

Case-Mix Coefficients for MA & PDP CAHPS

Approach to Case-mix Adjustment

MA & PDP CAHPS results are adjusted for certain respondent characteristics not under the control of the health or drug plan but related to the sampled member's survey responses. The 2017 MA & PDP CAHPS case-mix coefficients are also publicly available in the "Medicare 2018 Part C & D Star Rating Technical Notes."

The case-mix model used to analyze 2017 MA & PDP CAHPS Survey data includes three self-reported characteristics (education, general health, mental health), together with age, indicators of Medicaid dual eligibility, low-income subsidy status, information indicating whether another person helped the respondent complete the questionnaire, and whether the survey was completed in Chinese.

Case-mix adjustment is implemented via linear regression models predicting CAHPS measures from case-mix adjustors and contract indicators. In these models, missing case-mix adjustors are imputed as the contract mean. Adjusted means represent the mean that would be obtained for a given contract if the average of the case-mix variables for that contract was equal to the national average across all contracts.¹

Data from MA contracts are weighted to represent each contract's proportion of Part D enrollees.

The following three components are needed for case-mix adjustment at the contract level:

- Weighted contract means for each case-mix variable (only used in the case of respondents who answered the CAHPS items)
- Weighted national means for each case-mix variable (based on all respondents who answered the CAHPS items)
- Individual-level coefficients for each case-mix variable

The formula used to calculate a case-mix adjusted score is as follows:

$$\text{Adjusted Score} = \text{Raw Score} - \text{Net Adjustment.}$$

The net adjustment is the sum of a series of products. Each product is, for a single case-mix adjusted variable, calculated as follows:

$$(\text{contract mean} - \text{national mean}) \times \text{Coefficient.}$$

To illustrate how the contract mean for a given case-mix variable is calculated, consider the case of age. The table below shows age data for a hypothetical contract with 7 respondents. Seven indicator (0 or 1) age variables are created for each of the 5 age range groups. The age 70-74 category is not shown because it serves as the reference category.

¹ Consequently, the national mean of contract means is unchanged by case-mix adjustment.

Survey ID	Actual age at time of finalizing survey	Age 64 and under	Age 65-69	Age 75-79	Age 80-84	Age 85 and older
1	65	0	1	0	0	0
2	57	1	0	0	0	0
3	82	0	0	0	1	0
4	71	0	0	0	0	0
5	88	0	0	0	0	1
6	36	1	0	0	0	0
7	66	0	1	0	0	0

For this contract, the mean of each of the 5 age range variables is calculated as follows:

$$H_{\leq 64} = (0+1+0+0+0+1+0) / 7 = 2/7 = 0.29$$

$$H_{65-69} = (1+0+0+0+0+0+1) / 7 = 2/7 = 0.29$$

$$H_{75-79} = (0+0+0+0+0+0+0) / 7 = 0/7 = 0.00$$

$$H_{80-84} = (0+0+1+0+0+0+0) / 7 = 1/7 = 0.14$$

$$H_{85+} = (0+0+0+0+1+0+0) / 7 = 1/7 = 0.14$$

Case-mix Coefficients for 2018 Star Ratings

Case-mix adjustment is performed by CMS contractors. The case-mix coefficients are re-estimated each year based on new data. The case-mix coefficients for 2018 Star Ratings were estimated from CAHPS data collected in 2017 and can be found in Tables 1 and 2, below. The coefficients indicate how much higher or lower people with a given characteristic tend to respond compared to others with the baseline value for that characteristic, on the 0-100 scale used in consumer reports.

For example, for the composite "Customer Service," the coefficient for "age 80-84" is +0.0029, indicating that respondents in that age range tend to score their contracts 0.0029 points higher than otherwise similar people in the 70-74 age range (the baseline or reference category). Similarly, Medicaid dual eligibles tend to respond 0.0077 points lower on this item than otherwise similar non-duals. Contracts with higher proportions of beneficiaries who are in the 80-84 age range will be adjusted downwards to compensate for the positive response tendency of their respondents on this composite. Similarly, contracts with higher proportions of respondents who are dual eligibles will be adjusted upwards to compensate for their respondents' negative response tendency. The case-mix patterns are not always consistent across measures.

The composites consist of multiple items, each of which is adjusted separately before combining the adjusted scores into a composite score. In the tables we report the average of the coefficients for these several items, for each of the categories (rows) of the table, as a summary of the adjustment for the composite.

