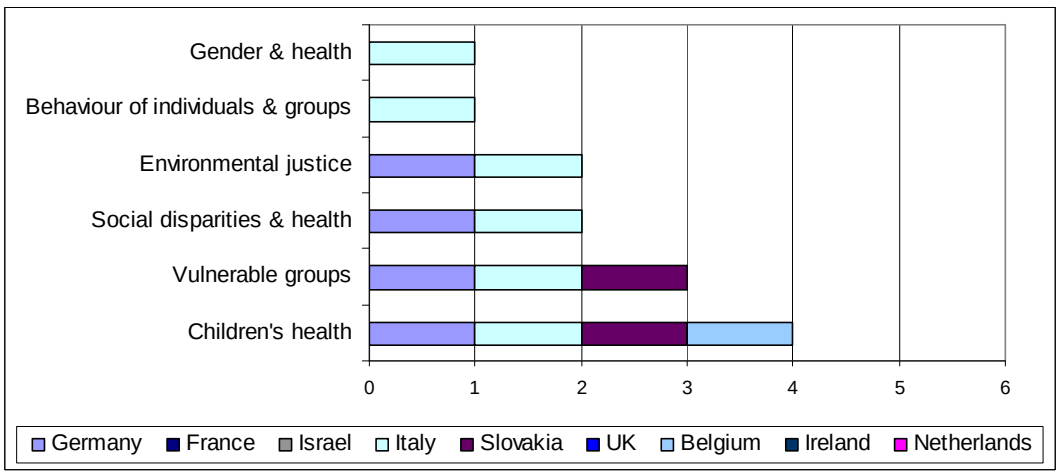

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Table 15: Matrix of answers to question 1b) "Social aspects of E&H"

Social aspects of E&H										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	**∑**
Children's health	X		X			X		X		**4**
Vulnerable groups			X			X		X		**3**
Social disparities & health			X			X				**2**
Environmental justice			X			X				**2**
Behaviour of individuals and groups						X				**1**
Gender & health						X				**1**

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6.2 FUNDING STRUCTURES

a) What kind of funding structures with regard to transnational cooperation exist or are possible in your organisation?

Figure 49: Frequency of answers to question 2a) "Existing funding structure"

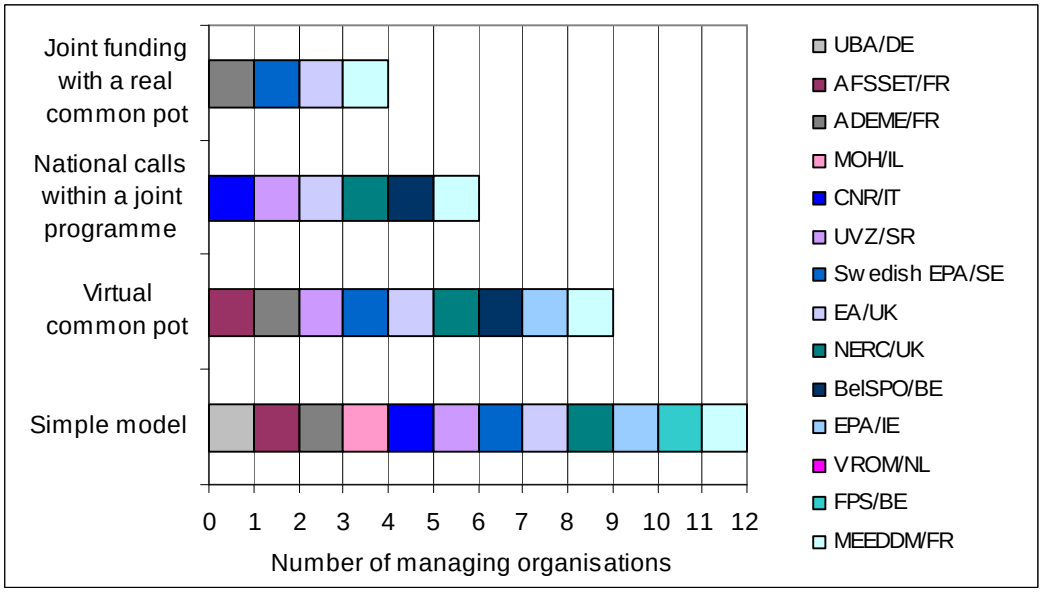
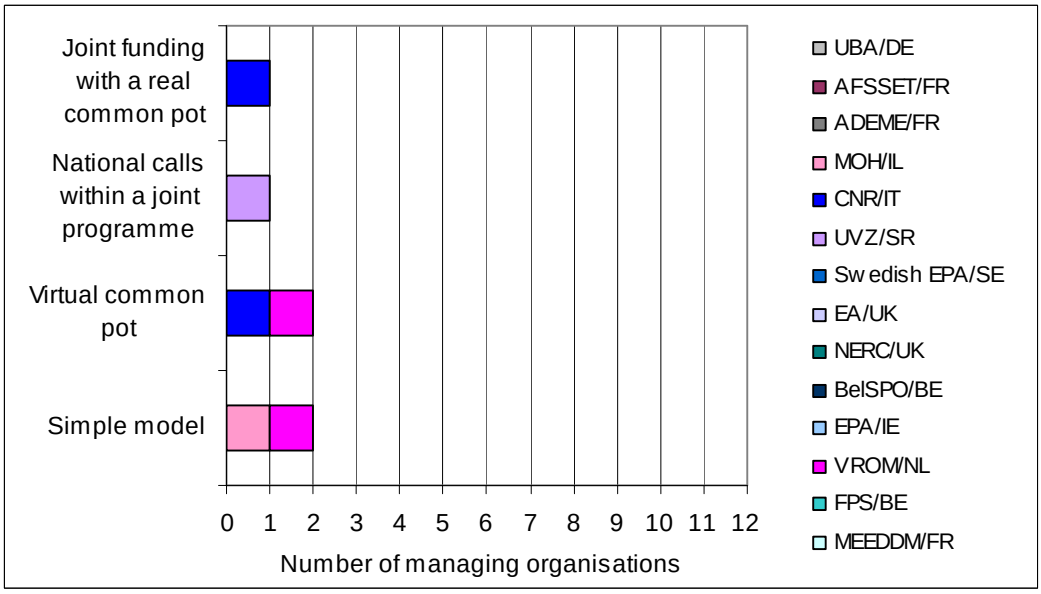


Figure 50: Frequency of answers to question 2a) "Partly existing funding structure"



Participating organisations have not specified the meaning of "partly existing funding structures".

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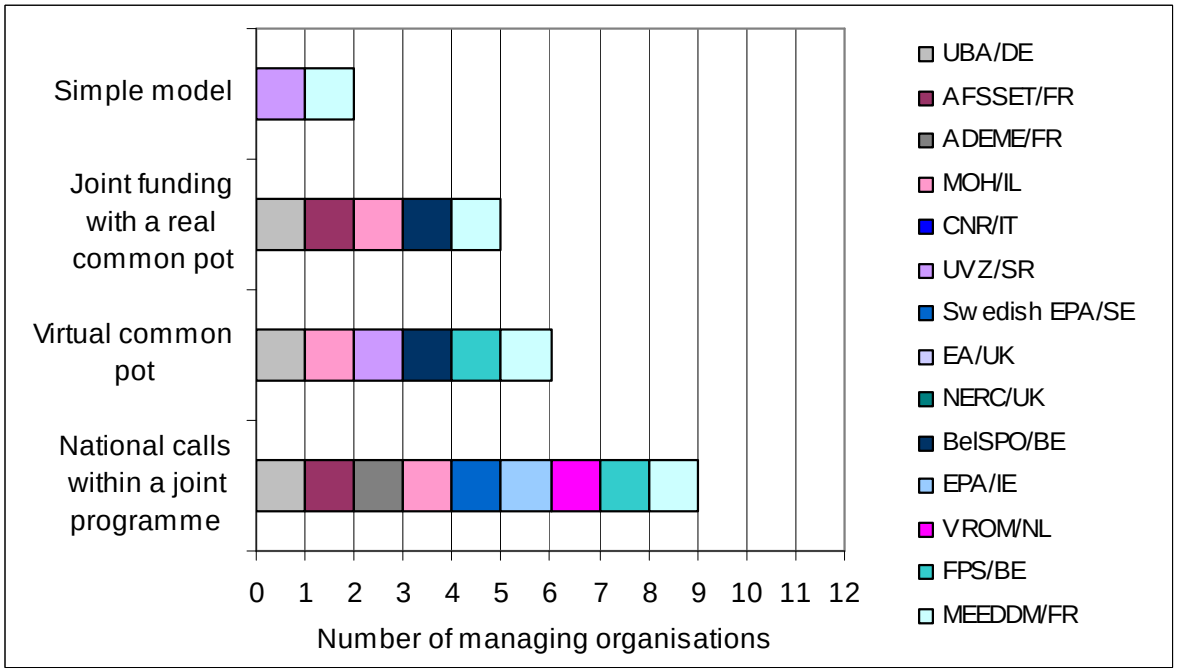
Figure 51: Frequency of answers to question 2a) "Possible funding structure"



Participating organisations did not indicate any supplementary information to this topic.

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Table 16: Matrix of answers to question 2a) "Funding structure"

Funding structure															
	BelSPO/BE	**FPS/BE**	**ADEME/FR**	**AFSSET/FR**	**MEEDDM/FR**	**UBA/DE**	**EPA/IE**	**MOH/IL**	**CNR/IT**	**VROM/NL**	**Swedish EPA/SE**	**UVZ/SK**	**EA/UK**	**NERC/UK**	**Σ**
Simple model															
Existing		X	X	X	X	X	X	X	X		X	X	X	X	**12**
Partly existing								X		X					**2**
Possible					X							X			**2**
National calls within a joint programme															
Existing	X				X				X			X	X	X	**6**
Partly existing												X			**1**
Possible		X	X	X	X	X	X	X		X	X				**9**
Virtual Common pot															
Existing	X		X	X	X		X				X	X	X	X	**9**
Partly existing									X	X					**2**
Possible	X	X			X	X		X				X			**6**
Joint funding with a real common pot															
Existing			X		X						X		X		**4**
Partly existing									X						**1**
Possible	X			X	X	X		X							**5**

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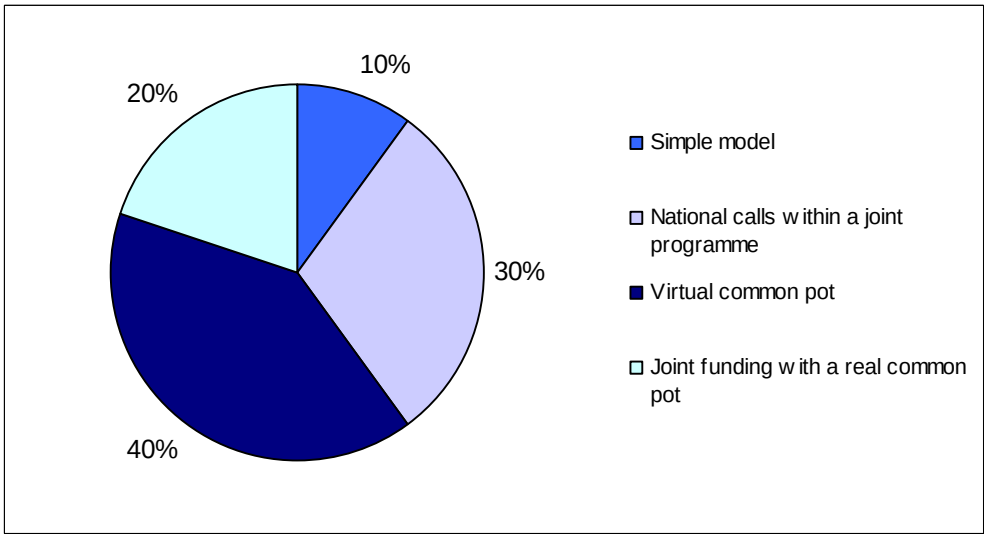
b) Which of these is/are the preferred funding structure/s in your organisation?

