

NHS Scotland reduces the postcode lottery for hip arthroplasty: an ecological study of the impact of waiting time initiatives

Graham Kirkwood, Allyson M Pollock, Colin Howie and Sarah Wild
J R Soc Med 2014 107: 237 originally published online 24 February 2014
DOI: 10.1177/0141076814523950

The online version of this article can be found at:
<http://jrs.sagepub.com/content/107/6/237>

Published by:



<http://www.sagepublications.com>

On behalf of:



[The Royal Society of Medicine](http://www.sagepublications.com)

Additional services and information for *Journal of the Royal Society of Medicine* can be found at:

Email Alerts: <http://jrs.sagepub.com/cgi/alerts>

Subscriptions: <http://jrs.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

>> [Version of Record](#) - Jun 9, 2014

[OnlineFirst Version of Record](#) - Feb 24, 2014

[What is This?](#)

NHS Scotland reduces the postcode lottery for hip arthroplasty: an ecological study of the impact of waiting time initiatives

Graham Kirkwood¹, Allyson M Pollock¹, Colin Howie² and Sarah Wild³

¹Centre for Primary Care and Public Health, Queen Mary, University of London, London E1 2AB, UK

²Lothian University Hospitals NHS Trust, Royal Infirmary of Edinburgh, Edinburgh EH16 4SA, UK

³Centre for Population Health Sciences, University of Edinburgh, Medical School, Edinburgh EH8 9AG, UK

Corresponding author: Allyson Pollock. Email: a.pollock@qmul.ac.uk

Abstract

Objectives: Following the election of the Labour government in 1997, policies were developed in England to reduce waiting times for NHS treatment with commitments to reduce health inequalities. Similar policies were adopted in Scotland but with less emphasis on the use of the private sector to deliver NHS treatments than in England. This study uses routinely collected NHS Scotland data to analyse geographical and socioeconomic inequalities in elective hip arthroplasty treatment before and after the introduction of the waiting time initiatives in Scotland in 2003.

Design: Ecological study design.

Setting: Scotland.

Participants: NHS-funded patients receiving elective hip arthroplasty delivered by the NHS and private hospitals between 1 April 1998 and 31 March 2008.

Main outcome measures: Directly standardised treatment rates and incidence rate ratios calculated using Poisson regression.

Results: There was a 42% increase in NHS-funded hip arthroplasties carried out in Scotland from 4095 in 2002–2003 (1 April 2002–31 March 2003) to 5829 in 2007–2008. There is evidence of a statistically significant reduction in geographical inequality (likelihood ratio test $p < 0.001$) but no evidence of any statistically significant change in socioeconomic inequality ($p = 0.108$), comparing the 5 years after 1 April 2003 with the 5 years before 1 April 2003. The number of NHS-funded hip arthroplasties undertaken privately rose from 1.1% in 2002–2003 to 2.9% in 2007–2008, whereas the NHS Golden Jubilee National Hospital increased its share from 3.3% to 10.6% over the same period.

Conclusions: The reduction in geographical inequality, or ‘postcode lottery’, in hip arthroplasty treatment in Scotland may be due to increased NHS capacity, in particular the development of the NHS Golden Jubilee National Hospital in Clydebank, Greater Glasgow as a dedicated centre to reduce surgery waiting times.

Keywords

surgery, orthopaedics, epidemiology, inequality, socioeconomic deprivation, geography

Introduction

Hip arthroplasty is one of the most frequently performed operations in the UK.^{1,2} It is cost-effective even among elderly patients and on average leads to an additional 6.5 quality-adjusted life years per patient.³ Despite its effectiveness and the increasing needs of an ageing population, there is considerable pressure in England with commissioners limiting access to planned hip surgery.^{4,5}

Reducing health inequalities is a priority of both UK and Scottish governments. Research has shown that patients living in areas of high socioeconomic deprivation are less likely to receive hip arthroplasty in both England and Scotland, even after adjusting for age- and sex-related differences and despite relatively high levels of need compared with patients from less deprived areas.^{6–10} Patients living in areas of high socioeconomic deprivation also undergo surgery younger, have more co-morbidities, more severe symptoms at presentation and are not as satisfied with the outcome of surgery compared with patients from less deprived areas.¹¹

Geographical inequalities also exist with patients in urban areas of England having lower rates of hip replacement than patients elsewhere as do patients living in the North of England compared with the South when adjusted for age differences.^{6–8,12} A study of patients treated in hospitals in the West of Scotland found higher age and sex standardised rates of primary total hip replacement among rural compared with urban communities.¹³ The ‘postcode lottery’ in treatment access, where patients in need receive differing levels of treatment depending on where they live is known to exist for other treatments, for example, varicose vein and postbariatric surgery.^{14,15} Recent research by Dr Foster Intelligence Ltd¹⁶ has found huge variation across clinical commissioning groups (CCGs) in England in hip

arthroplasties commissioned between financial year 2010–2011 and 2012–2013, from a decrease of 29% in National Health Service (NHS) Hammersmith and Fulham CCG to an increase of 57% in NHS Leeds South and East CCG, leading to media speculation of a postcode lottery in these treatments.

