Patient-Mix Adjustment Factors for
Home Health Care CAHPS Survey Results Publicly Reported on Home Health Compare in July 2018

Home Health Care CAHPS (HHCAHPS) Survey results will be "refreshed" or updated each calendar year quarter and published on the Home Health Compare (HHC) link on the https://www.Medicare.gov/ website. HHCAHPS Survey results based on survey responses from a sample of patients who received home health care from Medicare-certified home health agencies (HHAs) at some point between January 2017 and December 2017 are currently available on the Home Health Compare link on the https://www.Medicare.gov/ website.

Prior research has shown that patients' assessment of the health care they receive may be affected by both the survey data collection mode and patient characteristics. In 2009 and 2010, the Centers for Medicare & Medicaid Services (CMS) and the HHCAHPS Coordination Team conducted a mode experiment to assess the effects of the three approved data collection modes (mail only, telephone only, and mail with telephone follow-up of nonrespondents). Data collected during the HHCAHPS mode experiment were also used to determine which, if any, patient characteristics (patient mix) affected patients' assessment of the home health care they received. The results of the HHCAHPS Survey mode experiment showed no significant differences in results based on survey mode. There were, however, differences in responses attributable to patient mix characteristics. Therefore, patient mix adjustments are made on HHCAHPS Survey results that are publicly reported using selected patient characteristics identified during the mode experiment, but no adjustments are being made for mode differences.

The patient mix adjustment factors being used in the HHCAHPS Survey are derived from coefficients obtained from Ordinary Least Squares regression analyses on each separate HHCAHPS response item for the identified patient characteristics. The regression coefficients indicate the tendency of patients with particular characteristics to respond more positively or negatively to HHCAHPS Survey questions. Patient mix adjustment factors are calculated directly from these regression coefficients for each HHCAHPS response item by multiplying the coefficients by negative one (−1.0).

For example, analyses of the data on which results that are being currently publicly reported showed that patients who were aged 50–64 in the regression on the Overall Rating global measure were 2.6 percent less likely to provide the most positive ("top box") response (rating of a 9 or 10 for this HHCAHPS measure) when compared to the reference group of patients aged 65–74. Consequently, the adjustment factor for patients aged 50–64 is +2.6

percent. Likewise, patients with a schizophrenia diagnosis were 3.8 percent less likely to report the most positive (top box) response ("Definitely Recommend") on the Willingness to Recommend measure. Therefore, the adjustment factor for patients with a schizophrenia diagnosis on this specific item is +3.8 percent (Table 1).

Patient mix adjustment factors to account for HHA differences in patient mix are calculated for the latest quarter and applied to HHA raw scores for each of the latest quarter's HHCAHPS response items. The latest quarter's composite measures are then formed from these adjusted scores. The last four quarters of adjusted scores are then averaged to produce the current quarter's published scores. Published scores are adjusted for differences between an HHA's patient composition according to the HHCAHPS patient mix characteristics and the overall national composition of home health patients on these same characteristics. This adjustment, which allows consumers to compare different HHAs based on the same overall patient composition, is made by subtracting the national mean for a given patient characteristic from an HHA's share of patients on this patient characteristic. For example, if nationally 20 percent of patients are aged 65–74, but an HHA's share of patients on this measure is 25 percent, then this adjustment for the difference in the HHA's patient composition versus the overall national patient composition is calculated as 25 percent minus 20 percent, or 5 percent.

Four sets of numbers are needed to calculate an HHA's adjusted score for any given HHCAHPS response item: (1) the "raw score," or HHA's mean on the respective HHCAHPS outcome before adjustment, (2) the individual-level patient mix adjustment factors shown in Table 1 (top box adjustment factors), (3) the HHA's means on the patient mix characteristic variables, and (4) the national mean on the patient mix characteristic variables shown in Table 2.

