



JASPERS Networking Platform

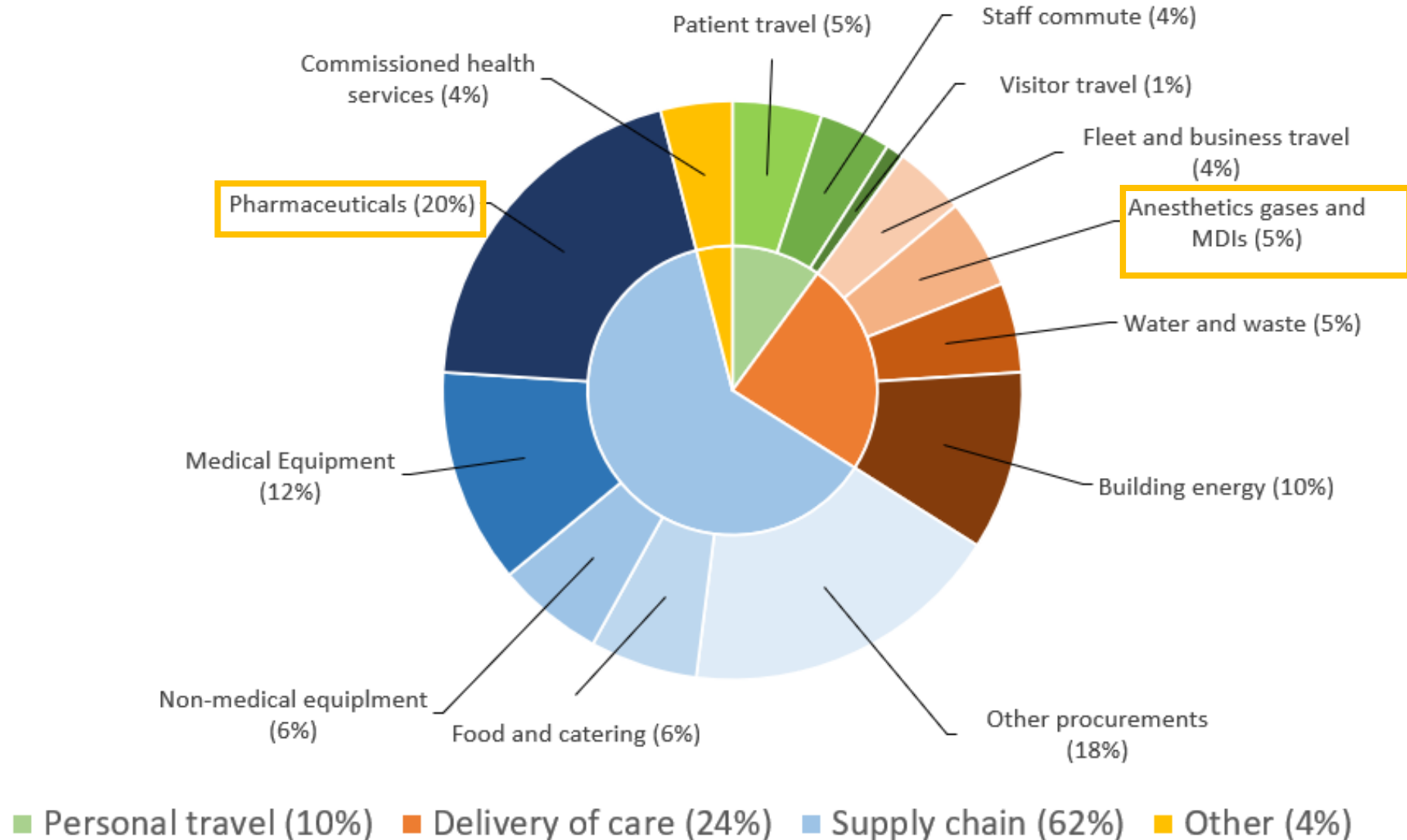
Webinar: Enhancing stakeholders' knowledge and applicability of climate change measures for hospitals and health infrastructures