The war on waiting in England

Following the election of the Labour government in 1997, the English Department of Health (DoH) introduced policies to reduce waiting times for patients to a maximum of 18 weeks from referral to treatment. Phase two of the ‘war on waiting’ between 2000 and 2004 saw the introduction of ‘Diagnostic and Treatment Centres’, for elective patients only, with the intention of avoiding the cancellation and rescheduling of appointments often encountered by patients in NHS general hospitals.¹⁷ In 2002, the DoH concluded that the private sector would be needed to deliver the additional capacity on behalf of the NHS.¹⁸ Consequently, £5.6 billion (€6.6 billion and \$9.1 billion) was set aside to establish the Independent Sector Treatment Centre (ISTC) programme to pump-prime the for profit private sector.¹⁹ From 1 January 2006, patients in England were given a choice of at least four hospitals, or what were termed suitable alternative providers, in which to have their NHS-funded treatments, including ISTC and non-ISTC private hospitals.²⁰ Accompanying these waiting time policies was a commitment by the Labour government to reduce health inequalities.²¹

Scotland

The responsibility for health is devolved from the UK government to the Scottish government and the response to the drive to reduce waiting times in Scotland was different. In February 2003, the ‘Partnership for Care’ NHS Scotland White Paper set out a clear strategy to ensure prompt access to services within a patient’s local NHS backed up by the right to be treated ‘elsewhere in the NHS, in the private sector, or in exceptional circumstances elsewhere in Europe’.²² As in England, these waiting time guarantees, reiterated in the Patient Rights (Scotland) Act 2011, were accompanied with a commitment to reduce health inequalities.²³ A key element of this strategy was the purchase of the Golden Jubilee National Hospital in Clydebank, Greater Glasgow as a specialist centre for elective NHS surgery from private healthcare company Health Care International after its failure to develop it as a health tourism venture. Scotland did not follow England in

the development of an ISTC programme until December 2006 when it opened an experimental ISTC, the Scottish Regional Treatment Centre (SRTC) in Tayside.²⁴ The contract to run the SRTC in the building of Stracathro NHS hospital was awarded to South African private healthcare company Netcare, which had already been awarded ISTC wave one contracts in England for mobile cataract surgery, a surgical centre in Manchester and a walk-in centre in Leeds worth £137.1 million (€162.7 million and \$223.9 million). The SRTC closed its doors in January 2010 when the Scottish government decided against renewing the contract following an analysis showing poor value for money.²⁵

In this study, we use primary elective hip arthroplasty treatment rates, a commonly used proxy to detect change in healthcare access inequalities,^{6,8,10} to assess if there were any changes in geographical and socioeconomic inequalities in access to treatment after the introduction of waiting time initiatives in Scotland.

Methods

We analysed an extract of secondary care admissions Scottish Morbidity Record (SMR01) data provided by the Information Services Division (ISD) of NHS National Services Scotland of NHS funded elective primary hip arthroplasties (including hip resurfacing and hybrid hip replacements) from 1 April 1998 to the 31 March 2008 for patients over 15 years of age identified using OPCS-4.4 codes as used by the Scottish Arthroplasty Project.²⁶

We calculated age and sex directly standardised hip arthroplasty rates by year of treatment for all of Scotland and by period of treatment defined as the 5 years before (1 April 1998 to 31 March 2003) and after (1 April 2003 to 31 March 2008) the introduction of the waiting time initiatives by health board of residence and Scottish Index of Multiple Deprivation (SIMD) quintile further adjusted by SIMD and health board, respectively.

We tested for an interaction between period of treatment and health board and separately, period of treatment and SIMD. We calculated age, sex and SIMD adjusted incidence rate ratios by health board and age, sex and health board adjusted incidence rate ratios by SIMD using Greater Glasgow and Clyde (the largest and most socioeconomically deprived of Scotland’s 14 geographical health boards) and SIMD quintile five (the most socioeconomically deprived fifth of Scotland) as reference categories, respectively, by period of treatment.

Finally, using a separate updated data-set from ISD which contained data on provider type

(NHS or private), we analysed the change in distribution of NHS-funded patients treated in public and private hospitals by calculating the proportion of NHS-funded elective hip arthroplasties carried out in the private sector in the year prior to the waiting time initiatives, financial year 2002–2003 (1 April 2002 to 31 March 2003) and 5 years later in 2007–2008.

Our denominators were age- and sex-specific populations over 15 years of age from mid-year Scottish population estimates from the General Register Office for Scotland. Scottish population data by SIMD and health board were provided by ISD. Socioeconomic deprivation was measured using the SIMD scores for 2006 supplied by ISD where quintile one represents the least deprived fifth and quintile five the most deprived fifth of the Scottish population. To ease analysis and interpretation we combined the island health boards, Orkney, Shetland and Western Isles; for simplicity this is referred to throughout as one health board although actually comprising three health boards. All rates were directly standardised to the 1997 Scottish mid-year population. All incidence

rate ratios were estimated using Poisson regression in the statistical package Stata version 12.1.

