



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 9081

Depuy Synthes Australia

Attune Total Knee

Report Generated: 8 February 2023

Data Period: 1 September 1999 - 7 February 2023

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	150611001 - 150611010	Rotating Tibial Baseplate Porocoat	4172

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	150640002 - 150640010	Attune FB Cemented Revision Tibial Base
Attune	150660002 - 150660010	Revision Tibial Base Rotating Platform
Attune	150670001 - 150670010	Tibial Base Fixed Bearing Cemented w S+ technology
Attune	150680001 - 150680010	Tibial Baseplate 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)
150611001 - 150611010	43	4172	5639	0.76 (0.55, 1.03)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

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

	N
Implant Usage	
Date First Used	8 November 2002
Date Last Used	20 December 2022
N Procedures	4172
N Patients	3589
N Hospitals Implanting	72
N Surgeons Implanting*	61
Outcome	
N Revised	43
N Deceased**	13

*40 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 in Primary Total Knee Replacement (All Diagnoses)

Model	N	Minimum	Maximum	Median	Mean	Std Dev
Attune	4172	0.05	20.2	1.25	1.35	0.91
TOTAL	4172	0.05	20.2	1.25	1.35	0.91

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	2060	49.4%	25	96	68	67.3	8.8
Female	2112	50.6%	38	93	68	67.9	8.9
TOTAL	4172	100.0%	25	96	68	67.6	8.9

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

Age	Attune		Other Total Knee	
	N	Col%	N	Col%
<55	321	7.7	59070	6.7
55-64	1174	28.1	231556	26.4
65-74	1740	41.7	349177	39.8
≥75	937	22.5	238099	27.1
TOTAL	4172	100.0	877902	100.0

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

Gender	Attune		Other Total Knee	
	N	Col%	N	Col%
Male	2060	49.4	386550	44.0
Female	2112	50.6	491352	56.0
TOTAL	4172	100.0	877902	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	224	5.4	28496	5.6
2	2364	56.7	276065	54.1
3	1538	36.9	199854	39.2
4	42	1.0	5479	1.1
5	.	.	15	0.0
TOTAL	4168	100.0	509909	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 4 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)	9	0.2	852	0.2
Normal (18.50-24.99)	418	10.1	43859	10.6
Pre Obese (25.00-29.99)	1316	31.7	129758	31.3
Obese Class 1 (30.00-34.99)	1431	34.5	127873	30.8
Obese Class 2 (35.00-39.99)	634	15.3	70087	16.9
Obese Class 3 (≥40.00)	345	8.3	42530	10.2
TOTAL	4153	100.0	414959	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 19 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	4134	99.1	858583	97.8
Rheumatoid Arthritis	25	0.6	10173	1.2
Other Inflammatory Arthritis	10	0.2	4432	0.5
Osteonecrosis	2	0.0	2644	0.3
Tumour	.	.	1053	0.1
Fracture	1	0.0	750	0.1
Chondrocalcinosis	.	.	15	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	.	.	250	0.0
TOTAL	4172	100.0	877902	100.0

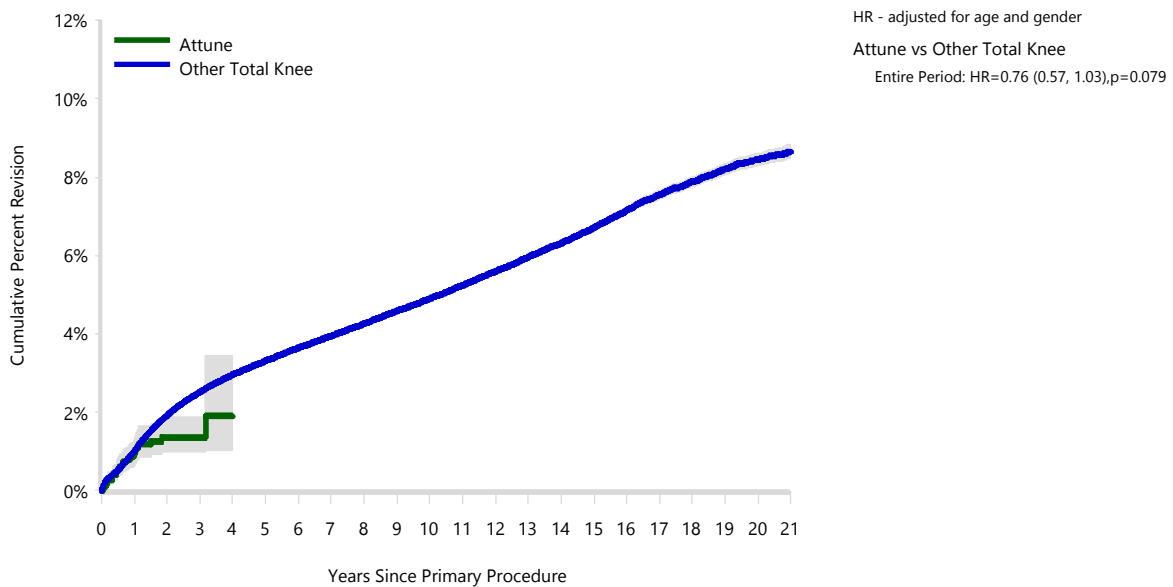
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	43	4172	5639	0.76 (0.55, 1.03)
Other Total Knee	35990	877902	6623564	0.54 (0.54, 0.55)
TOTAL	36033	882074	6629203	0.54 (0.54, 0.55)

