

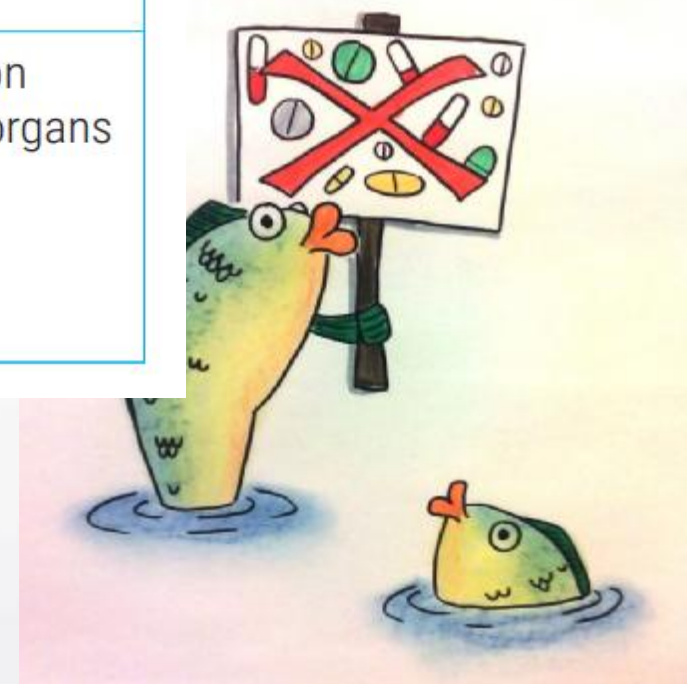


Pharmaceuticals in the Environment

IPEN Regional Meeting
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PHARMACEUTICALS GROUP	ENVIRONMENTAL HAZARD	IMPACT ON THE ENVIRONMENT
Sex hormones and modulators of the genital system	Toxicity, persistence, bioaccumulation	Cause reproductive problems for amphibians and fishes
Anti-Infectives for systemic use	Toxicity, persistence	Antimicrobial resistance (AMR)
Antiinflammatory and antirheumatic products	Persistence	Cause disruption of the internal organs

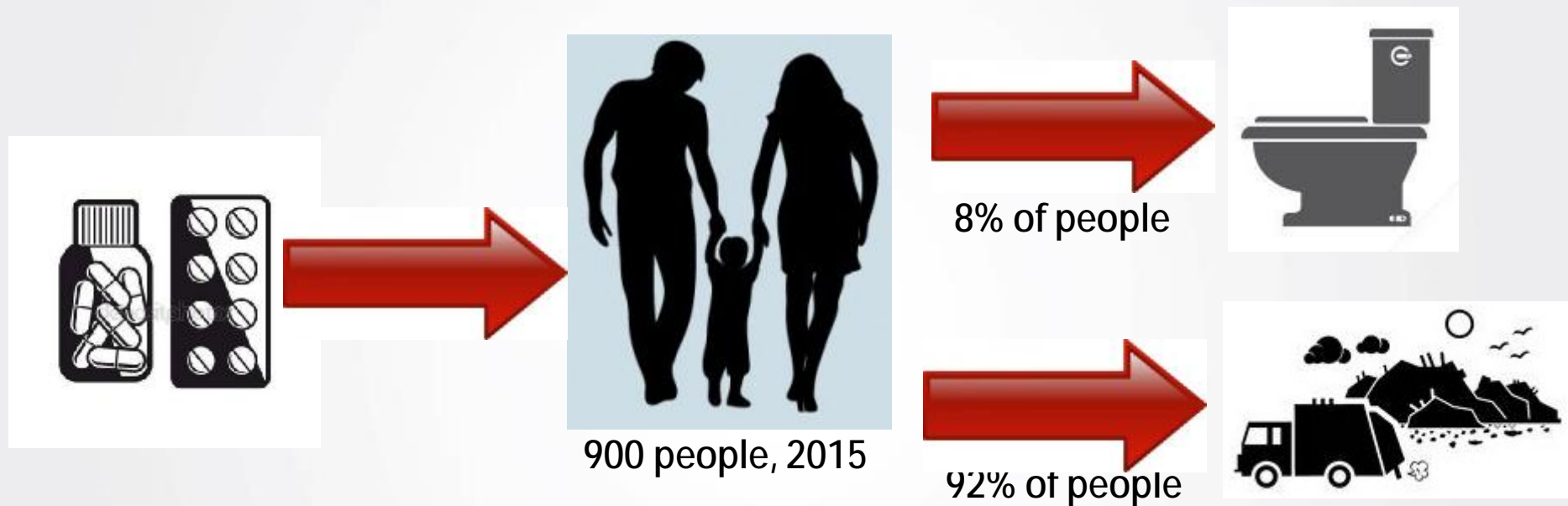


How drugs get into the environment?

