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## Guarantor

The corresponding author, Michael Allen, is the gaurantor of the paper (PI on the NIHR project funding).

## Contributorship

KP performed the majority of the modeling work, and was the primary author of the paper. MA assisted in the modelling and supervised the modeling work and co-authored the paper. AL performed analysis for the paper and reviewed/edited work. TM and RE provided additional oversight and analysis to the coding, contributed to the work plan, and edited the paper. MJ provided clinical oversight, reviewed all work, and contributed to writing and editing the paper.

## Data access and ethics

The NHS Health Research Authority decision tool was used to confirm that ethical approval was not required to access the data. No identifiable patient or hospital information were provided in the data, and anonymised hospital names were provided. Governance of the data and access to SSNAP was authorised by the Healthcare Quality Improvement Partnership (HQIP, reference HQIP303).

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## Author approval

All authors have seen and approved this manuscript.

## Conflict of interest statement

All authors declare no conflicts of interest.

## Links to source code, and online Jupyter book

1. GitHub repository: <https://github.com/samuel-book/samuel_shap_paper_1>
2. Jupyter book: <https://samuel-book.github.io/samuel_shap_paper_1/>