

Supplementary file 4 Health board clustering sensitivity analysis

Table S4.1 – Results of interrupted time series analysis of the impact of reducing and abolishing prescription fees in Scotland on hospital admissions (incidence rate ratios) and prescribed medicines (defined daily doses and cost) – adjusting for clustering with General Practice and Health Board

	Intercept		Monthly change		Reduction step change		Reduction change in slope		Abolition step change		Abolition change in slope	
	IR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
Admissions												
Intervention	9.04e ⁻³	7.75e ⁻³ to 1.06e ⁻²	1.00	1.00 to 1.01	1.03	0.98 to 1.08	0.99	0.99 to 0.99	0.81	0.72 to 0.90	1.00	0.99 to 1.00
Age-c'fact	5.70e ⁻²	4.95e ⁻² to 6.56e ⁻²	1.00	1.00 to 1.00	1.03	1.01 to 1.06	1.00	0.99 to 1.00	0.95	0.90 to 1.00	1.00	0.99 to 1.00
Condition-c'fact	4.72e ⁻³	4.14e ⁻³ to 5.38e ⁻³	1.00	1.00 to 1.01	0.95	0.88 to 1.03	1.00	1.00 to 1.01	1.01	0.86 to 1.20	1.00	1.00 to 1.01
Admissions 1 month lag												
Intervention	9.07e ⁻³	7.77e ⁻³ to 1.06e ⁻²	1.01	1.00 to 1.01	1.01	0.96 to 1.06	0.99	0.99 to 0.99	0.78	0.71 to 0.87	1.00	0.99 to 1.00
Age-c'fact	5.78e ⁻²	5.02e ⁻² to 6.65e ⁻²	1.00	1.00 to 1.00	1.03	1.01 to 1.06	1.00	0.99 to 1.00	0.95	0.90 to 1.00	1.00	0.99 to 1.00
Condition-c'fact	4.74e ⁻³	4.16e ⁻³ to 5.42e ⁻³	1.00	1.00 to 1.00	0.98	0.91 to 1.06	1.00	1.00 to 1.00	1.07	0.91 to 1.26	1.00	1.00 to 1.01
Admissions 2 month lag												
Intervention	9.09e ⁻³	7.79e ⁻³ to 1.06e ⁻²	1.00	1.00 to 1.01	1.01	0.96 to 1.06	0.99	0.99 to 0.99	0.79	0.71 to 0.87	1.00	0.99 to 1.00
Age-c'fact	5.80e ⁻²	5.04e ⁻² to 6.68e ⁻²	1.00	1.00 to 1.00	1.04	1.02 to 1.07	1.00	0.99 to 1.00	0.97	0.92 to 1.02	1.00	1.00 to 1.00
Condition-c'fact	4.77e ⁻³	4.18e ⁻³ to 5.44e ⁻³	1.00	1.00 to 1.00	0.99	0.92 to 1.07	1.00	1.00 to 1.01	1.10	0.93 to 1.29	1.00	1.00 to 1.01
Admissions 3 month lag												
Intervention	9.07e ⁻³	7.77e ⁻³ to 1.06e ⁻²	1.01	1.00 to 1.01	0.99	0.94 to 1.04	0.99	0.99 to 0.99	0.78	0.70 to 0.86	1.00	0.99 to 1.00
Age-c'fact	5.77e ⁻²	5.01e ⁻² to 6.64e ⁻²	1.00	1.00 to 1.00	1.02	1.00 to 1.05	1.00	0.99 to 1.00	0.94	0.90 to 0.99	1.00	1.00 to 1.00
Condition-c'fact	4.74e ⁻³	4.15e ⁻³ to 5.40e ⁻³	1.00	1.00 to 1.00	0.97	0.90 to 1.05	1.00	1.00 to 1.01	1.08	0.92 to 1.26	1.00	1.00 to 1.00
Defined Daily Doses (DDDs)												
Intervention	33.21	30.30 to 36.12	-0.04	-0.06 to -0.02	-0.11	-0.61 to 0.38	0.04	0.02 to 0.07	6.03	4.93 to 7.13	0.10	0.08 to 0.13
Age-c'fact	-	-	-	-	-	-	-	-	-	-	-	-
Condition-c'fact	59.82	54.81 to 64.82	0.14	0.10 to 0.18	-1.88	-2.90 to -0.86	-0.05	-0.11 to <0.01	6.02	3.72 to 8.31	0.15	0.09 to 0.20
Cost												
Intervention	£ 22.44	20.11 to 24.77	£ 0.17	0.15 to 0.18	£ 0.23	-0.20 to 0.65	£ -0.15	-0.17 to -0.13	£ -0.97	-1.92 to -0.02	£ -0.10	-0.12 to -0.08
Age-c'fact	£ 67.90	62.04 to 73.76	£ 0.62	0.56 to 0.68	£ 4.74	3.43 to 6.06	£ 0.03	-0.05 to 0.12	£ 14.26	10.87 to 17.65	£ -0.36	-0.44 to -0.27
Condition-c'fact	£ 29.61	26.75 to 32.47	£ 0.15	0.13 to 0.17	£ -3.16	-3.70 to -2.62	£ -0.01	-0.04 to 0.02	£ 1.99	0.78 to 3.20	£ -0.11	-0.14 to -0.09