The adjusted score for a given HHCAHPS Survey response item for an HHA is the sum of a series of products in the equation shown below, where each product multiplies the adjustment from Table 1 (top box) by the deviation of the HHA's mean on a given patient mix characteristic from the national mean on that characteristic from Table 2:

$$y' = y + a1(h1 - m1) + a2(h2 - m2) + a3(h3 - m3) + \ldots + a19(h19 - m19)$$

where

y'	is the HHA's adjusted score for the respective HHCAHPS response item
y	is the HHA's "raw score," or mean on the respective unadjusted top box HHCAHPS response item

a1 to a19 are the individual-level adjustments from Table 1 for the patient characteristics in the table expressed as a proportion rather than as a percentage

h1 to h19 are the HHA's mean proportions of patients with each of the patient characteristics in the same row

m1 to m19 are the national mean proportions of patients with each of the patient characteristics in Table 2 across the HHAs participating in HHCAHPS.

For public reporting purposes, the final adjusted HHCAHPS score is rounded to the nearest integer and expressed as a percentage (e.g., 84%).

Information presented in this document will permit an HHA to approximate the effect of patient mix adjustment on its HHCAHPS Survey results. Exact replication of published HHCAHPS results is not possible because of the effects of data cleaning and small differences between the effects of quarterly patient mix adjustments and the 4-quarter averages presented here.

For each future public reporting period, Tables 1 and 2 will be updated and posted on the Home Health Care CAHPS website at https://homehealthcahps.org/.

Table 1. "Top Box" HHCAHPS Patient-Mix Adjustment Factors (Four-Quarter Average for the July 2018 Public Reporting Period, January 2017 through December 2017 Home Health Patients)

Patient Mix Characteristic Patient Mix Level	Overall Rating	Willingness to Recommend	Care of Patients	Communication	Specific Care Issues
Proxy Proxy	0.007	0.012	0.002	0.003	0.007
Non-English survey response Non-English survey response	−0.054	−0.043	0.002	−0.003	−0.033
Age 18–49	0.071	0.051	0.038	0.023	0.028
50–64	0.026	0.014	0.016	0.008	0.005
65–74	RC	RC	RC	RC	RC
75–84	0.005	0.011	0.004	0.012	0.015
85+	0.015	0.027	0.009	0.027	0.030
Education < 8th grade	−0.004	−0.005	0.002	0.000	−0.022
Some high school	−0.013	−0.011	−0.003	−0.004	−0.017
High school graduate/GED	RC	RC	RC	RC	RC
Some college	0.022	0.012	0.011	0.012	0.018
College graduate or more	0.046	0.023	0.022	0.023	0.048
Residence status Patient lived alone	0.026	0.034	0.023	0.025	0.023
Self-reported health status Excellent	−0.101	−0.122	−0.049	−0.051	−0.062
Very good	−0.015	−0.006	−0.006	−0.004	−0.010
Good	RC	RC	RC	RC	RC
Fair	0.007	0.001	0.005	0.006	0.000
Poor	0.026	0.015	0.018	0.017	0.005
Mental/emotional status Excellent/very good	−0.044	−0.043	−0.024	−0.026	0.001
Good	RC	RC	RC	RC	RC
Fair/poor	0.020	0.015	0.011	0.015	0.008
Diagnoses Schizophrenia	0.049	0.038	0.041	0.038	0.040
Dementia/cerebral degeneration	0.008	0.004	0.003	0.012	0.010

RC = reference category

Table 2. National Means on Patient-Mix Adjustment Factors (Four-Quarter Average for the July 2018 Public Reporting Period, January 2017 through December 2017 Home Health Patients)

Patient Mix Characteristic Patient Mix Level	Mean
Proxy respondent used	0.12
Non-English survey response	0.06
Age 18–49	0.03
50–64	0.12
65–74	0.27
75–84	0.32
85+	0.26
Education 8th grade or less	0.11
Some high school	0.12
High school graduate/GED	0.34
Some college	0.24
College graduate or more	0.19
Residence status Patient lived alone	0.35
Self-reported health status Excellent	0.09
Very good	0.16
Good	0.31
Fair	0.33
Poor	0.12
Mental/emotional status Excellent/very good	0.42
Good	0.32
Fair/poor	0.26
Diagnoses Schizophrenia	0.01
Dementia/cerebral degeneration	0.08