

Implant Summary Report for:

DePuy

Marathon Cup

Comprising PRIMARY hips implanted up to:
NJR Database extract:

10 August 2020
09 October 2020

Produced on:
Licensed for use until:

16 October 2020
16 February 2021

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This report has been produced by the National Joint Registry of England, Wales and Northern Ireland (NJR). It summarises usage and outcomes associated with the Marathon Cup up to the specified dates. This analysis is based on data collected by the NJR and PROMs data collected by NHS Digital for the following combinations of products:

Acetabular components

Marathon Cup

Femoral Component

Any Femoral Components manufactured by DePuy

Appendix A lists details of all Marathon Cup components included in this report.

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NJR Recorded Usage

Implant Usage

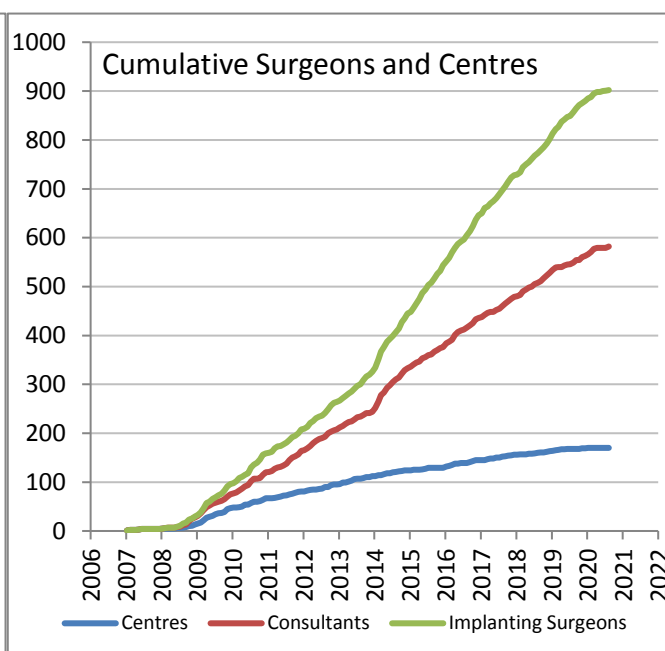
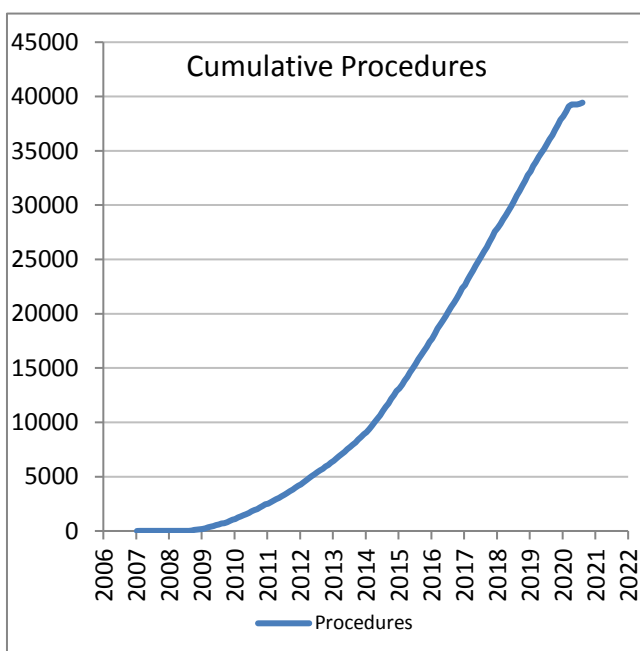
Date of first recorded usage in the NJR: **28 January 2004**

Date of last recorded usage in this dataset: **10 August 2020**

Maximum implantation time: 14.6 years

Mean implantation time: 4.2 years

Totals Recorded in NJR	Cumulative Total
Procedures	39,439
Patients	35,812
Centres	170
Consultants	582
Implanting Surgeons	902



Current Outcome	Year of implantation													Total	%
	Pre-2009	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
Death	48	261	370	387	416	478	611	516	432	284	179	97	10	4089	10.4%
Revised	5	25	26	34	38	47	58	61	57	45	39	23	3	461	1.2%
Unrevised	131	613	1019	1337	1688	2110	3374	3954	4459	4903	4998	4942	1361	34889	88.5%
Total	184	899	1415	1758	2142	2635	4043	4531	4948	5232	5216	5062	1374	39439	100%

Patient / Procedure Details

Patient Details

	Marathon Cup	All other Cemented Cups in NJR	All NJR hip replacement
Total Procedures	39,439	378,085	1,240,128
Total Patients	35,812	336,353	1,046,258
Demographics			
Mean age	70.9	73.7	68.6
< 50	3.4%	1.3%	5.9%
50 – 59	9.4%	5.2%	13.8%
60 – 69	26.7%	22.2%	28.9%
70 – 79	40.0%	44.5%	34.7%
≥ 80	20.5%	26.8%	16.6%
Median BMI	28	28	28
% BMI information available	65.0%	58.0%	62.4%
Underweight (BMI < 18.5)	0.9%	1.1%	0.9%
Normal (18.5 ≤ BMI < 25)	20.4%	22.5%	20.7%
Overweight (25 ≤ BMI < 30)	39.3%	40.2%	39.6%
Obese I (30 ≤ BMI < 35)	26.1%	24.8%	25.8%
Obese II (35 ≤ BMI < 40)	10.2%	8.6%	9.7%
Obese III (BMI ≥ 40)	3.1%	2.8%	3.3%
% Male	36.8%	33.4%	40.2%
ASA Grades			
P1 - Fit and healthy	9.4%	10.8%	15.6%
P2 - Mild disease not incapacitating	70.6%	67.7%	67.7%
P3 - Incapacitating systemic disease	19.4%	20.6%	16.2%
P4 / P5	0.5%	0.8%	0.6%
Indications			
Osteoarthritis	89.67%	91.26%	91.36%
Rheumatoid Arthritis	1.68%	1.36%	1.32%
Avascular Necrosis	2.34%	2.19%	2.51%
Fractured Neck of Femur	5.05%	4.41%	3.59%
CDH/DDH	1.29%	0.54%	1.57%
Other	2.02%	2.23%	2.12%

Total of indications may exceed total number of implants, since more than one indication can be listed per case.

Revision and Survivorship

Reasons for Revision - all bearing types

Reasons for revision of primary procedures in which the implant was used.

