# ACO REACH and Kidney Care Choices Models

# PY2025 Risk Adjustment

Reference Documents

| Title |
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| ACO REACH Model: Financial Operating Guide: Overview |
| ACO REACH Model: Financial Settlement |
| ACO REACH Model: Capitation and Advanced Payment Mechanisms |
| Kidney Care Choices Model: Financial Operating Guide: Overview |
| ACO REACH and Kidney Care Choices Models: Rate Book Development |

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# I.    Executive Summary

The ACO REACH Model and the Comprehensive Kidney Care Contracting (CKCC) Options of the Kidney Care Choices (KCC) Model advance risk-sharing arrangements and build on the financial and benchmarking methodologies used in the Centers for Medicare & Medicaid Services' (CMS's) Accountable Care Organization portfolio. Risk adjustment is a pivotal determinant in these financial arrangements, ensuring that payments are fair and accurate and that they reflect the true health status of the population being served. A risk adjustment goal is to promote payment accuracy, with a special focus on high-needs populations with high costs. A further goal is to direct provider resources away from coding intensity activities by reducing incentives for coding and higher risk scores, which may not reflect disease burden.

In ACO REACH, risk adjustment is used to adjust expenditures for beneficiary health risk and establish Performance Year (PY) Benchmarks. ACO REACH applies the CMS-Hierarchical Condition Categories (HCC) prospective risk adjustment model used in the Medicare Advantage (MA) program and a new Center for Medicare & Medicaid Innovation (CMMI)-HCC concurrent risk adjustment model. Risk scores for beneficiaries aligned to Standard and New Entrant Accountable Care Organizations (ACOs) are calculated using the CMS-HCC prospective risk adjustment model, the End-Stage Renal Disease (ESRD) prospective risk adjustment model, and the demographic-based New Enrollees risk adjustment model. These three risk adjustment models have been used for years in Medicare, and the impact of these risk adjustment models on payment will be predictably stable and is well understood.

Risk scores for beneficiaries aligned to High Needs Population ACOs are calculated using the new CMMI-HCC concurrent risk adjustment model[1] and the ESRD prospective risk adjustment model. The new CMMI-HCC concurrent risk adjustment model is similar to the CMS-HCC prospective model. The key difference is that it uses demographic indicators and diagnoses from a given year to predict expenditures in that same year. This is expected to provide a more stable financial position for High Needs Population ACOs serving small, complex, chronically sick and seriously ill populations with highly variable, high-expenditure needs. The Innovation Center is testing whether this concurrent risk model is better able to predict costs for a high-needs population, particularly because this new risk adjustment model is expected to better capture a rapid deterioration in health *in the current year*, such as through the occurrence of acute episodes that are difficult to predict or prevent (e.g., heart attack).

The Innovation Center encourages participants to improve their care management and coordination, which will likely result in the participants engaging in more complete coding of chronic conditions. Nonetheless, risk adjustment in ACO REACH is subject to limits in risk score growth over the performance period. For Standard and New Entrant ACOs, an annual retrospective Coding Intensity Factor (CIF) is used in combination with the application of a symmetric 3% cap to limit risk score growth. The normalized risk scores are subject to the cap first, and then to the retrospective CIF. Risk scores for newly voluntarily aligned beneficiaries will initially be excluded from this calculation (i.e., voluntarily aligned beneficiaries that are newly aligned will be excluded from this calculation, however, voluntarily aligned beneficiaries that are continuously aligned in the following model performance year will be included in this calculation). Similar to the Standard and New Entrant ACOs, High Needs Population ACOs are also subject to risk score growth constraints.

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[1] Expenditures for New Enrollees, for their months of Model eligibility, have been incorporated into the calibration of the CMMI-HCC concurrent risk adjustment model, making a separate new enrollee model unnecessary.

Several new updates to the risk adjustment policy for ACO REACH will be implemented in 2025. Two key objectives have been taken into consideration in making these changes: first, continuing to protect the Medicare Trust Fund from risk score growth and second, promoting consistency in the application of risk adjustment with other CMS programs and models, including Medicare Advantage.

For Standard ACOs and New Entrant ACOs, the revised 2024 Part C risk adjustment model will be applied. This is the same 2024 model that is being applied in MA starting in Calendar Year (CY) 2024. PY2025 risk scores will be blended using 33% of the risk scores under the 2020 risk adjustment model and 67% of the risk scores under the revised 2024 risk adjustment model. The ACO-level 3% symmetric cap and zero-sum model-wide Coding Intensity Factor (CIF) will both continue to be applied as risk score growth constraints; however, the 2025 CIF will be constrained to be no greater than 1%, and the 3% symmetric cap application will continue to be based on a static reference year with a demographic adjustment.

With regard to the High Needs Population ACOs, the CMMI concurrent risk adjustment model will continue to be used and an ACO-level 10% symmetric cap with a static reference population and a zero-sum model-wide CIF, constrained to be no greater than 1% for the 2025 performance year, will continue to be applied as risk score growth constraints.

As changes to the ACO REACH risk adjustment methodology are considered for future performance years, the impact and interaction of the new Part C risk adjustment model will be evaluated with the cap and CIF as well as broader financial methodology features scheduled to go into effect in PY2026.

The CKCC Options of the KCC Model use the CMS-HCC prospective risk adjustment model for all aligned beneficiaries with late-stage Chronic Kidney Disease and the CMS-HCC ESRD risk adjustment model for all aligned beneficiaries with ESRD to risk adjust expenditures and establish the PY Benchmarks. For Kidney Contracting Entities (KCEs), a KCE-level symmetric cap on risk score growth is applied. The risk scores are normalized first, and then the cap is applied.

The combined approach of applying the CMS-HCC prospective risk adjustment model and the CMMI-HCC concurrent risk adjustment model with these coding intensity adjustments is intended to improve payment accuracy for vulnerable subpopulations while mitigating the incentive for organizations to redirect valuable resources toward coding optimization activities and risk score growth.

## II.  Introduction

The ACO REACH[2] and the Comprehensive Kidney Care Contracting (CKCC) Options of the Kidney Care Choices (KCC) Model advance risk-sharing arrangements and build on the financial and benchmarking methodologies used in the Centers for Medicare & Medicaid Services' (CMS's) Accountable Care Organization (ACO) portfolio. In these models, CMS's risk adjustment goals are to promote payment accuracy with a focus on organizations that manage complex, chronically sick and seriously ill patients. Consequently, refinements to existing risk adjustment methodologies have been made to promote fair and accurate payment for these populations, alongside a coding intensity policy which limits risk score growth. This will help to ensure that ACO REACH and CKCC participants are paid accurately and fairly,

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[2] The ACO REACH model is a redesigned version of the Global and Professional Direct Contracting (GPDC) Model, which began on April 1, 2021. The ACO REACH Model began on January 1, 2023 and runs through 2026. For completeness and context, this paper may refer to policies in PY2021 and PY2022 of the GPDC Model. For more information on the ACO REACH Model, see https://innovation.cms.gov/innovation-models/aco-reach.

relative to the true health status of the patient population being served and that Model savings are not put at risk.

ACO REACH is applying the CMS-Hierarchical Condition Categories (HCC) prospective risk adjustment model used in Medicare Advantage (MA) and a new Center for Medicare & Medicaid Innovation (CMMI)-HCC concurrent risk adjustment model. The new CMMI-HCC concurrent risk adjustment model is based on the CMS-HCC prospective risk adjustment model. Risk scores for Standard and New Entrant ACOs are calculated using the CMS-HCC prospective risk adjustment model, while risk scores for the High Needs Population ACOs are calculated using the CMMI-HCC concurrent risk adjustment model. The CMS-HCC End-Stage Renal Disease (ESRD) risk adjustment model is also used for all aligned ESRD beneficiaries in the three ACO types. The New Enrollees risk adjustment model is used for new enrollees aligned to the Standard and New Entrant ACOs only.[3] The CMS-HCC ESRD risk adjustment model and the New Enrollees risk adjustment models are the same risk adjustment models as those used in MA.

For all three ACO types, a retrospective Coding Intensity Factor (CIF) is applied to aligned beneficiary risk scores to limit risk score growth relative to the baseline period. In PY2025, the zero-sum model-wide CIF will be constrained to be no greater than 1% for the performance year. In addition, an ACO-level cap is applied to the growth in risk scores to further diminish the incentive for coding intensity that does not reflect true health status burden. An ACO-level 3% symmetric cap is applied to the Standard and New Entrant ACOs, and a 10% symmetric cap will be applied to the High Needs Population ACOs. The combined approach of applying the CMS-HCC prospective risk adjustment model and the CMMI-HCC concurrent risk adjustment model with these coding intensity adjustments is intended to improve payment accuracy for vulnerable subpopulations while mitigating the incentive for organizations to redirect valuable resources toward coding optimization activities and risk score growth.

The CKCC Options of the KCC Model use the CMS-HCC prospective risk adjustment model for all aligned beneficiaries with late-stage Chronic Kidney Disease (CKD), and the CMS-HCC ESRD risk adjustment model for all aligned beneficiaries with ESRD to adjust expenditures and establish the PY Benchmarks. A cap has been applied to the growth in risk scores since PY2022; however, unlike in ACO REACH, CKCC Options do not apply a retrospective CIF to risk scores.

The purpose of this paper is to provide Model participants with detailed information on the different risk adjustment models and the application of risk adjustment to the three ACO types and Kidney Contracting Entities (KCEs). First, background information, including the history and general purpose of risk adjustment, is discussed. Second, the unique applications of risk adjustment to (1) Standard and New Entrant ACOs, (2) High Needs Population ACOs, and (3) CKCC, are addressed. Next, a discussion on how risk scores are monitored and audited, and how they are reported for operational purposes to all participants during the performance period, is provided. Finally, the appendices provide the relative risk factors and hierarchy information for the newly designed CMMI-HCC concurrent risk adjustment model.

## III.  Background

This section explains the history and general concepts of risk adjustment, coding intensity, and normalization. In ACO REACH and the CKCC options of the KCC Model, CMS is building on a platform of extensive experience with the CMS-HCC risk adjustment model and its application to risk adjust

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[3] Expenditures for New Enrollees in the High Needs Population ACO type, for their months of Model eligibility, have been incorporated into the calibration of the CMMI-HCC concurrent risk adjustment model, making a separate New Enrollees model unnecessary.

payments in MA. The risk adjustment model has also been used in the Medicare Shared Savings Program (Shared Savings Program) and a number of Innovation Center models, including the Next Generation ACO (NGACO) Model, Comprehensive ESRD Care Model, and Comprehensive Primary Care Model. Further, CMS uses a variant of the CMS-HCC model in the concurrent models for the Affordable Care Act Exchanges.
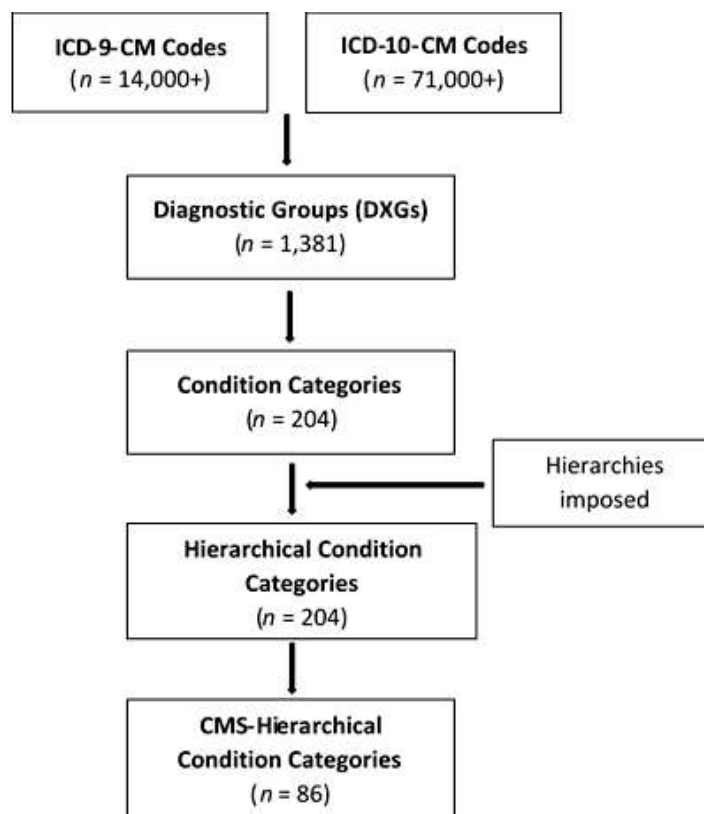
## i.    Concept and History of the CMS-HCC Prospective Risk Adjustment Model

The CMS-HCC prospective risk adjustment model is used as a method for measuring the health risks of an enrollee population and modifying payments to reflect the predicted expenditures of that population. Enrollee risks are measured using models to predict expenditures based on enrollee demographic characteristics, medical diagnoses, and other individual information. These models assign a risk score, scaled such that the population average is 1.0, to each individual in a population. The mean risk score for a group of enrollees indicates the group's overall health risks and expected level of health care expenditures. This mean risk score can be applied to adjust provider payments either upward or downward to better reflect the health status and predicted health care expenditures for a beneficiary.

Medical diagnoses in risk adjustment models are represented by HCCs. These are groups of diagnosis codes obtained from beneficiary claims data (bills to Medicare submitted by medical care providers) to indicate sets of similar medical conditions. The diagnosis codes are grouped first into Condition Categories (CCs), which are clinically related and associated with similar costs. Some CCs are then organized into hierarchies, in which having a more severe manifestation of an illness takes precedence over a less-severe manifestation. For purposes of risk adjustment, a beneficiary would have only one HCC flag in any given hierarchy (see **Figure 1**). Risk adjustment models are additive, which means that an individual's risk score will reflect the sum of the estimated cost increments for all diagnosed conditions, except where a lower HCC in a hierarchy is superseded by a higher HCC.

The CMS-HCC risk adjustment model used in MA, the Shared Savings Program, and the different Innovation Center models is a prospective model design, in which the payment or PY expenditures are predicted using the prior year's diagnoses. Therefore, the current year's risk scores are calculated based on diagnoses recorded during the previous calendar year. In

**Figure 1. 2020 CMS-HCC Prospective Risk Adjustment Model Used in MA Version 24 (V24), HCC Definition and Clinical Hierarchies**

contrast, the HHS-HCC model used to calculate transfer payments and charges for the Exchanges under the Affordable Care Act is a concurrent model—using current-year diagnoses to predict expenditures and generate risk scores for the same year.

In Medicare, the CMS-HCC prospective risk adjustment model is generally applied to payments where organizations are serving relatively large panels of enrollees or aligned beneficiaries. With larger panels of enrollees and aligned beneficiaries, challenges associated with risk scores and random variation in high-need, high-expenditure beneficiaries diminish; acute events that are hard to predict tend to average out across the population. In smaller panels, however, an unusually high (or low) frequency of acute events can have large financial impacts. In this context, a concurrent model is well suited to improve fairness by compensating for unforeseen spikes in acute events.

### ii. Normalization

Normalization is a mechanism to calibrate the population-average risk score to 1.0 in a given year. Risk models are calibrated using expenditures incurred within a particular year, the denominator year. In Medicare, when risk scores are calculated for beneficiaries and expenditures in years other than the denominator year, the average population risk score can diverge from 1.0 because of changes in the demographic structure of the Medicare fee-for-service (FFS) population, the prevalence of conditions in the FFS population, and the reporting of conditions on FFS claims. If population risk scores have an average greater or less than 1.0 and are applied to the expected cost of care in the payment year, there will be an overpayment or underpayment to the population in aggregate. In MA, CMS applies a normalization factor to risk scores in years other than the denominator year to maintain a 1.0 average risk score for the population and avoid over/underpayment.[4]

### iii. Coding Intensity

Risk adjustment affects each ACO's and KCE's financial Benchmark and the ACO REACH/KCC Rate Book, which links each participant's payments to its risk scores. This sets up an incentive for providers to code more diagnoses on their claims to raise their PY risk scores, a practice known as greater "coding intensity" (alternatively, "more complete and accurate coding"). Coding intensity does not necessarily involve fraud, because there is some discretion and variability in what diagnoses are recorded on claims and different degrees of diagnostic discovery. Further, the Innovation Center encourages participants to improve care management and coordination, which will likely result in participants engaging in more complete coding of chronic conditions.

