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Outline

1. Trends in health care inequality 2001-7
2. Do the poor cost much more?
3. Did fixed price competition generate ‘cream skimming’?

Trends in health care inequality in the English NHS from 2001/2 to 2007/8

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Four Deprivation Groups Using EDI Intervals

Group	EDI Income Deprivation (% individuals in low-income households)	Number of LSOAs	Proportion of LSOAs
1 (Least deprived)	< 10%	18,437	56.8%
2	10 - 20%	7,245	22.3%
3	20 - 30%	3,830	11.8%
4 (Most deprived)	30% +	2,970	9.1%

Need variables

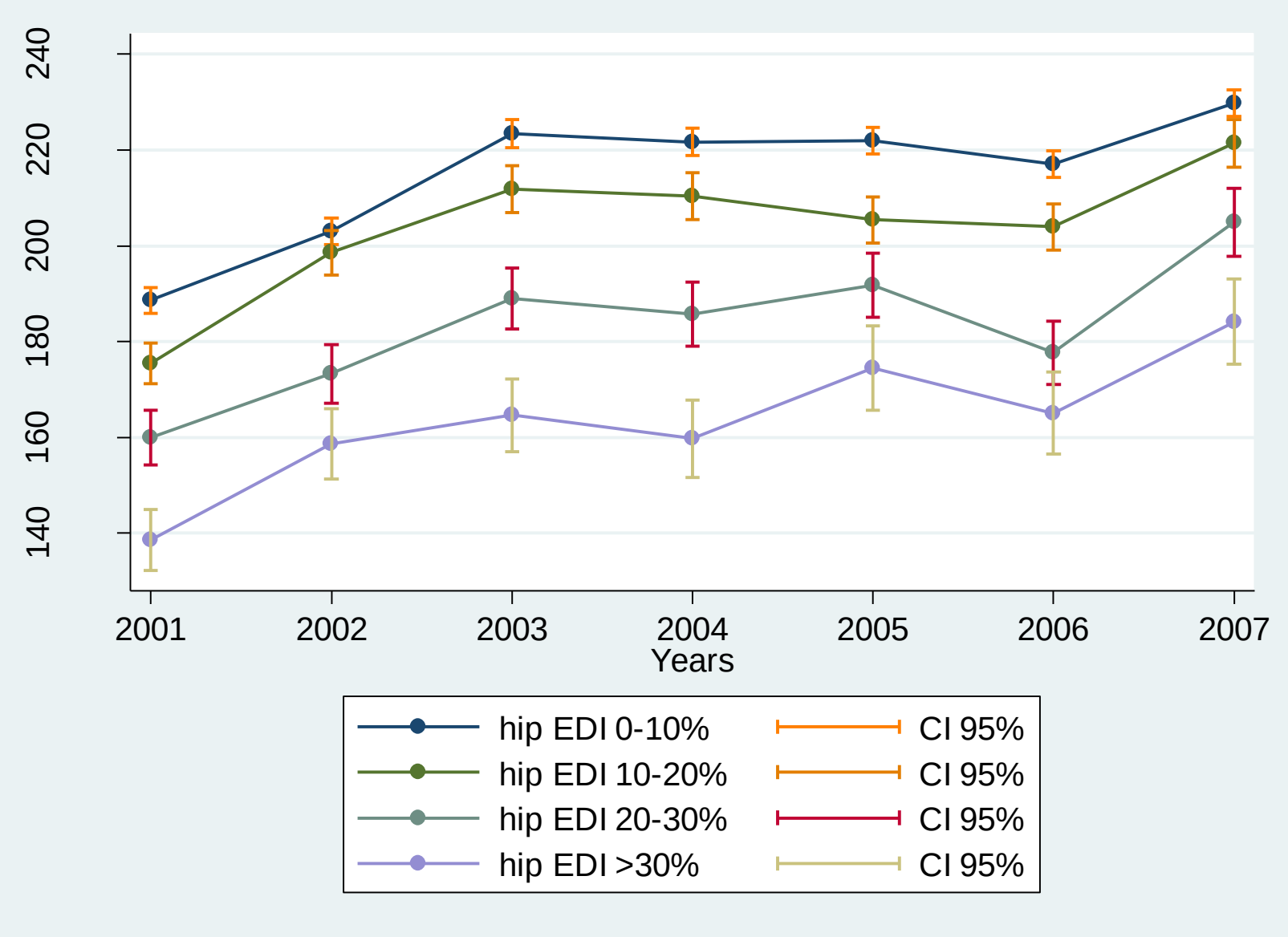
	2001	2002	2003	2004	2005	2006	2007
Proportion with coronary heart disease (mean 0-100)	3.6	3.6	3.6	3.6	3.6	3.6	3.5
Proportion with coronary heart disease, stroke/TIA, hypertension, diabetes, asthma, COPD (mean 0-100)	21.2	21.2	21.2	21.2	21.2	21.2	21.2
standardised mortality rate for ischaemic heart disease (mean, centred on 1)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
proportion obese (mean 0-100)	7.4	7.4	7.4	7.4	7.4	7.4	7.6

Crude utilisation rates

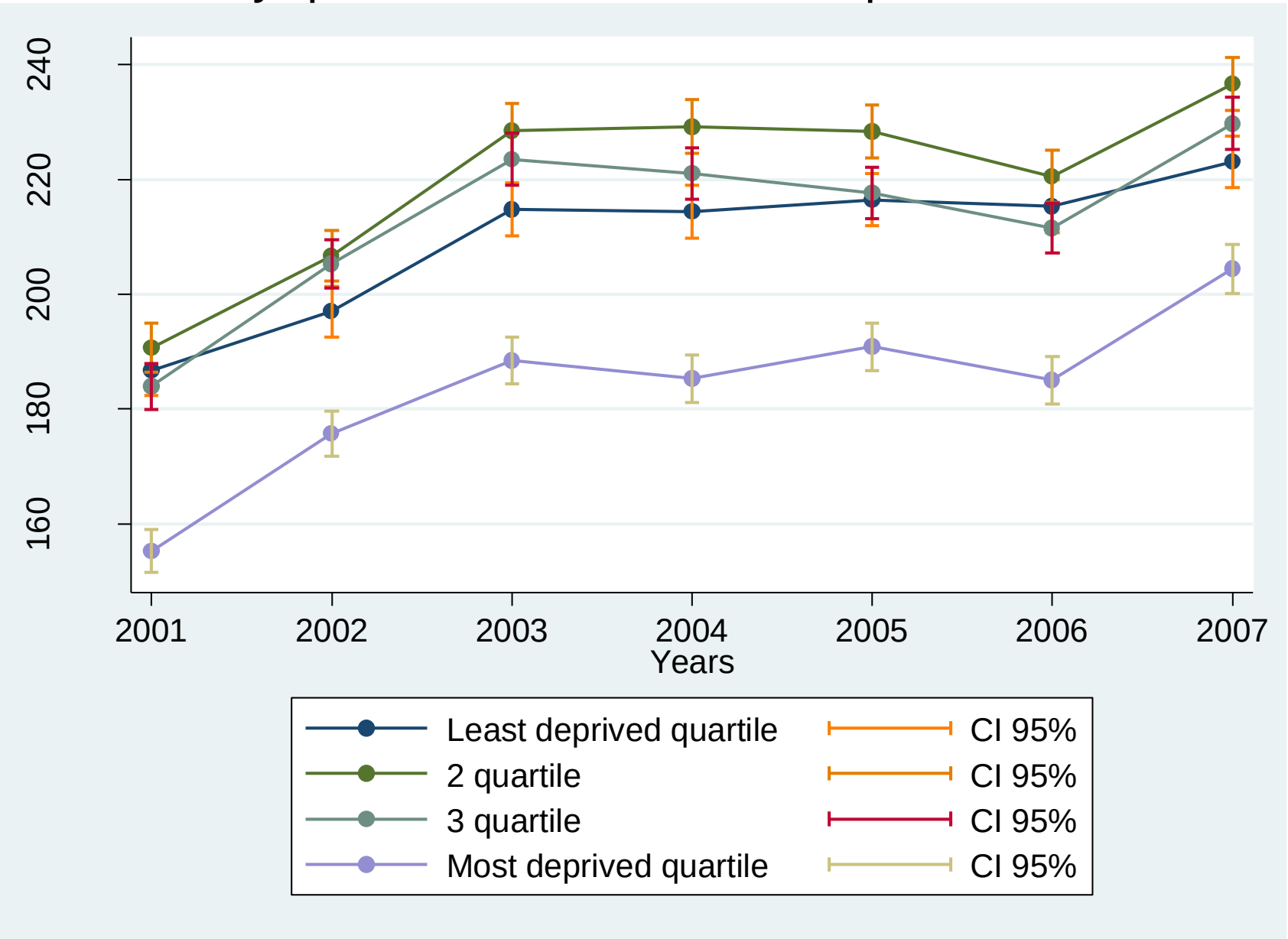
	2001	2002	2003	2004	2005	2006	2007
Hip replacement rate per 100,000							
Deprived	157	171	179	173	178	165	187
Non deprived	183	200	218	216	216	212	227
Ratio deprived / non-deprived	0.86	0.85	0.82	0.80	0.82	0.78	0.82
Cataract rate per 100,000							
Deprived	584	632	720	743	616	582	569
Non deprived	446	501	573	627	550	507	488
Ratio deprived / non-deprived	1.31	1.26	1.26	1.19	1.12	1.15	1.16
Gastroscopy rate per 100,000							
Deprived	2,408	2,334	2,220	2,025	2,083	2,314	2,417
Non deprived	1,668	1,653	1,578	1,487	1,519	1,620	1,693
Ratio deprived / non-deprived	1.44	1.41	1.41	1.36	1.37	1.43	1.43
Revascularisation rate per 100,000							
Deprived	178	196	209	229	228	227	222
Non deprived	155	169	182	202	197	198	195
Ratio deprived / non-deprived	1.15	1.16	1.15	1.13	1.16	1.14	1.13
Proportion of “deprived” LSOAs	21%	20%	20%	19%	18%	18%	18%