Figure 52: Frequency of answers to question 2b) "Preferred funding structure"



The **"Virtual common pot"** is the most frequently preferred funding structure of the participating partner organisations. It was marked as preferred by **ADEME/France, UBA/Germany, EPA/Ireland, CNR/Italy** and **NERC/UK**.

"National calls within a joint programme" are preferred by **BelSPO/Belgium**, **FPS/Belgium**, **UVZ/Slovakia** and **NERC/UK**.

"Joint funding with a real common pot" is preferred by **AFSSET/France** and **VROM/The Netherlands**.

CNR/Italy is the only organisation declaring the **"Simple model"** to be the preferred type of funding structure.

Some organisations have specifications and singularities in particular types of funding structures. **EA/UK** needs to have permission of its sponsoring Government Department to be able to give grants. As it declares, the preferred arrangement is to produce a tender setting out requirements and then inviting bids. **Swedish EPA/Sweden** is in the process of trying the best alternative among mentioned forms, and so far has identified pros and cons in each. **UBA/Germany** is still experimenting with common international calls: They „currently are testing the virtual common pot model. UBA also would like to test a real common pot model to find out which funding model is most efficient and effective."

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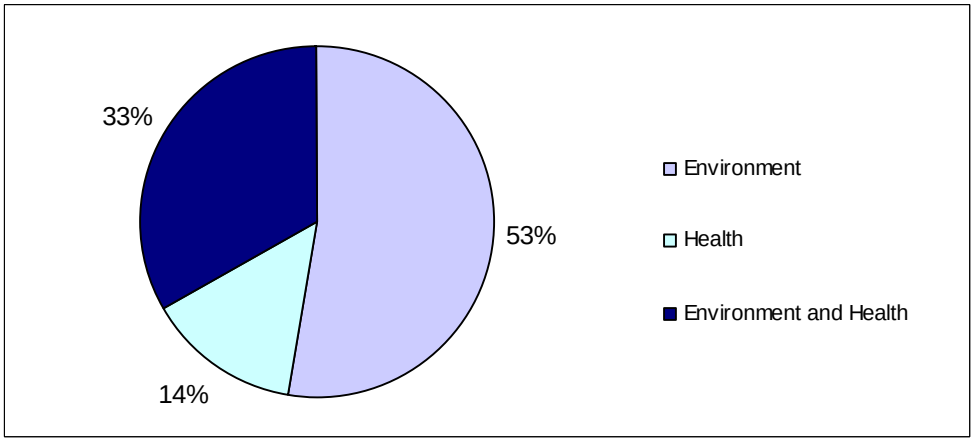
c) Which of the following subjects (environment, health, E&H) are primarily funded in your organisation?

Figure 53: Frequency of answers to question 2c) "Primarily funded subjects"



Environment is the most preliminary funded subject (53% of countries represented by the ERA-ENVHEALTH respondents). The second most frequent response is E&H (33%). The lowest number of responses is recorded for Health (14%) (see Table 17).

Table 17: Matrix of answers to question 2c) "Primarily funded subjects"

Subjects of preliminary funding															
	BelSPO/BE	**FPS/BE**	**ADEME/FR**	**AFSSET/FR**	**MEEDDM/FR**	**UBA/DE**	**EPA/IE**	**MOH/IL**	**CNR/IT**	**VROM/NL**	**Swedish EPA/SE**	**UVZ/SR**	**EA/UK**	**NERC/UK**	**Σ**
Environment	X		X		X	X	X		X	X	X	X	X	X	**11**
Health								X	X			X			**3**
Environment and Health	X	X		X	X	X				X		X			**7**

CNR/Italy also mentions Energy and Transports, Agro-Food and Technologies as funded subjects within the organisation.

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d) Please tick the following boxes:

- **The financing organisation is able to pay for foreign researchers/research institutes?**
- **The financing organisation is obliged to pay VAT when financing E&H research?**

ERA-ENVHEALTH partner organisations **BelSPO/Belgium, ADEME/France, AFSSET/France, MEEDDM/France, UBA/Germany, MOH/Israel, CNR/Italy, Swedish EPA/Sweden, VROM/The Netherlands and EA/UK** declare that the financing organisation is able to pay for foreign research, however, at the **CNR/Italy** VAT is not an issue for research projects, but all service activities demand 20% VAT.

UBA/Germany and **EA/UK** marked that they are obliged to pay VAT when financing E&H research in their organisation.

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6.3 DRIVERS FOR E&H RESEARCH ACTIVITIES AND PRIORITIES

a) What are important drivers for national E&H research activities in your country?

Nine out of ten partners stated national legislation and policy objectives as the most referred to drivers for national E&H research activities in their countries. The second most frequent response is the Budapest Agreement and the EU Environment and Health Action Plan. CEHAPE is present at the third place in number of responses. Other WHO and EU policies and priorities as well as organisation policy objectives are also mentioned as drivers. NGO/public/media are defined as a driver only in Germany (see Figure 54 and Table 18).

NERC/UK in addition to drivers mentions “Next Generation Science for Planet Earth“ which sets out NERC's strategic and scientific priorities for 2007-2012.

BelSPO/Belgium and **UVZ/Slovakia** define NEHAP referring to the Budapest Agreement in addition.

In **Sweden** there is a different situation. “The government bill about Swedish research and innovation for 2009-2012 has been presented and covers the general national research activities and priorities. There are several complex drivers behind that, which are not easily found. The Swedish EPA decides about and funds research in key areas for them”.

Figure 54: Frequency of answers to question 3a) “Important drivers for national E&H research activities”

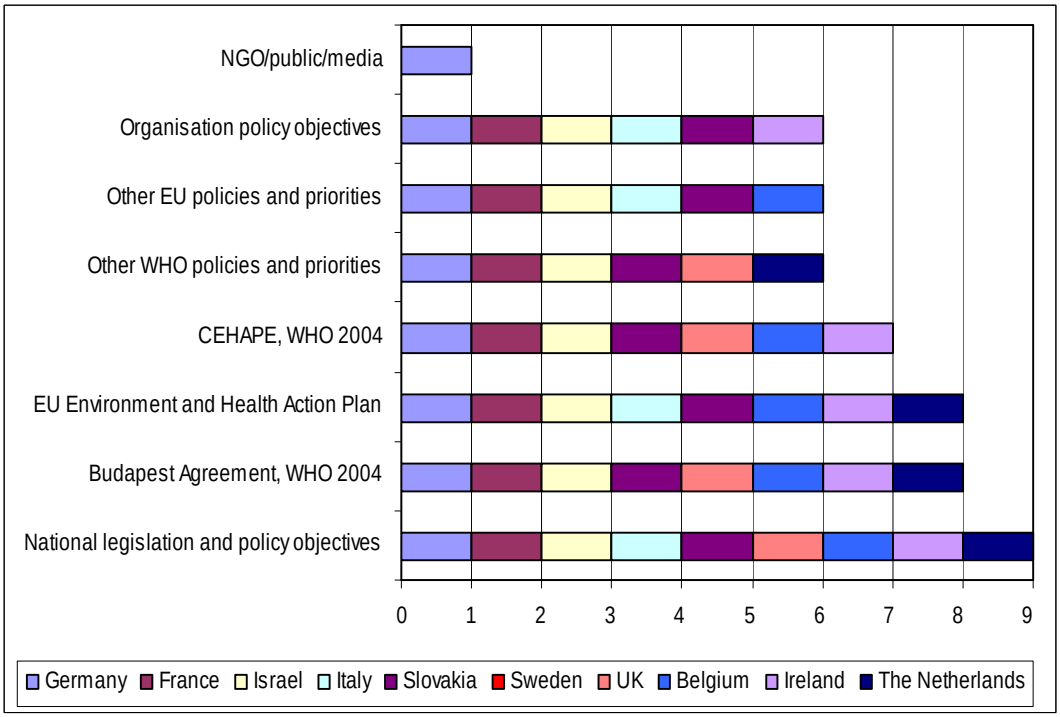

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Table 18: Matrix of answers to question 3a) "Important drivers for national E&H research activities"

Drivers for national E&H research activities										
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SK**	**UK**	∑
National legislation and policy objectives	X	X	X	X	X	X	X	X	X	9
Fourth Ministerial Conference on Environment and Health Declaration, WHO 2004 (Budapest Agreement)	X	X	X	X	X		X	X	X	8
EU Environment and Health Action Plan	X	X	X	X	X	X	X	X		8
Children's Environment and Health Action Plan for Europe, WHO 2004 (CEHAPE)	X	X	X	X	X			X	X	7
Other WHO policies and priorities		X	X		X		X	X	X	6
Other EU policies and priorities	X	X	X		X	X		X		6
Organisation policy objectives		X	X	X	X	X		X		6
Non-governmental organisations/ public/ media			X							1

b) How frequently are the priorities of E&H research activities defined?

The frequency of priority definition varies within countries. It depends on the type of organisation. In fact, partners asked for the answers mostly within their own organisation, so it represents priorities by organisation. Priorities are defined on an annual basis by **ADEME/France**, **AFSSET/France**, **UBA/Germany**, **EA/UK**, **NERC/UK** and **UVZ/Slovakia. AFSSET/France** in addition states that the Framework Programme Agenda is a basis for the priority definition for the research ministry and AFSSET's agenda is based on that of the technical ministries.

The priorities are defined every few years by **MEEDDM/France**, **EPA/Ireland**, **MOH/Israel**, **CNR/Italy** and **Swedish EPA/Sweden**. In **BelSPO/Belgium, FPS/Belgium** as well as in **UVZ/Slovakia** priorities are defined every five years. It varies from four to five years for **VROM/Netherlands.**

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6.4 PROGRAMME MANAGEMENT

Please briefly describe the mechanisms for E&H research activities in your country regarding…

a) Which is/are the competent authorities for the initiation and prioritisation of E&H research?