Given the incentives for greater coding intensity, Medicare payment programs employing risk adjustment have established mechanisms to offset the effects of greater diagnostic coding on Medicare payments—that is, to avoid or limit any overpayments resulting from differential coding patterns. The Innovation Center's NGACO program, for example, employs caps to limit the amount of risk score growth (or decline) reflected in Benchmarks for ACO-aligned beneficiaries. The MA program makes a coding pattern adjustment to MA risk scores.

## IV. Application of Risk Adjustment

In ACO REACH and KCC (CKCC Options), risk adjustment is applied to determine the Benchmarks and standardize Benchmark components (e.g., baseline expenditures and the ACO REACH/KCC Rate Book).

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[4] https://www.cms.gov/files/document/2021-advance-notice-part-ii.pdf, p. 35.

The Benchmarks are adjusted to reflect the health status of the aligned beneficiaries being served in each PY. The Benchmark components are standardized to calculate the costs of an average 1.0 beneficiary in Medicare FFS. Furthermore, refinements to the risk adjustment approach are being implemented to address two challenges: (1) accurately risk adjusting payments to small organizations serving complex, chronically and seriously ill beneficiaries with high expenditures; and (2) reducing provider incentives to increase risk scores through increased diagnosis reporting. Risk adjustment is also applied to the capitated payments in ACO REACH so that these payments reflect the health status of the aligned beneficiaries.

Benchmarks. Risk scores calculated by the methods described in this paper affect the Benchmark calculation for each ACO or KCE, which in turn affects shared savings or losses amounts. Each ACO or KCE is assigned a risk score calculated as the mean of the individual risk scores of its assigned beneficiary population, weighted by eligible months of assignment to that ACO or KCE. These risk scores are derived from demographic characteristics and diagnoses recorded on FFS Part A and Part B claims.[5] Each ACO or KCE risk score indicates predicted expenditures for its aligned beneficiaries relative to the mean of the population and is necessary to ensure that the Benchmark is appropriate for measuring cost performance. Risk scores for an ACO or KCE are distinct for Aged & Disabled and ESRD Benchmarks.

Capitated Payments. For ACO REACH, the Total Care Capitation and Primary Care Capitation capitated payments made to an ACO are subject to risk adjustment. Risk scores calculated for the different ACO types are used to risk adjust these payments because these payments are calculated as a percentage of the PY Benchmark. For the CKCC options of the KCC Model, the payment mechanisms (CKD Quarterly Capitation Payment, Adjusted Monthly Capitation Payment, and Kidney Transplant Bonus) are not risk adjusted.

Standardizing Blended Benchmark Components. Lastly, in the process of calculating the standardized Blended Benchmark, the baseline and regional rate (determined from the ACO REACH/KCC Rate Book) components are standardized with risk scores to estimate an average 1.0 expenditure amount.

Coding Intensity and Normalization. Risk scores are normalized and subject to coding intensity limitations. The ACO REACH and KCC Models each use different measures to reduce increases in payments triggered by increases in risk score growth and also to reduce payment incentives to engage in activities targeting risk score growth.

ACO REACH incorporates adjustments for coding intensity that include a retrospective CIF adjustment and a risk score growth cap. After normalizing risk scores for growth relative to a reference population (see section on Normalization below), a retrospective model-wide zero-sum CIF is applied to ensure no net growth in average risk scores relative to a specified reference year. Nonetheless, individual ACOs may still experience risk score growth. To limit the impact of and reduce incentives for coding intensity by each ACO, a symmetric cap over a period of two or more years (depending on the performance year) is also applied to the risk scores. This cap is applied before the retrospective CIF adjustment. Finally, for KCEs, a cap of ±3.0% and ±6.0% is applied to the ESRD and CKD Stages 4 or 5 risk scores, respectively. **Table 1** summarizes the risk score adjustment steps that will be applied to each ACO/KCE type, and the order in which those steps will be applied.

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[5] The MA data filtering logic is applied for the calculations of risk scores. As described below, the claims filtering method changed for PY2023 of the ACO REACH Model relative to what was previously used.

**Table 1. Risk Score Adjustment Process by ACO Type/KCE for PY2025**

| Adjustment Steps | Standard and New Entrant ACOs | High Needs Population ACOs | KCE |
|---|:---:|:---:|:---:|
| 1. Preliminary estimated normalization factor | X | X | |
| 2. Final normalization adjustment factor | X | X | |
| 3. Retrospective normalization | | | X |
| 4. Risk score cap[6] | X | X | X |
| 5. Retrospective CIF | X | X | |

For the CKCC options within the KCC Model, only the cap on year-to-year risk score growth is applied to the risk scores. This model forgoes use of the retrospective CIF adjustment because the Innovation Center anticipates increased coding intensity for the aligned population relative to the non-aligned population because of increased incentives for providers to deliver care to patients with late-stage CKD.

# V.    Standard and New Entrant ACOs

The 2020 CMS-HCC prospective risk adjustment model Version 24 (V24) is being applied to calculate risk scores for Standard and New Entrant ACOs. CMS and stakeholders have extensive experience with this risk adjustment model and are familiar with its design, application, and impacts. The 2020 CMS-HCC model V24 is well suited for Standard and New Entrant ACOs because it predicts well for large panels of beneficiaries, emphasizing the cost variations that are driven by expensive chronic conditions. For Standard and New Entrant ACOs, the revised 2024 Part C risk adjustment model Version 28 (V28) being applied in MA is also applied starting in Calendar Year (CY) 2024. PY2025 risk scores will be calculated as a blend of 33% of the risk scores calculated with the 2020 risk adjustment model (V24) and 67% of the risk scores calculated with the revised 2024 risk adjustment model (V28).

## i.    Parameters of the CMS-HCC Prospective Risk Adjustment Model

Beneficiary risk scores calculated with the CMS-HCC prospective risk adjustment model use diagnoses reported in the prior year to predict expenditures during the Performance Year (PY). Data used to generate risk scores come from Part A and Part B claims.[7] For example, ACOs in PY2025 will be assigned scores based on their beneficiaries' claims history throughout 2024. Beneficiaries without a complete 12-month diagnostic profile from the prior year have a "new enrollee" risk score calculated with a model including only demographic factors, dual eligibility status, and originally disabled status (see "ii. New Enrollees Model," below). In addition, this section focuses on model segments used to predict risk

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[6] See below for PY2025 changes to the risk score growth cap.

[7] The MA data filtering logic is applied for the calculations of risk scores. In order to maintain consistency with MA, beginning in PY2023, ACO REACH uses Current Procedural Terminology (CPT)/Healthcare Common Procedure Coding System (HCPCS) filtering rather than specialty filtering. CPT/HCPCS filtering is necessary to allow the use of encounter data for diagnoses. To ensure that PY risk scores are comparable to reference year risk scores, risk scores for all reference years will be re-run using CPT/HCPCS filtering.

scores for non-ESRD enrollees (see "iii. Enrollees with End Stage Renal Disease Risk Adjustment Model," below for ESRD enrollees).

For PY2025, the 2020 CMS-HCC prospective risk adjustment model (V24) and the revised 2024 CMS-HCC prospective risk adjustment model (V28) are both being used for Standard and New Entrant ACOs; these are the same model versions being used in MA for Calendar Year (CY) 2025. The fully calibrated CMS-HCC Prospective Risk adjustment model V24 can be found in Table VI-1, Table VI-2, and VI-3 on pages 74, 82, and 83, respectively, of the Announcement of Calendar Year 2020 Medicare Advantage Capitation Rates and Medicare Advantage and Part D Payment Policies and Final Call Letter (2020 Announcement).[8] This model may be updated over the course of the Model performance period PY2021 through PY2026 (see "Calibration of the Model" section below). The fully calibrated CMS-HCC Prospective Risk adjustment model V28 can be found in Table VIII-1, Table VIII-2, and VIII-4 on pages 183, 193, and 195, respectively, of the Announcement of Calendar Year (CY) 2024 Medicare Advantage (MA) Capitation Rates and Part C and Part D Payment Policies (2024 Announcement).[9] This model may be updated over the course of the Model performance period PY2021 through PY2026 (see "Calibration of the Model" section below).

The revised V28 model includes important technical updates, including restructured condition categories using the International Classification of Diseases (ICD)-10 classification system (instead of the ICD-9 classification system) and updated underlying FFS data years (from 2014 diagnoses and 2015 expenditures to 2018 diagnoses and 2019 expenditures), as well as revisions focused on conditions that are subject to more coding variation. The 2024 Announcement contains detailed descriptions of these updates.

The ACO REACH Standard and New Entrant PY2025 risk scores will be calculated as a blend of 33% of the risk scores calculated with the 2020 (V24) model and 67% of the risk scores calculated with the updated 2024 (V28) model as follows:

$$blended\ risk\ score = (0.33 \times V24\ risk\ score) + (0.67 \times V28\ risk\ score)$$

In PY2025, the normalization factor will be applied to the blended risk scores after the 2020 (V24) and the 2024 (V28) blending calculation has been conducted. In addition, the baseline benchmark expenditure years used to calculate the blended benchmarks will also be standardized using normalized blended risk scores.

<u>Calibration of the Models</u>. The 2020 CMS-HCC prospective risk adjustment model (V24) is calibrated using 2014–2015 Medicare FFS claims data, while the 2024 CMS-HCC prospective risk adjustment model (V28) is calibrated using 2018-2019 Medicare FFS claims data. Calibration of the model is required to develop the risk scores. The List of Disease Categories for the 2020 Prospective Risk Adjustment Model

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[8] Please refer to the following link for model details: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2020.pdf.

[9] Please refer to the following link for model details: https://www.cms.gov/files/document/2024-announcement-pdf.pdf.

can be found in Table VI-1 of the 2020 Announcement.[10] The List of Disease Categories for the 2024 Prospective Risk Adjustment Model can be found in Table VIII-1 of the 2024 Announcement.[11]

<u>CMS-HCC Prospective Risk Adjustment Model Coefficients</u>. The CMS-HCC prospective risk adjustment models are used to calculate risk scores for beneficiaries aligned to Standard ACOs or New Entrant ACOs. These are the same CMS-HCC models used to determine payments for MA plans.[12] The V24 model includes 86 HCCs along with a set of 24 age-sex indicator variables. There is also a set of payment HCC count variables to better capture the higher costs of beneficiaries with multiple HCCs. The revised V28 CMS-HCC model includes 115 HCCs along with the age-sex and HCC count variables. The full model specification includes the following:

- 24 age-gender indicator variables: female/male interacted with ages 0–34, 35–44, 45–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85–89, 90–94, and 95 or older;
- 86 CMS-HCCs for V24; 115 HCCs for V28 (see below);
- a current-year dual-enrollment (Medicare and Medicaid) status indicator (included for the institutional model segment only);
- an originally disabled indicator, flagging beneficiaries who were entitled by disability when they joined Medicare but are currently entitled by age;
- multiplicative interactions of selected HCCs with demographic variables, allowing the incremental effect of the HCC to differ by the presence of the demographic variable;
- multiplicative interactions of selected HCCs or "disease" interactions, allowing the incremental effect of the HCC to differ by the presence of another HCC; and
- a set of number of payment HCC (count) indicator variables to allow higher predicted expenditures for beneficiaries with larger numbers of HCCs.

<u>CMS-HCC Prospective Risk Adjustment Model Segments</u>. The CMS-HCC (non-ESRD) model currently includes eight distinct segments. A model segment is defined as a separate calibration (set of coefficient weights for each risk marker in the model) for a given subpopulation, such as community-residing versus long-term institutional beneficiaries, or those eligible for Medicare because of age versus disability status.

A comparison of model segments in the CMS-HCC non-ESRD and CMS-HCC ESRD models is shown in **Table 2**. The model segments are unchanged between V24 and V28.

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[10] Please refer to the following link for model details: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2020.pdf. Note, this model is referred to as the Alternative Payment Condition Count Model in the 2020 Announcement.
[11] For the V28 model, please refer to the following link: https://www.cms.gov/files/document/2024-announcement-pdf.pdf.
[12] For more detailed information on the CMS-HCC model see the 2023 Advance Notices and Announcement https://www.cms.gov/files/document/2023-advance-notice.pdf.

**Table 2. Model Segments (Subpopulations) for the CMS-HCC Risk Adjustment Model (V24 and V28)**

| CMS-HCC Non-ESRD (V24 and V28) | CMS-HCC ESRD (V24 and V28) |
|---|---|
| • Community Non-Dual Aged<br>• Community Non-Dual Non-Aged<br>• Community Full Benefit Dual Aged<br>• Community Full Benefit Dual Non-Aged<br>• Community Partial Benefit Dual Aged<br>• Community Partial Dual Non-Aged<br>• Institutional<br>• New Enrollees | • Continuing Enrollee Dialysis<br>• New Enrollees Dialysis<br>• Kidney Transplant [Months 1–3]<br>• Functioning Graft Community, non-dual or partial-benefit dual, aged<br>• Functioning Graft Community, non-dual or partial-benefit dual, non-aged<br>• Functioning Graft Community, full-benefit dual, aged<br>• Functioning Graft Community, full-benefit dual, non-aged<br>• Functioning Graft Institutional<br>• Functioning Graft New Enrollees |

CMS-HCC Prospective Risk Adjustment, Example Risk Scores. The following examples illustrate how a raw risk score is calculated using the V24 and V28 Models, and more specifically how the additive and hierarchical design of HCC models are applied in the calculation. Consider two beneficiaries with the following base-year diagnoses:

- Beneficiary A: 67-year-old female, community-residing non-dual, three HCCs: Inflammatory Bowel Disease/Crohn's (HCC35 in V24; HCC80 in V28), CKD, Severe, Stage 4 (HCC137 in V24; HCC327 in V28), and CKD, Moderate, Stage 3 (HCC138 in V24; HCC329 in V28).
- Beneficiary B: 88-year-old male, community-residing non-dual, five HCCs: Diabetes with Chronic Complications (HCC18 in V24; HCC37 in V28), End-Stage Liver Disease (HCC27 in V24; HCC63 in V28), Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC40 in V24; HCC93 in V28), Dementia without Complication (HCC52 in V24; HCC126 in V28), and Angina Pectoris (HCC88 in V24; HCC229 in V28).

The risk score calculations for these two beneficiaries using the V24 and V28 Models are as follows in **Table 3**.

The raw risk scores are obtained by adding up the relative factors of the individual risk markers. Note that Beneficiary A's risk score does not include any weight for HCC 138 CKD Stage 3, because HCC 137 CKD Stage 4 excludes HCC 138 according to the CMS-HCC model's clinical hierarchies. Beneficiary A is predicted to cost slightly less than average using V24 (risk score = 0.920 compared to the population average of 1.000), but more than average (risk score = 1.394) using V28. Beneficiary B's risk score consists of the sum of all five HCC relative factors, plus an additional increment tied to having an HCC count equal to five. In total, Beneficiary B is predicted to cost around three times as much as the population average (V24 risk score = 2.814; V28 risk score = 3.040).

**Table 2. Examples of Raw Risk Score Calculations**

| Beneficiary A | | Beneficiary B | |
|---|---|---|---|
| **Characteristic** | **V24 Relative Factor** | **Characteristic** | **V24 Relative Factor** |
| 65- to 69-year-old female | 0.323 | 85- to 89-year-old male | 0.686 |
| HCC35 | 0.308 | HCC18 | 0.302 |
| HCC137 | 0.289 | HCC27 | 0.882 |
| HCC138 | 0.000 | HCC40 | 0.421 |
| | | HCC52 | 0.346 |
| | | HCC88 | 0.135 |
| | | HCC count=5 | 0.042 |
| **TOTAL = risk score** | **0.920** | **TOTAL = risk score** | **2.814** |
| | | | |
| **Characteristic** | **V28 Relative Factor** | **Characteristic** | **V28 Relative Factor** |
| 65- to 69-year-old female | 0.330 | 85- to 89-year-old male | 0.664 |
| HCC80 | 0.550 | HCC37 | 0.166 |
| HCC327 | 0.514 | HCC63 | 0.962 |
| HCC329 | 0.000 | HCC93 | 0.617 |
| | | HCC126 | 0.341 |
| | | HCC229 | 0.240 |
| | | HCC count=5 | 0.050 |
| **TOTAL = risk score** | **1.394** | **TOTAL = risk score** | **3.040** |
| | | | |
| *Blended V24 & V28 risk score* | *1.238* | *Blended V24 & V28 risk score* | *2.965* |

For presentation purposes, the relative factors and risk scores are rounded to 3 decimal places. Beneficiary A does not receive an HCC count factor because the count factors indicate counts of 5, 6, 7, …, to 15 or more HCCs. There is no factor for three HCCs.