**Moving towards green procurement:
progress on anesthetics**

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Contribution of different sectors to the greenhouse gas emissions of the NHS England

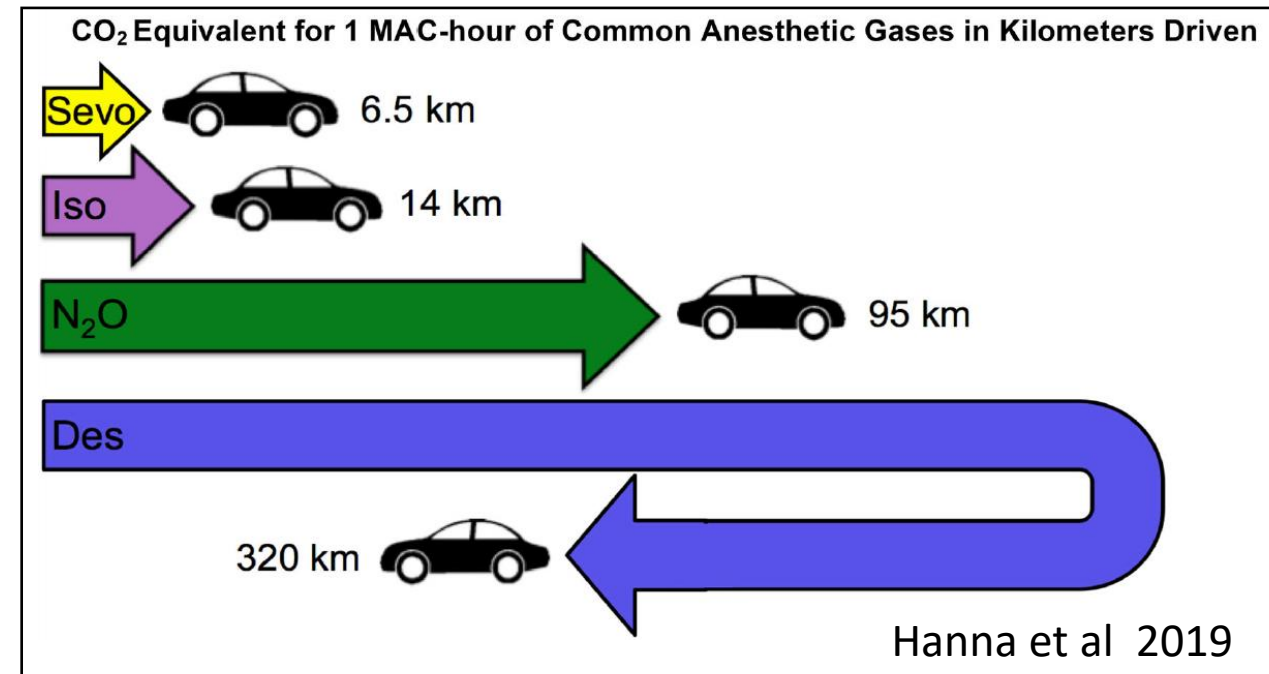


Sources of greenhouse gases emissions associated with the production and use of pharmaceuticals

- 1. Use of volatile anesthetics (2% of the emissions of the NHS)**
2. Use of pressurised metered-dose inhalers (MDI) for Asthma and COPD (3% of the emissions of the NHS)
3. Supply chain of pharmaceuticals (20% of the emissions of the NHS)

Global Warming Potential (GWP) of different anesthetics

- **Nitrous Oxide** (GWP: 273)
- **Halogenated anesthetics**
 - Sevoflurane (GWP:144)
 - Desflurane (GWP:2590)
 - Isoflurane (GWP: 539)
- **Other anesthetics**