“Deprived” defined as EDI income domain score of 20% or more

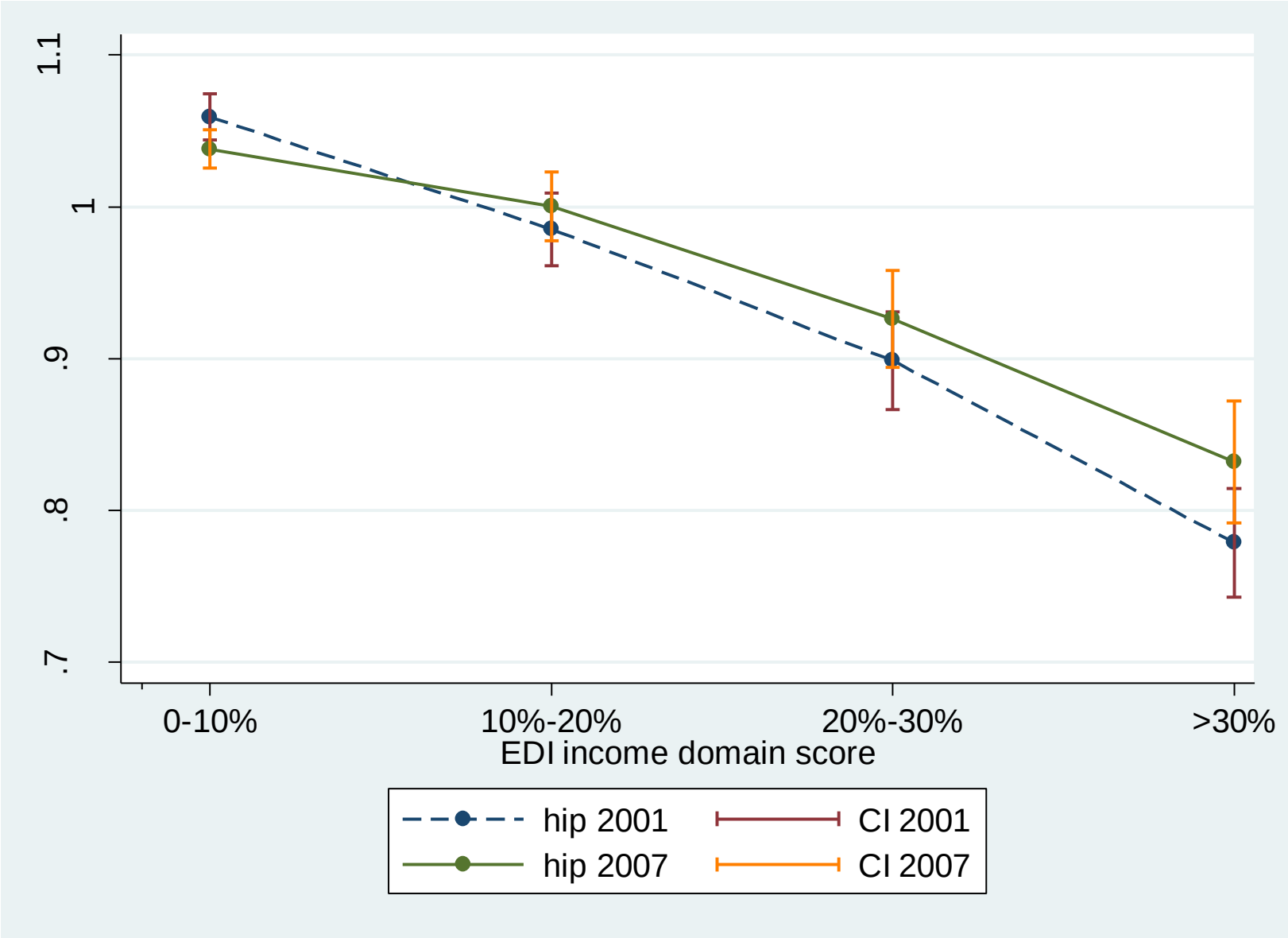
Trends in hip replacement rates 2001-7 by income deprivation groups (intervals of EDI)



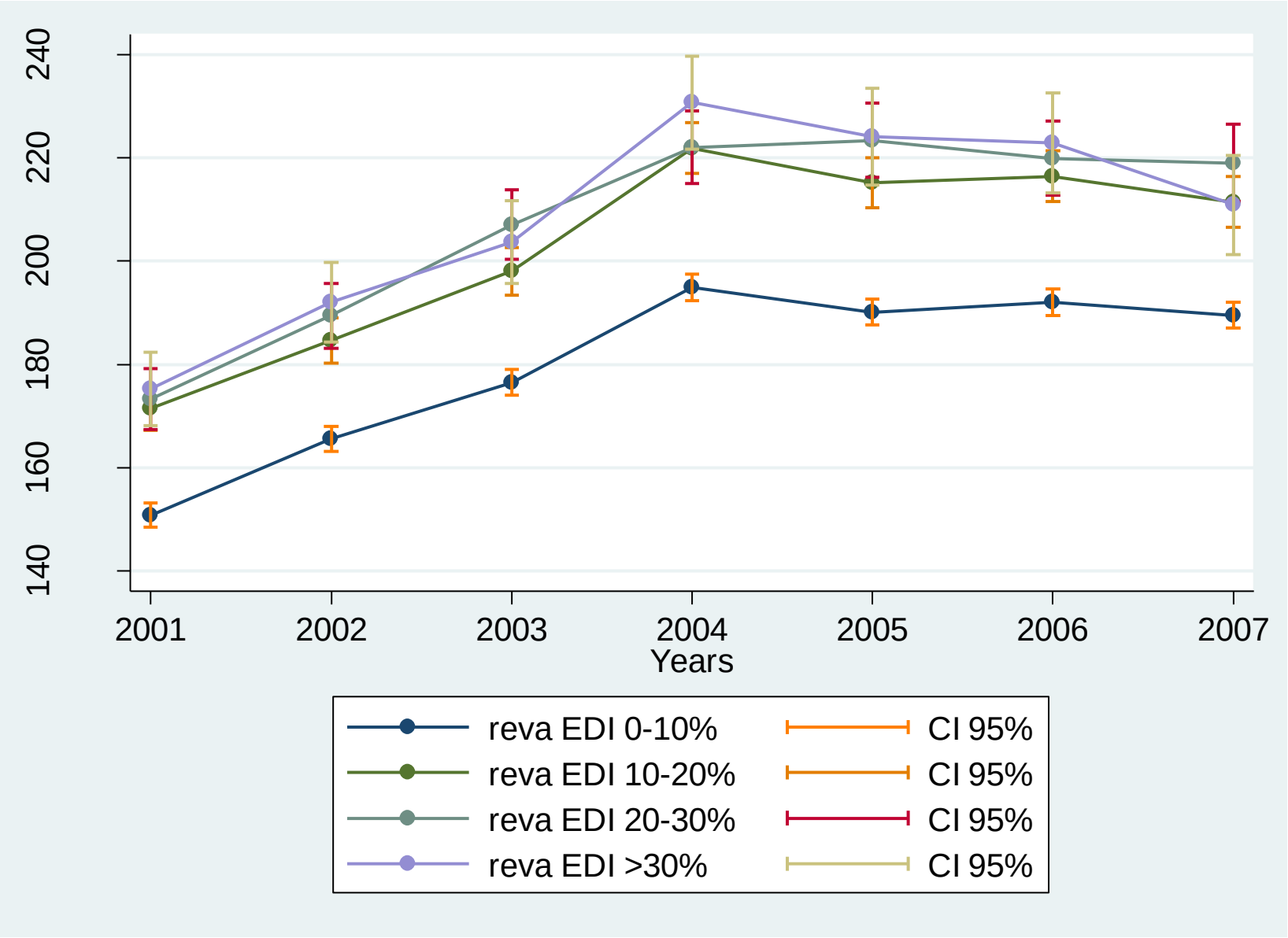
Trends in hip replacement rates 2001-7 by quartiles of EDI income deprivation



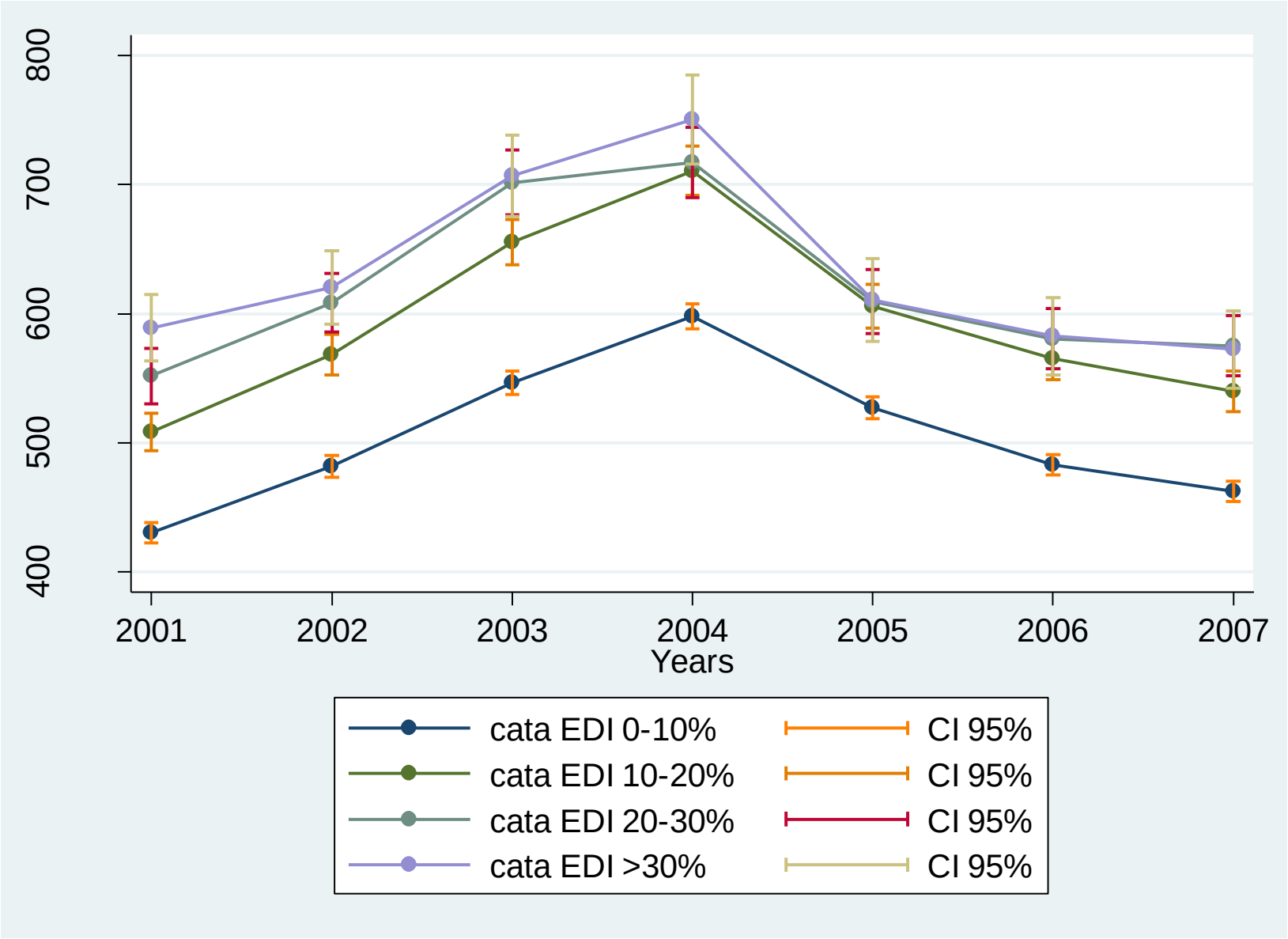
Small area inequality in hip replacement, comparing 2001 and 2007



