

Reducing the Carbon Footprint in NHS Surgical Procedures: A Study of Day-Case vs. In-Patient Laparoscopic Cholecystectomies

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Background: The National Health Service (NHS) in England has set a target to be net zero for carbon emissions by 2040. Increasing use of day-case surgery pathways may help to meet this target by reducing the per-patient carbon footprint of surgery.

Methods: Data were extracted from the Hospital Episode Statistics database for all day-case laparoscopic cholecystectomy procedures conducted in England from 1st January 2022 to 31st December 2022. Surgery conducted as day-case and as in-patient procedures were identified and the estimated carbon footprint for these elements of the surgical pathway calculated based on data from Greener NHS and the Sustainable Healthcare Coalition. Data were aggregated to Integrated Care Board (ICB) level for analysis

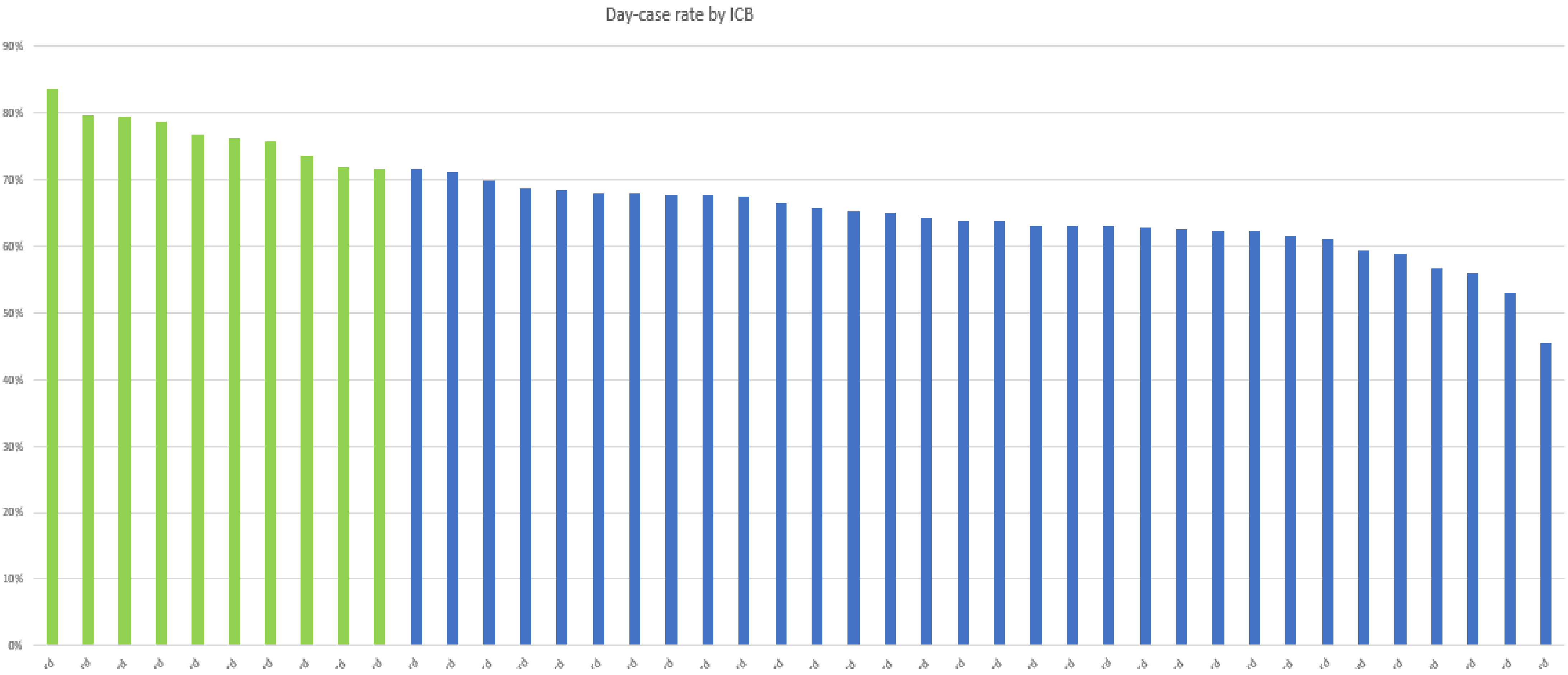


Figure 1: Day case rates by ICB (names removed). The top performing quartile represented by green bars