Sevoflurane and desflurane have similar use but a very different climate impact

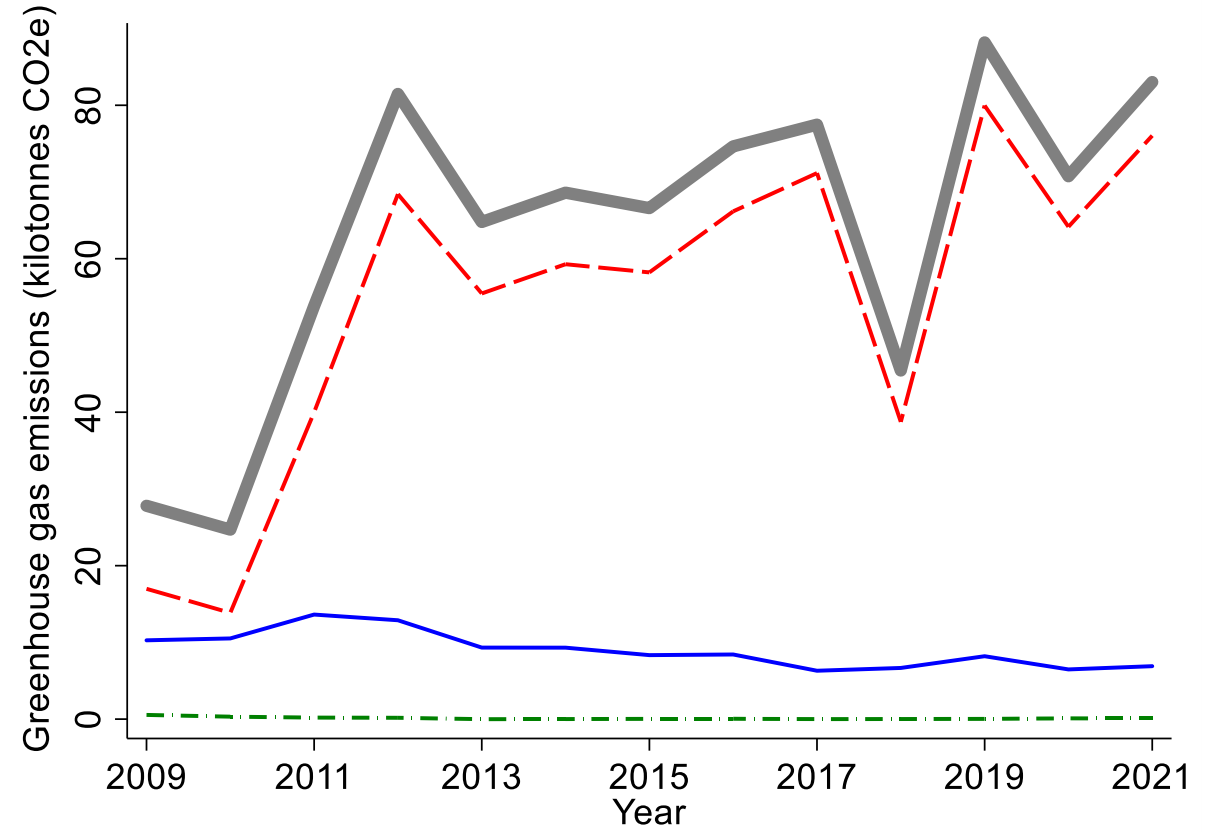