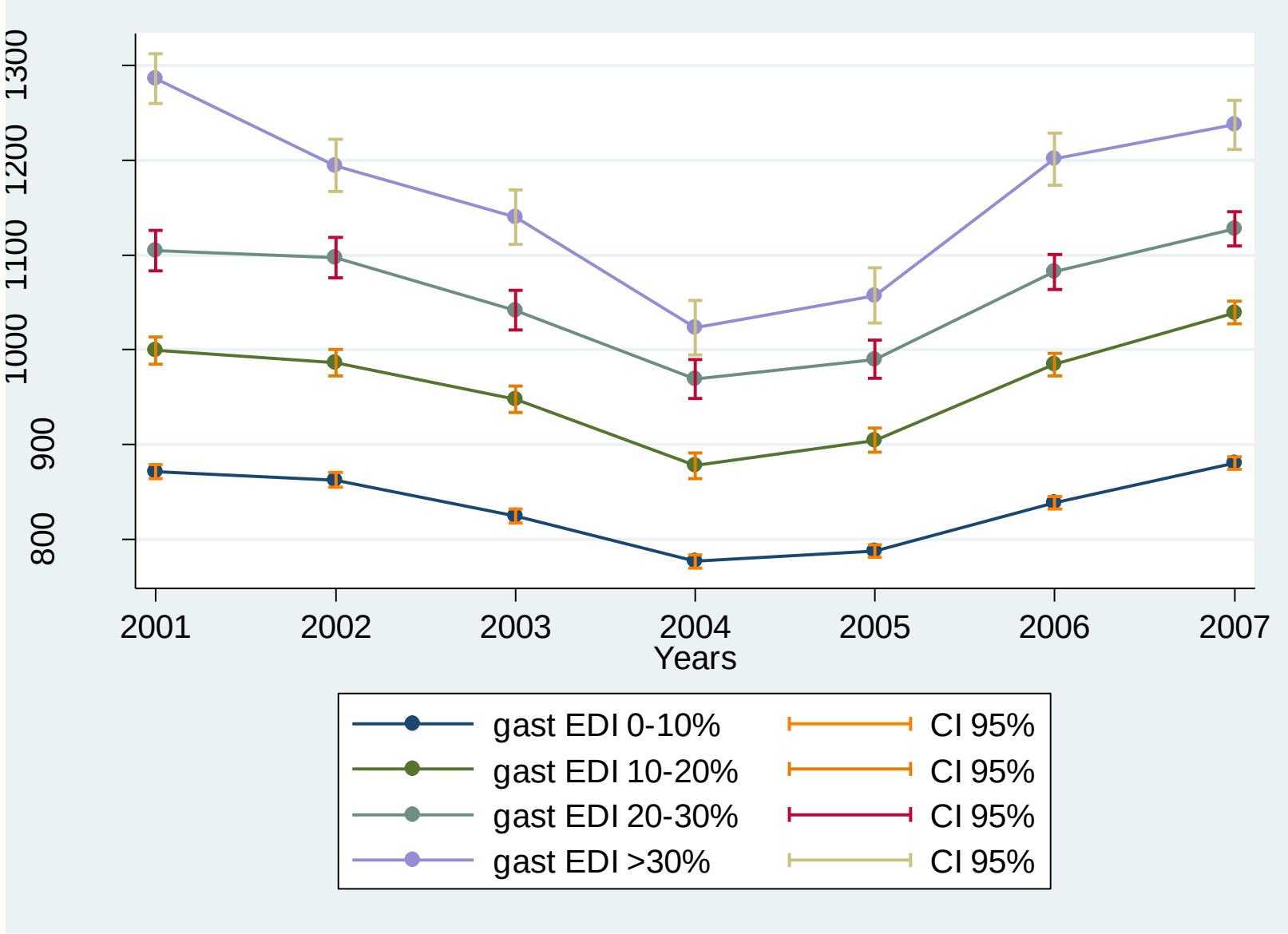
Trends in revascularisation rates 2001-7 by income deprivation groups (intervals of EDI)



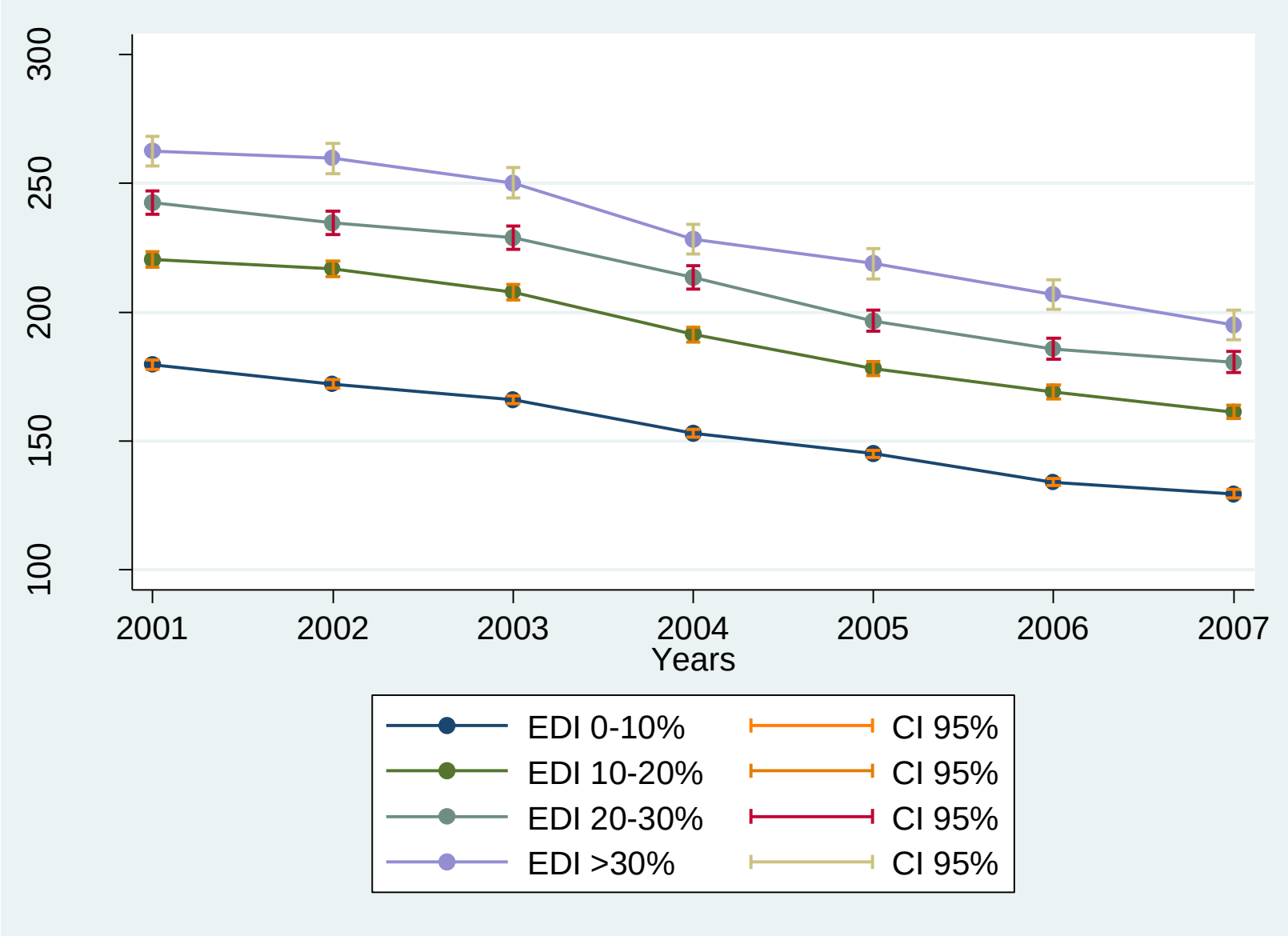
Inequality trends in cataract repair rates 2001-7 by income deprivation groups (intervals of EDI)



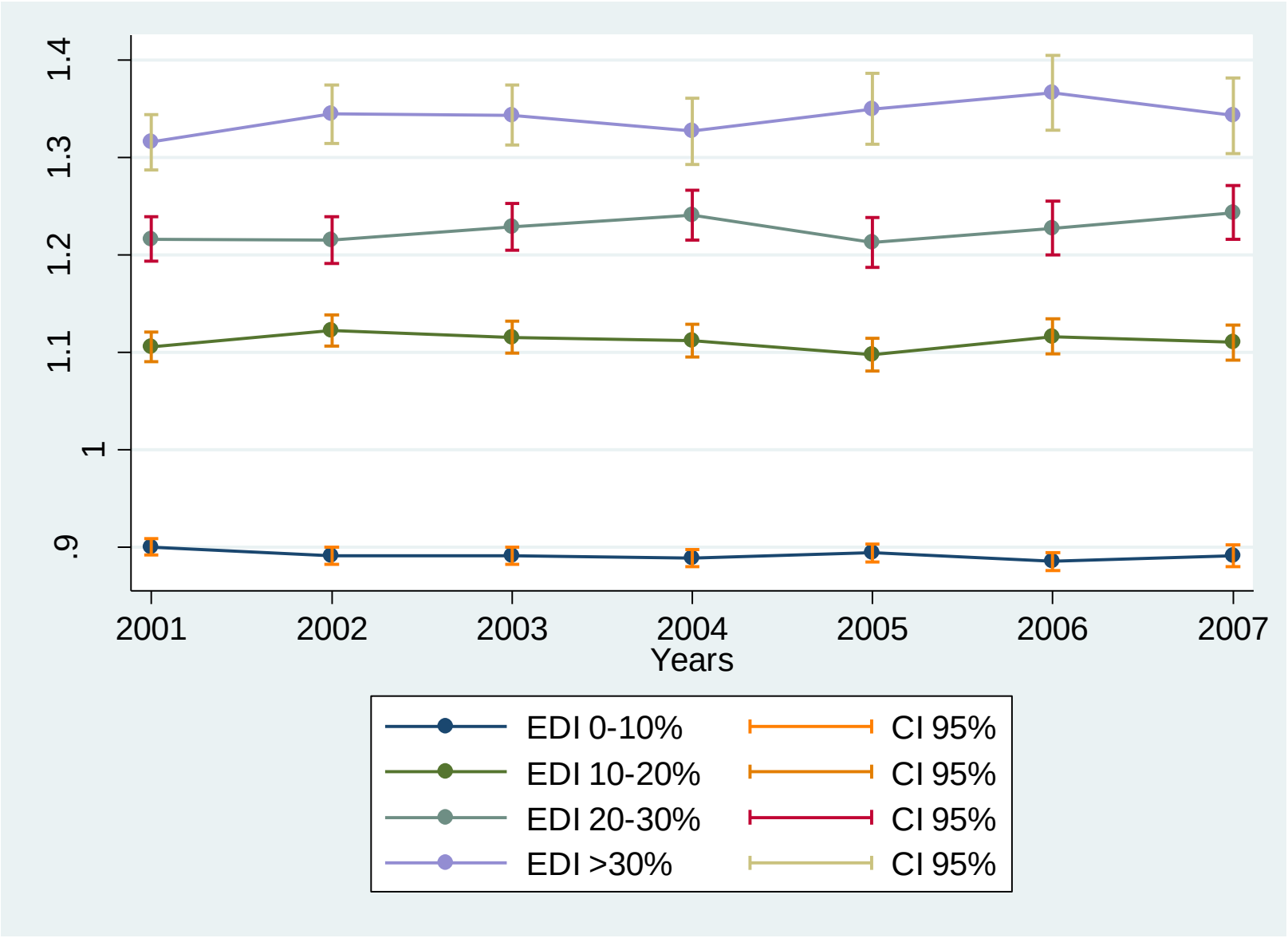
Inequality trends in gastroscopy rates 2001-7 by income deprivation groups (intervals of EDI)



