



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 2507

Depuy Synthes Australia

Attune Total Knee

Report Generated: 13 May 2020

Data Period: 1 September 1999 - 12 May 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.

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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	4364
Attune	150680001 - 150680010	Tibial Baseplate Rotating Platform	3022

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 - 150640008	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	43	4364	5038	0.85 (0.62, 1.15)
150680001 - 150680010	25	3022	2372	1.05 (0.68, 1.56)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	27 April 2020
N Procedures	7386
N Patients	6440
N Hospitals Implanting	133
N Surgeons Implanting*	154
Outcome	
N Revised	68
N Deceased**	27

*55 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	7386	0.01	2.32	0.94	1.00	0.56
TOTAL	7386	0.01	2.32	0.94	1.00	0.56

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	3303	44.7%	30	95	68	68.1	8.8
Female	4083	55.3%	18	94	69	68.9	9.1
TOTAL	7386	100.0%	18	95	69	68.6	9.0

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

Age	Attune		Other Total Knee	
	N	Col%	N	Col%
<55	434	5.9	48672	6.8
55-64	1893	25.6	189900	26.4
65-74	3115	42.2	284154	39.5
≥75	1944	26.3	197428	27.4
TOTAL	7386	100.0	720154	100.0

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

Gender	Attune		Other Total Knee	
	N	Col%	N	Col%
Male	3303	44.7	313913	43.6
Female	4083	55.3	406241	56.4
TOTAL	7386	100.0	720154	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	370	5.0	20785	5.9
2	4064	55.0	193731	55.0
3	2884	39.1	133958	38.0
4	67	0.9	3892	1.1
5	.	.	11	0.0
TOTAL	7385	100.0	352377	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 1 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)	23	0.3	529	0.2
Normal (18.50-24.99)	770	10.6	27025	10.5
Pre Obese (25.00-29.99)	2270	31.1	80405	31.1
Obese Class 1 (30.00-34.99)	2227	30.5	79382	30.7
Obese Class 2 (35.00-39.99)	1288	17.7	43893	17.0
Obese Class 3 (≥40.00)	719	9.9	27315	10.6
TOTAL	7297	100.0	258549	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 89 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	7301	98.8	703525	97.7
Rheumatoid Arthritis	39	0.5	9077	1.3
Other Inflammatory Arthritis	21	0.3	3647	0.5
Osteonecrosis	22	0.3	2237	0.3
Tumour	.	.	883	0.1
Fracture	.	.	556	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	3	0.0	209	0.0
TOTAL	7386	100.0	720154	100.0

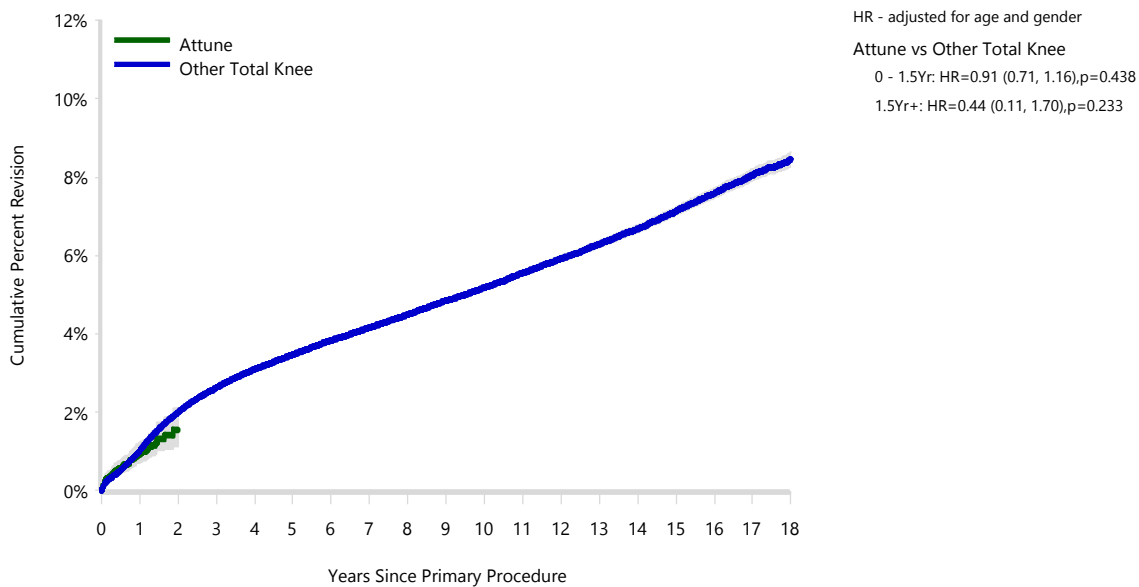
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	68	7386	7410	0.92 (0.71, 1.16)
Other Total Knee	28890	720154	4876921	0.59 (0.59, 0.60)
TOTAL	28958	727540	4884331	0.59 (0.59, 0.60)