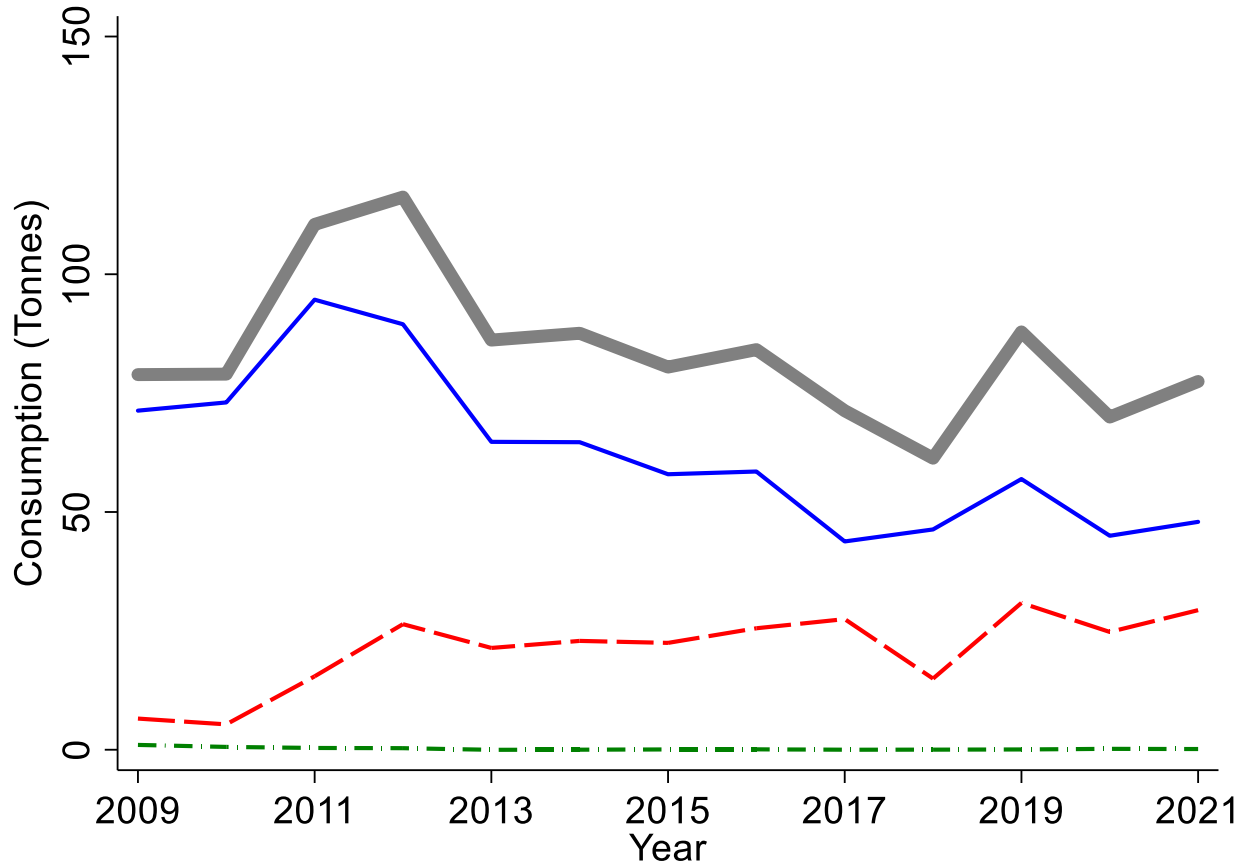
Halogenated anesthetics: what's going on?