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	7 Yrs
Attune	0.9 (0.6, 1.3)	1.4 (1.0, 1.9)	1.4 (1.0, 1.9)	1.9 (1.0, 3.4)			
Other Total Knee	1.0 (1.0, 1.0)	1.9 (1.9, 1.9)	2.5 (2.5, 2.5)	3.0 (2.9, 3.0)	3.3 (3.3, 3.4)	3.6 (3.6, 3.7)	4.0 (3.9, 4.0)
CPR	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs
Attune							
Other Total Knee	4.3 (4.2, 4.3)	4.6 (4.5, 4.6)	4.9 (4.8, 5.0)	5.2 (5.2, 5.3)	5.6 (5.5, 5.7)	6.0 (5.9, 6.0)	6.3 (6.2, 6.4)
CPR	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
Attune							
Other Total Knee	6.7 (6.6, 6.8)	7.1 (7.1, 7.2)	7.5 (7.4, 7.7)	7.9 (7.8, 8.0)	8.2 (8.1, 8.3)	8.5 (8.3, 8.6)	8.6 (8.5, 8.8)

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	9 Yrs	10 Yrs
Attune	4172	2525	600	198	102	25	1	1	1	1	1
Other Total Knee	877902	815353	746930	681147	613221	546974	482832	421761	364397	311463	262859
Number at Risk	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
Attune	1	1	1	1	1	1	1	1	1	1	0
Other Total Knee	218662	178231	143115	113352	87209	65557	47714	32904	21242	12181	5326

TABLE 12

Reasons for Revision

This is reported in two ways: a percentage of primaries 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 primaries. 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 20.2 Years)

Revision Diagnosis	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	11	0.3	25.6	8848	1.0	24.6
Loosening	16	0.4	37.2	8600	1.0	23.9
Instability	5	0.1	11.6	3214	0.4	8.9
Patellofemoral Pain	1	0.0	2.3	2827	0.3	7.9
Pain	1	0.0	2.3	2782	0.3	7.7
Patella Erosion	1	0.0	2.3	2308	0.3	6.4
Fracture	4	0.1	9.3	1315	0.1	3.7
Arthrofibrosis				1288	0.1	3.6
Malalignment				746	0.1	2.1
Wear Tibial Insert				719	0.1	2.0
Lysis				715	0.1	2.0
Metal Related Pathology				402	0.0	1.1
Incorrect Sizing				335	0.0	0.9
Implant Breakage Tibial Insert				298	0.0	0.8
Patella Maltracking				252	0.0	0.7
Bearing Dislocation	2	0.0	4.7	202	0.0	0.6
Implant Breakage Patella				176	0.0	0.5
Prosthesis Dislocation				112	0.0	0.3
Synovitis	1	0.0	2.3	111	0.0	0.3
Implant Breakage Tibial				81	0.0	0.2
Osteonecrosis				66	0.0	0.2
Wear Patella				60	0.0	0.2
Implant Breakage Femoral				57	0.0	0.2
Tumour				43	0.0	0.1
Heterotopic Bone				17	0.0	0.0
Wear Tibial				16	0.0	0.0
Progression Of Disease				9	0.0	0.0
Wear Femoral				4	0.0	0.0
Incorrect Side				2	0.0	0.0
Patella Dislocation				2	0.0	0.0
Other	1	0.0	2.3	365	0.0	1.0
N Revision	43	1.0	100.0	35972	4.1	100.0
N Primary	4172			877902		