Trends in age-sex adjusted mortality from ischaemic heart disease 2001-7 by income deprivation interval groups



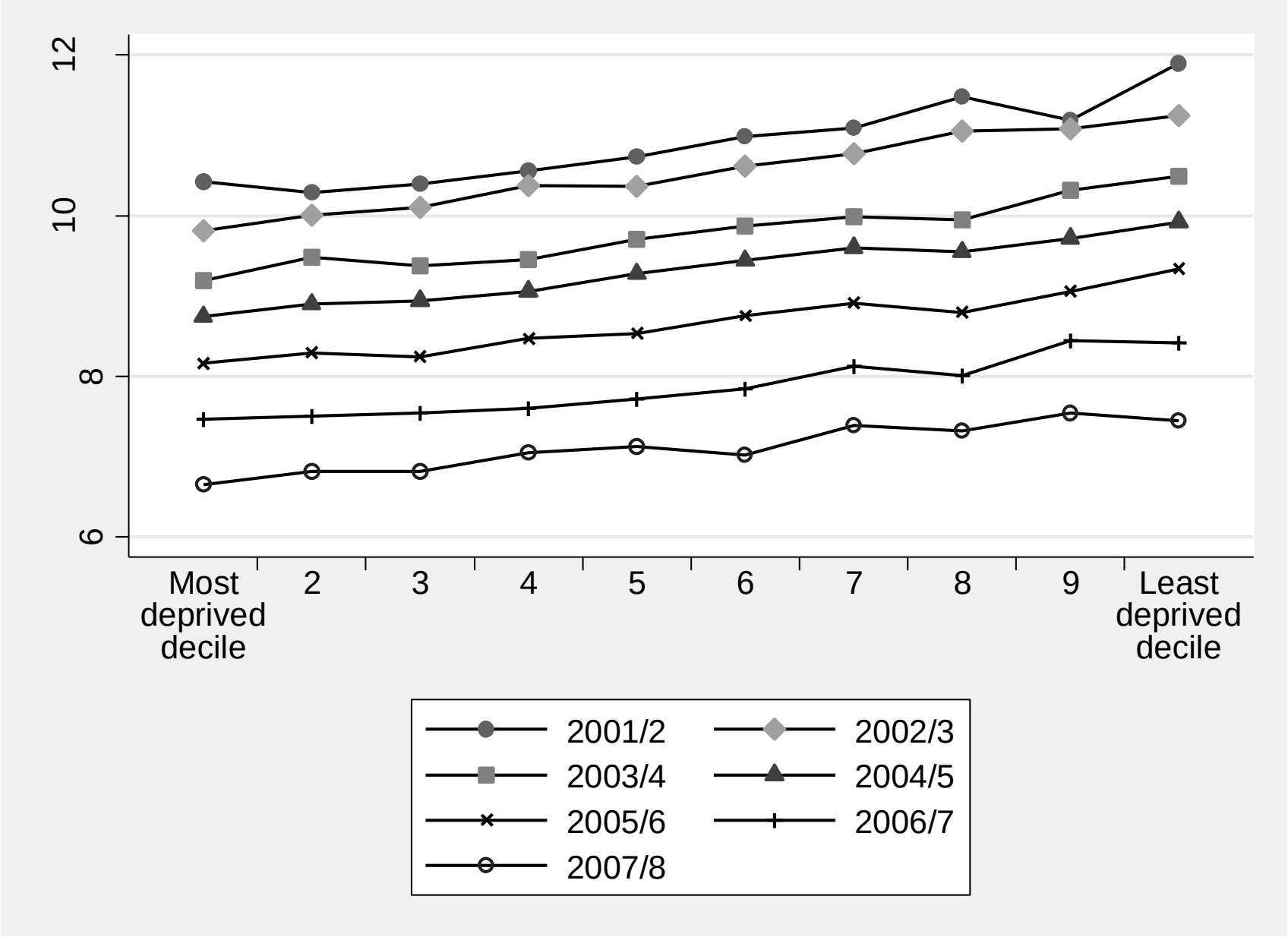
Trends in standardised mortality from ischaemic heart disease 2001-7 (age-sex standardised mortality ratios)