- In 2022, The World Federation of Societies of Anaesthesiologists (WFSA) issued guidelines to encourage the substitution of desflurane
- In 2023, Scotland became the first country in the world to issue an almost total ban of desflurane in 2023. England followed the same way in 2024
- In January 2024, The European Commission introduced severe restrictions on the use of desflurane from 2026 onwards
- However, it is still unclear what portion of the overall carbon footprint of anesthetics can be specifically attributed to the use of desflurane.

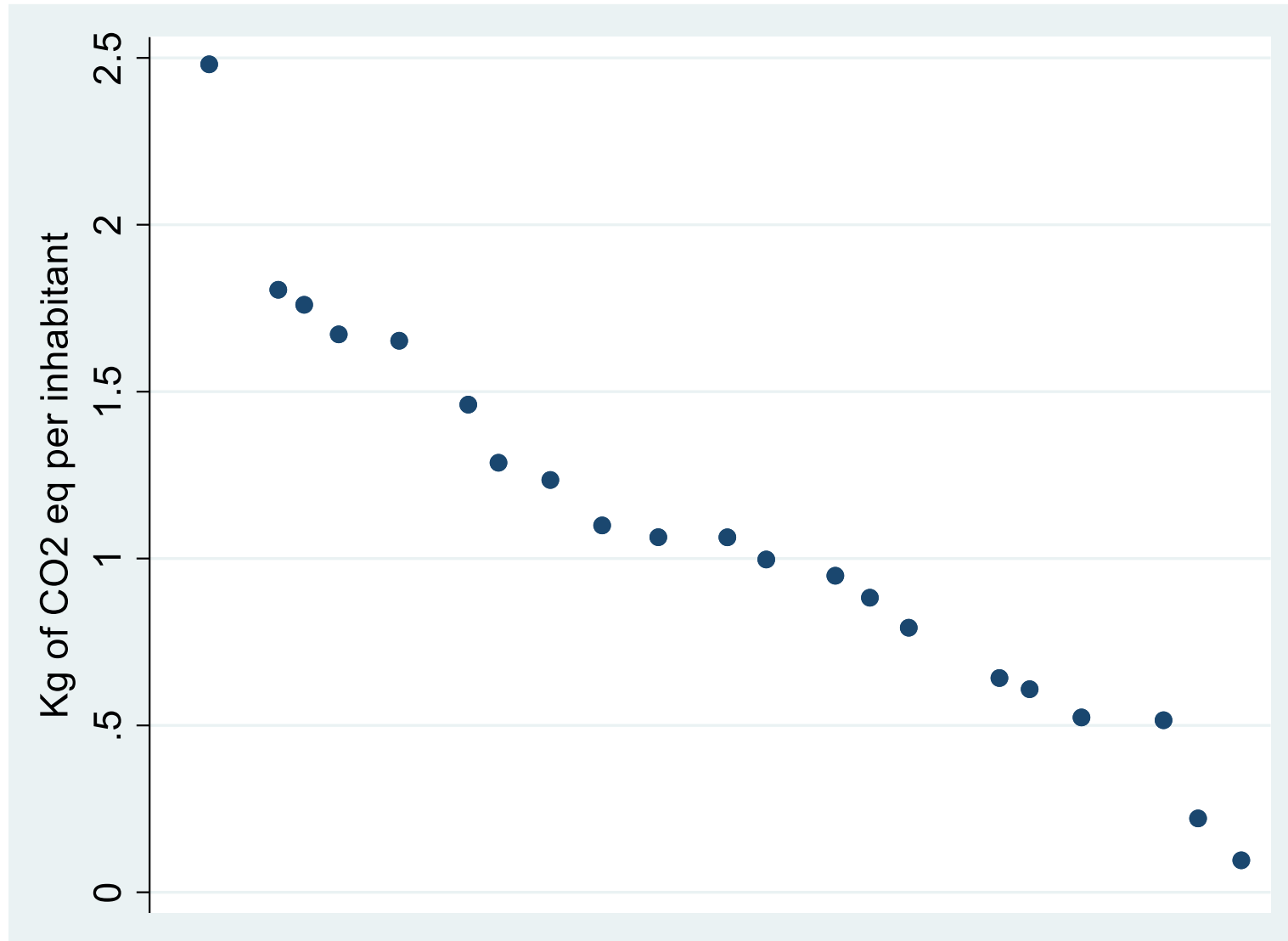
Methods

- Official drug consumption data from the Italian Medicine Agency for the period 2009-2021
- Global warming potential estimates proposed by Sulbaek Andersen et al (2023)
- Calculation of greenhouse gas emissions associated with the use of halogenated agents (desflurane, isoflurane and sevoflurane)
- Analysis conducted at the country level and at the regional level

