December 20, 2018

NOTE TO: Medicare Advantage Organizations, Prescription Drug Plan Sponsors, and Other Interested Parties

SUBJECT: Advance Notice of Methodological Changes for Calendar Year (CY) 2020 for the Medicare Advantage (MA) CMS-HCC Risk Adjustment Model

Medicare Advantage has been successful in providing Medicare beneficiaries with options so that they can choose the healthcare that best fits their individual health needs. The Medicare Advantage program demonstrates bringing the value of private sector innovation and creativity to a government program, and CMS is committed to continuing to strengthen Medicare Advantage by promoting greater innovation, transparency, flexibility, and program simplification.

A key element in the success of Medicare Advantage is ensuring that payments to plans reflect the relative risk of the people who enroll. A critical tool that CMS uses to accomplish that goal is the use of risk adjustment models that adjust payments based on the characteristics and health conditions of each plan's enrollees.

For 2020, we are proposing important changes to the Part C risk adjustment model based on section 1853(a)(1)(I) of the Social Security Act (the Act). This proposal reflects the requirement in the 21st Century Cures Act (Pub. L. 114-255) to take into account the number of conditions an individual beneficiary may have, making an adjustment as the number increases.

Therefore, we are notifying you of proposed changes in the Medicare Advantage risk adjustment methodology applied under Part C in accordance with sections 1853(a)(1)(I)(iii) and 1853(b)(2) of the Act, as amended by section 17006 of the 21st Century Cures Act, for CY 2020. As amended by the 21st Century Cures Act, section 1853(a)(1)(I)(iii) requires that CMS provide at least 60 days for public review and comment of proposed changes to the Part C risk adjustment model that are based on section 1853(a)(1)(I). The proposed changes also include those based on our authority under section 1853(a)(1)(C), for which we must provide 30 days to comment.

We are proposing the full set of risk adjustment model changes in this 60-day Advance Notice in order to provide greater transparency in our proposed changes to the Part C risk adjustment model for 2020 as we implement the risk adjustment requirements added by the 21st Century Cures Act, as well as to provide a meaningful opportunity for stakeholders to review and fully evaluate the substantive proposals in their entirety.

Pursuant to section 1853(b)(2) of the Act, we will provide notification of planned changes in the MA capitation rate methodology and other risk adjustment methodologies applied under the Act for CY 2020, along with any other proposed changes in the payment methodologies for Part D and annual adjustments to the Medicare Part D benefit parameters for the defined standard benefit, in the Advance Notice of Methodological Changes for CY 2020 for Medicare Advantage

Capitation Rates, Part C and Part D Payment Policies to be released on or before January 31, 2019.

For 2020, CMS will announce the MA capitation rates and final payment policies, including the final CMS Hierarchical Condition Category (HCC) risk adjustment model, no later than Monday, April 1, 2019, in accordance with the timetables established in section 1853(b)(2), as amended by the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) (Pub. L. 108-173) and the Securing Fairness in Regulatory Timing Act of 2015 (SFRTA) (Pub. L. 114-106); the statute requires CMS to publish the Advance Notice of Methodological Changes no fewer than 60 days before the publication of the Rate Announcement, and establishes a minimum 30-day period for the public to comment on the proposals in the Advance Notice.

To submit comments or questions electronically, go to https://www.regulations.gov, enter the docket number "CMS-2018-0154" in the "Search" field, and follow the instructions for "submitting a comment."

Comments will be made public. Submitters should not include any confidential or personal information in their comments. In order to receive consideration prior to the April 1, 2019 release of the final Rate Announcement of Calendar Year 2020 Medicare Advantage Capitation Rates and Medicare Advantage and Part D Payment Policies, comments must be received by 6:00 PM Eastern Standard Time on Tuesday, February 19, 2019.

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Demetrios Kouzoukas
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and Director, Center for Medicare

Background on Part C model

The CMS-HCC risk adjustment model is used to calculate risk scores that adjust capitated payments made for aged and disabled beneficiaries enrolled in Medicare Advantage (MA) plans and certain demonstrations. A risk score represents a beneficiary's expected medical cost relative to the average expected medical cost of beneficiaries entitled to Part A and enrolled in Part B, excluding those beneficiaries who are in End Stage Renal Disease (ESRD) or hospice status. For beneficiaries who are enrolled in a Medicare Advantage plan, and who are not in ESRD status, risk scores are calculated with distinct sets of coefficients depending on which segment, or group of beneficiaries, a beneficiary is assigned to. There are eight segments in total:

- New enrollees (those with less than 12 months of Part B enrollment in the data collection year)
- Continuing enrollees (those with 12 months of Part B enrollment in the data collection year) who are residing in the community in the payment month, with six different segments depending on whether they are entitled to Medicare due to age or disability (based on age as of February 1 of the payment year) and depending on whether they are full-benefit dual, partial-benefit dual, or non-dual (based on the payment month)
- Continuing enrollee who are in a long-term institutional stay (based on the payment month).

Coefficients are estimated for each segment separately to reflect the unique cost and utilization patterns of beneficiaries within the segment.

The CMS-HCC risk adjustment model is prospective in that it uses health status in a base year (i.e., data collection year) to predict a beneficiary's annual expected cost in the following year (payment year). Coefficients for continuing enrollees are estimated by regressing total Fee-For-Service (FFS) costs for each beneficiary in FFS Medicare who is entitled to Part A and enrolled in Part B onto their demographic factors, condition categories (as indicated by diagnoses), and interaction terms (combinations of conditions and/or demographic factors). Resulting dollar coefficients represent the marginal (i.e., additional) cost of the condition categories, demographic factors (e.g., age/sex group), and interaction terms. We divide each dollar coefficient by the average annual expected cost of beneficiaries entitled to Part A and enrolled in Part B in a specific year (the "denominator year") to create relative factors. The relative factors are the marginal expected cost of a condition or model variable relative to the average expected cost in FFS. The sum of relative factors assigned to a beneficiary is the risk score. In the denominator year, the average FFS risk score is 1.0. The denominator year for the proposed Payment Condition Count (PCC) CMS-HCC model is 2015. The average expected cost calculated from a 2015 cohort of FFS beneficiaries with 2014 diagnoses is $9,367.34. This denominator is used to create relative factors for all segments of the proposed PCC model.

The community and institutional segments have the same age/sex variables and Hierarchical Condition Categories (HCCs), with some differing interaction terms. CMS, in consultation with a panel of outside clinicians, creates HCCs by grouping ICD-9 diagnosis codes into condition

categories, such that each condition category comprises diagnoses with similar clinical characteristics and cost implications. All ICD-9 diagnosis codes are grouped into at least one condition category. However, only those condition categories that meet model criteria are included in the risk adjustment model for payment.[1] In a final step, hierarchies are imposed on some sets of condition categories to ensure that more severe and costly forms of a condition have a coefficient of at least the same or higher value than conditions that are less severe. Hierarchies also ensure that when a beneficiary develops a more severe manifestation of a condition in a hierarchy within the data collection period, credit is not given for both conditions in the hierarchy.[2]

21st Century Cures Act

Section 1853(a)(1)(I)(i)(I) of the Social Security Act (42 U.S.C. 1395w–23(a)(1)(I)(i)(I)), as added by section 17006(f) of the 21st Century Cures Act, requires us to make improvements to risk adjustment for 2019 and subsequent years. CMS is, among other things,[3] specifically directed to:

- Evaluate the impact of including in the risk adjustment model:

  (1) Additional diagnosis codes related to mental health and substance use disorders, and
  (2) Including the severity of chronic kidney disease.

- Take into account the total number of diseases or conditions of an individual enrolled in an MA plan by making an additional adjustment as the number of diseases or conditions of an individual increases.
- Phase-in any changes to risk adjustment payment over a 3-year period, "beginning with 2019, with such changes being fully implemented for 2022 and subsequent years."

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[1] For more information on the principles applied to determine inclusion of condition categories in the CMS-HCC model, see the references in footnote 6.

[2] While CMS maps ICD-10 codes to HCCs in order to calculate risk scores, the current HCCs were created using ICD-9 codes, meaning that the research conducted to determine which diagnoses should be grouped in each condition category was conducted using ICD-9 codes. Further, the models discussed in this Notice were calibrated using 2014 diagnoses (ICD-9 diagnoses) to predict 2015 costs.

[3] In connection with MA payment policies, the Cures Act also requires that the Secretary evaluate whether other factors should be taken into account in determining the capitation and risk adjustment payments for ESRD enrollees pursuant to section 1853(a)(1)(H).

CMS will begin implementing the risk adjustment requirements in the 21st Century Cures Act in Payment Year (PY) 2019, when we utilize a risk adjustment model with additional factors for substance use disorder, mental health, and Chronic Kidney Disease (CKD) diagnoses. CMS finalized this risk adjustment model in the "Announcement of Calendar Year (CY) 2019 Medicare Advantage Capitation Rates and Medicare Advantage and Part D Payment Policies and Final Call Letter," published April 2, 2018.[4]

In the 2019 Advance Notice, Part I, CMS proposed a new model that included factors to take into account the number of conditions each beneficiary has (Payment Condition Count model, or PCC), and provided another two new models for comparison: a model that counted all conditions a beneficiary has (All Condition Count model), and a model without count variables. All three models included the additional factors for substance use disorder, mental health, and CKD diagnoses. We received little support for the All Condition Count model, and some support for the PCC. In addition, we received a number of requests to delay implementation of the PCC model and to provide additional information. In response to these requests, CMS decided not to implement the PCC model in 2019 and indicated that we planned to begin implementing the PCC model in 2020. CMS used the time to provide stakeholders with more information on the proposed PCC model. Risk adjustment model software and mappings were posted on the CMS risk adjustment website.[5] We are proposing for payment year 2020 to implement the model proposed for 2019 that takes into account the number of payment conditions a beneficiary has. This is in order to meet requirements in the 21st Century Cures Act that a model meeting the criteria specified in the Act be phased-in over a 3-year period, with changes fully implemented for 2022 and subsequent years.

