

Secondary outcome 8: Cost effectiveness [Results taken from final HTA report]

Table 16: Inpatient costs for the main Healthcare Resource Groups (HRGs).

Code	HRG name	Elective cost (£)	Elective trim-point (days)	Non-elective cost (£)	Non-elective trim-point (days)	Costs for excess days (£/day)
BZ01Z	Enhanced Cataract Surgery	982	5	1,944	12	242
CZ05T	Tonsillectomy, 18 years and under without CC	1,083	5	1,013	5	330
FZ20E	Appendicectomy Procedures, 18 years and under without Major CC	2,403	5	2,379	5	268
FZ24E	Major Therapeutic Endoscopic Upper or Lower GI Tract Procedures, between 2 and 18 years	1,366	5	1,177	5	268
FZ62Z*	Endoscopic or Intermediate, Upper GI Tract Procedures, between 2 and 18 years	864	5	893	5	268
FZ63Z	Combined Upper and Lower GI Tract Diagnostic Endoscopic Procedures	513	5	694	5	209
HA73B	Minor Elbow and Lower Arm Procedures for Trauma, 18 years and under	1,192	5	1,192	5	317
PA03B	Febrile Convulsions, 1 year and over	659	5	584	5	288
PA04A	Headaches and Migraines, with CC	883	5	697	5	288
PA04B	Headaches and Migraines, without CC	673	5	550	5	288

PA11Z	Acute Upper Respiratory Tract Infection and Common Cold	566	5	484	5	288
PA12Z	Asthma or Wheezing	599	5	702	5	288
PA17A	Intermediate Infections with CC	1,121	5	1,261	8	288
PA19A	Viral Infections with length of stay 1 day or less	435	5	455	5	288
PA21A	Infectious or Non-Infectious Gastroenteritis, with CC	1,728	8	913	5	288
PA25B	Major Gastrointestinal Disorders without CC	1,352	5	1,103	5	288
PA26B	Other Gastrointestinal Disorders without CC	835	5	589	5	288
PA28B	Feeding Difficulties and Vomiting, without CC	828	5	551	5	288
PA29Z	Abdominal Pain	691	5	580	5	288
PA50Z	Ingestion Poisoning or Allergies	453	5	503	5	288
PA58Z	Examination, Follow-up, Special Screening or other Admissions, with length of stay 0 days	427	5	346	5	288
PA63B	Head, Neck and Ear Disorders with length of stay 1 day or more, with CC	1,524	5	994	5	288
PA67Z	Diabetes Mellitus, with Ketoacidosis or Coma	1,459	10	1,055	6	288
PA68Z	Diabetes Mellitus, without Ketoacidosis or Coma	1,207	5	954	5	288
PA69Z	Nephritic and Nephrotic Renal Diseases	662	5	1,350	9	288

WA21Y	Other Procedures or Health Care Problems, without CC	467	5	579	5	198
XB07Z**	Paediatric Critical Care High Dependency	1,004	N/A	N/A	N/A	N/A
XB05Z**	Paediatric Critical Care Intensive Care Basic	1,670	N/A	N/A	N/A	N/A

* Superseded in 2014-15 by FZ62A

**Unbundled intensive care and high dependency HRG costs taken from National Schedule 2014-15 and uplifted by HCHS Index value of 1.7% per annum.

CC = with complications.

Table 17: Unit costs (£) of patient contacts with healthcare ⁸⁴.

Profession	Surgery	Home	Telephone, e-mail and texts	Hospital outpatient	A&E	School visit
Advanced nurse including, infusion specialist, diabetes nurse	22.75	37.92	9.10	45.50	30.33	37.92
General practitioner (GP)	64.50	87.75	26.63	-	-	-
Social worker (children's services)	39.50	39.50	39.50	-	-	39.50
Hospital consultant	-	-	22.83	68.50	45.67	-
Specialist registrar	-	13.68	12.00	36.00	24.00	-
Community nurse	38.00	38.00	38.00	38.00	-	38.00
General practice nurse	14.75	-	5.60	-	-	-
Dietician	19.00	19.00	6.33	19.00	12.67	19.00
Psychologist	69.50	69.50	23.17	69.50	46.33	69.50

Table 18: Unit costs of devices and consumables.

