

6.4 Standards and Case Mix Adjustment Methods

When profiling providers on the basis of cost, efficiency, effectiveness of care, or utilization of services, it is important to consider the type of patients each provider treats. How ill are the patients, and how intensive is the treatment they require? What special circumstances (patients' age, sex, geographic location, comorbid conditions) must be considered? For example, a veterans' hospital cannot be evaluated on the same basis as an inner-city general hospital without adjusting for the different mix of patients.

To incorporate this information in your analysis, case mix adjustment methods are used. After factoring in the mix of patients in your population using a case mix adjustment method, you can compare a selected provider against the standard.

Several key criteria are used in adjusting for case mix:

- standard weights
- case mix index
- expected average cost
- case-mix adjusted cost
- efficiency index

These values are calculated separately for stays (based on DRGs) and for episodes (based on ETGs), but the process is the same for each type of grouping.

Standard Weights

When you are profiling an individual primary care physician, the standard represents the PCP's peer group: for example, all providers in the network. For this group of providers, an average cost is calculated for each DRG or ETG, based on the Allowed, Submitted, Paid, or Equivalent Cost (ETG only) amounts (depending on the parameters of the standard). An average cost for the network, including all DRGs or ETGs, is also calculated on the same basis. The ratio of each DRG or ETG's average cost to the overall average cost is called the weight of that DRG or ETG.

Standard weights are used to determine the expected level of utilization for members assigned to a specified PCP or practice group. To calculate weights for a standard, MCSource divides the average cost per stay or episode (for each DRG or ETG) by the total cost of all stays or episodes to obtain the standard weight for the DRG or ETG, as shown in the example below. Note that the case-mix index for the standard is always 1.00.

ETG	Number of Episodes in Standard	Total Cost of Episodes	Average Cost per Episode	Standard Weight
0010	965	73,340	76	$76 / 351 = 0.21652$
0045	2 (small cell)	536	268	Small Cell: Weight = 0
0272	105	72,972	695	$695 / 351 = 1.9800$
0278	491 x	355,484	724	$724 / 351 = 2.0626$
0293	18 x	6,840	380	$380 / 351 = 1.0826$
0304	34 x	6,766	199	$199 / 351 = 0.5669$
0373	367 x	179,463	489	$489 / 351 = 1.3931$
Total	1,982	694,868	351	$351 / 351 = 1.00$

Case-Mix Index

A case-mix index is a single value indicating the complexity or severity of illness present in a single provider's set of patients, as compared to a larger set of providers (the standard). The case-mix index for each population is based on the weight of the stays or episodes that the provider manages, and represents the weighted average of expectations for members whose stays or episodes are assigned to a specified DRG or ETG.

It is important to understand that a case-mix index is a relative value. A standard can be derived from a number of different populations (e.g., total plan, specialty, geographic location, network, IPA). Therefore, a provider's case-mix index may vary considerably depending on the population used in the analysis.

To determine the case-mix index for a single provider, MCSource performs the following calculations:

1. Multiply the number of the provider's cases within the DRG or ETG by the standard weight to obtain the sum of weighted cases.

Note: This does not include those DRGs or ETGs that met the small cell criterion (typically, having less than five stays or episodes).

2. Divide the sum of case-mix weights by the provider's total number of weighted cases, as shown in the last row of the example below:

ETG	Number of Cases for Standard	Standard Weight	Number of Cases for PCP	Case-Mix Weights
0010	965	0.0268	54	$54 * 0.0268 = 1.4472$
0272	105	0.2454	12	$10 * 0.2454 = 2.4540$
0278	491	0.2557	60	$60 * 0.2557 = 15.342$
0293	18	0.1342	5	$5 * 0.1342 = 0.6710$
0304	34	0.0702	8	$8 * 0.0702 = 0.5616$
0373	367	0.1727	42	$42 * 0.1727 = 7.2534$
<i>Total</i>	1982		181	27.7292
<i>Case Mix Index:</i>				$27.7292 / 181 = 0.1532$

Expected Average Cost

To calculate a provider's efficiency, you need to measure the actual costs against averages from the standard. These averages can vary depending on the basis amount used in the standard set. The standard data may be drawn from the Allowed, Submitted, Paid or Equivalent Cost Amount fields: for example, the ETG Average Amount comes from ETG_ETG_STANDARD_FACT, and the DRG Average Amount comes from DRG_DRG_STANDARD_FACT.

Note: Actual vs. expected days are calculated in the same manner.

