



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 3043

Depuy Synthes Australia

Attune Total Knee

Report Generated: 15 September 2020

Data Period: 1 September 1999 - 14 September 2020

This report has been prepared by the Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR). The report provides information on the usage and outcomes of the Attune tibial compared to all other total knee replacements, based on data collected by the AOANJRR.

Disclaimer

The AOANJRR has taken every care to ensure that the data supplied are accurate but does not warrant that the data are error free and does not accept any liability for errors or omissions in the data.

AOANJRR Automated Industry Report 3043 - Depuy Synthes Australia

Attune Total Knee

Data Period: 1 September 1999 - 14 September 2020

Report Generated: 15 September 2020

Catalogue Numbers of Attune Tibial Components included in this analysis

Model	Catalogue Range	Range Description	No. of Primary Procedures
Attune	150670001 - 150670010	Tibial Base Fixed Bearing Cemented w S+ technology	4880
Attune	150680001 - 150680010	Tibial Baseplate Rotating Platform	3640

The AOANJRR also reports these catalogue numbers as Attune Tibial Components. These are not included in the analysis.

Model	Catalogue Range	Range Description
Attune	150600001 - 150600010	Fixed Tibial Baseplate
Attune	150610001 - 150610010	Rotating Tibial Baseplate
Attune	150611002 - 150611010	Rotating Tibial Baseplate Porocoat
Attune	150640003 - 150640009	Attune FB Cemented Revision Tibial Base
Attune	150660002 - 150660009	Revision Tibial Base Rotating Platform

Table 1: Revision Rates of Attune Primary Total Knee Replacement by Tibial Catalogue Number Range (All Diagnoses)

Tibial Range	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
150670001 - 150670010	56	4880	6649	0.84 (0.64, 1.09)
150680001 - 150680010	29	3640	3567	0.81 (0.54, 1.17)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 2: Implant Usage of Attune in Primary Total Knee Replacement (All Diagnoses)

	N
Implant Usage	
Date First Used	17 January 2018
Date Last Used	31 August 2020
N Procedures	8520
N Patients	7422
N Hospitals Implanting	138
N Surgeons Implanting*	162
Outcome	
N Revised	85
N Deceased**	27

*63 Attune procedures have unknown surgeon

**'N Deceased' does not include patient deaths that occurred after the Attune implant was revised

Table 3: Follow Up Years of Attune Primary Total Knee Replacement (All Diagnoses)

Model	N	Minimum	Maximum	Median	Mean	Std Dev
Attune	8520	0.01	2.66	1.15	1.20	0.64
TOTAL	8520	0.01	2.66	1.15	1.20	0.64

Table 4: Age and Gender of Attune Primary Total Knee Replacement (All Diagnoses)

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	3889	45.6%	30	95	68	68.1	8.7
Female	4631	54.4%	18	96	69	68.9	9.1
TOTAL	8520	100.0%	18	96	69	68.5	8.9

Table 5: Primary Total Knee Replacement by Model and Age (All Diagnoses)

Age	Attune		Other Total Knee	
	N	Col%	N	Col%
<55	497	5.8	49707	6.8
55-64	2204	25.9	193849	26.4
65-74	3612	42.4	290094	39.5
≥75	2207	25.9	200763	27.3
TOTAL	8520	100.0	734413	100.0

Table 6: Primary Total Knee Replacement by Model and Gender (All Diagnoses)

Gender	Attune		Other Total Knee	
	N	Col%	N	Col%
Male	3889	45.6	320720	43.7
Female	4631	54.4	413693	56.3
TOTAL	8520	100.0	734413	100.0

Table 7: Primary Total Knee Replacement by Model and ASA Grade (All Diagnoses)

ASA Grade	Attune		Other Total Knee	
	N	Col%	N	Col%
1	434	5.1	21591	5.9
2	4712	55.3	201342	54.9
3	3288	38.6	139614	38.1
4	84	1.0	4044	1.1
5	.	.	11	0.0
TOTAL	8518	100.0	366602	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 2 Attune procedures with no ASA Grade recorded are excluded from this table

Table 8: Primary Total Knee Replacement by Model and BMI (All Diagnoses)

BMI	Attune		Other Total Knee	
	N	Col%	N	Col%
Underweight (<18.50)	24	0.3	551	0.2
Normal (18.50-24.99)	881	10.5	28513	10.5
Pre Obese (25.00-29.99)	2637	31.3	85011	31.2
Obese Class 1 (30.00-34.99)	2609	31.0	83730	30.7
Obese Class 2 (35.00-39.99)	1469	17.4	46227	17.0
Obese Class 3 (≥40.00)	803	9.5	28617	10.5
TOTAL	8423	100.0	272649	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 97 Attune procedures with no BMI recorded are excluded from this table