Note: This table is restricted to revisions within 20.2 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	11	0.2 (0.1, 0.4)	0.3 (0.1, 0.5)	0.3 (0.1, 0.5)			
	Loosening	16	0.3 (0.2, 0.5)	0.6 (0.3, 1.0)	0.6 (0.3, 1.0)			
	Instability	5	0.2 (0.1, 0.4)	0.2 (0.1, 0.4)	0.2 (0.1, 0.4)			
	Patellofemoral Pain	1	0.0 (0.0, 0.2)	0.0 (0.0, 0.2)	0.0 (0.0, 0.2)			
	Pain	1	0.0 (0.0, 0.0)	0.0 (0.0, 0.2)	0.0 (0.0, 0.2)			
	Other	9	0.2 (0.1, 0.4)	0.3 (0.1, 0.5)	0.3 (0.1, 0.5)			
	Deceased	13	0.1 (0.0, 0.2)	0.2 (0.1, 0.5)	0.6 (0.2, 1.8)			
	All Revision	43	0.9 (0.6, 1.3)	1.4 (1.0, 1.9)	1.4 (1.0, 1.9)			
	Other Total Knee	Infection	8852	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, 1.2)
Loosening		8604	0.1 (0.1, 0.2)	0.4 (0.3, 0.4)	0.5 (0.5, 0.5)	0.7 (0.7, 0.7)	1.1 (1.1, 1.1)	1.5 (1.5, 1.5)
Instability		3216	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)
Patellofemoral Pain		2827	0.1 (0.0, 0.1)	0.2 (0.1, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.4 (0.4, 0.5)
Pain		2782	0.0 (0.0, 0.0)	0.1 (0.1, 0.1)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.4 (0.4, 0.5)
Other		9709	0.2 (0.2, 0.2)	0.4 (0.4, 0.5)	0.6 (0.6, 0.6)	0.8 (0.8, 0.8)	1.2 (1.2, 1.2)	1.7 (1.7, 1.8)
Deceased		15184 7	0.7 (0.7, 0.7)	1.6 (1.6, 1.6)	2.8 (2.8, 2.8)	6.0 (5.9, 6.0)	18.4 (18.3, 18.5)	34.9 (34.7, 35.1)
All Revision		35990	1.0 (1.0, 1.0)	1.9 (1.9, 1.9)	2.5 (2.5, 2.5)	3.2 (3.2, 3.3)	4.6 (4.6, 4.7)	6.0 (5.9, 6.0)

