NO pills IN WATERS

PHARMACEUTICAL RESIDUES IN THE WATER CYCLE

noPILLS – background + objectives

Today about 3,000 pharmaceutical substances are licensed in Europe. After consumption their residues leave the body and get into the water cycle. Up to 70% of the consumed `medicine cocktail´ may be excreted or washed off - or unwanted medicines disposed off incorrectly into the toilet.

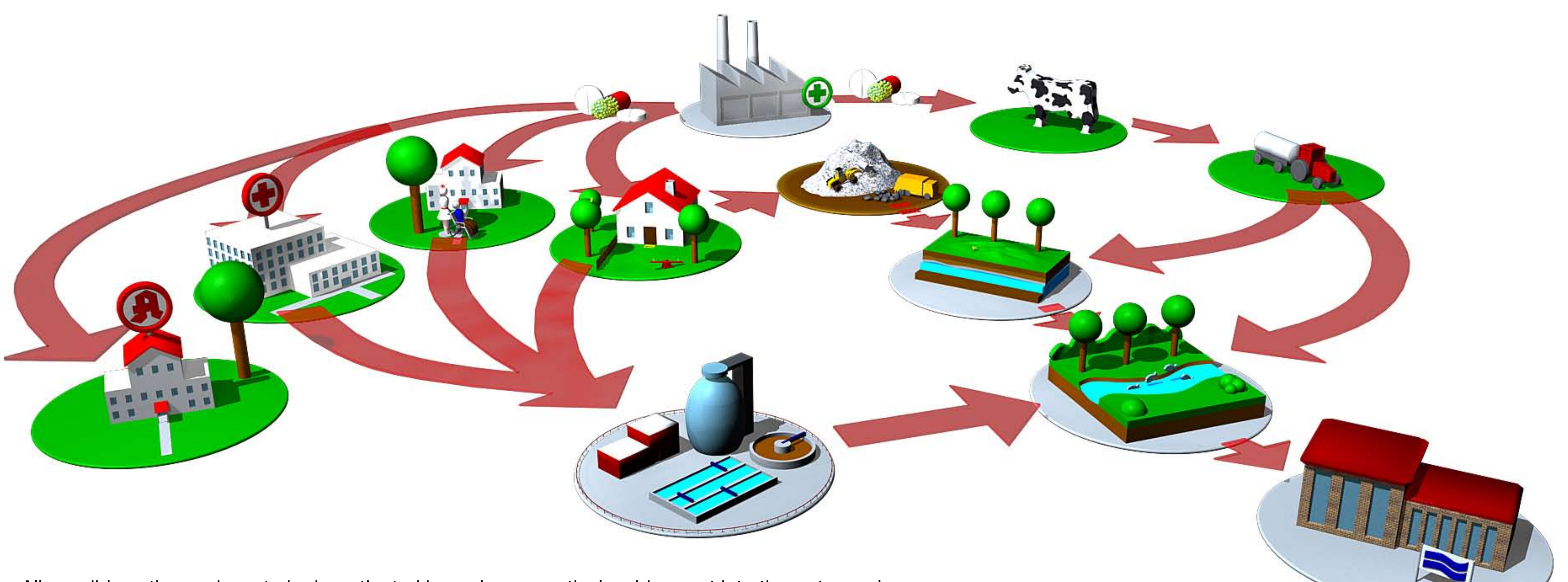
These pharmaceutical residues can pose a risk to the aquatic environment.

End-of-pipe treatment can reduce the concentrated discharge at point sources e.g. hospitals. But depending on local situations, point sources treatment at hospitals can only remove up to 20% of the total emission. The remaining 80% arise from consumption in private households.

Therefore other approaches are needed: The **noPILLS project** widens the investigative framework from technical waste water treatment towards sources of pharmaceuticals in sewage and the active change of consumers´ behaviour in order to reduce pharmaceutical residues in the water cycle.

noPILLS is going to investigate if or how promising strategies can reduce pharmaceutical residues in the water cycle in the long term, starting at the sources of pollution instead of elimination at end-of-pipe.