The blended raw risk score is obtained for each individual beneficiary by adding 33% of the V24 risk score and 67% of the V28 risk score. The blended raw risk score has not been normalized.

## ii.   New Enrollees Model

Beneficiaries may become eligible for Medicare at any point during a calendar year. Because of this flexibility, certain beneficiaries who are aligned to ACOs may lack a complete 12-month diagnostic profile from the prior calendar year. To address this limited lookback period, these beneficiaries have a risk score calculated using the New Enrollees Risk Adjustment Model that only accounts for the beneficiary's demographic factors. For example, beneficiaries aligned to Standard ACOs or New Entrant ACOs in PY2025 who initially lack a 12-month lookback period will have New Enrollee risk scores until the beneficiary attains a full calendar year of claims history to transition into the prospective risk

adjustment model. The relative factors for the Aged and Disabled New Enrollees may be found in Table VI-2 of the 2020 Announcement.[13]

### iii. Enrollees with End-Stage Renal Disease Risk Adjustment Model

Because of the unique expenditure profile associated with treating high-acuity patients with ESRD, the Innovation Center uses a separate risk adjustment model to calculate the financial Benchmarks for all aligned beneficiaries with ESRD, including beneficiaries aligned to Standard ACOs and New Entrant ACOs. The model is the same one used for ESRD beneficiaries in MA, the CMS-HCC ESRD model Version 24 (V24), a prospective design recently updated and calibrated on 2018-2019 data for PY2023 with separate sets of risk factors for new enrollees in dialysis, continuing enrollees in dialysis, and transplant recipient beneficiaries. Information on the revised model can be found in the "Advance Notice of Methodological Changes for Calendar Year (CY) 2023 for Medicare Advantage (MA) Capitation Rates and Part C and Part D Payment Policies" and "Announcement of Calendar Year (CY) 2023 Medicare Advantage (MA) Capitation Rates and Part C and Part D Payment Policies". The List of Disease Hierarchies for the ESRD Model may be found in Table VI-7 in the 2023 Announcement.[14] Please refer to Tables VI-5–VI-10 in the same link for the relative factors by segment.

In MA, the new CMS-HCC ESRD risk adjustment model V24 uses nine separate sets of risk scores allowing for different predicted expenditures for each of the following subpopulations (segments):

- Continuing Enrollees in Dialysis (includes community and institutionalized enrollees)
- New Enrollees in Dialysis
- Kidney Transplant (Months 1–3)
- Functioning Graft for Community Aged Population, Non-Dual or Partial-Benefit Dual
- Functioning Graft for Community Non-Aged Population, Non-Dual or Partial-Benefit Dual
- Functioning Graft for Community Aged Population, Full-Benefit Dual
- Functioning Graft for Community Non-Aged Population, Full-Benefit Dual
- Functioning Graft for Institutionalized Population
- Functioning Graft for New Enrollees

The ESRD model risk scores are used for the following three populations with different ESRD statuses in the current (performance) year:

1. Dialysis: The ESRD dialysis component of the ESRD model is used to measure risks for beneficiaries who are in dialysis status.
2. Transplant: Transplant factors measure risk for beneficiaries who have a kidney transplant. Factors are used in conjunction with the ESRD Dialysis State Rate Book to pay for the month in which a transplant occurred and the following 2 months.

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[13] Please refer to the following link for model details: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2020.pdf. Note, this model is referred to as the Alternative Payment Condition Count Model in the 2020 Announcement.

[14] Beginning in PY2023, ACO REACH and KCC Models apply V24 of the CMS-HCC ESRD risk adjustment models. The models are recalibrated with an updated clinical version (from V21 to V24) and updated data years, and the new models use separate segments for full dual and partial dual status. Please refer to the following link for model details: https://www.cms.gov/files/document/2023-advance-notice.pdf.

3. Post-graft: The post-graft component of the ESRD model measures risk for beneficiaries starting with the fourth month after a kidney transplant, for as long as they have a functioning graft (i.e., do not return to dialysis status).

If a beneficiary from a Standard or New Entrant ACO transitions into ESRD during the PY, the aligned beneficiary will initially receive a CMS-HCC prospective risk adjustment model risk score. After gaining ESRD eligibility, the same beneficiary will receive the appropriate ESRD risk adjustment model risk score. For kidney transplant recipients, risk scores are calculated by the ESRD transplant model for 3 months; beginning in the fourth month the beneficiary transitions to the appropriate ESRD functioning graft model risk score. (Please see Section VII for similar detail on the KCC Model.)

## iv. Normalization

Risk scores calculated using the CMS-HCC prospective model, including both non-ESRD and ESRD models and the New Enrollee model, are normalized each year. Risk models are estimated based on expenditures incurred during a particular payment year, also called the denominator year. A normalization factor is applied to ACO risk scores to adjust for changes in risk score growth, relative to the denominator year of the risk adjustment model being used. The normalization factor for each year is the average risk score of the ACO REACH National Reference Population in that year; ACO risk scores are normalized by dividing by this factor.[15]

For each PY, normalization factors will be determined separately for the CMS-HCC prospective risk adjustment model and the CMS-HCC ESRD model. The PY normalization factor (the average risk score of the ACO REACH National Reference Population in that year) will be calculated and incrementally updated throughout the payment year based on observed diagnosis data submitted for the ACO REACH National Reference Population. Dividing the ACO risk scores by the average risk score maintains an average risk score of 1.0 in the payment year for beneficiaries in the ACO REACH National Reference Population. A final normalization adjustment factor is then applied during settlement, after the payment year has ended, and once the actual growth trend can be measured with a full year of observed data. Normalization of base-year (2017-2019, 2021-2023) and ACO REACH Rate Book reference year (2021, 2022, and 2023) risk scores is based on actual observed risk scores of the ACO REACH reference population. In PY2025, the observed risk scores will be based on the blended risk score model.

## v. Coding Intensity

For Standard and New Entrant ACOs, an annual retrospective CIF is used in combination with the application of a symmetric 3% cap to limit risk score growth.[16] For PY2025, the CIF will be constrained to be no greater than 1.010, or 1%. The normalized risk scores are subject to the cap first, and then to the retrospective CIF. Risk score growth for voluntarily aligned beneficiaries in their first year of alignment is excluded from the application of the retrospective CIF and the cap, because initially ACOs are not responsible for the risk score diagnoses reported and used for ACOs' risk adjusted payments for those

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[15] For the blended V24/V28 CMS-HCC risk scores, scores will be blended first, then normalized based on the mean blended risk score for the reference population.

[16] After application of the CIF, although the ACO's risk score growth will always be below +3% relative to the risk score cap reference year, it is possible that the ACO's risk score growth could be below -3%, which would be outside of the symmetric cap. Were the CIF to be a 0.5% reduction (CIF value of 1.005), for example, the effective range of ACO-level risk score growth would in fact be −3.5% to +2.5%.

beneficiaries. An example calculation, which includes the normalization of risk scores and the application of the symmetric 3% cap and the CIF, can be found in Appendix C.

ACO-Specific Risk Score Growth Symmetric 3% Cap. For PY2025, a symmetric 3% cap is applied to ACO-specific risk score growth for all aligned beneficiaries in Standard and New Entrant ACOs. Initially, voluntarily aligned beneficiaries are excluded from the application of the symmetric 3% cap in their first model performance year of alignment. Voluntarily aligned beneficiaries in their second or later model performance year of alignment are included in the application of the symmetric 3% cap, even if they have not yet triggered claims-alignment.

The average normalized risk score for the ACO in the PY is constrained to be no more than 3% above or below the ACO's normalized risk score for the ACO-specific reference year population. The cap is applied separately for the Aged/Disabled and ESRD populations. For PY2025, the minimum reference population threshold for application of the cap will be 1,500 Aged/Disabled beneficiaries and there must also be sufficient claims history in the reference year. In addition, the cap will not be applied when the performance year Aged/Disabled population subject to the cap is more than three times as large as the historical reference Aged/Disabled population used to establish the cap. For PY2025, the minimum ESRD reference population threshold and the minimum ESRD performance year population threshold for the application of the cap will each be 50 ESRD beneficiaries, plus there must also be sufficient claims history in both the reference and performance years.

Beginning in PY2024 and for PY2025, the ACO REACH risk score growth cap will be modified to accommodate changes in the demographic characteristics of each ACO's aligned population over time. For PY2025, the growth rate (from PY2022 to PY2025) for each ACO will be capped at ±3% plus the growth rate (from PY2022 to PY2025) in the mean normalized demographic-only risk score for each ACO. Table 4 highlights the changes that will occur to Table 1 once the new risk score growth cap is implemented.

**Table 4. Risk Score Adjustment Process by ACO Type/KCE in PY2025**

| Adjustment Steps | Standard and New Entrant ACOs | High Needs Population ACOs | KCE |
|---|---|---|---|
| 1. Initial estimated normalization factors based on observed data, updated over time | X | X | |
| 2. Final normalization adjustment factors | X | X | |
| 3. Retrospective normalization | | | X |
| 4. Cap on risk score growth | | X | X |
| 5. Cap on the difference between the risk score growth rate and the demographic risk score growth rate | X | | |
| 6. Retrospective CIF, constrained to be no greater than 1% | X | X | |

**Table 5** presents three examples of how the revised risk score cap will work in PY2025. Three hypothetical ACOs are presented. Under the previous +/-3% symmetric cap, risk score growth would have been capped at 1.03 for all three ACOs. Under the revised caps policy, for ACO A demographic risk scores increased by 2%, and thus the risk score cap has a ceiling of 1.05. As a result, the ACO's risk scores will be allowed to increase by the full 5%. For ACO B, demographic risk scores remained the same, and thus risk score growth will be capped at 1.03 (0% demographic + 3%). For ACO C, demographic risk scores fell by 2%. As a result, risk score growth would be capped at 1.01 (-2% + 3%).

**Table 5. Illustration of HCC risk score cap for PY2025**

| ACO | HCC risk score | | | Demographic risk score | | | 2025 HCC risk score caps: | | Final 2025 capped HCC risk score |
|---|---|---|---|---|---|---|---|---|---|
| | 2022 risk score | 2025 risk score | Growth rate | 2022 risk score | 2025 risk score | Growth rate | Floor | Ceiling | |
| A | 1.00 | 1.05 | 5.0% | 1.00 | 1.02 | 2.0% | 0.99 | 1.05 | **1.05** |
| B | 1.00 | 1.05 | 5.0% | 1.00 | 1.00 | 0.0% | 0.97 | 1.03 | **1.03** |
| C | 1.00 | 1.05 | 5.0% | 1.00 | 0.98 | (2.0%) | 0.95 | 1.01 | **1.01** |

The ACO REACH demographic risk scores will be calculated using a demographic risk score model using the same methodology as the Shared Savings Program.[17] This model predicts beneficiary expenditures using age, gender, original reason for entitlement code (OREC), and Medicaid dual status; there are no HCCs in the model specification.

The ACO REACH risk score growth cap for PY2025 will be based on the static reference year for growth rate calculations, rather than allowing the reference year to advance with each performance year (see **Table 6**). The growth cap reference year for PY2024, PY2025 and PY2026 will be 2022. The table below summarizes how the risk score growth cap will be applied to Standard and New Entrant ACOs for future performance years. This change in reference years avoids growth from a baseline level that is already inflated by coding intensity effects.

**Table 6. Reference Population for Applying the Symmetric 3% Cap**

| Performance Year | Reference Year |
|---|---|
| IP (2020) | NA |
| PY2021 | 2019 |
| PY2022 | 2020 |
| PY2023 | 2021 |
| PY2024 | 2022 |
| PY2025 | 2022 |
| PY2026 | 2022 |

Model-Wide Coding Intensity Factor (CIF). A retrospective CIF adjustment is applied to Standard and New Entrant ACOs annually during final settlement after the payment year has ended.

The CIF is calculated as:

$$CIF = \frac{mean\ normalized\ capped\ risk\ score\ for\ all\ aligned\ beneficiaries\ in\ the\ PY}{mean\ normalized\ risk\ score\ for\ all\ aligned\ beneficiaries\ in\ the\ RY}$$

Where 'capped' means the risk score was subject to the application of the cap and may or may not have been constrained.

Each ACO that is subject to the CIF will have its capped risk score divided by this CIF value. For PY2025, the CIF will be constrained to be no greater than 1% (1.010). The CIF adjustment is tailored for application to risk scores based on the CMS-HCC prospective risk adjustment model such that the change in normalized payment risk scores, after the application of the cap and across all aligned beneficiaries in all REACH ACOs, is zero between 2019 and the PY. One CIF is calculated per PY to be applied to all REACH ACOs (whereas the cap is an ACO-specific calculation). Initially, voluntarily aligned beneficiaries are excluded from the application of the CIF in their first model performance year of alignment. Beneficiaries who are voluntarily aligned in their second or later model performance year are included in the application of the CIF, even if they have not yet triggered claims-alignment. A CIF is

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[17] The Shared Savings Program demographic risk adjustment model is similar to the new enrollee model used for MA, but is calibrated on the full sample of the Medicare FFS population rather than only on new enrollees.

calculated for Aged/Disabled beneficiaries to align with the CMS-HCC risk adjustment model. In addition, a separate CIF is calculated for ESRD beneficiaries to align with the ESRD risk adjustment model. The risk score reference population for each PY is shown in **Table 7**.

**Table 7. Risk Score Reference Population for Establishing the CIF**

| Performance Year | Reference Population for CIF | |
| --- | --- | --- |
| | Aged/Disabled | ESRD |
| IP–2020 | NA | NA |
| PY2021 | 2019 | 2019 |
| PY2022 | 2019 | 2019 |
| PY2023 | 2019 | 2019 |
| PY2024 | 2019 | 2019 |
| PY2025 | 2019 | 2019 |
| PY2026 | 2019 | 2019 |

Voluntarily Aligned Beneficiaries. Risk score growth for voluntarily aligned beneficiaries in their first model performance year of alignment is excluded from the retrospective CIF and the cap, because the Standard and New Entrant ACOs are not responsible for the initial reporting of risk score diagnoses for the CMS-HCC prospective risk adjustment model.

# VI.   High-Needs Population ACOs

For the High Needs Population ACOs, CMS uses a similar, but revised and concurrent, version of the CMS-HCC prospective risk adjustment model, the CMMI-HCC concurrent risk adjustment model (referred to here as the CMMI-HCC concurrent model). The CMMI-HCC concurrent model has been calibrated and subjected to evaluation analyses. It is similar to the CMS-HCC prospective model, following most of the 21st Century Cures Act requirements and including most of the prospective model variables. The key benefit of the CMMI-HCC concurrent model over the CMS-HCC prospective risk adjustment model for high-needs populations is that it more accurately predicts their higher costs incurred during the performance year. This provides a more stable financial position for High Needs Population ACOs serving small, complex, chronically and seriously ill populations with highly variable, high-cost needs. This should incentivize improved health care management and the provision of higher quality care for this vulnerable population.

A concurrent risk model for aligned beneficiaries uses demographic indicators and diagnoses from the PY to predict expenditures in the same year. Concurrent risk models are better able to predict costs for populations with high disease burden or who are otherwise seriously ill because the approach can better capture a rapid deterioration in health in the current year, such as through the occurrence of acute episodes that are difficult to predict or prevent (e.g., heart attack). This is a departure from the existing CMS-HCC prospective risk adjustment model, which predicts current-year costs using health status indicators (diagnoses) from the prior year.