Consumable or device	Annual Cost	Rationale	Source
Roche Pump	£594	Unit cost of £2,375 with a 4 year lifespan	Supplier
Roche Pump Consumables (e.g. reservoirs, cannula, batteries)	£1,818		Supplier
Medtronic Pump	£749	Unit cost of £2,995 with a 4 year lifespan	Supplier
Medtronic Pump Consumables (e.g. reservoirs, cannula, batteries)	£2,377		Supplier

Pen Injectors (various)	£80	1 x basal and 1 x bolus at £40 each	Based on children's pen device suppliers in the UK
Needles for pen devices	£87	4 injections a day at a cost of £5.95 per 100 needles	BNF [26] & Regional Drug and Therapeutic Centre, Newcastle
Blood Glucose Monitoring	£577	NICE recommendation of 5 tests a day, Aviva strips at £15.79 per 50 tests	BNF [26] & Regional Drug and Therapeutic Centre, Newcastle

Table 19: Unit costs of insulins taken from the British National⁸⁴

Insulin	Type	Cost (£/unit)
Insulin Aspart Novorapid	Short acting	0.0141
Insulin Detemir - Levemir	Intermediate/long acting	0.0290
Novomix 30	Short/intermediate acting	0.0199
Insulin Lispro - Humalog	Short acting	0.0166
Insulin Glargine - Lantus	Intermediate/long acting	0.0307
Humulin M3	Short/intermediate acting	0.0166

Table 20: Resource use in the 3-month prior to randomisation.

Item of resource use (units)	CSII (n=144) mean (95% CI)	MDI (n=149) mean (95% CI)	Difference (95% CI)
Healthcare professional contacts (number of telephone calls, faxes, texts, or e-mails)	3.32 (2.7, 3.97)	2.58 (1.96, 3.3)	0.74 (-0.18, 1.65)
Scheduled outpatient (number of visits)	1 (1, 1)	1 (1, 1)	0 (,)
Unscheduled outpatient visits (number of visits)	2.19 (1.77, 2.63)	1.12 (0.89, 1.37)	1.07 (0.6, 1.59)
A&E (number of attendances)	0.77 (0.56, 0.99)	0.62 (0.42, 0.88)	0.15 (-0.18, 0.46)
Other hospital e.g. ward visits (number)	0.49 (0.2, 0.82)	0.44 (0.18, 0.79)	0.04 (-0.38, 0.47)
GP visits (number of contacts)	0.25 (0.17, 0.34)	0.21 (0.14, 0.28)	0.04 (-0.07, 0.16)
Home visits (number of contacts)	1 (0.78, 1.24)	0.99 (0.75, 1.25)	0.01 (-0.33, 0.34)
School visits (number of contacts)	0.3 (0.2, 0.41)	0.24 (0.17, 0.32)	0.06 (-0.07, 0.19)
Training sessions (recorded sessions)	14.6 (12.99, 16.22)	13.83 (12.7, 14.99)	0.77 (-1.17, 2.74)
PA21A Infectious or non-infectious gastroenteritis, with CC	0.02 (0, 0.05)	0 (0, 0)	0.02 (0, 0.04)