95% CI; 95% confidence interval, c'fact; counterfactual, DDDs; Defined daily doses per 100 patients per practice per month, ΔDDD; change in DDDs, IR; Incidence rate per 100 patients per practice per month, IRR; incidence rate ratio, £; gross ingredient cost of medicines before any discount per 100 patients per practice per month, Δ£; change in £

Supplemental file 4 Health board clustering sensitivity analysis

Table S4.2 - Results of interrupted time series analysis of the impact of reducing and abolishing prescription fees in Scotland on hospital admissions (incidence rate ratios) and prescribed medicines (defined daily doses and cost) stratified by quintile of the Scottish Index of Multiple Deprivation [19] – adjusting for clustering with General Practice and Health Board

	Intercept		Monthly change		Reduction step change		Reduction change in slope		Abolition step change		Abolition change in slope	
	IR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
Admissions												
Q1 - most deprived	9.08e ⁻²	7.67e ⁻² to 1.08e ⁻¹	1.01	1.00 to 1.01	1.02	0.97 to 1.06	0.99	0.99 to 1.00	0.87	0.79 to 0.97	0.99	0.99 to 1.00
Q2	1.17e ⁻²	9.36e ⁻³ to 1.47e ⁻²	1.00	1.00 to 1.01	1.10	0.92 to 1.32	0.99	0.98 to 1.00	0.75	0.50 to 1.12	1.00	0.99 to 1.01
Q3	9.80e ⁻³	7.03e ⁻³ to 1.37e ⁻²	1.00	0.99 to 1.01	1.10	0.86 to 1.41	1.00	0.98 to 1.01	1.15	0.68 to 1.94	1.00	0.99 to 1.02
Q4	6.51e ⁻³	4.62e ⁻³ to 9.18e ⁻³	0.99	0.98 to 1.00	1.50	1.13 to 1.99	1.00	0.99 to 1.02	1.63	0.89 to 2.99	1.02	1.01 to 1.04
Q5 - least deprived	6.06e ⁻³	4.86e ⁻³ to 7.54e ⁻³	1.00	0.99 to 1.00	1.00	0.84 to 1.21	1.00	1.00 to 1.01	1.24	0.85 to 1.82	1.00	0.99 to 1.01
Admissions 1 month lag												
Q1 - most deprived	1.45e ⁻²	1.23e ⁻² to 1.72e ⁻²	1.01	1.01 to 1.02	0.94	0.86 to 1.03	0.99	0.98 to 0.99	0.60	0.49 to 0.73	0.99	0.98 to 0.99
Q2	1.20e ⁻²	9.58e ⁻³ to 1.51e ⁻²	1.00	1.00 to 1.01	1.12	0.93 to 1.34	0.99	0.98 to 1.00	0.79	0.53 to 1.16	1.00	0.99 to 1.01
Q3	9.77e ⁻³	6.99e ⁻³ to 1.37e ⁻²	1.00	0.99 to 1.01	1.00	0.78 to 1.27	1.00	0.99 to 1.01	0.99	0.60 to 1.65	1.00	0.99 to 1.02
Q4	6.84e ⁻³	4.83e ⁻³ to 9.67e ⁻³	0.99	0.98 to 1.00	1.53	1.16 to 2.02	1.00	0.99 to 1.01	1.66	0.91 to 3.00	1.02	1.01 to 1.04
Q5 - least deprived	6.12e ⁻³	4.90e ⁻³ to 7.64e ⁻³	1.00	0.99 to 1.00	1.03	0.86 to 1.23	1.01	1.00 to 1.01	1.27	0.87 to 1.85	1.00	0.99 to 1.01
Admissions 2 month lag												
Q1 - most deprived	1.46e ⁻²	1.24e ⁻² to 1.73e ⁻²	1.01	1.01 to 1.01	0.94	0.86 to 1.03	0.99	0.98 to 0.99	0.60	0.50 to 0.73	0.99	0.98 to 0.99
Q2	1.20e ⁻²	9.58e ⁻³ to 1.51e ⁻²	1.00	1.00 to 1.01	1.11	0.92 to 1.33	0.99	0.98 to 1.00	0.78	0.54 to 1.15	1.00	0.99 to 1.01
Q3	1.00e ⁻²	1.00e ⁻² to 1.40e ⁻²	1.00	0.99 to 1.01	1.07	0.84 to 1.37	1.00	0.99 to 1.01	1.12	0.68 to 1.84	1.00	0.99 to 1.02
Q4	6.80e ⁻³	4.81e ⁻³ to 9.60e ⁻³	0.99	0.98 to 1.00	1.57	1.19 to 2.07	1.00	0.98 to 1.01	1.70	0.95 to 3.05	1.02	1.00 to 1.03
Q5 - least deprived	6.21e ⁻³	4.98e ⁻³ to 7.75e ⁻³	0.99	0.99 to 1.00	1.09	0.91 to 1.31	1.00	1.00 to 1.01	1.38	0.95 to 1.99	1.00	0.99 to 1.01
Admissions 3 month lag												
Q1 - most deprived	1.47e ⁻²	1.24e ⁻² to 1.74e ⁻²	1.01	1.01 to 1.01	0.94	0.86 to 1.02	0.99	0.98 to 0.99	0.60	0.50 to 0.73	0.99	0.98 to 0.99
Q2	1.18e ⁻²	9.40e ⁻³ to 1.48e ⁻²	1.01	1.00 to 1.01	1.03	0.86 to 1.24	0.99	0.98 to 1.00	0.72	0.50 to 1.05	1.00	0.99 to 1.01
Q3	1.03e ⁻²	7.38e ⁻³ to 1.43e ⁻²	1.00	0.99 to 1.00	1.18	0.92 to 1.51	1.00	0.99 to 1.01	1.25	0.76 to 2.05	1.01	0.99 to 1.02
Q4	6.43e ⁻³	4.55e ⁻³ to 9.07e ⁻³	0.99	0.98 to 1.00	1.34	1.02 to 1.77	1.00	0.98 to 1.01	1.36	0.77 to 2.39	1.01	1.00 to 1.03
Q5 - least deprived	6.15e ⁻³	4.93e ⁻³ to 7.67e ⁻³	1.00	0.99 to 1.00	1.07	0.89 to 1.28	1.00	0.99 to 1.01	1.35	0.94 to 1.94	1.00	0.99 to 1.01
Defined Daily Doses (DDDs)												
Q1 - most deprived	24.46	21.29 to 27.62	-0.07	-0.10 to -0.04	0.25	-0.50 to 1.01	0.08	0.04 to 0.12	6.23	4.59 to 7.86	0.14	0.10 to 0.18
Q2	29.64	25.30 to 33.99	0.05	-0.03 to 0.12	-1.83	-3.80 to 0.15	-0.05	-0.15 to 0.05	2.09	-2.19 to 6.37	0.03	-0.07 to 0.14
Q3	35.64	31.29 to 39.98	-0.06	-0.18 to 0.06	1.11	-2.07 to 4.28	-0.03	-0.20 to 0.13	7.32	0.27 to 14.37	0.15	-0.02 to 0.32
Q4	37.99	34.12 to 41.87	-0.05	-0.14 to 0.03	0.12	-2.06 to 2.31	0.06	-0.05 to 0.17	7.62	2.87 to 12.38	0.09	-0.03 to 0.21
Q5 - least deprived	30.20	28.03 to 32.37	0.02	-0.02 to 0.06	-1.15	-2.24 to -0.05	9.05e ⁻⁴	-0.06 to 0.06	4.21	1.83 to 6.60	0.01	-0.05 to 0.06