## i.    Parameters of the CMMI-HCC Concurrent Risk Adjustment Model

The CMMI-HCC concurrent model generates risk scores for most beneficiaries aligned to High Needs Population ACOs, including newly aligned enrollees and continuing enrollees; those who qualify for Medicare by disability status and those who qualify by age; community-residing and long-term institutional Medicare beneficiaries; and those who have dual eligibility with state Medicaid programs. The only aligned beneficiaries in High Needs Population ACOs who do not receive risk scores from this model are ESRD patients receiving dialysis or those who have recently received kidney transplants.

Risk adjustment for High Needs Population ACOs (and also for Standard and New Entrant ACOs) uses a separate model for beneficiaries in ESRD dialysis or the first 3 months of post-kidney transplant status. For these beneficiaries, risk scores are generated from the standard prospective CMS-HCC ESRD model (V24). Note that kidney transplant patients who are at least 4 months post-graft, however, are included in the general CMMI-HCC concurrent model population.

CMMI-HCC Concurrent Model Design. The CMMI-HCC concurrent risk adjustment model is based on the CMS-HCC prospective model used for Standard and New Entrant ACO types, in MA, the Shared Savings Program, and the NGACO Program, and is therefore similar in design and structure. The CMMI-HCC concurrent model builds from Version 24 (V24) of the CMS-HCC prospective model, including largely the same payment HCCs and also incorporates most of the features required by the 21st Century Cures Act; for example, it includes a set of HCC condition count variables.

A key difference between the CMMI-HCC concurrent model and the CMS-HCC prospective model is that for a given year of expenditures, HCCs in the concurrent model are measured concurrently for aligned beneficiaries based on diagnoses reported in the same year, whereas HCCs in the prospective model are measured prospectively for aligned beneficiaries based on diagnoses reported in the prior year. Because of the concurrent nature of the CMMI-HCC model, acute conditions are weighted more heavily than chronic conditions in the model, and demographic factors receive relatively less weight. This is evidenced by differences in the calibrated coefficients of the HCCs included in the two models (concurrent and prospective). For PY2025, the CMMI-HCC concurrent model calibration is based on 2018 Medicare FFS data, with diagnoses and expenditures drawn from the same calendar year.

Below is a summary of the key design features of the CMMI-HCC concurrent model.

CMMI-HCC Model Risk Factors and Demographic Variables. The CMMI-HCC concurrent model uses a modified version of the V24 CMS-HCC prospective model HCCs. The CMMI-HCC specification includes 85 HCCs rather than the 86 in the V24 CMS-HCC prospective model,[18] with slight modifications to some HCC hierarchies and coefficient constraints. For some HCCs, there is a sizable difference in expected expenditures between aged (65 or older) beneficiaries and non-aged beneficiaries; these conditions tend to be associated with larger expenses in the non-aged population. To model these differences, we include interaction variables that indicate whether an individual has the HCC and is non-aged (less than 65). These HCCs include HCC46, Severe Hematological Disorders, HCC110, Cystic Fibrosis, and HCC136 or HCC137, CKD Stage 5 or CKD Stage 4. The CMMI-HCC concurrent model includes a set of 24 age-gender

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[18] HCC 134 Dialysis Status is removed from the CMMI-HCC specification because these beneficiaries receive a risk score calculated from the appropriate CMS-HCC ESRD model segment. Dialysis expenditures for non-ESRD beneficiaries will be included in other related model factors.

categories to model variations in risk among these demographic groups, and also to serve as predicted expenditure levels for people with zero HCCs.

CMMI-HCC Model Segments. The CMS-HCC prospective model, on which the CMMI-HCC concurrent model is based, uses separately calibrated "model segments" to generate risk scores for different demographic groups. There are separate model segments for long-term institutional residents and community-residing beneficiaries; for the aged population and for those who qualify for Medicare by disability status; and for dual-eligible Medicaid beneficiaries and those who are not enrolled in Medicaid. To maintain simplicity, the CMMI-HCC concurrent model, however, is calibrated on—and can provide risk scores for—most Medicare beneficiaries. The CMMI-HCC concurrent model is therefore a single model; it does not have model segments. Furthermore, the demographic factors which are used to segment the CMS-HCC prospective model—including dual Medicare/Medicaid eligibility status, disability status, and institutional status—do not have much predictive power in the concurrent model, so it is not necessary to include these factors as predictors in the risk model.

Beneficiaries who are 4 or more months beyond their kidney transplant procedure are assigned risk scores using the CMMI-HCC concurrent model. To reflect the additional costs of these patients, the model includes a set of four post-graft indicator variables that capture the additional risks these people represent:

- 4 to 9 months post-graft, age less than 65
- 4 to 9 months post-graft, age 65 or greater
- 10 or more months post-graft, age less than 65
- 10 or more months post-graft, age 65 or greater

Each post-graft assigned beneficiary is flagged with one of these four indicators and receives a risk increment associated with the relevant status.

HCC Count Variables. To reflect the higher costs of beneficiaries with multiple diagnoses (or HCCs), a series of payment HCC count indicator variables is included in the CMMI-HCC concurrent model specification. These were introduced in the CMS-HCC prospective model to comply with a requirement in the 21st Century Cures Act, and payment HCC count variables are similarly included here to improve predictive accuracy for people with and without multiple comorbidities in their risk profile.

The payment HCC count variables are implemented as a set of 11 indicators for people with exactly 5, 6, 7, etc. up to 14 payment HCCs and then a single indicator for anyone with 15 or more HCCs. Only HCCs that are included in the CMMI-HCC concurrent model specification are included in the count; "nonpayment" HCCs that are not in the model are not taken into consideration.

With these payment HCC count variables included in the model, the marginal effect of an HCC diagnosis on an individual's risk score thus depends on how many other HCCs are present in the risk profile. For a beneficiary with six HCCs, for example, the incremental effect of reporting an additional HCC therefore consists of two components: (1) the coefficient on the additional HCC, and (2) the difference between the HCC count = 7 coefficient and the HCC count = 6 coefficient.

21st Century Cures Act (2016). The 21st Century Cures Act (2016) directed specific modifications for the CMS-HCC model beginning in 2019. These modifications have mostly been incorporated into the CMMI-HCC concurrent risk adjustment model, and they include the following:

- "Taking into account total number of diseases or conditions." As discussed above, this has been achieved by including the payment HCC count indicator variables in the model specifications. To avoid incentives not to report HCCs, any count variables that would have a negative coefficient are removed from the model.
- "Evaluation of mental health and substance use disorders." The CMS-HCC substance use disorder HCCs were reconfigured and augmented in the 2020 CMS-HCC prospective model (V24) and two dementia-related HCCs were added. These are also included in the CMMI-HCC concurrent risk adjustment model.
- "Evaluation of chronic kidney disease." HCC 138 (Chronic Kidney Disease Stage 3) was added to the CMS-HCC models, but in the CMMI-HCC concurrent model the coefficient was constrained to zero because its unconstrained estimate was negative.

Calibration Data and Model Estimation. The CMMI-HCC concurrent model has been calibrated using 2018 Medicare FFS claims data. Calibration of the model is required to develop the risk scores. CMMI may rebase or recalibrate the CMMI-HCC concurrent model, V1, over the course of the model performance period (PY2021 through PY2026) to make improvements to predictive accuracy. In the process of recalibrating or rebasing the risk adjustment model, the Innovation Center will provide information regarding any changes prior to the start of the performance period. The relative factors for the CMMI-HCC concurrent model (V1) in 2025 are provided in Appendix B.

The CMMI-HCC concurrent model uses demographic indicators and diagnoses from the PY to predict expenditures in the same year. As with the prospective model, each beneficiary's risk profile is based on Part A and Part B claims and demographic information.[19] The concurrent model, however, does not require a full 12 months of enrollment or claims data; risk scores can be generated using as many eligible months of enrollment as are available.

The CMMI-HCC concurrent model is calibrated using a 100% sample of calendar year 2018 Medicare enrollment and claims records. This calibration sample includes continuing and new enrollees. (Because of the concurrent model design, no separate model for new enrollees is needed.) As mentioned in the previous section, the calibration sample includes beneficiaries who are eligible by disability or by age; who reside in institutional settings or in the community; who are Medicaid-enrolled and not Medicaid-enrolled. Only U.S. residents enrolled in both Medicare Parts A and B are included in the data. Beneficiaries with fewer than 12 eligible months of claims are included in the sample, and their expenditures are annualized—that is, extrapolated to the amount that would have been incurred over a full 12 months.

Expenditures (amounts paid by Medicare, excluding beneficiary cost sharing or any third-party payments) to be included are all physician and other eligible provider claims, supplier or carrier claims, durable medical equipment, inpatient facility paid amounts, skilled nursing facility paid amounts, outpatient facility paid amounts, home health aide expenditures, and hospice care costs. Inpatient pass-through payments are included; Part D (prescription drug) claims are excluded.

Explanatory variables in the model, as described above, include the following:

- 24 age-sex indicator variables

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[19] For 2025, the specialty filtering logic is applied for the calculation of concurrent model risk scores. To ensure comparability of performance year risk scores with reference year risk scores, the same specialty filtering logic was applied across all years.

- 85 CMMI-HCCs (modified from CMS-HCCs)
- 4 post-(kidney)-graft indicators
- 11 payment HCC count indicators (5, 6, 7, …, 14, 15+)
- 3 interactions of specific HCCs with an age less than 65 indicator

Diagnoses are included from claims based on the filters described above. Claims must have a through date during one of the beneficiary's eligible months. Thus, HCCs are defined only from diagnoses reported for services received during eligible months, not during all months of the year. This is to better match expenditures and associated diagnoses.

The CMMI-HCC concurrent model is estimated by weighted ordinary least squares. The weight applied to each individual observation is the number of eligible months divided by 12 (person years).

Because the dependent variable in the regression (annualized expenditures) is in dollars, coefficient estimates are calculated as dollar amounts. To generate risk scores, these dollar coefficients are converted to relative coefficients by dividing them by the mean expenditures of the calibration sample. This allows risk scores to have an overall mean of 1.0, and they express a predicted expenditure for each beneficiary relative to the population mean.

In addition, as in the CMS-HCC prospective model, coefficient constraints are imposed to uphold the principle that higher clinically ranked HCCs in an HCC hierarchy have at least as large incremental predicted expenditures as lower ranked HCCs. Constraints generally have the effect of averaging two or more groups together when, unconstrained, there is a violation of clinical logic.

Appendix A shows the calibrated CMMI-HCC concurrent model with relative coefficients.

CMMI-HCC Concurrent Model Example Risk Score Calculations. As with the CMS-HCC prospective model, the CMMI-HCC concurrent model is additive and hierarchical. **Table 8** provides two examples to illustrate how a raw risk score is calculated from a beneficiary risk marker profile:

- Beneficiary C: 62-year-old female, three HCCs: HCC19 (Diabetes without Complication), HCC137 (Chronic Kidney Disease, Severe, Stage 4), and HCC138 (Chronic Kidney Disease, Moderate, Stage 3).
- Beneficiary D: 80-year-old male, five HCCs: HCC8 (Metastatic Cancer and Acute Leukemia), HCC40 (Rheumatoid Arthritis and Inflammatory Connective Tissue Disease), HCC78 (Parkinson's and Huntington's Diseases), HCC86 (Acute Myocardial Infarction), and HCC108 (Vascular Disease).

**Table 8. Examples of Risk Score Calculations**

| Beneficiary C | | Beneficiary D | |
|---|---|---|---|
| **Characteristic** | **Relative Factor** | **Characteristic** | **Relative Factor** |
| 60- to 64-year-old female | 0.156 | 80- to 84-year-old male | 0.134 |
| HCC19 | 0.056 | HCC8 | 2.725 |
| HCC137 | 0.139 | HCC40 | 0.246 |
| HCC138 | 0.000 | HCC78 | 0.278 |
| HCC137 and age <65 | 0.453 | HCC86 | 0.965 |
| | | HCC108 | 0.173 |
| | | HCC count = 5 | 0.043 |
| **TOTAL = risk score** | **0.804** | **TOTAL = risk score** | **4.564** |

For presentation purposes, the relative factors and risk scores are rounded to 3 decimal places.
Beneficiary C does not receive an HCC count factor because the count factors indicate counts of 5, 6, 7, …, to 15 or more HCCs. There is no factor for three HCCs.

As we saw with the CMS-HCC prospective model above, because HCC137 (CKD Stage 4) is above HCC138 (CKD Stage 3) in the kidney hierarchy, Beneficiary C's score is credited with the HCC137 coefficient but not the HCC138 coefficient. Also, note that Beneficiary C receives an additional increment of 0.453 to her risk score, because of the higher costs of chronic kidney disease in the under-age-65 population. The resulting risk scores indicate that Beneficiary C's expenditures are predicted to be 80.4% of the population mean.

For Beneficiary D, there are no hierarchies that exclude any of this person's five HCCs, so the risk score includes the sum of all five HCC coefficients. In addition, because this person has five HCCs, the indicator for an HCC count of five is also added to the total. In sum, the risk score of 4.564 indicates that Beneficiary D's costs are expected to be about four and a half times as large as the population mean in the current year.

## ii.   Model Performance

The Innovation Center has conducted analyses to evaluate how well the CMMI-HCC concurrent model may perform in ACO REACH. Risk adjustment models are commonly evaluated with predictive ratios and R-squared values. Predictive ratios calculate the mean predicted expenditure divided by the mean actual expenditure for individuals in a selected subpopulation, such as people who share a particular demographic characteristic, health characteristic, or condition. This statistic allows us to see whether the model tends to over- or under-predict on average for these types of individuals and by how much. An ideal predictive ratio is 1.0, indicating that the model correctly predicts mean expenditures for the group.

Model performance can also be evaluated using an R-squared value ($R^2$), which expresses how much variation in individual health care spending is explained by the model. The higher the $R^2$, the better the model fits the data.

The CMMI-HCC concurrent model was developed for High Needs Population ACOs with two primary objectives in mind: (1) to predict expenditures for high-risk beneficiaries accurately, and (2) to better explain the high variation in risk scores among ACOs. Two performance measures illustrate that the CMMI-HCC model is well suited to these purposes.

For the first point, we calculated predictive ratios for subpopulations of the 2021 eligible beneficiary sample based on the decile of expenditures predicted by the model; this stratifies beneficiaries from those expected to incur the highest costs (tenth decile) from those expected to have the lowest (first decile). High-needs ACOs will be populated by high-risk beneficiaries from the upper portion of this distribution, so it is important that the CMMI-HCC model predict accurately for the tenth decile. With a value of 1.009, we see that this subpopulation of people with the highest health risks are over-predicted by the model by only 0.9%, on average. This is quite good and indicates a level of accuracy similar to the performance of the CMS-HCC prospective model.

To address the second point, the $R^2$ statistic obtained in a model calibration regression measures what portion of variation in individual expenditures is explained by the variables in the model. For the CMS-HCC prospective model, this value is 0.1245 for the non-dual aged beneficiary segment.[20] The comparable statistic for the CMMI-HCC concurrent model is 0.4911, which indicates that almost half of the variation in individual expenditures is explained by the model's risk markers. This is a feature of concurrent models, which inherently capture more expenditure variation because the explanatory variables are drawn from the same time period as the expenditures they are predicting. Relative to a prospective model design, a concurrent model is therefore well suited for smaller panels of beneficiaries with highly variable health statuses and costs. **Table 9** compares the $R^2$ statistic for these models.

**Table 9. R-Squared Statistic for the CMS-HCC Prospective and CMMI-HCC Concurrent Models**

|  | **CMS-HCC Prospective Model*** | **CMMI-HCC Concurrent Model** |
|---|---|---|
| $R^2$ statistic | 0.1245 | 0.4911 |

\* The CMS-HCC $R^2$ statistic is from the non-dual aged model segment, which includes a large majority of beneficiaries.

### iii.    New Enrollees Model Will Not Be Applied

As with the prospective model, each beneficiary's risk profile is based on Part A and Part B claims and demographic information. The concurrent model, however, does not require a full 12 months of enrollment or claims data; risk scores can be generated using as many eligible months of enrollment as are available. As a result, the New Enrollees Model based on demographic information is not used in tandem with the CMMI-HCC Concurrent model.