Taking Into Account the Number of Conditions of an Individual

We interpreted the statutory requirement to "take into account the total number of diseases or conditions of an individual" to mean that, in addition to the increase in the risk score that occurs today for each additional condition in the payment model that a beneficiary has, the CMS-HCC risk adjustment model should also separately account for the number or *count* of conditions a beneficiary has. Since the model is already additive, and already effectively provides an adjustment as the number of conditions increases, this requirement means that payment conditions are taken into account in two different ways in CMS-HCC models that have count variables: once with a coefficient for the specific condition included in the model, and a second time with a coefficient for a variable that counts the number of condition(s) a beneficiary has. When a count of conditions is introduced into the CMS-HCC model, the total predicted

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[4] https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2019.pdf

[5] https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors-Items/RiskOtherModel-Related.html

expenditures for each beneficiary would be the result of three things: (i) demographic variables, (ii) the specific conditions the beneficiary has that are in the model, and (iii) the total number of conditions that the beneficiary has. Thus, in the current CMS-HCC model specification, the incremental predicted expenditures of a given condition category (i.e., an HCC) is unaffected by the presence of other conditions (unless that specific HCC is part of a disease interaction). The proposed PCC model includes a separate factor for the count of conditions and the incremental predicted expenditure for a given HCC is dependent on the number of conditions the beneficiary may have, regardless of what those conditions may be. CMS findings on how to incorporate a count variable in the model were discussed in Part I of the 2019 Advance Notice,[6] and on the stakeholder user group call held October 24, 2018. The slides presented on the stakeholder user group call are available on the CMS risk adjustment website.[7]

Proposed PCC Model Specification

The PCC model we are proposing for PY2020 has the same set of variables as the CMS-HCC model implemented in 2019 except with additional variables that take into account the number of conditions a beneficiary has; and as the number of conditions increases, an adjustment is made to the total predicted cost (or risk score). As in PY2019, the model proposed for PY2020 includes the additional conditions for mental health, substance use disorder, and CKD, coefficients are determined by 2014 diagnoses predicting 2015 cost, and diagnoses were selected using the CPT/HCPCS filtering method that is used for encounter data risk score calculation.

The count variables are included in addition to the demographic, HCC, and interaction variables. Like all of the other variables in the CMS-HCC models, the count variables are dummy variables, meaning that a beneficiary either meets the criteria for having the coefficient added to the risk score or does not. There are separate variables included in the model segments for different numbers of conditions that a beneficiary may have, and a coefficient is estimated from the subgroup of beneficiaries in the model segment sample with the specific count of conditions for each count variable in the model. For example, all beneficiaries with five conditions would receive a coefficient that is estimated independently of the coefficient for beneficiaries with six conditions. Including variables in the model that count conditions takes into account the effect of the number of conditions a beneficiary has beyond the individual effect of each condition. The count variables are somewhat analogous to a non-linear, or highly interactive model. That is, the coefficient for the five payment condition count variable is the expected marginal cost of having any five payment conditions. Said another way, it is the average expected cost of all combinations of five payment conditions in the model sample.

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[6] https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2019.pdf

[7] https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors-Items/RiskOtherModel-Related.html

The count of conditions starts with between 4 and 6 payment conditions depending on the model segment. Each segment has a set of variables relating to the count of conditions. Including individual dummy count variables starting from a count of one results in negative coefficients for these variables; this result occurs in each segment. The negative coefficients for the count variables occur because the model determines a uniform coefficient for all beneficiaries with the same number of conditions. The negative count coefficients are offset by higher coefficients for HCCs and other variables in the model in order to predict the same overall cost.

A long standing principle used in developing the risk adjustment model is that MAOs (or providers) should not be penalized for reporting additional diagnoses (monotonicity). This principle has two consequences for developing the risk adjustment model: (1) no condition category should carry a negative payment weight, and (2) a condition that is higher-ranked in a disease hierarchy (causing lower-rank conditions to be excluded from risk score calculations) should have at least as large a payment weight as lower-ranked conditions in the same hierarchy. Consistent with our current practice of constraining demographic and HCC variables with negative coefficients to zero, we constrained the lower count variables with negative coefficients to zero, so that the remaining count variables would be positive. This avoids scenarios where the risk score could decrease with the reporting of additional diagnoses. For example, if we started the count variables from a count of one, it would be possible that, with a negative count coefficient, the increase from the coefficient of an additional HCC could be less than the decrease from the next count variable. Thus, we started the count variables in each segment of the model at a high enough number of conditions to result in positive coefficients for the count variables that were also statistically significant (t-statistic greater than two). We believe the additional criteria of statistical significance will help to ensure stability between model calibrations in the start point of the count variable.

Where the count variables begin in each model segment was determined independently by iteratively constraining to zero the lowest count variables until the minimum positive and statistically significant coefficient was reached. When the count variables start at a high enough number so that count variable coefficients are positive, the coefficients for many HCCs in the model are lower than in a model without count variables. This is because the model is predicting the same total cost and any variable that is correlated with the count variables must decrease in order to offset the positive coefficient for the count variable.

In addition to starting the condition count variables at more than one condition, we also capped the count variables, meaning that we did not include dummy variables up to the highest possible count of conditions in each segment. The last count variable in each model is for that number of conditions, plus any more. In the proposed PCC model, 10 conditions is the last dummy variable in each segment. Thus, the coefficient for 10 conditions applies for 10 and any more conditions the beneficiary may have. We first determined where to cap the count variables for each segment in the proposed PCC model with only statistical criteria. The count was stopped when the estimate was not statistically reliable—because either the sample size had become too small (less

than 1,000 beneficiaries), or including an additional dummy variable in the count resulted in a coefficient for the highest dummy variable that was less than the coefficient for the second highest dummy variable (i.e., the count variable was no longer monotonically increasing). Applying only the statistical criteria, the cap for the proposed PCC is between 11 and 16 conditions in the six community segments, and 15 conditions in the institutional segment. Under this scenario, the HCC coefficients in the non-dual aged segment of continuing enrollees in the proposed PCC model decreased by nine percent on average, and one HCC decreased by more than 50 percent.

We are concerned that if we included all count variables that met the statistical criteria, the clinical nature of the model would be significantly reduced. Risk adjustment is intended to account for the risk faced by plans when enrolling beneficiaries with varying health status by differentiating payments for individual beneficiaries by the expected cost (as determined from statistical modelling) of the specific conditions that they have. Thus, the CMS-HCC model is intended to compensate plans in a manner that aligns with the risk of their enrolled beneficiaries' specific conditions and with those conditions' levels of severity. Including all count variables in the model differentiates levels of disease burden, given the number of conditions, but it may no longer be sufficient to differentiate relative expected cost differences between conditions when the coefficients for the individual condition categories are significantly reduced. The additional amount added to the beneficiary's risk score for having four conditions is only modestly tied to the actual medical conditions the beneficiary has (i.e., the average additional expected medical cost of all beneficiaries with four conditions is reflected in the coefficient). If emphasis in the model is placed on the count of conditions, the beneficiary's risk score will instead be increased mainly by the number of the conditions he or she has, regardless of what those conditions are, and may or may not appropriately reflect the expected cost of providing care to that beneficiary.

Although use of the statistical criteria alone to identify the number of count variables would result in assigning coefficients to dummy variables for a count of more than 10 conditions, we believe that the cap should be proposed at 10 payment conditions. We did this for several reasons. First, with the significant drop in HCC coefficients from including all count variables that met only statistical considerations there are wide swings in contract-level risk scores. Second, given the already severe and chronic nature of most payment conditions, the clinicians with whom we consulted did not think it was clinically meaningful to distinguish between 10 and 16 conditions (the maximum number of payment conditions with at least 1,000 beneficiaries) in the PCC model. When adding a cap on the count variables at ten or more conditions resulted in one of the lower count variables becoming either statistically insignificant, or no longer monotonically increasing, we constrained the count variable to the coefficient for the previous count variable. For example, if the coefficient for seven conditions was lower than the coefficient for six conditions, the coefficient for seven conditions was constrained to the same value as the coefficient for six conditions.

Improving Risk Adjustment

The 21st Century Cures Act included a goal to "improve risk adjustment." The goal of the CMS-HCC risk adjustment model is to accurately differentiate between beneficiaries who have annual costs that are higher or lower than the average annual cost of providing Medicare Parts A and B benefits in the original Medicare program. We interpreted the statute's directive to improve risk adjustment to mean improving the accuracy of the cost predicted by the risk adjustment model across subgroups of beneficiaries in the program. Adding a count of payment conditions, as constructed for our proposed PCC model, improves the risk adjustment model by improving accuracy across deciles of predicted risk, by either decreasing over-prediction observed in some deciles or decreasing under-prediction in other deciles.

Alternative CMS-HCC Model Specification

By law, we will have to implement a model in 2020 that takes into account the number of conditions a beneficiary may have, in order to be able to complete the phase in of the model by 2022. Although we are proposing for PY2020 the PCC model that we proposed in the PY2019 Advance Notice (as we stated in the PY2019 Rate Announcement), we also present for consideration a PCC model that is similar to the proposed PCC model except that it has additional HCCs for Dementia and Pressure Ulcers. CMS research found that some beneficiaries with multiple chronic conditions were under predicted by the CMS-HCC model. Some stakeholders submitted comments on Part I of the 2019 Advance Notice stating that the proposed PCC model did not meet the implied intent of the requirements in the 21st Century Cures Act to improve prediction in the CMS-HCC model for high need beneficiaries with multiple chronic conditions. To test whether the PCC model could be improved overall and for beneficiaries with multiple chronic conditions, we evaluated chronic conditions not in the current CMS-HCC model for payment to see if any of these conditions met CMS criteria for inclusion in the model.

CMS's methodology for determining which HCCs are chronic is discussed in the Part I of the 2019 Advance Notice and in the 2018 Report to Congress on Risk Adjustment in Medicare Advantage. Also, as discussed in Part I of the 2019 Advance Notice, three criteria for assessing when and whether certain condition categories should be added to the model were adapted from the ten principles that guided development of the original CMS-HCC risk adjustment model, and are used for ongoing assessment of the HCC classification system.[8] The chronic condition categories were evaluated against these three criteria to determine if they should be in the model for payment:

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[8] Pope, G.C., Kautter, J., Ellis, R.P., et al.: Risk Adjustment for Medicare Capitation Payments Using the CMS-HCC Model. *Health Care Financing Review* 25(4):121-122, Summer 2004. *See also* "Evaluation of the CMS-HCC Risk Adjustment Model," March 2011, available at https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Evaluation_Risk_Adj_Model_2011.pdf.