Pmnts/Disch: submitted amount (Cost) per discharge

Exp Pmnts/Disch: expected average (standard) submitted amount per discharge

Pmnts/Disch Diff: difference between the actual and the expected amounts per discharge

Provider 3175 significantly exceeded both the expected average cost and the expected days for many DRGs. Why?

	A	B	C	D	E	F	G	H	I	J	
1	Prod Name: VPS HMO										
2	Prov ID - Consist	DRG Code - Consist	Dischs - Perf	Pmnts / Disch	Exp Pmnts / Disch	Pmnts / Disch Diff	Days	Exp Days	Days Diff	Days above Std	
219	3174	333	1	7,650	7,650	0	6	6.00	0	0.00	
220		352	1	1,275	1,275	0	1	1.00	0	0.00	
221		256	3	2,125	3,604	(1,479)	5	20.25	(15)	0.00	
222	3175	321	1	6,000	2,233	3,767	8	2.82	5	5.17	
224		014	1	16,215	7,055	9,160	15	6.67	8	8.33	
225		390	1	2,162	1,030	1,132	2	1.67	0	0.33	
226		127	1	6,750	3,232	3,518	9	3.78	5	5.22	
227		035	1	16,215	9,179	7,036	15	6.40	9	8.60	
228		255	1	2,250	1,288	962	3	1.60	1	1.40	
229		391	1	1,200	726	474	3	1.42	2	1.68	
230		384	3	3,700	2,361	1,340	19	9.75	9	11.50	
231		096	2	3,497	2,570	927	8	6.00	2	2.00	
232		383	19	2,939	2,172	767	70	51.96	18	21.98	
233		371	2	4,050	3,000	1,050	6	7.09	(1)	0.45	
234		373	156	2,766	2,076	690	382	320.24	42	86.25	
235		379	18	2,970	2,309	661	88	50.40	18	27.00	
236		183	2	1,875	1,510	365	5	3.28	2	1.71	
237		190	5	4,108	3,214	794	19	18.33	1	5.00	
238		181	1	3,000	2,465	535	4	3.50	1	0.50	
239		097	6	2,901	2,430	471	21	16.31	5	6.13	
240		451	2	3,705	3,317	389	9	12.22	(3)	0.89	

Efficiency Index

By comparing the expected average cost to the provider's actual cost, you can evaluate the provider's cost efficiency in comparison to the standard, as shown in the following dataview. This measurement is called the *efficiency index*.

To calculate a provider's efficiency index, MCSource divides the actual (submitted, allowed or paid) amount by the expected (standard) amount. The higher the efficiency index, the greater the provider's financial inefficiency.

For example, in the following dataview, the efficiency index for provider 3175 ranged from 1.08 to 2.60: from 100% to 260% of the standard.

Pmnts/Disch: submitted amount (Cost) per discharge

Exp Pmnts/Disch: expected average (standard) submitted amount per discharge

Effic Index: Subm/Disch divided by Exp Subm/Disch; the actual amount divided by the expected amount.

The efficiency index for Provider 3175 is consistently above 1.00 and ranges over 2.00, indicating financial inefficiency.

	A	B	C	D	E	F	G	H	I	J	K	
1	Prod Name: VPS HMO											
2	Prov ID - Consist	DRG Code - Consist	Dischs - Perf	Pmnts / Disch	Exp Pmnts / Disch	Pmnts / Disch Diff	Days	Exp Days	Days Diff	Days above Std	Effic Index	
219	3174	333	1	7,650	7,650	0	6	6.00	0	0.00	0.00000	
220		352	1	1,275	1,275	0	1	1.00	0	0.00	1.00000	
221		256	3	2,125	3,604	(1,479)	5	20.25	(15)	0.00	0.59828	
222	3175	321	1	6,000	2,233	3,767	8	2.82	5	5.17	2.60709	
224		014	1	16,215	7,055	9,160	15	6.67	8	8.33	2.29821	
225		390	1	2,162	1,030	1,132	2	1.67	0	0.33	2.09861	
226		127	1	6,750	3,232	3,518	9	3.78	5	5.22	2.08829	
227		035	1	16,215	9,179	7,036	15	6.40	9	8.60	1.76657	
228		255	1	2,250	1,288	962	3	1.60	1	1.40	1.74667	
229		391	1	1,200	726	474	3	1.42	2	1.58	1.65367	
230		384	3	3,700	2,361	1,340	19	9.75	9	11.50	1.56745	
231		096	2	3,497	2,570	927	8	6.00	2	2.00	1.98008	
232		383	19	2,939	2,172	767	70	51.96	18	21.98	1.35319	
233		371	2	4,050	3,000	1,050	6	7.09	(1)	0.45	1.34687	
234		373	156	2,766	2,076	690	382	320.24	42	86.25	1.23214	
235		379	18	2,970	2,309	661	89	58.48	19	37.50	1.29825	
236		183	2	1,875	1,510	365	5	3.28	2	1.71	1.24002	
237		190	5	4,108	3,214	794	19	18.33	1	5.00	1.23803	
238		181	1	3,000	2,465	535	4	3.50	1	0.50	1.21708	
239		097	6	2,901	2,430	471	21	16.31	5	6.13	1.19318	
240		451	2	3,705	3,317	389	9	12.22	(3)	0.89	1.11724	
241		372	14	2,754	2,548	205	227	98.24	237	276.88	1.09492	