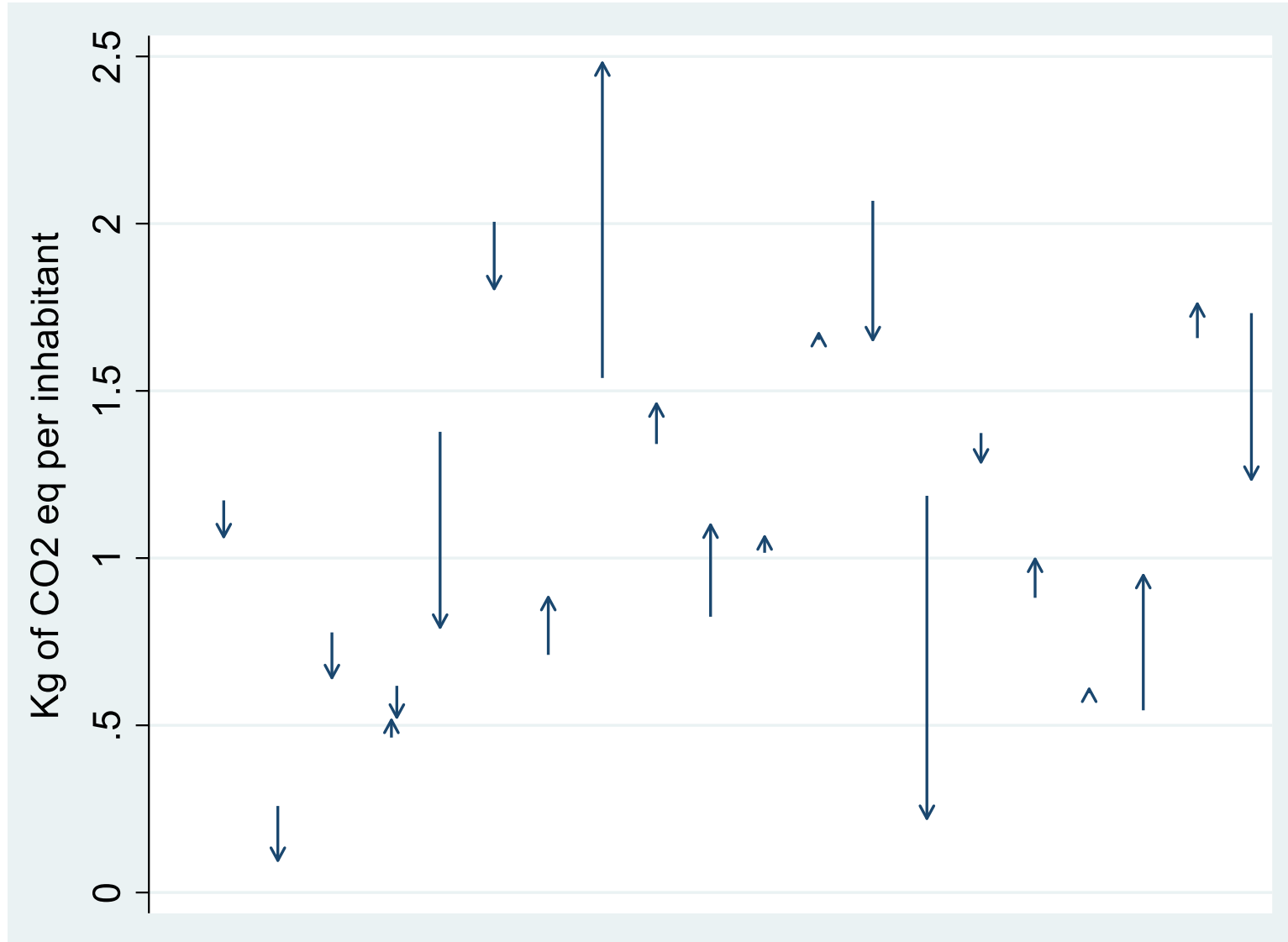
Consumption of different types of halogenated anesthetics and associated greenhouse emissions in Italy