PA67Z Diabetes mellitus, with ketoacidosis or coma	0.13 (0.07, 0.2)	0.11 (0.06, 0.17)	0.02 (-0.07, 0.11)
PA68Z Diabetes mellitus, without ketoacidosis or coma	0.74 (0.65, 0.83)	0.72 (0.64, 0.81)	0.02 (-0.1, 0.14)
PA69Z Nephritic and nephrotic renal Diseases	0 (0, 0)	0.01 (0, 0.02)	-0.01 (-0.02, 0)
XB05Z Paediatric critical care intensive care basic	0.01 (0, 0.02)	0.02 (0, 0.06)	-0.01 (-0.06, 0.03)
XB07Z Paediatric critical care high dependency	0.15 (0.03, 0.32)	0.05 (0.01, 0.11)	0.09 (-0.04, 0.27)

Table 21: Resource use in the 12-month from randomisation

Items of resource use (units)	CSII (n=144) mean (95% CI)	MDI (n=149) mean (95% CI)	Difference (95% CI)
Healthcare professional contacts (number of telephone calls, faxes, texts or e-mails)	21.15 (18.31, 23.99)	16.87 (14.62, 19.25)	4.29 (0.64, 7.98)
Scheduled outpatient (number of visits)	4 (4, 4)	4 (4, 4)	0 (,)
Unscheduled outpatient visits (number of visits)	10.85 (9.6, 12.08)	10.81 (9.65, 11.98)	0.05 (-1.63, 1.73)
A&E (number of attendances)	0.85 (0.51, 1.24)	0.4 (0.24, 0.58)	0.44 (0.07, 0.88)
Other hospital e.g. ward visits (number)	0.33 (0.1, 0.67)	0.26 (0.11, 0.44)	0.06 (-0.23, 0.43)
GP visits (number of contacts)	1.46 (1.16, 1.78)	1.2 (0.99, 1.42)	0.26 (-0.11, 0.64)
Home visits (number of contacts)	2.45 (1.91, 3.1)	1.99 (1.6, 2.42)	0.46 (-0.23, 1.22)
School visits (number of contacts)	1.4 (1.14, 1.69)	1.5 (1.19, 1.85)	-0.1 (-0.53, 0.32)
Training sessions (recorded sessions)*	24.79 (21.87, 27.92)	22.45 (19.38, 25.54)	2.34 (-1.89, 6.61)
Insulin (mean prescribed daily units)	71.61 (62.76, 81.78)	66.32 (58.81, 74.2)	5.05 (-6.6, 17.53)
FZ62Z Diagnostic and intermediate procedures on the upper GI tract	0.01 (0, 0.02)	0.02 (0, 0.05)	-0.01 (-0.04, 0.02)
PA21A Infectious or non-infectious gastroenteritis, with CC	0.01 (0, 0.03)	0.01 (0, 0.02)	0.01 (-0.01, .)
PA25B Major gastrointestinal disorders without CC	0.02 (0, 0.05)	0.01 (0, 0.02)	0.01 (-0.01, 0.05)
PA67Z Diabetes mellitus, with ketoacidosis or coma	0 (0, 0)	0.01 (0, 0.02)	-0.01 (-0.02, .)
PA68Z Diabetes mellitus, without ketoacidosis or coma	0.17 (0.08, 0.27)	0.07 (0.03, 0.12)	0.09 (0, 0.21)
Other HRGs	0.09 (0.04, 0.15)	0.07 (0.03, 0.12)	0.02 (-0.06, 0.09)

*Training sessions were not included in the total cost as they were recorded as contacts with healthcare professionals

Table 22: Disaggregated and total 12-month costs from randomisation, by intervention group.