- **Ministries**
- **Agencies**
- **Other, please specify**

Concerning question 4a) nearly every country – **France**, **Germany**, **Ireland, Israel**, **Italy, Slovakia, Sweden** and the **United Kingdom –** stated that the competent authorities for the initiation and prioritisation of E&H research are ministries together with their agencies. In **Belgium** and in **The Netherlands** the competent authorities are ministries only. In **France** – in addition to ministries and agencies – research organisations also are competent authorities for the initiation and prioritisation of E&H research and in the **UK** also research councils, such as NERC. UVZ additionally specifies the EC, the WHO and the Chief Hygienist of the **Slovak Republic**.

It can be assumed that also in those countries where ministries (and agencies) are the only competent authorities for the initiation and prioritisation of E&H research, other scientific organisations have options to decide and/or set own priorities for their research, such as foundations and project management institutions.

In summary in most of the ERA-ENVHEALTH partner countries, the competences for the initiation and prioritisation of E&H research seem to be very similar. Differences are linked to the authorities other than the ministries and probably the way the decision-making and/or consultation process takes place. It is also possible that the partners were more or less formal when answering this question and when deciding whether or not the agencies are mentioned to be “competent authorities”.

b) Preparation (process and procedures) and implementation (call and proposals)

According to FPS in **Belgium** actions for the NEHAP (National Environment Health Action Plan) are prepared by the national cell “environment and health” and are approved by each minister responssible for environment or health: “Consequently the plan is peer reviewed by a public consultation. Remarks are reworked in a final action plan and published.”

For BelSPO the preparation of research programmes has to respond to the following steps: “Firstly writing a proposal of programme by BelSPO administration, secondly the proposal is submitted to an advisory committee for advice, thirdly the amended proposal is submitted to the Federal Ministry of Science Policy for approval, fourthly the minister defends the programme by the ministry council to obtain the budget and fifthly after the approval of the budget BelSPO implements the calls.”

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Questioned on the preparation and implementation of research, ADEME and MEEDDM declared that in **France** there are annual calls for proposals jointly prepared by a steering council and a scientific committee.

In **Germany** every year the Environment Ministry and the UBA draw up the environment research plan – called UFOPLAN – for the next year: "This plan also includes E&H projects concerning the Environment Ministry. It is published at the beginning of every year with a call for expression of interest for every project. UBA then commissions the research projects, mainly according to the rules of procurement and sometimes by grants to researchers. (This is the description of the procedure within the Environment Ministry. Other procedures are carried out by the Health and the Research Ministries, the 16 federal states, foundations etc.)."

In **Italy** public bodies, agencies, foundations and private enterprises are responsible for the preparation and implementation of research.

In **Sweden** the government bill includes the national priorities and the budget:[35] "The implementation is mainly carried out by the national research councils. The Swedish EPA is responsible for and in control of the 'Swedish Environment Research Grant', a national funding programme."

In the **United Kingdom** there are no standard national procedures; they vary from organisation to organisation. For the EA on an annual basis research needs are identified. The work will then be undertaken in-house, in partnership or by issuing a tender.

c) Quality assurance

- **Peer review**
- **Steering committee**
- **Evaluation/valorisation**
- **Other, please specify**

With regard to question 4c) the quality assurance in all countries is undertaken with the help of "Steering committees" as well as "Peer reviews" and/or "Evaluation/valorisation".

For **Belgium**, **France, Israel**, **Slovakia**, **Sweden** and the **United Kingdom** all three instruments are relevant. In Belgium – according to FPS – there is also "Public consultation", in France "Audits" (ADEME) and in Slovakia "Reports". The Swedish EPA stated that the given answer applies to research initiated by their organisation only. EA and NERC add that in the UK the quality assurance varies from organisation to organisation, but that the three mentioned above mostly take place.

In **Germany** and **Ireland** "Peer reviews" and "Steering committees" are tools for quality assurance, in **Italy** "Steering committees" and "Evaluation/valorisation". In **The Netherlands** there are "Steering committees", "Evaluation/valorisation" and a "Specialised procurement department" (see Table 19).

[35] Also see answer to question 3a) on page 143.

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Table 19: Matrix of answers to question 4c) "Quality assurance"

Quality assurance											
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SE**	**SK**	**UK**	**∑**
Steering committee	X	X	X	X	X	X	X	X	X	X	**10**
Peer review	X	X	X	X	X			X	X	X	**8**
Evaluation/valorisation	X	X			X	X		X	X	X	**7**
Other	X	X					X		X		**4**

d) Communication, dissemination and reporting (including stakeholder engagement)

- **Scientific dissemination (reports, peer reviewed papers, workshops etc.)**
- **Policy reports and recommendations**
- **Public dissemination of scientific results (reports, brochures, internet, educational material etc.)**
- **Others, please state**
- **Please add information on the methods used to disseminate results and how end-users and stakeholders are involved**

In the majority of the countries – **Belgium**, **France, Germany, Ireland**, **Italy, Israel**, **Slovakia** and the **United Kingdom** – there are "Policy reports and recommendations" (identified by ten countries), "Public dissemination of scientific results (reports, brochures, internet, educational material etc.)" as well as "Scientific dissemination (reports, peer reviewed papers, workshops etc.)" (both identified by nine countries). In **Belgium** there is also "Public consultation". In **Sweden** there are "Scientific dissemination" and "Policy reports and recommendations", but "Public dissemination of scientific results" was not mentioned. In **The Netherlands** there are "Policy reports and recommendations" as well as "Public dissemination of scientific results", but "Scientific dissemination" was not mentioned (see Table 20).

Table 20: Matrix of answers to question 4d) "Communication, dissemination and reporting"

Communication, dissemination and reporting											
	BE	**FR**	**DE**	**IE**	**IL**	**IT**	**NL**	**SE**	**SK**	**UK**	**∑**
Policy reports and recommendations	X	X	X	X	X	X	X	X	X	X	**10**
Public dissemination of scientific results	X	X	X	X	X	X	X		X	X	**9**
Scientific dissemination	X	X	X	X	X	X		X	X	X	**9**
Other	X										**1**

Additional information on the methods used to disseminate results and how end-users and stakeholders are involved was requested. **BelSPO/Belgium** mentioned "press conferences", **FPS/Belgium** "mailing-list, website and official publications" and **MEEDDM/France** stated

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that “workshops and symposiums are good opportunities to make the scientific results available”. **UBA/Germany** added that it “publishes results of research projects either on its website, in its newsletter, through a press release or publishes the whole research report. Important results or results which are of high political interest are also published in the monthly report of the Environment Ministry. Stakeholders are often involved in the projects and insofar very well informed about the projects. Dissemination to the scientific community is done either through scientific publications by the researchers or also by scientists of UBA. Also there are a lot of activities for the general public (brochures, flyers, open days etc.).” **EPA/Ireland** added that “research findings are primarily disseminated through project reports which are published on the internet and sometimes also hard-copy (printed). Where appropriate, seminars/workshops will be organised to bring research to target user groups. Media is used when a public interest is identified within the research.” **CNR/Italy** mentioned “media and website”, **UVZ/Slovakia** “internet, reports, journals, training, workshops, seminars, conferences, brochures and media (TV, press, radio)” and **EA/UK** “workshops and presentations at conferences”. EA/UK and NERC/UK stated that in the United Kingdom “the communication, dissemination and reporting vary between organisations” and **NERC/UK** added that “the Research Councils now ask grant holders to provide an ‘impact plan’, which details how they will maximise the impact of their research (including stakeholder engagement and other dissemination activities) and the cost implications of carrying out these impact activities).”

e) (1) Are there any E&H issues which are not pursued at present but for which your organisation is keeping a watching brief on in case the issue becomes more important?

To this question the answers of the ERA-ENVHEALTH partners are on different levels. Most partners appointed specific issues which are not (or rarely) pursued at present; some gave more general feedback.

For **FPS/Belgium** the issue not pursued at present is “Climate change on health”, for **AFSSET/France** the issues are “Human biomonitoring” and “Integrated risk assessment” and for **ADEME/France** the issue is “Nanomaterials”. **MOH/Israel** specified “Exposure to chemicals” and **VROM/Netherlands** “Air quality inside cars”.

EPA/Ireland declared that there is some activity in “Climate change and human health” for which the level of work may increase over time. **NERC/UK** highlighted that “the Environment Agency has a small team who undertake horizon scanning to raise awareness of emerging issues.” That’s how they became aware of “Nanoscience” and “Synthetic biology”.

Swedish EPA/Sweden stated that Sweden has a well developed system for monitoring the state of its environment and that Swedish EPA is responsible for this: ”Monitoring concentrations of chemical substances in mother´s milk, blood and urine are concrete examples of Swedish environmental monitoring with implications on E&H. Further information can be found on our homepage http://www.swedishepa.se/en/In-English/Menu/State-of-the-environment/Environmental-monitoring/.”

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e) (2) Are there any important E&H issues which fall outside the remit of your organisation?

Most partners confirmed that there are important E&H issues which fall outside the remit of their organisation. For **AFSSET/France** theses issues are “Food safety”, “Radioactivity and “MSD (musculoskeletal disorders)”, for **ADEME/France** they are “Food safety”, “Radioactivity” and “Water quality”. For **EPA/Ireland** these issues are “Electromagnetic fields” and “Exposure to radon” and for **UBA/Germany** they are “Food safety”, “Electromagnetic fields”, “Radioactivity” and “Health in general (e.g. infectious diseases)”.

Swedish EPA/Sweden pointed out “Chemicals” (responsible: Swedish Chemical Agency), “Radiation” (responsible: Swedish Radiation Safety Authority), “Health and welfare” (responsible: The National Board of Health and Welfare) and “Public health” (responsible: The Swedish National Institute of Public Health) and **VROM/The Netherlands** “Vector and pathogens proliferation due to climate change”.

EA/UK and **NERC/UK** stated that there are many issues which fall outside their remit; examples include “Indoor air”, “Food”, “Occupational health” and “Agriculture and farmed animals”. However, these issues are covered by other organisations.

MOH/Israel also agreed that there are important E&H issues that fall outside the remit of its organisation; some of them are within the scope of the Ministry of Environmental Protection.

FPS/Belgium declared that “by definition there are no important E&H issues” which fall outside their remit, “but every five years priorities are defined. Also E&H issues are very scattered between the very diverse Belgian governments”.

e) (3) Has your organisation undertaken any horizon scanning or similar exercises on E&H issues?

Most of the ERA-ENVHEALTH partners indicated that they had not yet undertaken a broad horizon scanning on E&H issues. **ADEME/France** and **EPA/Ireland** both answer with “no”, **FPS/Belgium** and UVZ/SK with “not yet” and **AFSSET/France** with “planned”.

UBA/Germany stated that the participation in the ERA-ENVHEALTH project is a first step in this direction”. **Swedish EPA/Sweden** and **EA/UK** stated that they have not undertaken a horizon scanning or similar exercises especially for E&H. For the EA however, horizon scanning has been undertaken in the general area of the environment which includes E&H. Also, as part of the ERA-ENVHEALTH project, a scan for E&H issues has been conducted.

