

EPA-Funded Research: Environment and Health Projects

Reports from completed projects¹ will be available on the EPA website at www.epa.ie/downloads/pubs/research/

During the ERTDI Programme 2000-2006, 13 research projects were funded in the area of Environment and Health, including:

- 1 Capability development project
- 1 Desk study
- 5 Doctorate projects
- 1 Fellowship
- 2 Medium-scale studies
- 1 Scholarship
- 2 Small-scale studies

13 Total projects

13 EPA (2000 – 2006) Projects indexed by

Year and Content

Lead Organisations

Project Leaders

Year and Content:

2003-PHD3-3	<u><i>The Microbiological Status of Irish Groundwater in Relation to Human Health</i></u>
2003-PHD3-4	<u><i>National Environmental Health Impact Assessment: The Burden of Disease Attributable to Environmental Pollution in the Republic of Ireland</i></u>
2004-PHD4-6-M1	<u><i>Assessment of Pharmaceutical Residue Levels and Consequent Potential Health Impacts in Receiving Waters at Three Irish Sewage Treatment Plants</i></u>
2004-SS-37-M1	<u><i>Screening of Environmental Waters for Pharmaceutical Compounds to Determine Their Impact on the Health of Ecosystems</i></u>
2005-CD-H1-M1	<u><i>Enhancing Human Health Through Improved Water Quality</i></u>
2005-PHD5-EH-3	<u><i>Towards Developing a Microbial Risk Assessment/forecast Model for Cryptosporidiosis</i></u>
2005-PHD5-EH-5	<u><i>An Investigation of the Health Risks Associated with Private Rural Well Schemes in Ireland</i></u>
2005-S-ET-16-M3	<u><i>Correlation of Conventional Sampling and Lab Analysis Methods with Field Deployed Sensors for Environmental Monitoring Leading to Improvements in Field Deployable Sensor Performance</i></u>

¹ None to date (June 2007)

EPA Research-Funded Projects: Environment and Health

- 2006-EH-DS-27-M1 [*A Determination of the Mortality-Temperature Dose Response Relationship for the Irish Population, as a Tool for Policy Making with Respect to the Threat of Global Warming*](#)
- 2006-EH-FS-40-M4 [*Understanding the Links Between the Environment and Human Health and Well-Being*](#)
- 2006-EH-MS-49 [*Environmental Linkages Between In-Port Ship Emissions of Particulate Matter, Their Chemical Analysis and Effects on Health \(ELIPSE\)*](#)
- 2006-SS-47-M1 [*A Novel Study for Assessing the Potential Pathogens Present and the Environmental Health Risks Arising from Aerial Spraying of Slurry*](#)
- 2007-EH-MS-51 [*Comparative Study of the Health Status in a Semi-Rural Irish Community before and after the Licensing of a Waste Incinerator in the Area*](#)

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Lead Organisations:

Belfast City Hospital

2006-SS-47-M1 [A Novel Study for Assessing the Potential Pathogens Present and the Environmental Health Risks Arising from Aerial Spraying of Slurry](#)

Dublin City University

2004-PHD4-6-M1 [Assessment of Pharmaceutical Residue Levels and Consequent Potential Health Impacts in Receiving Waters at Three Irish Sewage Treatment Plants](#)

2004-SS-37-M1 [Screening of Environmental Waters for Pharmaceutical Compounds to Determine Their Impact on the Health of Ecosystems](#)

2005-S-ET-16-M3 [Correlation of Conventional Sampling and Lab Analysis Methods with Field Deployed Sensors for Environmental Monitoring Leading to Improvements in Field Deployable Sensor Performance](#)

Dublin Institute of Technology

2006-EH-DS-27-M1 [A Determination of the Mortality-Temperature Dose Response Relationship for the Irish Population, as a Tool for Policy Making with Respect to the Threat of Global Warming](#)

HSE West

2007-EH-MS-51 [Comparative Study of the Health Status in a Semi-Rural Irish Community before and after the Licensing of a Waste Incinerator in the Area](#)

