



DEAD(LY) DEVICES

Emily Bader, Sara Grimholt, Sander Sulusnes
Department of Biological Sciences (BIO316), University of Bergen



Electronic waste (**E-waste**) is one of the **fastest growing** solid waste streams in the world, posing serious **health and environmental risks** due to its **hazardous components** and widespread **informal recycling**.

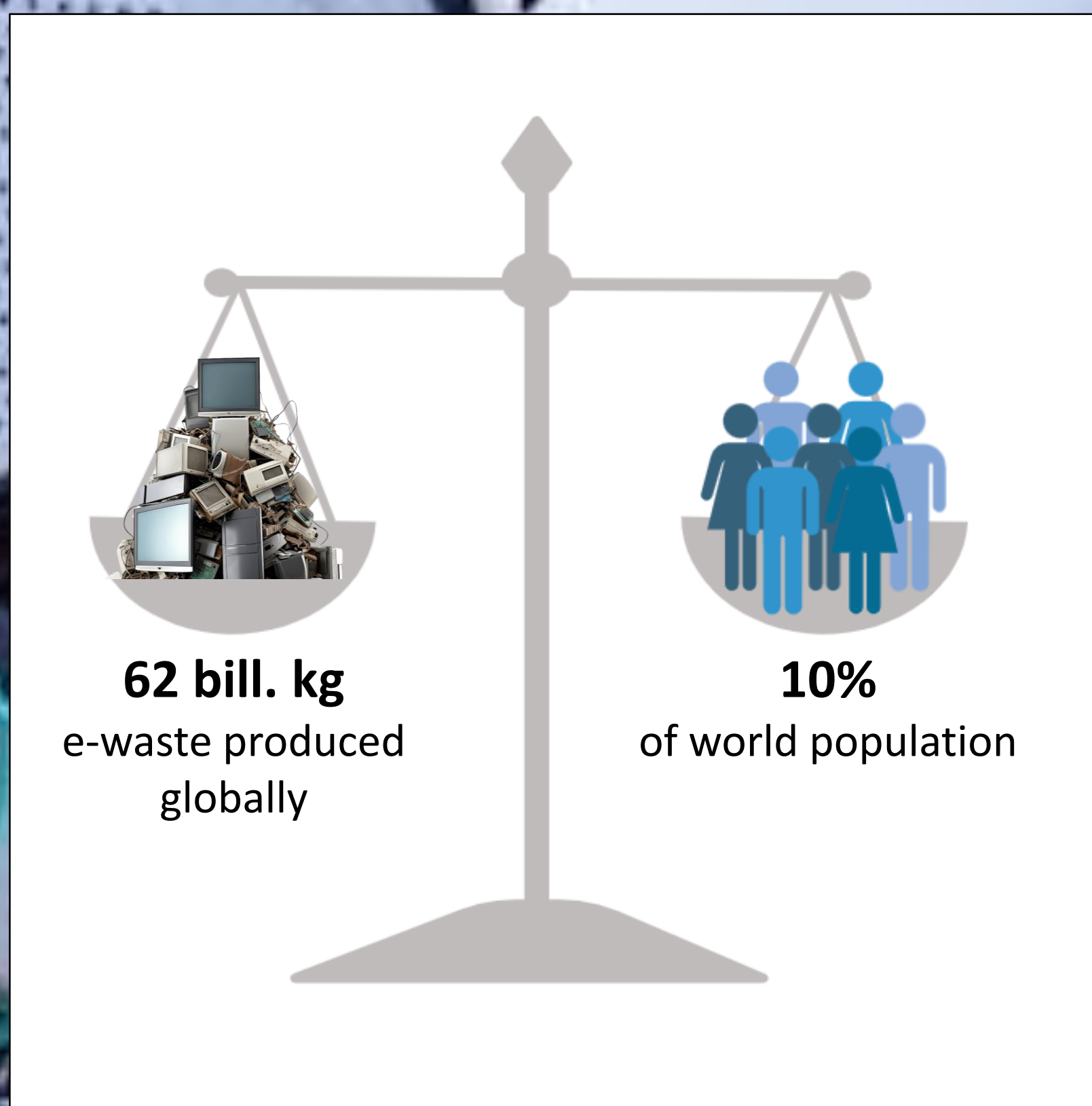


Fig. 1: Amount of global e-waste is equal to weight of 10% of world population (8 billion humans at 75 kg) (1)