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 (1.1, 2.1)				
Other Total Knee	1.0 (1.0, 1.0)	2.0 (2.0, 2.0)	2.6 (2.6, 2.7)	3.1 (3.1, 3.1)	3.5 (3.4, 3.5)	3.8 (3.8, 3.9)
CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
Attune						
Other Total Knee	4.2 (4.1, 4.2)	4.5 (4.4, 4.6)	4.8 (4.8, 4.9)	5.2 (5.1, 5.2)	5.6 (5.5, 5.6)	5.9 (5.8, 6.0)
CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs
Attune						
Other Total Knee	6.3 (6.2, 6.4)	6.7 (6.6, 6.8)	7.1 (7.0, 7.2)	7.6 (7.5, 7.7)	8.1 (7.9, 8.2)	8.5 (8.3, 8.6)

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	7386	3341	461	0	0	0	0	0	0	
Other Total Knee	720154	663759	599180	534856	472494	413900	358775	307553	260794	
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	216918	177270	142566	112308	86290	64318	45692	30241	18259	8798

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 2.3 Years)

Revision Diagnosis	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	29	0.4	42.6	4606	0.6	31.0
Loosening	2	0.0	2.9	3012	0.4	20.3
Patellofemoral Pain	2	0.0	2.9	1398	0.2	9.4
Instability	10	0.1	14.7	1283	0.2	8.6
Pain	7	0.1	10.3	1166	0.2	7.9
Arthrofibrosis	4	0.1	5.9	691	0.1	4.7
Patella Erosion	2	0.0	2.9	644	0.1	4.3
Fracture	3	0.0	4.4	423	0.1	2.8
Malalignment	1	0.0	1.5	358	0.0	2.4
Incorrect Sizing	2	0.0	2.9	227	0.0	1.5
Bearing Dislocation	1	0.0	1.5	143	0.0	1.0
Patella Maltracking				131	0.0	0.9
Metal Related Pathology				95	0.0	0.6
Lysis				94	0.0	0.6
Wear Tibial Insert				82	0.0	0.6
Prosthesis Dislocation				58	0.0	0.4
Implant Breakage Tibial Insert	1	0.0	1.5	50	0.0	0.3
Synovitis	1	0.0	1.5	47	0.0	0.3
Implant Breakage Patella				40	0.0	0.3
Osteonecrosis				31	0.0	0.2
Implant Breakage Tibial				18	0.0	0.1
Implant Breakage Femoral				17	0.0	0.1
Tumour				12	0.0	0.1
Heterotopic Bone				4	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	4.4	209	0.0	1.4
N Revision	68	0.9	100.0	14849	2.1	100.0
N Primary	7386			720154		

Note: This table is restricted to revisions within 2.3 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	29	0.4 (0.3, 0.6)	0.5 (0.3, 0.8)				
	Instability	10	0.1 (0.0, 0.2)	0.3 (0.1, 0.5)				
	Pain	7	0.1 (0.0, 0.2)	0.3 (0.1, 0.7)				
	Arthrofibrosis	4	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)				
	Fracture	3	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)				
	Other	15	0.2 (0.1, 0.4)	0.3 (0.2, 0.6)				
	Deceased	27	0.4 (0.2, 0.6)	0.6 (0.4, 0.8)				
	All Revision	68	0.9 (0.7, 1.2)	1.5 (1.1, 2.1)				
Other Total Knee	Infection	6911	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	2461	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	2323	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)
	Arthrofibrosis	1019	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)
	Fracture	935	0.0 (0.0, 0.0)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.2 (0.1, 0.2)	0.2 (0.2, 0.3)
	Other	15241	0.4 (0.4, 0.4)	0.9 (0.9, 0.9)	1.2 (1.2, 1.2)	1.7 (1.6, 1.7)	2.6 (2.6, 2.7)	3.5 (3.5, 3.6)
	Deceased	11851 1	0.7 (0.7, 0.8)	1.8 (1.7, 1.8)	3.1 (3.0, 3.1)	6.6 (6.5, 6.7)	20.5 (20.4, 20.7)	39.0 (38.8, 39.2)
	All Revision	28890	1.0 (1.0, 1.0)	2.0 (1.9, 2.0)	2.6 (2.6, 2.6)	3.4 (3.4, 3.4)	4.9 (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)