### iv.    Enrollees with End-Stage Renal Disease Risk Adjustment Model

Because of the unique expenditure profile associated with treating high-acuity patients with ESRD, the Innovation Center uses a separate risk adjustment model to calculate the financial Benchmarks for all aligned beneficiaries with ESRD, including beneficiaries aligned to High Needs Population ACOs. The model is the same one used for ESRD beneficiaries in MA, the CMS-HCC ESRD model Version 24 (V24), a prospective design recently updated and calibrated on 2018-2019 data for 2023 with separate sets of risk factors for new enrollees in dialysis, continuing enrollees in dialysis, and transplant recipient

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[20] This segment represents the vast majority of beneficiaries in MA.

beneficiaries. Information on the revised model can be found in the "Advance Notice of Methodological Changes for Calendar Year (CY) 2023 for Medicare Advantage (MA) Capitation Rates and Part C and Part D Payment Policies" and "Announcement of Calendar Year (CY) 2023 Medicare Advantage (MA) Capitation Rates and Part C and Part D Payment Policies". The List of Disease Hierarchies for the ESRD Model may be found in Table VI-7 in the 2023 Advance Notice.[21] Please refer to Tables VI-5–VI-10 in the same link for the relative factors by segment.

In MA, the new CMS-HCC ESRD risk adjustment model V24 uses nine separate sets of risk scores allowing for different predicted expenditures for each of the following subpopulations (segments):

- Continuing Enrollees in Dialysis (includes community and institutional enrollees)
- New Enrollees in Dialysis
- Kidney Transplant (Months 1–3)
- Functioning Graft for Community Aged Population, Non-Dual or Partial-Benefit Dual
- Functioning Graft for Community Non-Aged Population, Non-Dual or Partial-Benefit Dual
- Functioning Graft for Community Aged Population, Full-Benefit Dual
- Functioning Graft for Community Non-Aged Population, Full-Benefit Dual
- Functioning Graft for Institutionalized Population
- Functioning Graft New Enrollees

The ESRD prospective model risk scores are used for the following three populations with different ESRD statuses in the current (performance) year:

1. Dialysis: The ESRD dialysis component of the ESRD prospective model is used to measure risks for beneficiaries who are in dialysis status.
2. Transplant: Transplant factors measure risk for beneficiaries who have a kidney transplant. Factors are used in conjunction with the ESRD Dialysis State Rate Book to pay for the month in which a transplant occurred and the following 2 months.
3. Post-graft: The post-graft component of the ESRD prospective model measures risk for beneficiaries starting with the fourth month after a kidney transplant, for as long as they have a functioning graft (i.e., do not return to dialysis status).

If a beneficiary from a High Needs Population ACO transitions into ESRD during the PY, the aligned beneficiary initially receives a CMMI-HCC concurrent risk adjustment model risk score. After gaining ESRD eligibility, the same beneficiary receives the appropriate ESRD risk adjustment model risk score. For kidney transplant recipients, risk scores are calculated by the ESRD transplant model for 3 months; beginning in the fourth month the beneficiary transitions back to the CMMI-HCC concurrent model risk score.

## v. Normalization

For High Needs Population ACOs, risk scores calculated using the CMMI-HCC concurrent risk adjustment model and the ESRD model are normalized in each year. A normalization factor is applied to ACO risk scores to adjust for changes in risk score growth relative to the denominator year of the risk adjustment

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[21] Beginning in PY2023, the ACO REACH and KCC Models apply V24 of the CMS-HCC ESRD risk adjustment models. The new models are recalibrated with an updated clinical version (from V21 to V24) and updated data years, and the new models use separate segments for full dual and partial dual status. Please refer to the following link for model details: https://www.cms.gov/files/document/2023-advance-notice.pdf

model being used. The normalization factor for each year is the average risk score of the ACO REACH National Reference Population in that year; ACO risk scores are normalized by dividing by this factor.

For each PY, normalization factors will be determined separately for the CMMI-HCC concurrent risk adjustment model and for the CMS-HCC ESRD model. For the CMMI-HCC concurrent risk adjustment model, we will prospectively estimate the normalization factor (the average risk score of the ACO REACH National Reference Population in that year) and provide updates as appropriate based on available data. For the CMS-HCC ESRD model, the PY normalization factor (again, the average risk score of the ACO REACH National Reference Population in that year) will be calculated and incrementally updated throughout the payment year based on observed diagnosis data submitted for the ACO REACH National Reference Population. (This new approach is being substituted for the less informative projection approach used in PY2021 and PY2022.) For both risk adjustment models, dividing the risk scores by the average risk score maintains an average risk score of 1.0 in the payment year for beneficiaries in the ACO REACH National Reference Population. A final normalization adjustment factor is then applied during settlement, after the payment year has ended, and once the actual growth trend can be measured with a full year of data.

## vi.   Coding Intensity

Risk score growth constraints will be applied in PY2025 for the High Needs Population ACOs. An ACO-level 10% symmetric cap with a static reference population and a zero-sum model-wide CIF, constrained to no greater than 1% (1.010) for the 2025 performance year, will be applied as risk score growth constraints.

ACO-Specific Risk Score Growth Cap. In PY2025, a symmetric 10% cap is applied to ACO-specific risk score growth for all claims-aligned and continuously voluntarily aligned A&D beneficiaries in High Needs Population ACOs. (Newly voluntarily aligned A&D beneficiaries are excluded from the risk score growth cap.) A symmetric 3% cap is applied to ACO-specific risk score growth for all aligned ESRD beneficiaries in High Needs Population ACOs. The mean normalized A&D risk score for the ACO in the PY is constrained to be no more than 10% above or below the ACO's mean normalized risk score in the reference year. For ESRD beneficiaries, the mean normalized risk score is constrained to be no more than 3% above or below the mean normalized risk score in the reference year. For PY2025, the minimum Aged/Disabled reference population threshold and the minimum Aged/Disabled performance year population threshold for the application of the cap will be 750 Aged/Disabled beneficiaries[22], plus there must also be sufficient claims history in both the reference and performance years. For PY2025, the minimum ESRD reference population threshold and the minimum ESRD performance year population threshold for the application of the cap will be 50 ESRD beneficiaries, plus there must also be sufficient claims history in both the reference and performance years.

Model-Level Retrospective Coding Intensity Factor (CIF). A retrospective CIF is applied to High Needs Population ACOs annually during final settlement after the PY has ended. One model-wide CIF is calculated per PY to be applied to all High Needs ACOs, whereas the cap is an ACO-specific calculation.

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[22] In the performance year, the beneficiary count to determine cap application will include claims-aligned beneficiaries and continuously voluntarily aligned beneficiaries. In the reference year, the count will include beneficiaries who would have been claims aligned in 2022 based on the 2025 Participant Provider List.

The CIF is calculated as:

$$CIF = \frac{mean\ normalized\ capped\ risk\ score\ for\ all\ aligned\ beneficiaries\ in\ the\ PY}{mean\ normalized\ risk\ score\ for\ all\ aligned\ beneficiaries\ in\ the\ RY}$$

Where 'capped' means the risk score was subject to the application of the cap, even though the risk score may not have been constrained.

Each ACO that is subject to the CIF will have its capped risk score divided by this CIF value. For PY2025, the CIF will be constrained to be no greater than 1% (1.010). The CIF adjustment is tailored for application to risk scores based on the CMMI-HCC concurrent model (for Aged/Disabled beneficiaries) and the ESRD model (for ESRD beneficiaries) such that the change in normalized payment risk scores across all aligned beneficiaries in all High Needs ACOs, is zero between 2019 and the PY. Separate retrospective CIFs are calculated for Aged/Disabled and ESRD beneficiaries to align with the CMMI-HCC concurrent model and the ESRD prospective model, respectively. A reference population of beneficiaries meeting the eligible criteria for ACO REACH in 2019 is used (see **Table 10**).

**Table 10. Risk Score Reference Population for Establishing the Retrospective CIF**

| | Reference Population for Retrospective CIF | |
| --- | --- | --- |
| **Performance Year** | **Aged/Disabled** | **ESRD** |
| IP (2020) | NA | NA |
| PY2021 | 2019 | 2019 |
| PY2022 | 2019 | 2019 |
| PY2023 | 2019 | 2019 |
| PY2024 | 2019 | 2019 |
| PY2025 | 2019 | 2019 |
| PY2026 | 2019 | 2019 |

## VII.  Kidney Care Choices

The CKCC Options of the KCC Model leverage a risk adjustment methodology that shares similarities with the Standard and New Entrant ACOs in ACO REACH. Beneficiaries with late-stage CKD (stages 4 and 5) and beneficiaries with ESRD are aligned to KCEs.

The CMS-HCC prospective model is used to establish the Benchmark and risk adjust expenditures for KCEs' CKD stage 4 and CKD stage 5 beneficiaries. The same versions of the CMS-HCC prospective model (V24 and V28) that are being applied in MA for 2025 will be applied to KCEs in 2025. CMS evaluated several risk adjustment models to determine how to most accurately reimburse providers for the late-stage CKD population. These analyses indicated that the CMS-HCC prospective risk scores yield more accurate Benchmarks than alternatives, including the CMMI-HCC concurrent risk model, for the CKD4 and CKD5 populations. For beneficiaries with ESRD, CKCC will continue to use the same CMS-HCC ESRD

prospective model which is applied in MA. The relative factors for the ESRD Models begin with Table VI-1 in the 2023 Announcement.[23]

## i.    Parameters of the CMS-HCC Prospective Model

Beneficiary risk scores calculated with the CMS-HCC prospective model use diagnoses reported in the prior year to predict expenditures during the PY. Data to generate risk scores come from Part A and Part B claims.[24] For example, KCEs in PY2025 will be assigned scores based on their beneficiaries' claims history throughout 2024. Beneficiaries without a complete 12-month diagnostic profile from the prior year have a "new enrollee" risk score calculated, including only demographic factors, dual eligibility status, and originally disabled status (see **Table 10**).

For PY2025, the 2020 CMS-HCC prospective risk adjustment model (V24) and the revised 2024 CMS-HCC prospective risk adjustment model (V28) are both being used for CKD beneficiaries in KCEs; these are the same model versions being used in MA for Calendar Year (CY) 2025. The fully calibrated CMS-HCC prospective risk adjustment model V24 can be found in Tables VI-1, VI-2, and VI-3 on pages 74, 82, and 83, respectively, of the Announcement of Calendar Year 2020 Medicare Advantage Capitation Rates and Medicare Advantage and Part D Payment Policies and Final Call Letter (2020 Announcement).[25] This model may be updated over the course of the Model performance period through PY2026 (see "Calibration of the Model" section below). The fully calibrated CMS-HCC prospective risk adjustment model V28 can be found in Tables VIII-1, VIII-2, and VIII-4 on pages 183, 193, and 195, respectively, of the Announcement of Calendar Year (CY) 2024 Medicare Advantage (MA) Capitation Rates and Part C and Part D Payment Policies (2024 Announcement).[26] This model may be updated over the course of the Model performance period through PY2026 (see "Calibration of the Model" section below).

The revised V28 model includes important technical updates, including restructured condition categories using the International Classification of Diseases (ICD)-10 classification system (instead of the ICD-9 classification system) and updated underlying FFS data years (from 2014 diagnoses and 2015 expenditures to 2018 diagnoses and 2019 expenditures), as well as revisions focused on conditions that are subject to more coding variation. The 2024 Announcement contains detailed descriptions of these updates.

The KCC PY2025 CKD risk scores will be calculated as a blend of 33% of the risk scores calculated with the 2020 (V24) model and 67% of the risk scores calculated with the updated 2024 (V28) model as follows:

$$blended\ risk\ score = (0.33 \times V24\ risk\ score) + (0.67 \times V28\ risk\ score)$$

In PY2025, the normalization factor will be applied to the blended risk scores after the 2020 (V24) and the 2024 (V28) blending calculation has been conducted. In addition, the baseline benchmark

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[23] Please refer to the following link for model details: https://www.cms.gov/files/document/2023-advance-notice.pdf

[24] The MA data filtering logic is applied for the calculations of risk scores.

[25] Please refer to the following link for model details: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2020.pdf.

[26] Please refer to the following link for model details: https://www.cms.gov/files/document/2024-announcement-pdf.pdf.

expenditure years used to calculate the blended benchmarks will also be standardized using normalized blended risk scores.

21st Century Cures Act (2016). The 21st Century Cures Act (2016) directed specific modifications for the CMS-HCC prospective model beginning in 2019. These modifications will affect risk adjustment for KCEs, and they include the following:

- "Taking into account total number of diseases or conditions." This has been achieved by including the payment HCC count indicator variables in the model specifications. To avoid incentives not to code HCCs, any count variables that would have a negative coefficient are removed from the model.
- "Evaluation of mental health and substance use disorders." The CMS-HCC substance use disorder HCCs were reconfigured and augmented in the CMS-HCC prospective model (V24) that was one of the models implemented in 2021, and two dementia-related HCCs were added. These will also be included in the CMMI-HCC concurrent risk adjustment model.

Calibration of the Models. The 2020 CMS-HCC prospective risk adjustment model (V24) is calibrated using 2014–2015 Medicare FFS claims data, while the 2024 CMS-HCC prospective risk adjustment model (V28) is calibrated using 2018-2019 Medicare FFS claims data. Calibration of the model is required to develop the risk scores. The List of Disease Categories for the 2020 Prospective Risk Adjustment Model can be found in Table VI-1 of the 2020 Announcement.[27] The List of Disease Categories for the 2024 Prospective Risk Adjustment Model can be found in Table VIII-1 of the 2024 Announcement.[28]

CMS-HCC Prospective Risk Adjustment Model Coefficients. The CMS-HCC prospective risk adjustment model is used to calculate risk scores for beneficiaries aligned to KCEs. These are the same CMS-HCC models used to determine payments for MA plans.[29] The V24 model includes 86 HCCs along with a set of 24 age-sex indicator variables. There is also a set of payment HCC count variables to better capture the higher costs of beneficiaries with multiple HCCs. The revised V28 CMS-HCC model includes 115 HCCs along with the age-sex and HCC count variables. The full model specification includes the following:

- 24 age-gender indicator variables: female/male interacted with ages 0–34, 35–44, 45–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85–89, 90–94, and 95 or older;
- 86 CMS-HCCs for V24; 115 HCCs for V28 (see below);
- A current-year dual-enrollment (Medicare and Medicaid) status indicator (included for the institutional model segment only);
- an originally disabled indicator, flagging beneficiaries who were entitled by disability when they joined Medicare but are currently entitled by age;
- multiplicative interactions of selected HCCs with demographic variables, allowing the incremental effect of the HCC to differ by the presence of the demographic variable;
- multiplicative interactions of selected HCCs or "disease" interactions, allowing the incremental effect of the HCC to differ by the presence of another HCC; and

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[27] Please refer to the following link for model details: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2020.pdf. Note, this model is referred to as the Alternative Payment Condition Count Model in the 2020 Announcement.

[28] For the v28 model, please refer to the following link: https://www.cms.gov/files/document/2024-announcement-pdf.pdf.

[29] For more detailed information on the CMS-HCC model see the 2021 Advance Notices and Announcement https://www.cms.gov/files/document/2021-announcement.pdf.

- a set of number of payment HCC (count) indicator variables to allow higher predicted expenditures for beneficiaries with larger numbers of HCCs.

CMS-HCC Prospective Risk Adjustment Model Segments. The CMS-HCC (non-ESRD) model includes eight distinct segments. A model segment is defined as a separate calibration (set of coefficient weights for each risk marker in the model) for a given subpopulation, such as community-residing versus long-term institutional beneficiaries, or those eligible for Medicare because of age versus disability status. A comparison of model segments in the CMS-HCC non-ESRD and CMS-HCC ESRD models is shown in **Table 11**. The model segments are unchanged between V24 and V28.