Items of resource use	CSII (n=144) mean £ (95% CI)	MDI (n=149) mean £ (95% CI)	Difference mean £ (95% CI)
Consumables (e.g. needles, infusion sets, reservoirs)	1841 (1826, 1861)	664 (664, 664)	1177 (1162, 1197)
Device (pump 4-year lifespan or 2 pen devices)	600 (596, 606)	80 (80, 80)	520 (516, 526)
Insulin (prescribed)	422 (364, 486)	482 (426, 541)	-60 (-142, 24)
Healthcare professional contacts (telephone calls, faxes, texts or e-mails)	138 (117, 162)	108 (92, 124)	30 (3, 59)
Scheduled outpatients visits	434 (434, 434)	434 (434, 434)	0 (0, 0)
Unscheduled outpatient visits	309 (272, 346)	328 (292, 366)	-19 (-71, 33)
Inpatient stays costed from HRGs	387 (245, 553)	219 (142, 306)	168 (5, 352)
A&E	26 (16, 39)	13 (8, 19)	13 (2, 27)
Other hospital e.g. ward visits	3 (1, 7)	3 (1, 5)	1 (-3, 5)
GP visits	71 (56, 88)	57 (45, 69)	15 (-5, 35)
Home visits	106 (80, 138)	83 (66, 100)	23 (-9, 59)
School visits	53 (43, 64)	56 (44, 69)	-3 (-19, 13)
Concomitant medications	12 (8, 17)	15 (8, 23)	-2 (-12, 6)
Total cost	4404 (4197, 4642)	2541 (2412, 2672)	1863 (1620, 2137)