NUI Galway

2003-PHD3-3 [The Microbiological Status of Irish Groundwater in Relation to Human Health](#)

2005-CD-H1-M1 [Enhancing Human Health Through Improved Water Quality](#)

Trinity College Dublin

2005-PHD5-EH-5 [An Investigation of the Health Risks Associated with Private Rural Well Schemes in Ireland](#)

University College Cork

2006-EH-MS-49 [Environmental Linkages Between In-Port Ship Emissions of Particulate Matter, Their Chemical Analysis and Effects on Health \(ELIPSE\)](#)

University College Dublin

2003-PHD3-4 [National Environmental Health Impact Assessment: The Burden of Disease Attributable to Environmental Pollution in the Republic of Ireland](#)

2005-PHD5-EH-3 [Towards Developing a Microbial Risk Assessment/forecast Model for Cryptosporidiosis](#)

University of Limerick

2006-EH-FS-40-M4 [Understanding the Links Between the Environment and Human Health and Well-Being](#)

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Project Leaders:

Cormican, Prof. Martin

2005-CD-H1-M1 [Enhancing Human Health Through Improved Water Quality](#)

de Souza, Ms Valerie

2007-EH-MS-51 [Comparative Study of the Health Status in a Semi-Rural Irish Community before and after the Licensing of a Waste Incinerator in the Area](#)

Garavan, Dr Carrie

2006-EH-FS-40-M4 [Understanding the Links Between the Environment and Human Health and Well-Being](#)

Goodman, Dr Patrick G.

2006-EH-DS-27-M1 [A Determination of the Mortality-Temperature Dose Response Relationship for the Irish Population, as a Tool for Policy Making with Respect to the Threat of Global Warming](#)

Holden, Dr Nick

2005-PHD5-EH-3 [Towards Developing a Microbial Risk Assessment/forecast Model for Cryptosporidiosis](#)

Misstear, Prof. Bruce

2005-PHD5-EH-5 [An Investigation of the Health Risks Associated with Private Rural Well Schemes in Ireland](#)

Moore, Dr. John E

2006-SS-47-M1 [A Novel Study for Assessing the Potential Pathogens Present and the Environmental Health Risks Arising from Aerial Spraying of Slurry](#)

O'Flaherty, Dr Vincent

2003-PHD3-3 [The Microbiological Status of Irish Groundwater in Relation to Human Health](#)

Regan, Dr Fiona

2004-SS-37-M1 [Screening of Environmental Waters for Pharmaceutical Compounds to Determine Their Impact on the Health of Ecosystems](#)

2005-S-ET-16-M3 [Correlation of Conventional Sampling and Lab Analysis Methods with Field Deployed Sensors for Environmental Monitoring Leading to Improvements in Field Deployable Sensor Performance](#)

Sodeau, Prof. John

2006-EH-MS-49

[Environmental Linkages Between In-Port Ship Emissions of Particulate Matter, Their Chemical Analysis and Effects on Health \(ELIPSE\)](#)

Staines, Dr Anthony

2003-PHD3-4

[National Environmental Health Impact Assessment: The Burden of Disease Attributable to Environmental Pollution in the Republic of Ireland](#)

Tobin, Dr John

2004-PHD4-6-M1

[Assessment of Pharmaceutical Residue Levels and Consequent Potential Health Impacts in Receiving Waters at Three Irish Sewage Treatment Plants](#)

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PROJECT TITLE

*The Microbiological Status of Irish Groundwater in Relation to Human Health
(2003-PHD3-3)*

LEAD ORGANISATION

NUI Galway

START DATE

01/11/2003

CONTACT

Dr Vincent O'Flaherty

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

Biological contamination of drinking water presents a significant risk to human health. Drinking water is traditionally analysed for coliform bacteria, indicators of biological contamination, but drinking water derived from groundwater is not routinely treated prior to supply in Ireland. This project will determine the microbial load in groundwaters from a number of hydrogeological settings, using culture-independent screening. Microbial occurrence in groundwater will be related to supply site characteristics and hydrogeochemistry. Sources of pathogens will be assessed at a number of sites and related to potentially polluting activities. The risk to human health posed by contaminated groundwater will be evaluated and suitable abatement /treatment systems will be recommended.