Reason for Revision	Revised [†]	Expected Revisions [*]	p value
Unexplained Pain	24	30.32	0.266
Dislocation / Subluxation	106	156.23	<0.001
Adverse Soft Tissue Reaction	5	5.07	1
Infection	121	157.92	0.002
Aseptic Loosening - Stem	48	44.42	0.592
Aseptic Loosening - Socket	40	91.52	<0.001
Periprosthetic Fracture Stem	109	101.84	0.441
Periprosthetic Fracture Socket	4	5.92	0.527
Malalignment Stem	20	17.57	0.534
Malalignment Socket	19	22.51	0.514
Wear Of Acetabular Component	12	13.60	0.783
Lysis Stem	3	7.20	0.13
Lysis Socket	9	13.42	0.267
Implant Fracture Stem	6	8.59	0.482
Implant Fracture Socket	0	0.78	1
Implant Fracture Head	0	2.65	0.104
Dissociation of Liner	3	4.64	0.628
Other / reason not recorded	17	18.45	0.809
Total Revised	461	583.39	<0.001

[†] multiple reasons may be listed for one revision procedure^{*} Based on All NJR Cemented Cups, adjusted for agegroup, gender, indications, and implantation year

Significantly better, p < 0.001

Significantly better, p < 0.05

Significantly worse p < 0.05

Significantly worse p < 0.001



Components Revised	Number of procedures	Marathon Cup	All other Cemented Cups in NJR
Femoral only	147	32%	17%
Acetabular only	82	18%	26%
Both femoral and acetabular	162	35%	50%
Neither femoral nor acetabular revision recorded [*]	70	15%	7%

^{*} includes isolated head and/or liner exchange

Revision and Survivorship

Reasons for Revision - excluding Metal on Metal

Reasons for revision of non-MoM primary procedures in which the implant was used.

Reason for Revision	Revised [†]	Expected Revisions [*]	p value
Unexplained Pain	24	30.33	0.266
Dislocation / Subluxation	106	156.22	<0.001
Adverse Soft Tissue Reaction	5	4.91	0.818
Infection	121	157.88	0.002
Aseptic Loosening - Stem	48	44.43	0.592
Aseptic Loosening - Socket	40	91.56	<0.001
Periprosthetic Fracture Stem	109	101.84	0.441
Periprosthetic Fracture Socket	4	5.92	0.527
Malalignment Stem	20	17.57	0.534
Malalignment Socket	19	22.51	0.514
Wear Of Acetabular Component	12	13.61	0.783
Lysis Stem	3	7.21	0.13
Lysis Socket	9	13.43	0.267
Implant Fracture Stem	6	8.58	0.482
Implant Fracture Socket	0	0.79	1
Implant Fracture Head	0	2.65	0.103
Dissociation of Liner	3	4.64	0.628
Other / reason not recorded	17	18.45	0.809
Total Revised	461	583.20	<0.001

† multiple reasons may be listed for one revision procedure

* Based on All NJR Cemented Cups (excluding metal on metal), adjusted for agegroup, gender, indications, and implantation year

Significantly better, $p < 0.001$ Significantly better, $p < 0.05$ Significantly worse $p < 0.05$ Significantly worse $p < 0.001$ 

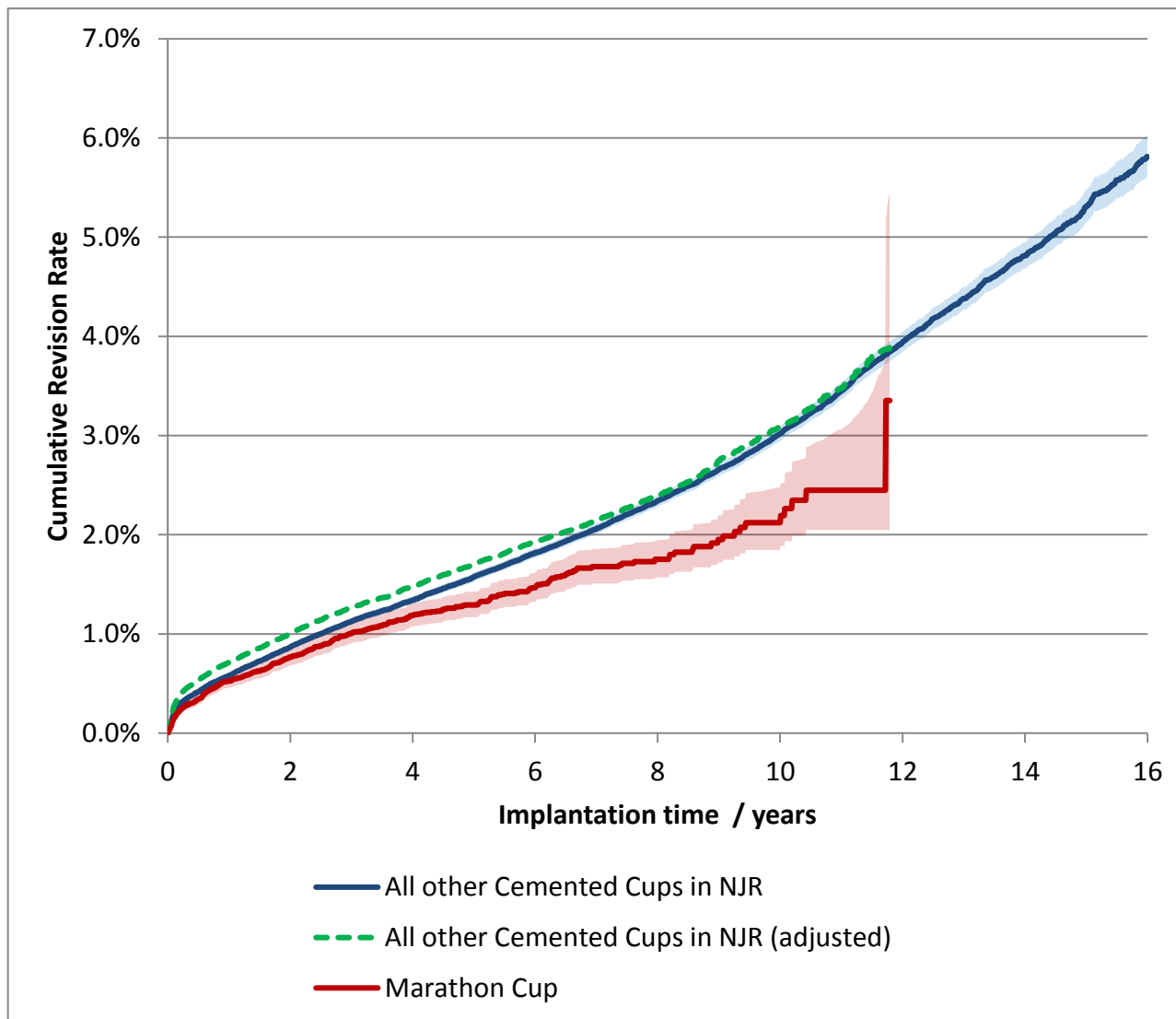
Components Revised	Number of procedures	Marathon Cup	All other Cemented Cups in NJR
Femoral only	147	32%	17%
Acetabular only	82	18%	26%
Both femoral and acetabular	162	35%	50%
Neither femoral nor acetabular revision recorded *	70	15%	7%