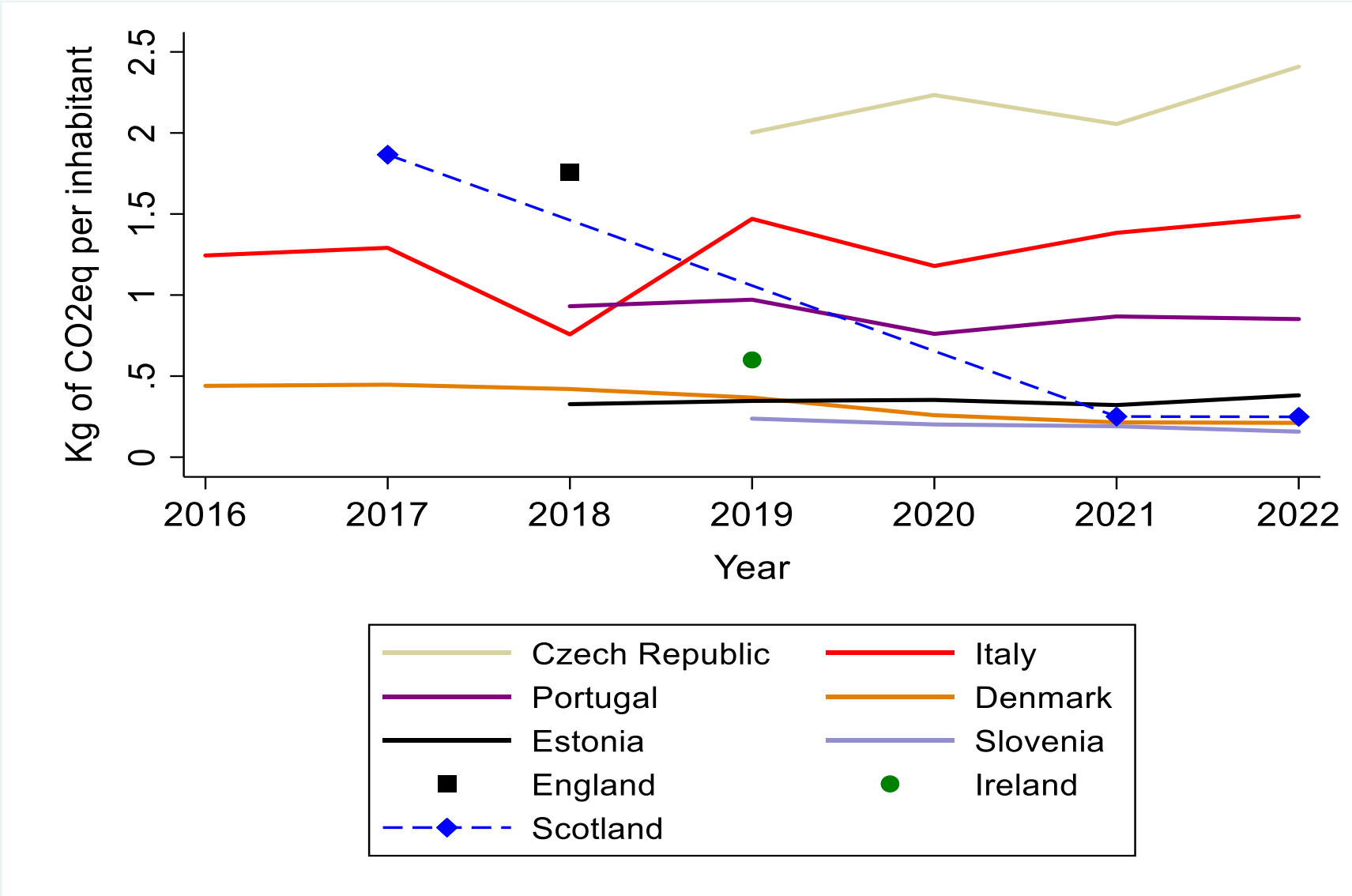
Greenhouse emissions per inhabitant associated to halogenated anesthetics in the different Italian regions



Changes in greenhouse emissions among Italian regions between 2016 and 2021



Greenhouse emissions associated to halogenated anesthetics. Where does Italy stand, compared to other countries?