Results

There were 47,069 NHS-funded elective primary hip arthroplasties carried out in Scotland for the 10-year period 1 April 1998 to 31 March 2008 identified from data returned to ISD. The age and sex adjusted treatment rate fell from 106.3 (95% confidence interval 103.0, 109.5) per 100,000 Scottish population in 1998–1999 to 99.0 (95.9, 102.1) per 100,000 in 2001–2002, rose to 147.3 (143.6, 151.0) per 100,000 in 2006–2007 before falling to 138.7 (135.1, 142.2) per 100,000 in 2007–2008 (see Figure 1). There was a 42% increase in NHS hip arthroplasties carried out in Scotland from 4095 in 2002–2003 to 5829 in 2007–2008.

The health board with the lowest age, sex and SIMD adjusted elective hip arthroplasty rate was Lanarkshire, 78.1 (74.0, 82.2) treatments per 100,000 residents for the 5 years before 1 April 2003 and Ayrshire and Arran, 102.8 (97.9, 107.7) per 100,000 for the 5 years after 1 April 2003 (see Table 1).

Figure 1. Elective primary hip arthroplasties in NHS-funded patients in Scotland (aged over 15 years). Total arthroplasties and arthroplasty rates directly standardised by age and sex, 1 April 1998 to 31 March 2008.

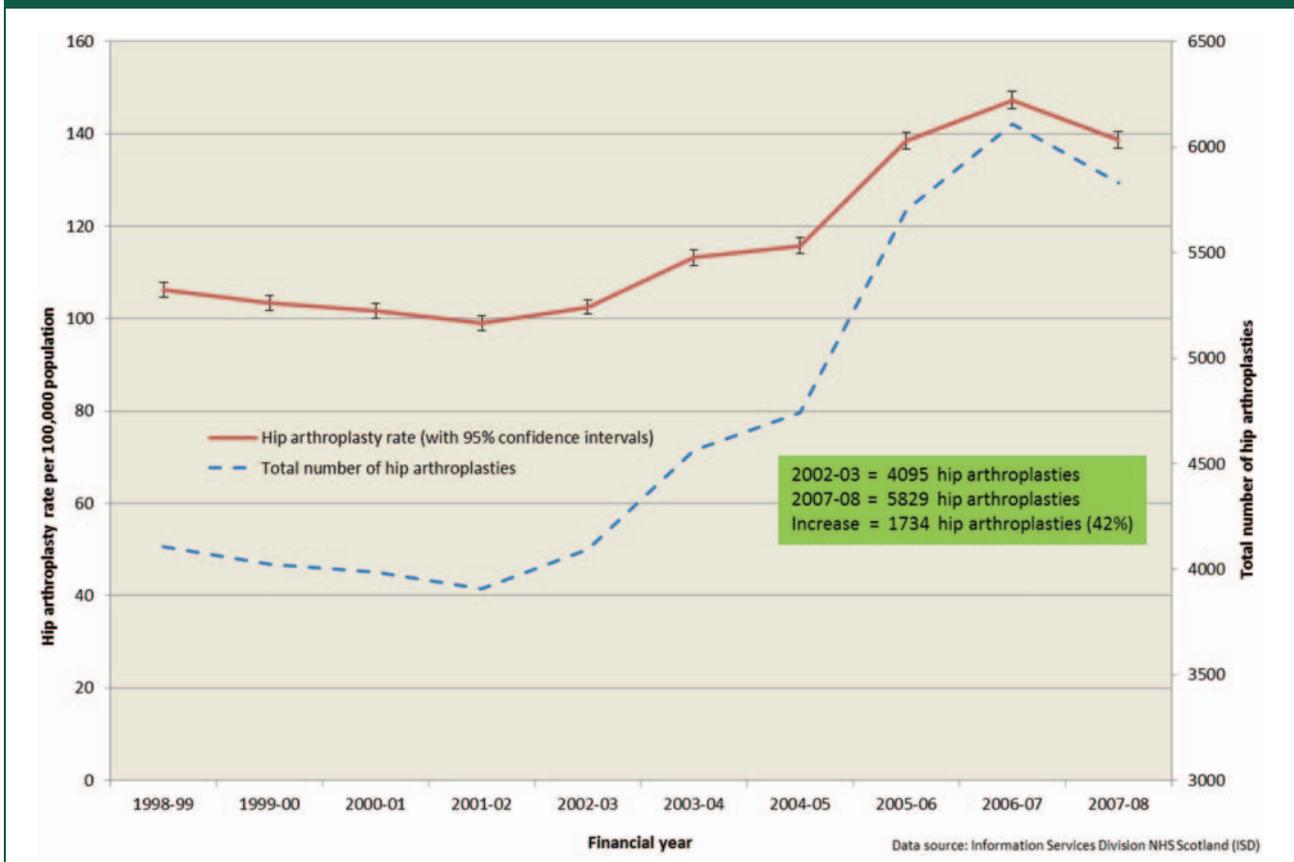


Table 1. Scotland health board populations (over 15 years), elective primary hip arthroplasty rates and incidence rate ratios (relative to Greater Glasgow and Clyde), before (1 April 1998–31 March 2003) and after (1 April 2003–31 March 2008) the introduction of waiting time initiatives.

