

**Methodology to determine the REF weighting table and
REF count table for 2009**

[Base 2005, Use 2009]

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1. Introduction and purpose of this document

This document sets out the methodology used to determine the inflation factors that were used to adjust the REF weighting table (REFWT)¹. The inflation adjustment has not lead to a change in the cost hierarchy of conditions and the count table was therefore not recalculated to estimate the industry community rate for 2009.

2. Adjustment to REFWT for inflation

2.1. Inflation estimate

During September 2008 Discovery, Metropolitan Health Group, and Medscheme administrators submitted inflation estimates after applying the methods set out in Annexure A (page 4).

These four inflation estimates for each of DTP Hospital, CDL Medicine and Related Diagnosis & Treatment costs, were weighted by the number of beneficiaries on which the respective estimates were based. The weighted average for these estimates is presented in Table 1 (page 2).

¹ Previously the REF weighting table was called the REF contribution table (REFCT). The Medical Schemes Amendment Bill that will be introduced to parliament soon refers to the table as a weighting table.



Table 1: Weighted inflation estimate

Weighted Inflation estimates to be applied for the adjustment of REFCT2007 for use in 2009				
Based on submissions from Medscheme, Discovery, and MHG				
Weighted average industry inflation estimate for the REF weighting table , representing 4,381,834 beneficiaries, weighted by the total number of lives on which the respective estimates were based.				
Year	Comment	DTP Hospital	CDL Medicine	Related Diagnosis & Treatment
2005 - 2006	Previous Estimate	6.50%	4.90%	10.85%
2005 - 2006	Actual	9.32%	5.58%	9.62%
2006 - 2007	Previous Estimate	7.50%	8.16%	4.90%
2006 - 2007	Actual	7.33%	6.40%	5.40%
2007 - 2008	Previous Estimate	8.74%	5.91%	7.04%
2007 - 2008	Actual	7.25%	4.69%	5.90%
2008 - 2009	Current Estimate	12.00%	9.00%	11.00%

2.2. REF Weighting table for 2009 (Base 2005, Use 2009) (REFWT 2009)

The weighted inflation estimates for each of the cost components were applied to calculate the factor that was applied to each of the cost components, and are presented in Table 2.

Table 2: Factors applied to 2007 table to generate REFWT 2009

Factors applied to the 2007 table for the creation of 2009 table			
	DTP Hospital	CDL Medicine	Related Diagnosis & Treatment
Inflation factor used for 2005-2007 based on projections	1.175200000	1.142000000	1.149900000
Correct inflation factor for 2005-2007 based on actuals	1.173285684	1.123391115	1.155394800
Inflation factor for 2005-2009 based on known actuals & current estimate	1.409360064	1.281904572	1.358155033
Adjustment required to 2007 table to generate 2009 table	1.199251246	1.122508382	1.181107082

The full REFWT 2009, indicating the new estimated costs by risk factor, is presented in Annexure B (page 6).



3. Adjustment to Count 2008 table to prepare the Count 2009 table

There were no changes to the cost hierarchy that necessitated changes to the expected count table for 2009, which was the case in 2008².

Since schemes have consistently reported lower HIV rates than those expected in accordance with the expected count tables, adjustments were made to the expected HIV rates in the Count 2009 table. The HIV rates that were reported to the CMS during the first three shadow years were used to project the expected HIV rates, which were incorporated in the Count 2009 table, attached in Annexure C (page 8).

4. Estimated industry community rate for 2009

The target population used to estimate the 2009 industry community rate is based on the March 2008 statutory returns, and is presented in Annexure D (page 10)

Applying the Count 2009 table and the REFWT 2009 tables to the March 2008 target population, the community rate for 2009 is estimated to be R 307.65 pbpm.