Figure 5: Mean utility values (95% CI) over 12-months for the base case analysis

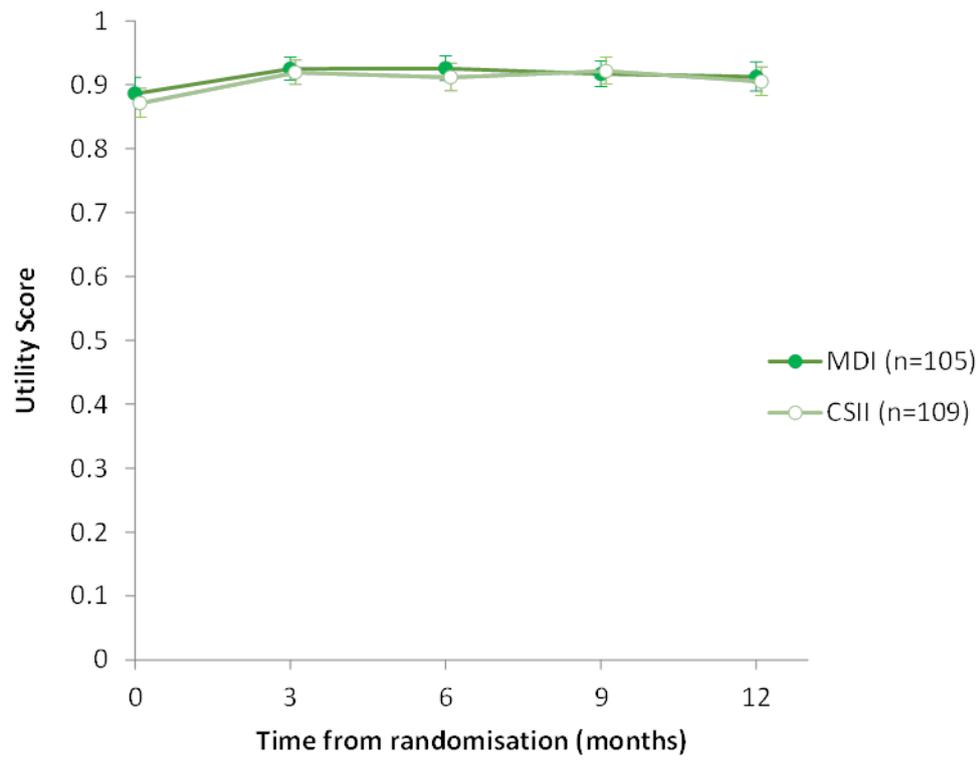
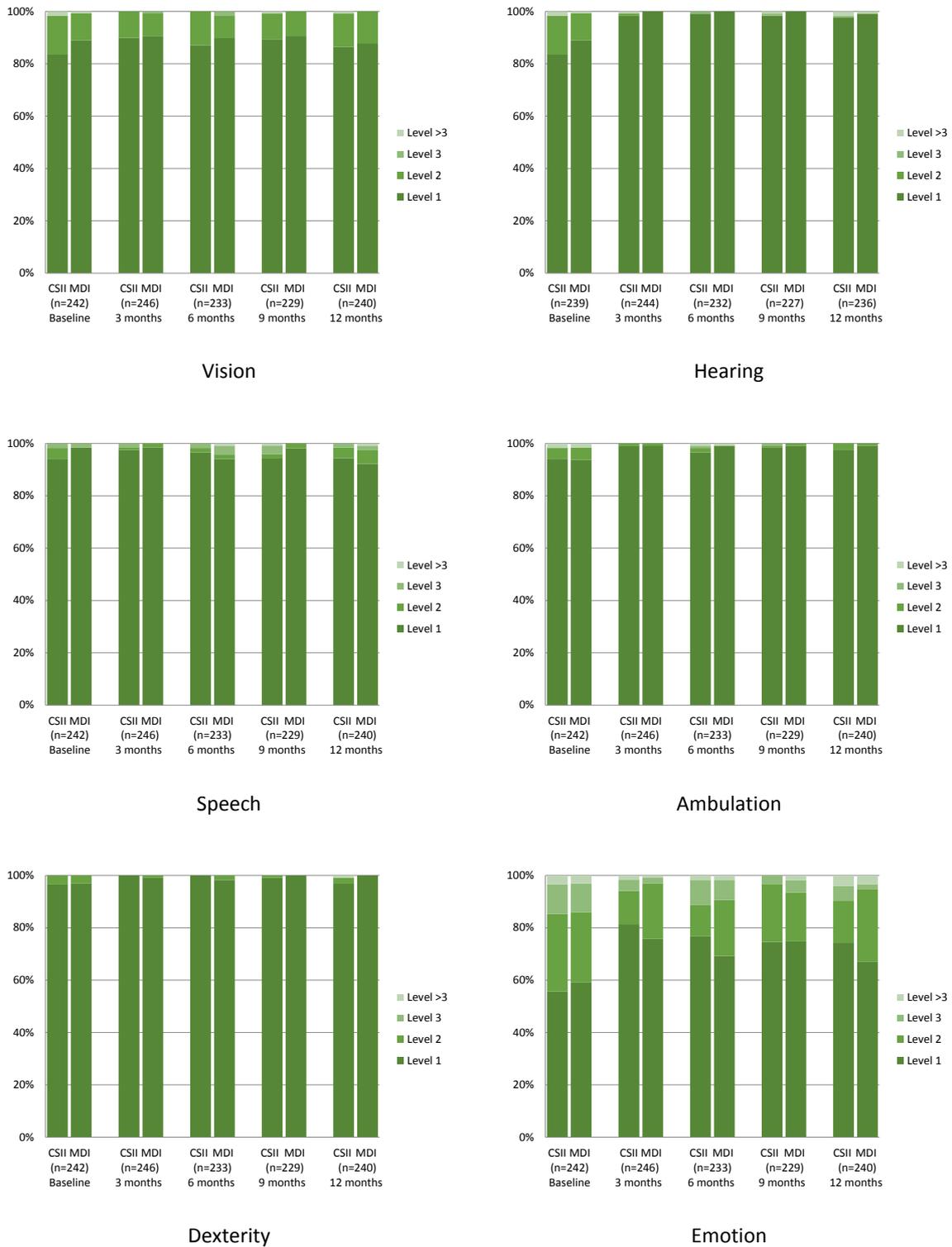


Figure 6: Distribution of responses to HUI domain, by intervention group, over time