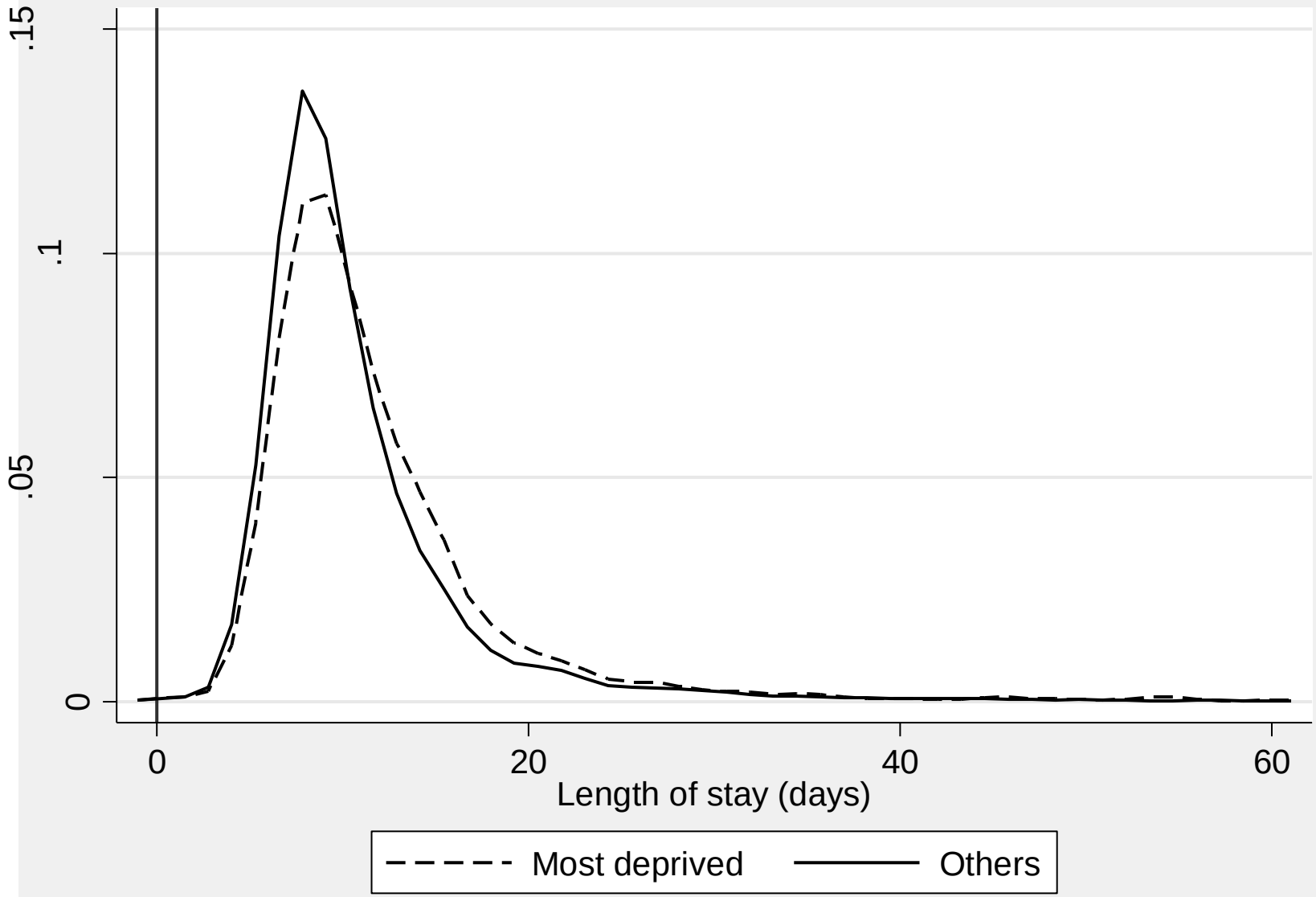


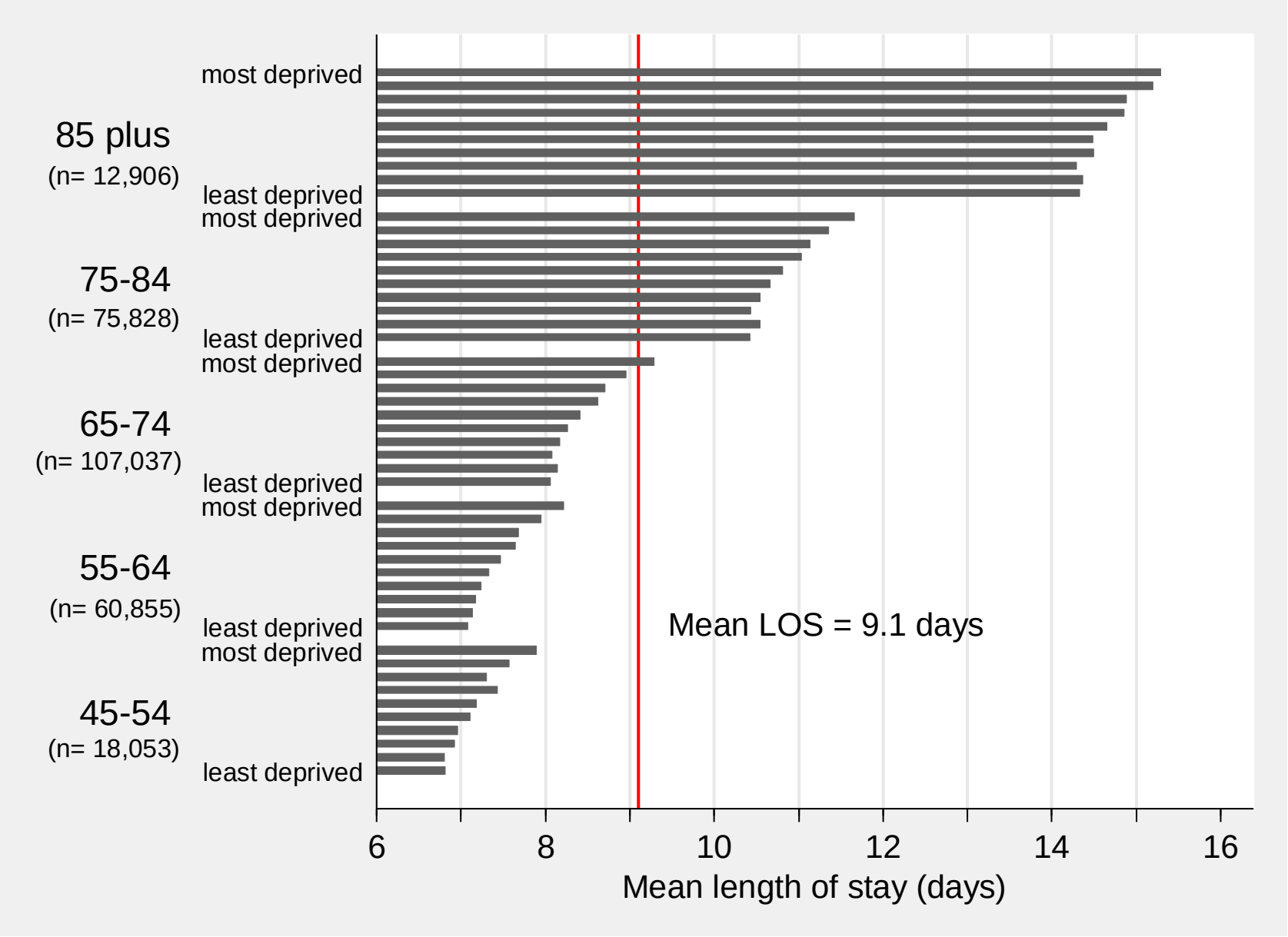
Do the poor cost much more? Relationship between small area income deprivation and length of stay for elective hip replacement in the English NHS from 2001/2 to 2007/8

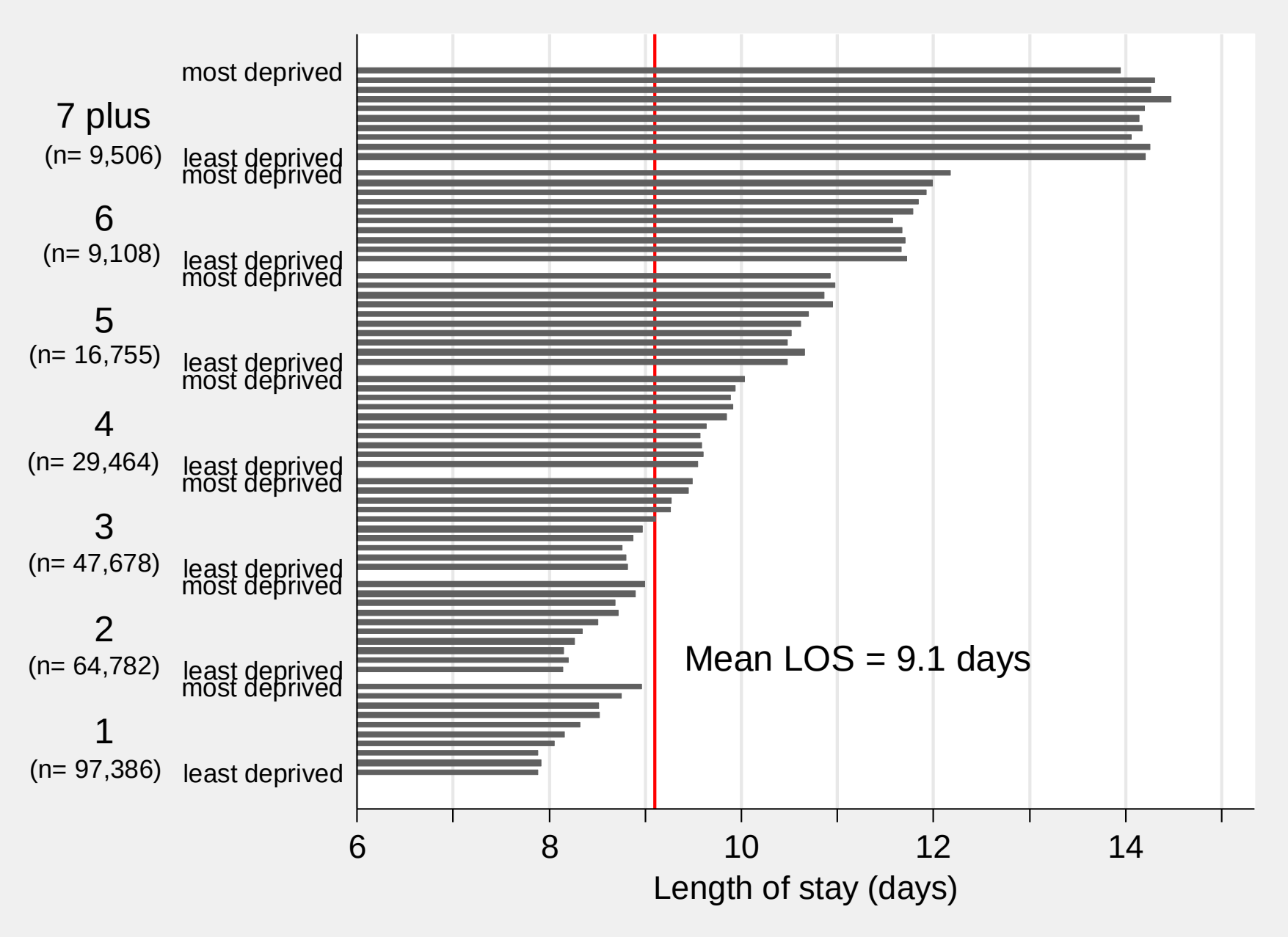
Richard Cookson[1] Mauro Laudicella[2]

[1] Department of Social Policy and Social Work
[2] Centre for Health Economics


12
10
8
6
Most deprived decile
2
3
4
5
6
7
8
9
Least deprived decile
2001/2
2002/3
2003/4
2004/5
2005/6
2006/7
2007/8


.15
.1
.05
0
0
20
40
60
Length of stay (days)
Most deprived
Others


most deprived
85 plus
(n= 12,906)
least deprived
most deprived
75-84
(n= 75,828)
least deprived
most deprived
65-74
(n= 107,037)
least deprived
most deprived
55-64
(n= 60,855)
least deprived
most deprived
45-54
(n= 18,053)
least deprived
Mean LOS = 9.1 days
6
8
10
12
14
16
Mean length of stay (days)


most deprived
7 plus
(n= 9,506)
least deprived
most deprived
6
(n= 9,108)
least deprived
most deprived
5
(n= 16,755)
least deprived
most deprived
4
(n= 29,464)
least deprived
most deprived
3
(n= 47,678)
least deprived
most deprived
2
(n= 64,782)
least deprived
most deprived
1
(n= 97,386)
least deprived
Mean LOS = 9.1 days
6
8
10
12
14
Length of stay (days)

	2001	2002	2003	2004	2005	2006	2007
Deprivation differentials							
Gap: most deprived decile - least deprived decile	1.47	1.44	1.25	1.26	1.03	0.77	0.75
Ratio: most deprived decile / least deprived decile	1.14	1.14	1.13	1.14	1.13	1.11	1.12
Age differentials							
Gap: age 85 or over - age 45-54	7.80	7.15	7.07	7.34	6.65	5.90	5.86
Ratio: age 85 or over / age 45-54	1.86	1.81	1.88	1.98	1.95	1.95	2.05
Co-morbidity differentials							
Gap: one diagnosis - seven or more diagnoses	6.10	6.92	6.41	5.18	5.98	5.22	5.26
Ratio: one diagnosis / seven or more diagnoses	1.61	1.71	1.71	1.61	1.78	1.75	1.84

Does competition generate ‘cream skimming’ by NHS hospitals? Evidence from hip replacement admissions in England from 2001/2 to 2007/8

Richard Cookson[1] Mauro Laudicella[2]

[1] Department of Social Policy and Social Work
[2] Centre for Health Economics

Background

- Recent health reforms in the English NHS:
  - Fixed price hospital payment phased in from 2003/4
  - Private sector entry for elective surgery phased in from 2005/6
    - “Independent Sector Treatment Centres” (ISTCs)
  - Patient choice of hospital phased in from 2005/6
  - Maximum waiting time targets phased in from 2001/2
- Interest in patient selection effects as a possible threat to equality of access
  - Competitive incentives for hospitals to ‘cream skim’ easy cases with low cost and short length of stay
- Hypotheses about patient selection effects:
  - Private sector entry will increase case mix co-morbidity for local public hospitals (due to ‘cream skimming’ by private hospitals)
  - Quasi market competition will reduce case mix co-morbidity for public hospitals (due to ‘cream skimming’ by public hospitals)