NERC/UK answered positively to question 4e)-3 and stated that this activity is carried out during the strategic development of the EPHH (Environment Pollution and Human Health) Theme Action Plan.

VROM/The Netherlands as well as **MOH/Israel** answered positively to the question. The Netherlands have a scoping commission and Israel has a forum which includes other governmental ministries and NGOs to discuss issues of mutual interest.

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e) (4) If different programmes have different management mechanisms please explain briefly

Only a few partners gave an answer to this question. **VROM/The Netherlands** replied that it is impossible to answer because all programme management mechanisms are different; there is no uniform methodology of management in their country.

BelSPO/Belgium stated that "the 'Interuniversity Attraction Poles' (IAP) programme aims to provide support for teams of excellence in basic research that belongs to the various (linguistic) communities. These teams work as part of a network in order to increase their joint contribution to general scientific advances and, where applicable, to international scientific networks. The proposition of the thematic evaluation of calls selection of projects is the responsibility of the network leader. In this programme BelSPO is responsible for the funding and secretariat."

UVZ/Slovakia stated that "in case of multinational projects there is a defined responsible partner for management at national level; it depends on the field of the activity and interest."

NERC/UK pointed out that they "try to maintain a standard governance protocol in managing programmes, but there may be slight variations depending on co-funder partnerships and any specific needs they may have."

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6.5 GOVERNANCE

a) Describe the principal accountabilities in the "science to policy chain" in your country: How does the transfer from science to policy work? How do research results make their way from science into policy?

14 institutions out of all partner countries answered this question.

In **Belgium** with respect to the "science to policy chain" different procedures from the regional to the federal levels exist: "These are no standard procedures, but co-operations and interactions between researchers, stakeholders, society and policy makers resulting in a short-/long-term legislation or policy instruments, recommendations, information and measures."

In **France** "research results make their way from science into policy through public controversy via media pressure on the one hand and from agencies to ministries through scientific watch and reports on the other hand. Within the ministry the transfer takes place through a direct link between the research programme manager and the minister's team (cabinet)."

Germany has many ways of transferring research results from science to policy: "First of all there are a lot of scientific agencies in Germany working in the sphere of responsibility of the (federal and state) ministries. These agencies – like UBA – conduct their own research or contract research in close cooperation with the ministry to help answering political questions via scientific methods. The results of this research are directly communicated to the ministries, sometimes the ministries are already involved in the project process. Secondly Germany has a lot of research institutes whose goal is to conduct implementation oriented research with political advice. These institutions are funded mainly by the Research Ministry, and the results are published by dialogue processes, steering committees etc. Thirdly there are two expert advisory councils, the Advisory Council on the Environment (SRU) and the German Advisory Council on Global Change (WBGU). Fourthly Germany has several advisory committees and since 2008 the National Academy (German Academy of Sciences Leopoldina), one of its goals is to give scientific political advice."

In **Ireland** policy-making in the environment area is responsibility of the Environment Ministry (Department of Environment, Heritage, and Local Government): "Officials of this ministry use research reports, published literature and personal contact with researchers to inform their work. Other outlets for scientific work include information and justifications for particular positions in meetings (at international level) to prepare legislation e.g. the National Emissions Ceiling Directive and the Post-Kyoto agreement."

Israel has several committees that deal with policies: "Most of them include representatives of other ministries or other governmental authorities. Currently an environmental epidemiology unit is established which will be able to deal with specific policy issues."

In **Italy** a main driver is the media relevance of a new issue and the expected impact on the political administrators' public image: "The relevance in the EU context can be a driver, if a high visibility on media can be reached. Many scientific experiences and proposals are

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developed and discussed, to support scientific methods and procedures, but these need to be standardised and ruled."

In the **Netherlands** "different advisory committees deliver reports (requested and unrequested) on top of the reports by RIVM, signals from experts within the ministry."

In **Slovakia** "the results from research are taken into account for the preparation, creation of strategies, policies, legislation, action plans as well as implementation in industry. In general, as there is very limited budget allocated for research from the governmental side, research as a whole is not a priority within the governmental programme."

In **Sweden** the transfer from science to policy and the responsibilities are shared: "Research funders need to have funding arrangements that ensure that the researchers are available to support implementation of research results after the research projects have been completed. The researchers need to have necessary communication skills and/or communication support. A specific responsibility for communication may be allocated to an individual within the research team. In order to ensure that outputs meet their needs, potential users should be involved from the early planning stages of research programmes and projects. Identification of potential users, and an evaluation of their different needs and concerns, should therefore be carried out at the start of the programme or project. Their continued engagement through the research and dissemination stages is necessary to make sure that the answers generated by the researchers remain tuned to the evolving questions of the users."

Swedish EPA also sees an important role for interpreters and intermediaries: Their role is "to facilitate interactions between the research and user communities, and to put research results into context and in proportion, using language that can readily be understood by policy makers and other stakeholders. They should work with projects and programmes from the initial planning stage to enable the timely transfer of new knowledge. This role might be in-house science advisers, agencies and research institutes, advisory committees, consultants, or professional, industrial and commercial bodies and associations. Engagement with stakeholders on research programmes and results in a two-way communication process are particularly valuable, enabling research, and the explanation of research results, to respond to stakeholders' framings and concerns. The media plays an important intermediary role, and a constructive relationship should be developed to help communicate research to broader audiences."

In the **United Kingdom** no formal process exists which regulates the transfer of scientific results into policy: "Generally the scientists will make reports available to policymakers and presentations and meetings will be held."

With respect to NERC, "policymakers are often involved in research programmes as co-funders or in an advisory capacity, and therefore have immediate access to the outputs of the programme's research. Scientists can feed directly into consultations held by the Government, and the Research Councils can coordinate reports from the scientific community to feed into government."

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The recently published NERC guidance to researchers in the environmental science community outlines current processes: www.nerc.ac.uk/publications/corporate/documents/science-into-policy.pdf

There is also a general description of the process on the defra-webpage: www.defra.gov.uk/science/how/evidence.htm

b) If possible, please add any further comments on governance and its impacts such as any direct changes this may have had on policy or scientific priorities for the future and if public perceptions have been impacted …

Only three partners from three different countries added further comments on governance and its impacts such as any direct changes this may have had on policy or scientific priorities for the future and if public perceptions have been implemented. One partner claims that to answer this question would have taken "at least 3 pages for which the time is lacking". The given answers all lie on different levels.

CNR/Italy responded to question 5b) by giving two examples:

"1. The 2003 'heat wave', with the negative consequences on population living in larger towns, produced the implementation of several research activities and the activation of an ad-hoc surveillance system.

2. The increasing quality, quantity and public attention around epidemiological studies in risk areas, is leading to the inclusion of environment and health studies within the current activities developed in the 'National Reclamation Sites', funded by the Government."

These examples relate to drivers for E&H research activities and priorities and therefore could also be understood as an additional answer to question 3a) of the 2nd questionnaire (see section 6.3).

UVZ/Slovakia gave the following answer: "Governmental programmes, organisation programmes, operational programmes, EU, other EU funding programmes, financial aspect and cooperation with scientific audience."

And **NERC/UK** presents the following link which relates to case studies of how NERC-science has been used: www.nerc.ac.uk/publications/corporate/knowledge.asp. "NERC-funded research contributes directly to policy development, monitoring and assessment. NERC provides reliable and independent policy advice to government in a variety of ways. These include direct briefings, sitting on advisory committees, contributing to international reports and commissioned research. NERC-science has had a major impact across the globe; for example, the discovery of the hole in the ozone layer gave impetus to the Montreal Protocol, an international treaty to eliminate the production and consumption of ozone-depleting chemicals. NERC continues to provide the science needed for both national and international policy in key areas such as climate change, energy, biodiversity and the Water Framework Directive."

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6.6 ANALYSIS OF THE PRIORITIES FROM THE 1ST AND 2ND QUESTIONNAIRES

It is not possible to compare all the results of the 1st and the 2nd questionnaires but only those which refer to similar points. As the results of the topics of the E&H programmes (Q 9, 1st questionnaire, see section 4.4), the future priorities of the E&H programmes (Q 13-16, 1st questionnaire, see section 4.6), the current governmental priorities (Q 1-a, 2nd questionnaire, see section 6.1-a) and the planned and most important E&H activities of the consortium partners (Q 1-b, 2nd questionnaire, see section 6.1-b) all refer to current and future E&H activities, they lend themselves to the comparison. This compilation can help analysing the actual and future E&H research situation and thus could help identifying potential research gaps.

Themes

With respect to the themes, “Outdoor air quality” and “Indoor air quality” are recorded most frequently as topics of the E&H programmes, as future priorities of the E&H programmes, as current governmental priorities and as planned and most important E&H activities of the consortium partners. “Climate change” is recorded most frequently as a future priority, as a current governmental priority and as a planned and most important E&H activity as well. “Local/living environment” is also recorded most frequently as a topic of the E&H programmes.

Table 21: Most frequently recorded “Themes related to human health effects”

Topics of E&H programmes	Future priorities of the E&H programmes	Current governmental priorities	Planned and most important activities of consortium partners
Outdoor air quality	Climate change	Outdoor air quality	Indoor air quality
Water quality & supply	Indoor air quality	Climate change	Climate change
Local/living environment	Outdoor air quality	Indoor air quality	Outdoor air quality
Indoor air quality			

Agents

With respect to the agents, “Other chemical agents” and “Particulate matter” are recorded most frequently as topics of the E&H programmes, as current governmental priorities and as planned and most important E&H activities of the consortium partners. “Biological agents & Microorganisms” and “Pesticides & biocides” are also recorded most frequently as topics of the E&H programmes. “Biological agents” are recorded most frequently as current governmental priorities as well. “Nanomaterials” and “Noise” are recorded most frequently as planned and most important E&H activities as well. “Nanomaterials” and “Other chemical

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agents/Endocrine disrupters" are also recorded most frequently as future priorities of the E&H programmes.

Table 22: Most frequently recorded "Agents"

Topics of E&H programmes	Future priorities of the E&H programmes	Current governmental priorities	Planned and most important activities of consortium partners
Other chemical agents)	Nanomaterials	Other chemical agents	Nanomaterials
Biological agents & Microorganisms	Other chemical agents / Endocrine disrupters	Particulate matter	Particulate matter
Pesticides & biocides		Biological agents	Other chemical agents
Particulate Matter			Noise

Human health effects

With respect to the human health effects, "Respiratory diseases" and "Cardiovascular diseases" are recorded most frequently as topics of the E&H programmes, as current governmental priorities and as planned and most important E&H activities of the consortium partners. "Asthma" is recorded most frequently as a topic of the E&H programmes and as current governmental priority. "Allergies" is recorded most frequently as a topic of the E&H programmes and as a planned and most important activity as well. "Cancer" is recorded most frequently as a current governmental priority and as a planned and most important E&H activity as well. "Vector borne diseases" is recorded most frequently as a current national activity. "Reprotoxic & development disruption" is recorded most frequently as planned and most important E&H activity as well.