Health board of residence	Before (1 April 1998–31 March 2003)			After (1 April 2003–31 March 2008)		
	Average annual population (over 15 years)	Annual hip arthroplasty rate per 100,000 (with 95% confidence intervals) ^a	Incidence rate ratio (with 95% confidence intervals) ^b	Average annual population (over 15 years)	Annual hip arthroplasty rate per 100,000 (with 95% confidence intervals) ^a	Incidence rate ratio (with 95% confidence intervals) ^b
Greater Glasgow and Clyde	966,590	78.7 (75.9, 81.5)	1	976,941	107.4 (104.1, 110.6)	1
Ayrshire and Arran	296,968	87.8 (83.1, 92.5)	1.15 (1.08, 1.22)	299,765	102.8 (97.9, 107.7)	0.97 (0.92, 1.03)
Borders	86,345	117.2 (103.3, 131.1)	1.56 (1.43, 1.70)	89,580	149.8 (132.7, 166.9)	1.38 (1.28, 1.49)
Dumfries and Galloway	119,768	92.4 (83.8, 101.0)	1.25 (1.15, 1.36)	121,910	106.6 (97.3, 115.8)	1.06 (0.98, 1.14)
Fife	279,644	113.1 (107.6, 118.5)	1.48 (1.40, 1.57)	290,527	134.4 (128.5, 140.2)	1.28 (1.21, 1.35)
Forth Valley	223,706	80.5 (75.2, 85.9)	1.06 (0.99, 1.14)	230,072	105.6 (99.6, 111.6)	1.00 (0.94, 1.07)
Grampian	425,570	120.5 (114.8, 126.2)	1.55 (1.47, 1.63)	432,049	143.7 (137.6, 149.8)	1.37 (1.31, 1.43)
Highland	241,651	124.4 (117.1, 131.6)	1.61 (1.51, 1.70)	249,037	157.6 (149.6, 165.6)	1.44 (1.37, 1.52)
Lanarkshire	441,174	78.1 (74.0, 82.2)	1.00 (0.94, 1.06)	448,533	110.4 (105.9, 115.0)	1.04 (0.99, 1.09)
Lothian	630,861	96.1 (92.3, 99.9)	1.23 (1.17, 1.29)	654,926	121.5 (117.3, 125.7)	1.13 (1.08, 1.18)
Orkney, Shetland and Western Isles	54,509	141.0 (120.4, 161.6)	2.01 (1.82, 2.22)	54,935	167.1 (147.3, 186.9)	1.93 (1.77, 2.09)
Tayside	317,741	106.7 (101.7, 111.6)	1.42 (1.35, 1.51)	320,769	136.8 (131.3, 142.4)	1.32 (1.26, 1.39)

Source: General Register Office for Scotland mid-year Scottish population estimates. SMR01 data (over 15 years) from Information Services Division NHS Scotland.

SIMD: Scottish Index of Multiple Deprivation.

^aDirectly standardised by age, sex and SIMD to Scotland 1997 mid-year population.

^bAdjusted by age, sex and SIMD.

Orkney, Shetland and Western Isles had the highest treatment rate both for the 5 years before 1 April 2003, 141.0 (120.4, 161.6) per 100,000 and in the 5 years after 1 April 2003, 167.1 (147.3, 186.9) per 100,000.

Hip arthroplasty rates were statistically significantly lower among the most socioeconomically deprived quintile of the Scottish population (SIMD quintile five) than among the other quintiles both in the 5 years before and after the 1 April 2003, 82.8 (79.2, 86.3) per 100,000 and 107.9 (103.8, 112.0) per 100,000, respectively.

There was a significant interaction between health board and period of treatment (likelihood ratio test $p < 0.001$) indicating that treatment rates in other health boards were significantly higher than Greater Glasgow and Clyde in the 5 years before the 1 April 2003 compared with the 5 years after the 1 April 2003. In the 5 years before 1 April 2003 there were nine health boards (Table 1, Figure 2) with significantly higher treatment rates than Greater Glasgow and Clyde, only Forth Valley and Lanarkshire were not significantly different, whereas in the 5 years after 1 April 2003 only

seven health boards had significantly higher treatment rates than Greater Glasgow and Clyde, with Ayrshire and Arran, Dumfries and Galloway, Forth Valley and Lanarkshire not significantly different.

In four health boards, Ayrshire and Arran, Dumfries and Galloway, Fife and Grampian the incidence rate ratio relative to Greater Glasgow and Clyde decreased significantly for the 5 years after 1 April 2003 compared with the 5 years before 1 April 2003 (Table 1, Figure 2).