* includes isolated head and/or liner exchange

Revision and Survivorship

Cumulative Revision Rate

Endpoint: All reasons for revision. All Bearing types



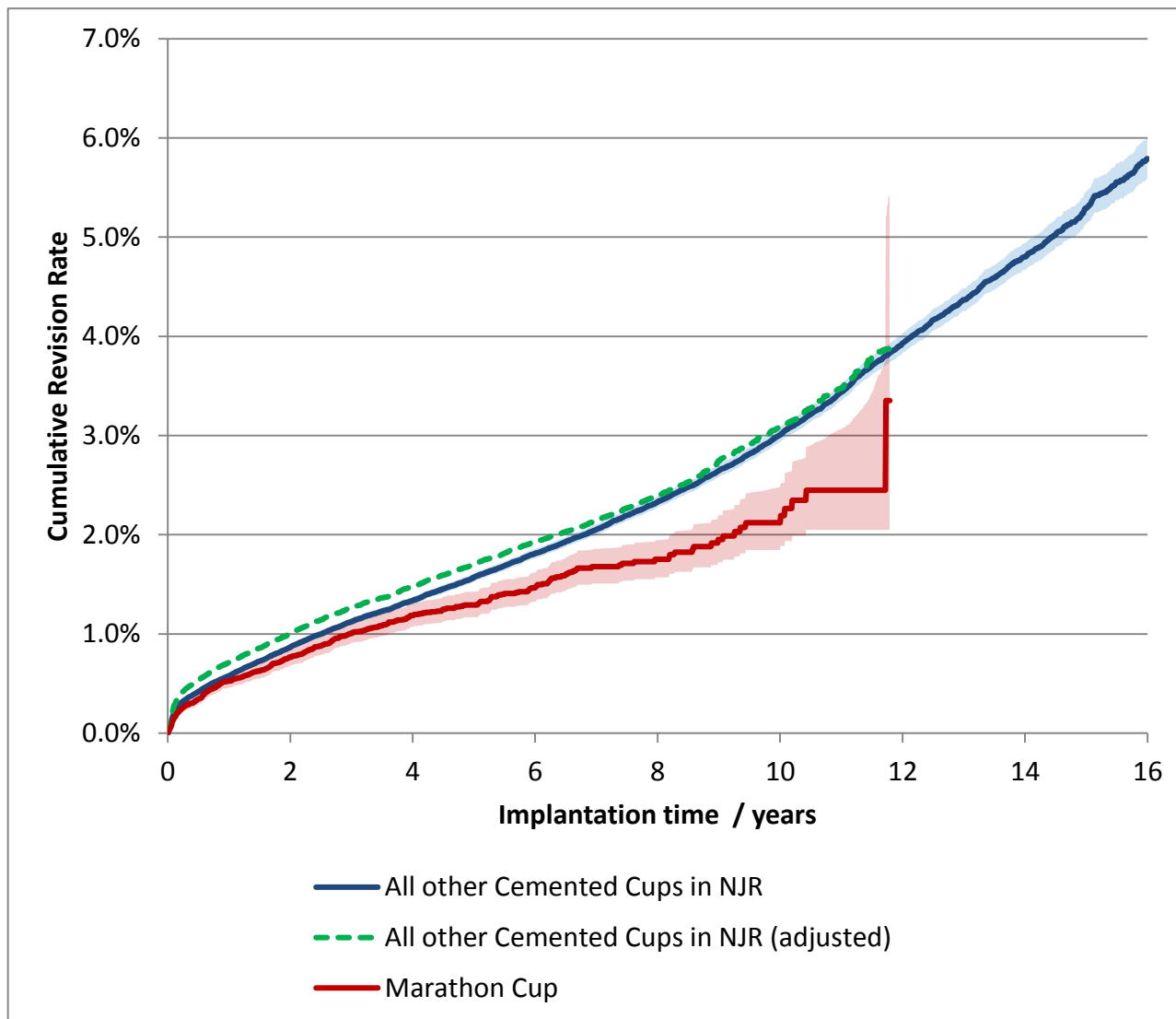
Cox Proportional Hazards model for revision risk ratio of Marathon Cup / All other Cemented Cups in NJR, with endpoint as any revision.

Adjustment	Hazard Ratio (95% CI)	p-value
All bearings. Unadjusted.	0.82 (0.75 - 0.90)	<0.001
All bearings. Adjusted for age, gender, year cohort and indications.	0.76 (0.69 - 0.84)	<0.001