Data

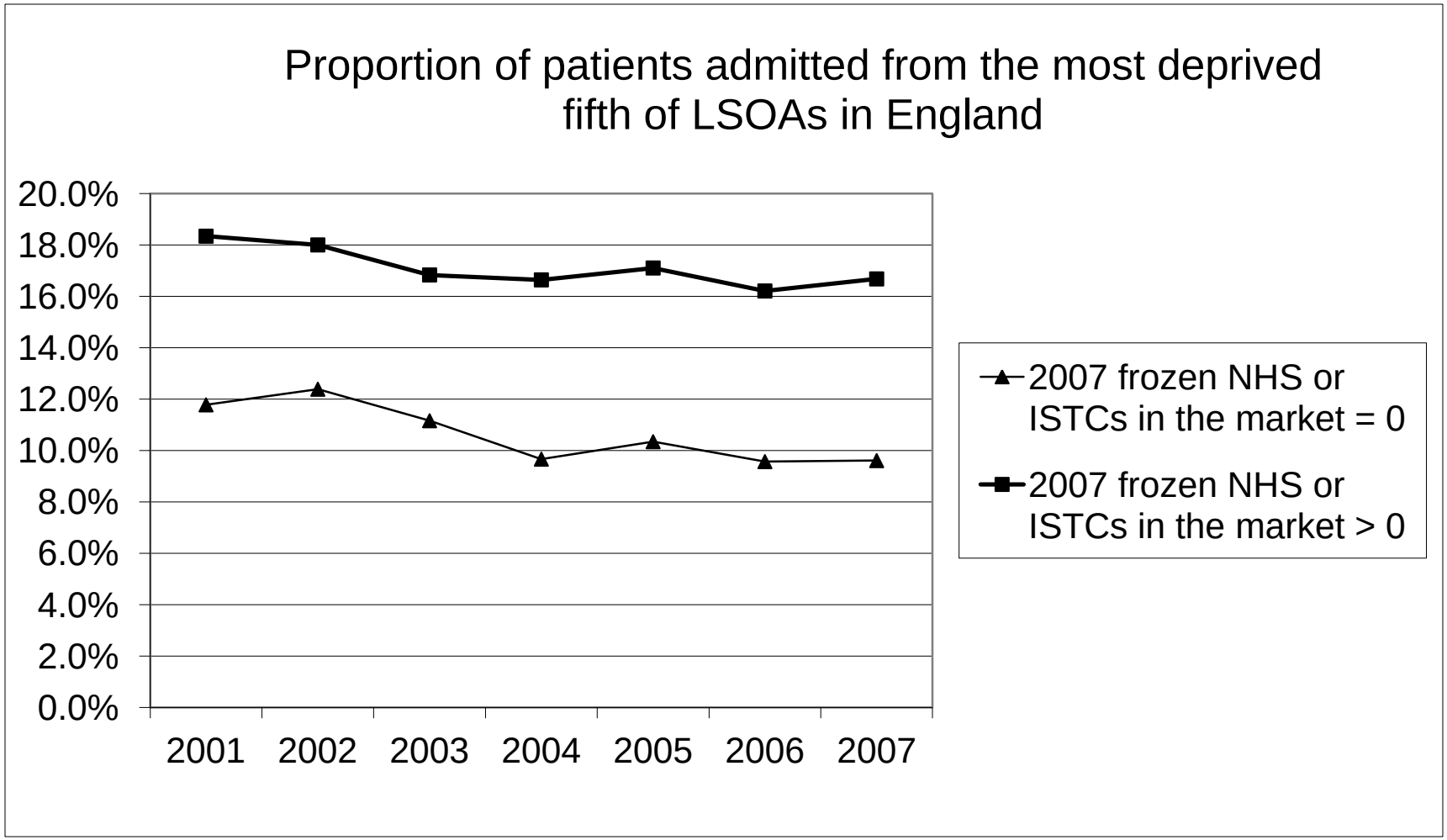
- Focus on elective hip replacement
  - Good test case for patient selection hypotheses, as co-morbidity drives substantial variation in length of stay, which influences both cost and waiting time
- Proportion of patients with more than one diagnosis to proxy case mix co-morbidity
- Private sector entry measured by number of ISTCs within 30 minutes drive
- Quasi market competition measured by number of NHS rivals within 30 minutes drive

Descriptive statistics for key variables by financial years 2001/2 to 2007/8

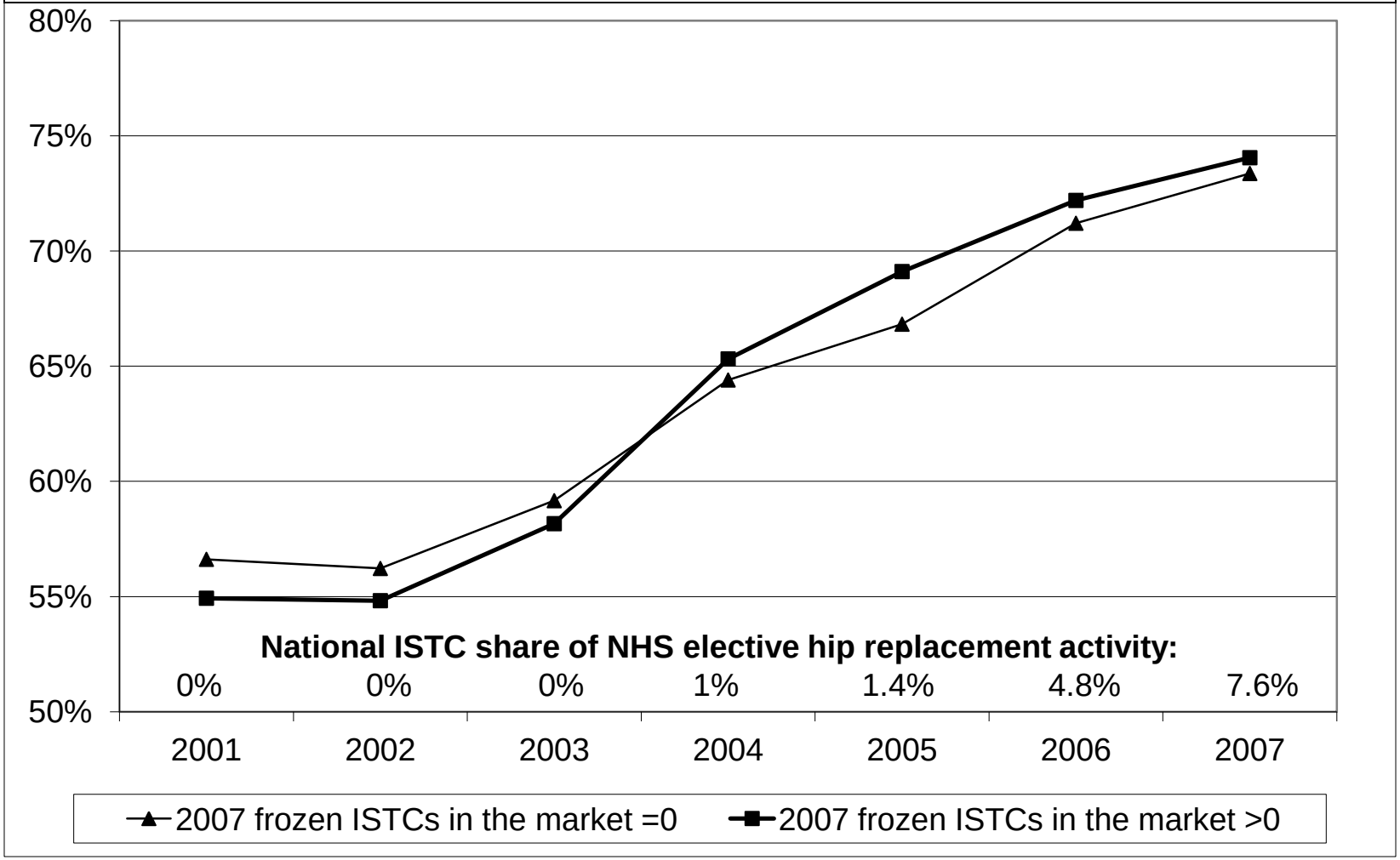
Year	2001	2002	2003	2004	2005	2006	2007
Number of public hospitals	165	151	151	148	147	145	142
Mean activity per NHS hospital	206.0	245.9	273.1	273.3	278.8	272.5	289.9
Mean % with more than one diagnosis	55.5%	55.3%	58.5%	65.0%	68.2%	71.8%	73.8%
Mean waiting time pressure	4.8%	8.1%	12.9%	6.0%	16.6%	24.2%	12.1%
Mean 80th percentile waiting time (days)	385.3	359.0	314.7	257.1	222.8	185.1	151.9
Waiting time target (months)	18	15	12	9	6	6	6
Date of current year target	Mar-02	Mar-03	Mar-04	Mar-05	Dec-05	Mar-07	Mar-08

Note

Waiting time pressure defined as proportion of patients treated during the financial year waiting longer than the current year target.

