

## Case-Mix Coefficients for MA & PDP CAHPS

### *Approach to Case-mix Adjustment*

As noted in Chapter IX of the *Medicare Advantage and Prescription Drug Plan CAHPS Survey Quality Assurance Protocols & Technical Specifications, V5.0* (<http://www.ma-pdpcahps.org>), 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 2014 MA & PDP CAHPS case-mix coefficients are also publicly available in the "Medicare 2015 Part C & D Star Rating Technical Notes."

The case-mix model used to analyze MA & PDP CAHPS Survey data includes three self-reported characteristics (education, general health, mental health), together with age, indicators of Medicaid dual eligibility, eligibility for low-income subsidy, 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.<sup>1</sup>

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: Adjusted Score = Raw Score – 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:

(contract mean - national mean) x 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

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

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.

| 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 2015 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 2015 Star Ratings were estimated from CAHPS data collected in 2014 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 "Getting Needed Care", the coefficient for "age 80-84" is +0.015, indicating that respondents in that age range tend to score their contracts 0.015 point higher than otherwise similar people in the 70-74 age range (the baseline or reference category). Similarly, dual eligibles tend to respond 0.022 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                        | C23: Getting Needed Care (Comp) | C24: Getting Appointments and Care Quickly (Comp) | C25: Customer Service (Comp) | C26: Rating of Health Care Quality | C27: Rating of Health Plan | C28: Care Coordination (Comp) |
|----------------------------------|---------------------------------|---|------------------------------|------------------------------------|----------------------------|-------------------------------|
| Age: 64 or under                 | -0.038                          | -0.033  | -0.019                       | -0.204                             | -0.221                     | -0.021                        |
| Age: 65 - 69                     | -0.004                          | -0.004  | 0.005                        | -0.064                             | -0.093                     | 0.011                         |
| Age: 75 - 79                     | 0.004                           | 0.001   | -0.004                       | 0.017                              | 0.061                      | -0.012                        |
| Age: 80 - 84                     | 0.015                           | 0.025   | 0.018                        | 0.067                              | 0.159                      | -0.01                         |
| Age: 85 and older                | 0.014                           | -0.002  | 0.034                        | 0.086                              | 0.171                      | -0.04                         |
| Less than an 8th grade education | -0.033                          | -0.002  | -0.027                       | -0.012                             | 0.15                       | -0.004                        |
| Some high school                 | 0.005                           | -0.049  | -0.005                       | -0.043                             | 0.143                      | 0.007                         |
| Some college                     | -0.046                          | -0.01   | -0.042                       | -0.083                             | -0.18                      | -0.037                        |
| College graduate                 | -0.049                          | 0   | -0.065                       | -0.155                             | -0.291                     | -0.044                        |
| More than a bachelor's degree    | -0.109                          | -0.022  | -0.091                       | -0.217                             | -0.351                     | -0.064                        |
| General health rating: excellent | 0.093                           | 0.08  | 0.031                        | 0.387                              | 0.317                      | 0.034                         |
| General health rating: very good | 0.041                           | 0.046   | 0.047                        | 0.216                              | 0.189                      | 0.023                         |
| General health rating: fair      | -0.067                          | -0.046  | -0.034                       | -0.235                             | -0.13                      | -0.04                         |
| General health rating: poor      | -0.105                          | -0.04   | -0.091                       | -0.436                             | -0.246                     | -0.048                        |
| Mental health rating: excellent  | 0.164                           | 0.142   | 0.119                        | 0.48                               | 0.399                      | 0.125                         |
| Mental health rating: very good  | 0.066                           | 0.065   | 0.051                        | 0.23                               | 0.179                      | 0.061                         |
| Mental health rating: fair       | -0.056                          | 0.003   | 0.014                        | -0.161                             | -0.076                     | -0.033                        |
| Mental health rating: poor       | -0.167                          | -0.059  | -0.057                       | -0.424                             | -0.359                     | -0.11                         |
| Proxy helped                     | -0.014                          | -0.044  | -0.039                       | -0.169                             | -0.163                     | 0.018                         |
| Proxy answered                   | 0.003                           | -0.022  | -0.039                       | -0.006                             | -0.135                     | -0.016                        |
| Medicaid dual eligible           | -0.022                          | -0.017  | 0.027                        | -0.045                             | 0.301                      | -0.01                         |
| Low-income subsidy (LIS)         | -0.032                          | -0.028  | 0.029                        | -0.071                             | 0.065                      | -0.007                        |
| Chinese language survey          | -0.127                          | -0.072  | -0.331                       | 0.175                              | -0.424                     | 0.013                         |

Source: Medicare 2015 Part C & D Star Rating Technical Notes

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

| Predictor                        | MA-PD                    |   | PDP                      |   |
|----------------------------------|--------------------------|---|--------------------------|---|
|                                  | D06: Rating of Drug Plan | D07: Getting Needed Prescription Drugs (Comp) | D06: Rating of Drug Plan | D07: Getting Needed Prescription Drugs (Comp) |
| Age: 64 or under                 | -0.228                   | -0.034  | -0.174                   | -0.056  |
| Age: 65 - 69                     | -0.127                   | -0.011  | -0.107                   | -0.017  |
| Age: 75 - 79                     | 0.125                    | 0.023   | 0.32                     | 0.028   |
| Age: 80 - 84                     | 0.267                    | 0.033   | 0.404                    | 0.032   |
| Age: 85 and older                | 0.389                    | 0.032   | 0.431                    | 0.032   |
| Less than an 8th grade education | 0.077                    | -0.045  | 0.1                      | -0.041  |
| Some high school                 | 0.086                    | 0   | 0.136                    | -0.017  |
| Some college                     | -0.207                   | -0.011  | -0.271                   | -0.064  |
| College graduate                 | -0.339                   | -0.027  | -0.33                    | -0.069  |
| More than a bachelor's degree    | -0.45                    | -0.055  | -0.551                   | -0.072  |
| General health rating: excellent | 0.287                    | 0.009   | 0.108                    | -0.049  |
| General health rating: very good | 0.214                    | 0.027   | 0.155                    | -0.009  |
| General health rating: fair      | -0.151                   | -0.044  | -0.113                   | -0.044  |
| General health rating: poor      | -0.339                   | -0.082  | -0.366                   | -0.053  |
| Mental health rating: excellent  | 0.356                    | 0.1   | 0.228                    | 0.102   |
| Mental health rating: very good  | 0.128                    | 0.048   | 0.162                    | 0.062   |
| Mental health rating: fair       | -0.044                   | -0.018  | -0.069                   | -0.018  |
| Mental health rating: poor       | -0.278                   | -0.066  | -0.189                   | -0.063  |
| Proxy helped                     | -0.219                   | -0.004  | -0.311                   | -0.028  |
| Proxy answered                   | -0.179                   | 0.001   | -0.2                     | -0.01   |
| Medicaid dual eligible           | 0.583                    | 0.037   | 0.764                    | 0.038   |
| Low-income subsidy (LIS)         | 0.462                    | 0.037   | 0.572                    | 0.055   |
| Chinese language survey          | -0.453                   | -0.046  | N/A                      | N/A   |

Source: Medicare 2015 Part C & D Star Rating Technical Notes