1. ***The condition category should be clinically meaningful.*** The group of diagnoses mapped to a condition category should relate to a reasonably well-specified disease or medical condition that defines the overall category. Condition categories should also include diagnoses that have similar levels of severity and expected costs over time.
2. ***The condition category should predict medical expenditures.*** The condition category should produce a reasonable and statistically significant estimate of medical expenditures for Medicare Part A and B benefits. This assessment takes into account the number of people with the condition category, the level of predicted cost, and whether it would have much effect on risk scores. In addition, we reviewed the accuracy of the prediction for people with the condition category; adding a condition category to the model should improve the accuracy of prediction for beneficiaries with that condition. However, a condition category may not need to be added to the model if the condition categories already in the model predict well for beneficiaries with that condition.
3. ***The condition category should not comprise discretionary diagnoses.*** The condition category should include diagnoses where there is minimal clinical discretion and that are indicative of meaningful disease burden. The diagnoses included for payment typically are chronic conditions that can be diagnosed definitively.

We identified chronic non-payment HCCs that were under predicted by the 2019 CMS-HCC model with a predictive ratio less than or equal to 0.9, more than 30,000 beneficiaries with the condition, and annual average cost above the mean. We also considered HCCs that were prevalent among beneficiaries with multiple chronic conditions whose cost were under predicted. Table 1 provides the chronic condition categories considered, the sample size, the annual average cost incurred for beneficiaries with the condition, and the predictive ratio calculated with the 2019 CMS-HCC model.

Table 1: Chronic Conditions Evaluated for Inclusion

Hierarchical Condition Category (HCC)	Sample Size	Annual Average Cost	Predictive Ratio
HCC51 Dementia with Complications	470,051	$22,432.96	0.873
HCC52 Dementia without Complication	1,516,764	$19,006.55	0.902
HCC159 Pressure Ulcer of Skin with Partial Thickness Skin Loss	73,846	$37,361.44	0.837
HCC102 Cerebrovascular Atherosclerosis, Aneurysm, and Other Disease	203,465	$17,491.97	0.892
HCC89 Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease	4,616,202	15,792.03	0.924
HCC140 Unspecified Renal Failure	56,342	$15,898.69	0.871
HCC41 Disorders of the Vertebrae and Spinal Discs	4,604,072	$14,461.27	0.867
HCC42 Osteoarthritis of Hip or Knee	2,988,229	$14,281.96	0.833
HCC113 Asthma	1,220,110	$11,342.69	0.891

Hierarchical Condition Category (HCC)	Sample Size	Annual Average Cost	Predictive Ratio
HCC95 Hypertension	14,387,218	$9,903.56	0.969

HCC 51, HCC 52, and HCC 159 meet the conditions for inclusion in the model in that they are well-specified, predict medical expenditures, are definitively diagnosed and can indicate significant disease burden. In the model provided as an alternative for discussion, the coefficients for HCC 51 and HCC 52 are constrained to be equal to one another so as to limit any effect that clinical discretion may have in payment. HCC 102, HCC 89, HCC 140, and HCC 113 were determined to be either not clinically specific, or composed of a diverse array of diagnoses with varying levels of severity. HCC 41, HCC 42, and HCC 95 are highly prevalent in the Medicare population, and thus not likely to predict additional variation from the average medical expenditure.

The count variables were re-estimated after adding the additional conditions that met the model criteria into each full risk segment of the CMS-HCC model. Like the proposed PCC model, count variables with a negative coefficient were constrained to zero and the count variables were capped at 10 or more conditions. In the community full risk segments the count variables are positive and statistically significant starting between 4 and 6 conditions. In the institutional segment, all count variables are constrained to zero because none of the variables met the criteria of being positive or statistically significant. The population of full risk beneficiaries residing in an institution for 90 days or more is clinically distinct from the beneficiaries residing in the community. Once the additional conditions are added to the institutional segment of the model, including variables that count conditions does not help to explain variation in their costs on average. While beneficiaries residing in an institution are sicker and thus have higher cost, there is less variance in how their cost are distributed. That is, more beneficiaries have an annual cost that is closer to the average. As is, the HCC coefficients contribute less to the overall predicted amount than the HCC coefficients in the community segments. The added count variables, in addition to the HCCs, explain even less of the variation (which was smaller to begin with) among institutional beneficiaries. Thus, the additive nature of the base model is the preferred modeling choice for this population segment. Predicted expenditures rise with the number of conditions, but at an additive, linear, pace.

Two sets of model coefficients can be found in Attachment 1:

1. The proposed model with variables that count the 83 payment conditions in the model.
2. A model that is identical to the proposed model, but with 3 additional chronic conditions included for payment, bringing the total number of conditions included in the count to 86.

In Tables 1 and 2 of the attachment, we provide predictive ratios across the seven segments for the two versions of the Payment Condition Count CMS-HCC model. For payment year 2020 we are proposing to implement the payment count model that we proposed in 2019. We are seeking

comment on the value of the differences between the proposed PCC model and the alternative PCC model for predicting risk.

Three Year Phase in 2019 - 2022

The 21st Century Cures Act requires that any changes to risk adjusted payments under section 1853(a)(1)(C)(i) resulting from the implementation of section 1853(a)(1)(I) must be phased-in over a 3-year period, beginning with 2019, with such changes being fully implemented for 2022 and subsequent years. The statute thus requires a three year phase-in over a four year period. Last year, we explained how we interpreted the statute's direction to mean that the proposed changes to the risk adjustment model under section 1853(a)(1)(C)(i) could be implemented in 2019 without the required provisions from section 1853(a)(1)(I), and could be further modified and implemented consistent with provisions from section 1853(a)(1)(I) for 2020. Our proposed model, if finalized in 2020, would then be phased-in, in that modified form, over three years such that 100% of risk adjusted payments to Medicare Advantage organizations for 2022 are based on the risk adjustment model finalized for 2020, which complies with the statutory requirements in section 1853(a)(1)(I).

For Payment Year 2020, we propose to continue to phase in the implementation of proposed changes to the risk adjustment model by calculating risk scores using the sum of:

- 50% of the risk score calculated with the proposed "Payment Condition Count" CMS-HCC model and
- 50% of the risk score calculated with the 2017 CMS-HCC model.

Encounter Data as a Diagnosis Source for 2020

For PY 2019, CMS calculated risk scores by adding 25% of the risk score calculated using diagnoses from encounter data, FFS claims, and RAPS inpatient records with 75% of the risk score calculated using diagnoses from all RAPS records and FFS claims. For PY 2020, CMS proposes to calculate risk scores by adding 50% of the risk score calculated using diagnoses from encounter data, FFS claims, and RAPS inpatient records with 50% of the risk score calculated with diagnoses from all RAPS records and FFS claims.

Specifically, we propose to calculate the encounter data-based risk scores as follows:

- With the proposed PCC CMS-HCC model,
- Using diagnoses from encounter data, FFS claims, and RAPS inpatient records.

RAPS risk scores would be calculated as follows:

- With the 2017 CMS-HCC model,
- Using diagnoses from all RAPS records and FFS claims.

Thus, as proposed, encounter data based risk scores would only be calculated with the PCC model proposed in this Notice.

For PACE organizations for PY 2020, we propose to continue the same method of calculating risk scores that we have been using since PY 2015, which is to pool risk adjustment-eligible diagnoses from the following sources to calculate a single risk score (with no weighting): (1) encounter data, (2) RAPS, and (3) FFS claims. We are not proposing to calculate risk scores for PACE organizations in PY 2020 with the proposed PCC model.

Attachment I. Predictive Ratios and CMS-HCC Risk Adjustment Factors

Table 1. Predictive Ratios by Decile of Predicted Risk and Count of Chronic HCCs – Payment Condition Count Model

Deciles of Predicted Risk							
Decile	**Non Dual Aged**	**Non Dual Disabled**	**Full Dual Aged**	**Full Dual Disabled**	**Partial Dual Aged**	**Partial Dual Disabled**	**Institutional**
First (lowest) decile	0.962	1.082	0.958	1.083	0.989	0.933	0.874
Second decile	0.980	0.957	1.011	1.021	1.001	1.058	0.968
Third decile	0.994	0.981	0.994	0.892	0.981	0.954	1.003
Fourth decile	0.993	0.980	1.001	0.948	0.989	0.989	0.998
Fifth decile	1.006	0.959	0.999	0.982	1.001	0.979	1.021
Sixth decile	1.002	0.994	0.999	0.997	0.998	0.996	1.019
Seventh decile	1.006	0.982	1.005	1.018	1.006	1.013	1.019
Eighth decile	1.003	1.011	1.006	1.022	1.007	1.023	1.013
Ninth decile	1.004	1.028	1.000	1.010	1.003	1.013	1.013
Tenth (highest)	1.002	1.001	1.001	1.001	1.000	0.996	0.993
Top 5%	0.999	0.991	1.004	0.995	0.996	0.988	0.989
Top 1%	0.985	0.996	0.981	0.985	0.997	0.999	0.965
Counts of Chronic Conditions							
0	1.490	1.403	0.967	1.235	1.183	1.307	0.797
1	1.166	1.158	1.050	1.199	1.084	1.255	1.068
2	1.121	1.104	1.082	1.133	1.100	1.146	1.094
3	1.081	1.039	1.070	1.072	1.080	1.065	1.085
4	1.046	1.021	1.059	1.044	1.051	1.028	1.096
5+	0.957	0.950	0.987	0.962	0.970	0.958	0.989

NOTES:

1. Predictive ratios are the ratio of predicted cost to actual cost for the applicable subgroup. A predicted ratio of 1.0 indicates average predicted cost is equal to the average actual cost. Values below 1.0 indicate underprediction. Values over 1.0 indicate overprediction.
2. Each model is calibrated with 2014-2015 data.
3. Dual status is defined in the payment year.

SOURCE: RTI International analysis of 2014-2015 Medicare 100% data.