Table 23: Most frequently recorded "Human health effects"

Topics of E&H programmes	Future priorities of the E&H programmes	Current governmental priorities	Planned and most important activities of consortium partners
Respiratory diseases		Asthma	Respiratory diseases
Cardiovascular diseases		Respiratory diseases	Allergies
Asthma		Cardiovascular diseases	Cardiovascular diseases
Allergies		Cancer	Cancer
		Vector borne diseases	Reprotoxic & development disruption

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Methodologies

With respect to the methodologies, “Exposure assessment” is recorded most frequently as a topic of the E&H programmes, as a future priority of E&H programme, as a current governmental priority and as a planned and most important E&H activity of the consortium partners. “Health impact assessment” is recorded most frequently as a topic of the E&H programmes, as a current governmental priority and as a planned and most important E&H activity. “Epidemiological studies” is recorded most frequently as a topic of the E&H programmes, as a future priority of the E&H programmes and as a current national priority. “Modelling” is recorded most frequently as a topic of the E&H programmes and as a current governmental priority as well. And “Human biomonitoring” is recorded most frequently as a future priority of the E&H programmes and as a planned and most important activity of the consortium partners.

Table 24: Most frequently recorded “Methodologies”

Topics of E&H programmes	Future priorities of the E&H programmes	Current governmental priorities	Planned and most important activities of consortium partners
Exposure Assessment	Exposure Assessment	Modelling	Human biomonitoring
Health Impact Assessment	Human biomonitoring	Health impact assessment	Health impact assessment
Epidemiological Studies	Epidemiological studies	Epidemiological studies	Exposure assessment
Modelling		Exposure assessment	

Social aspects of E&H

With respect to the social aspects, “Children’s health” and “Vulnerable groups” are recorded most frequently as topics of the E&H programmes, as current governmental priorities and planned and most important E&H activities of the consortium partners. “Behaviour of individuals & groups” is recorded most frequently as a topic of the E&H programmes. “Social disparities & health” is recorded most frequently as a current governmental priority.

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Table 25: Most frequently recorded "Social aspects of E&H"

Topics of E&H programmes	Future priorities of the E&H programmes	Current governmental priorities	Planned and most important activities of consortium partners
Children's health		Vulnerable groups	Children's health
Vulnerable groups		Social disparities & health	Vulnerable groups
Behaviour of individuals and groups		Children's health	

The compilation of the most frequently recorded topics of the E&H programmes, the future priorities of the E&H programmes, the current governmental priorities and the planned and most important E&H activities of the consortium partners can indicate where E&H research is at present, where it is heading to and where there are potential research gaps – especially when the issues are not pursued at present but for which the partner organisations are watching in case they become more important (2nd questionnaire, see section 6.4-e(1)). The important issues which fall outside the remit of the partner organisations (2nd questionnaire, see section 6.4-e(2)) are also taken into account.

The above compilation indicates that "Air quality" in general is a very important and well established theme in most of the countries and that further research still is considered to be necessary in this field. Particularly "Indoor air quality" seems to be considered increasingly important as it holds the third place with respect to the programme topics and the current governmental priorities and the first place with respect to the planned and most important activities of the consortium partners. "Climate change" and "Transport" are considered to be important themes as well. Taking into account that "Climate change" was nominated by several partners as a future priority of the E&H programmes and an issue not pursued at present but for which the organisation is watching in case it becomes more important, it seems that "Climate change" is not established in every country at present and that there is an urgent need for further research in this field.

With respect to the agents, the compilation indicates that "Other chemical agents" (like POPs and endocrine disrupters) and "Particulate matter" are important and well recognised in most of the countries. Still further research in these fields seems to be considered necessary. "Biological agents & Microorganisms" also are important and recognised agents, but for most countries further research in this field does not seem to be a priority. "Nanomaterials" and "Noise" seem to be less established in most countries or they do not fall under the responsibility of the partner organisations, but future research activities in these fields seem to be considered important.

"Respiratory Diseases" and "Cardiovascular Diseases" are recognised human health effects and have been, are, and will continue to be important. The same is true for "Allergies", "Asthma" and "Cancer". "Vector borne diseases" seem to be a new priority linked to the "Climate change" issue.

"Exposure assessment", "Epidemiological studies" and – with respect to future research priorities – "Health impact assessment", are important and well established methodologies.

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As “Human biomonitoring” was most frequently recorded as a planned and most important E&H activity of the consortium partners and as a future priority of the E&H programmes but only a few times as an important programme topic and a current national priority, it is possible that this methodology is not very well established in most countries. The consortium performing human biomonitoring at the European scale (COPHES) – funded by the EU under the 7th Framework Programme of the Research Directorate General – can be seen as an indicator that human biomonitoring is gaining more and more importance especially on an international level.

“Vulnerable groups” and “Children’s health” used to be, are, and will be the most important and established social aspects (considering that “Vulnerable groups” is a cumulative topic).

To sum up, the results suggest that there are topics which have been, are, and – in the near future – will be important and recognised, such as the themes “Outdoor air quality”, “Indoor air quality” and “Transport”, the agents “Particulate matter” and “Other chemical agents”, the health effects “Allergies”, “Cancer”, “Cardiovascular diseases” and “Respiratory diseases” and the methodology “Health impact assessment”. Topics that are recorded as planned and most important E&H activities for the consortium partners (future state) but not as current programme topics and governmental priorities (actual state) can indicate research gaps, i.e. quite new areas where research activities are necessary. This might be the case for the themes “Climate Change”, “Nanomaterials” and “Noise” and the methodology “Human biomonitoring”.

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7. DISCUSSION AND CONCLUSIONS

General remarks

First of all it should be highlighted that the participating organisations showed a great interest in exchanging information within the ERA-ENVHEALTH network and in future cooperation within the field of E&H. By the 3rd of September 2009, 38 organisations (including the 16 ERA-ENVHEALTH partners) from 11 countries gathered and entered data on 49 E&H funding programmes and 461 associated projects. This information provides a strong basis for analysing research in the field of E&H in the participating countries. It reflects the diversity of the participating countries, their different cultures and structures for research and administration as well as their similarities. The large amount of information gathered stresses the high interest in further cooperation and also the need for future collaboration in this area.

With the aim of getting good quality answers, the two questionnaires used for gathering the information on projects, programmes and organisations were discussed with all ERA-ENVHEALTH partners. A compromise was found to cover all interesting subjects for the partners on one hand and to try to keep the questionnaires short, understandable and clear on the other hand in order to motivate programme managers to answer and not have to spend too much time for the completion of the questionnaires. The requested themes were not scaled, only a yes/no answer could be ticked. Therefore, it is not possible to identify how intensively a topic has been covered. This, to some extent, can be done with respect to the funded projects. To have a clear picture, the partners decided to not collect all funded projects but mainly relevant projects which characterise the programme the best. The overall aim was to identify possibilities for further collaboration. Therefore, not all interesting issues for E&H research could be defined in detail.

Also, it is important to note that due to the database structure every project needed to be linked to a programme. So in some cases “virtual programmes” were created to enable the entry of projects into the research database. Therefore, the programmes themselves represent very different “modes” ranging from “real, big and pure E&H programmes” to “more general research funding programmes which do also fund E&H” to artificially created “virtual programmes”.

One challenge was to find an appropriate definition of E&H, which in fact is not considered to be the same in every country. In some countries, e.g. France “Occupational health” is definitely seen as an E&H subject, whereas in other countries this is not necessarily the case. Therefore, a quite broad definition had to be found which allowed all the ERA-ENVHEALTH partners’ E&H activities to be taken into account (see section 3.2.1). The country-specific conceptions of E&H had an influence on which other programme managing organisations were asked to enter their programmes and projects into the database and – if asked – if these felt to be the right address for giving information on E&H at all. The country-specific conceptions therefore had an influence on the results in general.

As the participating organisations are only rarely the competent authorities for both environment and health (see section 4.1), the questionnaires might have been answered

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from a slightly different perspective depending on whether the answering organisation is responsible mostly for environment, for health or for both.

In addition, it is likely that the differing numbers of E&H programme managing organisations (see section 4.1) and funding programmes (see section 4.2) in the different countries are due to different research and administration structures as well as federal structures in certain countries and do not necessarily reflect the total amount of the actual E&H activities in those countries. However, in conclusion the content of the database gives in any case a good overview of the E&H research activities of the partners and the relevant organisations in the partner countries. For the reasons mentioned above it cannot be estimated to what extent all E&H research activities of other programme managers in the countries are covered.

The budget of a programme could be an indicator for the importance of the programme and how many activities are allotted. Even if only half of the programme managing organisations answered the budget question it shows that there is a wide range of financial conditions from 0.1 M€ to 160 M€ (see section 4.3). But the poor response also shows that the answer to this question seemed to be very difficult. This could be due to different research and administration structures and that some of these programmes have a wide range of objectives and do not only fund E&H research. So it was not always possible to clearly distinguish which part of the funding of a programme relates to E&H research only.

Programme topics

When looking at the programmes' topics (see section 4.4) it is essential to take into account that programmes are normally frameworks with more generally formulated objectives. They are flexible with respect to their topics and may cover a wide range of topics that can be funded. This can explain why some managing organisations indicated that it was not easy for them to clearly identify the relevant topics for their programme(s). It can be assumed that the topics which were selected are and have been covered within this/these programme(s). This probably does not mean that other topics are considered to be not important or that cooperation concerning other topics is impossible.

The topics that were recorded most frequently by the relevant programmes can be considered as being the most important and/or most established ones for the majority of the programme managing organisations. These are themes such as "Outdoor air quality", "Other chemical agents", "Biological agents & Microorganisms" as well as "Exposure Assessment" and "Health Impact Assessment". Cross-national overlap can be suspected for these themes, selected by 30 or more out of the 49 programmes. But at this rather general level of the funding programmes, the extent of this overlap cannot be analysed in detail. Some of the most mentioned topics are likely to cover research that features mandatory work, e.g. referring to EU legislation. Also some topics that are stated to a high extent do have a cumulative character. For example the topic "Other chemical agents" was selected by many programmes, probably because it covers other important and well established agents such as "Persistent organic pollutants (POPs)" and "Endocrine disrupters". Similarly, it might be the case for the topic "Vulnerable groups" which can be considered as a higher-level category with respect to children, poor, elderly people and other social groups.