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Cost	Intercept		Monthly change		Reduction step change		Reduction change in slope		Abolition step change		Abolition change in slope	
	£s	95% CI	Δ£s	95% CI	Δ£s	95% CI	Δ£s	95% CI	Δ£s	95% CI	Δ£s	95% CI
Q1 - most deprived	17.49	14.36 to 20.62	0.07	0.05 to 0.09	0.37	-0.24 to 0.98	-0.06	-0.09 to -0.03	1.02	-0.32 to 2.36	-0.02	-0.05 to 0.02
Q2	22.94	17.26 to 17.26	0.21	0.14 to 0.28	-0.88	-2.67 to 0.90	-0.21	-0.30 to -0.12	-2.63	-6.59 to 1.32	-0.18	-0.28 to -0.09
Q3	22.97	19.33 to 26.60	0.20	0.10 to 0.29	0.83	-1.55 to 3.20	-0.25	-0.38 to -0.13	-1.67	-6.95 to 3.62	-0.08	-0.21 to 0.04
Q4	24.86	21.27 to 28.46	0.22	0.14 to 0.30	0.14	-1.92 to 2.21	-0.24	-0.35 to -0.13	-2.63	-7.26 to 2.01	-0.19	-0.30 to -0.08
Q5 - least deprived	20.76	17.57 to 23.94	0.20	0.17 to 0.24	-0.78	-1.72 to 0.16	-0.18	-0.23 to -0.14	-2.67	-4.76 to -0.58	-0.18	-0.23 to -0.13

95% CI; 95% confidence interval; DDDs; Defined daily doses per 100 patients per practice per month, ΔDDD; change in DDDs, IR; Incidence rate per 100 patients per practice per month, IRR; incidence rate ratio, £s; gross ingredient cost of medicines before any discount per 100 patients per practice per month, Δ£s; change in £s, Q1-5; quintiles of the Scottish Index of Multiple Deprivation from most to least deprived