Presentation of WP7 – Environmental risk factors and breast cancer

- The first step is to find scientific literature review on breast cancer and environmental factors. Both studies with positive and negative results are considered.

- The second point is the research of European and national environmental databanks.

- The third point there is a design of protocol for pilot environmental study.

- Data collection and analysis of pilot environmental study in the area will be identified by the Steering Committee.

WP7 - Literature review on environmental factors related with breast cancer

1. we are researching scientific articles in the PubMed, Scopus, and Embase, and other databases using the term ‘‘**breast cancer**’’ in combination with **environmental persistent organic pollutants (POPs)** that we have chosen in the Wasaby European project like:

   - **Polychlorinated Biphenyls (PCBs)**
   - **DDT, DDD, DDE, HCB and Chlordane and Dioxins (TCDD)**
   - **PAHs**
   - **Perfluoroalkylated substances (PFAs)**
   - **Triazine**
   - **Heavy Metals (In principle Cadmium)**

WP7 - Literature review on environmental factors related with breast cancer

Persistent organic pollutants (POPs) are a group of **heterogeneous compounds** of both natural and **anthropogenic origin** with **highly persistent** and **bioaccumulative properties** and common properties like **lipophilic compounds** accumulate in fat, resulting **in bioaccumulation** and **biomagnification** up the food chain

There is growing concern that POPs **may increase breast cancer risk** due to their **xenoestrogenic properties.** They are also **resistant to photolytic**, **biological or chemical degradation** and remain in the environment for a long period (Damstra 2002).

However, **most of the studies have examined exposure** to the pollutants **after diagnosis of breast cancer**, overlooking exposure during critical windows of vulnerability.

T. A. Mouly, L.L. Toms. Breast cancer and persistent organic pollutants (excluding DDT): a systematic literature review. **Environ. Sci. Pollut. Res. Int., 23 (2016), pp. 22385-22407**

WP7 - Literature review on environmental factors related with breast cancer

2. We're going to put **in excel schematic table** the scientific articles found on exposure to various environmental persistent contaminants (in particular in water and soil) and the risk of breast cancer as written in the Wasaby proposal**:**

- ❑ the name of the researchers of the scientific and scientific journal;
- ❑ the place and the study design;
- ❑ the exposure to the main contaminants;
- ❑ the years of the study interest;
- ❑ the relative risk or odds ratio
- ❑ the relevant comments for the scientific article.

WP7 - Literature review on environmental factors related with breast cancer

At the moment we have found the following scienticific articles that correlate the BC with the different **environmental (POPs)**

Contaminants	number of scientific articles
DDT, DDD, DDE, HCB and PCBs	9
Dioxins (TCDD)	12
PAHs	8
Perfluoroalkylated substances (PFAs)	5
Triazine	4
Heavy Metals (in principle Cadmium)	7
Review BC and POPs	17
Meta-Analysis	1
	TOT. 63

WP7 – Water & soil environmental databases

1. In Wasaby we will use a geochemical baseline data to examine the distribution of high levels of persistent organic pollutants (POPs) and heavy metals in Europe.

2. In this project we need specific geographic information systems (GIS) database containing European mapping and environmental monitoring data in water and soil of the main environmental contaminants that persist in the identified environmental matrices.

3. In order to identify possible indicators already available in the mentioned databases, we start to investigate some online databases to be used during the project.

WP7 – Water & soil environmental databases

Online databases

Code	Name	Argument	Web address	Organization	Countries included	Years covered	Collection points
1	CENSUS_UNITS_2011_RG	European administrative boundaries	http://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units	EUROSTAT	33 (EU and EFTA)	ND	ND
2	Global Administrative Area	European administrative boundaries	http://www.gadm.org/	University of California	World	ND	ND
3	Waterbase groundwater	Water quality data	http://www.eea.europa.eu/data-and-maps/data/waterbase-groundwater-6	EEA	38	1990-2012	28,000
4	European Pollutant Release and Transfer Register E-PRTR	Industrial sites Waste	http://prtr.ec.europa.eu/	EEA	33 (EU and EFTA)	2007-2011	30,000
5	European Environment Agency	Environmental pollutants	http://www.eea.europa.eu/	EEA	33 (EU and EFTA)	ND	ND
6	Geochemical Atlas of Europe	Soil quality data	http://weppi.gtk.fi/publ/foregsatlas/	FOREGS	33 (EU and EFTA)	ND	ND
7	EuroGeoSurveys	Water and Soil resources	http://www.eurogeosurveys.org/		33 (EU and EFTA)	ND	ND
8	Geochemical Atlas of Europe	Soil quality data	http://eusoils.jrc.ec.europa.eu/content/heavy-metals-topsoils#tabs-0-description=1	European Soil Data Centre (ESDAC)	26	2008	1,588 topsoil samples

Pollutants indicators available

Pollutants	Indicator	Database code	Matrix	Measure periodicity	Spatial resolution
Cadmium	µg/l	Waterbase_groundwater_v14	Water	annual	Sample points
	mg/kg	Geochemical Atlas of Europe	Soil	2008	5km grid
DDT	µg/l	Waterbase_groundwater_v14	Water	annual	Sample points
Atrazine	µg/l	Waterbase_groundwater_v14	Water	annual	Sample points
PAH	µg/l	Waterbase_groundwater_v14	Water	annual	Sample points

WP7 – Example of Data and Maps

The **FOREGS Geochemical Baseline Mapping** Programme was initiated in 1998 to provide high quality environmental geochemical baseline data in Europe (link:**http://weppi.gtk.fi/publ/foregsatlas/**

The **FOREGS databases and material archives comprise**:

- ❑ archived sample materials (topsoil, subsoil, ecc.);
- ❑ access databases for field observations;
- ❑ analytical data files;
- ❑ databases of combined field and analytical data;
- ❑ GIS layers;
- ❑ work maps and tables;
- ❑ collections of field photographs;

The **Geological Survey of Finland (GTK)** has been responsible for database management and map production for the FOREGS group.

WP7 – Example of Data and Maps

The **FOREGS database structure**

Basic information collected for **all sample sites** included:

- ❑ sample identifiers (using agreed FOREGS sampling code);
- ❑ date of collection and name of sampler;
- ❑ sampling site location, including geographical region, map sheet, sampling coordinates (easting and northing and latitude and longitude) and altitude;
- ❑ number of subsites and a site description, including, landscape/topography, land use (agriculture, pasture, forest, wetland, *etc), bedrock lithology and type of overburden);*
- ❑ **Analytical data** from **nine European geochemical laboratories** were combined with the field data;
- ❑ **GIS data layers were then created and preliminary dot maps**, basic tables and distribution graphs prepared.

WP7 – Example of Map of distribution Cadmium in Subsoil

Map Production using the **ArcView GIS®**;

- ❑ the data were interpolated to generate a regular grid with a 6 km x 6 km output cell size;
- ❑ a 10-grade colour scale was selected to present the distribution and concentration of Cd in mg/Kg
- ❑ Dot size scale for Subsoil Cadmium concentrations
- ❑ The histogram and cumulative distribution function curve for Cadmium in subsoil.