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15 themes were selected by less than 15 out of the 49 programmes, e.g. “Green Space”, “Transport”, “Electromagnetic Fields” (see section 4.4). The fact that certain topics only got selected a few times might be due to different reasons: Firstly, as mentioned above, these topics may fall outside the remit of some of the programme managing organisations. This could be the case for “Food Safety”, “Radioactivity”, ”Occupational Health” and “Infectious Diseases”, where in fact some ERA-ENVHEALTH partners stated that these topics are considered to be important but fall outside their remit (see section 6.4-e(2)). Secondly, it is possible that these topics are considered to be not important for most of the involved programme managing organisations. Thirdly, it is possible that these topics are quite old, the risks are probably known and further research is not urgently needed here (this could be the case for “Fibres”). And fourthly, it is possible that these topics are just upcoming ones that are not yet established as being important in the field of E&H (this could be the case for “Epigenomic changes”).

Project topics

Information about the topics of the programmes does not show which special themes were really funded. Therefore, the information on the projects which are relevant for the programmes gives a good impression about the main achieved objectives. When looking at the topics of the 461 E&H projects, it is not surprising that the distribution of the selected themes is very similar to that of the programmes. A slight difference appears with respect to “Occupational Health”, which for the programmes is one of the least and for the projects one the most recorded social aspects. This difference is probably due to the fact that AFSSET/France is responsible for “Occupational health” as well as for “Environment and Health” and funds a large amount of projects on this topic and thus, entered a high number into the database.

The purpose of the data collection was to integrate a majority of projects and in particular selected projects, i.e. projects which are representative for the programmes. It was not possible to get a complete overview of all projects. Therefore, the pure **number of these selected projects** in the database referring to specific topics does not reflect the real number of projects for that topic. So for example if a programme did fund several similar projects for an important topic, they have not necessarily all been entered into the database.

The attribution of the project **budgets** to the different topics also has to be compared very carefully. Topics demanding experimental studies (e.g. analysing the impact of chemicals or biological agents on human health) may need more financial resources than a project which e.g. develops a new aspect of a climate change model. Therefore, the financial demand of a project does not necessarily reflect its importance for science, policy and society.

As mentioned above, at this rather general level the organisations are dealing with similar problems but it cannot be analysed to what extent the research in the different (partner) countries does really overlap. The cluster analyses of the project themes in the following work package (task 2.1 of WP2) may reveal more clearly commonalities and gaps that cannot be detected at the programme level and from the project summaries. When doing this further analysis, it has to be considered that the projects in the database were selected to be

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representative for their programmes and do not necessarily reflect the whole E&H research landscape in Europe. If an overlap is detected, information exchange and future cooperation could diminish duplication of work and thus release further resources that can be used for other themes.

Priorities and cooperation

When asked for the **future priorities of the E&H programme** (1st questionnaire), the three themes that were most frequently stated by the organisations refer to “Climate change”, “Exposure assessment” and “Indoor air quality” (see section 4.6). Some organisations had difficulties answering this question. This might be due to the fact that, on one hand, the topics of the programmes are flexible and do often cover a wide range of possible themes and, on the other hand, the setting of the future priorities is a political issue which can not always be predicted easily by the participating organisations.

When looking at the answers of the ERA-ENVHEALTH partners with respect to the **national priorities of E&H activities** in their countries (2nd questionnaire) it has to be considered that E&H is not an existing specified area in every country and therefore an official priority list of E&H research activities does not necessarily exist. When comparing the priorities of the different countries one should bear in mind that the given answers may also depend on the ERA-ENVHEALTH partners’ individual perception (e.g. as competent ministry for environment) whether a topic is a priority or not. With respect to this perspective, it is important to note that the priorities of the research ministries (which come from the perception of the researchers) and those of the technical ministries – health, environment etc. – (which come from the perception of the end-users) are not always the same. Logically each of the different organisations has different priorities in line with their specific responsibilities in the E&H area.

As much as eight topics (see section 6.1-a**)** were indicated by all participating countries as being “current governmental priorities”, e.g. “Outdoor air quality”, “Respiratory diseases” and ”Health impact assessment”, and roughly three quarters of the topics were stated by more than half of the countries as being a priority. This shows that countries have to solve similar problems and it is likely that areas for future cooperation can be found easily within these common priorities.

The **drivers for national E&H activities and priorities** are very similar in the ERA-ENVHEALTH partner countries (see section 6.3). All nine answering countries are driven by legislation and policy objectives, most of them by international commitments (WHO CEHAPE, EU Environment and Health Action Plan). Differences are likely to occur in the different structures and ways for formal and informal actions of the relevant driving forces. Surprisingly and, to some extent unlikely, the role of “NGO/public/media” as a driver is apparently negligible in most of the countries.

Due to the diverse research and administrative structures in the different countries, the **funding structures** of the ERA-ENVHEALTH partner organisations show a large heterogeneity (see section 6.2). It was not easy for the partners to express the complicated funding laws in the questionnaire particularly because the responsibility for funding typically

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lies in different departments of the organisations than that of programme management. The heterogeneity is based on different budget and funding laws. This is the reason for the difficulties and barriers for funding international research, which also became obvious during the first ERA-ENVHEALTH call. The main challenge for future common calls consists in reducing these differences, especially by increasing the possibilities for participation in a common financing instrument such as the “virtual common pot” and “real common pot”. To solve this problem empirically it will take a long time and is probably not possible for ERA-ENVHEALTH’s 2nd call and without the help from the EC. Therefore, the partners should find a pragmatic solution for common research.

Concerning the **programme management** in the partner countries (see section 6.4) there are a lot of similarities, e.g. in nearly every country the competent authorities for the initiation and prioritisation of E&H research are ministries together with their agencies. Regarding the preparation (process and procedures) and implementation (call and proposal) of E&H research the answers vary a lot, probably due to the diverse research and administrative structures in the countries. With respect to quality assurance and to communication, dissemination and reporting, mainly similarities can be identified.

Concerning “communication, dissemination and reporting” it can be highlighted, that on all levels – organisations, programmes and projects – a big effort is done not only to communicate scientific results to the scientific community and policy-makers but also to a broader public. In addition to future cooperation concerning research in specific E&H topics, the communication, e.g. the science to policy interface and also specific target groups, should be of interest for further cooperation, too.

When searching areas for new or further cooperation within the ERA-ENVHEALTH network, it is reasonable to firstly look at the topics of the funding programmes in order to identify commonalities / cross-national overlap and to reveal gaps where further research seems to be needed most.

Within the report a closer look was taken at the topics of the 21 E&H programmes owned or managed by the consortium partners (see section 4.4) as these are the basis for future cooperation. When comparing the results of the entirety of the programme topics with these of the partner programmes only minor differences can be found.

In order to help identifying possible common research fields of the ERA-ENVHEALTH partner programmes, a matrix of all the topics covered by the partner programmes has been created (see Table 4, section 4.4). This overview can serve as a tool for identifying which partners are working on certain topics and might wish to cooperate in the future. When looking at this overview with regards to future cooperation possibilities, it seems obvious that it will be relatively easy to find cooperating partners for subjects like “Exposure assessment”, “Health impact assessment” and “Outdoor air quality” as respectively 17 and 18 out of the 21 partner programmes indicated that these themes are funded by their programme. But even in those cases where only a few of the partner organisations are dealing with a certain topic (e.g. only three programmes are dealing with “Epigenomic changes”, “Electromagnetic fields” and “Hearing loss”) this overview can help bring these together so they can exchange information and provide experience and knowledge for other partners. So the constraints of

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working together are not primarily the content of the topics but mostly the responsibilities of the organisations.

It can be stated, that when searching for research gaps it has to be carefully reflected which topics really demand further attention. This might be the case for some topics that only few organisations deal with but also for some of the ones “in the middle” that quite a lot of programmes deal with but which for one or another reason demand future common research. For example, “Climate change” is a subject that nearly half of the programmes indicated to be dealing with but it was nominated by several partners as being an issue not pursued at present but for which the organisations are watching in case it becomes more important. Also it is one of the current governmental priorities in almost all ERA-ENVHEALTH partner countries. So there seems to be a lot of possibilities for working together in this area of interest.

Additionally, when searching areas for future cooperation, it could be of interest that partners are working on different aspects of a theme which were sometimes only indirectly covered by E&H. One example is the human health effect “Vector borne diseases” which the programmes of the UBA/Germany did not mark when answering the questionnaire because they do not especially deal with the diseases themselves. But UBA researchers deal with the vectors (like ticks and mosquitoes) and the effects that climate change may have on them and thus are likely to be interested in cooperating when it comes to deal for example with “Vector borne diseases”, the vectors, and climate change. Similar cases are most likely to occur as it was impossible to list all topics in the huge field of E&H. Therefore, for a selected topic partners should exchange more detailed information.

All in all it can be stated that this Final Report – together with the ERA-ENVHEALTH research database – is an excellent tool for giving an overview of the relevant E&H programmes and projects within the participating countries. It is desirable to carry on feeding into the database and completing it with new programmes and projects also from other European countries in the future. This should be done in a quality assurance way in order to be able to keep the actual high quality level.

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8. RECOMMENDATIONS

1. The report gives a very good overview over the E&H research activities of the participating organisations. The analysis shows that a lot of research is done in similar fields. Detailed exchange of results, knowledge and experience between the partners is very reasonable, helps to avoid double work and saves money. The partners should intensify this exchange.
2. Most of the E&H funding programmes are designed as a framework. They are flexible with respect to their topics and evolve over the years. Therefore, future cooperation with a certain programme or the associated organisation could still be possible even though the programme is not actually covering a certain topic.
3. In order to help identify possible common research fields of the ERA-ENVHEALTH partners, a matrix of all topics of the partner programmes is provided in this report (see Table 4, section 4.4). This matrix can serve as a tool to identify possible partners for future cooperation.
4. The topics that have been indicated by a majority of the programmes are likely to include cross-national overlap. Further analysis has to reveal the concrete overlap as well as the possible gaps for these topics, especially those which summarise several topics on a "higher-level", e.g. "Other chemical agents". A closer look at the content and results of the projects will help identify the similarities and gaps in detail for future cooperation (cluster analysis of WP 2).
5. Before looking at an emerging issue, partners with experience in this field can be identified with this report and should be asked for information and cooperation.
6. One of the main challenges for future common calls consists in reducing the differences in regulations for funding, especially the possibilities for participation in a common financing instrument such as the "virtual common pot" and "real common pot". Due to the diverse research and administrative structures in the different countries and the experience of the 1st call the ERA-ENVHEALTH, partner organisations should find a pragmatic and practical solution applicable to the 2nd call.
7. A lot of the E&H programme outputs do not only refer to the scientific community but also to a broader public (i.e. policy-makers, stakeholders and citizens). Therefore, it could be helpful to exchange information on how exactly the outputs of E&H research are communicated publicly (e.g. which different target groups are addressed and in which way).
8. The report shows that a lot of research is already done. Bridging the gap between science and policy is required; partners should exchange experience how the results are or might be better implemented into policy.
9. In some cases (e.g. when a topic falls outside the responsibility of a partner organisation) it might be an option to additionally find cooperating partners outside the ERA-ENVHEALTH partner organisations. ERA-ENVHEALTH partners should

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always be asked to contact relevant organisations in their countries in order to make them join the network. Also if a partner wants to work on a new and rare topic, the database is a very valuable tool for finding expert contact persons for this topic in Europe.

