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Supplementary Material

Supplementary material; Table 1: Deciles of Income Deprivation

Country	Decile	Alive at 30 Days								Dead at 30 days							
		SHS		IM Long Nail		IM Short Nail		All		SHS		IM Long Nail		IM Short Nail		All	
		N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
England	1	4,412	(7.6)	455	(9.2)	360	(9.2)	5,227	(7.8)	360	(7.4)	54	(11.6)	30	(8.5)	444	(7.8)
	2	5,495	(9.4)	503	(10.1)	399	(10.2)	6,397	(9.5)	467	(9.6)	63	(13.5)	42	(12.0)	572	(10.1)
	3	5,896	(10.1)	499	(10.0)	375	(9.6)	6,770	(10.1)	572	(11.8)	39	(8.4)	37	(10.5)	648	(11.4)
	4	6,219	(10.7)	556	(11.2)	421	(10.8)	7,196	(10.7)	544	(11.2)	45	(9.7)	36	(10.3)	625	(11.0)
	5	6,229	(10.7)	497	(10.0)	412	(10.6)	7,138	(10.6)	542	(11.1)	58	(12.4)	37	(10.5)	637	(11.2)
	6	6,391	(11.0)	528	(10.6)	405	(10.4)	7,324	(10.9)	508	(10.4)	55	(11.8)	44	(12.5)	607	(10.7)
	7	6,283	(10.8)	510	(10.3)	411	(10.5)	7,204	(10.7)	524	(10.8)	38	(8.2)	38	(10.8)	600	(10.6)
	8	6,075	(10.4)	472	(9.5)	393	(10.1)	6,940	(10.3)	517	(10.6)	38	(8.2)	32	(9.1)	587	(10.3)
	9	5,763	(9.9)	423	(8.5)	378	(9.7)	6,564	(9.8)	425	(8.7)	36	(7.7)	29	(8.3)	490	(8.6)
	10	5,480	(9.4)	526	(10.6)	351	(9.0)	6,357	(9.5)	408	(8.4)	40	(8.6)	26	(7.4)	474	(8.3)
Wales	1	286	(7.6)	34	(7.9)	9	(14.3)	329	(7.8)	27	(9.6)	3	(7.9)	2	(28.6)	32	(9.8)
	2	368	(9.8)	52	(12.0)	7	(11.1)	427	(10.1)	28	(10.0)	6	(15.8)	2	(28.6)	36	(11.1)
	3	373	(10.0)	45	(10.4)	5	(7.9)	423	(10.0)	30	(10.7)	3	(7.9)	0	(0.0)	33	(10.2)
	4	423	(11.3)	50	(11.5)	7	(11.1)	480	(11.3)	38	(13.6)	4	(10.5)	0	(0.0)	42	(12.9)
	5	376	(10.0)	37	(8.5)	5	(7.9)	418	(9.9)	19	(6.8)	2	(5.3)	0	(0.0)	21	(6.5)
	6	431	(11.5)	50	(11.5)	5	(7.9)	486	(11.5)	31	(11.1)	4	(10.5)	0	(0.0)	35	(10.8)
	7	398	(10.6)	33	(7.6)	4	(6.3)	435	(10.3)	27	(9.6)	5	(13.2)	2	(28.6)	34	(10.5)
	8	382	(10.2)	33	(7.6)	9	(14.3)	424	(10.0)	24	(8.6)	3	(7.9)	0	(0.0)	27	(8.3)
	9	410	(10.9)	49	(11.3)	8	(12.7)	467	(11.0)	35	(12.5)	3	(7.9)	0	(0.0)	38	(11.7)
	10	298	(8.0)	50	(11.5)	4	(6.3)	352	(8.3)	21	(7.5)	5	(13.2)	1	(14.3)	27	(8.3)
Missing	0	4 452	(6.7)	571	(9.6)	208	(5.0)	5 231	(6.8)	339	(6.2)	40	(7.4)	13	(3.5)	392	(6.1)

Supplementary material; Table 2: Multiple Imputation via Chained Equations Model (MICE) model specification

Outcome	Link function	Predictors									
		i.Death	c.Age at event	c.Pre-op AMTS	i.Admitted From	i.Pre-op mobility	i.Fracture type	i.Pathology	i.ASA Grade	i.prosthesis	i.Dow of admission
Pre-op AMTS	linear	✓	✓			✓		✓	✓	✓	
Pre-op mobility	ologit	✓	✓	✓	✓			✓	✓	✓	
Pathology	mlogit	✓	✓	✓	✓	✓			✓	✓	
ASA Grade	ologit	✓	✓	✓	✓	✓		✓		✓	
Falls Assessment	logit	✓	✓	✓		✓			✓	✓	✓
MDT	logit	✓	✓			✓			✓	✓	✓
Anaesthetic	mlogit	✓	✓	✓			✓		✓	✓	

AMTS = Abbreviated Mental Test Score, DOW = Day of the week, MDT = Multi-disciplinary Team, i. = indicator variable parameterisation, c. = continuous parameterisation

Supplementary material; Table 3: Sensitivity analyses for 3 exposure groups defined by the implants used

Model	Exposure	<u>Complete Cases</u>			<u>Multiple Imputation</u>		
		OR	(95% CI)	P=	OR	(95% CI)	P=
5	Sliding hip screw	1			1		
	Intramedullary short nail	1.191	(1.029, 1.379)	0.019	1.116	(0.995, 1.251)	0.060
	Intramedullary long nail	1.147	(1.013, 1.300)	0.031	1.109	(1.006, 1.222)	0.038
6	Sliding hip screw	1			1		
	Intramedullary short nail	1.188	(1.027, 1.375)	0.020	1.115	(0.994, 1.250)	0.062
	Intramedullary long nail	1.145	(1.011, 1.297)	0.033	1.110	(1.007, 1.223)	0.036

Supplementary material; Table 4: Sensitivity analyses for 2 exposure groups defined by the implants used (sliding hip screw, intramedullary nail). Model 5 - elapsed month parameterisation; Model 6 - trigonometric regression; Fourier series seasonal specification.

Model	Exposure	<u>Complete Cases</u>			<u>Multiple Imputation</u>		
		OR	(95% CI)	P=	OR	(95% CI)	P=
5	Sliding hip screw	1			1		
	Intramedullary nail	1.165	(1.056, 1.286)	0.0023	1.112	(1.029, 1.201)	0.0069
6	Sliding hip screw	1			1		
	Intramedullary nail	1.163	(1.054, 1.283)	0.0027	1.112	(1.030, 1.201)	0.0068

Supplementary material; Table 5: Crude 30-day mortality rates (%) by ASA grade for subsets of trochanteric fractures with complete case data

	ASA	Sliding Hip Screw (SHS)	Intramedullary Nail (IMN)	Total
All	I & II	2.51 (n=13,445)	3.31 (n=1,962)	2.62 (n=15,407)
	III	7.27 (n=26,536)	8.01 (n=3,907)	7.37 (n=30,443)
	IV & V	18.38 (n=45,693)	19.80 (n=919)	18.58 (n=6,631)
Trochanteric fractures excluding pathological (malignancy) & atypical	I & II	2.53 (n=13,344)	3.30 (n=1,907)	2.62 (n=15,251)
	III	7.23 (n= 26,248)	7.89 (n=3,753)	7.31 (n=30,001)
	IV & V	18.29 (n=5,614)	19.04 (n=851)	18.39 (n=6,465)