Table 2. Predictive Ratios by Decile of Predicted Risk and Count of Chronic HCCs – Alternative Payment Condition Count Model

Deciles of Predicted Risk							
Decile	**Non Dual Aged**	**Non Dual Disabled**	**Full Dual Aged**	**Full Dual Disabled**	**Partial Dual Aged**	**Partial Dual Disabled**	**Institutional**
First (lowest) decile	0.969	1.090	0.969	1.076	0.998	0.935	0.858
Second decile	0.983	0.959	1.006	1.016	0.998	1.020	0.959
Third decile	0.997	0.982	0.988	0.893	0.977	0.988	0.995
Fourth decile	0.990	0.982	0.994	0.940	0.987	0.979	1.000
Fifth decile	1.004	0.952	1.006	0.992	0.999	0.982	1.022
Sixth decile	1.002	0.997	1.000	0.999	1.004	0.999	1.023
Seventh decile	1.004	0.983	1.004	1.020	1.003	1.011	1.026
Eighth decile	1.003	1.008	1.003	1.019	1.006	1.025	1.020
Ninth decile	1.003	1.028	1.002	1.008	1.006	1.010	1.015
Tenth (highest)	1.003	1.001	1.001	1.002	0.999	0.996	0.989
Top 5%	1.000	0.991	1.004	0.996	0.994	0.989	0.984
Top 1%	0.984	0.999	0.978	0.984	0.999	1.002	0.967
Counts of Chronic Conditions							
0	1.469	1.402	0.934	1.220	1.166	1.306	0.778
1	1.155	1.153	1.020	1.187	1.070	1.249	1.048
2	1.113	1.100	1.063	1.126	1.086	1.142	1.078
3	1.077	1.038	1.056	1.070	1.071	1.062	1.074
4	1.043	1.020	1.050	1.043	1.046	1.028	1.088
5+	0.960	0.952	0.992	0.964	0.975	0.959	0.993

NOTES:

1. Predictive ratios are the ratio of predicted cost to actual cost for the applicable subgroup. A predicted ratio of 1.0 indicates average predicted cost is equal to the average actual cost. Values below 1.0 indicate underprediction. Values over 1.0 indicate overprediction.
2. Each model is calibrated with 2014-2015 data.
3. Dual status is defined in the payment year.

SOURCE: RTI International analysis of 2014-2015 Medicare 100% data.

Table 3. 2020 Payment Condition Count Model Relative Factors for Continuing Enrollees

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
Female								
0-34 Years		-	0.239	-	0.351	-	0.382	0.926
35-44 Years		-	0.313	-	0.352	-	0.413	1.131
45-54 Years		-	0.347	-	0.378	-	0.417	1.068
55-59 Years		-	0.380	-	0.440	-	0.415	1.089
60-64 Years		-	0.430	-	0.500	-	0.415	1.092
65-69 Years		0.321	-	0.437	-	0.356	-	1.265
70-74 Years		0.388	-	0.530	-	0.410	-	1.172
75-79 Years		0.460	-	0.624	-	0.489	-	1.037
80-84 Years		0.550	-	0.774	-	0.575	-	0.905
85-89 Years		0.679	-	0.955	-	0.692	-	0.821
90-94 Years		0.835	-	1.101	-	0.831	-	0.691
95 Years or Over		0.843	-	1.172	-	0.930	-	0.523
Male								
0-34 Years		-	0.154	-	0.242	-	0.388	1.126
35-44 Years		-	0.198	-	0.237	-	0.281	1.026
45-54 Years		-	0.241	-	0.311	-	0.312	0.989
55-59 Years		-	0.288	-	0.409	-	0.341	1.041
60-64 Years		-	0.331	-	0.537	-	0.375	1.085
65-69 Years		0.307	-	0.488	-	0.366	-	1.308
70-74 Years		0.395	-	0.607	-	0.428	-	1.350
75-79 Years		0.480	-	0.734	-	0.511	-	1.340
80-84 Years		0.573	-	0.848	-	0.564	-	1.232
85-89 Years		0.717	-	1.070	-	0.689	-	1.146

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
90-94 Years		0.883	-	1.233	-	0.874	-	1.014
95 Years or Over		1.033	-	1.374	-	1.090	-	0.846
Medicaid and Originally Disabled Interactions								
Medicaid		-	-	-	-	-	-	0.062
Originally Disabled, Female		0.251	-	0.171	-	0.136	-	0.002
Originally Disabled, Male		0.148	-	0.183	-	0.083	-	0.002
Disease Coefficients	**Description Label**							
HCC1	HIV/AIDS	0.335	0.291	0.596	0.394	0.480	0.203	1.710
HCC2	Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock	0.372	0.417	0.488	0.533	0.332	0.300	0.309
HCC6	Opportunistic Infections	0.415	0.737	0.557	0.796	0.312	0.661	0.512
HCC8	Metastatic Cancer and Acute Leukemia	2.650	2.713	2.546	2.793	2.446	2.657	1.286
HCC9	Lung and Other Severe Cancers	1.018	0.908	0.998	0.994	0.994	0.878	0.606
HCC10	Lymphoma and Other Cancers	0.671	0.666	0.709	0.757	0.643	0.670	0.447
HCC11	Colorectal, Bladder, and Other Cancers	0.302	0.343	0.304	0.346	0.325	0.349	0.279
HCC12	Breast, Prostate, and Other Cancers and Tumors	0.148	0.213	0.155	0.210	0.153	0.182	0.198
HCC17	Diabetes with Acute Complications	0.305	0.353	0.344	0.420	0.331	0.374	0.437
HCC18	Diabetes with Chronic Complications	0.305	0.353	0.344	0.420	0.331	0.374	0.437
HCC19	Diabetes without Complication	0.105	0.124	0.109	0.142	0.089	0.122	0.175
HCC21	Protein-Calorie Malnutrition	0.493	0.686	0.745	0.730	0.499	0.690	0.252
HCC22	Morbid Obesity	0.244	0.182	0.369	0.291	0.226	0.204	0.436
HCC23	Other Significant Endocrine and Metabolic Disorders	0.193	0.379	0.207	0.298	0.172	0.322	0.357

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC27	End-Stage Liver Disease	0.878	1.067	1.104	1.095	0.735	0.888	0.849
HCC28	Cirrhosis of Liver	0.360	0.334	0.402	0.359	0.403	0.341	0.463
HCC29	Chronic Hepatitis	0.144	0.314	0.031	0.285	0.177	0.237	0.463
HCC33	Intestinal Obstruction/Perforation	0.218	0.501	0.262	0.534	0.237	0.551	0.334
HCC34	Chronic Pancreatitis	0.283	0.576	0.346	0.751	0.367	0.594	0.400
HCC35	Inflammatory Bowel Disease	0.305	0.522	0.268	0.543	0.273	0.540	0.338
HCC39	Bone/Joint/Muscle Infections/Necrosis	0.398	0.376	0.554	0.673	0.437	0.435	0.379
HCC40	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	0.417	0.366	0.363	0.321	0.345	0.263	0.278
HCC46	Severe Hematological Disorders	1.368	3.564	1.210	4.301	1.237	4.136	0.783
HCC47	Disorders of Immunity	0.663	0.861	0.450	0.690	0.673	0.592	0.553
HCC48	Coagulation Defects and Other Specified Hematological Disorders	0.191	0.312	0.223	0.295	0.189	0.329	0.169
HCC54	Substance Use with Psychotic Complications	0.344	0.549	0.683	0.894	0.386	0.684	0.158
HCC55	Substance Use Disorder, Moderate/Severe, or Substance Use with Complications	0.344	0.279	0.505	0.350	0.380	0.274	0.158
HCC56	Substance Use Disorder, Mild, Except Alcohol and Cannabis	0.344	0.245	0.505	0.342	0.380	0.274	0.158
HCC57	Schizophrenia	0.595	0.362	0.684	0.386	0.568	0.315	0.178
HCC58	Reactive and Unspecified Psychosis	0.520	0.362	0.684	0.250	0.568	0.258	0.178
HCC59	Major Depressive, Bipolar, and Paranoid Disorders	0.343	0.169	0.355	0.129	0.337	0.112	0.178
HCC60	Personality Disorders	0.343	0.112	0.355	0.104	0.287	0.069	-

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC70	Quadriplegia	1.300	1.030	1.120	1.019	1.048	1.161	0.545
HCC71	Paraplegia	1.094	0.764	0.950	0.980	1.048	0.965	0.484
HCC72	Spinal Cord Disorders/Injuries	0.500	0.377	0.551	0.393	0.527	0.346	0.274
HCC73	Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease	1.016	1.136	1.128	1.251	0.718	0.949	0.461
HCC74	Cerebral Palsy	0.343	0.103	-	-	0.125	-	-
HCC75	Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy	0.472	0.483	0.410	0.400	0.292	0.316	0.315
HCC76	Muscular Dystrophy	0.519	0.623	0.399	0.593	-	0.287	0.343
HCC77	Multiple Sclerosis	0.434	0.574	0.764	0.796	0.285	0.466	0.023
HCC78	Parkinson's and Huntington's Diseases	0.675	0.533	0.703	0.480	0.613	0.459	0.150
HCC79	Seizure Disorders and Convulsions	0.257	0.208	0.292	0.150	0.299	0.178	0.050
HCC80	Coma, Brain Compression/Anoxic Damage	0.511	0.302	0.534	0.132	0.735	0.168	-
HCC82	Respirator Dependence/Tracheostomy Status	0.985	0.787	2.149	1.461	0.828	0.775	1.598
HCC83	Respiratory Arrest	0.345	0.403	0.909	0.531	0.371	0.775	0.481
HCC84	Cardio-Respiratory Failure and Shock	0.282	0.390	0.495	0.531	0.368	0.345	0.286
HCC85	Congestive Heart Failure	0.337	0.450	0.388	0.487	0.345	0.424	0.206
HCC86	Acute Myocardial Infarction	0.195	0.263	0.376	0.416	0.293	0.377	0.343
HCC87	Unstable Angina and Other Acute Ischemic Heart Disease	0.195	0.263	0.297	0.416	0.279	0.377	0.343