Revision and Survivorship

Cumulative Revision Rate

Endpoint: All reasons for revision. Excluding Metal-on-Metal



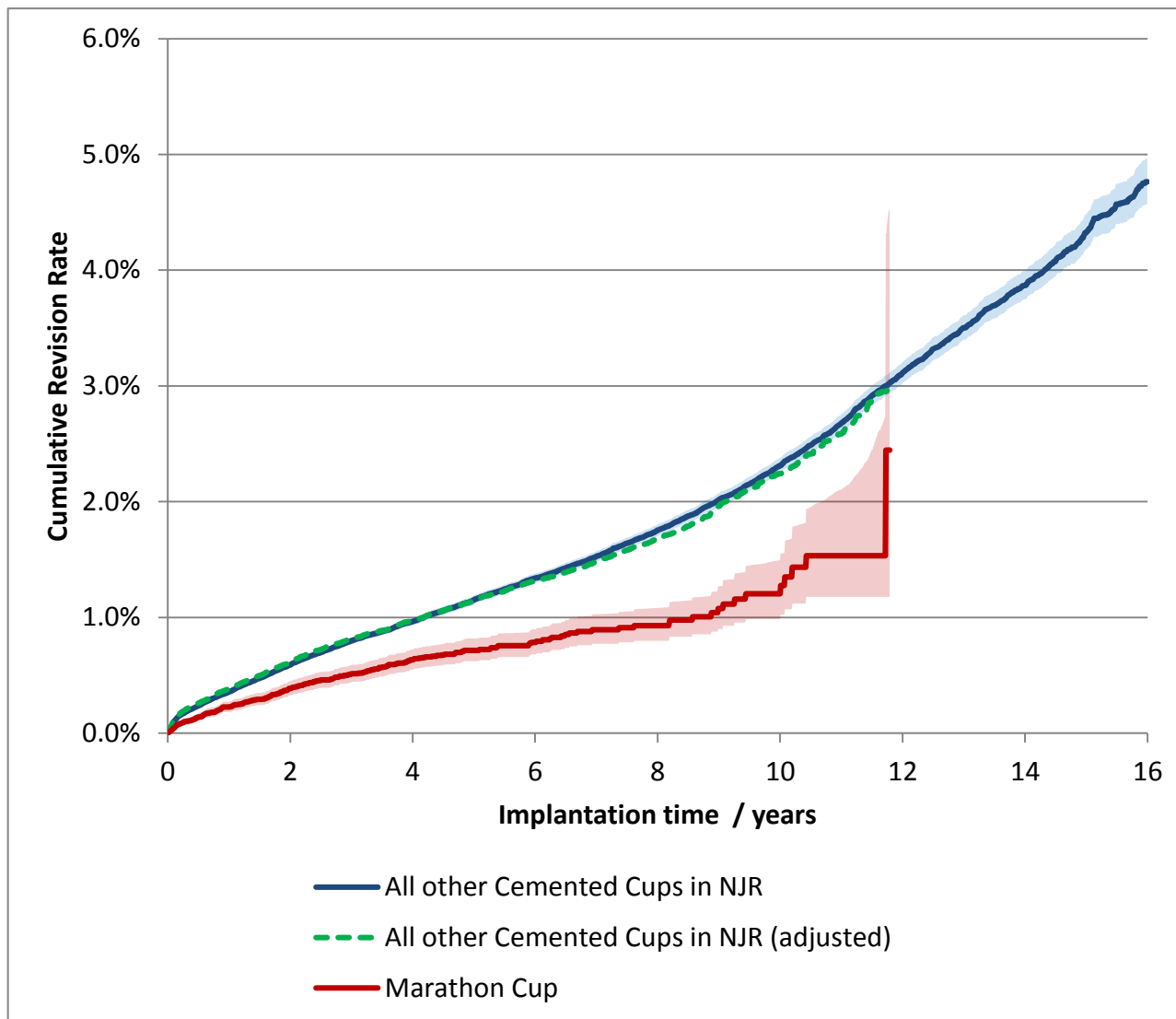
Cox Proportional Hazards model for revision risk ratio of Marathon Cup / All other Cemented Cups in NJR, with endpoint as any revision.

Adjustment	Hazard Ratio (95% CI)	p-value
Excluding MoM, Unadjusted.	0.82 (0.75 - 0.91)	<0.001
Excluding MoM. Adjusted for age, gender, year cohort and indications.	0.76 (0.69 - 0.84)	<0.001

Revision and Survivorship

Cumulative Revision Rate

Endpoint: Acetabular Revision. All Bearing types



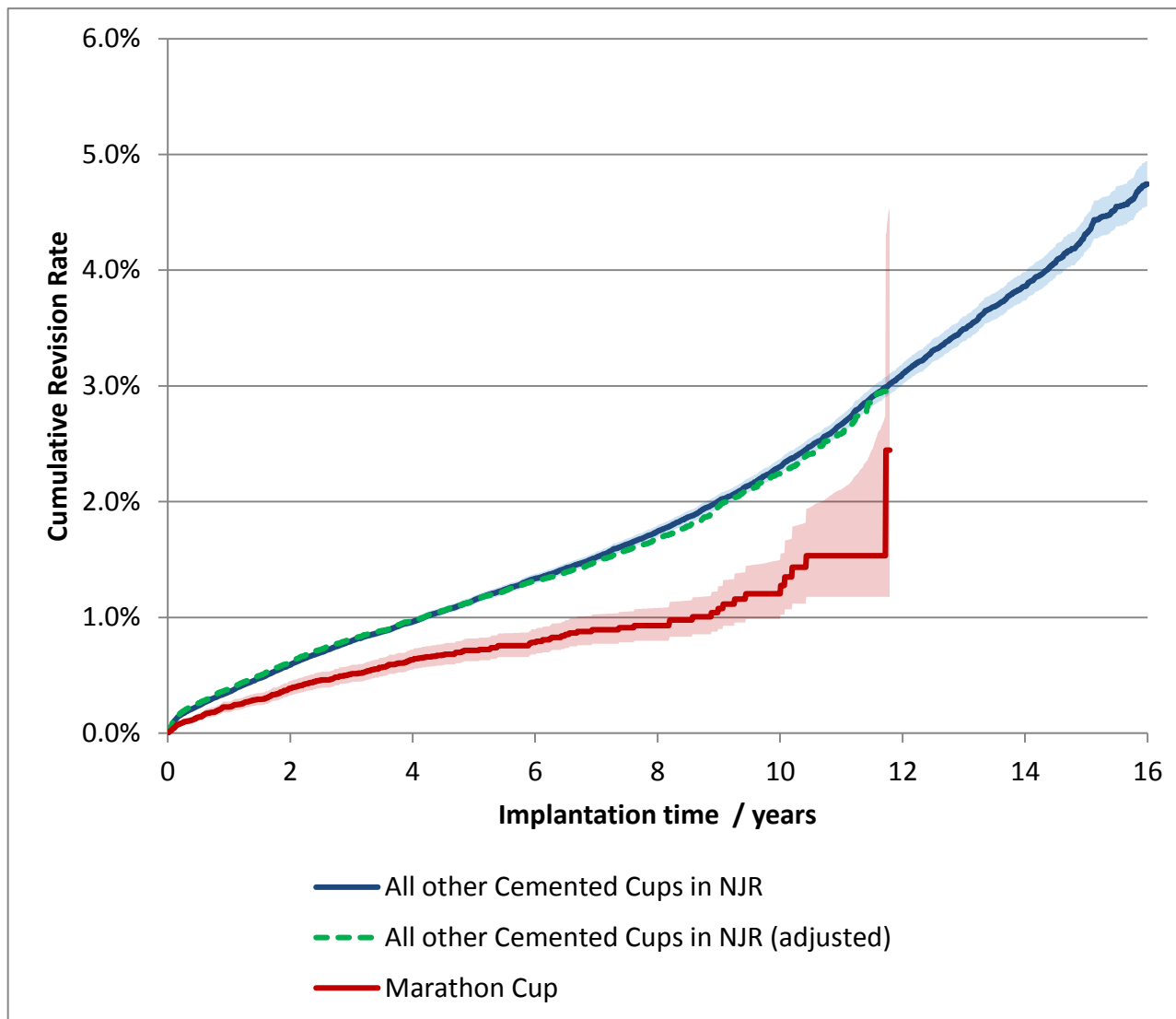
Cox Proportional Hazards model for revision risk ratio of Marathon Cup / All other Cemented Cups in NJR, with endpoint as any revision.