- Production (manufacturers/producers): waste, wastewater
- Use (health institutions/patients/food producers): excretion, expired pharmaceuticals
- Disposal (health institutions/patients/food producers): waste, wastewater



Sociological Survey of Belarusian People



65% of Belarusians
buy more medicines than they need

36 packs of medicines
per person per year

Working meetings with line ministries



Checking our water Belarus, 2016-2017

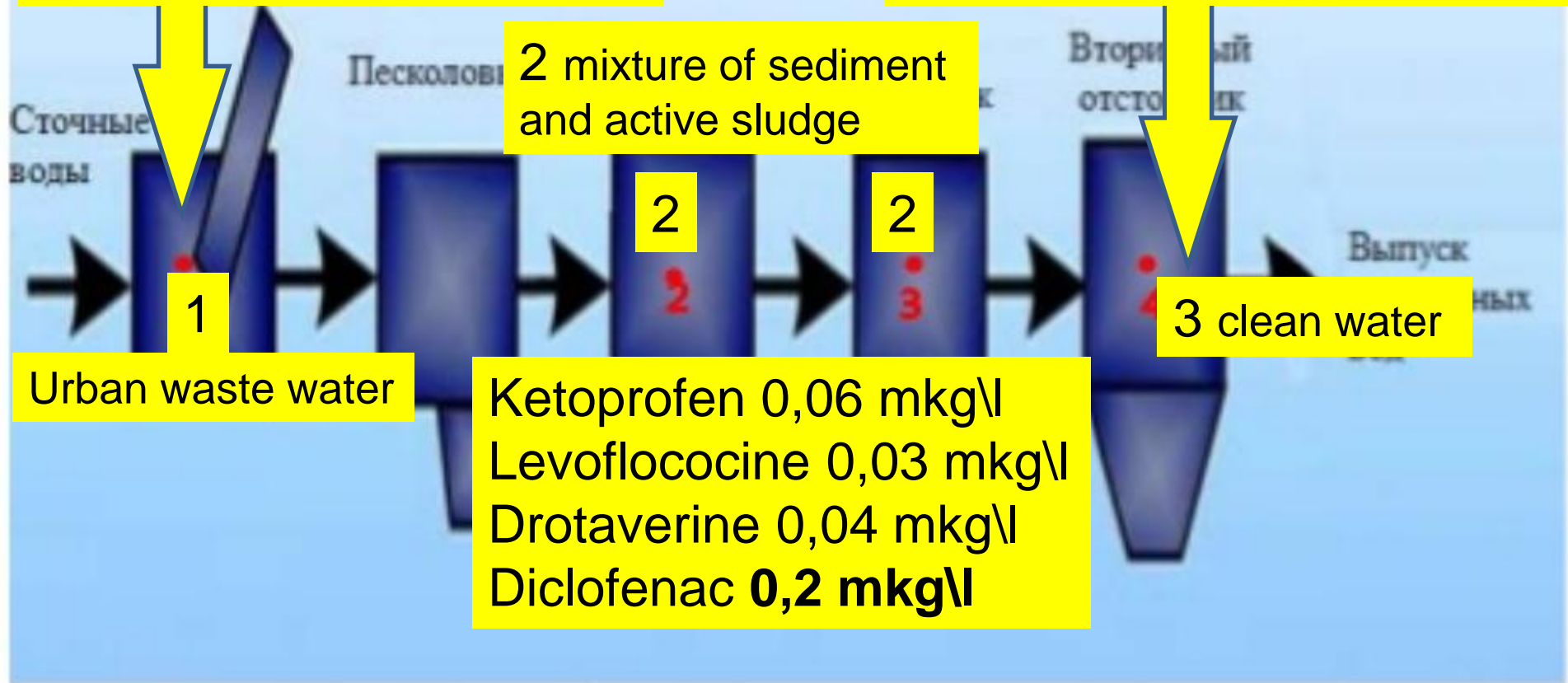


Non-steroidal anti-inflammatory drugs	Diclofenac, Ketoprofen	High resistance in the environment
Hormones	17-b-estradiol, etinilestradiol	High level of environmental risk High resistance Toxicity Bioaccumulation potential
Antibacterial drugs	Ciprofloxacin Levofloxacin	Intermediate environmental risk High resistance in the environment Toxicity
Antispasmodics	Drotaverine	High resistance in the environment