**Table 11. Model Segments (Subpopulations) for the CMS-HCC Risk Adjustment Model**

| CMS-HCC Non-ESRD | CMS-HCC ESRD |
|---|---|
| • Community Non-Dual Aged<br>• Community Non-Dual Non-Aged<br>• Community Full Benefit Dual Aged<br>• Community Full Benefit Dual Non-Aged<br>• Community Partial Benefit Dual Aged<br>• Community Partial Dual Non-Aged<br>• Institutional<br>• New Enrollees | • Continuing Enrollee Dialysis<br>• New Enrollee Dialysis<br>• Kidney Transplant [Months 1–3]<br>• Functioning Graft Community, non-dual or partial-benefit dual, aged<br>• Functioning Graft Community, non-dual or partial-benefit dual, non-aged<br>• Functioning Graft Community, full-benefit dual, aged<br>• Functioning Graft Community, full-benefit dual, non-aged<br>• Functioning Graft Institutional<br>• Functioning Graft New Enrollee |

CMS-HCC Prospective Risk Adjustment Example Risk Score. The following examples illustrate how a raw risk score is calculated using the V24 and V28 models, and more specifically how the additive and hierarchical design of HCC models are applied in the calculation. Consider two beneficiaries with the following base-year diagnoses:

- Beneficiary A: 67-year-old female, three HCCs: Inflammatory Bowel Disease/Crohn's (HCC35 in V24; HCC80 in V28), CKD, Severe, Stage 4 (HCC137 in V24; HCC327 in V28), and CKD, Moderate, Stage 3 (HCC138 in V24; HCC329 in V28).
- Beneficiary B: 88-year-old male, community-residing non-dual, five HCCs: Diabetes with Chronic Complications (HCC18 in V24; HCC37 in V28), End-Stage Liver Disease (HCC27 in V24; HCC63 in V28), Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC40 in V24; HCC93 in V28), Dementia without Complication (HCC52 in V24; HCC126 in V28), and Angina Pectoris (HCC88 in V24; HCC229 in V28).

The risk score calculations for these two beneficiaries using the V24 and V28 models are presented in **Table 12**.

**Table 12. CMS-HCC Prospective Risk Score Calculations**

| Beneficiary A | | Beneficiary B | |
|---|---|---|---|
| **Characteristic** | **V24 Relative Factor** | **Characteristic** | **V24 Relative Factor** |
| 65- to 69-year-old female | 0.323 | 85- to 89-year-old male | 0.686 |
| HCC35 | 0.308 | HCC18 | 0.302 |
| HCC137 | 0.289 | HCC27 | 0.882 |
| HCC138 | 0.000 | HCC40 | 0.421 |
| | | HCC52 | 0.346 |
| | | HCC88 | 0.135 |
| | | HCC count=5 | 0.042 |
| **TOTAL = risk score** | **0.920** | **TOTAL = risk score** | **2.814** |
| | | | |
| **Characteristic** | **V28 Relative Factor** | **Characteristic** | **V28 Relative Factor** |
| 65- to 69-year-old female | 0.330 | 85- to 89-year-old male | 0.664 |
| HCC80 | 0.550 | HCC37 | 0.166 |
| HCC327 | 0.514 | HCC63 | 0.962 |
| HCC329 | 0.000 | HCC93 | 0.617 |
| | | HCC126 | 0.341 |
| | | HCC229 | 0.240 |
| | | HCC count=5 | 0.050 |
| **TOTAL = risk score** | **1.394** | **TOTAL = risk score** | **3.040** |
| | | | |
| ***Blended V24 & V28 risk score*** | ***1.238*** | ***Blended V24 & V28 risk score*** | ***2.965*** |

For presentation purposes, the relative factors and risk scores are rounded to 3 decimal places.
Beneficiary A does not receive an HCC count factor because the count factors indicate counts of 5, 6, 7, …, to 15 or more HCCs. There is no factor for three HCCs.

The raw risk scores are obtained by adding up the relative factors of the individual risk markers. Note that Beneficiary A's risk score does not include any weight for HCC 138 Chronic Kidney Disease Stage 3, because HCC 137 Chronic Kidney Disease Stage 4 excludes HCC 138 according to the CMS-HCC model's clinical hierarchies. Beneficiary A is predicted to cost slightly less than average using V24 (risk score = 0.920 compared to the population average of 1.000), but more than average (risk score = 1.394) using V28. Beneficiary B's risk score consists of the sum of all five HCC relative factors, plus an additional increment tied to having an HCC count equal to five. In total, Beneficiary B is predicted to cost nearly three times as much as the population average (V24 risk score = 2.814; V28 risk score = 3.040).

The blended raw risk score is obtained for each individual beneficiary by adding 33% of the V24 risk score and 67% of the V28 risk score. The blended raw risk score has not been normalized.

## ii.    New Enrollee Model

Beneficiaries may become eligible for Medicare at any point during a calendar year. Because of this flexibility, certain beneficiaries who are aligned to KCEs may lack a complete 12-month diagnostic profile from the prior calendar year. To address this limited lookback period, these beneficiaries have a risk score calculated using the New Enrollee Risk Adjustment Model that only accounts for the beneficiary's demographic factors. Once a beneficiary attains a 12-month lookback period for Part A and Part B claims data, the beneficiary's assigned scores are updated using the appropriate risk adjustment model -- the CMS-HCC prospective risk adjustment model for CKD 4 or 5 beneficiaries and the CMS ESRD prospective risk adjustment model for ESRD beneficiaries. For example, beneficiaries aligned to KCEs in PY2025 who initially lack a 12-month lookback period will have New Enrollee risk scores until the beneficiary attains a full calendar year of claims history to transition into the CMS-HCC prospective risk adjustment model.

## iii.    Enrollees with CMS-HCC ESRD Prospective Model

Because of the unique expenditure profile associated with treating high-acuity patients with ESRD, the Innovation Center continues to use a separate risk adjustment model to calculate the financial Benchmarks for all aligned beneficiaries with ESRD in KCEs. If an aligned beneficiary in a KCE transitions from CKD 4 or 5 into ESRD during the course of the PY, the aligned beneficiary's KCE initially receives CMS-HCC Prospective model risk scores, and then the beneficiary receives the appropriate CMS-HCC ESRD prospective model risk scores corresponding to the months for which the beneficiary was ESRD. The CMS-HCC ESRD prospective model calculates prospective risk scores using prior-year diagnoses to predict expenditures during the PY.

The prospective model is the same CMS-HCC ESRD prospective model which is applied in MA and which uses nine separate calibrations to assign risk scores to six model segments (subpopulations). It was recently updated for 2023 and was calibrated on 2018-2019 data, and is referred to as V24.[30] Separate segments allow for different predicted expenditures for each of the following subpopulations, and they are structured as follows:

- Continuing Enrollees Dialysis (includes community and institutional enrollees)
- New Enrollees Dialysis (also referred to as the Demographic Risk Score)
- Kidney Transplant (Months 1–3)
- Functioning Graft for Community Aged Population, Non-Dual or Partial-Benefit Dual
- Functioning Graft for Community Non-Aged Population, Non-Dual or Partial-Benefit Dual
- Functioning Graft for Community Aged Population, Full-Benefit Dual
- Functioning Graft for Community Non-Aged Population, Full-Benefit Dual
- Functioning Graft for Institutionalized Population
- Functioning Graft for New Enrollees

These components of the CMS-HCC ESRD prospective model are used to pay for populations with different ESRD statuses in the current (performance) year:

1. Dialysis: The ESRD dialysis component of the CMS-HCC ESRD prospective model is used to measure risks for beneficiaries who are in dialysis status.

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[30] V24 is the most recent calibration of the ESRD model. ESRD beneficiaries receive V24 risk scores only; there is no V28 ESRD model or blending of risk scores for ESRD beneficiaries.

2. Transplant: Transplant factors measure risk for beneficiaries who have a kidney transplant. Factors are used in conjunction with the ESRD Dialysis State Rate Book to pay for the month in which a transplant occurred and the following 2 months.
3. Post-graft: The post-graft component of the CMS-HCC ESRD prospective model measures risk for beneficiaries starting with the fourth month after a kidney transplant, for as long as they have a functioning graft (i.e., do not return to dialysis status).

To be aligned in the KCC Model, however, a beneficiary must also not be *ineligible due to transplant.*[31] If an aligned CKD or ESRD beneficiary transitions to Transplant, those beneficiary months do not enter the CKCC Benchmark computations (i.e., they are removed from the base year and performance year). This means that expenditures associated with the beneficiary following the transplantation are no longer counted toward the KCE's financial calculation, and no separate Benchmark is calculated for this beneficiary. In the case where the transplant fails, the beneficiary is de-aligned. The beneficiary can be realigned as a CKD or ESRD beneficiary either to the original KCE or to a different KCE in the following PY.

## iv. Normalization

For KCEs, risk scores calculated using the CMS-HCC prospective model, the ESRD model, and the New Enrollee model are normalized each year. A normalization factor is applied to KCE risk scores to adjust for changes in risk score growth relative to the denominator year of the risk adjustment model being used. The normalization factor for each year is the average risk score of the ACO REACH National Reference Population[32] in that year; KCE risk scores are normalized by dividing by this factor.

For each PY, normalization factors will be determined separately for the CMS-HCC prospective risk adjustment model and the CMS-HCC ESRD model. The PY normalization factor (the average risk score of the ACO REACH National Reference Population in that year) will be calculated and incrementally updated throughout the payment year based on observed diagnosis data submitted for the ACO REACH National Reference Population. Dividing the KCE risk scores by the average risk score maintains an average risk score of 1.0 in the payment year for beneficiaries in the ACO REACH National Reference Population. A final normalization adjustment factor is then applied during settlement, after the payment year has ended, and once the actual growth trend can be measured with a full year of observed data. Normalization of base-year (2017, 2018, and 2019) and ACO REACH Rate Book reference year (2021, 2022, and 2023) risk scores is based on actual observed risk scores of the ACO REACH reference population. In PY2025, the observed risk scores will be based on the blended risk score model.

## v. Coding Intensity

For KCEs, a KCE-level symmetric cap on risk score growth is applied. The risk scores are normalized first, and then the cap will be applied.

KCE-Level Risk Score Growth Symmetric Cap. A symmetric cap is applied to KCE-specific risk score growth. Risk score growth is determined and the cap applied for each PY relative to an annual rolling risk score reference year (see **Table 13**). For each reference year, average normalized risk scores will be calculated for each KCE using the same risk adjustment models as used for the corresponding PY. The

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[31] Beneficiaries are made ineligible due to transplant on the month of transplant and the following 12 months. To be aligned, the beneficiary must not be ineligible due to transplant at the time alignment is run.
[32] The ACO REACH Reference Population is used to normalize risk scores rather than a reference population created using the more restrictive KCC alignment criteria.

cap is applied separately for the CKD Stages 4 or 5 (Aged/Disabled) and ESRD populations, with each population having a different Risk Score Growth Cap. For the ESRD population, the average normalized risk score for the KCE in the PY is compared to the average normalized risk score for the KCE during the PY's corresponding reference year and constrained to 3% above or below the average risk score of the KCE during the reference year. For the CKD Stages 4 or 5 population, the average normalized risk score for the KCE in the PY is compared to the average normalized risk score for the KCE during the PY's corresponding reference year and constrained to 6% above or below the average risk score of the KCE during the reference year.

**Table 13. Reference Year for Applying the Symmetric Cap**

| Performance Year | Reference Year | Claims from Calendar Year (prospective model) |
|---|---|---|
| IP–2021 | NA | NA |
| PY2022 | 2020 | 2019 |
| PY2023 | 2020[a] | 2019 |
| PY2024 | 2022 | 2021 |
| PY2025 | 2023 | 2022 |
| PY2026 | 2024 | 2023 |

[a] Note that CY2020 was used as the reference year instead of CY2021 for PY2023 in order to avoid coding biases that may be introduced by COVID-19 in calendar year 2020 claims.

## VIII. Monitoring and Audits

The Innovation Center will conduct routine evaluation and monitoring, and audits based on medical record reviews, of the risk scores used in the financial and payment methodologies for Standard ACOs, New Entrant ACOs, High Needs Population ACOs, and KCEs. Increases in risk score growth and diagnosis data will be validated to ensure payment integrity.

Evaluation and Monitoring. Evaluation and monitoring could include comparing risk scores for beneficiaries in the Standard ACOs, New Entrant ACOs, High Needs Population ACOs, and KCEs with other beneficiaries in the FFS program. This comparison could be conducted for each model PY. Likewise, trend analyses in annual risk score increases throughout the performance period will be conducted. The Innovation Center could implement additional coding intensity measures if an unacceptable level of coding intensity is identified.

Medical Record Reviews. In addition, the Innovation Center expects to conduct audits based on medical record review to validate diagnoses submitted for risk adjusting payments. Diagnoses that are not supported by medical record documentation will be considered invalid for payment purposes, and the extent of improper payments would be further assessed.

## IX. Risk Score Reporting and Operations

Quarterly Benchmark Reports provide the ACOs and KCEs with their prospective Benchmark and quarterly updates of financial performance on a year-to-date basis for aligned beneficiaries that remain alignment-eligible at the end of that reporting period. Risk scores used in payment are also shared with ACOs throughout each PY, and starting from PY2024, as noted by CMS, will be provided throughout each

PY for KCEs. These risk scores are calculated at the beneficiary level and include initial, updated, and final risk scores. These risk scores are provided multiple times over the course of a year. A claims submission deadline for risk score calculations is defined by CMS. After this deadline, no additional diagnoses will be accepted for risk score calculations and after financial settlement all risk scores will be considered final.

# X.   Conclusion

ACO REACH and the CKCC Options of the KCC Model provide a unique set of challenges and an opportunity to test and implement risk adjustment for benchmarking and payment purposes in FFS. This includes the opportunity to test the newly designed CMMI-HCC concurrent risk adjustment model for organizations that serve high-needs populations and to determine whether it provides more accurate financial compensation. The Innovation Center appreciates the opportunity to partner with ACOs and KCEs and seeks to achieve payment accuracy through improved risk adjustment methods. Resources on risk adjustment policy and operations will be routinely made available to participants to further clarify the risk adjustment methodology and facilitate technical aspects of the payment process by, for example, interpreting participant reports, calculating risk scores, and explaining risk adjusted Benchmarks. The risk adjustment methodology should be considered in the context of the larger benchmarking and capitation policy. Participants are encouraged to review the ACO REACH and CKCC websites, particularly the finance, benchmarking, and risk adjustment materials, as well as MA documents addressing risk adjustment models and policy.[33,34]

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[33] For more information on ACO REACH, please refer to the following link:
https://www.cms.gov/priorities/innovation/innovation-models/aco-reach.
[34] For more information on the CKCC Options, please refer to the following link:
https://innovation.cms.gov/innovation-models/kidney-care-choices-kcc-model.