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PROJECT TITLE

National Environmental Health Impact Assessment: The Burden of Disease Attributable to Environmental Pollution in the Republic of Ireland (2003-PHD3-4)

LEAD ORGANISATION

University College Dublin

START DATE

01/12/2003

CONTACT

Dr Anthony Staines

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

We propose to integrate Irish environmental data, population data, and risks derived from the international published literature, using methods derived from the WHO European region Environmental Health Indicators project and the WHO Global Burden of disease project. The result will be regional and national estimates of the population health burden from environmental contamination.

These will be of great scientific and public health interest, but will also be valuable to policy makers in both the health and environment areas. In particular, these results will form a valuable basis for future Environmental Health Impact Assessments in Ireland. This proposal builds on our current work with the EUROHEIS project, with the HRB and the DoELG on waste management, and on our recently established links with the WHO European Region project on Environmental Health Indicators.

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PROJECT TITLE

***Assessment of Pharmaceutical Residue Levels and Consequent Potential Health Impacts in Receiving Waters at Three Irish Sewage Treatment Plants
(2004-PHD4-6-M1)***

LEAD ORGANISATION

Dublin City University

START DATE

01/12/2004

CONTACT

Dr John Tobin

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

This study will adopt a twofold approach to the assessment of both the presence and health impacts of pharmaceutical residues at three Irish sewage treatment plants (STPs) and their receiving waters. A combination of a comprehensive year-long sampling regime and leading-edge liquid chromatography-mass spectroscopy (LC-MS) analytical techniques will provide a detailed understanding of the treatment efficiencies achievement by each of the STPs and the resulting discharge levels, as well as a novel overview of the temporal/seasonal factors affecting environmental pharmaceutical concentrations. Exposure models will be developed incorporating dilution effects at each site and desktop ecotoxicology studies will provide mean and worst-case scenarios of the expected health impacts for a range of biota.

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PROJECT TITLE

**Enhancing Human Health Through Improved Water Quality
(2005-CD-H1-M1)**

LEAD ORGANISATION

NUI Galway

START DATE

01/02/2006

CONTACT

Prof. Martin Cormican

STATUS

Ongoing

PROJECT TYPE

Capability Development

TOTAL BUDGET (€)

1,062,998.40

PROJECT DESCRIPTION

'Sustainable access to safe drinking water' is universally recognised as a key issue in human health and development. Treatment of water intended for human consumption to eliminate recognised infectious and toxic contaminants plays a central role in ensuring access to safe drinking water but it is not sufficient to rely only on conventional treatment. It is important to protect water sources against bacterial contamination and to consider also the adverse health impacts of contamination of water with antimicrobial substances and non-bacterial pathogens such as protozoans.

This project will assess temporal variation in the occurrence of pathogens in aquifers across a vulnerability gradient. It will develop molecular biology techniques to discriminate between human and animal sources of faecal contamination in water sources to increase insight into human/animal sources of faecal contamination. The project will examine the potential for effluent and water to contribute to the emergence and spread of antimicrobial resistance and examine the relevance of spatially-related data including water supply to the occurrence of cryptosporidiosis in the population. The project will also develop a Microbial Risk Assessment (MRA) model for catchment waters which can be used both to identify when potable water is at high risk of being contaminated.

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PROJECT TITLE

Towards Developing a Microbial Risk Assessment/forecast Model for Cryptosporidiosis (2005-PHD5-EH-3)

LEAD ORGANISATION

University College Dublin

START DATE

01/01/2006

CONTACT

Dr Nick Holden

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

A trial microbial risk assessment will be developed using GIS for a water source of a municipal water system to identify when potable water is at a high risk of being contaminated with zoonotic enteric pathogens via surface pathways. *Cryptosporidium spp.* oocysts will be used as the indicator organism.