² See "Methodology to determine the REF weighting table and REF count table for 2008 [Base 2005, Use 2008]", 21 April 2008" available at:
<http://www.medicalschemes.com/publications/ZipPublications/Risk%20Equalisation%20Fund/Methodology%20to%20Determine%20the%20REFWT%20for%202008.pdf>



Annexure A: Methodology to Determine the Inflation Estimates used to Adjust the REF Contribution Table

Note prepared for RETAP by Brett Mill
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This document sets out the methodology used to determine the inflation factors to be used in adjusting the REF contribution table and the industry community rate. The inflation calculations set out below should be done for the year-to-date.

Three inflation components are determined:

1. DTP Hospital Costs

Step 1: Calculate the actual year-on-year change in the per life per month DTP Hospital Cost.

Step 2: Quantify the impact of the change in the age and gender profile of the scheme over the year. This can be done by using the following steps:

- a) Calculate a per life per month DTP Hospital Cost per age band and gender for the prior year.
- b) Calculate the weighted average DTP Hospital Cost by multiplying the prior year exposure per age band and gender by the per life per month DTP Hospital Cost per age band and gender calculated in Step 2a) and dividing the result by the total exposure.
- c) Redo the calculation Step 2b) using the current year exposure per age band and gender.
- d) The impact of the actual change in the age and gender profile is calculated as the per life per month DTP Hospital Cost calculated in Step 2c) divided by the per life per month DTP Hospital Cost calculated in Step 2b) minus 1.

Step 3: The REF inflation factor is equal to the increase calculated in Step 1 less the demographic change effect calculated in Step 2.

2. CDL Medicine Costs

Step 1: Calculate the year-on-year change in the CDL Medicine Cost per claimant per month. The CDL Medicine Cost per claimant per month is calculated as the sum of the CDL Medicine Costs divided by the sum of the CDL claimants in each month. The CDL medicine cost should be based on a mark-up of R26/26%. The CDL claimants in each month are determined without applying the REF Entry and Verification criteria. A beneficiary is counted as a claimant in a particular month if a claim for CDL medication obtained in that month has been paid.

Step 2: Quantify the impact of the change in the mix of chronic conditions over the year. This can be done by using the following steps:

- a) Calculate a cost per claimant per month for each CDL condition for the prior year.



- b) Calculate the weighted average cost per claimant per month by multiplying the monthly claimants per condition for the prior year by the cost per claimant per month calculated in Step 2a) and dividing the result by the total number of claimants.
- c) Redo the calculation Step 2b) using the monthly claimants per condition for the current year.
- d) The impact of the actual change in the mix of CDL conditions is calculated as the cost per claimant calculated in Step 2c) divided by the cost per claimant calculated in Step 2b) minus 1.

Step 3: The REF inflation factor is equal to the increase calculated in Step 1 less the demographic change effect calculated in Step 2.

3. Related Diagnosis and Treatment Costs

The REF inflation factor is set as the average NHRPL price increase for Related Diagnosis and Treatment Costs plus a 0.5% margin to allow for increased utilization.



Annexure B: REF Weighting table [Base 2005, Use 2009]