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC88	Angina Pectoris	0.130	0.110	0.023	0.143	0.147	0.147	0.343
HCC96	Specified Heart Arrhythmias	0.269	0.263	0.389	0.307	0.266	0.281	0.240
HCC99	Intracranial Hemorrhage	0.258	0.195	0.425	0.516	0.261	0.176	0.093
HCC100	Ischemic or Unspecified Stroke	0.258	0.156	0.425	0.332	0.261	0.176	0.093
HCC103	Hemiplegia/Hemiparesis	0.460	0.294	0.515	0.305	0.465	0.320	-
HCC104	Monoplegia, Other Paralytic Syndromes	0.342	0.277	0.360	0.264	0.306	0.166	-
HCC106	Atherosclerosis of the Extremities with Ulceration or Gangrene	1.511	1.536	1.761	1.758	1.531	1.544	0.867
HCC107	Vascular Disease with Complications	0.384	0.464	0.570	0.646	0.464	0.450	0.289
HCC108	Vascular Disease	0.296	0.304	0.312	0.268	0.302	0.316	0.086
HCC110	Cystic Fibrosis	0.507	2.669	0.497	3.500	0.397	3.042	0.589
HCC111	Chronic Obstructive Pulmonary Disease	0.336	0.247	0.435	0.325	0.361	0.267	0.308
HCC112	Fibrosis of Lung and Other Chronic Lung Disorders	0.218	0.238	0.161	0.272	0.205	0.229	0.106
HCC114	Aspiration and Specified Bacterial Pneumonias	0.543	0.243	0.671	0.385	0.530	0.204	0.140
HCC115	Pneumococcal Pneumonia, Empyema, Lung Abscess	0.131	-	0.256	-	0.096	0.081	0.140
HCC122	Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	0.217	0.228	0.260	0.258	0.176	0.198	0.376
HCC124	Exudative Macular Degeneration	0.512	0.313	0.277	0.138	0.383	0.155	0.205
HCC134	Dialysis Status	0.456	0.412	0.720	0.595	0.470	0.483	0.451
HCC135	Acute Renal Failure	0.456	0.412	0.720	0.595	0.470	0.483	0.451
HCC136	Chronic Kidney Disease, Stage 5	0.288	0.231	0.260	0.320	0.285	0.262	0.234
HCC137	Chronic Kidney Disease, Severe (Stage 4)	0.288	0.105	0.260	0.132	0.282	0.036	0.193

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC138	Chronic Kidney Disease, Moderate (Stage 3)	0.070	0.022	0.020	-	0.045	-	0.083
HCC157	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	2.039	2.063	2.456	2.540	2.057	2.476	0.823
HCC158	Pressure Ulcer of Skin with Full Thickness Skin Loss	1.085	1.198	1.483	1.361	1.180	0.910	0.293
HCC161	Chronic Ulcer of Skin, Except Pressure	0.529	0.605	0.757	0.594	0.555	0.556	0.293
HCC162	Severe Skin Burn or Condition	0.232	0.503	0.172	0.312	-	0.332	-
HCC166	Severe Head Injury	0.511	0.302	0.534	0.132	0.735	0.168	-
HCC167	Major Head Injury	0.111	0.018	0.187	0.057	0.068	0.045	-
HCC169	Vertebral Fractures without Spinal Cord Injury	0.490	0.377	0.551	0.393	0.527	0.346	0.236
HCC170	Hip Fracture/Dislocation	0.388	0.400	0.464	0.475	0.392	0.341	-
HCC173	Traumatic Amputations and Complications	0.208	0.172	0.212	0.518	0.176	0.185	0.071
HCC176	Complications of Specified Implanted Device or Graft	0.582	0.914	0.680	0.986	0.522	0.836	0.448
HCC186	Major Organ Transplant or Replacement Status	0.823	0.442	0.714	0.854	0.427	0.610	1.013
HCC188	Artificial Openings for Feeding or Elimination	0.538	0.762	0.768	0.776	0.528	0.739	0.502
HCC189	Amputation Status, Lower Limb/Amputation Complications	0.521	0.441	0.803	0.927	0.699	0.630	0.340
Disease Interactions								
HCC47_gCancer	Immune Disorders*Cancer	0.829	0.457	0.831	0.668	0.646	0.601	-
Diabetes_CHF	Congestive Heart Failure*Diabetes	0.119	0.023	0.187	0.038	0.111	-	0.151

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
CHF_gCopdCF	Congestive Heart Failure*Chronic Obstructive Pulmonary Disease	0.152	0.120	0.223	0.150	0.156	0.140	0.174
HCC85_gRenal_V23	Congestive Heart Failure*Renal	0.151	0.404	0.171	0.456	0.179	0.381	-
gCopdCF_CARD_RESP_FAIL	Cardiorespiratory Failure*Chronic Obstructive Pulmonary Disease	0.354	0.371	0.511	0.445	0.377	0.475	0.405
HCC85_HCC96	Congestive Heart Failure*Specified Heart Arrhythmias	0.081	0.278	0.126	0.353	0.097	0.299	-
gSubstanceUseDisorder_gPsych	Substance Use Disorder*Psychiatric	-	0.139	-	0.190	-	0.201	-
SEPSIS_PRESSURE_ULCER	Sepsis*Pressure Ulcer	-	-	-	-	-	-	0.124
SEPSIS_ARTIF_OPENINGS	Sepsis*Artificial Openings for Feeding or Elimination	-	-	-	-	-	-	0.464
ART_OPENINGS_PRESSURE_ULCER	Artificial Openings for Feeding or Elimination*Pressure Ulcer	-	-	-	-	-	-	0.345
gCopdCF_ASP_SPEC_BACT_PNEUM	Chronic Obstructive Pulmonary Disease*Aspiration and Specified Bacterial Pneumonias	-	-	-	-	-	-	0.205
ASP_SPEC_BACT_PNEUM_PRES_ULC	Aspiration and Specified Bacterial Pneumonias*Pressure Ulcer	-	-	-	-	-	-	0.472
SEPSIS_ASP_SPEC_BACT_PNEUM	Sepsis*Aspiration and Specified Bacterial Pneumonias	-	-	-	-	-	-	0.339

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
SCHIZOPHRENIA_gCopdCF	Schizophrenia*Chronic Obstructive Pulmonary Disease	-	-	-	-	-	-	0.413
SCHIZOPHRENIA_CHF	Schizophrenia*Congestive Heart Failure	-	-	-	-	-	-	0.124
SCHIZOPHRENIA_SEIZURES	Schizophrenia*Seizure Disorders and Convulsions	-	-	-	-	-	-	0.572
Disabled/Disease Interactions								
DISABLED_HCC85	Disabled, Congestive Heart Failure	-	-	-	-	-	-	0.269
DISABLED_PRESSURE_ULCER	Disabled, Pressure Ulcer	-	-	-	-	-	-	0.546
DISABLED_HCC161	Disabled, Chronic Ulcer of the Skin, Except Pressure Ulcer	-	-	-	-	-	-	0.474
DISABLED_HCC39	Disabled, Bone/Joint Muscle Infections/Necrosis	-	-	-	-	-	-	0.449
DISABLED_HCC77	Disabled, Multiple Sclerosis	-	-	-	-	-	-	0.470
DISABLED_HCC6	Disabled, Opportunistic Infections	-	-	-	-	-	-	0.414
Payment HCC Counts								
K1	1 payment HCCs	-	-	-	-	-	-	-
K2	2 payment HCCs	-	-	-	-	-	-	-
K3	3 payment HCCs	-	-	-	-	-	-	-
K4	4 payment HCCs	0.012	-	-	0.035	-	-	-
K5	5 payment HCCs	0.043	0.040	-	0.079	0.038	0.093	-
K6	6 payment HCCs	0.088	0.122	0.061	0.195	0.070	0.102	0.060
K7	7 payment HCCs	0.136	0.230	0.061	0.306	0.070	0.334	0.073
K8	8 payment HCCs	0.242	0.439	0.131	0.474	0.228	0.429	0.110
K9	9 payment HCCs	0.282	0.439	0.205	0.604	0.380	0.543	0.110

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
K10P	10 or more payment HCCs	0.567	0.942	0.473	1.150	0.599	0.921	0.245

NOTES:

1. The denominator is $9,367.34.
2. In the "disease interactions" and "disabled interactions," the variables are defined as follows:
   - Immune Disorders = HCC 47
   - Cancer = HCCs 8-12
   - Congestive Heart Failure = HCC 85
   - Diabetes = HCCs 17-19
   - Chronic Obstructive Pulmonary Disease = HCCs 110-112
   - Renal = HCCs 134-138
   - Cardiorespiratory Failure = HCCs 82-84
   - Specified Heart Arrhythmias = HCC 96
   - Substance Use = HCCs 54-56
   - Psychiatric = HCCs 57-60
   - Pressure Ulcer = HCCs 157-158
   - Chronic Ulcer of Skin, except Pressure = HCC 161
   - Bone/Joint/Muscle Infections/Necrosis = HCC 39
   - Multiple Sclerosis = HCC 77
   - Opportunistic Infections = HCC 6
   - Sepsis = HCC 2
   - Artificial Openings for Feeding or Elimination = HCC 188
   - Aspiration and Specified Bacterial Pneumonias = HCC 114
   - Schizophrenia = HCC 57
   - Seizure Disorders and Convulsions = HCC 79

SOURCE: RTI International analysis of 2014-2015 Medicare 100% data and RTI International analysis of 2014-2015 Medicare 100% institutional sample.

Table 4. 2020 Payment Condition Count Model Relative Factors for Aged and Disabled New Enrollees

	Non-Medicaid & Non-Originally Disabled	Medicaid & Non-Originally Disabled	Non-Medicaid & Originally Disabled	Medicaid & Originally Disabled
Female				
0-34 Years	0.804	0.969	-	-
35-44 Years	0.947	1.202	-	-
45-54 Years	1.015	1.305	-	-
55-59 Years	1.016	1.307	-	-
60-64 Years	1.122	1.408	-	-
65 Years	0.520	0.993	1.122	1.462
66 Years	0.515	0.897	1.174	1.887
67 Years	0.544	0.919	1.174	1.887
68 Years	0.597	0.950	1.174	1.887
69 Years	0.600	0.950	1.174	1.887
70-74 Years	0.690	0.985	1.174	1.887
75-79 Years	0.860	1.133	1.174	1.887
80-84 Years	1.014	1.352	1.174	1.887
85-89 Years	1.293	1.535	1.293	1.887
90-94 Years	1.293	1.701	1.293	1.887
95 Years or Over	1.293	1.701	1.293	1.887
Male				
0-34 Years	0.442	0.734	-	-
35-44 Years	0.657	1.059	-	-
45-54 Years	0.864	1.353	-	-
55-59 Years	0.903	1.418	-	-
60-64 Years	0.921	1.550	-	-
65 Years	0.517	1.144	0.921	1.811
66 Years	0.533	1.094	1.071	2.198
67 Years	0.582	1.151	1.123	2.198
68 Years	0.626	1.202	1.123	2.198
69 Years	0.690	1.202	1.319	2.198
70-74 Years	0.785	1.298	1.408	2.198
75-79 Years	1.059	1.407	1.408	2.198
80-84 Years	1.246	1.555	1.408	2.198
85-89 Years	1.497	1.777	1.497	2.198
90-94 Years	1.497	1.777	1.497	2.198
95 Years or Over	1.497	1.777	1.497	2.198

NOTES:

1. The denominator is $9,367.34.
2. For payment purposes, a new enrollee is a beneficiary who did not have 12 months of Part B eligibility in the data collection year. CMS-HCC new enrollee models are not based on diagnoses, but include factors for different age and gender combinations by Medicaid and the original reason for Medicare entitlement.