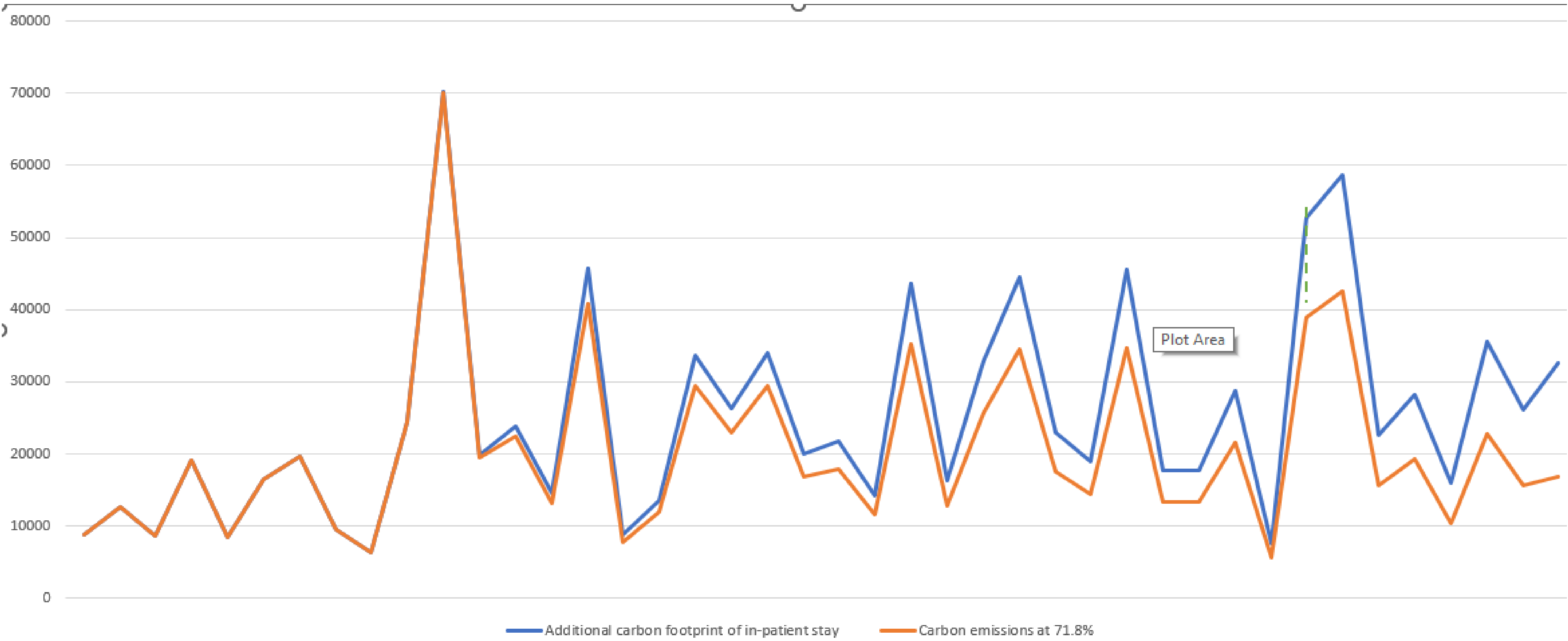


Figure 2: Additional carbon cost of Trusts performing LCs at actual (blue) vs optimal (orange) levels. The additional carbon cost of current levels is the difference between the two lines (green dotted line).

Results: We identified 48,393 laparoscopic cholecystectomy procedures in 2022 of which 32,231 (66.6%) were done as day-case surgery. Day-case rates varied across the 42 ICBs in England with the upper quartile with the best performing trusts had a minimum day-case rate of 71.8%. Using figures calculated by the Sustainable Healthcare Coalition (SHC) for average carbon footprint of surgery per patient, we estimate that if all the ICBs in England had performed at least this well, we could have saved up to 189,437.5 KgCO₂e (equivalent to powering at least 172 homes for the year 2022).

Conclusions: Our study highlights potential NHS carbon savings through efficient use of day-case surgical pathways. Reducing variation in care of laparoscopic cholecystectomies across the NHS and encouraging all hospitals to adopt day-case surgeries, where clinically appropriate, would lead to further carbon savings. Such changes are also likely to reduce costs and increase patient throughput, thus leading to more efficient and productive healthcare