The pathways of pharmaceuticals in relation to the water cycle



All possible pathways have to be investigated how pharmaceutical residues get into the water cycle.
Technical measures at point sources can eliminate only a smaller part. The input of pharmaceuticals must be reduced at decentralised sources.

noPILLS – partners

Six partners coming from five European States are working together in the **noPILLS**-project:

- France — Université de Limoges
- Germany (Lead Partner) — EMSCHER GENOSSENSCHAFT
- Germany — LIPPE VERBAND
- Luxembourg — tudor
- The Netherlands — Rijksinstituut voor Volksgezondheid en Milieu
- United Kingdom — GCU Glasgow Caledonian University

Project duration:
June 2012 – September 2015

Budget:
Approx. 9,3 million Euro; 43% co-financed by ERDF

The **noPILLS** partnership is supported in the framework of the INTERREG IV B programme of the EU.

Investing in Opportunities
This project has received European Regional Development Funding through INTERREG IV B.
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INTERREG IVB

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noPILLS – people and activities

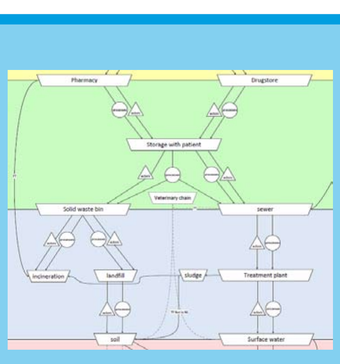
The **noPILLS** partner activities are focused on the following:

- Joint measures complementing EU environmental policy and legislation, here especially the EU Water Framework Directive
- Promotion of responsible pharmaceutical production and consumption patterns
- Transnational actions to promote eco-innovation, improved management tools for green technologies, lifecycle thinking and cleaner production processes
- Joint actions to assist businesses in integrating/implementing innovative products, processes and services in their activities

The **noPILLS** partners identified 3 fields they concentrate their work on:

Awareness raising | **Demonstration tools** | **Impact assessment**

noPILLS – pilot locations



DRAFT 2014

Bilthoven, NL

- Conceptualising the medicinal product chain including production, consumption and degradation in the environment
- Providing an overview of available knowledge on the actors and processes in the medicinal product chain and finding leverage points to affect the input of medicinal products in the water cycle

Glasgow, GB

Catchment management investigations:

- Establishing consumers' perceptions and attitudes towards pharmaceutical effluents and disposal
- Testing modern media dissemination tools
- Quantifying pharmaceutical concentrations and eco-toxicity at point sources and in river basin
- Evaluating advanced treatment techniques

Gelsenkirchen, D

- Long-term operation of a full-scale hospital wastewater treatment plant:

  Advanced treatment technologies (like membrane bioreactor, ozonation activated carbon adsorption, sand filtration), optimization (e.g. energy consumption), monitoring (e.g. pharmaceuticals)
- Evaluation of the integration into hospital management: Residual management (e.g. waste, sludge), emission control (e.g. noise, odour)
- Characterisation of hospital wastewater: Chemical analysis, consumption data

Dülmen, D

- Analyzing consumers' behavior regarding drug consumption and disposal of old drugs
- Awareness raising pilot studies with the health sector and civil society in a city with 47.000 residents
- Testing advanced treatment technique in an existing waste water treatment plant within a defined drinking water catchment

3-D image of two filled urine bags, to the right with x-ray contrast media, to the left without x-ray contrast media (Bayer HealthCare/CRP Henri Tudor)

Esch-zur-Alzette, Lux

- The Centre Hospitalier Emile Mayrisch (CHEM) in Esch-dur-Alzette, ca. 400 beds
- Source control: avoiding emissions of specific persistent substances (x -ray contrast media) into municipal sewage by separate collection of urine
- Advanced efficient treatment technics: Test of biologically activated carbon filtration

Bellecombe/ Limoges F

- Site Pilote de Bellecombe: pharmaceutical in waste water sludge, assessment of their fate in the processing system and at the agricultural use
- Limoges: Enhanced techniques to eliminate pharmaceuticals from waste water, antibiotic resistance and biofilm in water; investigation of sociological aspects of the risk and strategies for a better use of pharmaceuticals

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