REF Contribution Table [Base 2005, Use 2009] Combined		Expected Industry REF Community Rate										0.00	The actual Industry Community Rate for each payment period is determined according to the REF Grids that are approved for shadow payments.				
Per Beneficiary Per Month [Important: see Note 3 below]																	
Age Bands	No CDL Diseases NON	Chronic Disease List (CDL) Conditions															
		ADS	AST	BCE	BMD	CHF	CMY	COP	CRF	CSD	DBI	DM1	DM2	DYS	EPL	GLC	
Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Under 1	605.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1-4	104.76	270.16	455.33	637.40	1,462.64	2,811.36	1,487.46	1,695.57	18,816.14	1,506.78	1,026.67	1,738.11	609.92	794.75	920.07	358.92	
5-9	48.30	213.70	398.86	580.94	1,406.17	2,754.89	1,431.00	1,639.10	18,759.68	1,450.31	970.20	1,681.64	553.46	738.29	863.60	302.46	
10-14	44.69	210.09	395.25	577.33	1,402.57	2,751.28	1,427.39	1,635.49	18,756.07	1,446.70	966.59	1,678.04	549.85	734.68	859.99	298.85	
15-19	66.08	231.48	416.65	598.73	1,423.96	2,772.68	1,448.79	1,656.89	18,777.47	1,468.10	987.99	1,699.43	571.25	756.08	881.39	320.25	
20-24	104.56	269.96	455.13	637.20	1,462.44	2,811.16	1,487.27	1,695.37	18,815.94	1,506.58	1,026.47	1,737.91	609.73	794.55	919.87	358.73	
25-29	147.39	312.79	497.96	680.03	1,505.27	2,853.98	1,530.09	1,738.20	18,858.77	1,549.41	1,069.29	1,780.74	652.55	837.38	962.70	401.55	
30-34	170.06	335.46	520.63	702.71	1,527.94	2,876.66	1,552.77	1,760.87	18,881.45	1,572.08	1,091.97	1,803.41	675.23	860.06	985.37	424.23	
35-39	176.49	341.89	527.05	709.13	1,534.37	2,883.08	1,559.19	1,767.29	18,887.87	1,578.50	1,098.39	1,809.83	681.65	866.48	991.79	430.65	
40-44	198.07	363.47	548.64	730.71	1,555.95	2,904.66	1,580.77	1,788.88	18,909.45	1,600.08	1,119.97	1,831.42	703.23	888.06	1,013.37	452.23	
45-49	229.82	395.22	580.39	762.47	1,587.70	2,936.42	1,612.53	1,820.63	18,941.21	1,631.84	1,151.73	1,863.17	734.99	919.82	1,045.13	483.99	
50-54	289.79	455.19	640.35	822.43	1,647.66	2,996.38	1,672.49	1,880.59	19,001.17	1,691.80	1,211.69	1,923.13	794.95	979.78	1,105.09	543.95	
55-59	372.89	538.29	723.46	905.54	1,730.77	3,079.49	1,755.60	1,963.70	19,084.28	1,774.91	1,294.80	2,006.24	878.06	1,062.89	1,188.20	627.06	
60-64	501.13	666.53	851.70	1,033.77	1,859.01	3,207.73	1,883.84	2,091.94	19,212.51	1,903.15	1,423.04	2,134.48	1,006.30	1,191.12	1,316.44	755.30	
65-69	627.27	792.67	977.83	1,159.91	1,985.15	3,333.86	2,009.97	2,218.07	19,338.65	2,029.28	1,549.17	2,260.62	1,132.43	1,317.26	1,442.57	881.43	
70-74	722.10	887.51	1,072.67	1,254.75	2,079.98	3,428.70	2,104.81	2,312.91	19,433.49	2,124.12	1,644.01	2,355.45	1,227.27	1,412.10	1,537.41	976.27	
75-79	769.47	934.87	1,120.03	1,302.11	2,127.35	3,476.06	2,152.17	2,360.27	19,480.85	2,171.48	1,691.37	2,402.82	1,274.63	1,459.46	1,584.77	1,023.63	
80-84	714.19	879.59	1,064.76	1,246.83	2,072.07	3,420.78	2,096.89	2,305.00	19,425.57	2,116.21	1,636.09	2,347.54	1,219.35	1,404.18	1,529.50	968.35	
85+	640.60	806.01	991.17	1,173.25	1,998.48	3,347.20	2,023.31	2,231.41	19,351.99	2,042.62	1,562.51	2,273.95	1,145.77	1,330.60	1,455.91	894.77	