Adjustment	Hazard Ratio (95% CI)	p-value
All bearings. Unadjusted.	0.60 (0.53 - 0.69)	<0.001
All bearings. Adjusted for age, gender, year cohort and indications.	0.61 (0.53 - 0.70)	<0.001

Revision and Survivorship

Cumulative Revision Rate

Endpoint: Acetabular Revision. Excluding Metal-on-Metal



Cox Proportional Hazards model for revision risk ratio of Marathon Cup / All other Cemented Cups in NJR, with endpoint as any revision.

Adjustment	Hazard Ratio (95% CI)	p-value
Excluding MoM. Unadjusted.	0.61 (0.53 - 0.69)	<0.001
Excluding MoM. Adjusted for age, gender, year cohort and indications.	0.61 (0.54 - 0.70)	<0.001

Revision and Survivorship

Cumulative Revision Rate

Endpoint: All revisions

Period /years	All Bearing types				Excluding Metal on Metal Bearings			
	At Risk	Marathon Cup	All other Cemented Cups in NJR	All THR	At Risk	Marathon Cup	All other Cemented Cups in NJR	All THR
0	39,439	-	-	-	39,439	-	-	-
1	35,332	0.5% (0.5% - 0.6%)	0.6% (0.6% - 0.6%)	0.8% (0.8% - 0.8%)	35,332	0.5% (0.5% - 0.6%)	0.6% (0.6% - 0.6%)	0.8% (0.8% - 0.8%)
2	29,723	0.8% (0.7% - 0.9%)	0.9% (0.8% - 0.9%)	1.1% (1.1% - 1.2%)	29,723	0.8% (0.7% - 0.9%)	0.9% (0.8% - 0.9%)	1.1% (1.1% - 1.1%)
3	24,117	1.0% (0.9% - 1.1%)	1.1% (1.1% - 1.2%)	1.5% (1.5% - 1.5%)	24,117	1.0% (0.9% - 1.1%)	1.1% (1.1% - 1.2%)	1.4% (1.3% - 1.4%)
4	18,817	1.2% (1.1% - 1.3%)	1.3% (1.3% - 1.4%)	1.8% (1.8% - 1.8%)	18,817	1.2% (1.1% - 1.3%)	1.3% (1.3% - 1.4%)	1.6% (1.6% - 1.6%)
5	13,929	1.3% (1.2% - 1.4%)	1.6% (1.5% - 1.6%)	2.2% (2.1% - 2.2%)	13,929	1.3% (1.2% - 1.4%)	1.6% (1.5% - 1.6%)	1.8% (1.8% - 1.8%)
6	9,750	1.5% (1.3% - 1.6%)	1.8% (1.8% - 1.9%)	2.6% (2.5% - 2.6%)	9,750	1.5% (1.3% - 1.6%)	1.8% (1.8% - 1.9%)	2.0% (2.0% - 2.1%)
7	6,593	1.7% (1.5% - 1.9%)	2.1% (2.0% - 2.1%)	3.0% (2.9% - 3.0%)	6,593	1.7% (1.5% - 1.9%)	2.1% (2.0% - 2.1%)	2.3% (2.3% - 2.3%)
8	4,497	1.8% (1.6% - 1.9%)	2.3% (2.3% - 2.4%)	3.4% (3.4% - 3.4%)	4,497	1.8% (1.6% - 1.9%)	2.3% (2.3% - 2.4%)	2.6% (2.5% - 2.6%)
9	2,705	2.0% (1.7% - 2.2%)	2.7% (2.6% - 2.7%)	3.9% (3.8% - 3.9%)	2,705	2.0% (1.7% - 2.2%)	2.6% (2.6% - 2.7%)	2.9% (2.8% - 2.9%)
10	1,421	2.1% (1.8% - 2.5%)	3.0% (2.9% - 3.1%)	4.3% (4.3% - 4.4%)	1,421	2.1% (1.8% - 2.5%)	3.0% (2.9% - 3.1%)	3.2% (3.2% - 3.2%)
11	483	2.4% (2.0% - 3.1%)	3.5% (3.4% - 3.5%)	4.9% (4.8% - 4.9%)	483	2.4% (2.0% - 3.1%)	3.4% (3.4% - 3.5%)	3.6% (3.5% - 3.6%)
12		(-)	3.9% (3.8% - 4.0%)	5.4% (5.4% - 5.5%)		(-)	3.9% (3.8% - 4.0%)	4.0% (4.0% - 4.1%)
13		(-)	4.4% (4.3% - 4.5%)	5.9% (5.9% - 6.0%)		(-)	4.4% (4.3% - 4.5%)	4.5% (4.4% - 4.5%)
14		(-)	4.8% (4.7% - 4.9%)	6.5% (6.4% - 6.6%)		(-)	4.8% (4.7% - 4.9%)	4.9% (4.8% - 5.0%)
15		(-)	5.3% (5.1% - 5.5%)	7.0% (6.9% - 7.1%)		(-)	5.3% (5.1% - 5.5%)	5.4% (5.3% - 5.5%)

