Presentation from

# 2016 World Water Week in Stockholm

www.worldwaterweek.org

# Status report on pharmaceuticals in the Baltic Sea region


Dmitry Frank-Kamenetsky
HELCOM Secretariat

HELCOM

# Helsinki Convention 1974 ➔ 1992

## Helsinki Commission (HELCOM)

- Intergovernmental organisation
- 9 coastal countries & EU
- Marine area:
  - 415,000 km²
- Catchment area:
  - 1.72 million km² (4 x size of the sea area)
  - 14 countries
  - 85 million people

# The Baltic Sea Action Plan about hazardous substances

**The ecological objectives:**

- Concentrations of hazardous substances close to natural levels;
- All fish safe to eat;
- Healthy wildlife;
- Radioactivity at pre-Chernobyl level.

# Policy context

- **2013 HELCOM Ministerial Declaration:**

  *to collect information on pharmaceuticals and assess the status of contamination of pharmaceuticals and their degradation products in the marine environment;*

  - **EU directive 2013/39/EU:**
    - *The contamination of water and soil with pharmaceutical residues is an emerging environmental concern;*

- **Policy Area Hazards of the EU Strategy for the Baltic Sea Region (EUSBSR) :**
  - *decided to give increased attention to the topic of pharmaceuticals in the Baltic environment during the years 2015-2017 due to growing concern over environmental impacts of these substances in EU, HELCOM region and globally;*

# Status report on pharmaceuticals in the Baltic Sea

The first comprehensive assessment of input of pharmaceutical substances to the Baltic Sea and the status of contamination of the Baltic Sea marine environment

Based on compilation of existing information available through publications at national and regional level

# Scope of the Status report

- **Assessment of the state of contamination** of the Baltic Sea environment:
  - Concentrations observed in biota, water and sediment;
  - Observed environmental effects of pharmaceuticals in the region.

- **Assessment of the pressure** on the Baltic Sea environment:
  - The use of pharmaceuticals – medicine, veterinary;
  - Sources – WWTP, agriculture, medical wastes, etc.;
  - Pathways – ground water, rain water, surface water, etc.

# Expected outcome

**Status report on pharmaceuticals in the Baltic Sea region:**

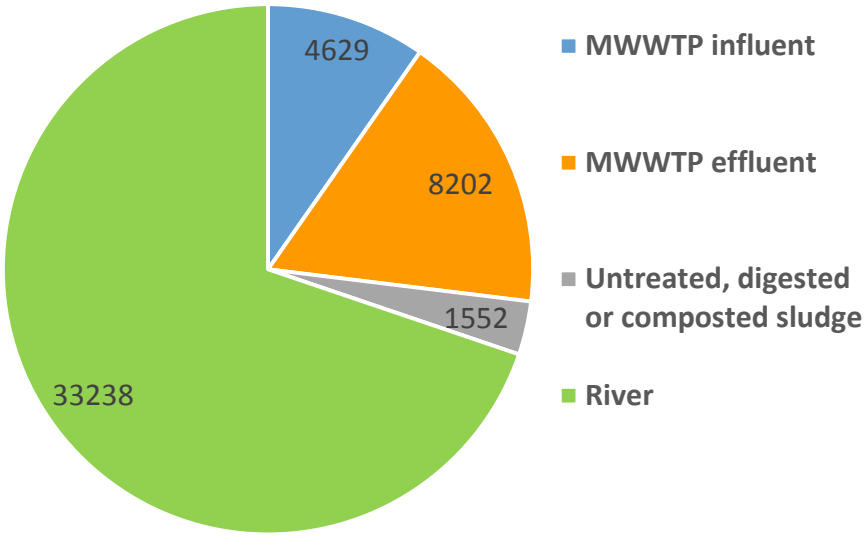
- Conclusions on the major sources and pathways of pharmaceuticals;
- Conclusions on the major environmental threats in the region caused by pharmaceuticals;
- Identified knowledge gaps;
- Possible measures for addressing pharmaceuticals.