The data layers in the GIS will include:

- soils; geology; stock density;
- animal husbandry;
- farm storage of animal wastes;
- animal waste disposal practices;
- data from biological surveillance of the environment, and
- meteorological data.

Field monitoring will provide probability data for oocysts prevalence and survival along the transport vector and geo-spatial analysis within the GIS will be used to estimate probability of the transport vector being active from source to target. Monte Carlo simulation will be used to determine the risk of contamination of potable water in the trial area.

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PROJECT TITLE

An Investigation of the Health Risks Associated with Private Rural Well Schemes in Ireland (2005-PHD5-EH-5)

LEAD ORGANISATION

Trinity College Dublin

START DATE

01/02/2006

CONTACT

Prof. Bruce Misstear

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

The subject of this research is the health risks associated with small private rural drinking water schemes in Ireland. Methodologies applied in the USA and elsewhere would be applied to existing water quality data from Ireland to quantify the health risks, especially with respect to microbial contamination. These risks would be linked to the vulnerability to pollution of the water source. The project will focus on groundwater sources, since these are the most numerous water sources for private schemes. Guidelines will be produced for the private consumer on how to locate, implement and operate new well schemes. This guidance will take account of the level of public awareness about water contamination and health, which will be determined in the project by carrying out surveys of private well owners' attitudes and awareness.

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PROJECT TITLE

Correlation of Conventional Sampling and Lab Analysis Methods with Field Deployed Sensors for Environmental Monitoring Leading to Improvements in Field Deployable Sensor Performance (2005-S-ET-16-M3)

LEAD ORGANISATION

Dublin City University

START DATE

01/10/2005

CONTACT

Dr Fiona Regan

STATUS

Ongoing

PROJECT TYPE

Scholarship

TOTAL BUDGET (€)

30,000.00

PROJECT DESCRIPTION

This is a challenging multi-disciplinary project evaluating sensing for environmental monitoring. Currently there is much research in the area of environmental sensor development, however most sensing devices never make it to the field for long-term measurements. Many devices are not tested in relation to parallel lab-based analyses for validation relying only on existing data. We propose to examine novel, field-deployed sensor-based technologies in parallel with conventional lab-based methods. The results obtained will be exposed to statistical analysis. These tests will draw together data values and interpretation possibilities, leading not only to environmental quality assessment but also useful results for field sensor design and use.

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PROJECT TITLE

A Determination of the Mortality-Temperature Dose Response Relationship for the Irish Population, as a Tool for Policy Making with Respect to the Threat of Global Warming (2006-EH-DS-27-M1)

LEAD ORGANISATION

Dublin Institute of Technology

START DATE

01/12/2006

CONTACT

Dr Patrick G. Goodman

STATUS

Ongoing

PROJECT TYPE

Desk Study

TOTAL BUDGET (€)

64,233.00

PROJECT DESCRIPTION

This desk based study will involve a complex analysis of the weather and mortality patterns of the Irish population over a 20 year period. In particular, the study will generate dose-response relationships for the Irish population relating temperature changes to changes in mortality patterns. These dose-response relationships will be invaluable in allowing policy makers to evaluate the risk to the Irish population from temperature changes associated with Climate Change. The study will also evaluate which sections of the population are most susceptible to such temperature changes. It will look at different age groups within the population, and at city dwellers in comparison to rural dwellers to see if this has an effect on their susceptibility to temperature change. The analysis will not just involve temperature alone, but will include many weather variables, and will also investigate the lag structure associated with such exposures. The study will also analyse the 2003 heat wave, as experienced across Europe, to see if it gave rise to any excess mortality in Ireland. The study will also facilitate the development of key analysis skills of the Irish investigators through the collaboration.