Methodology to determine the REFWT and REF Count tables for 2009



Combined Female and Male table for use in Shadow Year 2008

											HIV/ AIDS
HAE	HYL	HYP	IBD	IHD	MSS	PAR	RHA	SCZ	SLE	TDH	HIV
17	18	19	20	21	22	23	24	25	26	27	28
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12,146.77	359.21	298.10	583.51	1,082.59	10,134.08	1,107.50	538.77	822.55	1,594.98	201.34	1,249.49
12,090.31	302.74	241.63	527.05	1,026.13	10,077.62	1,051.04	482.31	766.08	1,538.52	144.87	1,193.02
12,086.70	299.13	238.03	523.44	1,022.52	10,074.01	1,047.43	478.70	762.47	1,534.91	141.26	1,189.41
12,108.09	320.53	259.42	544.83	1,043.92	10,095.40	1,068.83	500.10	783.87	1,556.31	162.66	1,210.81
12,146.57	359.01	297.90	583.31	1,082.40	10,133.88	1,107.30	538.57	822.35	1,594.78	201.14	1,249.29
12,189.40	401.84	340.73	626.14	1,125.22	10,176.71	1,150.13	581.40	865.18	1,637.61	243.97	1,292.12
12,212.07	424.51	363.40	648.81	1,147.90	10,199.38	1,172.81	604.07	887.85	1,660.29	266.64	1,314.79
12,218.50	430.93	369.82	655.24	1,154.32	10,205.81	1,179.23	610.50	894.27	1,666.71	273.06	1,321.21
12,240.08	452.52	391.41	676.82	1,175.90	10,227.39	1,200.81	632.08	915.86	1,688.29	294.64	1,342.80
12,271.83	484.27	423.16	708.57	1,207.66	10,259.14	1,232.57	663.83	947.61	1,720.05	326.40	1,374.55
12,331.80	544.23	483.12	768.53	1,267.62	10,319.11	1,292.53	723.80	1,007.57	1,780.01	386.36	1,434.51
12,414.90	627.34	566.23	851.64	1,350.73	10,402.21	1,375.64	806.91	1,090.68	1,863.12	469.47	1,517.62
12,543.14	755.58	694.47	979.88	1,478.97	10,530.45	1,503.87	935.14	1,218.92	1,991.35	597.71	1,645.86
12,669.28	881.71	820.60	1,106.02	1,605.10	10,656.59	1,630.01	1,061.28	1,345.05	2,117.49	723.84	1,771.99
12,764.12	976.55	915.44	1,200.85	1,699.94	10,751.43	1,724.85	1,156.12	1,439.89	2,212.33	818.68	1,866.83
12,811.48	1,023.91	962.80	1,248.22	1,747.30	10,798.79	1,772.21	1,203.48	1,487.25	2,259.69	866.04	1,914.19
12,756.20	968.64	907.53	1,192.94	1,692.02	10,743.51	1,716.93	1,148.20	1,431.98	2,204.41	810.76	1,858.92
12,682.62	895.05	833.94	1,119.35	1,618.44	10,669.92	1,643.35	1,074.62	1,358.39	2,130.83	737.18	1,785.33

Modifiers	Modifier for number of chronic conditions			
	Number of Conditions	2	3	4 or more
		CC2	CC3	CC4
	All Ages	226.38	619.52	1,260.01
	Amount is per beneficiary per month. Add to amounts obtained from Columns 1 to 28. Not applicable to Under 1's.			
	Modifier for Maternity			
		MAT		
	All Ages	20,995.70		
	Amount is per delivery (as defined). Use only once per delivery, not monthly.			



