

The carbon footprint of hospital services and care pathways: a systematic literature review

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This study was a collaboration between Amsterdam UMC - Department of Public and Occupational Health, Amsterdam Business School - Faculty of Economics and Business and Amsterdam School of Communication Research (ASCoR) - Department of Communication Science

Introduction

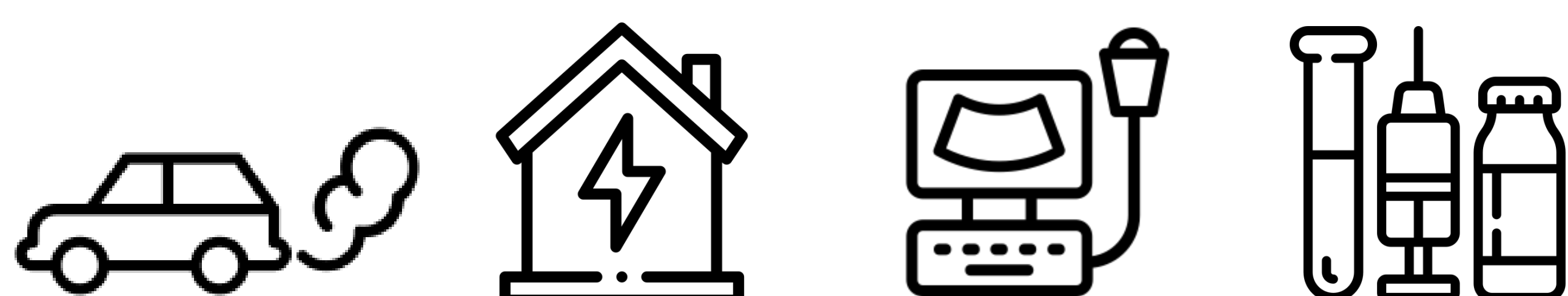
Climate change is the biggest global health threat of the 21st century, posing a risk for healthcare systems worldwide. Paradoxically, the healthcare sector contributes to greenhouse gas emissions. This study reviews the carbon footprint of hospital services and care pathways and its most important contributing factors. Additionally, it includes an assessment of the methodological quality and the rationale behind the chosen hospital services and care pathways employed in the studies.

Methods

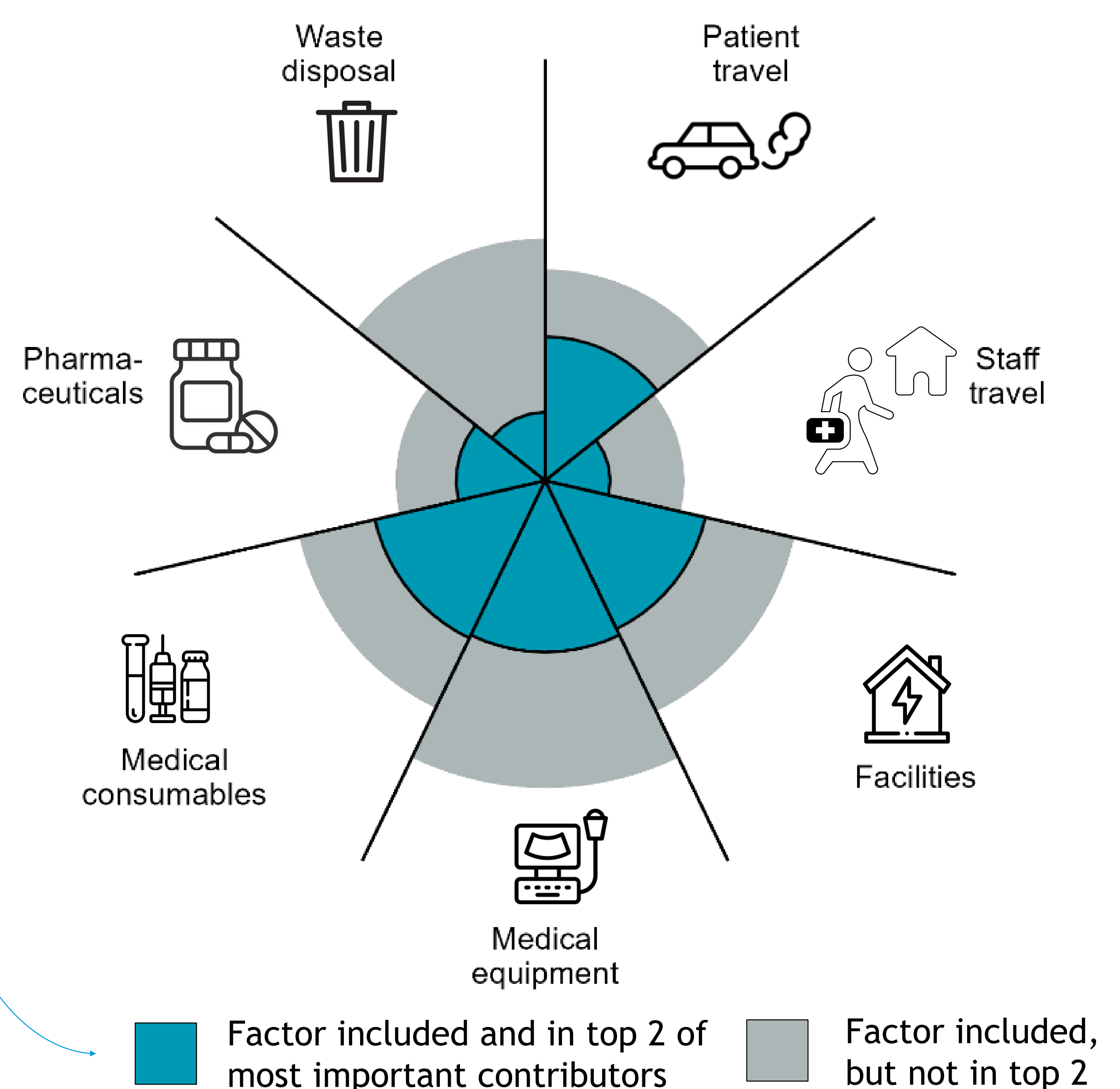
- Systematic literature review
- Six databases were searched on February 13th, 2023:
 - MEDLINE, Embase, CINAHL, GreenFILE, Web of Science, Scopus
- Grey literature (HealthcareLCA database, reports)
- Quality assessment (guidelines for critical review of product Life Cycle Assessment)

Results

- 62 studies out of 4,579 records included
- Total of 123 different hospital services and care pathways have been studied
 - Selection based on volume or lack of evidence
- Wide range of estimated carbon footprints:
 - 0.01 kgCO₂e for an hour of propofol anaesthesia
 - 10,200 kgCO₂e for a year of haemodialysis treatment



- Travel, facilities, equipment and consumables most important contributing factors
- Relative importance of emission hotspots differed per medical specialty, service, and setting
- Methods used for carbon footprint quantification heterogeneous
- Quality of evidence on average **Moderate**, but wide range of quality scores: 20% - 97%



“Evidently, a hotspot can only be found if it was included in the first place.”

Conclusion

- Hospital services and care pathways have a large climate impact
- Main carbon hotspots include travel, facilities, medical equipment and consumables
- Variation in footprint and hotspots between medical specialties, services and settings
 - Underlines need for local studies and tailored mitigation strategies
- Future studies would benefit from a more standardized methodological approach