10. The ERA-ENVHEALTH research database is an excellent tool for giving an overview of the relevant E&H programmes and projects within the participating countries. It is desirable to carry on feeding into the database and completing it with new programmes and projects also from other countries in the future. This should be done in a quality assurance way in order to be able to keep the actual high quality level.

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9. ANNEXES

ANNEX 1: 1ST QUESTIONNAIRE

"Research Programmes – National programmes and projects related to Environment and Health within the partner countries"

ANNEX 2: 2ND QUESTIONNAIRE

"Framework for joint activities relating to environment and health research within the partner countries"

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ANNEX 1: 1ST QUESTIONNAIRE

Questionnaire

To be completed in English

Research Programmes

National programmes and projects related to Environment and Health within the partner countries

Dissemination level: ERA-ENHEALTH participants and national E&H research programme managers

Task leaders: BELSPO & UBA

WP1 leader: UVZ

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The following questionnaire aims to gather information on national programmes, projects, and research priorities from 2006 to date (as we agreed during the first WP1 workshop held in Brussels) in the field of environment and health, among the ERA-ENVHEALTH consortium partner countries. It is dedicated to providing the basic facts on research programmes in order to help understand the overall portfolio of research being funded and facilitate mutual knowledge and systematic exchange on information concerning research programming in environment and health. An additional questionnaire will be sent later on specific questions related to the programme management, administrative and scientific organisation, and procedures of evaluation and selection of the projects for funding in ERA-ENVHEALTH partner organisations in order to help prepare a second call for E&H research projects. Concretely, the information provided by this questionnaire will facilitate the elaboration of the following deliverables for the Work Package 1, coordinated by the *Public Health Authority of the Slovak Republic* – UVZ:

- **D1.1.1 and D1.1.3 specification and creation of a Database of Environmental and Health research programmes, projects and facilities. (responsible: *Belgian Federal Science Policy Office* – BelSPO (Belgium)**

- **D1.2.1 and D1.2.2 Draft and final overview of programmes and projects including synthesis and recommendations. (responsible: *Federal Environment Agency* – UBA (Germany)**

Questionnaire

SECTION A: The programme manager's organisation (the persons completing the questionnaire should be the programme managers rather than the funding organisation)

1. General information: (please provide as much information as you can in this section. Stars (*) are for mandatory information)

Name* (English name)**:**

Acronym*:

URL:

Country*:

City:

Contact and address of the organisation

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Post address:

Phone:

Fax:

2. Description of the organisation and its role: (please provide a general overview of the organisation; it may be an abstract from the organisation's website. i.e. Key purpose, role and responsibilities of organisation)

3. Type of organisation: (please tick all that apply)

Ministry	☐	Regional agency	☐
Federal agency	☐	Research organisation	☐
Public body	☐	International organisation	☐
Non profit organisation	☐	Private organisation	☐
Foundation	☐		

If other, please specify and/or add any additional comments:

SECTION B: Funding the E&H programme.

(provide information on all the E & H funding programmes which are managed by the above mentioned organisation ending in 2006 or later or planned) (replicate this section depending on the number of programmes which you think are relevant for the future joint activities of the ERA-ENVHEALTH project)

B. 1. Overall information on the programme

4. General information: (please, provide as much information as you can in the section. Stars (*) are for mandatory fields)

Name*:

Acronym:

URL:

Country*:

Start date* (dd/mm/yyyy)**:**

End date* (dd/mm/yyyy)**:**

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Frequency of the programme (e.g. annual, biannual, quintannual...):

Nature of programme: (e.g. permannent, exceptional, policy oriented,....):

5. General objectives of the E&H programme: (please provide general details relating to the E&H programme and specific details relating to areas of research that are funded).

6. Type of funding source for the E&H programme:

National/Federal ☐
Regional/Subnational ☐
European ☐
International ☐
Donations by individuals ☐

7. Total budget of the E&H programme in Euros: (if available, otherwise yearly budget or budget spent until completion of this questionnaire)

Budget:

Total budget ☐
Yearly budget ☐
Budget spent until now ☐

8. Number of projects funded through the E&H programme from 2006 to date (general information for the whole programme, please give more details for certain projects illustrating the E&H programme, and distribution for each item when available – approximately)

9. Topics of the E&H programme: (please tick all that apply)

1/ Themes related to human health aspects

Air quality outdoor	☐	Food safety	☐
Air quality indoor	☐	Water quality & supply	☐
Climate change	☐	Soil contamination	☐
Transport	☐	Local/living environment	☐
Green space	☐		

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If other please specifies and add any additional comments:

2/ Agents

Biological agents & Microorganisms	☐	Pesticides & biocides	☐
Other chemicals agents	☐	Nanomaterials	☐
Electromagnetic Fields	☐	Particulate Matter	☐
Other physical agents	☐	Radioactivity	☐
Fibres (incl. mineral fibres, asbestos..)	☐	Noise	☐

If other, please specify and add any additional comments:

3/ Human Health Effects

Asthma	☐	Respiratory diseases	☐
Allergies	☐	Infectious diseases	☐
Reprotoxic & developmental disruption	☐	Cardiovascular diseases	☐
Hearing loss	☐	Cancer	☐
Endocrine disruption	☐	Sleeping disorders	☐
Emerging diseases	☐	Epigenomic changes	☐
Ocular disorders	☐	Vector borne diseases	☐
Well-being/(risk perception)	☐	Insomnia	☐

If other, please specify and add any additional comments:

4/ Methodologies

Health impact assessment	☐	Epidemiological studies	☐
Cost/Benefit analysis in E&H	☐	Human biomonitoring	☐
Risk communication	☐	Integrated risk assessments	☐
Exposure assessment	☐	Effect monitoring	☐

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Modelling	☐	Biomedical technology	☐
Quality assurance & management	☐	Standardisation/Harmonisation	☐

If other, please specify and add any additional comments.

5/ Social aspects of environment and health and populations

Behaviour of individuals and groups	☐	Environmental justice	☐
Socioeconomic disparities & health	☐	Children's health	☐
Vulnerable groups (elderly, children, poor...)	☐	Gender & Health	☐
Occupational Health	☐		

If other, please specify and add any additional comments.

B. 2. Output of the programme

10/ Information about the results or outcomes of the programmes

Science (scientific publications)	☐
Policy (recommendations for policy makers)	☐
Public (stakeholders informed)	☐
Publicly available information	☐

If other, please specify and add any additional comments.

11/ Relevant Reports or information on the results or outcome of the programme in English language (e.g. Title, Links if available)

Other relevant information

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12/ Output and Recommendations: (please formulate what are the most important outputs of the programme and what we can learn from this programme? please also discuss the requirements and constraints)

B. 3. Future Priorities of your E&H Programme.

13/ What is planned for your E&H programme in the near future and which of the topics stated above in question 9 are for you the most important in the coming years?

14/ What other subjects should E&H programmes in general be dealing with?

15/ In which area of research on E&H topics do you wish new or further cooperation with other partners?

16. Please make any additional comments you wish to be considered.

SECTION C: Relevant Projects funded by this E&H programme

Projects which best illustrate the programme (replicate this section depending on the number of projects funded by the programme which you think are relevant for the future joint activities)

17. General information: (please, provide as much information as you can in the section. Stars (*) are for mandatory fields)

Title*:

Acronym:

URL:

Countries*:

Start date* (dd/mm/yyyy)**:**

End date* (dd/mm/yyyy)**:**

Name and acronym of the funding programme of this project:

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18. Type of project: (please tick all that apply)

Applied research	☐	Action research	☐
Basic research	☐	Qualitative research	☐
Health survey	☐	Quantitative research	☐
Evaluation research	☐	Policy oriented research	☐

If other, please specify and add any additional comments

19. Orientation of the project:

Bottom up	☐
Top down	☐
Both	☐

20. Objectives of the project: (please provide general details related to the specific areas of research).

21. Methodology used in the project: (please provide general details related to the specific materials, instruments and methodology used in the project).

22. Information on the outputs of the project (if finished, otherwise the last report)

(e.g. Titles, links to the main publications and reports in English language).

23. Budget provided by the funding programme for the project:

< € 100.000	☐
€ 100.000 to 500.000	☐
€ 500.000 to 1.000.000	☐
> € 1.000.000	☐

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Please indicate which type of budget:

Total budget ☐

Yearly budget ☐

Budget spent until now ☐

24. Scientific output of the project: (please provide information/abstract on the scientific outputs of the project). What are the most important outputs of the project? Also, if applicable, provide information on quality assurance, recommendations and constraints)

25. Research themes of the project: (please tick all that apply)

1/ Themes related to human health aspects

Air quality outdoor	☐	Food safety	☐
Air quality indoor	☐	Water quality & supply	☐
Climate change	☐	Soil contamination	☐
Transport	☐	Local/living environment	☐
Green space	☐		

If other please specifies and add any additional comments:

2/ Agents

Biological agents & Microorganisms	☐	Pesticides & biocides	☐
Other chemicals agents	☐	Nanomaterials	☐
Electromagnetic Fields	☐	Particulate Matter	☐
Other physical agents	☐	Radioactivity	☐
Fibres (incl. mineral fibres, asbestos..)	☐	Noise	☐

If other, please specify and add any additional comments:

3/ Human Health Effects

Asthma	☐	Respiratory diseases	☐

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Allergies	☐	Infectious diseases	☐
Reprotoxic & developmental disruption	☐	Cardiovascular diseases	☐
Hearing loss	☐	Cancer	☐
Endocrine disruption	☐	Sleeping disorders	☐
Emerging diseases	☐	Epigenomic changes	☐
Ocular disorders	☐	Vector borne diseases	☐
Well-being/(risk perception)	☐		

If other, please specify and add any additional comments:

4/ Methodologies

Health impact assessment	☐	Epidemiological studies	☐
Cost/Benefit analysis in E&H	☐	Human biomonitoring	☐
Risk communication	☐	Integrated risk assessments	☐
Exposure assessment	☐	Effect monitoring	☐
Modelling	☐	Biomedical technology	☐
Quality assurance & management	☐	Standardisation/Harmonisation	☐

If other, please specify and add any additional comments.

5/ Social aspects of environment and health and populations

Behaviour of individuals and groups	☐	Environmental justice	☐
Socioeconomic disparities & health	☐	Children's health	☐
Vulnerable groups (elderly, children, poor...)	☐	Gender & Health	☐
Occupational Health	☐		

If other, please specify and add any additional comments.