We found weak evidence of an interaction between SIMD and period of treatment (likelihood ratio test $p = 0.108$) but no evidence that the incidence rate ratios for SIMDs one to four relative to SIMD five in the 5 years after 1 April 2003 were significantly different to those calculated for the 5 years before 1 April 2003 (Table 2, Figure 3).

According to the separate updated data-set from ISD, the proportion of NHS-funded elective primary hip arthroplasties conducted in the private sector increased from 1.1% in 2002–2003 to 2.9% in 2007–2008. The NHS Golden Jubilee National Hospital in Clydebank (NHS National Waiting

Figure 2. Elective primary hip arthroplasties in NHS-funded patients in Scotland (aged over 15 years). Incidence rate ratios adjusted by age, sex and Scottish index of multiple deprivation with 95% confidence intervals compared with greater Glasgow and Clyde health board.

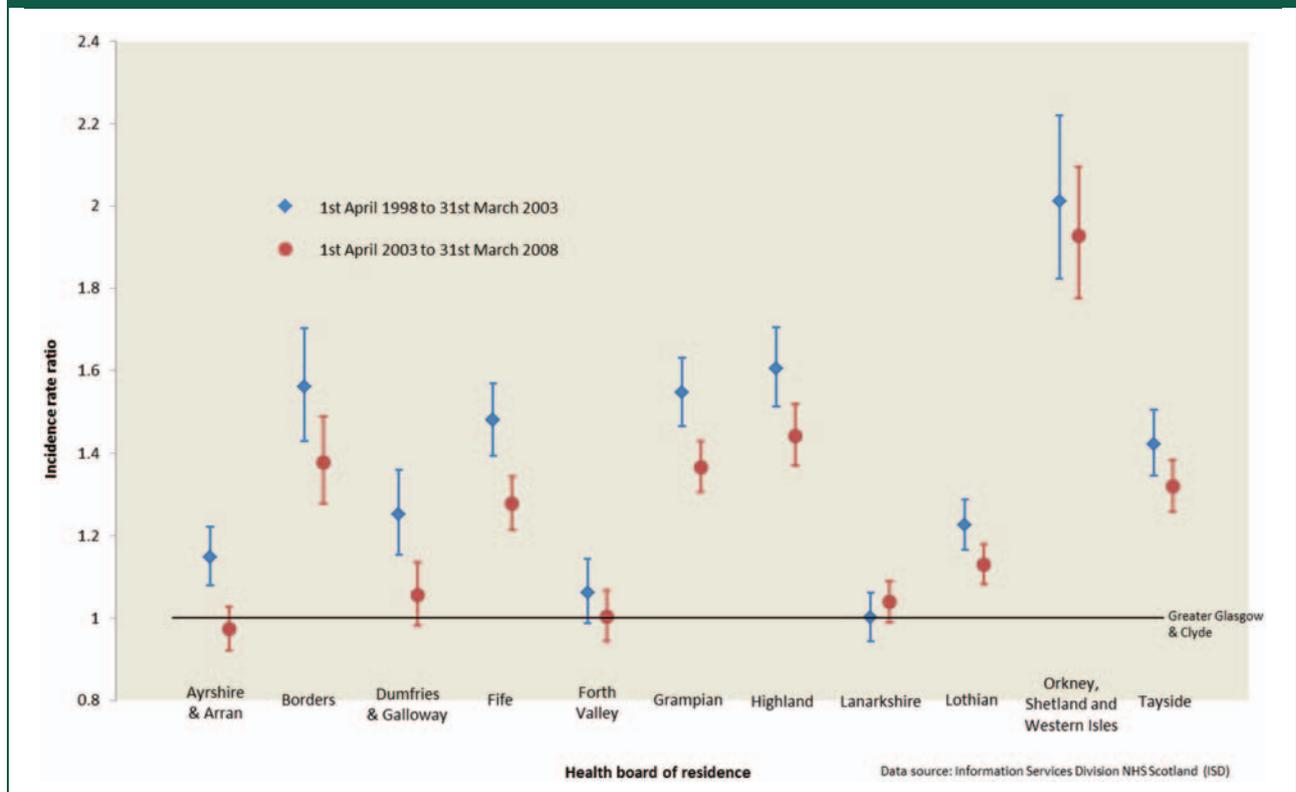


Table 2. Scotland socioeconomic deprivation (SIMD) quintile populations (over 15 years), elective hip arthroplasty rates and incidence rate ratios (relative to SIMD five), before (1 April 1998–31 March 2003) and after (1 April 2003–31 March 2008) the introduction of waiting time initiatives.