SOURCE: RTI International analysis of 2014-2015 100% Medicare data.

Table 5. 2020 Payment Condition Count Model Relative Factors for New Enrollees in Chronic Condition Special Needs Plans (C-SNPs)

	Non-Medicaid & Non-Originally Disabled	Medicaid & Non-Originally Disabled	Non-Medicaid & Originally Disabled	Medicaid & Originally Disabled
Female				
0-34 Years	1.521	1.783	-	-
35-44 Years	1.521	1.783	-	-
45-54 Years	1.521	2.018	-	-
55-59 Years	1.623	2.104	-	-
60-64 Years	1.693	2.132	-	-
65 Years	1.010	1.382	1.826	2.210
66 Years	1.010	1.382	1.826	2.210
67 Years	1.081	1.490	1.846	2.227
68 Years	1.118	1.563	1.846	2.254
69 Years	1.172	1.580	1.846	2.335
70-74 Years	1.319	1.791	2.015	2.428
75-79 Years	1.522	1.969	2.116	2.546
80-84 Years	1.748	2.177	2.472	2.733
85-89 Years	1.968	2.455	2.472	2.733
90-94 Years	2.153	2.633	2.472	2.733
95 Years or Over	2.153	2.633	2.472	2.733
Male				
0-34 Years	1.286	1.539	-	-
35-44 Years	1.286	1.539	-	-
45-54 Years	1.507	1.859	-	-
55-59 Years	1.640	2.046	-	-
60-64 Years	1.677	2.174	-	-
65 Years	0.989	1.533	1.679	2.182
66 Years	0.989	1.533	1.679	2.182
67 Years	1.026	1.650	1.734	2.185
68 Years	1.091	1.650	1.753	2.185
69 Years	1.148	1.650	1.809	2.185
70-74 Years	1.353	1.968	1.945	2.414
75-79 Years	1.589	2.127	2.078	2.488
80-84 Years	1.838	2.252	2.342	2.768
85-89 Years	2.096	2.584	2.342	2.768
90-94 Years	2.349	2.584	2.342	2.768
95 Years or Over	2.349	2.584	2.342	2.768

NOTES:

1. The denominator is $9,367.34.
2. For payment purposes, a new enrollee is a beneficiary who did not have 12 months of Part B eligibility in the data collection year. CMS-HCC new enrollee models are not based on diagnoses, but include factors for different age and gender combinations by Medicaid and the original reason for Medicare entitlement.

SOURCE: RTI International analysis of 2014-2015 100% Medicare data.

Table 6. 2020 Alternative Payment Condition Count Model Relative Factors for Continuing Enrollees

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
Female								
0-34 Years		-	0.241	-	0.349	-	0.383	0.902
35-44 Years		-	0.315	-	0.349	-	0.414	1.105
45-54 Years		-	0.348	-	0.374	-	0.418	1.043
55-59 Years		-	0.379	-	0.434	-	0.414	1.065
60-64 Years		-	0.428	-	0.490	-	0.412	1.067
65-69 Years		0.323	-	0.441	-	0.359	-	1.245
70-74 Years		0.386	-	0.519	-	0.406	-	1.150
75-79 Years		0.451	-	0.593	-	0.476	-	1.014
80-84 Years		0.529	-	0.716	-	0.550	-	0.882
85-89 Years		0.642	-	0.865	-	0.653	-	0.798
90-94 Years		0.784	-	0.987	-	0.783	-	0.668
95 Years or Over		0.787	-	1.041	-	0.873	-	0.501
Male								
0-34 Years		-	0.156	-	0.240	-	0.389	1.101
35-44 Years		-	0.199	-	0.235	-	0.282	1.002
45-54 Years		-	0.241	-	0.307	-	0.313	0.965
55-59 Years		-	0.287	-	0.402	-	0.340	1.017
60-64 Years		-	0.330	-	0.526	-	0.373	1.061
65-69 Years		0.309	-	0.494	-	0.370	-	1.288
70-74 Years		0.394	-	0.600	-	0.427	-	1.329
75-79 Years		0.473	-	0.710	-	0.500	-	1.317
80-84 Years		0.556	-	0.803	-	0.544	-	1.207
85-89 Years		0.687	-	1.000	-	0.659	-	1.122
90-94 Years		0.842	-	1.142	-	0.834	-	0.989
95 Years or Over		0.987	-	1.267	-	1.047	-	0.821
Medicaid and Originally Disabled Interactions								
Medicaid		-	-	-	-	-	-	0.061
Originally Disabled, Female		0.250	-	0.173	-	0.136	-	-
Originally Disabled, Male		0.147	-	0.182	-	0.083	-	-
Disease Coefficients	**Description Label**							
HCC1	HIV/AIDS	0.335	0.287	0.595	0.396	0.482	0.200	1.722

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC2	Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock	0.353	0.414	0.453	0.530	0.316	0.297	0.324
HCC6	Opportunistic Infections	0.425	0.740	0.572	0.803	0.318	0.658	0.534
HCC8	Metastatic Cancer and Acute Leukemia	2.658	2.714	2.566	2.801	2.455	2.659	1.303
HCC9	Lung and Other Severe Cancers	1.024	0.910	1.010	1.001	1.001	0.880	0.623
HCC10	Lymphoma and Other Cancers	0.675	0.663	0.717	0.756	0.648	0.667	0.461
HCC11	Colorectal, Bladder, and Other Cancers	0.306	0.345	0.317	0.355	0.330	0.351	0.294
HCC12	Breast, Prostate, and Other Cancers and Tumors	0.149	0.212	0.158	0.212	0.154	0.181	0.210
HCC17	Diabetes with Acute Complications	0.302	0.351	0.340	0.423	0.326	0.373	0.440
HCC18	Diabetes with Chronic Complications	0.302	0.351	0.340	0.423	0.326	0.373	0.440
HCC19	Diabetes without Complication	0.104	0.124	0.107	0.145	0.087	0.122	0.178
HCC21	Protein-Calorie Malnutrition	0.455	0.674	0.693	0.723	0.457	0.679	0.267
HCC22	Morbid Obesity	0.249	0.183	0.383	0.297	0.233	0.204	0.455
HCC23	Other Significant Endocrine and Metabolic Disorders	0.193	0.378	0.211	0.299	0.174	0.319	0.379
HCC27	End-Stage Liver Disease	0.881	1.065	1.111	1.101	0.729	0.887	0.874
HCC28	Cirrhosis of Liver	0.362	0.334	0.411	0.365	0.403	0.341	0.485
HCC29	Chronic Hepatitis	0.147	0.314	0.042	0.292	0.181	0.238	0.485

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC33	Intestinal Obstruction/Perforation	0.217	0.503	0.258	0.538	0.232	0.552	0.352
HCC34	Chronic Pancreatitis	0.286	0.580	0.349	0.762	0.371	0.597	0.422
HCC35	Inflammatory Bowel Disease	0.307	0.523	0.275	0.551	0.275	0.543	0.355
HCC39	Bone/Joint/Muscle Infections/Necrosis	0.400	0.378	0.558	0.682	0.443	0.435	0.401
HCC40	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	0.421	0.367	0.371	0.328	0.347	0.264	0.292
HCC46	Severe Hematological Disorders	1.371	3.566	1.214	4.309	1.234	4.138	0.799
HCC47	Disorders of Immunity	0.664	0.860	0.452	0.691	0.674	0.594	0.576
HCC48	Coagulation Defects and Other Specified Hematological Disorders	0.191	0.312	0.221	0.298	0.186	0.330	0.190
HCC51	Dementia With Complications	0.346	0.224	0.453	0.256	0.420	0.257	-
HCC52	Dementia Without Complication	0.346	0.224	0.453	0.256	0.420	0.257	-
HCC54	Substance Use with Psychotic Complications	0.328	0.543	0.538	0.896	0.372	0.679	0.178
HCC55	Substance Use Disorder, Moderate/Severe, or Substance Use with Complications	0.328	0.279	0.538	0.356	0.372	0.275	0.178
HCC56	Substance Use Disorder, Mild, Except Alcohol and Cannabis	0.328	0.247	0.538	0.348	0.372	0.275	0.178
HCC57	Schizophrenia	0.524	0.352	0.570	0.381	0.495	0.309	0.187

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC58	Reactive and Unspecified Psychosis	0.392	0.352	0.570	0.231	0.449	0.239	0.187
HCC59	Major Depressive, Bipolar, and Paranoid Disorders	0.308	0.164	0.299	0.127	0.306	0.109	0.187
HCC60	Personality Disorders	0.308	0.108	0.299	0.100	0.255	0.065	-
HCC70	Quadriplegia	1.242	1.001	1.038	1.000	1.000	1.134	0.549
HCC71	Paraplegia	1.067	0.739	0.921	0.957	1.000	0.933	0.492
HCC72	Spinal Cord Disorders/Injuries	0.481	0.369	0.532	0.377	0.512	0.336	0.289
HCC73	Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease	0.998	1.132	1.101	1.245	0.687	0.933	0.476
HCC74	Cerebral Palsy	0.339	0.098	-	-	0.114	-	-
HCC75	Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy	0.471	0.481	0.407	0.404	0.287	0.314	0.332
HCC76	Muscular Dystrophy	0.518	0.621	0.413	0.597	-	0.286	0.356
HCC77	Multiple Sclerosis	0.422	0.566	0.742	0.789	0.276	0.460	-
HCC78	Parkinson's and Huntington's Diseases	0.606	0.501	0.601	0.443	0.536	0.430	0.159
HCC79	Seizure Disorders and Convulsions	0.221	0.196	0.237	0.139	0.257	0.169	0.065
HCC80	Coma, Brain Compression/Anoxic Damage	0.497	0.274	0.511	0.105	0.729	0.134	-
HCC82	Respirator Dependence/Tracheostomy Status	1.002	0.781	2.183	1.465	0.836	0.769	1.622
HCC83	Respiratory Arrest	0.354	0.400	0.902	0.531	0.361	0.769	0.511