Case-Mix Adjusted Cost

To adjust a provider's cost to what it would be if the provider treated the standard case mix, MCSource calculates the case-mix adjusted cost. The provider's actual (submitted, allowed or paid) amount is divided by the provider's case-mix index. Once this is done, the provider can be ranked based on the adjusted cost.

Pmnts/Disch: submitted amount per discharge

Exp Pmnts/Disch: expected average (standard) submitted amount per discharge

CMI: Case Mix Index

CAj Pmnts/Disch: payments per discharge, adjusted for case mix using the DRG

The case-mix adjusted costs for Provider 3175 are consistent with this provider's cost-intensive pattern.

	A	B	C	D	E	F	G	H	I
1	Prod Name: VPS HMO								
2	ProvID - Consist - Pref	DRG Code - Consist	Dischs	Pmnts / Disch	Exp Pmnts / Disch	Pmnts / Disch Diff	CMI	Effc Index	CAj Pmnts / Disch
224	3175	014	1	16,215	7,055	9,160	2.308300	2.298210	7,025
225		390	1	2,162	1,030	1,132	0.336800	2.099681	6,419
226		127	1	6,750	3,232	3,518	1.057500	2.080297	6,383
227		035	1	16,215	9,179	7,036	3.003100	1.766507	5,399
228		255	1	2,250	1,298	952	0.421400	1.746967	5,339
229		391	1	1,200	726	474	0.237400	1.657667	5,055
230		384	3	3,700	2,381	1,340	0.772200	1.567465	4,792
231		096	2	3,497	2,570	927	0.840800	1.360506	4,159
232		383	19	2,939	2,172	767	0.710500	1.353193	4,137
233		371	2	4,050	3,090	1,050	0.981600	1.349879	4,126
234		373	156	2,766	2,076	690	0.679200	1.332124	4,072
235		379	18	2,970	2,309	661	0.755400	1.286353	3,932
236		183	2	1,875	1,510	365	0.493900	1.242002	3,796
237		190	5	4,108	3,314	794	1.084200	1.239600	3,789
238		181	1	3,000	2,465	535	0.806400	1.217108	3,720
239		097	6	2,901	2,430	471	0.794900	1.193916	3,649
240		451	2	3,706	3,317	389	1.085200	1.117224	3,415
241		372	14	2,754	2,548	205	0.833700	1.080489	3,303

Case Mix Adjustment and Comparison Measures

The criteria described in the preceding pages are a few of many *comparison measures* that MCSource offers. They are found in the Comparison Counts and Amounts and Comparison Measures folders in the Comparison dataviews of the Profile Health module.

These dataviews are located on the following Navigator pathways:

- Profile Health - Hospitals - Profile by DRG (Hospital, MDC and DRG Comparison Summaries)
- Profile Health - Utilization Assessment - Service Experience - Inpatient Stays (Standard Comparison and Provider Comparison by DRG)
- Profile Health - Utilization Assessment - Population-Based Analysis - Experience by Age and Gender (Inpatient Comparisons by DRG and Episodal Comparisons by ETG)
- Profile Health - Physicians - Profile by ETG - Episode Views (PCP, MDC and ETG Comparison Summaries)
- Profile Health - Physicians - Profile by ETG - Episode Subset Views (PCP Treatment and PCP Drug Utilization Comparisons)
- Profile Health - Utilization Assessment - Service Experience - Episodes of Care (Standard Comparison and Provider Comparison by ETG)