Table 1. Case-mix Coefficients for Part C CAHPS Measures

Predictor	C03: Annual Flu Vaccine	C22: Getting Needed Care (Comp)	C23: Getting Appointments and Care Quickly (Comp)	C24: Customer Service (Comp)	C25: Rating of Health Care Quality	C26: Rating of Health Plan	C27: Care Coordination (Comp)
Age: 64 or under	N/A	-0.0309	-0.0513	-0.0012	-0.1779	-0.2362	-0.0330
Age: 65 – 69	N/A	-0.0382	-0.0187	-0.0029	-0.0947	-0.0574	-0.0313
Age: 75 – 79	N/A	-0.0070	0.0114	-0.0163	-0.0325	0.0552	-0.0150
Age: 80 – 84	N/A	-0.0035	-0.0051	0.0029	0.0220	0.1512	-0.0331
Age: 85 and older	N/A	-0.0148	0.0121	-0.0141	0.0077	0.1916	-0.0414
Less than an 8th grade education	N/A	-0.0566	-0.0414	-0.0141	-0.0513	0.1072	0.0265
Some high school	N/A	-0.0191	-0.0100	-0.0193	0.0507	0.0915	0.0104
Some college	N/A	-0.0343	-0.0182	-0.0473	-0.0557	-0.1222	-0.0412
College graduate	N/A	-0.0309	-0.0128	-0.0604	-0.1199	-0.2249	-0.0416
More than a bachelor's degree	N/A	-0.0557	-0.0357	-0.1333	-0.2005	-0.3240	-0.0479
General health rating: excellent	N/A	0.0422	0.0777	0.0367	0.3574	0.3636	0.0413
General health rating: very good	N/A	0.0391	0.0518	0.0226	0.1938	0.1738	0.0208
General health rating: fair	N/A	-0.0516	-0.0183	-0.0291	-0.2786	-0.1224	-0.0401
General health rating: poor	N/A	-0.1029	-0.0729	-0.0462	-0.5188	-0.3475	-0.0808
Mental health rating: excellent	N/A	0.1725	0.1287	0.1335	0.4462	0.3208	0.1261
Mental health rating: very good	N/A	0.0710	0.0569	0.0484	0.1768	0.1343	0.0447
Mental health rating: fair	N/A	-0.0522	-0.0185	-0.0009	-0.1271	-0.1170	-0.0505
Mental health rating: poor	N/A	-0.1051	-0.0325	-0.0905	-0.4554	-0.5123	-0.0903
Proxy helped	N/A	0.0157	-0.0451	-0.0125	-0.0945	-0.0650	0.0130
Proxy answered	N/A	0.0412	0.0332	0.0035	0.1215	-0.0205	0.0328
Medicaid dual eligible	N/A	-0.0151	0.0001	-0.0077	0.0300	0.2654	-0.0117
Low-income subsidy (LIS)	N/A	-0.0169	0.0024	-0.0076	-0.0783	0.1352	0.0009
Chinese Language	N/A	0.0779	-0.0527	-0.0498	-0.1288	-0.6225	0.0390

Table 2. Case-mix Coefficients for Part D CAHPS Measures

Predictor	MA-PD D08: Rating of Drug Plan	MA-PD D09: Getting Needed Prescription Drugs (Comp)	PDP D08: Rating of Drug Plan	PDP D09: Getting Needed Prescription Drugs (Comp)
Age: 64 or under	-0.2632	-0.0569	-0.2960	-0.0042
Age: 65 – 69	-0.1173	-0.0375	-0.1257	-0.0614
Age: 75 – 79	0.0748	0.0011	0.1338	-0.0041
Age: 80 – 84	0.1935	0.0013	0.1942	-0.0157
Age: 85 and older	0.3037	0.0029	0.3513	0.0247
Less than an 8th grade education	0.0386	-0.0634	0.1293	0.0249
Some high school	0.0700	-0.0087	0.0744	-0.0321
Some college	-0.2052	-0.0415	-0.2391	-0.0508
College graduate	-0.2639	-0.0302	-0.3140	-0.0517
More than a bachelor's degree	-0.3860	-0.0737	-0.5384	-0.1463
General health rating: excellent	0.2642	0.0194	0.2086	0.0718
General health rating: very good	0.1341	0.0297	0.2398	0.0746
General health rating: fair	-0.1628	-0.0368	-0.2138	-0.0662
General health rating: poor	-0.3174	-0.0714	-0.2253	-0.0546
Mental health rating: excellent	0.3575	0.1077	-0.0134	-0.0175
Mental health rating: very good	0.1677	0.0443	-0.0103	0.0070
Mental health rating: fair	-0.0690	-0.0455	-0.0102	-0.0520
Mental health rating: poor	-0.3416	-0.0898	-0.0701	-0.1312
Proxy helped	-0.1081	0.0151	-0.1689	-0.0412
Proxy answered	-0.0229	0.0104	-0.1371	0.0235
Medicaid dual eligible	0.5330	0.0344	0.5459	-0.0526
Low-income subsidy (LIS)	0.4569	0.0038	0.4959	-0.0311
Chinese Language	-0.3198	-0.0029	0.0000	0.0000