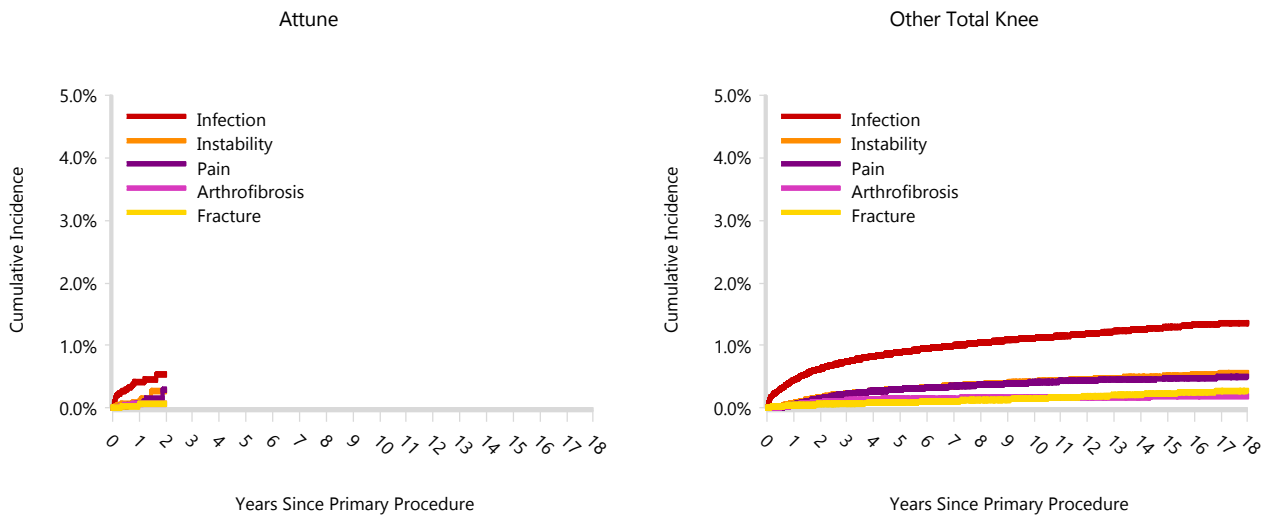


TABLE 14

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 2.3 Years)

Type of Revision	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	44	0.6	64.7	4528	0.6	30.5
Patella Only	8	0.1	11.8	2870	0.4	19.3
TKR (Tibial/Femoral)	5	0.1	7.4	2869	0.4	19.3
Tibial Component				1383	0.2	9.3
Insert/Patella	6	0.1	8.8	1082	0.2	7.3
Femoral Component	2	0.0	2.9	1033	0.1	7.0
Cement Spacer	1	0.0	1.5	919	0.1	6.2
Removal of Prostheses	2	0.0	2.9	100	0.0	0.7
Minor Components				38	0.0	0.3
Cement Only				9	0.0	0.1
Reinsertion of Components				9	0.0	0.1
Total Femoral				9	0.0	0.1
N Revision	68	0.9	100.0	14849	2.1	100.0
N Primary	7386			720154		

Note: This table is restricted to revisions within 2.3 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	66	7306	7368	0.90 (0.69, 1.14)
Hybrid (Tibial Cemented)	2	80	42	4.76 (0.58, 17.20)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	68	7384	7407	0.92 (0.71, 1.16)
Unknown	0	2	3	0.00 (0.00, 135.1)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	43	4363	5036	0.85 (0.62, 1.15)
Rotating	25	3021	2371	1.05 (0.68, 1.56)
Unknown	0	2	3	0.00 (0.00, 135.1)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	52	6354	6257	0.83 (0.62, 1.09)
No Patella	16	1032	1153	1.39 (0.79, 2.25)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	29	3358	3197	0.91 (0.61, 1.30)
Non-Navigated	39	4028	4213	0.93 (0.66, 1.27)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	337	293	0.00 (0.00, 1.26)
IDI Not Used	68	7049	7117	0.96 (0.74, 1.21)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	2	1	0.00 (0.00, 254.7)
Non-Robotic	68	7384	7408	0.92 (0.71, 1.16)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	30	1966
2019	37	4438
2020	1	982
TOTAL	68	7386

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	3	2	0.00 (0.00, 148.1)
Attune CR	49	4874	4773	1.03 (0.76, 1.36)
Attune PS	19	2509	2634	0.72 (0.43, 1.13)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)

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	2	0.00 (0.00, 168.0)
150670002	0	35	42	0.00 (0.00, 8.83)
150670003	1	373	435	0.23 (0.01, 1.28)
150670004	8	900	1059	0.76 (0.33, 1.49)
150670005	11	951	1123	0.98 (0.49, 1.75)
150670006	9	703	792	1.14 (0.52, 2.16)
150670007	7	724	853	0.82 (0.33, 1.69)
150670008	2	499	543	0.37 (0.04, 1.33)
150670009	4	145	154	2.60 (0.71, 6.65)
150670010	1	32	35	2.89 (0.07, 16.11)
150680002	0	11	5	0.00 (0.00, 73.03)
150680003	0	192	140	0.00 (0.00, 2.63)
150680004	3	564	426	0.70 (0.15, 2.06)
150680005	9	649	517	1.74 (0.80, 3.31)
150680006	5	473	366	1.36 (0.44, 3.18)
150680007	3	519	423	0.71 (0.15, 2.08)
150680008	2	408	330	0.61 (0.07, 2.19)
150680009	3	175	136	2.20 (0.45, 6.44)
150680010	0	31	29	0.00 (0.00, 12.69)
TOTAL	68	7386	7410	0.92 (0.71, 1.16)