# Appendix A: CMMI-HCC Coefficients

**Table A-1. List of Disease Categories for Concurrent Risk Adjustment Model**

| Hierarchical Condition Category | If the disease group is listed in this column… | … Then drop the HCC(s) listed in this column |
|---|---|---|
| | Hierarchical Condition Category 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 |

| Hierarchical Condition Category | If the disease group is listed in this column… | … Then drop the HCC(s) listed in this column |
|---|---|---|
| 114 | Aspiration and Specified Bacterial Pneumonias | 115 |
| 136 | Chronic Kidney Disease, Stage 5 (mod hierarchy) | 137, 138 |
| 137 | Chronic Kidney Disease, Severe (Stage 4) (mod hierarchy) | 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 |

# Appendix B: Concurrent Risk Adjustment Relative Factors

**Table B-1. CMMI-HCC Concurrent Risk Adjustment Model Relative Factors**

| Variable | | Relative Factors |
|---|---|---|
| **Age/Sex Cells** | | |
| F0_34 | Age range 0–34, Female | 0.1559 |
| F35_44 | Age range 35–44, Female | 0.1559 |
| F45_54 | Age range 45–54, Female | 0.1559 |
| F55_59 | Age range 55–59, Female | 0.1559 |
| F60_64 | Age range 60–64, Female | 0.1559 |
| F65_69 | Age range 65–69, Female | 0.1949 |
| F70_74 | Age range 70–74, Female | 0.1949 |
| F75_79 | Age range 75–79, Female | 0.1949 |
| F80_84 | Age range 80–84, Female | 0.1949 |
| F85_89 | Age range 85–89, Female | 0.1949 |
| F90_94 | Age range 90–94, Female | 0.2512 |
| F95_GT | Age range 95+, Female | 0.3532 |
| M0_34 | Age range 0–34, Male | 0.0559 |
| M35_44 | Age range 35–44, Male | 0.0559 |
| M45_54 | Age range 45–54, Male | 0.0559 |
| M55_59 | Age range 55–59, Male | 0.0559 |
| M60_64 | Age range 60–64, Male | 0.0559 |
| M65_69 | Age range 65–69, Male | 0.1340 |
| M70_74 | Age range 70–74, Male | 0.1340 |
| M75_79 | Age range 75–79, Male | 0.1340 |
| M80_84 | Age range 80–84, Male | 0.1340 |
| M85_89 | Age range 85–89, Male | 0.1340 |
| M90_94 | Age range 90–94, Male | 0.1340 |
| M95_GT | Age range 95+, Male | 0.2279 |
| **HCCs** | | |
| 1 | HIV/AIDS | 0.2847 |
| 2 | Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock | 1.1030 |
| 6 | Opportunistic Infections | 0.9210 |
| 8 | Metastatic Cancer and Acute Leukemia | 2.7247 |
| 9 | Lung and Other Severe Cancers | 0.8743 |
| 10 | Lymphoma and Other Cancers | 0.6678 |
| 11 | Colorectal, Bladder, and Other Cancers | 0.2083 |
| 12 | Breast, Prostate, and Other Cancers and Tumors | 0.2083 |
| 17 | Diabetes with Acute Complications | 0.4229 |
| 18 | Diabetes with Chronic Complications | 0.0555 |

| | Variable | Relative Factors |
|---|---|---|
| 19 | Diabetes without Complication | 0.0555 |
| 21 | Protein-Calorie Malnutrition | 1.5099 |
| 22 | Morbid Obesity | 0.1876 |
| 23 | Other Significant Endocrine and Metabolic Disorders | 0.1428 |
| 27 | End-Stage Liver Disease | 0.5031 |
| 28 | Cirrhosis of Liver | 0.0660 |
| 29 | Chronic Hepatitis | 0.0660 |
| 33 | Intestinal Obstruction/Perforation | 1.0700 |
| 34 | Chronic Pancreatitis | 0.2739 |
| 35 | Inflammatory Bowel Disease | 0.2258 |
| 39 | Bone/Joint/Muscle Infections/Necrosis | 0.9684 |
| 40 | Rheumatoid Arthritis and Inflammatory Connective Tissue Disease | 0.2462 |
| 46 | Severe Hematological Disorders | 0.9257 |
| 47 | Disorders of Immunity | 0.9672 |
| 48 | Coagulation Defects and Other Specified Hematological Disorders | 0.3814 |
| 51 | Dementia With Complications | 0.3057 |
| 52 | Dementia Without Complication | 0.3057 |
| 54 | Substance Use with Psychotic Complications | 0.7220 |
| 55 | Substance Use Disorder, Moderate/Severe, or Substance Use with Complications | 0.2926 |
| 56 | Substance Use Disorder, Mild, Except Alcohol and Cannabis | 0.2926 |
| 57 | Schizophrenia | 0.5725 |
| 58 | Reactive and Unspecified Psychosis | 0.5725 |
| 59 | Major Depressive, Bipolar, and Paranoid Disorders | 0.1677 |
| 60 | Personality Disorders | 0.1677 |
| 70 | Quadriplegia | 0.7435 |
| 71 | Paraplegia | 0.7435 |
| 72 | Spinal Cord Disorders/Injuries | 0.7435 |
| 73 | Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease | 0.8043 |
| 74 | Cerebral Palsy | 0.0000 |
| 75 | Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy | 0.5403 |
| 76 | Muscular Dystrophy | 0.1906 |
| 77 | Multiple Sclerosis | 0.5095 |
| 78 | Parkinson's and Huntington's Diseases | 0.2778 |
| 79 | Seizure Disorders and Convulsions | 0.1260 |
| 80 | Coma, Brain Compression/Anoxic Damage | 1.5190 |

| | Variable | Relative Factors |
|---|---|---|
| 82 | Respirator Dependence/Tracheostomy Status | 4.4570 |
| 83 | Respiratory Arrest | 1.6367 |
| 84 | Cardio-Respiratory Failure and Shock | 0.9949 |
| 85 | Congestive Heart Failure | 0.3126 |
| 86 | Acute Myocardial Infarction | 0.9650 |
| 87 | Unstable Angina and Other Acute Ischemic Heart Disease | 0.6713 |
| 88 | Angina Pectoris | 0.1678 |
| 96 | Specified Heart Arrhythmias | 0.2539 |
| 99 | Intracranial Hemorrhage | 1.0540 |
| 100 | Ischemic or Unspecified Stroke | 0.2868 |
| 103 | Hemiplegia/Hemiparesis | 0.7026 |
| 104 | Monoplegia, Other Paralytic Syndromes | 0.4081 |
| 106 | Atherosclerosis of the Extremities with Ulceration or Gangrene | 1.5502 |
| 107 | Vascular Disease with Complications | 0.5992 |
| 108 | Vascular Disease | 0.1732 |
| 110 | Cystic Fibrosis | 0.5460 |
| 111 | Chronic Obstructive Pulmonary Disease | 0.0762 |
| 112 | Fibrosis of Lung and Other Chronic Lung Disorders | 0.0762 |
| 114 | Aspiration and Specified Bacterial Pneumonias | 1.0537 |
| 115 | Pneumococcal Pneumonia, Empyema, Lung Abscess | 0.1374 |
| 122 | Proliferative Diabetic Retinopathy and Vitreous Hemorrhage | 0.0356 |
| 124 | Exudative Macular Degeneration | 0.3653 |
| 135 | Acute Renal Failure | 0.8558 |
| 136 | Chronic Kidney Disease, Stage 5 | 0.1387 |
| 137 | Chronic Kidney Disease, Severe (Stage 4) | 0.1387 |
| 138 | Chronic Kidney Disease, Moderate (Stage 3) | 0.0000 |
| 157 | Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone | 1.8170 |
| 158 | Pressure Ulcer of Skin with Full Thickness Skin Loss | 1.1260 |
| 159 | Pressure Ulcer of Skin with Partial Thickness Skin Loss | 0.6845 |
| 161 | Chronic Ulcer of Skin, Except Pressure | 0.1049 |
| 162 | Severe Skin Burn or Condition | 1.7078 |
| 166 | Severe Head Injury | 1.5190 |
| 167 | Major Head Injury | 0.3867 |
| 169 | Vertebral Fractures without Spinal Cord Injury | 0.5770 |
| 170 | Hip Fracture/Dislocation | 1.8075 |
| 173 | Traumatic Amputations and Complications | 1.0607 |
| 176 | Complications of Specified Implanted Device or Graft | 1.3937 |
| 186 | Major Organ Transplant or Replacement Status | 1.5373 |

| Variable | | Relative Factors |
|---|---|---|
| 188 | Artificial Openings for Feeding or Elimination | 0.7851 |
| 189 | Amputation Status, Lower Limb/Amputation Complications | 0.1076 |
| **Post-Kidney Transplant Indicators** | | |
| | Age <65 and 4–9 months post-graft | 1.9729 |
| | Age <65 and 10+ months post-graft | 0.1835 |
| | Age >= 65 and 4–9 months post-graft | 2.3938 |
| | Age >= 65 and months post-graft | 0.2678 |
| **Count of HCCs in the Model** | | |
| | # of payment HCCs =5 | 0.0433 |
| | # of payment HCCs =6 | 0.1425 |
| | # of payment HCCs =7 | 0.2854 |
| | # of payment HCCs =8 | 0.4763 |
| | # of payment HCCs =9 | 0.7227 |
| | # of payment HCCs =10 | 1.0152 |
| | # of payment HCCs =11 | 1.4179 |
| | # of payment HCCs =12 | 1.9065 |
| | # of payment HCCs =13 | 2.4376 |
| | # of payment HCCs =14 | 3.0497 |
| | # of payment HCCs >=15 | 5.2582 |
| **HCC Interactions with Age < 65** | | |
| 46 | Severe Hematological Disorders | 2.5608 |
| 110 | Cystic Fibrosis | 1.2052 |
| 136 | Chronic Kidney Disease, Stage 5 (mod hierarchy) | 0.4535 |
| 137 | Chronic Kidney Disease, Severe (Stage 4) (mod hierarchy) | 0.4535 |

**NOTES:**

**Relative Factors:** Relative factors are calculated by dividing each coefficient estimate by average spending in our 2018 Medicare FFS concurrent modeling sample, $10,717.60. For presentation purposes, we round the relative factors to 4 decimal places. For the ACO REACH/KCC models, raw risk scores will be normalized each year for the ACO REACH reference population.

**Concurrent Sample Criteria:**

1. At least 1 month of eligibility in concurrent year.
2. Only months with Part A&B enrollment, non-HMO, non-ESRD (dialysis and transplant) non-MSP are included as eligible.
3. Ineligible months are excluded from diagnoses and expenditure data, but beneficiaries with ineligible months are retained with eligible months only.
4. Include post-graft status months as eligible (codes G, R, or Y).
5. U.S. residents only.

6. Sample includes aged and disabled, non-dual-eligible and dual-eligible, community-residing and institutional beneficiaries.

**Age Definition:** Age is defined as of February 1, 2018.

**CMS-HCCs:** CMS-HCCs = CMS-Hierarchical Condition Categories. CMS-HCCs are based on ICD-10-CM diagnosis codes from valid sources (including hospital inpatient and physician office). There are 86 V24 CMS-HCCs, among which 85 CMS-HCCs are used in this risk adjustment model. (HCC134 Dialysis Status is excluded.) However, given the CMS-HCC groups, the effective number of CMS-HCCs is 82.

**Modified Hierarchies:** This CMMI-HCC model modifies the kidney hierarchy (HCCs 135–138) in the following ways:

1. HCC 134 Dialysis Status, which is normally included in V24 CMS-HCCs, is excluded from this model.
2. HCC 135 Acute Renal Failure, which is normally above HCCs 136–138 in the hierarchy and excludes those diagnoses, is separated from the rest of the hierarchy in this model. It is possible for an individual to have diagnoses for Acute Renal Failure and one of the Chronic Kidney Disease HCCs.
3. Also, as a policy decision, the model does not enforce the hierarchy constraint requiring the HCC 80 coefficient to be less than or equal to the HCC 27 coefficient. HCC 27 does still exclude an HCC 80 diagnosis, however.

**HCC Groups:** An HCC group is a set of HCCs that are effectively treated as a single HCC. For example, HCC group G1 is defined by HCCs 18 and 19. An HCC group variable is created that equals 1 if the person has HCC 18 or 19 and equals 0 otherwise. In the risk adjustment model regression, only the HCC group variable is included; variables for individual HCCs 18 and 19 are not included. However, in this table, we present the individual HCCs 18 and 19, each with the coefficient for the HCC group variable from the risk adjustment model regression. Whether an enrollee has only one HCC in an HCC group or has multiple HCCs in an HCC group, the enrollee's incremental predicted expenditures for the HCC group are the same.

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# Appendix C: Example Application of Normalization, the Symmetric 3% Cap with Demographic Adjustment, and the CIF for Standard and New Entrant ACOs Using the CMS-HCC Prospective Risk Adjustment Model

The application of the symmetric 3% cap and the CIF follows multiple steps and requires multiple component elements which are defined in more detail below. An example calculation then presents the steps to derive an ACO's final normalized and coding-adjusted risk score from an unadjusted "raw" risk score. In this context, a "raw" risk score refers to the risk score obtained by summing the applicable relative factors estimated with the CMS-HCC prospective risk adjustment model (or for High Needs Population ACOs, the CMMI-HCC concurrent risk adjustment model[35]) or the ESRD model. In other words, the raw risk score does not include any further adjustment, such as the application of normalization, the symmetric 3% cap, or the CIF.

**ACO REACH National Reference Population:** The ACO REACH National Reference Population is defined in each calendar year by identifying all beneficiary months that meet all of the eligibility criteria for ACO REACH. The ACO REACH National Reference Population includes both aligned beneficiaries and alignment-eligible beneficiaries who are not actually aligned to an ACO in either a reference year (RY) or performance year (PY). The ACO REACH National Reference Population is divided into two sub-populations, which are characterized by beneficiary months accruing to either the Aged & Disabled (A&D) benchmark or the ESRD benchmark.

**Performance Year (PY) versus the Reference Year (RY):** The PY is the current performance year of ACO REACH (in the example provided, it is PY2025), while the RY is a comparison point for calculating the change in ACO mean normalized risk scores and is used to determine the symmetric 3% cap and CIF adjustments. For the same PY, the RY used for the purpose of calculating the symmetric 3% cap may differ from the RY used to calculate the CIF. See **Tables 6 and 7** in Section V for a summary of the RYs used in ACO REACH for the symmetric 3% cap and CIF, respectively.

**Reference Year (RY) Populations:** Beneficiaries aligned during the RY may be, but are not necessarily, present in the ACO's PY aligned population. The reference population for the symmetric 3% cap is the population of beneficiaries that would have been claims-aligned to the ACO in the symmetric 3% cap RY. The reference population for the CIF is the ACO REACH National Reference Population in the CIF RY.

**Normalization Factor:** This is the average beneficiary-month weighted risk score for the ACO REACH National Reference Population, which includes all beneficiary-months that meet the ACO REACH alignment eligibility criteria during each month in a calendar year. Normalization factors are calculated separately for both A&D and ESRD beneficiary months in each reference year and for the performance year. (Separate normalization factors are also calculated for the CMS-HCC prospective risk adjustment model and the CMMI-HCC concurrent risk adjustment model.) Shown below are the CMS-HCC prospective risk adjustment model normalization factors for the A&D ACO REACH National Reference Population. ***The preliminary PY2025 factor has not yet been determined.***

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[35] A&D risk score growth for High Needs Population ACOs is subject to a separate 10% symmetric cap without any demographic adjustment. Calculations are analogous to those described in this section.

**Table C-1. Normalization Factors for the ACO REACH Eligible Aged & Disabled Population for the CMS-HCC Prospective Risk Adjustment Model (67% v28, 33% v24)**

| Year | Normalization Factor[36] |
|------|--------------------------|
| 2017 | 1.037 |
| 2018 | 1.051 |
| 2019 | 1.065 |
| 2021 | 1.040 |
| 2022 | 1.070 |
| 2023 | 1.091 |
| 2024 | TBD |
| 2025 | TBD |

**ACO Mean Risk Score:** This is the mean risk score for ACO-aligned beneficiaries during a RY or PY. This can be calculated as the sum of risk scores weighted by beneficiary months divided by total beneficiary months for a given year and benchmark population (A&D or ESRD). Beneficiaries aligned in the RY and PY may overlap, but do not necessarily maintain alignment in both periods. Alignment for the RY and the PY is based on the same list of ACO REACH Participant Providers but may include a different set of aligned beneficiaries in each period.

**ACO Mean Normalized Risk Score:** A normalized risk score is calculated by dividing a raw risk score by the normalization factor for the applicable year, benchmark (A&D or ESRD), and risk adjustment model. Normalization may equivalently be applied either to individual beneficiary risk scores or to an ACO's mean risk score. An ACO's mean normalized risk score is thus the ACO's mean risk score divided by the normalization factor.

**ACO Mean Demographic Mean Risk Score:** This is the mean risk score for ACO-aligned beneficiaries using the demographic risk score model currently used by the Shared Savings Program. It is calculated as the sum of risk scores weighted by beneficiary months divided by total beneficiary months for a given year and benchmark population (A&D or ESRD). Beneficiaries aligned in the RY and PY are based on the PY list of ACO REACH Participant Providers, but do not necessarily maintain alignment in both years.

**ACO Risk Score Growth Rate**: This growth rate is calculated as the percentage change in the ACO's mean normalized risk score between a base period (reference year) and performance year.

The growth rate, $g$, is calculated as:

$$g = \left( \frac{\text{Mean Norm. Risk Score}_{PY}}{\text{Mean Norm. Risk Score}_{RY}} - 1 \right) \times 100$$

The reference year is set in each PY according to **Table C.2**.

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[36] Normalization factors may be updated with additional data.

**ACO Demographic Risk Score Growth Rate:** This growth rate is calculated as the percentage change in the ACO's mean demographic risk score between the base period (reference year) and the performance year.