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

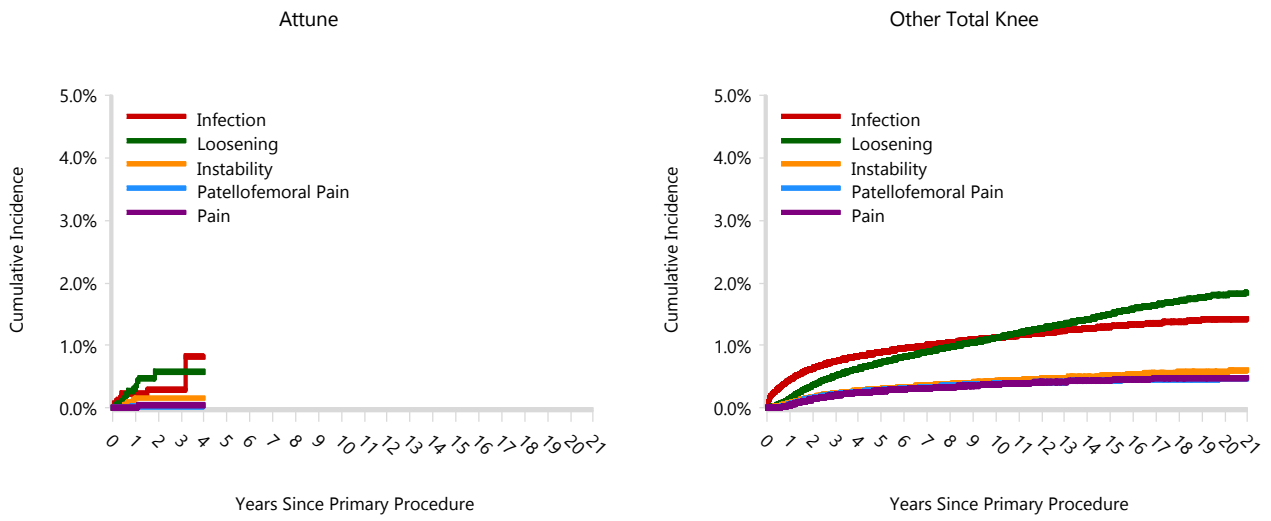


TABLE 14

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 20.2 Years)

Type of Revision	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
TKR (Tibial/Femoral)	5	0.1	11.6	9844	1.1	27.4
Insert Only	18	0.4	41.9	9010	1.0	25.0
Patella Only	3	0.1	7.0	6572	0.7	18.3
Insert/Patella				3796	0.4	10.6
Tibial Component	15	0.4	34.9	2780	0.3	7.7
Cement Spacer				1809	0.2	5.0
Femoral Component	2	0.0	4.7	1804	0.2	5.0
Removal of Prostheses				197	0.0	0.5
Minor Components				90	0.0	0.3
Total Femoral				27	0.0	0.1
Cement Only				25	0.0	0.1
Reinsertion of Components				18	0.0	0.1
N Revision	43	1.0	100.0	35972	4.1	100.0
N Primary	4172			877902		

Note: This table is restricted to revisions within 20.2 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	1	6	3	30.98 (0.78, 172.6)
Cementless	25	3215	4424	0.57 (0.37, 0.83)
Hybrid (Tibial Cemented)	0	5	6	0.00 (0.00, 60.23)
Hybrid (Tibial Cementless)	17	946	1205	1.41 (0.82, 2.26)
TOTAL	43	4172	5639	0.76 (0.55, 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	43	4172	5639	0.76 (0.55, 1.03)
TOTAL	43	4172	5639	0.76 (0.55, 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	0	1	1	0.00 (0.00, 253.7)
Rotating	43	4171	5637	0.76 (0.55, 1.03)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

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

Stability	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Minimally Stabilised	23	3054	4113	0.56 (0.35, 0.84)
Posterior Stabilised	20	1118	1526	1.31 (0.80, 2.02)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

Table 19: 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	33	3218	4497	0.73 (0.51, 1.03)
No Patella	10	954	1141	0.88 (0.42, 1.61)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

Table 20: 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	13	1473	1998	0.65 (0.35, 1.11)
Non-Navigated	30	2699	3641	0.82 (0.56, 1.18)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

Table 21: 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	1	70	92	1.09 (0.03, 6.07)
IDI Not Used	42	4102	5547	0.76 (0.55, 1.02)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

Table 22: 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	1	401	225	0.44 (0.01, 2.48)
Non-Robotic	42	3771	5414	0.78 (0.56, 1.05)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

Table 23: Number of Revisions of Attune Primary Total Knee Replacement by Year of Implant (All Diagnoses)

Year of Implant	Number Revised	Total Number
2002	0	1
2017	0	20
2018	3	88
2019	1	82
2020	2	294
2021	27	1958
2022	10	1729
TOTAL	43	4172

Table 24: 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 CR	23	3055	4117	0.56 (0.35, 0.84)
Attune PS	20	1117	1521	1.31 (0.80, 2.03)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)

Table 25: 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)
150611001	0	2	2	0.00 (0.00, 236.8)
150611002	2	26	44	4.53 (0.55, 16.36)
150611003	4	292	444	0.90 (0.25, 2.31)
150611004	7	647	900	0.78 (0.31, 1.60)
150611005	5	844	1144	0.44 (0.14, 1.02)
150611006	11	697	947	1.16 (0.58, 2.08)
150611007	5	718	921	0.54 (0.18, 1.27)
150611008	5	602	799	0.63 (0.20, 1.46)
150611009	2	253	313	0.64 (0.08, 2.30)
150611010	2	91	125	1.60 (0.19, 5.79)
TOTAL	43	4172	5639	0.76 (0.55, 1.03)