

Challenges of evaluating environmental sustainability of electronic healthcare devices: a systematic review

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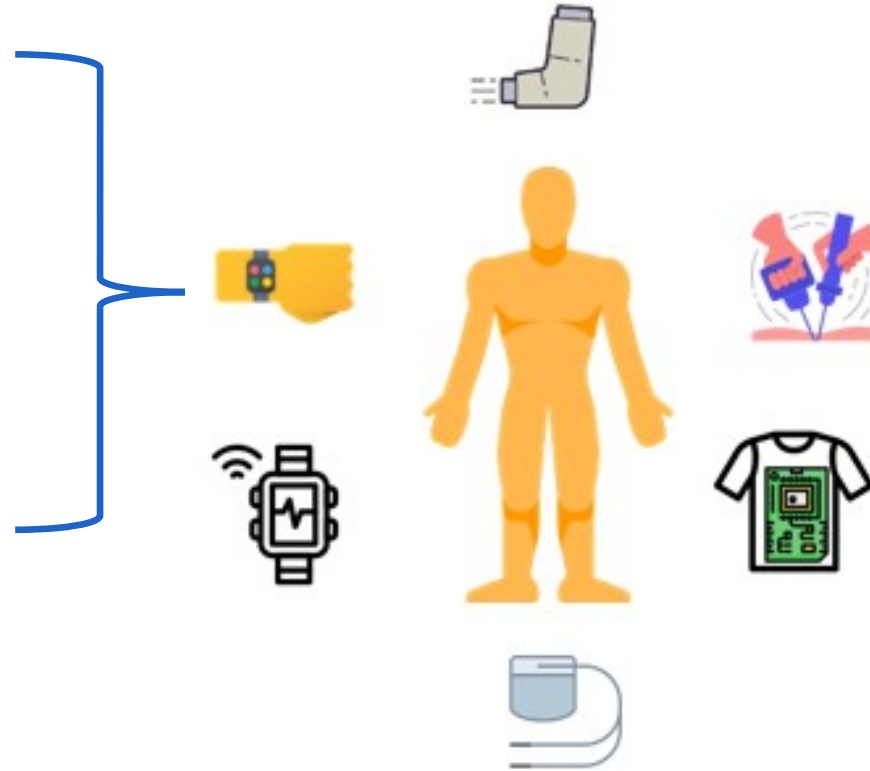
ELECTRONIC HEALTHCARE DEVICES

Aging population

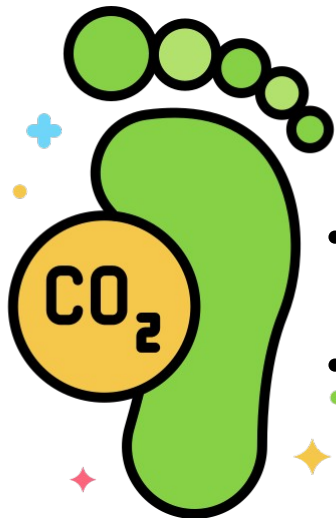
Epidemic & pandemic

Health inequality

High healthcare cost



- ✓ Reliable diagnostics
- ✓ Self-monitoring capabilities
- ✓ Improved patient comfort
- ✓ Less invasive procedures

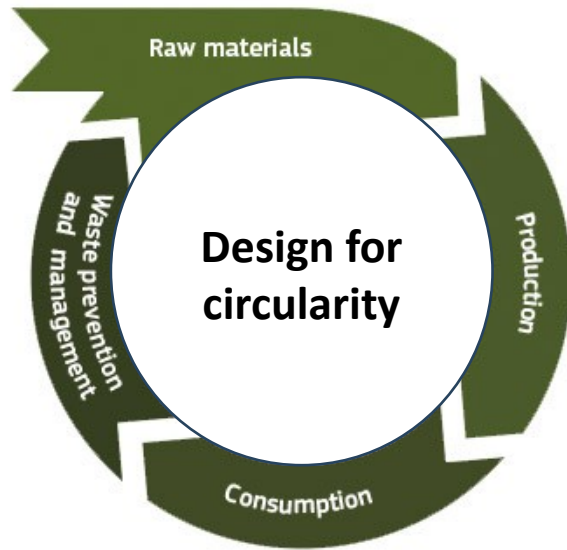


- Healthcare => 2-5% of global contribution
- Hospital waste => 70% is operating room waste

BUT ELECTRONIC HEALTHCARE DEVICES...