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC84	Cardio-Respiratory Failure and Shock	0.282	0.385	0.492	0.531	0.361	0.343	0.313
HCC85	Congestive Heart Failure	0.331	0.447	0.371	0.486	0.336	0.422	0.203
HCC86	Acute Myocardial Infarction	0.194	0.264	0.377	0.425	0.293	0.379	0.366
HCC87	Unstable Angina and Other Acute Ischemic Heart Disease	0.194	0.264	0.302	0.425	0.276	0.379	0.366
HCC88	Angina Pectoris	0.134	0.111	0.034	0.152	0.149	0.149	0.366
HCC96	Specified Heart Arrhythmias	0.268	0.262	0.384	0.308	0.264	0.281	0.252
HCC99	Intracranial Hemorrhage	0.233	0.170	0.380	0.486	0.230	0.163	0.111
HCC100	Ischemic or Unspecified Stroke	0.233	0.146	0.380	0.324	0.230	0.163	0.111
HCC103	Hemiplegia/Hemiparesis	0.435	0.281	0.487	0.296	0.438	0.310	-
HCC104	Monoplegia, Other Paralytic Syndromes	0.330	0.270	0.345	0.258	0.300	0.164	-
HCC106	Atherosclerosis of the Extremities with Ulceration or Gangrene	1.486	1.521	1.724	1.748	1.504	1.525	0.867
HCC107	Vascular Disease with Complications	0.382	0.464	0.565	0.653	0.463	0.450	0.299
HCC108	Vascular Disease	0.287	0.301	0.294	0.267	0.297	0.314	0.093
HCC110	Cystic Fibrosis	0.511	2.676	0.509	3.516	0.392	3.051	0.593
HCC111	Chronic Obstructive Pulmonary Disease	0.335	0.246	0.430	0.331	0.358	0.267	0.311
HCC112	Fibrosis of Lung and Other Chronic Lung Disorders	0.219	0.237	0.161	0.275	0.200	0.229	0.110
HCC114	Aspiration and Specified Bacterial Pneumonias	0.513	0.236	0.641	0.375	0.514	0.198	0.156

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC115	Pneumococcal Pneumonia, Empyema, Lung Abscess	-	-	0.258	-	0.093	0.082	0.156
HCC122	Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	0.221	0.231	0.271	0.269	0.182	0.201	0.394
HCC124	Exudative Macular Degeneration	0.521	0.314	0.298	0.145	0.393	0.158	0.217
HCC134	Dialysis Status	0.435	0.406	0.683	0.594	0.446	0.480	0.468
HCC135	Acute Renal Failure	0.435	0.406	0.683	0.594	0.446	0.480	0.468
HCC136	Chronic Kidney Disease, Stage 5	0.288	0.231	0.260	0.323	0.280	0.261	0.245
HCC137	Chronic Kidney Disease, Severe (Stage 4)	0.288	0.105	0.260	0.138	0.280	0.039	0.201
HCC138	Chronic Kidney Disease, Moderate (Stage 3)	0.069	0.021	0.017	-	0.043	-	0.092
HCC157	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	2.025	2.097	2.463	2.582	2.028	2.512	0.854
HCC158	Pressure Ulcer of Skin with Full Thickness Skin Loss	1.068	1.212	1.471	1.380	1.162	0.925	0.322
HCC159	Pressure Ulcer of Skin with Partial Thickness Skin Loss	0.655	0.628	0.863	0.467	0.649	0.824	0.322
HCC161	Chronic Ulcer of Skin, Except Pressure	0.514	0.592	0.727	0.583	0.541	0.542	0.294
HCC162	Severe Skin Burn or Condition	0.223	0.506	0.162	0.308	-	0.324	-
HCC166	Severe Head Injury	0.497	0.274	0.511	0.105	0.729	0.134	-
HCC167	Major Head Injury	-	-	0.144	0.025	0.034	0.019	-

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC169	Vertebral Fractures without Spinal Cord Injury	0.477	0.369	0.532	0.377	0.512	0.336	0.250
HCC170	Hip Fracture/Dislocation	0.350	0.394	0.409	0.469	0.354	0.333	-
HCC173	Traumatic Amputations and Complications	0.208	0.172	0.221	0.525	0.176	0.180	0.092
HCC176	Complications of Specified Implanted Device or Graft	0.581	0.911	0.680	0.982	0.520	0.832	0.469
HCC186	Major Organ Transplant or Replacement Status	0.831	0.445	0.728	0.865	0.438	0.613	1.046
HCC188	Artificial Openings for Feeding or Elimination	0.533	0.755	0.742	0.770	0.520	0.732	0.514
HCC189	Amputation Status, Lower Limb/Amputation Complications	0.517	0.437	0.795	0.934	0.697	0.626	0.357
Disease Interactions								
HCC47_gCancer	Immune Disorders*Cancer	0.837	0.460	0.853	0.679	0.656	0.601	-
Diabetes_CHF	Congestive Heart Failure*Diabetes	0.120	0.024	0.192	0.043	0.113	-	0.169
CHF_gCopdCF	Congestive Heart Failure*Chronic Obstructive Pulmonary Disease	0.153	0.121	0.230	0.154	0.158	0.141	0.191
HCC85_gRenal_v24	Congestive Heart Failure*Renal	0.155	0.411	0.187	0.461	0.186	0.382	-
gCopdCF_CARD_RESP_FAIL	Cardiorespiratory Failure*Chronic Obstructive Pulmonary Disease	0.363	0.379	0.528	0.455	0.392	0.479	0.414

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
HCC85_HCC96	Congestive Heart Failure*Specified Heart Arrhythmias	0.084	0.282	0.138	0.361	0.101	0.303	-
gSubstanceUseDisorder_gPsych	Substance Use Disorder*Psychiatric	-	0.138	-	0.191	-	0.201	-
SEPSIS_PRESSURE_ULCER	Sepsis*Pressure Ulcer	-	-	-	-	-	-	0.155
SEPSIS_ARTIF_OPENINGS	Sepsis*Artificial Openings for Feeding or Elimination	-	-	-	-	-	-	0.474
ART_OPENINGS_PRESSURE_ULCER	Artificial Openings for Feeding or Elimination*Pressure Ulcer	-	-	-	-	-	-	0.359
gCopdCF_ASP_SPEC_BACT_PNEUM	Chronic Obstructive Pulmonary Disease*Aspiration and Specified Bacterial Pneumonias	-	-	-	-	-	-	0.216
ASP_SPEC_BACT_PNEUM_PRES_ULC	Aspiration and Specified Bacterial Pneumonias*Pressure Ulcer	-	-	-	-	-	-	0.472
SEPSIS_ASP_SPEC_BACT_PNEUM	Sepsis*Aspiration and Specified Bacterial Pneumonias	-	-	-	-	-	-	0.346
SCHIZOPHRENIA_gCopdCF	Schizophrenia*Chronic Obstructive Pulmonary Disease	-	-	-	-	-	-	0.417
SCHIZOPHRENIA_CHF	Schizophrenia*Congestive Heart Failure	-	-	-	-	-	-	0.127
SCHIZOPHRENIA_SEIZURES	Schizophrenia*Seizure Disorders and Convulsions	-	-	-	-	-	-	0.573
Disabled/Disease Interactions								
DISABLED_HCC85	Disabled, Congestive Heart Failure	-	-	-	-	-	-	0.279

Variable	Description Label	Community NonDual Aged	Community NonDual Disabled	Community FBDual Aged	Community FBDual Disabled	Community PBDual Aged	Community PBDual Disabled	Institutional
DISABLED_PRESSURE_ULCER	Disabled, Pressure Ulcer	-	-	-	-	-	-	0.544
DISABLED_HCC161	Disabled, Chronic Ulcer of the Skin, Except Pressure Ulcer	-	-	-	-	-	-	0.473
DISABLED_HCC39	Disabled, Bone/Joint Muscle Infections/Necrosis	-	-	-	-	-	-	0.456
DISABLED_HCC77	Disabled, Multiple Sclerosis	-	-	-	-	-	-	0.496
DISABLED_HCC6	Disabled, Opportunistic Infections	-	-	-	-	-	-	0.405
Payment HCC Counts								
D1	1 payment HCC	-	-	-	-	-	-	-
D2	2 payment HCCs	-	-	-	-	-	-	-
D3	3 payment HCCs	-	-	-	-	-	-	-
D4	4 payment HCCs	0.009	-	-	-	-	-	-
D5	5 payment HCCs	0.047	0.043	-	0.055	0.037	0.083	-
D6	6 payment HCCs	0.083	0.131	0.040	0.167	0.071	0.117	-
D7	7 payment HCCs	0.134	0.201	0.057	0.269	0.080	0.291	-
D8	8 payment HCCs	0.224	0.441	0.095	0.424	0.125	0.452	-
D9	9 payment HCCs	0.270	0.441	0.156	0.549	0.402	0.499	-
D10P	10 or more payment HCCs	0.522	0.897	0.373	1.056	0.548	0.893	-

NOTES:

1. The denominator is $9,365.50.
2. In the "disease interactions" and "disabled interactions," the variables are defined as follows:
   Immune Disorders = HCC 47
   Cancer = HCCs 8-12
   Congestive Heart Failure = HCC 85
   Diabetes = HCCs 17-19
   Chronic Obstructive Pulmonary Disease = HCCs 110-112
   Renal = HCCs 134-138
   Cardiorespiratory Failure = HCCs 82-84
   Specified Heart Arrhythmias = HCC 96

Substance Use Disorder = HCCs 54-56
Psychiatric = HCCs 57-60
Pressure Ulcer = HCCs 157-159
Chronic Ulcer of Skin, except Pressure = HCC 161
Bone/Joint/Muscle Infections/Necrosis = HCC 39
Multiple Sclerosis = HCC 77
Opportunistic Infections = HCC 6
Sepsis = HCC 2
Artificial Openings for Feeding or Elimination = HCC 188
Aspiration and Specified Bacterial Pneumonias = HCC 114
Schizophrenia = HCC 57
Seizure Disorders and Convulsions = HCC 79

SOURCE: RTI International analysis of 2014-2015 Medicare 100% data and RTI International analysis of 2014-2015 Medicare 100% institutional sample.