SIMD quintile	Before (1 April 1998–31 March 2003)			After (1 April 2003–31 March 2008)		
	Average annual population (over 15 years)	Annual hip arthroplasty rate per 100,000 (with 95% confidence intervals) ^a	Incidence rate ratio (with 95% confidence intervals) ^b	Average annual population (over 15 years)	Annual hip arthroplasty rate per 100,000 (with 95% confidence intervals) ^a	Incidence rate ratio (with 95% confidence intervals) ^b
1 (least deprived)	802,103	95.3 (91.5, 99.0)	1.11 (1.06, 1.17)	831,087	120.8 (116.9, 124.7)	1.09 (1.04, 1.13)
2	796,013	105.0 (101.6, 108.3)	1.24 (1.18, 1.30)	839,645	131.4 (127.8, 135.0)	1.20 (1.15, 1.25)
3	819,382	104.6 (101.4, 107.8)	1.24 (1.18, 1.30)	842,224	133.2 (129.6, 136.8)	1.21 (1.16, 1.26)
4	836,077	95.2 (92.2, 98.2)	1.13 (1.07, 1.18)	841,105	121.2 (117.8, 124.6)	1.10 (1.06, 1.15)
5 (most deprived)	830,950	82.8 (79.2, 86.3)	1	814,984	107.9 (103.8, 112.0)	1

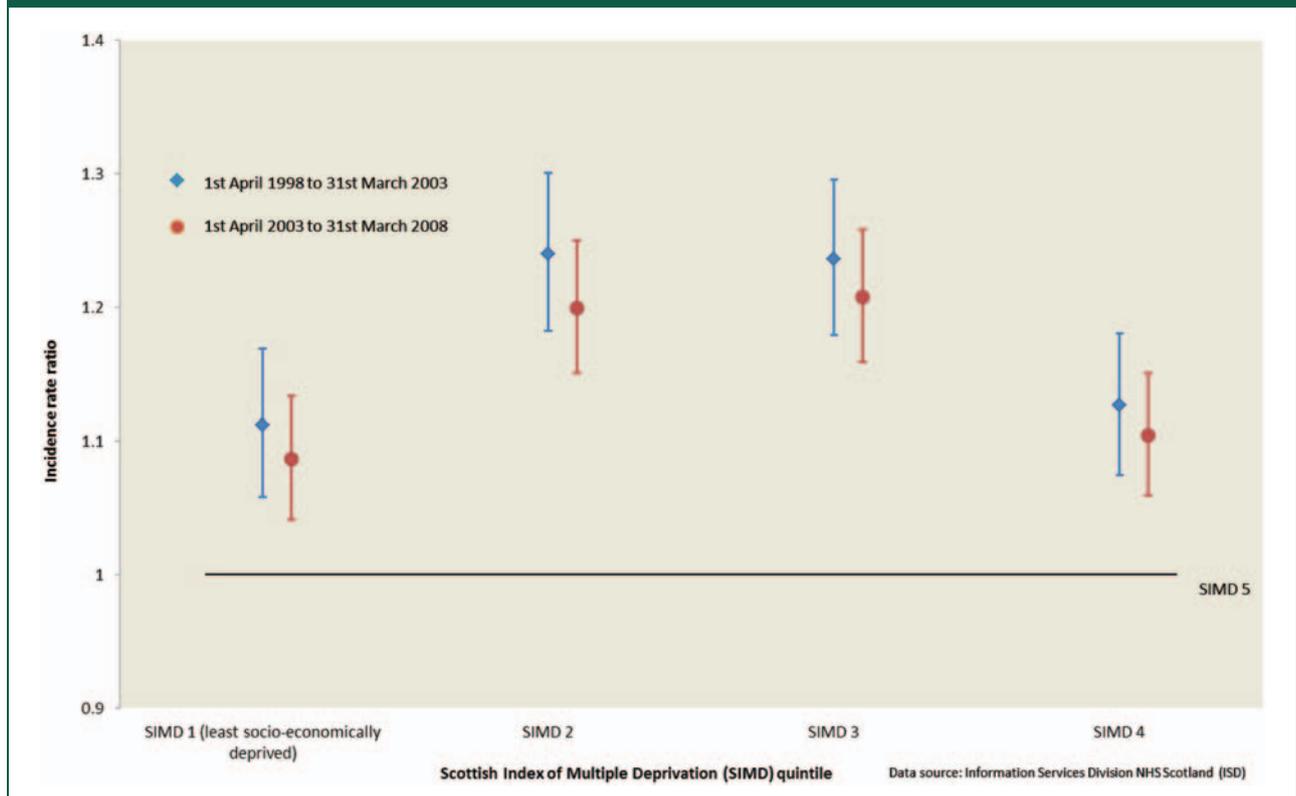
Source: General Register Office for Scotland mid-year Scottish population estimates. SMR01 data (over 15 years) from Information Services Division NHS Scotland.

SIMD: Scottish Index of Multiple Deprivation.

^aDirectly standardised by age, sex and health board of residence to Scotland 1997 mid-year population.

^bAdjusted by age, sex and health board of residence.

Figure 3. Elective primary hip arthroplasties in NHS-funded patients in Scotland (aged over 15 years). Incidence rate ratios adjusted by age, sex and health board of residence with 95% confidence intervals compared with the 20% most socioeconomically deprived population (SIMD 5).



Times Centre Board) increased its share from 3.3% to 10.6% over the same period.

Discussion

We have found evidence of a statistically significant reduction in geographical inequality in elective primary hip arthroplasty treatment rates between health boards in Scotland in the 5 years after the introduction of waiting time initiatives in 2003 compared with 5 years before. We did not find any significant reduction in inequality by socioeconomic deprivation.