ELECTRONIC HEALTHCARE DEVICES



Circularity strategies

- ❖ Replacing single use with reusables
- ❖ Reprocessing of surgical devices
- ❖ Repair and remanufacturing

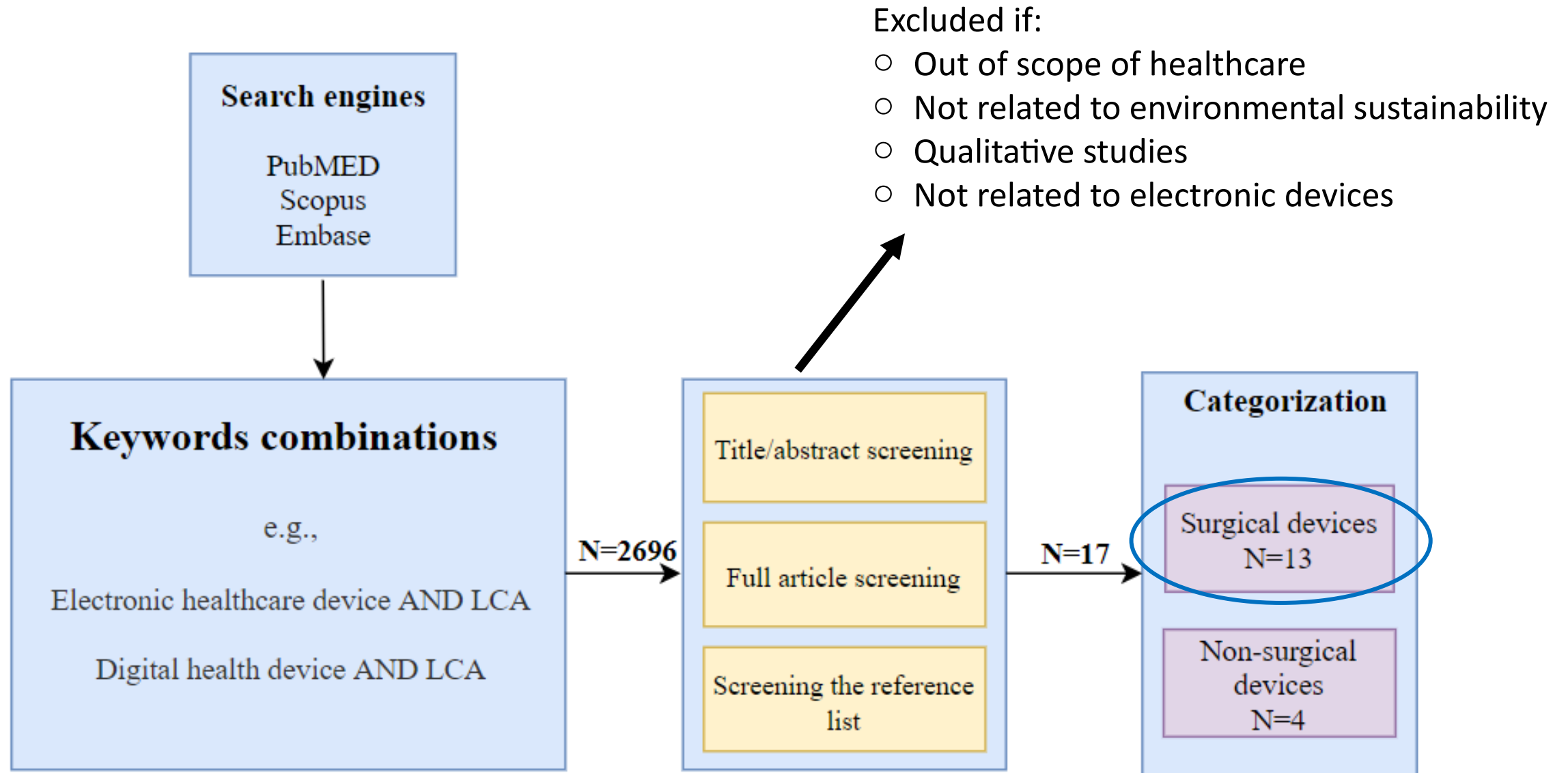
The environmental benefits and burdens are not yet fully understood