Annexure C: REF Count 2009 table

Expected combined REF Grid Count in 2009																
Rate per 1,000 Beneficiaries in each Age Band																
Age Bands	No CDL Diseases NON	Chronic Disease List (CDL) Conditions														
		ADS	AST	BCE	BMD	CHF	CMY	COP	CRF	CSD	DBI	DM1	DM2	DYS	EPL	GLC
Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Under 1	1,000.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-4	974.55	0.01	22.20	0.06	0.01		0.08	0.45	0.01	0.00	-	0.19	0.01	0.00	1.09	0.01
5-9	971.85	0.01	22.83	0.03	0.02		0.05	0.34	0.01	0.00	0.01	0.56	0.03	0.01	1.94	0.00
10-14	977.61	0.01	16.84	0.04	0.06		0.04	0.22	0.01	0.01	0.01	1.00	0.07	0.02	2.36	0.01
15-19	981.76	0.02	11.68	0.02	0.23		0.07	0.19	0.02	0.05	0.01	1.28	0.22	0.02	2.92	0.02
20-24	982.06	0.01	7.79	0.01	0.48		0.07	0.14	0.07	0.10	0.02	1.78	0.41	0.05	3.11	0.08
25-29	975.53	0.01	7.33	0.02	0.56		0.18	0.16	0.11	0.16	0.02	1.75	0.87	0.06	2.33	0.10
30-34	951.11	0.02	10.37	0.03	0.71		0.49	0.32	0.16	0.19	0.01	1.98	2.53	0.15	2.66	0.14
35-39	922.32	0.04	12.18	0.03	0.87		1.03	0.50	0.18	0.21	0.01	2.40	6.13	0.24	3.02	0.26
40-44	884.10	0.04	13.39	0.06	0.82		2.28	0.87	0.29	0.20	0.02	3.18	12.17	0.36	3.66	0.49
45-49	835.73	0.03	14.55	0.05	1.02		3.93	1.62	0.37	0.28	0.02	3.93	19.80	0.80	3.98	0.93
50-54	770.64	0.04	16.28	0.07	1.00		6.77	3.32	0.57	0.35	0.00	4.48	27.39	1.54	4.73	1.87
55-59	698.78	0.07	17.78	0.13	0.96		10.59	6.34	0.81	0.33	0.03	5.26	34.07	2.94	5.11	2.88
60-64	629.09	0.12	20.24	0.17	1.08		15.53	11.44	1.04	0.56	0.02	5.92	38.20	5.45	5.46	4.35
65-69	555.39	0.07	21.22	0.17	1.03		25.80	17.91	1.04	0.47	0.01	6.46	41.98	8.01	6.65	7.19
70-74	499.30	0.10	22.77	0.14	0.67		38.11	24.70	0.99	0.44	0.02	6.40	42.30	11.90	7.46	9.82
75-79	478.95	0.16	20.40	0.16	0.76		53.21	26.48	0.77	0.32	-	5.99	39.29	15.42	7.55	12.34
80-84	474.89	0.03	18.00	0.07	0.45		75.83	25.61	0.42	0.27	-	4.70	30.63	15.16	6.79	16.50
85+	528.97	0.13	11.64	0.03	0.31		101.93	18.18	0.52	0.09	-	2.68	20.10	14.52	5.83	18.04
Total by Condition*	884.60	0.03	14.66	0.05	0.57	-	5.05	2.73	0.26	0.18	0.01	2.52	10.45	1.32	3.29	1.26