Research into access to NHS treatment in England between 2001 and 2008 has also found no reduction in socioeconomic inequality in hip arthroplasty treatment during this period of waiting time initiatives and NHS reforms.¹⁰ Earlier research in one health board in Scotland has suggested that waiting time initiatives introduced there have not discriminated against patients from lower socioeconomic groups.²⁷ There has been no research into possible changes in geographical inequalities in either England or Scotland following the waiting time initiatives, although this is

problematic in England due to frequent changes in NHS organisation and boundaries. Moreover, in England, there has been a deterioration in data quality and completeness because the private sector does not return complete, timely and accurate data. In contrast, health board boundaries in Scotland are more stable which facilitates geographical comparisons over time.

The reduction in geographical inequality we found in Scotland has taken place without any major expansion in the use of the private sector to deliver NHS treatments and may be as a result of increased NHS activity, in particular the major investment at the NHS Golden Jubilee National Hospital in Clydebank. The model chosen in Scotland to increase capacity within the NHS was very different from that followed in England where a major ISTC programme and extension of patient choice took place such that by 2010–2011, around 20% of all NHS-funded hip arthroplasties were being carried out in private hospitals.²⁸ In Scotland, in 2010–2011 only 0.8% of NHS-funded hip arthroplasties were performed privately down from a peak of 8.3% in 2008–2009 when the SRTC was most active. There is a need for an

analysis in England to assess any change in geographical inequality which would make a useful comparison with the experience in Scotland although this is difficult for the reasons outlined above.

There are few studies of employment and risk of hip osteoarthritis, the main reason for a hip arthroplasty, but farming and agricultural labourers have an increased risk which may explain some of the rural/urban differences pattern.^{29,30} We were unable in this study to adjust for need for treatment or to adjust for any measure of co-morbidity. Factors contributing to the observed differences in treatment rates between health boards in Scotland might include competing priorities on limited budgets but might also include differing levels of need within geographical populations. The reduction we found in geographical inequality suggests that previously unmet need is being met as a result of increased capacity but more research is needed to understand why there has been no impact on socioeconomic inequality.

Declarations

Competing interests: None declared

Funding: This work was supported by the Chief Scientist Office, Scotland [CZG/2/367].

Guarantor: GK

Ethical approval: The data extract was authorised by the ISD Privacy Advisory Committee.

Contributorship: AP conceived the study and obtained funding. AP and GK designed the study and had full access to all of the data in the study. GK analysed the data and takes responsibility for the accuracy of the data analysis. AP, GK, CH and SW monitored the study through to completion. GK and AP drafted the manuscript. GK, AP, CH and SW critically revised the manuscript and approved the final version for publication.

Acknowledgements: We thank the analysts at the Scottish Arthroplasty Project and Information Services Division (NHS) Scotland for providing the data extracts, information and figures. We also thank the members of the Scottish Arthroplasty Steering Committee for their advice on the project and Dr Stephen Bremner, Queen Mary University of London for advice on the statistical analysis.

Provenance: Not commissioned; peer-reviewed by Andrew Judge

References

- Information Services Division NHS Scotland. *Inpatient and Day Case Surgical Procedures and Operations – All Ages*. See www.isdscotland.org/Health-Topics/Hospital-Care/Operations-and-Procedures/ (last checked 20 December 2013).
- Hospital Episode Statistics. *Admitted Patient Care – England, 2011–12*. See www.hscic.gov.uk/article/1823/What-HES-data-is-available (last checked 20 December 2013).
- Jenkins PJ, Clement ND, Hamilton DF, et al. Predicting the cost-effectiveness of total hip and knee replacement: a health economic analysis. *Bone Joint J* 2013; 95-B: 115–121.
- Campbell D. NHS Rationing is Putting Health at Risk, *Says Doctors' Leader*. The Guardian. 31 August 2012. See www.theguardian.com/society/2012/aug/31/nhs-rationing-risking-lives-doctors-leader (last checked 20 Dec 2013).
- Birrell F, Johnell O and Silman A. Projecting the need for hip replacement over the next three decades: influence of changing demography and threshold for surgery. *Ann Rheum Dis* 1999; 58: 569–572.
- Judge A, Welton NJ, Sandhu J, et al. Equity in access to total joint replacement of the hip and knee in England: cross sectional study. *BMJ* 2010; 341: c4092.
- Goldacre M, Yeates D, Gill L, et al. *Elective Hip Arthroplasty in England 2009–2011. A Geographical Profile of Hospital Admissions*. Unit of Health-Care Epidemiology: University of Oxford, 2013. http://www.uhce.ox.ac.uk/Atlases/Linked/2009-2011/Operations/Elective%20hip%20arthroplasty_Final.pdf (last checked 20 December 2013).
- Judge A, Welton NJ, Sandhu J, et al. Geographical variation in the provision of elective primary hip and knee replacement: the role of socio-demographic, hospital and distance variables. *J Public Health (Oxf)* 2009; 31: 413–422.
- Scottish Arthroplasty Project. *Annual Report 2006*. See http://www.arthro.scot.nhs.uk/Reports/Arthro_Report_2006.pdf (last checked 20 December 2013).
- Cookson R, Laudicella M and Donni PL. Measuring change in health care equity using small-area administrative data – evidence from the English NHS 2001–2008. *Soc Sci Med* 2012; 75: 1514–1522.
- Clement ND, Muzammil A, Macdonald D, et al. Socioeconomic status affects the early outcome of total hip replacement. *Bone Joint J* 2011; 93: 464–469.
- Steel N, Melzer D, Gardener E, et al. Need for and receipt of hip and knee replacement—a national population survey. *Rheumatology (Oxford)* 2006; 45: 1437–1441.
- Dunsmuir RA, Allan DB and Davidson LA. Increased incidence of primary total hip replacement in rural communities. *BMJ* 1996; 313: 1370.
- Nasr MK, Budd JS and Horrocks M. Uncomplicated varicose vein surgery in the UK – a postcode lottery? *Ann R Coll Surg Engl* 2008; 90: 474–476.
- Highton L, Ekwobi C and Rose V. Post-bariatric surgery body contouring in the NHS: a survey of UK bariatric surgeons. *J Plast Reconstruct Aesthet Surg* 2012; 65: 426–432.
- Dr Foster Intelligence Ltd. *HG2013 Commissioning Metrics from DATA: Download ZIP 2013*. See <http://myhospitalguide.drfoosterintelligence.co.uk/#/the-report> (last checked 20 December 2013).
- Lewis R and Appleby J. Can the English NHS meet the 18-week waiting list target? *J R Soc Med* 2006; 99: 10–13.