Objectives

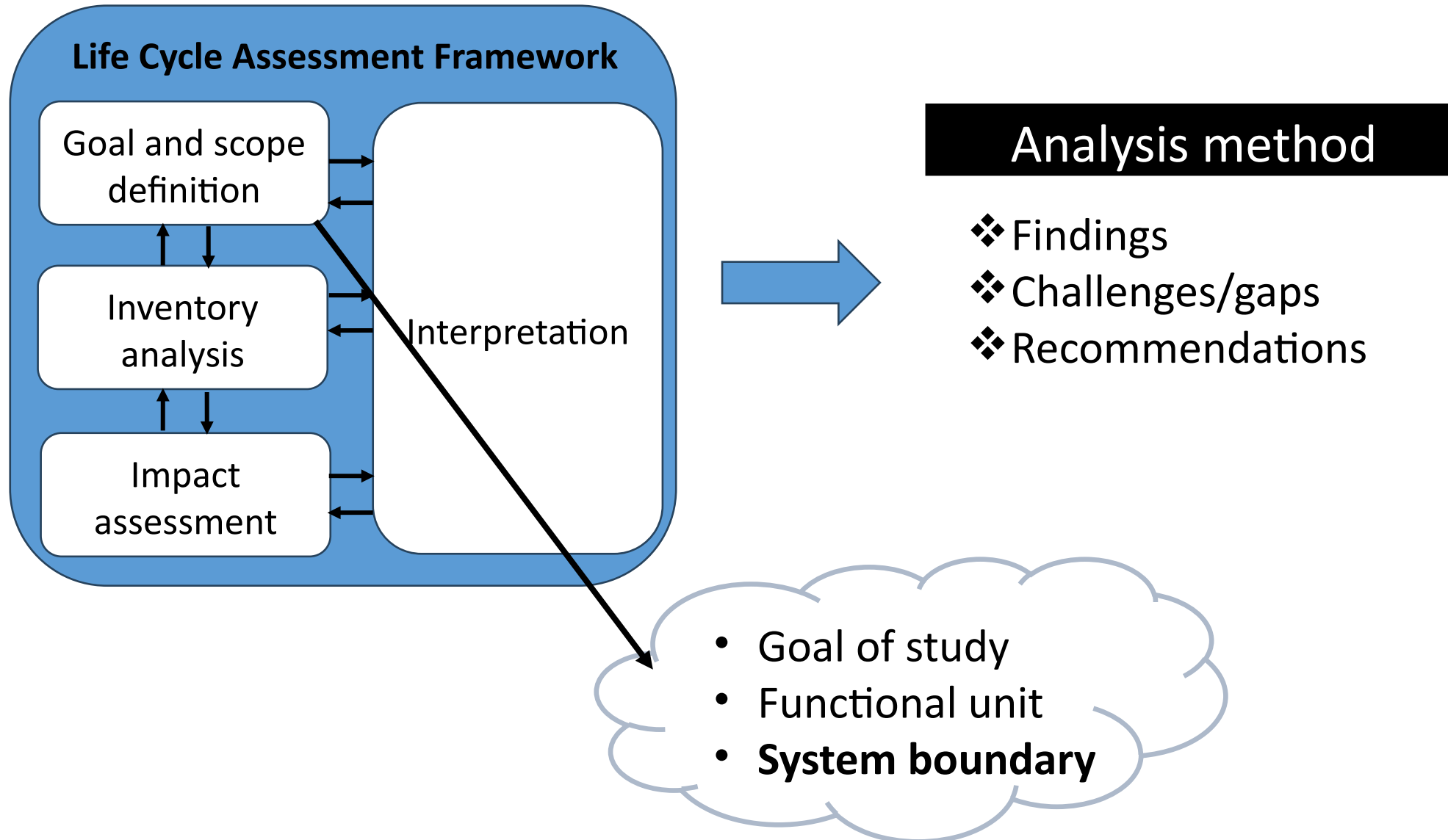
Investigate the current state of knowledge on environmental assessment

Identify research gaps and offer recommendations from the perspective of using LCA

METHODOLOGY

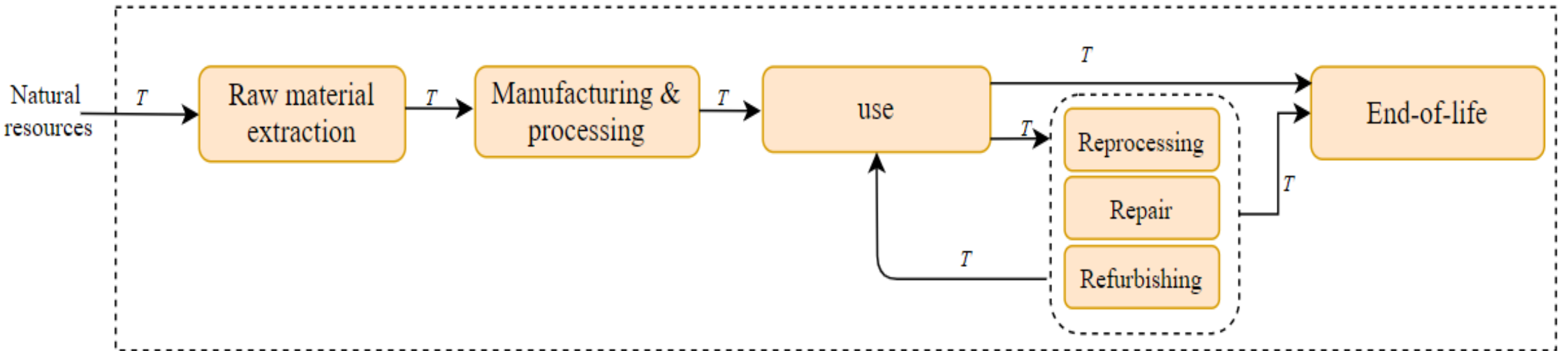


ANALYSIS OF SELECTED STUDIES



FINDINGS: SYSTEM BOUNDARY

Goal: Comparative analysis of single-used versus reusable electronic surgical devices