Table 9: Primary Total Knee Replacement by Model and Primary Diagnosis

Primary Diagnosis	Attune		Other Total Knee	
	N	Col%	N	Col%
Osteoarthritis	8429	98.9	717501	97.7
Rheumatoid Arthritis	42	0.5	9186	1.3
Other Inflammatory Arthritis	22	0.3	3714	0.5
Osteonecrosis	23	0.3	2286	0.3
Tumour	.	.	905	0.1
Fracture	1	0.0	585	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	3	0.0	216	0.0
TOTAL	8520	100.0	734413	100.0

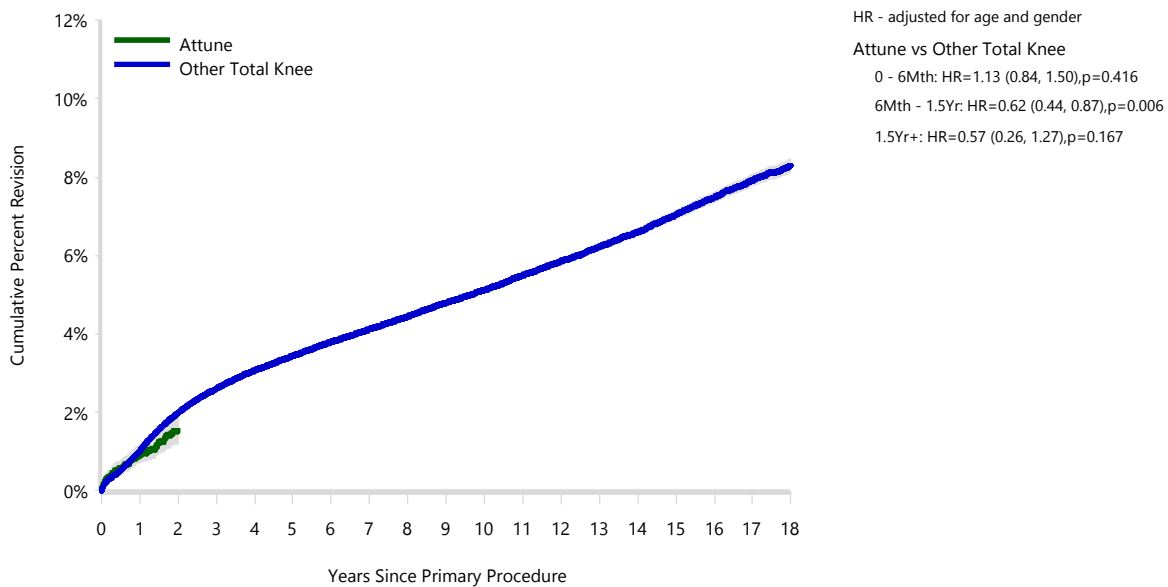
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	85	8520	10216	0.83 (0.66, 1.03)
Other Total Knee	29593	734413	5076762	0.58 (0.58, 0.59)
TOTAL	29678	742933	5086978	0.58 (0.58, 0.59)

Table 11: Yearly Cumulative Percent Revision of Primary Total Knee Replacement by Model (All Diagnoses)

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs
Attune	0.9 (0.7, 1.2)	1.5 (1.2, 2.0)				
Other Total Knee	1.0 (1.0, 1.0)	2.0 (1.9, 2.0)	2.6 (2.6, 2.6)	3.1 (3.0, 3.1)	3.4 (3.4, 3.5)	3.8 (3.7, 3.8)
CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
Attune						
Other Total Knee	4.1 (4.1, 4.2)	4.4 (4.4, 4.5)	4.8 (4.7, 4.9)	5.1 (5.1, 5.2)	5.5 (5.4, 5.6)	5.9 (5.8, 5.9)
CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs
Attune						
Other Total Knee	6.2 (6.1, 6.3)	6.6 (6.5, 6.7)	7.0 (6.9, 7.1)	7.5 (7.4, 7.6)	7.9 (7.8, 8.1)	8.3 (8.1, 8.5)

Figure 1: Cumulative Percent Revision of Primary Total Knee Replacement by Model (All Diagnoses)



Number at Risk	0 Yr	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs	
Attune	8520	4998	1119	0	0	0	0	0	0	
Other Total Knee	734413	681947	617605	553142	489880	430104	373552	321343	273456	
Number at Risk	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs
Attune	0	0	0	0	0	0	0	0	0	0
Other Total Knee	228636	187725	151382	120456	92898	70113	50748	34482	21630	11631

TABLE 12

Reasons for Revision

This is reported in two ways: a percentage of primary procedures revised and as a percentage of all revision procedures.