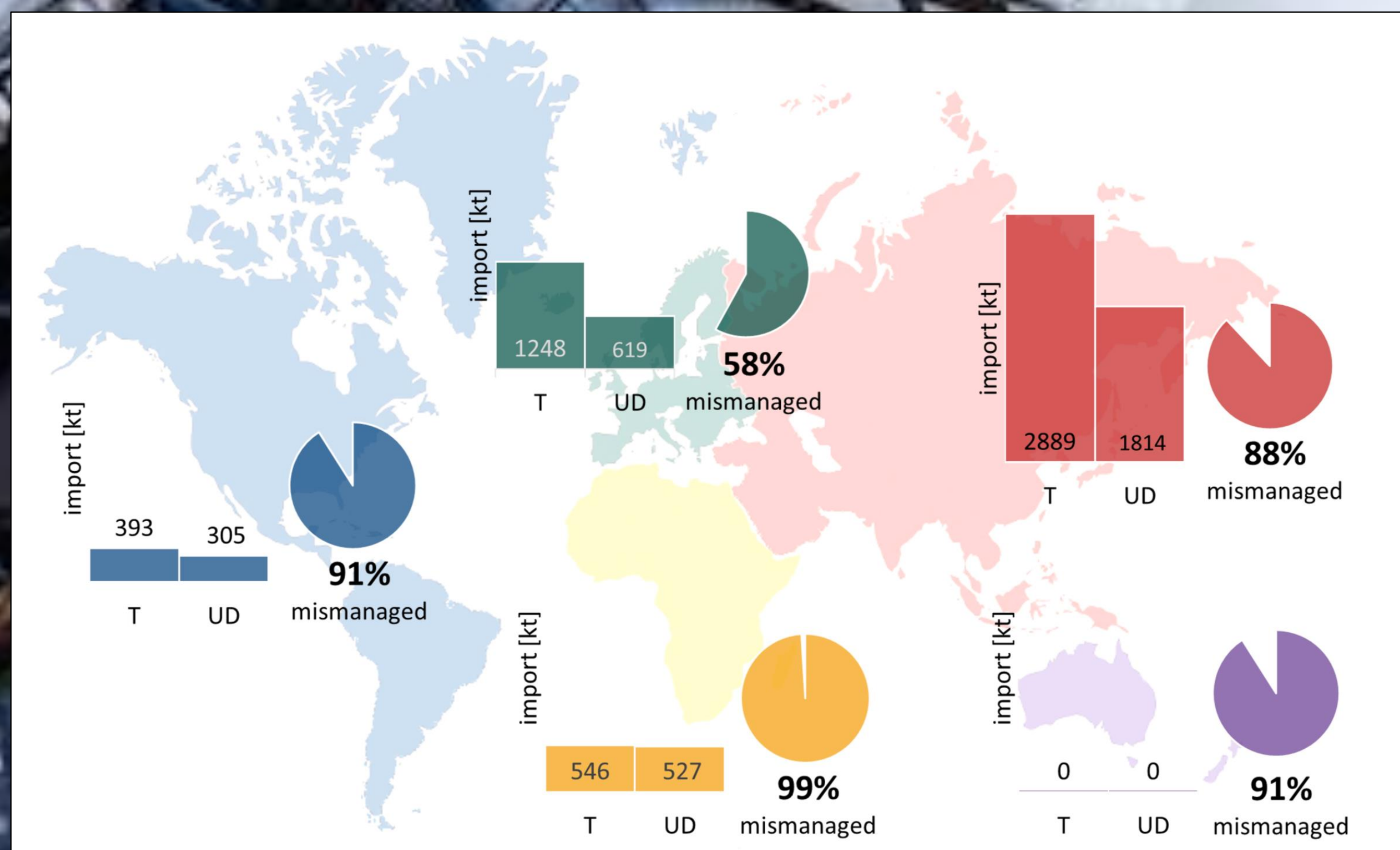


Fig. 2: Amount of imported e-waste (T: total, UD: undocumented) in different continents and percentage of not environmentally sound managed e-waste. (1)

PROBLEMS

- Improper recycling can lead to the release of up to 1000 different **chemical substances** (e.g. dioxins, lead, mercury, ...)
- **Children and pregnant women** are particularly vulnerable
- **Sources of exposure**
 - Informal recycling: disassembling of e-waste to retrieve valuable elements, with little or no **protective equipment**
 - Environmental exposure: contaminated drinking water, soil, plants and animals. **Toxic fumes** are released when burning e-waste
- **Adverse effects** on humans, animals and plants over large distances

Adverse health effects:

- Neurotoxicity
- Carcinogenesis
- Adverse neonatal outcomes, including stillbirths and spontaneous abortions
- Reduced respiratory function
- Changes in learning and behaviour



SOLUTIONS

- Reduction of e-waste through longer life cycle (using until death, repairing instead of buying new, ...)



- Increasing rates of formal recycling (regulations in all countries, monitoring, ...)



- Enhancing protection of workers' health and ban of child labor



References:

- (1) Baldé, C.P. *et al.* (2022) 'Global Transboundary E-waste Flows Monitor - 2022', <https://ewastemonitor.info/gtf-2022/>.
- (2) Grant, K. *et al.* (2013) 'Health consequences of exposure to e-waste: a systematic review', *Lancet Global Health*, [https://doi.org/10.1016/S2214-109X\(13\)70101-3](https://doi.org/10.1016/S2214-109X(13)70101-3).
- (3) Kumar, P. *et al.* (2024) 'A review on e-waste contamination, toxicity, and sustainable clean-up approaches for its management', *Toxicology*, <https://doi.org/10.1016/j.tox.2024.153904>.
- (4) WHO (2024) 'Fact sheet: e-waste', [https://www.who.int/news-room/fact-sheets/detail/electronic-waste-\(e-waste\)](https://www.who.int/news-room/fact-sheets/detail/electronic-waste-(e-waste)).