Table 7. 2020 Alternative Payment Condition Count Model Relative Factors for Aged and Disabled New Enrollees

	Non-Medicaid & Non-Originally Disabled	Medicaid & Non-Originally Disabled	Non-Medicaid & Originally Disabled	Medicaid & Originally Disabled
Female				
0-34 Years	0.804	0.969	-	-
35-44 Years	0.947	1.202	-	-
45-54 Years	1.016	1.306	-	-
55-59 Years	1.017	1.307	-	-
60-64 Years	1.122	1.408	-	-
65 Years	0.520	0.993	1.122	1.462
66 Years	0.515	0.897	1.174	1.887
67 Years	0.544	0.920	1.174	1.887
68 Years	0.598	0.951	1.174	1.887
69 Years	0.600	0.951	1.174	1.887
70-74 Years	0.690	0.985	1.174	1.887
75-79 Years	0.860	1.134	1.174	1.887
80-84 Years	1.014	1.353	1.174	1.887
85-89 Years	1.293	1.536	1.293	1.887
90-94 Years	1.293	1.701	1.293	1.887
95 Years or Over	1.293	1.701	1.293	1.887
Male				
0-34 Years	0.442	0.734	-	-
35-44 Years	0.657	1.059	-	-
45-54 Years	0.864	1.353	-	-
55-59 Years	0.904	1.418	-	-
60-64 Years	0.921	1.551	-	-
65 Years	0.518	1.144	0.921	1.811
66 Years	0.533	1.094	1.071	2.199
67 Years	0.582	1.151	1.123	2.199
68 Years	0.626	1.202	1.123	2.199
69 Years	0.690	1.202	1.320	2.199
70-74 Years	0.786	1.298	1.408	2.199
75-79 Years	1.060	1.407	1.408	2.199
80-84 Years	1.247	1.555	1.408	2.199
85-89 Years	1.498	1.777	1.498	2.199
90-94 Years	1.498	1.777	1.498	2.199
95 Years or Over	1.498	1.777	1.498	2.199

NOTES:

1. The denominator is $9,365.50.
2. For payment purposes, a new enrollee is a beneficiary who did not have 12 months of Part B eligibility in the data collection year. CMS-HCC new enrollee models are not based on diagnoses, but include factors for different age and gender combinations by Medicaid and the original reason for Medicare entitlement.

SOURCE: RTI International analysis of 2014-2015 100% Medicare data.

Table 8. 2020 Alternative Payment Condition Count Model Relative Factors for New Enrollees in Chronic Condition Special Needs Plans (C-SNPs)

	Non-Medicaid & Non-Originally Disabled	Medicaid & Non-Originally Disabled	Non-Medicaid & Originally Disabled	Medicaid & Originally Disabled
Female				
0-34 Years	1.513	1.776	-	-
35-44 Years	1.513	1.776	-	-
45-54 Years	1.513	2.010	-	-
55-59 Years	1.619	2.095	-	-
60-64 Years	1.686	2.126	-	-
65 Years	0.999	1.375	1.810	2.183
66 Years	0.999	1.375	1.810	2.209
67 Years	1.070	1.483	1.834	2.213
68 Years	1.108	1.559	1.834	2.248
69 Years	1.164	1.576	1.834	2.336
70-74 Years	1.310	1.789	2.006	2.424
75-79 Years	1.516	1.98	2.112	2.562
80-84 Years	1.746	2.194	2.476	2.772
85-89 Years	1.971	2.490	2.476	2.772
90-94 Years	2.161	2.680	2.476	2.772
95 Years or Over	2.161	2.680	2.476	2.772
Male				
0-34 Years	1.276	1.533	-	-
35-44 Years	1.276	1.533	-	-
45-54 Years	1.498	1.854	-	-
55-59 Years	1.630	2.041	-	-
60-64 Years	1.673	2.167	-	-
65 Years	0.980	1.525	1.664	2.173
66 Years	0.980	1.525	1.667	2.173
67 Years	1.020	1.646	1.725	2.179
68 Years	1.082	1.646	1.740	2.179
69 Years	1.140	1.646	1.797	2.179
70-74 Years	1.345	1.967	1.935	2.419
75-79 Years	1.581	2.140	2.073	2.509
80-84 Years	1.832	2.272	2.349	2.805
85-89 Years	2.095	2.630	2.349	2.805
90-94 Years	2.351	2.630	2.349	2.805
95 Years or Over	2.351	2.630	2.349	2.805

NOTES:

1. The denominator is $9,365.50.
2. For payment purposes, a new enrollee is a beneficiary who did not have 12 months of Part B eligibility in the data collection year. CMS-HCC new enrollee models are not based on diagnoses, but include factors for different age and gender combinations by Medicaid and the original reason for Medicare entitlement.

SOURCE: RTI International analysis of 2014-2015 100% Medicare data.

Table 9. Disease Hierarchies for the 2020 Payment Condition Count Model

Hierarchical Condition Category (HCC)	If the Disease Group is Listed in this column…	…Then drop the Disease Group(s) listed in this column
	Hierarchical Condition Category (HCC) LABEL	
8	Metastatic Cancer and Acute Leukemia	9, 10, 11, 12
9	Lung and Other Severe Cancers	10, 11, 12
10	Lymphoma and Other Cancers	11, 12
11	Colorectal, Bladder, and Other Cancers	12
17	Diabetes with Acute Complications	18, 19
18	Diabetes with Chronic Complications	19
27	End-Stage Liver Disease	28, 29, 80
28	Cirrhosis of Liver	29
46	Severe Hematological Disorders	48
54	Substance Use with Psychotic Complications	55, 56
55	Substance Use Disorder, Moderate/Severe, or Substance Use with Complications	56
57	Schizophrenia	58, 59, 60
58	Reactive and Unspecified Psychosis	59, 60
59	Major Depressive, Bipolar, and Paranoid Disorders	60
70	Quadriplegia	71, 72, 103, 104, 169
71	Paraplegia	72, 104, 169
72	Spinal Cord Disorders/Injuries	169
82	Respirator Dependence/Tracheostomy Status	83, 84
83	Respiratory Arrest	84
86	Acute Myocardial Infarction	87, 88
87	Unstable Angina and Other Acute Ischemic Heart Disease	88
99	Intracranial Hemorrhage	100
103	Hemiplegia/Hemiparesis	104
106	Atherosclerosis of the Extremities with Ulceration or Gangrene	107, 108, 161, 189
107	Vascular Disease with Complications	108
110	Cystic Fibrosis	111, 112
111	Chronic Obstructive Pulmonary Disease	112
114	Aspiration and Specified Bacterial Pneumonias	115
134	Dialysis Status	135, 136, 137, 138
135	Acute Renal Failure	136, 137, 138
136	Chronic Kidney Disease, Stage 5	137, 138
137	Chronic Kidney Disease, Severe (Stage 4)	138
157	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	158, 161
158	Pressure Ulcer of Skin with Full Thickness Skin Loss	161
166	Severe Head Injury	80, 167

How Payments are Made and Counts are Calculated with a Disease Hierarchy:

EXAMPLE: If a beneficiary triggers Disease Groups 135 (Acute Renal Failure) and 136 (Chronic Kidney Disease, Stage 5), then DG 136 will be dropped. In other words, payment and payment HCC counts will always be associated with the DG in column 1, if a DG in column 3 also occurs during the same collection period. Therefore, the organization's payment and payment HCC counts will be based on DG 135 rather than DG 136.

Table 10. Disease Hierarchies for the 2020 Alternative Payment Condition Count Model

Hierarchical Condition Category (HCC)	If the Disease Group is Listed in this column…	…Then drop the Disease Group(s) listed in this column
	Hierarchical Condition Category (HCC) LABEL	
8	Metastatic Cancer and Acute Leukemia	9, 10, 11, 12
9	Lung and Other Severe Cancers	10, 11, 12
10	Lymphoma and Other Cancers	11, 12
11	Colorectal, Bladder, and Other Cancers	12
17	Diabetes with Acute Complications	18, 19
18	Diabetes with Chronic Complications	19
27	End-Stage Liver Disease	28, 29, 80
28	Cirrhosis of Liver	29
46	Severe Hematological Disorders	48
51	Dementia With Complications	52
54	Substance Use with Psychotic Complications	55, 56
55	Substance Use Disorder, Moderate/Severe, or Substance Use with Complications	56
57	Schizophrenia	58, 59, 60
58	Reactive and Unspecified Psychosis	59, 60
59	Major Depressive, Bipolar, and Paranoid Disorders	60
70	Quadriplegia	71, 72, 103, 104, 169
71	Paraplegia	72, 104, 169
72	Spinal Cord Disorders/Injuries	169
82	Respirator Dependence/Tracheostomy Status	83, 84
83	Respiratory Arrest	84
86	Acute Myocardial Infarction	87, 88
87	Unstable Angina and Other Acute Ischemic Heart Disease	88
99	Intracranial Hemorrhage	100
103	Hemiplegia/Hemiparesis	104
106	Atherosclerosis of the Extremities with Ulceration or Gangrene	107, 108, 161, 189
107	Vascular Disease with Complications	108
110	Cystic Fibrosis	111, 112
111	Chronic Obstructive Pulmonary Disease	112
114	Aspiration and Specified Bacterial Pneumonias	115
134	Dialysis Status	135, 136, 137, 138
135	Acute Renal Failure	136, 137, 138
136	Chronic Kidney Disease, Stage 5	137, 138
137	Chronic Kidney Disease, Severe (Stage 4)	138
157	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	158, 159, 161
158	Pressure Ulcer of Skin with Full Thickness Skin Loss	159, 161
159	Pressure Ulcer of Skin with Partial Thickness Skin Loss	161
166	Severe Head Injury	80, 167

How Payments are Made and Counts are Calculated with a Disease Hierarchy:

EXAMPLE: If a beneficiary triggers Disease Groups 135 (Acute Renal Failure) and 136 (Chronic Kidney Disease, Stage 5), then DG 136 will be dropped. In other words, payment and payment HCC counts will always be associated with the DG in column 1, if a DG in column 3 also occurs during the same collection period. Therefore, the organization's payment and payment HCC counts will be based on DG 135 rather than DG 136.