% Primaries Revised: This shows the proportional contribution of each revision diagnosis as a percentage of the total number of primary procedures. This percentage can be used to approximate the risk of being revised for that diagnosis. Differing percentages between groups, with the same distribution of follow up time, may identify problems of concern.

% Revisions: The number of revisions for each diagnosis is expressed as a percentage of the total number of revisions. This shows the distribution of reasons for revision within a group but cannot be used as a comparison between groups.

Table 12: Revision Diagnosis of Primary Total Knee Replacement by Model (All Diagnoses) (Follow-up Limited to 2.7 Years)

Revision Diagnosis	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	38	0.4	44.7	4952	0.7	30.3
Loosening	5	0.1	5.9	3368	0.5	20.6
Patellofemoral Pain	2	0.0	2.4	1531	0.2	9.4
Instability	11	0.1	12.9	1430	0.2	8.7
Pain	9	0.1	10.6	1329	0.2	8.1
Arthrofibrosis	4	0.0	4.7	759	0.1	4.6
Patella Erosion	3	0.0	3.5	735	0.1	4.5
Fracture	4	0.0	4.7	460	0.1	2.8
Malalignment	1	0.0	1.2	395	0.1	2.4
Incorrect Sizing	2	0.0	2.4	241	0.0	1.5
Bearing Dislocation	1	0.0	1.2	147	0.0	0.9
Patella Maltracking				138	0.0	0.8
Metal Related Pathology				118	0.0	0.7
Lysis				108	0.0	0.7
Wear Tibial Insert				91	0.0	0.6
Prosthesis Dislocation				60	0.0	0.4
Synovitis	1	0.0	1.2	56	0.0	0.3
Implant Breakage Tibial Insert	1	0.0	1.2	50	0.0	0.3
Implant Breakage Patella				48	0.0	0.3
Osteonecrosis				36	0.0	0.2
Implant Breakage Tibial				21	0.0	0.1
Implant Breakage Femoral				20	0.0	0.1
Tumour				15	0.0	0.1
Heterotopic Bone				5	0.0	0.0
Wear Patella				3	0.0	0.0
Wear Tibial				3	0.0	0.0
Incorrect Side				2	0.0	0.0
Patella Dislocation				1	0.0	0.0
Post Operative Haematoma				1	0.0	0.0
Other	3	0.0	3.5	228	0.0	1.4
N Revision	85	1.0	100.0	16351	2.2	100.0
N Primary	8520			734413		

Note: This table is restricted to revisions within 2.7 years for all groups to allow a time-matched comparison of revisions.

Table 13: Yearly Cumulative Incidence Revision Diagnosis of Primary Total Knee Replacement by Model (All Diagnoses)

Model	Event	N Events	1 Yr	2 Yrs	3 Yrs	5 Yrs	10 Yrs	15 Yrs
Attune	Infection	38	0.4 (0.3, 0.6)	0.6 (0.4, 0.8)				
	Instability	11	0.1 (0.0, 0.2)	0.2 (0.1, 0.5)				
	Pain	9	0.1 (0.0, 0.2)	0.2 (0.1, 0.5)				
	Loosening	5	0.1 (0.0, 0.1)	0.1 (0.0, 0.3)				
	Arthrofibrosis	4	0.1 (0.0, 0.1)	0.1 (0.0, 0.1)				
	Other	18	0.2 (0.1, 0.3)	0.3 (0.2, 0.5)				
	Deceased	27	0.3 (0.2, 0.5)	0.4 (0.3, 0.6)				
	All Revision	85	0.9 (0.7, 1.2)	1.5 (1.2, 1.9)				
Other Total Knee	Infection	7115	0.4 (0.4, 0.5)	0.6 (0.6, 0.6)	0.7 (0.7, 0.8)	0.9 (0.9, 0.9)	1.1 (1.1, 1.1)	1.3 (1.3, 1.3)
	Instability	2526	0.1 (0.1, 0.1)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.5 (0.5, 0.5)
	Pain	2378	0.0 (0.0, 0.1)	0.1 (0.1, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.5 (0.4, 0.5)
	Loosening	7251	0.2 (0.2, 0.2)	0.4 (0.4, 0.4)	0.6 (0.5, 0.6)	0.8 (0.8, 0.8)	1.2 (1.2, 1.2)	1.6 (1.6, 1.7)
	Arthrofibrosis	1037	0.0 (0.0, 0.0)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)
	Other	9286	0.2 (0.2, 0.3)	0.5 (0.5, 0.6)	0.7 (0.7, 0.7)	1.0 (0.9, 1.0)	1.5 (1.5, 1.6)	2.1 (2.0, 2.1)
	Deceased	11850 7	0.7 (0.7, 0.7)	1.7 (1.7, 1.7)	3.0 (2.9, 3.0)	6.4 (6.3, 6.5)	19.8 (19.7, 19.9)	37.3 (37.1, 37.6)
	All Revision	29593	1.0 (1.0, 1.0)	2.0 (1.9, 2.0)	2.6 (2.5, 2.6)	3.4 (3.3, 3.4)	4.8 (4.8, 4.9)	6.2 (6.1, 6.3)