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PROJECT TITLE

*Understanding the Links Between the Environment and Human Health
and Well-Being
(2006-EH-FS-40-M4)*

LEAD ORGANISATION

University of Limerick

START DATE

08/01/2007

CONTACT

Dr Carrie Garavan

STATUS

Ongoing

PROJECT TYPE

Fellowship

TOTAL BUDGET (€)

157,513.52

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PROJECT TITLE

Environmental Linkages Between In-Port Ship Emissions of Particulate Matter, Their Chemical Analysis and Effects on Health (ELIPSE) (2006-EH-MS-49)

LEAD ORGANISATION

University College Cork

START DATE

01/01/2007

CONTACT

Prof. John Sodeau

STATUS

Ongoing

PROJECT TYPE

Medium-scale study

TOTAL BUDGET (€)

362,900.00

PROJECT DESCRIPTION

The main aims of this three-year cluster programme are to physico-chemically characterize and toxicologically assess airborne particulate matter (PM10 and PM2.5) present in Cork Harbour and to compare the results obtained to other urban locations. The driving force for the studies is based on the world-wide recognition that ship emissions comprise a major, relatively unmeasured source of pollution with potentially adverse effects on human health.

The aims will be achieved by performing the following specific tasks:

- A three-year PM monitoring programme in two selected port-side sites, two city-side sites and one rural site;
- A 'total' chemical analysis programme suitable for the measurement of inorganic and organic compounds as well as parameters such as Elemental Carbon /Organic Carbon splits and S(IV) to S(VI) oxidation;
- A physical characterization study of the collected PM for comparison and identification purposes;
- A toxicological study to assess the health impacts of the collected PM, and
- The development of a source and partition model for the air quality results.

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PROJECT TITLE

Comparative Study of the Health Status in a Semi-Rural Irish Community before and after the Licensing of a Waste Incinerator in the Area

(2007-EH-MS-51)

LEAD ORGANISATION

HSE West

START DATE

01/04/2007

CONTACT

Ms Valerie de Souza

STATUS

Ongoing

PROJECT TYPE

Medium-scale study

TOTAL BUDGET (€)

146,300.00

PROJECT DESCRIPTION

Survey-based, follow-up study looking at the health status of a sample of the population of the Clarecastle area of Co. Clare and comparing this to data collected on a demographically matched sample of residents collected in 1996. This baseline data was originally collected for comparison purposes as one part of a large multi-agency investigation into reports of animal ill-health in Askeaton, Co. Limerick.

A licence to operate an incinerator was granted to Roche Pharmaceuticals in Clarecastle around the same time as the Askeaton study was taking place. This decision generated health concerns among local residents. The aim of the proposed study is to evaluate any impact the operation of this incinerator has had on the health status of the Clarecastle population by comparing health status data collected in 1996, before the incinerator was licensed, to data collected from a similar sample at the present time. The original health status data was collected using a modified version of SF-36, a well-validated and widely used questionnaire which measures eight health concepts in order to give a summary of physical and mental health.

In addition to SF-36, another seven sections of questions were included to collect data specifically on respiratory symptoms, skin disease, general symptoms, fertility/childbirth, lifestyle, social factors, and environmental concerns. Participants were sampled partly to reflect the demographics of the population but an excess of children and women of child-bearing age was included. The proposed study aims to assess the health status of a comparable sample of participants using the same study methods.

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Small-scale studies:

PROJECT TITLE

Screening of Environmental Waters for Pharmaceutical Compounds to Determine Their Impact on the Health of Ecosystems (2004-SS-37-M1)

LEAD ORGANISATION

Dublin City University

STATUS

Ongoing

CONTACT

Dr Fiona Regan

TOTAL BUDGET (€)

6,348.00

PROJECT TYPE

Small-scale study

PROJECT TITLE

A Novel Study for Assessing the Potential Pathogens Present and the Environmental Health Risks Arising from Aerial Spraying of Slurry (2006-SS-47-M1)

LEAD ORGANISATION

Belfast City Hospital

START DATE

01/04/2006

CONTACT

Dr John E. Moore

STATUS

Ongoing

PROJECT TYPE

Small-scale study

TOTAL BUDGET (€)

6,348.00

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End of listing of EPA [2000-2006] Environment and Health Projects