Producing Small Area Estimates of the Need for Hip and Knee Replacement Surgery

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ABSTRACT (248)

Objective:
To produce estimates of the need for hip and knee replacement surgery across small areas of England to inform local health service planning.

Methods:
The English Longitudinal Study of Ageing is a population-based sample of 11,392 people aged 50 years or over living in England. Multilevel Poisson regression modelling is used to estimate rates of need for hip/knee replacement by age, sex, deprivation, rurality and ethnic mix of the area. Estimates of need from the regression model are then combined with census population counts to produce small area estimates of need. Separate analyses are conducted for hip and knee replacement using the Bayesian software WinBUGS.

Results:
Small area estimates of need for hip/knee replacement have been produced for wards and districts in England. Rates of need are adjusted for the socio-demographic characteristics of an area, and include estimates of uncertainty (95% credible intervals). Need for hip/knee replacement varies geographically, dependant on the socio-demographic characteristics of an area. Need is highest in the South West, London, the West Midlands, Lincolnshire, Yorkshire, Nottinghamshire, the North West and North East. Need is lower in the South than North of England.

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Conclusion:
For the first time, small area estimates of need for hip/knee replacement surgery have been produced to inform local health planning. The methodological approach described here could be reproduced in other countries and for other disease indicators. Further research is required to combine small area estimates of need, with provision, to determine whether there is equitable access to care.