Cumulative revision rate with 95% confidence intervals

Rate is only reported for times where more than 40 remain at risk

Revision and Survivorship

Cumulative Revision Rate

Endpoint: Acetabular Revision

Period /years	All Bearing types				Excluding Metal on Metal Bearings			
	At Risk	Marathon Cup	All Other Cemented Cups in NJR	All THR	At Risk	Marathon Cup	All Other Cemented Cups in NJR	All THR
0	39,439	-	-	-	39,439	-	-	-
1	35,332	0.2% (0.2% - 0.3%)	0.4% (0.3% - 0.4%)	0.4% (0.4% - 0.4%)	35,332	0.2% (0.2% - 0.3%)	0.4% (0.3% - 0.4%)	0.4% (0.4% - 0.4%)
2	29,723	0.4% (0.3% - 0.4%)	0.6% (0.6% - 0.6%)	0.7% (0.7% - 0.7%)	29,723	0.4% (0.3% - 0.4%)	0.6% (0.6% - 0.6%)	0.6% (0.6% - 0.6%)
3	24,117	0.5% (0.4% - 0.6%)	0.8% (0.8% - 0.8%)	0.9% (0.9% - 0.9%)	24,117	0.5% (0.4% - 0.6%)	0.8% (0.8% - 0.8%)	0.8% (0.8% - 0.8%)
4	18,817	0.6% (0.5% - 0.7%)	1.0% (0.9% - 1.0%)	1.2% (1.1% - 1.2%)	18,817	0.6% (0.5% - 0.7%)	1.0% (0.9% - 1.0%)	1.0% (0.9% - 1.0%)
5	13,929	0.7% (0.6% - 0.8%)	1.2% (1.1% - 1.2%)	1.4% (1.4% - 1.5%)	13,929	0.7% (0.6% - 0.8%)	1.1% (1.1% - 1.2%)	1.1% (1.1% - 1.1%)
6	9,750	0.8% (0.7% - 0.9%)	1.3% (1.3% - 1.4%)	1.7% (1.7% - 1.8%)	9,750	0.8% (0.7% - 0.9%)	1.3% (1.3% - 1.4%)	1.3% (1.2% - 1.3%)
7	6,593	0.9% (0.8% - 1.0%)	1.5% (1.5% - 1.6%)	2.0% (2.0% - 2.1%)	6,593	0.9% (0.8% - 1.0%)	1.5% (1.5% - 1.6%)	1.4% (1.4% - 1.4%)
8	4,497	0.9% (0.8% - 1.1%)	1.8% (1.7% - 1.8%)	2.4% (2.3% - 2.4%)	4,497	0.9% (0.8% - 1.1%)	1.7% (1.7% - 1.8%)	1.6% (1.6% - 1.6%)
9	2,705	1.1% (0.9% - 1.3%)	2.0% (2.0% - 2.1%)	2.7% (2.7% - 2.8%)	2,705	1.1% (0.9% - 1.3%)	2.0% (1.9% - 2.1%)	1.8% (1.8% - 1.8%)
10	1,421	1.2% (1.0% - 1.5%)	2.3% (2.2% - 2.4%)	3.1% (3.1% - 3.2%)	1,421	1.2% (1.0% - 1.5%)	2.3% (2.2% - 2.4%)	2.0% (2.0% - 2.1%)
11	483	1.5% (1.2% - 2.1%)	2.7% (2.6% - 2.8%)	3.5% (3.5% - 3.6%)	483	1.5% (1.2% - 2.1%)	2.7% (2.6% - 2.7%)	2.3% (2.3% - 2.4%)
12		(-)	3.1% (3.0% - 3.2%)	4.0% (3.9% - 4.0%)		(-)	3.1% (3.0% - 3.2%)	2.7% (2.6% - 2.7%)
13		(-)	3.5% (3.4% - 3.6%)	4.4% (4.3% - 4.5%)		(-)	3.5% (3.4% - 3.6%)	3.0% (2.9% - 3.1%)
14		(-)	3.9% (3.7% - 4.0%)	4.8% (4.8% - 4.9%)		(-)	3.9% (3.7% - 4.0%)	3.4% (3.3% - 3.4%)
15		(-)	4.3% (4.2% - 4.5%)	5.3% (5.2% - 5.4%)		(-)	4.3% (4.2% - 4.5%)	3.8% (3.7% - 3.9%)