18. Naylor C and Gregory S. *Independent Sector Treatment Centres. Briefing. 2009*. See www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/briefing-independent-sector-treatment-centres-istc-chris-naylor-sarah-gregory-kings-fund-october-2009.pdf (last checked 20 December 2013).
19. House of Commons Health Committee. *Independent Sector Treatment Centres. Fourth report of session 2005–06. Volume 1*. See www.publications.parliament.uk/pa/cm200506/cmselect/cmhealth/934/934i.pdf (last checked 20 December 2013).
20. NHS England. *Extended and Free Choice Network*. See www.nhsidentity.nhs.uk/all-guidelines/guidelines/extended-and-free-choice-network/introduction (last checked 20 December 2013).
21. Speech by Hazel Blears MP. *18 February 2003 at the North East Health Summit*. See http://web.archive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/MediaCentre/Speeches/Speecheslist/DH_4064768 (last checked 20 December 2013).
22. NHS Scotland. *Partnership for Care. Scotland's Health White Paper 2003*. See www.sehd.scot.nhs.uk/publications/PartnershipforCareHWP.pdf (last checked 20 December 2013).
23. The Scottish Government. *Patient Rights (Scotland) Act 2011*. www.legislation.gov.uk/asp/2011/5/contents (last checked 20 December 2013).
24. Macdonald R and Evans J. *The Scottish Regional Treatment Centre (SRTC) Pilot Project at Stracathro Hospital by Brechin, Angus. 2008*. See www.keepournhspublic.com/pdf/SRTCfinalong.pdf (last checked 20 December 2013).
25. Pollock AM and Kirkwood G. Independent sector treatment centres: learning from a Scottish case study. *BMJ* 2009; 338: b1421.
26. Information Services Division NHS Scotland. *Summary of OPCS Codes Used by Scottish Arthroplasty Project*. See www.arthro.scot.nhs.uk/OPCS_codes_summary_150710.pdf (last checked 20 December 2013).
27. Wood GC and Howie C. Do waiting list initiatives discriminate in favour of those in a higher socioeconomic group? *Scott Med J* 2011; 56: 76–79.
28. National Joint Registry for England and Wales. *8th and 9th Annual Reports. 2011 and 2012*. See <http://www.njrcentre.org.uk/njrcentre> (last checked 20 December 2013).
29. Cooper C, Campbell L, Byng P, et al. Occupational activity and the risk of hip osteoarthritis. *Ann Rheum Dis* 1996; 55: 680–682.
30. Croft P, Cooper C, Wickham C, et al. Osteoarthritis of the hip and occupational activity. *Scand J Work Environ Health* 1992; 18: 59–63.

Authors!

Submit your
article online with
SAGE Track

SAGE Track is a web-based peer review and submission system powered by ScholarOne® Manuscripts

The entire process, from article submission to acceptance for publication is now handled online by the SAGE Track web site. 300 of our journals are now on SAGE Track, which has a graphical interface that will guide you through a simple and speedy submission with step-by-step prompts.

SAGE Track makes it easy to:

- Submit your articles online
- Submit revisions and resubmissions through automatic linking
- Track the progress of your article online
- Publish your research faster

To submit a manuscript, please visit:

<http://www.sagepub.com/journalsIndex.nav>

Select a journal and click on the Manuscript Submissions tab for detailed instructions for submission.

 **SAGE track**