Based on REF Study 2005 with Industry Age and Gender Profile March 2008

Chronic Disease List (CDL) Conditions												HIV	Total by Age Band	Multiple CDL Conditions			Maternity (Monthly per 1,000 Female Lives)
HAE	HYL	HYP	IBD	IHD	MSS	PAR	RHA	SCZ	SLE	TDH	HIV			2	3	4 or more	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
-	-	-	-	-	-	-	-	-	-	-	-	1,000.00	-	-	-	-	
0.01	0.00	0.03	0.01	0.00	-	-	0.02	0.01	0.00	0.05	1.22	1,000.00	0.26	-	-	-	
0.03	0.03	0.03	0.01	0.00	0.00	-	0.03	0.01	0.00	0.05	2.10	1,000.00	0.27	0.01	0.00	-	
0.01	0.11	0.07	0.03	0.01	0.01	-	0.07	0.02	0.03	0.14	1.21	1,000.00	0.26	0.01	0.00	0.03	
0.02	0.32	0.20	0.04	0.02	0.02	-	0.13	0.09	0.04	0.32	0.28	1,000.00	0.38	0.02	0.00	1.25	
0.03	0.63	0.87	0.12	0.03	0.05	0.01	0.21	0.29	0.08	0.67	0.84	1,000.00	0.80	0.09	0.01	5.30	
0.02	1.17	2.51	0.22	0.12	0.13	0.01	0.39	0.20	0.13	1.37	4.55	1,000.00	1.40	0.16	0.01	10.23	
0.01	3.12	7.96	0.23	0.33	0.18	0.02	0.75	0.27	0.18	2.65	13.45	1,000.00	3.81	0.52	0.04	7.98	
0.01	6.16	18.00	0.33	0.97	0.21	0.03	1.39	0.31	0.22	3.87	19.07	1,000.00	8.80	1.38	0.15	3.23	
0.02	11.90	36.20	0.32	2.45	0.24	0.09	2.38	0.33	0.29	5.28	18.59	1,000.00	18.29	3.01	0.29	0.56	
0.01	21.77	59.08	0.38	5.52	0.28	0.12	3.66	0.39	0.37	7.83	13.56	1,000.00	34.16	6.37	0.62	0.03	
0.02	36.28	88.40	0.56	10.32	0.22	0.31	4.90	0.39	0.41	10.80	8.37	1,000.00	55.70	11.65	1.36	0.02	
0.00	55.06	114.79	0.66	17.50	0.27	0.81	6.27	0.43	0.36	12.86	4.94	1,000.00	83.99	18.91	2.34	-	
0.00	72.39	135.35	0.59	27.44	0.19	1.71	6.70	0.54	0.32	13.98	2.15	1,000.00	111.74	28.34	3.94	-	
0.01	84.49	157.62	0.69	37.07	0.18	3.44	8.33	0.46	0.33	13.13	0.85	1,000.00	141.19	37.86	5.62	-	
-	83.97	172.91	0.65	49.73	0.12	5.82	8.21	0.58	0.33	12.25	0.31	1,000.00	163.59	44.22	6.84	-	
-	71.88	181.17	0.60	55.30	0.09	9.59	7.00	0.67	0.23	11.37	0.31	1,000.00	168.05	41.46	6.43	-	
-	50.25	192.44	0.60	56.88	0.15	10.78	6.74	0.77	0.21	11.78	0.06	1,000.00	154.66	34.20	4.89	-	
-	19.11	180.16	0.41	49.37	0.12	11.50	4.75	1.30	0.13	10.20	0.00	1,000.00	116.05	21.23	2.54	-	
0.01	15.69	36.53	0.26	6.23	0.13	0.57	2.03	0.25	0.18	4.29	6.84	1,000.00	26.55	6.03	0.80	2.23	



Annexure D: Target population for the calculation of the estimated REF community rate for 2009

Based on the March 2008 REF returns

Age bands	Females	Males	Total	% Female
Under 1	67,659	132,885	2%	49.08%
1-4	252,795	495,127	6%	48.94%
5-9	314,491	617,856	8%	49.10%
10-14	325,647	641,439	8%	49.23%
15-19	328,009	649,317	9%	49.48%
20-24	241,777	509,732	7%	52.57%
25-29	243,451	535,056	7%	54.50%
30-34	282,645	614,762	8%	54.02%
35-39	311,840	664,143	9%	53.05%
40-44	296,149	614,736	8%	51.83%
45-49	273,070	565,006	7%	51.67%
50-54	223,175	459,905	6%	51.47%
55-59	173,366	358,824	5%	51.68%
60-64	126,767	265,755	3%	52.30%
65-69	86,407	187,038	2%	53.80%
70-74	58,694	132,649	2%	55.75%
75-79	38,917	94,003	1%	58.60%
80-84	20,629	55,395	1%	62.76%
85+	10,956	34,890	0%	68.60%
Total	3,676,444	7,628,518	100%	51.81%