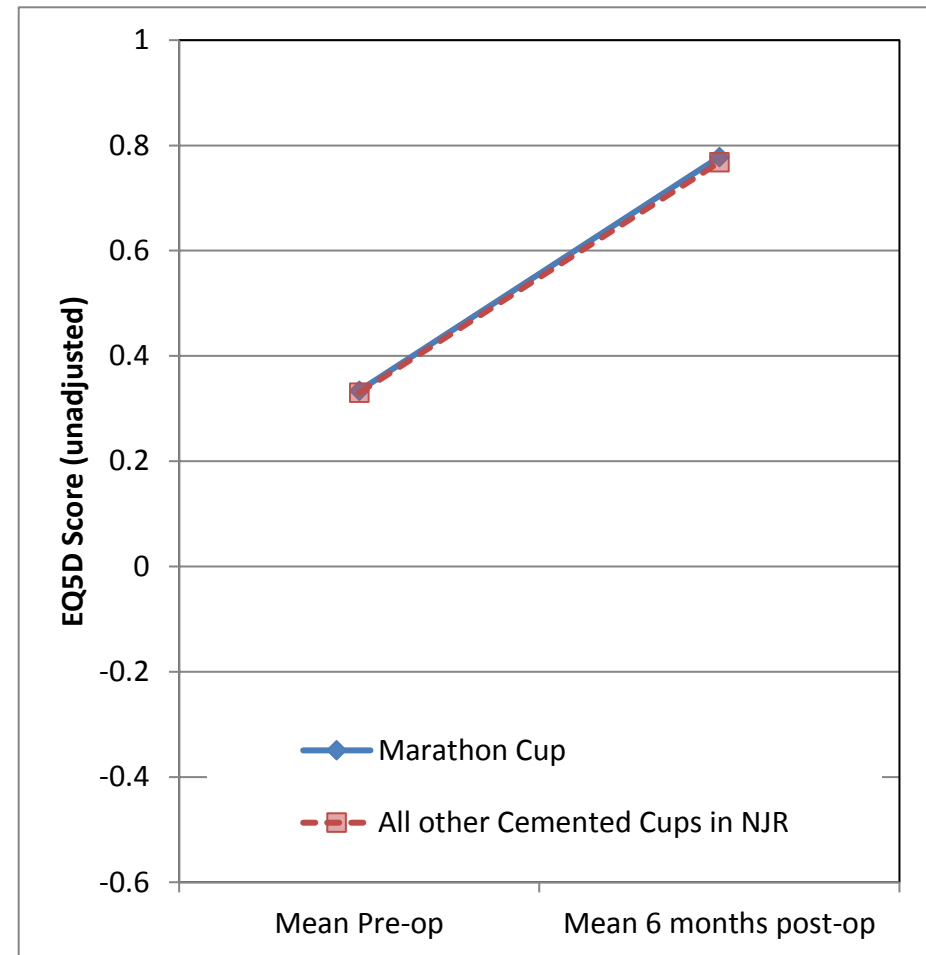
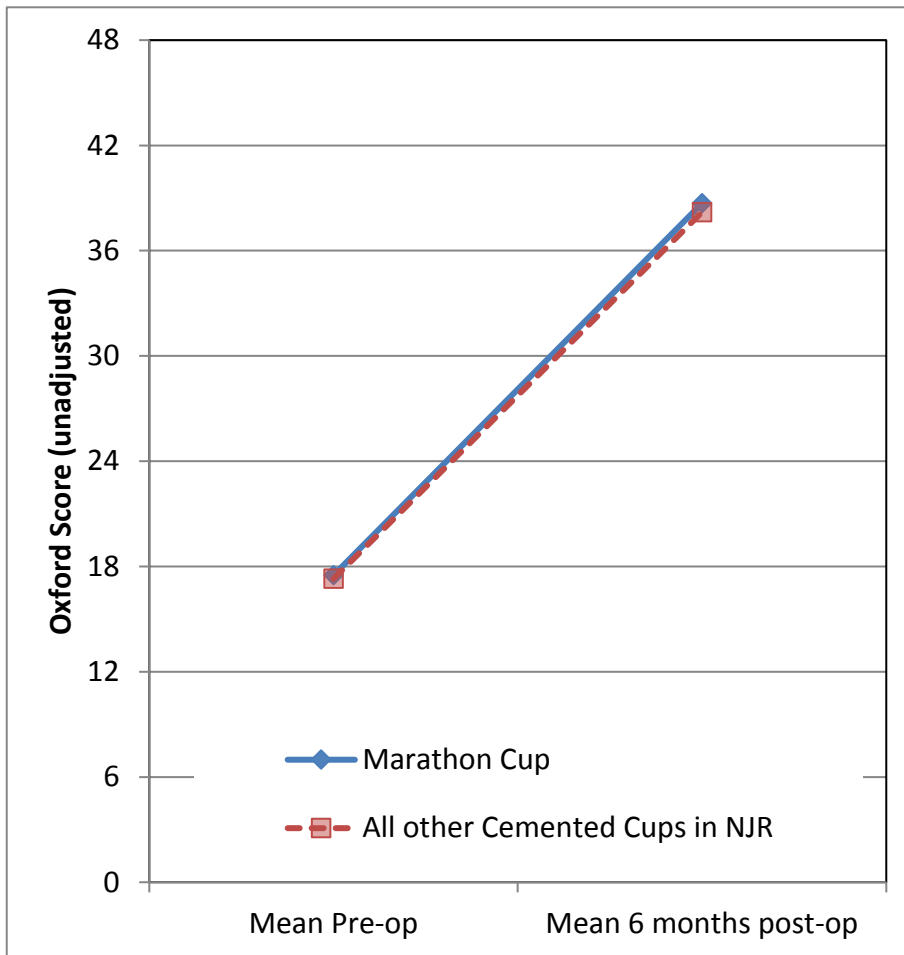
Cumulative revision rate with 95% confidence intervals

Rate is only reported for times where more than 40 remain at risk

Patient Reported Outcomes

Comprising PROMs data up to and including: 29/03/2018

PROMs Analysis



Patient Reported Outcomes

PROMs Analysis

Comprising PROMs data up to and including: 29/03/2018

Oxford Hip Score (0 - 48)	Marathon Cup	All other Cemented Cups in NJR	All THR in NJR
Paired Records	11,227	89,096	291,093
PreOp score	17.5 (17.3 - 17.6)	17.3 (17.3 - 17.4)	18.0 (18.0 - 18.0)
6 month score	38.7 (38.5 - 38.9)	38.2 (38.1 - 38.2)	39.3 (39.3 - 39.4)
6 month score (adjusted)	39.1 (38.9 - 39.2)	38.8 (38.8 - 38.9)	39.3 (39.3 - 39.4)
Health gain	21.2 (21.0 - 21.4)	20.9 (20.8 - 20.9)	21.3 (21.3 - 21.4)
Health gain (adjusted)	21.1 (20.9 - 21.2)	20.8 (20.7 - 20.8)	21.3 (21.3 - 21.4)
p value (adjusted health gain)	< 0.001		
Score Improved	97.2%	97.0%	97.2%

EQ-5D Index (-0.59 - 1.00)	Marathon Cup	All other Cemented Cups in NJR	All THR in NJR
Paired Records	10,263	81,277	267,698
PreOp score	0.334 (0.328 - 0.340)	0.330 (0.328 - 0.332)	0.355 (0.354 - 0.356)
6 month score	0.778 (0.773 - 0.782)	0.768 (0.766 - 0.770)	0.792 (0.791 - 0.792)
6 month score (adjusted)	0.786 (0.781 - 0.790)	0.780 (0.778 - 0.781)	0.792 (0.791 - 0.792)
Health gain	0.444 (0.437 - 0.450)	0.438 (0.435 - 0.440)	0.437 (0.435 - 0.438)
Health gain (adjusted)	0.431 (0.426 - 0.435)	0.425 (0.423 - 0.426)	0.437 (0.436 - 0.437)
p value (adjusted health gain)	0.006		
Score Improved	89.4%	88.7%	89.4%

