

# Trends in length of stay for arthroplasty from 1989-2021: An observational study of 292,772 patients from the Scottish Arthroplasty Project Database

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## INTRODUCTION:

Arthroplasty procedures and practices have evolved significantly since their expansion in the 1980s. What was once a procedure taking multiple hours, suffering significant blood loss and requiring a long inpatient stay is now being performed as a day case in ideal candidates. The Scottish Arthroplasty Project (SAP) is a national audit used to record all joint replacements performed in the National Health Service and independent sector. It receives additional data from two routinely-collected administrative datasets - the Scottish Morbidity Record (SMR01) and the National Records of Scotland NHS Central Register of Deaths. Data linkage is performed via a unique identifier given to every person living in Scotland – the community health index (CHI).

## METHODS:

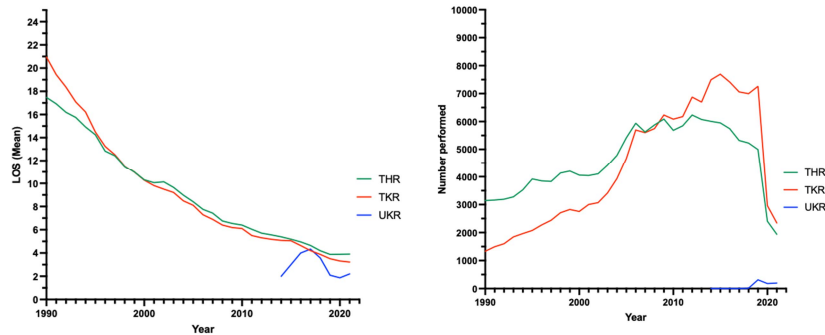
Using all available procedure codes for “Total hip replacement” (THR) and “Total knee replacement” (TKR) a list of all procedures performed in the NHS from 1989-2021 was generated. The CHI was then used to link these data to those from the SMR01 to identify length of stay (LOS) for each procedure, age, sex and social deprivation status. For each year the number of operations, minimum, maximum, mean and standard deviation of LOS were calculated.

## RESULTS:

The maximum LOS were in 1989, there were 3114 THR and 1208 TKR with mean (range, SD) LOS of 18.1 days (0-231, 11.1) and 21.6 days (0-384, 16.9). The minimum LOS were in 2019 for 4993 THR – 3.88 days (0-128, 4.2) and 2021 for 2342 TKR – 3.2 days (0-24, 2.2). Age, sex and deprivation status were found to be significant contributing factors to LOS ( $p < 0.001$ ). There is an overall downwards trend through the years in LOS for both procedures.

## DISCUSSION AND CONCLUSION:

This is the first robust large scale national data set showing trends in length of stay for arthroplasty over a 30 year period. We demonstrate a period of significant expansion of operations with an accompanied reduction in LOS. Age, sex and social deprivation status have a significant effect on LOS.



Dependent	unit	value	Coefficient (univariable)	Coefficient (multivariable)
LOS				
Age	[16.0, 106.0]	Mean (sd) 8.6 (8.0)	0.10 (0.09 to 0.10, $p < 0.001$ )	0.10 (0.09 to 0.10, $p < 0.001$ )
Gender		Mean (sd) 8.0 (7.5)	-	-
		Mean (sd) 9.0 (8.2)	0.99 (0.90 to 1.07, $p < 0.001$ )	0.74 (0.66 to 0.82, $p < 0.001$ )
Deprcat		Mean (sd) 9.4 (8.6)	-	-
		Mean (sd) 9.0 (8.3)	-0.41 (-0.54 to -0.28, $p < 0.001$ )	-0.51 (-0.64 to -0.38, $p < 0.001$ )
		Mean (sd) 8.7 (8.1)	-0.75 (-0.88 to -0.62, $p < 0.001$ )	-0.88 (-1.01 to -0.75, $p < 0.001$ )
		Mean (sd) 8.1 (7.1)	-1.36 (-1.49 to -1.23, $p < 0.001$ )	-1.33 (-1.46 to -1.20, $p < 0.001$ )
		Mean (sd) 8.0 (7.6)	-1.39 (-1.53 to -1.25, $p < 0.001$ )	-1.61 (-1.75 to -1.47, $p < 0.001$ )
		Mean (sd) 9.9 (12.2)	0.45 (0.02 to 0.87, $p = 0.039$ )	0.36 (-0.06 to 0.78, $p = 0.093$ )