WWTPs

Ketoprofen 0,12-0,2 mkg\\
Diclofenac **0,05 mkg**
17-b-estradiol 0,9 mkg\\
Ethinyl-estradiol 0,1 mkg\\

Ketoprofen 0,09-0,13 mkg\\
Diclofenac **1,4-1,9 mkg**
Drotaverine 0,04-0,18 mkg\\
Ethinyl-estradiol 0,1 mkg\\
Ciprofloxacin 0,019 mkg\\



Urban waste water

Ketoprofen 0,06 mkg\\
Levofloxocine 0,03 mkg\\
Drotaverine 0,04 mkg\\
Diclofenac **0,2 mkg**

3 clean water

Pharmaceuticals in surface water, Belarus, 2016-2017



The Wild Closed Lake — below detection limit

The Lake with the intensive economic activity of people in the catchment area:

Synthetic hormone drug ethinylestradiol (0,4 mcg\l - in water)

anti-inflammatory drug ketoprofen (0,003 mcg\l in silt)

Reservoir for fish farming needs:

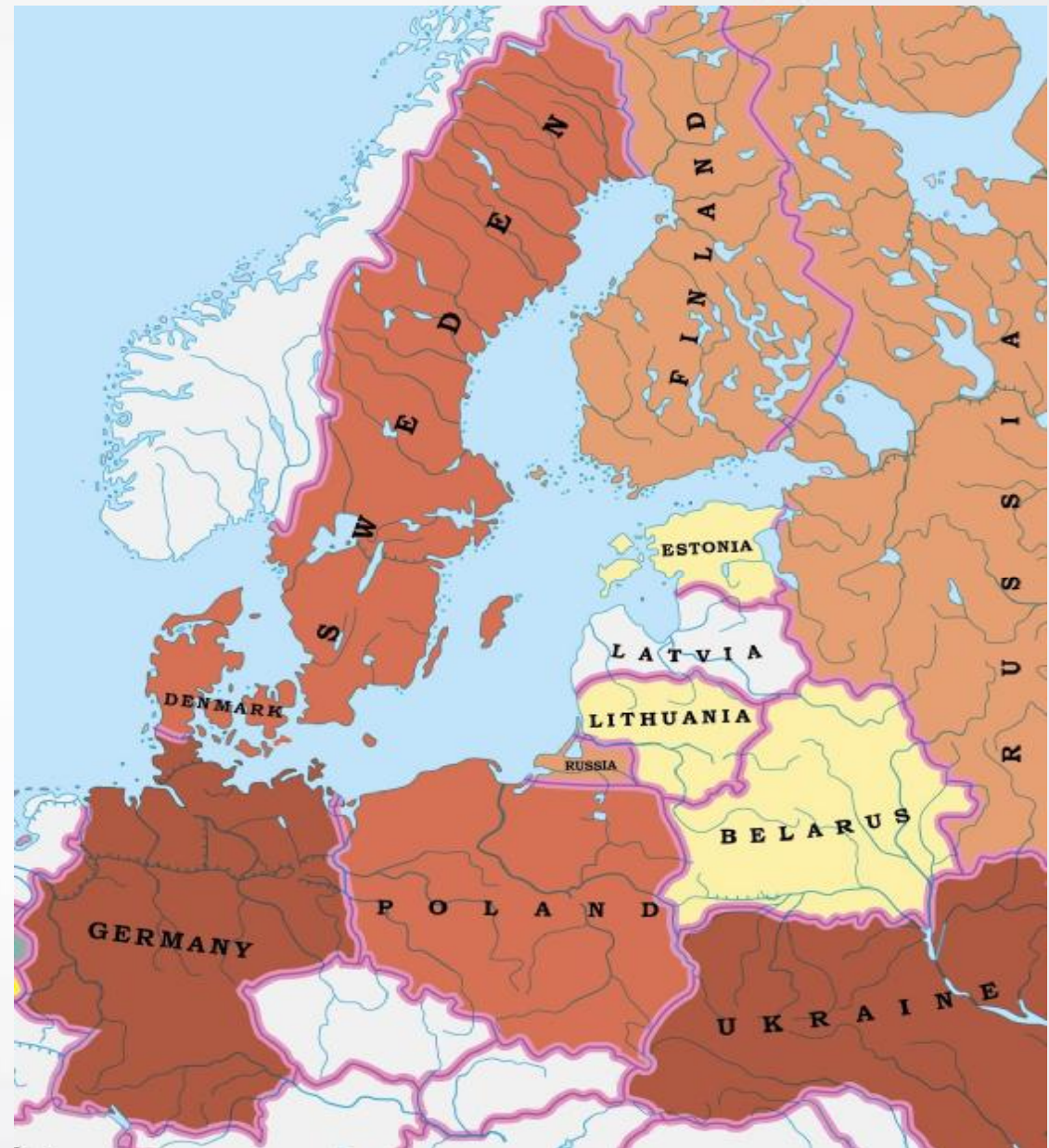
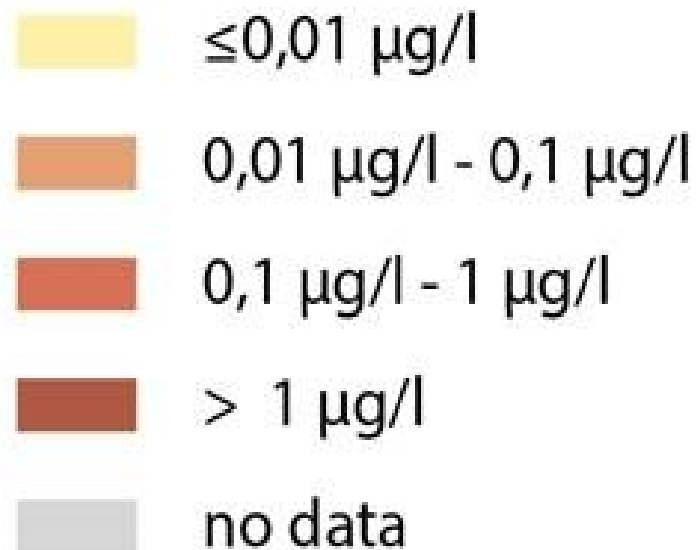
Hormonal preparations:

0,12 mcg\l in water, 0,007 mcg/g dry weight in sludge

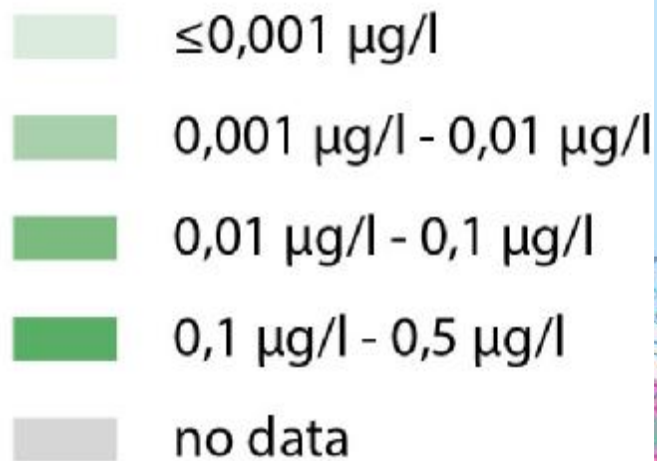
Antibacterial drug ciprofloxacin, Spasmolytic drotaverin (in the sludge).

The highest ethinylestradiol concentration
in river sediment — 71 $\mu\text{g/g}$ dry weight

*Highest diclofenac concentration
in surface waters
Baltic Sea Region countries*



Highest 17-alpha-Ethinylestradiol concentration in surface waters BSR-countries



Tools for use:



The UBA database is free to access and can be used by many different stakeholders with an interest in the topic of pharmaceuticals in the environment. It allows users to search for data pertaining to their particular region or the pharmaceutical substance of interest to them <https://www.umweltbundesamt.de/en/database-pharmaceuticals-in-the-environment-0>

