



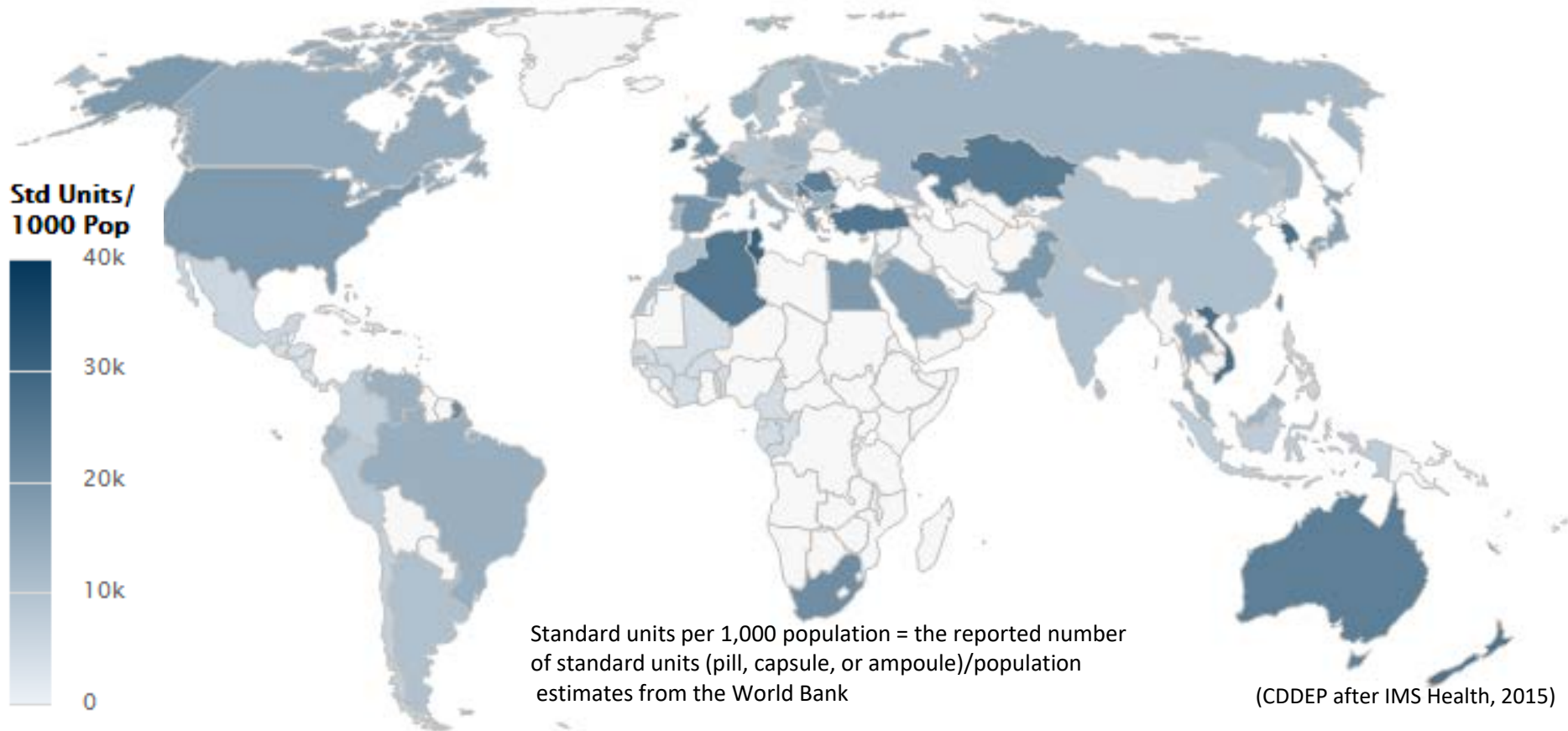
Emerging pollutants in water reuse: Health and environmental risks

Olfa Mahjoub

National Research Institute for Rural Engineering, Water, and Forestry (INRGREF), Tunisia

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Event: Emerging pollutants in water reuse addressing knowledge and policy gaps*

Use of antibiotics (2015)



- Substantial increase of pharmaceutical consumption in developing countries during the last 10 years.
- In Tunisia, the use of antibiotics increased by 38% during 2005-2013.
- In general, population growth is not the main cause; the increased access to antibiotics and self-medication are also incriminated.

- More than 1000 emerging substances are listed
- In Tunisia, research on emerging pollutants started in the early years 2000'. However, little is known about emerging pollutants in water resources.
- The occurrence of emerging pollutants and its potential risks are not well addressed in the context of reuse for agricultural irrigation.
- Risk assessment and setting science-based policy are challenging in developing countries to reduce the potential impacts of EP on health and the environment.

- Knowns and unknowns about emerging pollutants in the context of reuse in agriculture.
- The role of science in supporting policy-making to protect the water resources and the environment.
- The role of policy-makers and stakeholders in enabling scientific research.



Project components

- Literature review → Compilation of the data available in reports and scientific literature on EP of concern.
- Survey among decision-makers and stakeholders of the water and water-related sectors → Assessment of the state of knowledge on regulation, policy, risks, capacities, etc.
- Field study on the area of Oued Souhil, Tunisia, irrigated with TWW → Assessment of the potential impact of reuse and identify relevant EP for health and the environment.



State of knowledge

- The first survey carried out on the topic of emerging pollutants.
- 12 institutions: 9 governmental + 3 NGOs
- 41 interviewees
- Questionnaire
 - Policy
 - Regulation
 - Presence, fate, behaviour
 - Analytical and human capacities
 - Treatment
 - Risks perception
 - etc.



Providing evidences

- Wastewater irrigated area of Oued Souhil, Tunisia
- Chemical analysis
 - Secondary treated wastewater and groundwater
 - 26 pharmaceuticals and hormones
 - Antibiotics (9)
 - NSAIDs (4)
 - β -Blockers (4)
 - Hormone (3)
 - Lipid regulators (2)
 - Psychiatric drugs (2)
 - Central nervous system stimulant (1)
 - Anti-ulcer agent (1)



Main outcomes

- Very little is published in the context of reuse on the impact on the environment and health → Joint research programmes to produce reliable data for a science-based decision-making and for setting realistic regulation.
- Gap of knowledge and lack of awareness among actors of the water and water-related sectors including scientists, policy-makers, stakeholders, and civil society → Dissemination of research, outcomes, raising awareness.
- Treated wastewater and groundwater used for irrigation in the area of Oued Souhil are contaminated by antibiotics. Reuse and likely the use of manure are the main sources → Monitoring programmes.

THANK YOU



By Frits Ahlefeldt