**Background for developing regional environmental policy regarding pharmaceuticals and regional actions to minimize their environmental impact**

# Methodology

# Sources and Pathways

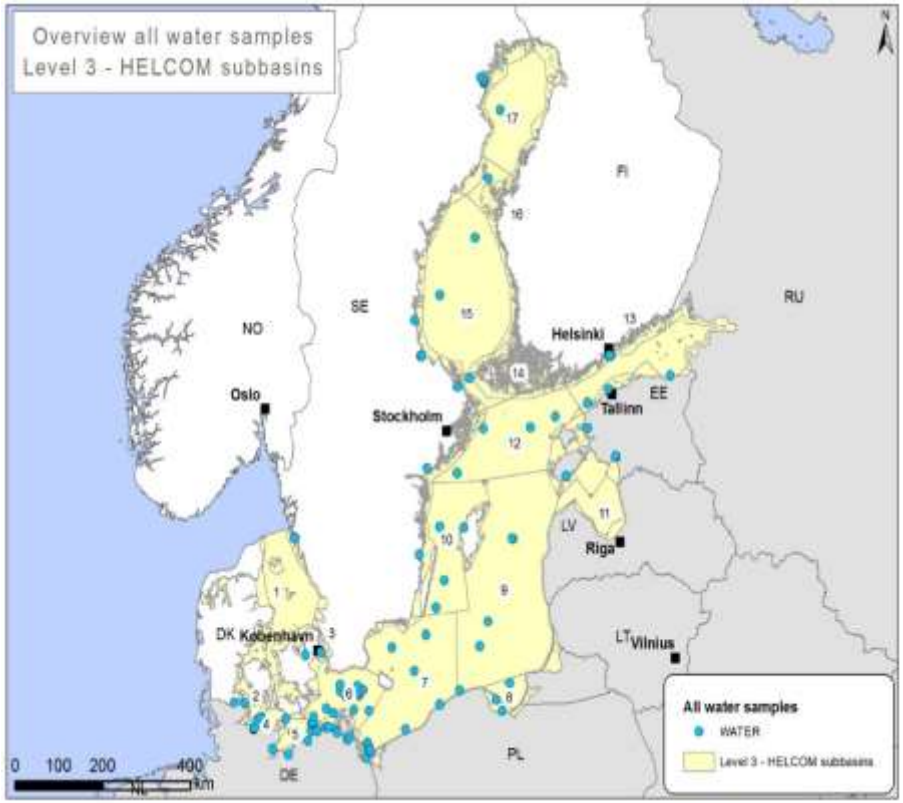
## Reported measurements




**Analysed:**
156 pharmaceuticals & 2 metabolites
**Detected:**
142 pharmaceuticals & 2 metabolites

- **The major identified source - MWWTP;**
- **Concentration in effluents:**
  - The highest average – furosemide 22.3 μg/l;
  - The highest absolute – paracetamol 360 μg/l;
- **Top 5 substances in sludge – antibiotics;**
- **16 substances had higher concentration in effluents than in influents.**

# Contamination of the Sea Environment




**The most frequently detected pharmaceuticals:**

anti-inflammatory - diclofenac, ibuprofen and paracetamol;

antimicrobal – Sulfamethoxazole;

cardiovascular agents - metoprolol, bisoprolol and sotalol;

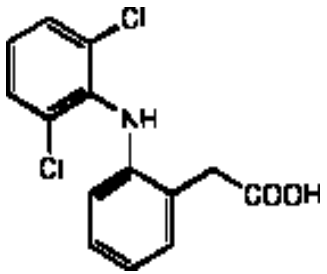
central nervous system agents - carbamazepine and primidone.

**4600 measurements reported;**

**167 pharmaceuticals analysed;**

**74 detected at least one of the matrices:**

51 in water, 9 in sediment, 35 in biota samples.



# What's next?

***Fill in data gaps:***

- *The use of pharmaceuticals in all BS countries;*
- *The use of pharmaceuticals in veterinary;*
- *Concentration of pharmaceuticals in MWWTP in all BS countries.*

***Fill in knowledge gaps:***

- Sufficient methodology to identify hormones;
- Environmental effects of pharmaceuticals;
- Technical solutions for removal at WWTP.

***Actions:***

- Establishing a regional expert group on pharmaceuticals to identify priorities;
- Including pharmaceutical into national monitoring programmes;
- Launching regional projects aimed prevention releasing of pharmaceuticals into the environment using different financial tools.

**Impact on regional policy:**

- Pharmaceuticals have been recognized as one of the priority micropollutants in effluents from wastewater treatment plants in the BS region;
- Diclofenac and hormones will be used among the others as indicators of the ecosystem health of the Baltic Sea.

# Acknowledgement

The report was produced in cooperation with Policy Area Hazards of the EU Strategy for the Baltic Sea Region

Data are provided by:
Denmark, Estonia, Finland, Germany, Poland, Russia and Sweden

Discussion of the results and conclusions:
HELCOM Working Group on Reduction of Pressures from the Baltic Sea Catchment Area
HELCOM Working Group on the State of the Environment and Nature Conservation

*Financial support:*