26. Keywords for the project: (please enter all keywords given by the project)

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27. Coordinator of the project:

Name & surname*:

Institution and address:

Country*:

E-mail*:

URL or personal homepage:

List of partner teams: (please give the organisation name and country)

THIS QUESTIONNAIRE IS TO BE COMPLETED BY THE PROGRAMME MANAGER:

Name:

Title:

Position:

Institution:

Date of last update:

Phone:

Fax:

E-mail:

Postal address:

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ANNEX 2: 2ND QUESTIONNAIRE

Grant agreement number 219337

ERA-ENVHEALTH

Coordination of national environment and health research programmes – Environment and Health ERA-NET

Instrument: ***CSA Coordination Action***
AREA: ***FP7- ENV-2007-1.2.3-01***

Environment and Health Research Programmes

2nd Questionnaire

To be completed in English

Framework for joint activities relating to environment and health research within the partner countries

Dissemination level: ERA-ENHEALTH partners

Task leader: UBA

WP1 leader: UVZ

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The following questionnaire aims to describe the structure available for funding of trans-national research in the field of environment and health, among the ERA-ENVHEALTH partners. Therefore, it is focused on the funding structures in your country and the drivers for environment and health research activities. Other aims are to identify the principal accountabilities in the science to policy chain and to get some information about the programme management in each country. That includes the mechanisms for initiation and prioritisation, preparation, implementation, quality assurance as well as communication, dissemination and reporting. This information will be used to analyse the feasibility and prepare a second joint call for research projects within the ERA-ENVHEALTH consortium.

The information provided by this questionnaire will facilitate the elaboration of the following deliverables for the Work Package 1, coordinated by the *Public Health Authority* – UVZ (Slovak Republic) and the Work Package 2, coordinated by the *Environment Agency* – EA (United Kingdom):

- **D1.2.1 and D1.2.2 Draft and final overview of programmes and projects including synthesis and recommendations. (responsible: *Federal Environment Agency* – UBA, Germany)**
- **D2.1.1 and D2.2.2 Report on programme strategic and emerging E&H issues, complementarities and clustering arrangements. Report on the development and application of prioritisation criteria and list of prioritised work areas. (responsible: *Environment Agency* – EA, United Kingdom and *The National Institute for Public Health and the Environment* – RIVM, The Netherlands)**

1. National E&H priorities

a) What are the current governmental priorities of E&H research activities in your country?

1/ Themes related to human health aspects

Air quality outdoor	☐	Food safety	☐
Air quality indoor	☐	Water quality & supply	☐
Climate change	☐	Soil contamination	☐
Transport	☐	Local/living environment	☐
Green space	☐		

If other, please specify and add any additional comments:

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2/ Agents

Biological agents & Microorganisms	☐	Pesticides & biocides	☐
Other chemicals agents	☐	Nanomaterials	☐
Electromagnetic Fields	☐	Particulate Matter	☐
Other physical agents	☐	Radioactivity	☐
Noise	☐		

If other, please specify and add any additional comments:

3/ Human Health Effects

Asthma	☐	Respiratory diseases	☐
Allergies	☐	Infectious diseases	☐
Reprotoxic & developmental disruption	☐	Cardiovascular diseases	☐
Hearing loss	☐	Cancer	☐
Endocrine disruption	☐	Sleeping disorders	☐
Emerging diseases	☐	Epigenomic changes	☐
Ocular disorders	☐	Vector borne diseases	☐
Well-being/(risk perception)	☐		

If other, please specify and add any additional comments:

4/ Methodologies

Health impact assessment	☐	Epidemiological studies	☐
Cost/Benefit analysis in E&H	☐	Human biomonitoring	☐
Risk communication	☐	Integrated risk assessments	☐
Exposure assessment	☐	Effect monitoring	☐
Modelling	☐	Biomedical technology	☐
Quality assurance & management	☐	Standardisation/Harmonisation	☐

If other, please specify and add any additional comments.

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5/ Social aspects of environment and health

Behaviour of individuals and groups	☐	Environmental justice	☐
Socioeconomic disparities & health	☐	Children's health	☐
Vulnerable groups (elderly, children, poor...)	☐	Gender & Health	☐

If other, please specify and add any additional comments.

b) In the next one to three years what E&H research activities are planned and which of the topics stated above in question 1a are most important for your organisation?

2. Funding Structure

Several funding structures can be implemented by ERA-NETs: "common pot" (everything is put in common), "virtual common pot" (each partner funds its national teams but the rest is in common), "coordinated common pot" which is a mixed model (such as in our first call in the end – the UK funded its national teams but the Dutch and French could fund teams from other countries). When planning a joint call, the first issue to be addressed is the funding structure and this is often determined by national legal constraints as some organisations have national regulations forbidding funding research teams outside the country.

a) What kind of funding structures with regard to trans-national cooperation exist, or are possible in your organisation? Please tick all applicable boxes:

Type	**Existing**	**Partly existing** (please specify below)	**Possible**
Simple model (no transnational funding or coordinating is possible), this includes: • National/organisational funding in national research programmes/projects • National call and national evaluation process	☐	☐	☐

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Type	Existing	Partly existing (please specify below)	Possible
National calls within a joint programme (simple mode but with jointly agreed theme), this includes: • Jointly agreed research theme, common steering • National funding • National call and evaluation process • Exchanging information between the projects	☐	☐	☐
Virtual Common pot (Coordinated national funding within a joint programme), this includes: • Jointly agreed research theme, common steering • Joint funding, but each partner funds its national researchers (budget approval is granted nationally and therefore separately) • Joint call • Joint evaluation processes and selection procedure combined with national evaluation and selection • Joint dissemination	☐	☐	☐
Joint funding with a real common pot, this includes: • Jointly agreed research theme, common steering • Joint funding – common pot (no prior defining of who the money goes to in which country – French contribution could be financed by Dutch partner for example; funding is provided irrespective of the applicant's nationality, allowing a transnational flow of funds) • Joint call and evaluation processes • Joint dissemination	☐	☐	☐

If partly applicable or other, please specify and add any additional comments:

b) Which of these is/are the preferred funding structure/s in your organisation?

c) Which of the following subjects are primarily funded in your organisation?

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- ☐ Environment
- ☐ Health
- ☐ Environment and Health

If other, please specify and add any additional comments:

d) If applicable, please tick the following boxes:

- ☐ The financing organisation is able to pay for foreign researchers/research institutes?
- ☐ The financing organisation is obliged to pay VAT when financing E&H research?

If other, please specify and add any additional comments:

3. Drivers for E&H research activities and priorities

a) What are important drivers for national E&H research activities in your country?

- ☐ Fourth Ministerial Conference on Environment and Health Declaration, WHO 2004 (Budapest Agreement)
- ☐ Children's Environment and Health Action Plan for Europe, WHO 2004 (CEHAPE)
- ☐ Other WHO policies and priorities
- ☐ EU Environment and Health Action Plan
- ☐ Other EU policies and priorities
- ☐ National legislation and policy objectives
- ☐ Organisation policy objectives
- ☐ Non-governmental organisations/public/media

If other, please specify and add any additional comments:

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b) How frequently are the priorities of E&H research activities defined?

- ☐ Annual
- ☐ Every so many years
- ☐ If other, please specify

4. Programme Management

Please briefly describe the mechanisms for E&H research activities in your country regarding:

a) Which is/are the competent authorities for initiation and prioritisation E&H research?

- ☐ Ministries
- ☐ Agencies
- ☐ Other, please state

b) Preparation (process and procedures) and implementation (call and proposals)

c) Quality assurance

- ☐ Peer review
- ☐ Steering committee
- ☐ Evaluation/valorisation
- ☐ Other, please state

d) Communication, dissemination and reporting (including stakeholder engagement)

- ☐ Scientific dissemination (reports, peer reviewed papers, workshops etc.)
- ☐ Policy reports and recommendations
- ☐ Public dissemination of scientific results (reports, brochures, internet, educational material etc.)
- ☐ Other, please state

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Please add information on the methods used to disseminate results and how end-users and stakeholders are involved

e) Are any E&H issues which are not pursued at present but for which your organisation is keeping a watching brief on in case the issue becomes more important,

Are there any important E&H issues which fall outside the remit of your organisation?

Has your organisation undertaken any horizon scanning or similar exercises on E&H issues?

If different programmes have different programme management mechanisms please explain this briefly:

5. Governance

a) Describe the principal accountabilities in the “science to policy chain” in your country: How does the transfer from science to policy work? How do research results make their way from science into policy?

b) If possible, please add any further comments on governance and its impacts such as any direct changes this may have had on policy or scientific priorities for the future and if public perceptions have been impacted…

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How to join the ERA-ENVHEALTH project

Your organisation funds and/or manages E&H research programme

If your organisation is interested in taking part in the ERA-ENVHEALTH project, please contact the leader of the "Extend the network" task for more information on how to join the project as an E&H research funding and/or managing organisation:

Luciana SINISI
ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale
Via Curatone 3
00185 Roma
Italy
Tel: +39 0650071
luciana.sinisi@isprambiente.it

You are interested in becoming a member of the External Interest Group (EIG)

If you are interested in joining the External interest group to be kept informed of the progress of the project and maybe be called upon to participate in certain meetings and discussions, please contact the leaders of WP5 "Dissemination and Communciation":

Bart VERHAGEN
and Mohssine EL KAHLOUN
ERA-ENVHEALTH project communication
Federal Coordination Environment & Health
Services of the President
FPS Health, Food Chain Safety and Environment
Victor Horta Square 40, box 10
B-1060 Brussels
Belgium
Tel: +32-2524 96 89
Fax: +32-2524 90 70
Bart.Verhagen@health.fgov.be
and mohssine.elkahloun@belspo.be

You are part of another ERA-NET focusing on Environment and/or Health

Other ERA-NETs with a focus on environment and health are more than welcome get in contact to exchange ideas and look at possible cooperation. In this case, please contact the coordinator of the project:

Adrienne PITTMAN
ERA-ENVHEALTH project coordination
European and International Relations Unit
AFSSET - French Agency for Environmental and Occupational Health Safety
253 avenue du Général Leclerc.
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afsset
agence française de sécurité sanitaire de l'environnement et du travail

Partners of the consortium:

Partner name	Acronym	Logo
French Agency for Environmental and Occupational Health Safety (France)	AFSSET	
French Environment and Energy Management Agency (France)	ADEME	
Ministry of Ecology, Energy, Sustainable Development and the Sea (France)	MEEDDM	
Belgian federal Science Policy Office (Belgium)	BelSPO	
Federal Public Service Health, Food Chain Safety and Environment (Belgium)	FPS	
Environmental Protection Agency (Ireland)	EPA	
Superior Institute for Environmental Protection and Research (Italy)	ISPRA	
Swedish Environmental Protection Agency (Sweden)	Swedish EPA	
Ministry for Housing, Spatial Planning and Environment (Netherlands)	VROM	
National Institute for Public Health and the Environment (Netherlands)	RIVM	
Public Health Authority of the Slovak Republic (Slovak Republic)	UVZ	
Environment Agency (England and Wales)	EA	
Natural Environment Research Council (UK)	NERC	
Ministry of Health (Israel)	MOH	
Federal Environment Agency (Germany)	UBA	
National Research Council (Italy)	CNR	

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