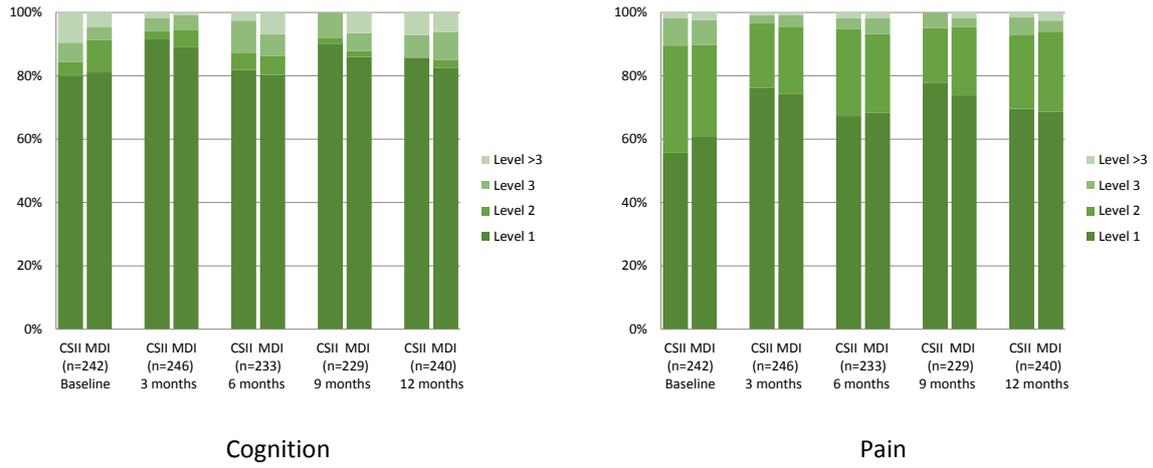


Figure 7: Cost-effectiveness plane presenting the joint uncertainty in incremental costs and QALYs

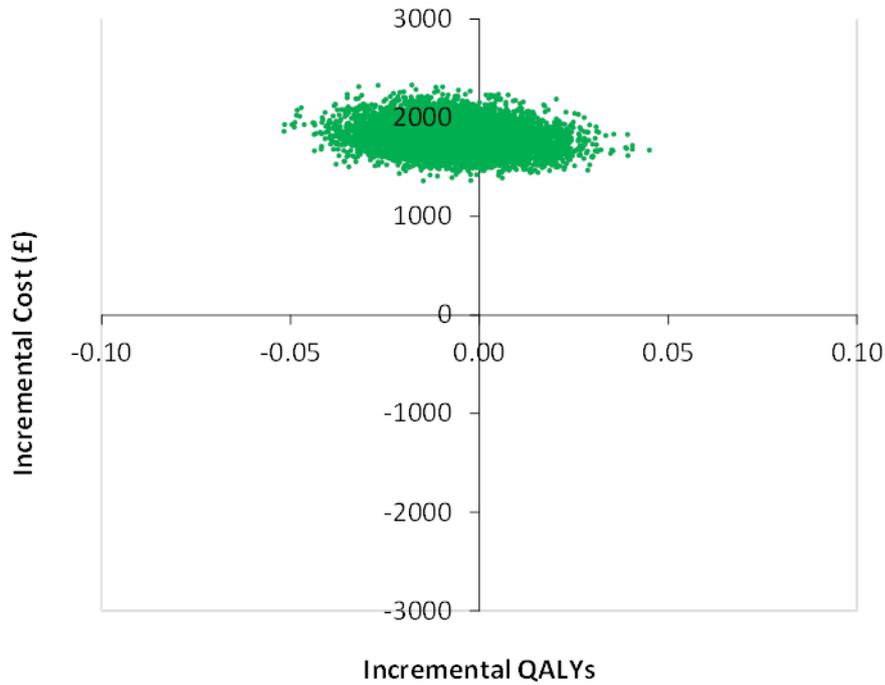


Figure 8: Cost-effectiveness acceptability curve indicating the probability of CSII being cost-effective for different thresholds of cost-effectiveness