Figure 2: Cumulative Incidence Revision Diagnosis of Primary Total Knee Replacement by Model (All Diagnoses)

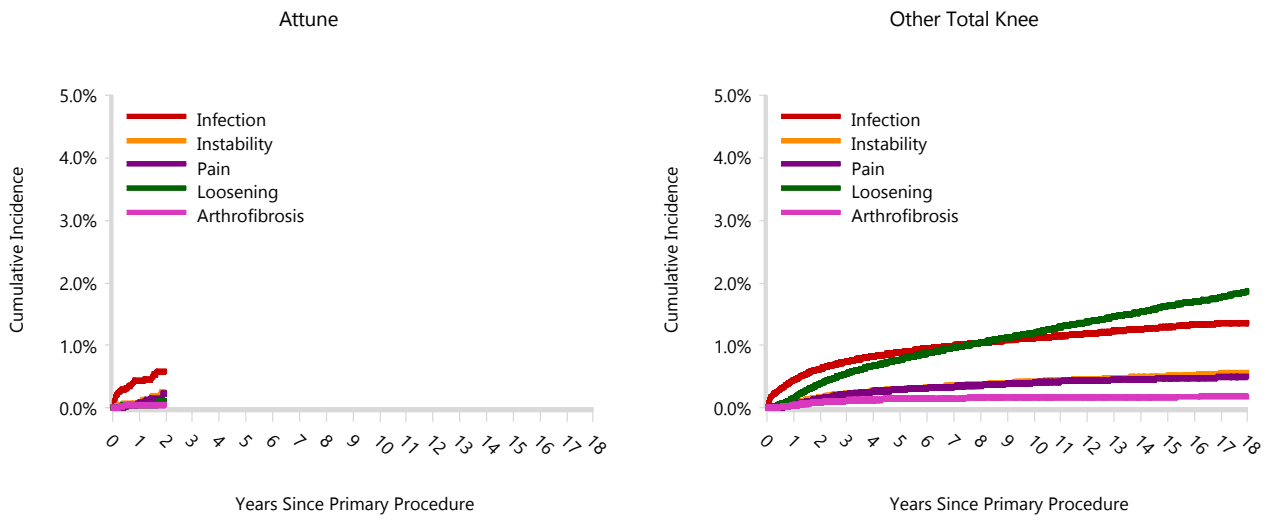


TABLE 14

Type of Revision

This is reported in two ways: a percentage of primary procedures revised and as a percentage of all revision procedures.

% Primaries Revised: This shows the proportional contribution of each type of revision as a percentage of the total number of primary procedures. This percentage can be used to approximate the risk of having that type of revision. Differing percentages between groups, with the same distribution of follow up time, may identify problems of concern.

% Revisions: The number of revisions for each type of revision is expressed as a percentage of the total number of revisions. This shows the distribution of types of revision within a group but cannot be used as a comparison between groups.

Table 14: Type of Revision of Primary Total Knee Replacement by Model (All Diagnoses) (Follow-up Limited to 2.7 Years)

Type of Revision	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	54	0.6	63.5	4862	0.7	29.7
TKR (Tibial/Femoral)	11	0.1	12.9	3257	0.4	19.9
Patella Only	8	0.1	9.4	3207	0.4	19.6
Tibial Component				1504	0.2	9.2
Insert/Patella	7	0.1	8.2	1208	0.2	7.4
Femoral Component	2	0.0	2.4	1128	0.2	6.9
Cement Spacer	1	0.0	1.2	1005	0.1	6.1
Removal of Prostheses	2	0.0	2.4	110	0.0	0.7
Minor Components				42	0.0	0.3
Total Femoral				10	0.0	0.1
Cement Only				9	0.0	0.1
Reinsertion of Components				9	0.0	0.1
N Revision	85	1.0	100.0	16351	2.2	100.0
N Primary	8520			734413		

Note: This table is restricted to revisions within 2.7 years for all groups to allow a time-matched comparison of revisions.