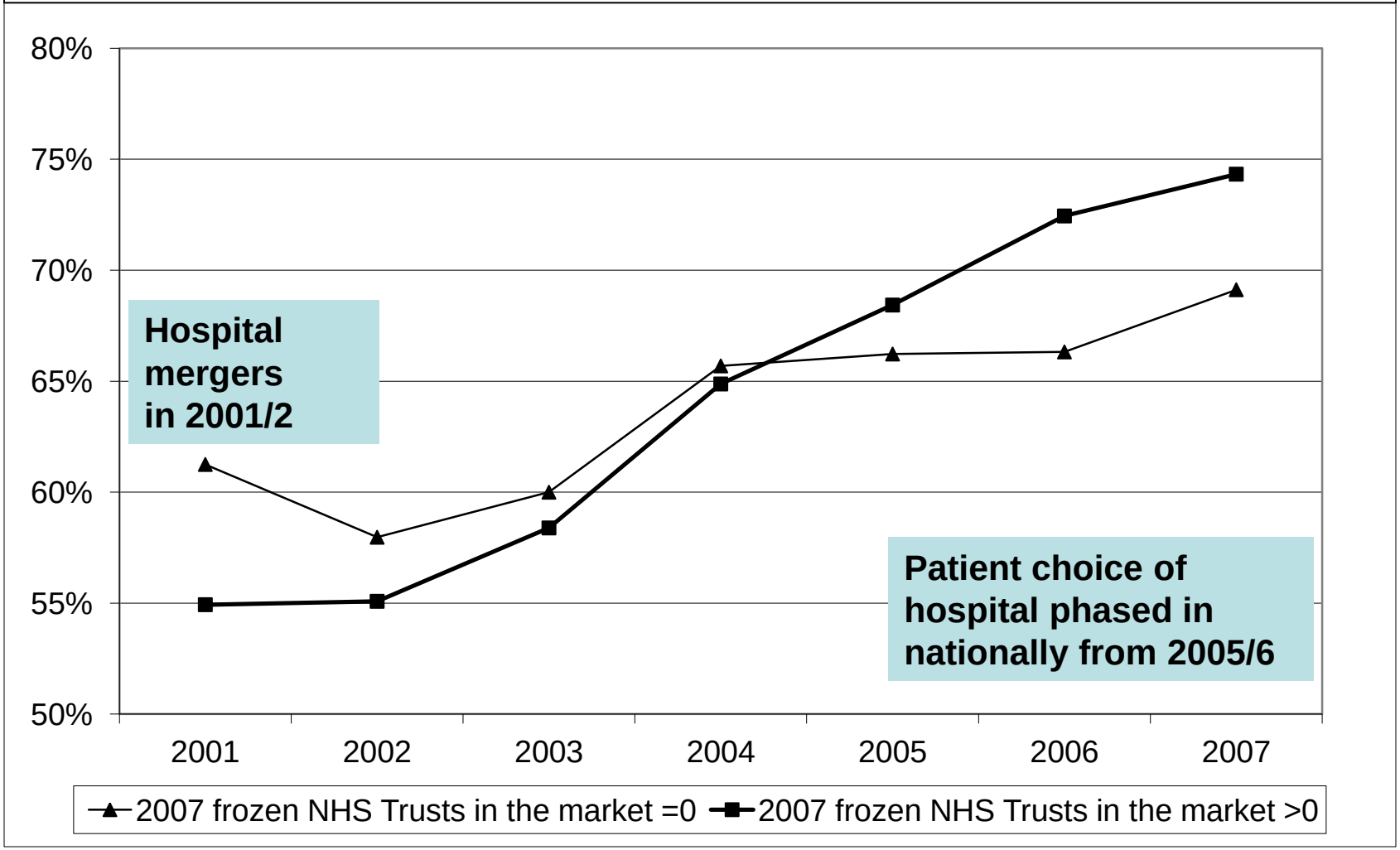

Proportion of patients admitted from the most deprived fifth of LSOAs in England
20.0%
18.0%
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
2001
2002
2003
2004
2005
2006
2007
2007 frozen NHS or ISTCs in the market = 0
2007 frozen NHS or ISTCs in the market > 0

Proportion of admissions with more than one diagnosis, comparing NHS hospitals with some ISTC rivals versus no ISTC rivals within a 30 minute drive



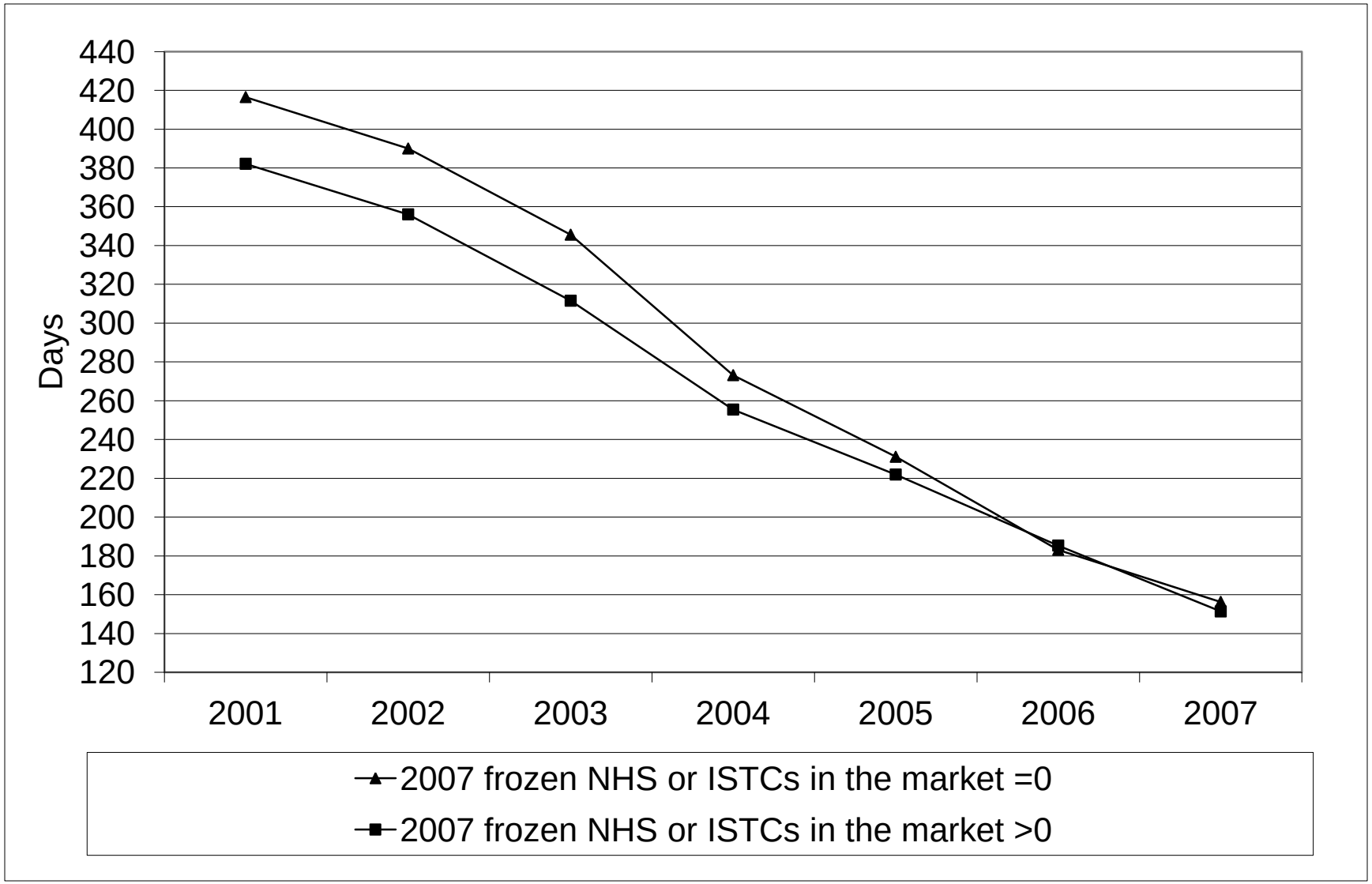
Note: About 38% of NHS hospitals have no ISTC rivals within a 30 minute drive

Proportion of admissions with more than one diagnosis, comparing NHS hospitals with some NHS rivals versus no NHS rivals within a 30 minute drive



Note: About 10% of NHS hospitals have no NHS rivals within a 30 minute drive

80th percentiles of waiting time for hip replacement admissions, comparing NHS hospitals with some rivals versus no rivals



Difference-in-difference in the proportion of patients with more than one diagnosis

Covariates	dy/dx
d_some_NHS_rivals	-0.013
d_some_ISTC_rivals	-0.001
d2001 X some NHS rivals	-0.032
d2003 X some NHS rivals	0.008
d2004 X some NHS rivals	0.017
d2005 X some NHS rivals	0.035
d2006 X some NHS rivals	**0.100****
d2007 X some NHS rivals	**0.103****
d2001 X some ISTC rivals	0.023
d2003 X some ISTC rivals	0.011
d2004 X some ISTC rivals	0.025
d2005 X some ISTC rivals	0.031
d2006 X some ISTC rivals	0.007
d2007 X some ISTC rivals	0.000
d2001	0.025
d2003	0.017
d2004	0.063
d2005	0.094**
d2006	0.086**
d2007	0.094**
waiting time pressure1	-0.068
hospital total admissions /100	-0.071***
has NHS treatment centre	-0.118
Foundation Trust	-0.009
financial surplus	0.002*
Teaching hospital	-0.034

Marginal effects after GLM

y = proportion of patients admitted with one or more co-diagnoses

Observations: 880 NHS hospitals, unbalanced panel pooled over last 6 years

Baseline: hospitals with no NHS or ISTC rivals; year: 2002; region: Northen and Yorkshire region

Cluster robust standard errors
*** p<0.01, ** p<0.05, * p<0.1

(Regional dummies not reported)

Discussion

- Neither patient selection hypothesis supported:
  - Private sector entry did not significantly increase public hospital case mix co-morbidity
  - Quasi market competition appears to significantly *increase* public hospital case mix co-morbidity in 2006/7 – the reverse of our selection hypothesis
  - Perhaps “choice” in 2006/7 unleashed a one-off exodus of co-morbid patients away from monopoly hospitals with long waiting times?
- Pressure to meet waiting time targets has no statistically significant effect on case mix co-morbidity

Thank you.

NHS quasi market competition vs. ISTC penetration

year = 2007

	No ISTC rivals	**Some ISTC rivals**	Total	
No NHS rivals	14	1	15	10%
Some NHS rivals	42	90	132	90%
Total	56	91	147	
	38%	62%		

Independent Sector Treatment Centre (ISTC) share of English NHS elective hip replacement activity 2001-2007