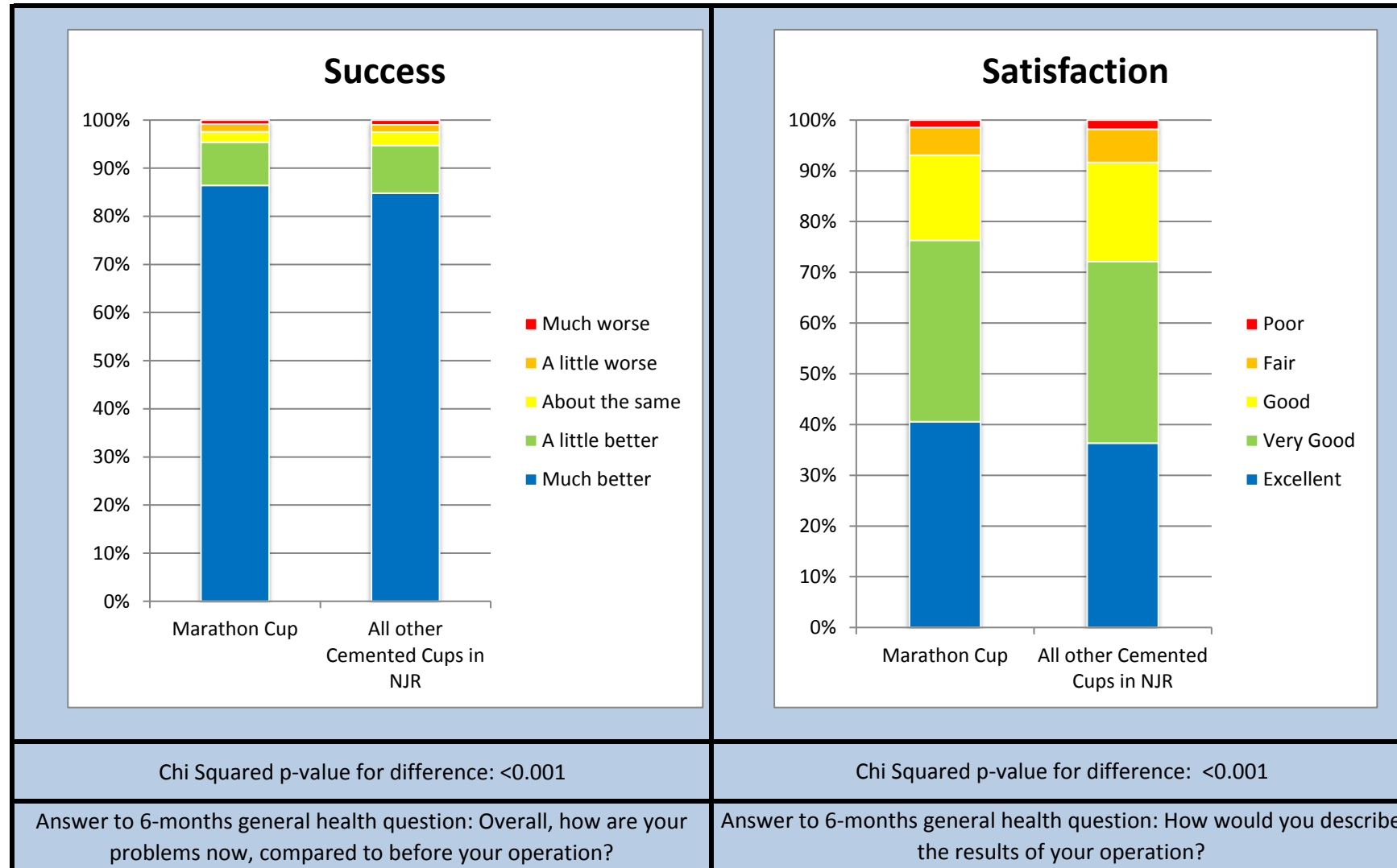
EQ-VAS (0 - 100)	Marathon Cup	All other Cemented Cups in NJR	All THR in NJR
Paired Records	9,777	77,436	256,692
PreOp score	64.6 (64.2 - 65.0)	64.3 (64.2 - 64.5)	65.0 (64.9 - 65.1)
6 month score	76.0 (75.7 - 76.4)	75.0 (74.9 - 75.2)	76.8 (76.7 - 76.9)
6 month score (adjusted)	76.5 (76.2 - 76.8)	76.1 (76.0 - 76.2)	76.8 (76.7 - 76.8)
Health gain	11.4 (10.9 - 11.9)	10.7 (10.5 - 10.9)	11.8 (11.7 - 11.9)
Health gain (adjusted)	11.5 (11.1 - 11.8)	11.1 (11.0 - 11.2)	11.8 (11.7 - 11.8)
p value (adjusted health gain)	0.017		
Score Improved	65.3%	63.3%	65.6%

Adjusted scores correspond to the NHS Digital version 3 casemix-adjustment model. This includes patient variables from PROMs, HES, and IMD data.

Figures in parentheses represent the 95% confidence interval for the mean

Responses are not case mix adjusted

Patient Reported Outcomes



Patient Reported Outcomes

Success

Response	Marathon Cup	All other Cemented Cups in NJR
Much better	9858	76780
A little better	1017	9001
About the same	254	2504
A little worse	180	1333
Much worse	95	908

Answer to 6-months general health question:

"Overall, how are your problems now, compared to before your operation?"

Satisfaction

Response	Marathon Cup	All other Cemented Cups in NJR
Excellent	4613	32838
Very Good	4067	32318
Good	1906	17699
Fair	625	5932
Poor	164	1611

Answer to 6-months general health question:

"How would you describe the results of your operation?"

Disclaimer

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Appendix A: Component List

Catalogue Number	Description	Number Implanted
965512238	Marathon XLPE Cemented Cup 22.225/38mm	156
965512240	Marathon XLPE Cemented Cup 22.225/40mm	642
965512243	Marathon XLPE Cemented Cup 22.225/43mm	477
965512245	Marathon XLPE Cemented Cup 22.225/45mm	141
965512247	Marathon XLPE Cemented Cup 22.225/47mm	175
965512250	Marathon XLPE Cemented Cup 22.225/50mm	37
965512253	Marathon XLPE Cemented Cup 22.225/53mm	6
965512650	Marathon XLPE Cemented Cup 26/50mm	1
965512653	Marathon XLPE Cemented Cup 26/53mm	1
965512840	Marathon XLPE Cemented Cup 28/40mm	7117
965512843	Marathon XLPE Cemented Cup 28/43mm	9358
965512845	Marathon XLPE Cemented Cup 28/45mm	3749
965512847	Marathon XLPE Cemented Cup 28/47mm	3608
965512850	Marathon XLPE Cemented Cup 28/50mm	1438
965512853	Marathon XLPE Cemented Cup 28/53mm	399
965513245	Marathon XLPE Cemented Cup 32/45mm	4957
965513247	Marathon XLPE Cemented Cup 32/47mm	3703
965513250	Marathon XLPE Cemented Cup 32/50mm	1729
965513253	Marathon XLPE Cemented Cup 32/53mm	561
965513650	Marathon XLPE Cemented Cup 36/50mm	927
965513653	Marathon XLPE Cemented Cup 36/53mm	257