Table 15: Revision Rates of Attune Primary Total Knee Replacement by Fixation (All Diagnoses)

Fixation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Cemented	83	8411	10137	0.82 (0.65, 1.02)
Hybrid (Tibial Cemented)	2	108	80	2.51 (0.30, 9.08)
Hybrid (Tibial Cementless)	0	1	0	0.00 (0.00, 2867)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 16: Revision Rates of Attune Primary Total Knee Replacement by Polyethylene Type (All Diagnoses)

Polyethylene Type	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
XLPE + Antioxidant	85	8518	10213	0.83 (0.66, 1.03)
Unknown	0	2	3	0.00 (0.00, 108.0)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 17: Revision Rates of Attune Primary Total Knee Replacement by Bearing Mobility (All Diagnoses)

Bearing Mobility	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Fixed	56	4879	6647	0.84 (0.64, 1.09)
Rotating	29	3639	3566	0.81 (0.54, 1.17)
Unknown	0	2	3	0.00 (0.00, 108.0)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 18: Revision Rates of Attune Primary Total Knee Replacement by Patella Usage (All Diagnoses)

Patella Usage	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Patella Used	67	7363	8683	0.77 (0.60, 0.98)
No Patella	18	1157	1534	1.17 (0.70, 1.85)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 19: Revision Rates of Attune Primary Total Knee Replacement by Computer Navigation (All Diagnoses)

Computer Navigation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Computer Navigated	40	3932	4490	0.89 (0.64, 1.21)
Non-Navigated	45	4588	5727	0.79 (0.57, 1.05)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 20: Revision Rates of Attune Primary Total Knee Replacement by IDI Usage (All Diagnoses)

IDI Usage	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
IDI Used	0	400	425	0.00 (0.00, 0.87)
IDI Not Used	85	8120	9791	0.87 (0.69, 1.07)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 21: Revision Rates of Attune Primary Total Knee Replacement by Robotic Assistance (All Diagnoses)

Robotic Assistance	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Robotically Assisted	0	4	3	0.00 (0.00, 121.1)
Non-Robotic	85	8516	10213	0.83 (0.66, 1.03)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 22: Number of Revisions of Attune Primary Total Knee Replacement by Year of Implant (All Diagnoses)

Year of Implant	Number Revised	Total Number
2018	35	1972
2019	43	4449
2020	7	2099
TOTAL	85	8520

Table 23: Revision Rates of Attune Primary Total Knee Replacement by Femoral Component (All Diagnoses)

Femoral	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	0	4	4	0.00 (0.00, 102.6)
Attune CR	60	5646	6631	0.90 (0.69, 1.16)
Attune PS	25	2870	3582	0.70 (0.45, 1.03)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)

Table 24: Revision Rates of Attune Primary Total Knee Replacement by Tibial Catalogue Number (All Diagnoses)

Tibial Catalogue Number	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
150670001	0	2	3	0.00 (0.00, 128.1)
150670002	0	40	55	0.00 (0.00, 6.69)
150670003	1	400	570	0.18 (0.00, 0.98)
150670004	13	989	1389	0.94 (0.50, 1.60)
150670005	11	1067	1475	0.75 (0.37, 1.33)
150670006	12	779	1047	1.15 (0.59, 2.00)
150670007	11	806	1120	0.98 (0.49, 1.76)
150670008	3	592	735	0.41 (0.08, 1.19)
150670009	4	169	209	1.91 (0.52, 4.90)
150670010	1	36	46	2.17 (0.05, 12.09)
150680002	0	17	10	0.00 (0.00, 35.28)
150680003	0	226	215	0.00 (0.00, 1.72)
150680004	4	657	645	0.62 (0.17, 1.59)
150680005	10	771	770	1.30 (0.62, 2.39)
150680006	6	568	552	1.09 (0.40, 2.36)
150680007	4	636	626	0.64 (0.17, 1.64)
150680008	2	510	498	0.40 (0.05, 1.45)
150680009	3	216	208	1.44 (0.30, 4.21)
150680010	0	39	42	0.00 (0.00, 8.85)
TOTAL	85	8520	10216	0.83 (0.66, 1.03)