

Patient Reported Outcome Measures (PROMs)

Exploratory data analysis of knee and hip surgeries

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Patient reported outcome measures (PROMs)

- Questionnaires filled in by patients
- Done before and/or after treatment

Research questions

- Can we evaluate the conditions of the patients over time?
- What are the key questions to ask patients?
- How can PROMs improve diagnoses in the future?

Publicly available PROMs data from the National Health Service (NHS) from four elective surgeries[1][2]:

- Hip replacements
- Knee replacements
- Groin hernia operations
- Varicose vein operations

Dataset: Numbers

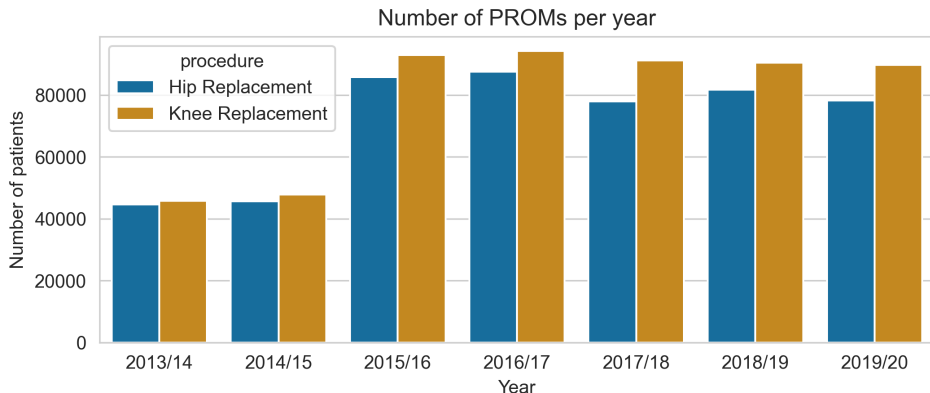


Figure: The number of PROMs recorded from 2013 to 2020. The total number of PROMs is just over 1 million.

Oxford Knee/Hip Scores (OKS/OHS)

- Joint-specific outcome measure tools
- 12 multiple choice questions relating to the patient's experience of pain and ease of movement
- Scores from 0 (bad) to 4 (good)
- Sum ranges from
 - 0 : worst condition
 - 48 : best condition

Exploratory Data Analysis: Scores

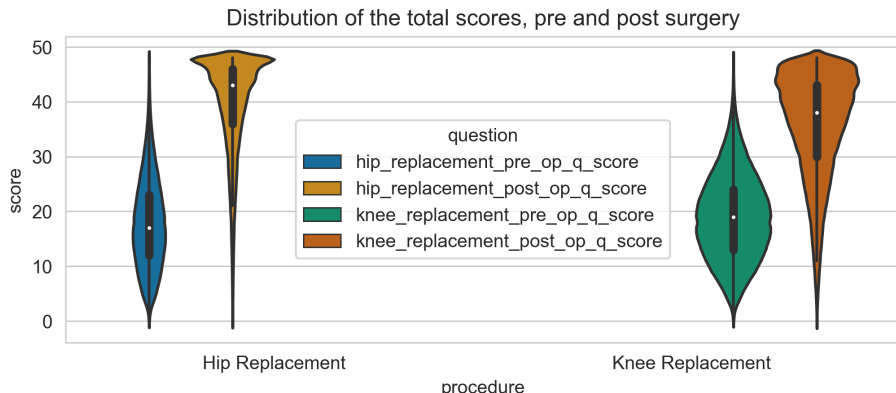


Figure: The scores of can range from 0 being the worst possible state a patient can report, to 48 being the best.

Exploratory Data Analysis: Score differences

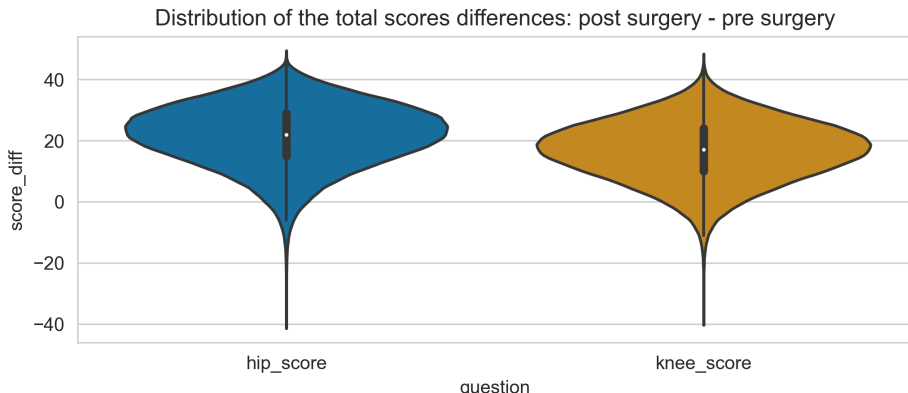


Figure: The scores difference a patients reports before and after surgery. Ranging from -48 being the worst possible outcome, to 48 being the best.

Discussion: Condition over time

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- The majority of patient report an improvement
- Assuming that the surgery improves the patient's well being:
 - Yes PROMs can be used to check on the condition of the patients over time

Discussion: Key questions

Arguably, the most important questions have the largest difference between the pre and post surgery scores:

- During the past 4 weeks, have you been **limping** when walking, because of your hip/knee?
- During the past 4 weeks, how would you describe the **pain** you usually had from your hip/knee?
- During the past 4 weeks, have you been troubled by **pain** from your hip in bed at night?
- During the past 4 weeks, have you felt that your knee might suddenly '**give way**' or **let you down**?

Discussion: Improve diagnoses

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- For these types of hip and knee problems, the diagnosis is trivial.
- Further analysis needs to be done to see if PROMs can be used to improve the diagnoses.

- The NHS has provided a large dataset of PROMs.
- An initial analysis of a subset of this dataset shows that there are many insights to be gained.[3]
- More thorough analysis can be done on the full dataset.

References

- [1] National Health Insitute. *PROMs data*. URL: <https://digital.nhs.uk/data-and-information/publications/statistical/patient-reported-outcome-measures-proms>. (accessed: 2023-04-13).
- [2] National Health Insitute. *PROMs guide*. URL: <https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/patient-reported-outcome-measures-proms#guidance>. (accessed: 2023-04-13).
- [3] David Parker. *PROMs EDA repository*. URL: https://github.com/Quillox/nhs_proms. (accessed: 2023-04-13).