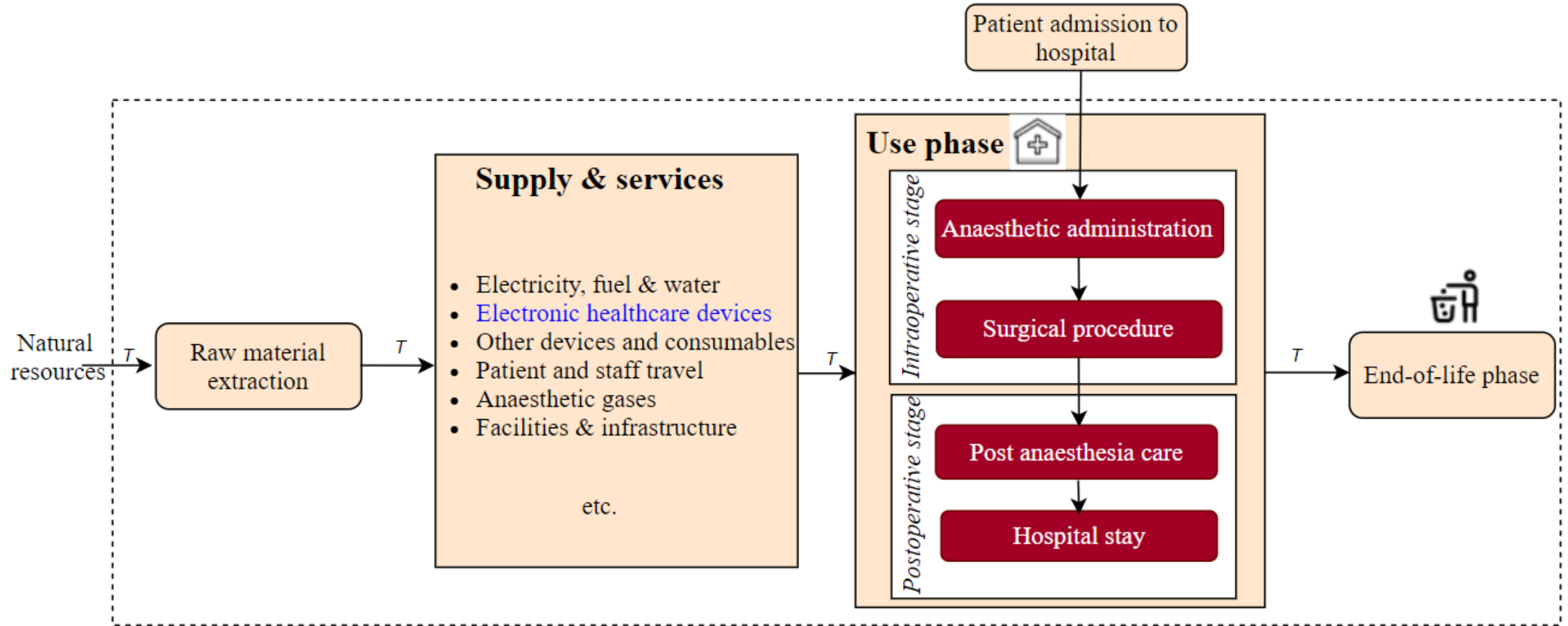


Drawbacks

❖ Only the direct life cycle impacts are considered

Note: Devices also have indirect impacts: i.e., optimization of surgical procedures, demand for other resources

RECOMMENDATION: SYSTEM BOUNDARY



System level perspective:

- Considers a wider boundary of the care pathway (surgical pathway)
- Paint a comprehensive picture of burden and benefits
- Impacts associated with service delivery

CONCLUSIONS AND PERSPECTIVES

Findings & recommendation	Direct impacts	Indirect impacts
Current studies	✓	--
Future studies	✓	✓

- Both direct and indirect environmental impacts should be considered
- System boundary: system perspective is recommended
- The challenge: data availability

The results will be published in Muindi, N. et al. (in preparation)

THANK YOU!

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Project

Digital Health in the Circular Economy
(DiCE)

<https://circulardigitalhealth.eu/>