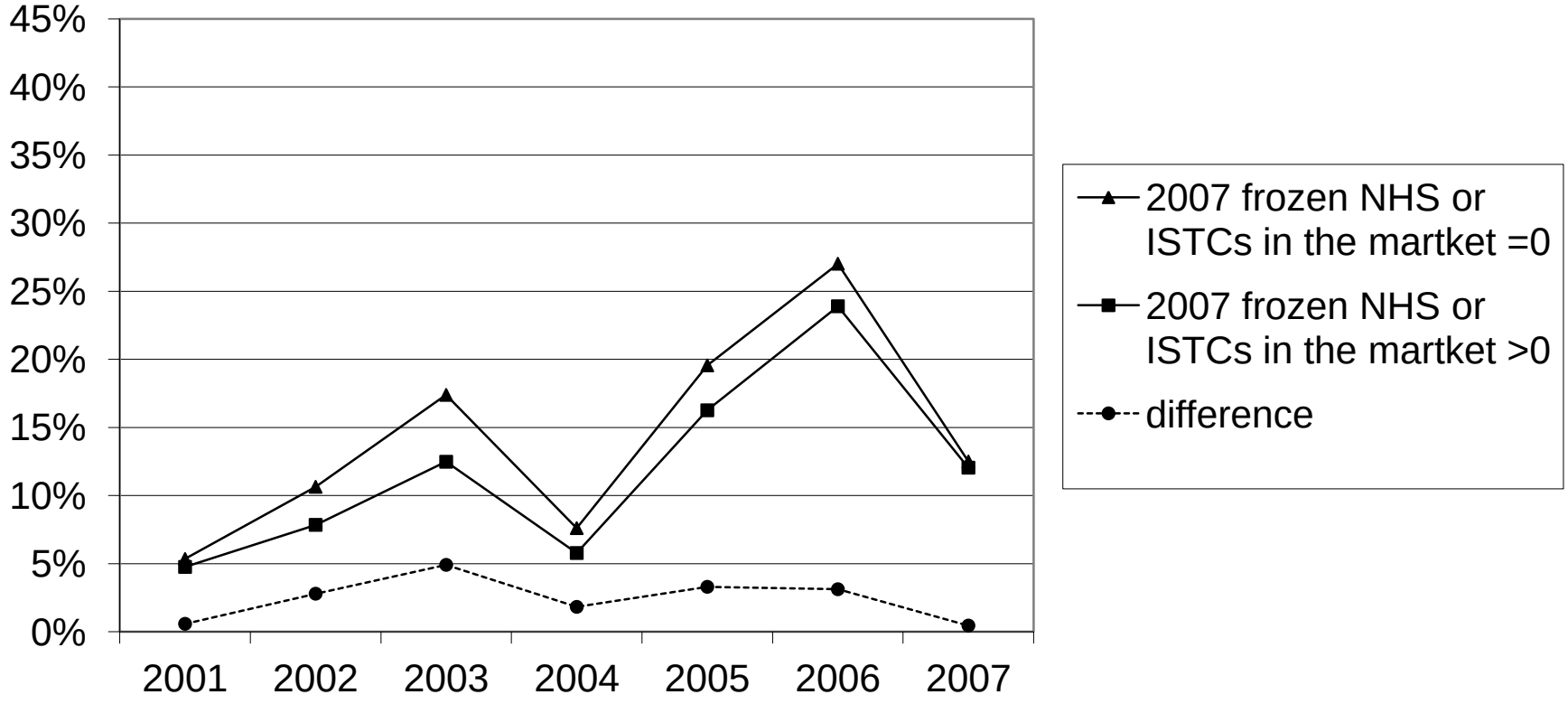
	2001	2002	2003	2004	2005	2006	2007
ISTC				417	585	2,030	3,454
Non-ISTC	34,407	38,019	41,459	40,912	41,455	40,008	42,212
Total NHS funded	34,407	38,019	41,459	41,329	42,040	42,038	45,666
ISTC share of total	0.0%	0.0%	0.0%	1.0%	1.4%	4.8%	7.6%

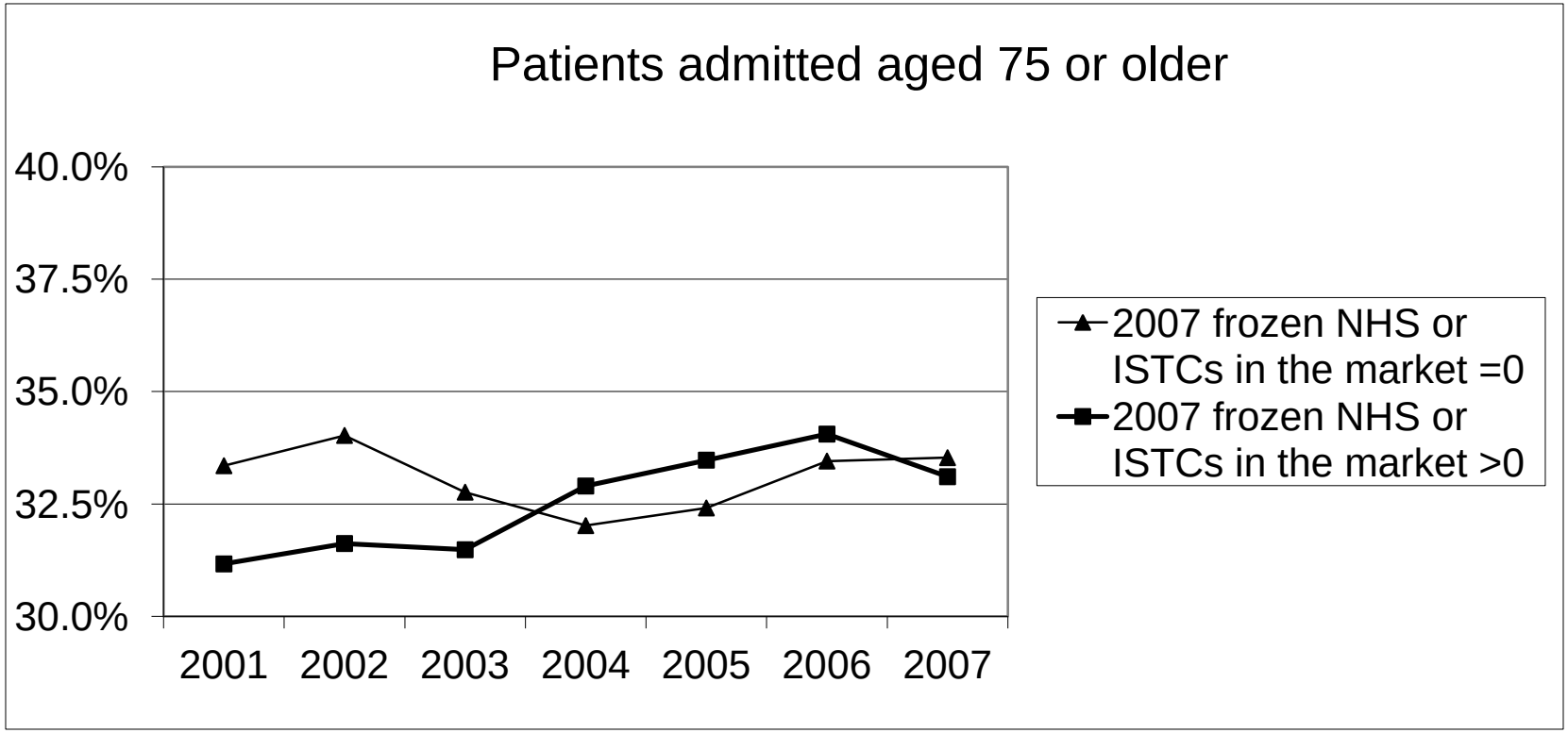
Source: Hospital Episode Statistics

Note: ISTC volumes for 2004-6 are somewhat under-reported in this data.

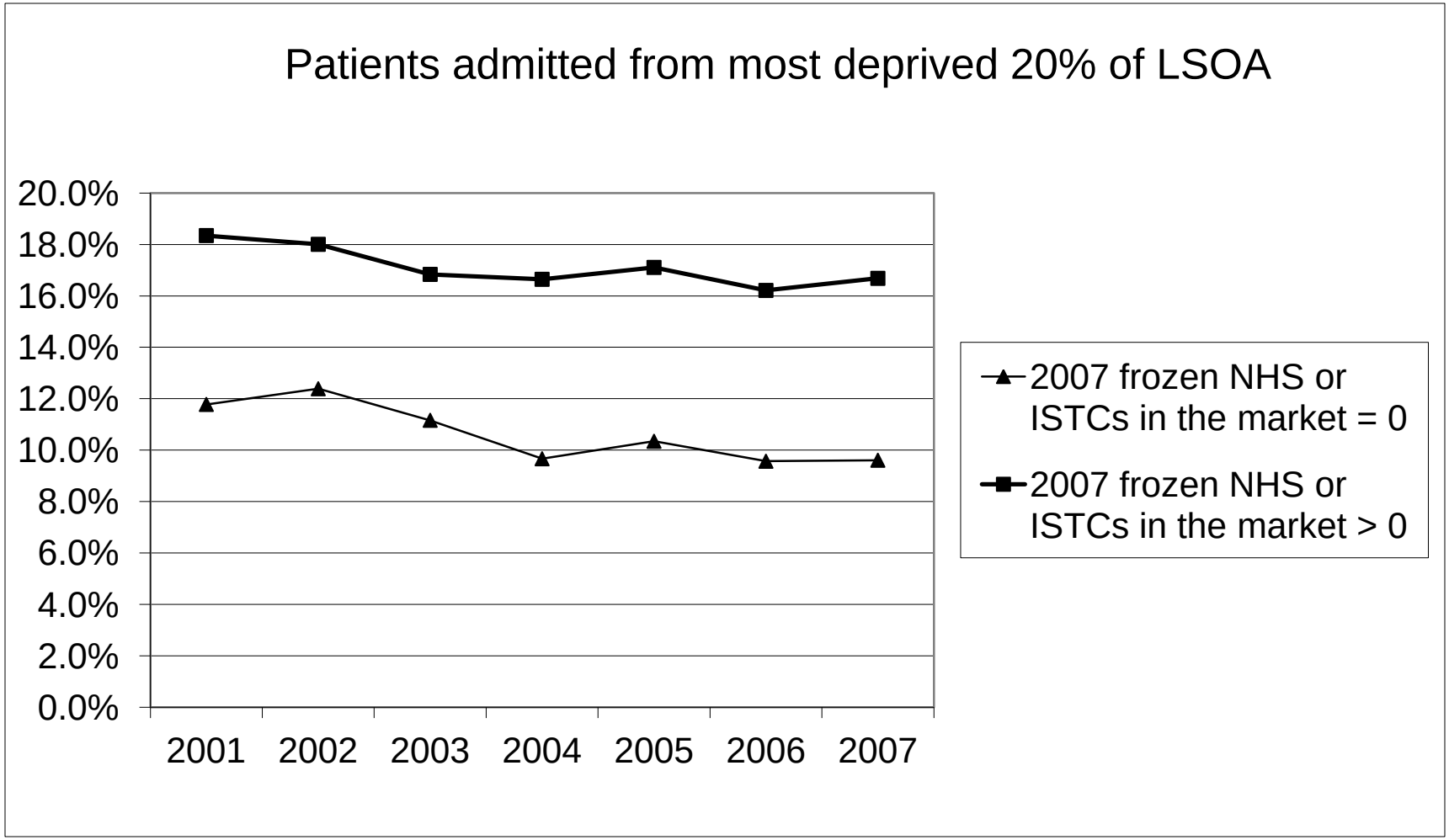
Waiting time pressure:

Proportion of admissions in financial year who wait longer than the current year target





	Mean age of patients						
2007 frozen NHS or ISTCs in the market =0	69.9	69.9	69.8	69.6	69.9	70.2	70.1
2007 frozen NHS or ISTCs in the market >0	69.3	69.3	69.5	69.8	69.9	70.0	69.8
Difference	**-0.6**	**-0.5**	**-0.3**	**0.2**	**-0.1**	**-0.2**	**-0.3**



	Mean EDI income score of hospital admissions						
2007 frozen NHS or ISTCs in the market = 0	0.103	0.103	0.095	0.087	0.086	0.086	0.086
2007 frozen NHS or ISTCs in the market > 0	0.117	0.114	0.109	0.103	0.101	0.099	0.100
Diff	0.014	0.011	0.014	0.016	0.016	0.014	0.014