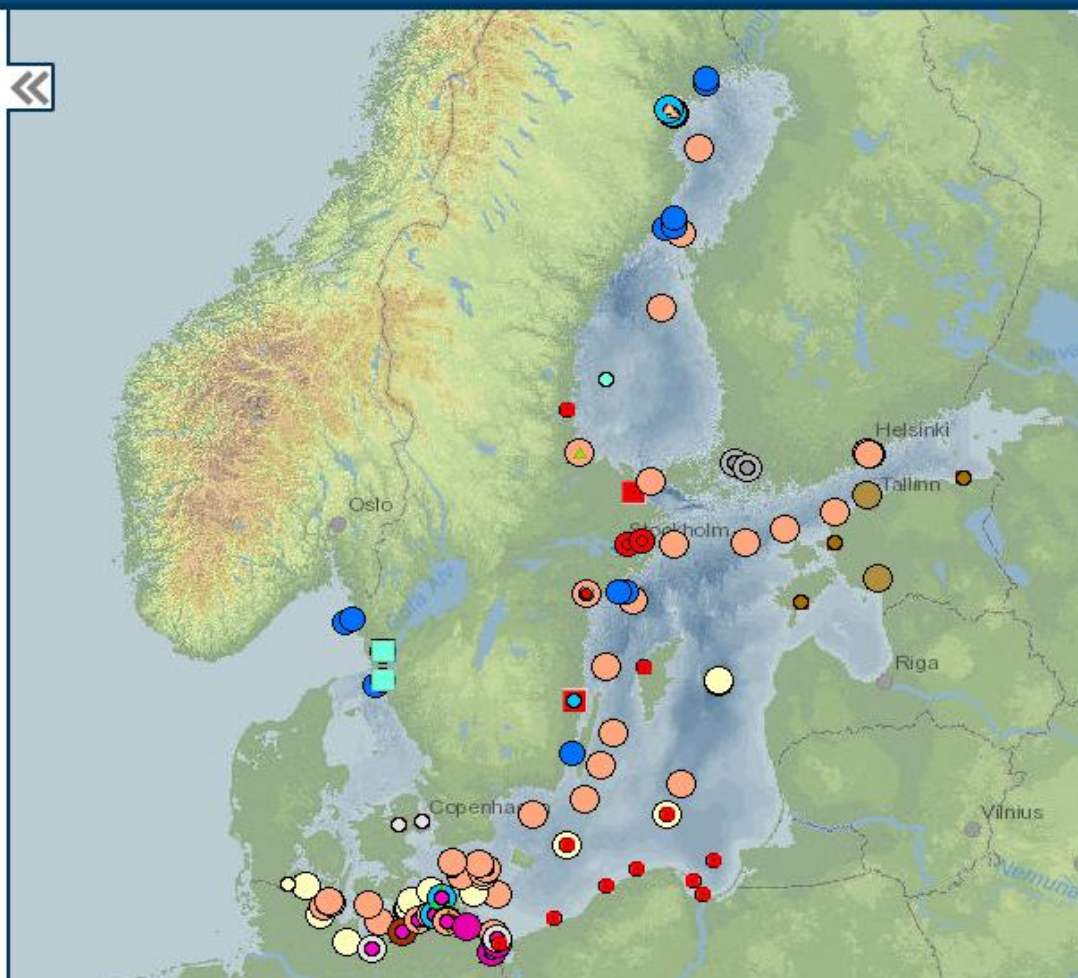


Search...

- Antimicrobial (incl. antibiotic, antifungal, antiviral, antiparasitic, disinfectant, antiseptic) - Not detected
- Cardiac and blood pressure medicine and diuretics - Not detected
- Dermatological Agent - Detected
- Hormones and hormone antagonists - Not detected

- Pharmaceuticals in water
 - Cardiovascular Agent - antiarrhythmics - Detected
 - Cardiovascular Agent - antiarrhythmics - Not detected
 - Metabolic Agent - Lipid regulator - Detected
 - Metabolic Agent - Lipid regulator - Not detected
 - Analgesics - Detected

Collapose laver list Hide all layers



Some data (georeferenced measurements in the marine environment) has been prepared via the map service and as shape files.

<http://maps.helcom.fi/website/mapservice/index.html>



Learn how you can contribute to the work and be a part of the policy development in the region to reduce the emission of pharmaceuticals to the Baltic.
And spread the word to anyone interested!

<http://www.swedishepa.se/hazards/pharmaceuticals>

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