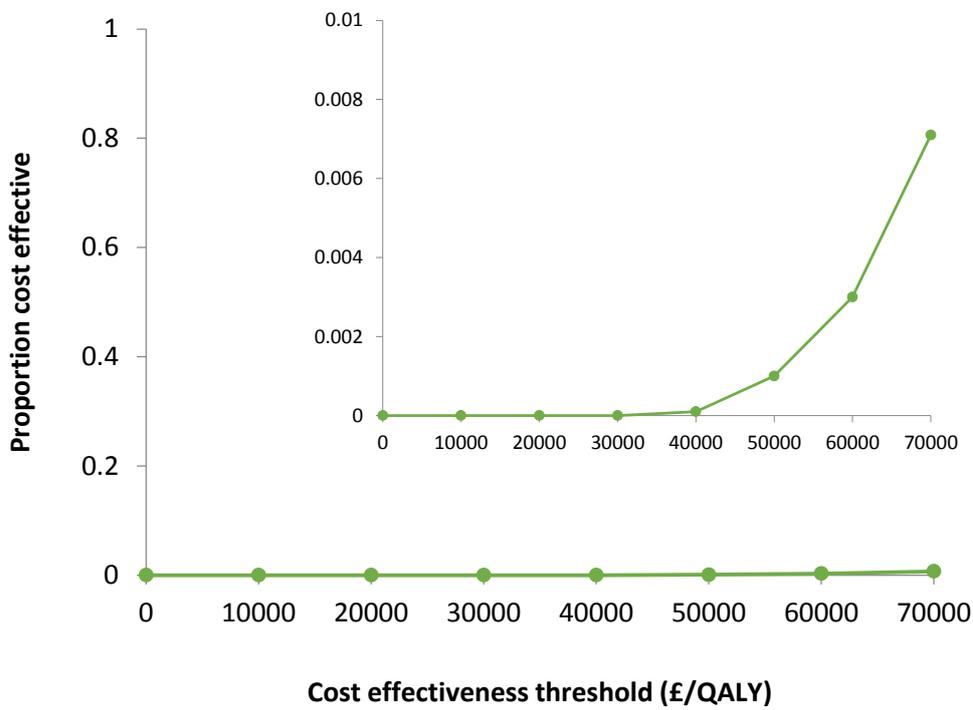


Table 23: Incremental analysis of the cost-effectiveness of CSII

	CSII (n=109) mean (95% CI)	MDI (n=105) mean (95% CI)	Difference mean (95% CI)	ICER
Costs (£)	4,404 (4,197, 4642)	2,541 (2,412, 2,672)	1,863 (1,620, 2,137)	CSII dominated
QALYs	0.910 (0.892, 0.927)	0.916 (0.899, 0.933)	-0.006 (-0.031, 0.018)	

Table 24: Sensitivity analyses for different methods of calculating QALYs and consideration of missing data

Scenario	CSII mean (95% CI)	MDI mean (95% CI)	Difference mean (95% CI)
QALYs (base case)	0.910 (0.892, 0.927) (n=105)	0.916 (0.899, 0.933) (n=109)	-0.006 (-0.031, 0.018)
QALYs (Canadian tariffs)	0.908 (0.884, 0.929) (n=105)	0.912 (0.887, 0.933) (n=109)	-0.004 (-0.036, 0.029)
MICE imputed QALYs	0.910 (0.896, 0.923) (n=138)	0.915 (0.903, 0.926) (n=141)	-0.004 (-0.022, 0.014)

LOCF imputed QALYs	0.911 (0.896, 0.925) (n=138)	0.912 (0.896, 0.926) (n=141)	-0.001 (-0.022, 0.020)
Parental QALYs	0.914 (0.897, 0.930) (n=105)	0.915 (0.899, 0.931) (n=109)	-0.001 (-0.024, 0.023)
Child QALYs	0.910 (0.892, 0.927) (n=105)	0.916 (0.899, 0.932) (n=109)	-0.006 (-0.031, 0.018)