Discussion

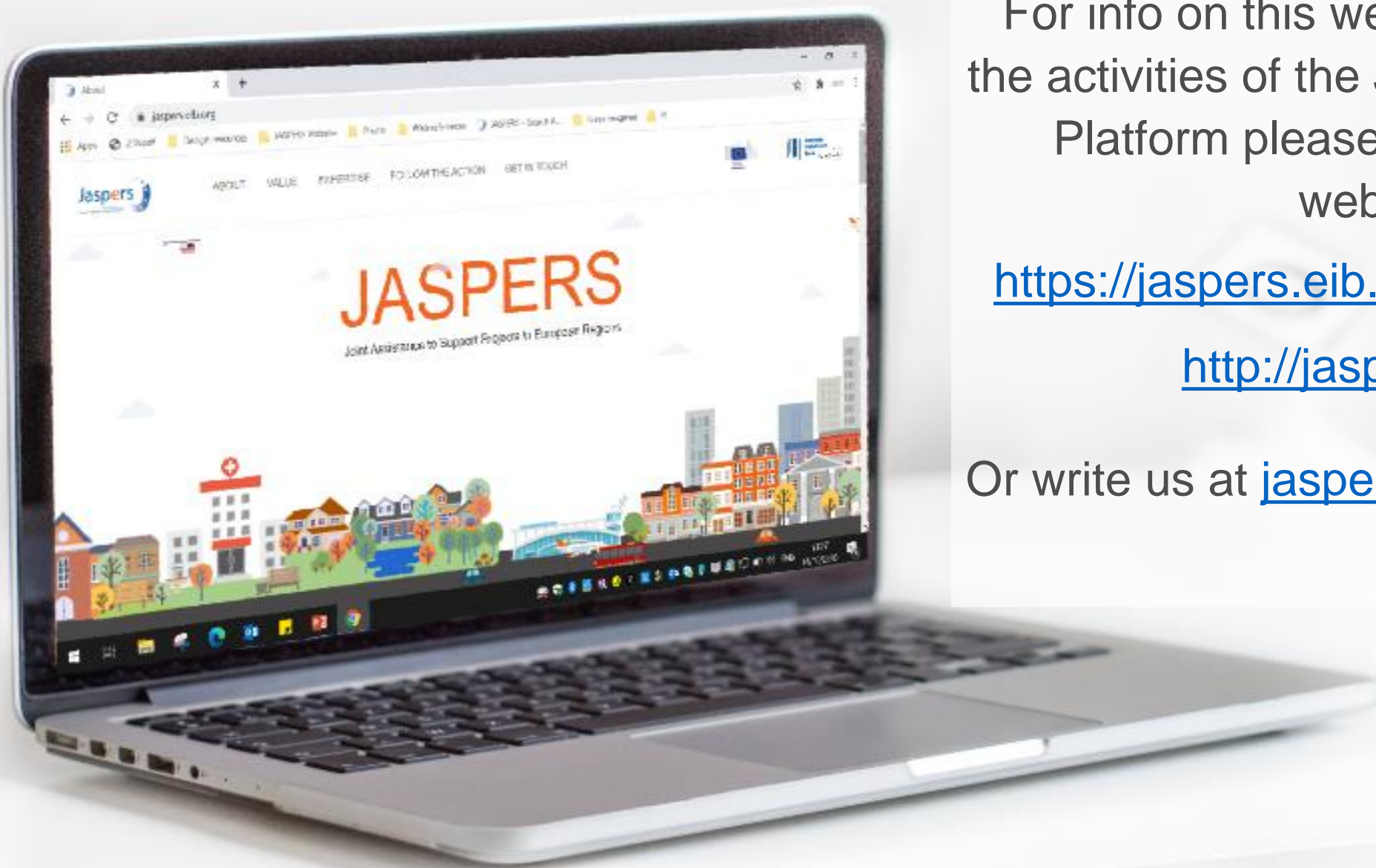
- The use of anesthetics is responsible for a substantial amount of greenhouse gas emissions produced in operating theatres
- Desflurane currently plays a major role in greenhouse gas emissions related to halogenated agents, at least in Italy
- The observed variation in desflurane usage across the Italian regions suggests that recommendations to substitute desflurane have been inconsistently implemented
- There is room for a substantial reduction in the use of desflurane while delivering high-quality care
- Need of public data on the use of halogenated anesthetics in the different European countries to track improvements

Thanks for the attention!

References

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- Hanna M, Bryson GL. A long way to go: minimizing the carbon footprint from anesthetic gases. *Can J Anaesth*. 2019 Jul;66(7):838-839
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