The growth rate, *d*, is calculated as:

$$d = \left( \frac{\text{Mean Demographic Risk Score}_{PY}}{\text{Mean Demographic Risk Score}_{RY}} - 1 \right) \times 100$$

The reference year is set in each PY according to **Table C.2**.

**ACO Capped Mean Risk Score:** If the calculated risk score growth rate is less than -3% below the demographic risk score growth rate or greater than +3% above the demographic risk score growth rate, then the ACO mean normalized risk score for the 2025 performance year is replaced with the ACO mean normalized risk score for the base period multiplied by 1 plus the demographic risk score growth rate minus 3% or plus 3%, respectively. This is the ACO capped mean risk score. The symmetric 3% cap is applied separately for A&D and ESRD beneficiary months and risk scores.

This calculation is shown below, using a symmetric 3% cap:

| If: | Then ACO capped mean risk score equals: |
|---|---|
| $g > d + 3\%$ | $Mean\ normalized\ risk\ score_{RY} \times (100\% + d + 3\%)$ |
| $d - 3\% \le g \le d + 3\%$ | $Mean\ normalized\ risk\ score_{PY}$ |
| $g < d - 3\%$ | $Mean\ normalized\ risk\ score_{RY} \times (100\% + d - 3\%)$ |

**Table C-2. Reference Population for Applying the Symmetric 3% cap**

| Performance Year | Reference Year |
|---|---|
| IP–2020 | NA |
| PY2021 | 2019 |
| PY2022 | 2020 |
| PY2023 | 2021 |
| PY2024 | 2022 |
| PY2025 | 2022 |
| PY2026 | 2022 |

**ACO REACH Aligned (all ACOs) Population Mean Capped Risk Score:** This is the average ACO capped mean risk score across all ACOs in a performance year weighted by beneficiary-months aligned to each ACO. This is calculated separately for A&D and ESRD beneficiary months for the CMS-HCC prospective risk adjustment model (and separately for the CMMI-HCC concurrent risk adjustment model).

The ACO REACH aligned population mean capped risk score, $\bar{C}_{PY}$ is defined as:

$$\bar{C}_{PY} = \frac{\sum_{a=1}^{A} \text{ACO capped mean risk score}_{a,PY} \times w_{a,PY}}{\sum_{a=1}^{A} w_{a,PY}}$$

Where ACO capped mean risk score$_{a,PY}$ is the capped performance year risk score for ACO *a* and $w_{a,PY}$ is the total aligned beneficiary months for ACO *a* during the performance year, for either the A&D or ESRD benchmark.

**Coding Intensity Factor (CIF):** The CIF adjustment is applied so that the model-wide ACO aligned population mean normalized risk score, after risk score growth rate caps are applied, remains constant from the CIF RY to the PY. The CIF ensures that ACO REACH model-wide risk scores do not outpace the risk score growth observed in the ACO REACH national reference population. The CIF for each PY is calculated as the ACO REACH aligned population mean capped risk score in the PY divided by the ACO REACH aligned population mean normalized risk score in the CIF RY. All ACO capped mean risk scores are divided by the CIF to calculate the final coding adjusted risk score.

The CIF is then defined as:

$$\text{CIF}_{PY} = \frac{\bar{C}_{PY}}{\text{ACO REACH-Aligned Mean Norm. Risk Score}_{RY}}$$

**Hypothetical Example Normalization, Symmetric 3% Cap, and CIF Calculation:** The following is an example calculation that presents the steps to derive the final normalized and coding adjusted risk score from an unadjusted "raw" risk score at the end of PY2025 (See **Table C.3**). In this hypothetical example, the three Standard ACOs, A, B, and C, comprise all model participants, and calculated mean risk scores reflect each ACO's aligned A&D population in the RY (2022) and PY (2025). (Note: this simplified example uses 2022 as the RY for both the symmetric 3% cap and the CIF. In reality, the symmetric 3% cap and the CIF typically have different RYs.)

The following scenario is presented in the table below:

- ACO A's mean normalized risk score grows from 1.000 to 1.0187, an increase of 1.87%. Meanwhile, its demographic risk score grows from 1.000 to 1.010, an increase of 1.0%. Because the 1.87% normalized risk score growth rate is within the demographic-adjusted cap of -2.0% to +4.0%, ACO A's capped risk score remains 1.0187. This is then divided by the CIF of 1.0082, resulting in a final coding intensity adjusted mean risk score of 1.0104.
- ACO B exhibits a 6.44% change in mean normalized risk scores, from 0.9587 to 1.0204. Meanwhile, its demographic risk score grows from 1.000 to 1.020, an increase of 2%. Because the 6.44% normalized risk score growth is greater than the demographic-adjusted upper cap of 2.0% + 3.0% = 5.0%, ACO B's PY risk score is capped at 105.0% of the RY mean normalized risk score, 1.0066 (0.9587*105% = 1.0066).
- The CIF is applied to ACO B's capped risk score; the final coding adjusted risk score is 0.9984, which reflects a 4.15% increase in risk score over the RY.
- ACO C exhibits a 7.608% decline in mean normalized risk score from RY to PY. Meanwhile, its demographic risk score declines from 1.000 to 0.990, a decrease of 1%. Because the -7.608% growth is beyond the demographic-adjusted lower cap of -1.0% - 3.0% = -4.0%, ACO C's PY risk score is downwardly capped at 96.0% of the RY mean normalized risk score, 1.0081

(1.0501*96% = 1.0081). The restricted CIF is applied to the capped risk score, 1.0081, and ACO C's final coding adjusted risk score is 0.9999.

- ACO C's final coding adjusted risk score of 0.9999 is 4.78% lower than the RY risk score, 1.0501. Although the application of the CIF results in a risk score decline which is larger in absolute value than the 4.0% lower cap, the net result is still a limit to the allowed decline in mean risk score versus no coding adjustments.

- The net result of the application of the demographic-adjusted ±3% cap and the CIF is that individual ACO risk scores are allowed to vary within the ±3% range, yet the model-wide mean risk score (1.0029 in this example) remains unchanged from RY to PY. This means that, on average for ACO REACH Model-aligned beneficiaries, the change in observed risk score is constrained so that it does not outpace risk score growth in the ACO REACH National Reference Population.

**Table C-3. Hypothetical Example Calculation Adjusting Risk Scores for Normalization, the Symmetric 3% Cap, and the CIF (Data Shown is Not Real)**

| Row | Value | Formula | A | B | C | Total ACO Aligned* |
|---|---|---|---|---|---|---|
| (1) | RY ACO Mean Risk Score | | 1.1370 | 1.0900 | 1.1940 | 1.1403 |
| (2) | PY ACO Mean Risk Score | | 1.1980 | 1.2000 | 1.1410 | 1.1797 |
| (3) | RY Norm Factor[a] | | 1.1370 | 1.1370 | 1.1370 | 1.1370 |
| (4) | PY Norm Factor[a] | | 1.1760 | 1.1760 | 1.1760 | 1.1760 |
| (5) | RY ACO Mean Norm Risk Score | (1) / (3) | 1.0000 | 0.9587 | 1.0501 | 1.0029 |
| (6) | PY ACO Mean Norm Risk Score | (2) / (4) | 1.0187 | 1.0204 | 0.9702 | 1.0031 |
| (7) | ACO normalized risk growth rate | [(6) - (5)] / (5) | 1.871% | 6.441% | -7.608% | 0.019% |
| (8) | RY ACO Demographic Risk Score | | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| (9) | PY ACO Demographic Risk Score | | 1.0100 | 1.0200 | 0.9900 | 1.0067 |
| (10) | ACO demographic risk growth rate | [(9) - (8)] / (8) | 1.000% | 2.000% | -1.000% | 0.667% |
| (11) | ACO risk growth rate upper cap | (10) + 3% | 4.000% | 5.000% | 2.000% | n/a |
| (12) | ACO risk growth rate lower cap | (10) - 3% | -2.000% | -1.000% | -4.000% | n/a |
| (13) | Capped ACO mean Risk Score growth rate | | 1.871% | 5.000% | -4.000% | n/a |
| (14) | Capped ACO mean Risk Score | ( (13) + 1 ) * (5) | 1.0187 | 1.0066 | 1.0081 | 1.0111 |
| (15) | Coding Intensity Factor adjustment[a] | (14) / (5) for aligned pop | 1.0082 | 1.0082 | 1.0082 | 1.0082 |
| (15a) | Restricted CIF (maximum 1%)[a] | Min( (14), 1.01) | 1.0082 | 1.0082 | 1.0082 | 1.0082 |
| (16) | Final coding adjusted risk score | (14) / (15a) | 1.0104 | 0.9984 | 0.9999 | 1.0029 |

\* Values shown in the Total ACO Aligned column show the combined (mean) values across all ACOs. In this example, we assume that the three ACOs all have the same size beneficiary population. In general, the ACO-aligned population means are weighted by each ACO's number of aligned beneficiary-months.

[a] Numbers in this row do not vary across the columns.

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# Appendix D: Example Application of Normalization and the Symmetric Risk Score Growth Cap to Risk Scores for KCEs Using the CMS-HCC Prospective Risk Adjustment Model

The application of the ±3% and ±6% symmetric caps to risk score growth for the ESRD and CKD Stages 4 or 5 populations respectively follows multiple steps and requires multiple component elements, which are defined in more detail below. An example calculation then presents the steps to derive the final normalized and coding-adjusted risk score from an unadjusted "raw" risk score. In this context, a "raw" risk score refers to the beneficiary risk score obtained by summing the applicable relative factors estimated with the appropriate risk adjustment model. In other words, the raw risk score does not include any further adjustment, such as the application of normalization or the symmetric cap.

**Performance Year versus the Reference Year:** The performance year is the current performance year of the Kidney Care Choices Model (in the example provided, it is a hypothetical PY2024),[37] while the reference year is a comparison point for calculating the change in KCE mean normalized risk scores and is used to determine whether the KCE's risk score growth exceeds the symmetric cap. See **Table 11** in Section VII for a summary of the reference years used in KCC for the symmetric cap.

**Reference Year Populations:** Beneficiaries aligned during the reference year may be, but are not necessarily, present in the KCE's PY aligned population. The reference population for the symmetric cap is the population of beneficiaries that would have been claims-aligned to the KCE in the symmetric cap reference year.

**Normalization Factor:** This is the average beneficiary-month weighted risk score for the ACO REACH National Reference Population, which includes all beneficiary-months that meet the ACO REACH alignment eligibility criteria during each month in a calendar year.[38] Normalization factors are calculated separately for both A&D and ESRD beneficiary months in each reference year and for the performance year. The PY2024 normalization factor is "preliminary" since there is not yet risk score data available for 2024. This "preliminary" normalization factor has been estimated using a projected linear trend and will be updated retrospectively after the close of the performance year, once final risk score data from 2024 is available. PY2025 normalization will follow this same pattern. Shown below are the CMS-HCC prospective risk adjustment model normalization factors for the A&D ACO REACH National Reference Population.

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[37] Given the start of KCC was delayed to 1/1/2022, technically 2021 is not a performance year, it is an implementation period year.

[38] Please note, that for the normalization of risk scores, CMS uses the ACO REACH National Reference Population which includes a broader set of beneficiaries including those not eligible for the KCC model. The reference population used to normalize the risk scores does not meet the additional alignment criteria for the KCC model.

**Table D-1. Normalization Factors for the ACO REACH Eligible Aged & Disabled Population for the CMS-HCC Prospective Risk Adjustment Model**

| Year | Normalization Factor |
|------|---------------------|
| 2017 | 1.037 |
| 2018 | 1.051 |
| 2019 | 1.065 |
| 2021 | 1.040 |
| 2022 | 1.070 |
| 2023 | 1.091 |
| 2024 | TBD |
| 2025 | TBD |

\* Projected using a linear trend. Projections based on 2019-2021 mean prospective risk scores for A&D beneficiary months.

**KCE Mean Risk Score:** This is the mean risk score for KCE-aligned beneficiaries during a RY or PY. This can be calculated as the sum of risk scores weighted by beneficiary months divided by total beneficiary months for a given year and benchmark population (CKD or ESRD). Beneficiaries aligned in the RY and PY may overlap, but do not necessarily maintain alignment in both periods. Alignment for the RY and the PY is based on the same list of KCE Participant Providers but may include a different set of aligned beneficiaries in each period.

**KCE Mean Normalized Risk Score:** A normalized risk score is calculated by dividing a raw risk score by the normalization factor for the applicable year, benchmark (CKD or ESRD), and risk adjustment model. Normalization may equivalently be applied either to individual beneficiary risk scores or to a KCE's mean risk score. A KCE's mean normalized risk score is thus the KCE mean risk score divided by the normalization factor.

**KCE Risk Score Growth Rate**: A symmetric cap is applied to the risk score growth rate for each KCE. This growth rate is calculated as the percentage change in KCE's mean normalized risk score between a base period (reference year) and performance year.

The growth rate, $g$, is calculated as:

$$g = \left( \frac{\text{Mean Norm. Risk Score}_{PY}}{\text{Mean Norm. Risk Score}_{RY}} - 1 \right) \times 100$$

The reference year is set in each PY according to **Table D.2**.

**KCE Capped Mean Risk Score:** For CKD Stages 4 or 5 risk scores, if the calculated risk score growth rate is less than −6% or greater than +6%, then the KCE mean normalized risk score for the performance year is replaced with the KCE mean normalized risk score for the reference year multiplied by 0.94 or 1.06, respectively. Similarly, for ESRD risk scores, if the calculated risk score growth rate is less than −3% or greater than +3%, then the KCE mean normalized risk score for the performance year is replaced with the KCE mean normalized risk score for the reference year multiplied by 0.97 or 1.03, respectively. This

is the KCE capped mean risk score. The symmetric cap is applied separately for CKD Stages 4 or 5 and ESRD beneficiary months and risk scores.

This calculation is shown below, using the CKD Stages 4 or 5 population and its corresponding symmetric 6% cap:

$$\text{KCE Capped Mean Risk Score}_{PY} = \begin{cases} 1.06 \times \text{Mean Norm. Risk Score}_{RY} & \text{if } g > 6\% \\ \text{Mean Norm. Risk Score}_{PY} & \text{if } -6\% \leq g \leq 6\% \\ 0.94 \times \text{Mean Norm. Risk Score}_{RY} & \text{if } g < -6\% \end{cases}$$

**Table D-2. Reference Population for Applying the Symmetric Cap**

| Performance Year | Reference Year |
|---|---|
| IP–2020 | NA |
| IP–2021[a] | 2019 |
| PY2022 | 2020 |
| PY2023 | 2020[b] |
| PY2024 | 2022 |
| PY2025 | 2023 |
| PY2026 | 2024 |

[a] Because the start of KCC was delayed to 1/1/2022, 2021 is now considered an implementation period year, not a performance year.

[b] Please note that RY2020 (2019 claims) will be used as the reference year instead of RY2021 (2020 claims) for PY2023 in order to avoid coding biases that may be introduced by Covid-19.

**Example Application of Normalization and the Symmetric 6% Risk Score Growth Cap for A&D:** The following is an example calculation that presents the steps to derive the final normalized and coding adjusted risk score from an unadjusted "raw" risk score at the end of IP2021.[39] In this hypothetical example, the three KCEs, A, B, and C, comprise all model participants, and calculated mean risk scores reflect each KCE's aligned aged-disabled population in the reference year (2019) and performance year (2021).

[39] Because the start of KCC was delayed to 1/1/2022, 2021 is now considered an implementation period year, not a performance year.

**Table D-3. Example Calculation Adjusting CKD Risk Scores for Normalization and the Risk Score Growth Cap**

| KCE | (1) RY KCE CKD Mean Risk Score | (2) PY KCE CKD Mean Risk Score | (3) RY Norm Factor | (4) PY Norm Factor | (5) RY KCE CKD Mean Norm Risk Score (1) / (3) | (6) PY KCE CKD Mean Norm Risk Score (2) / (4) | (7) KCE CKD Risk Growth Rate [(6) - (5)] / (5) | (8) PY KCE CKD Capped Mean Risk Score** |
|---|---|---|---|---|---|---|---|---|
| A | 2.729 | 2.906 | 1.137 | 1.176 | 2.400 | 2.471 | 2.98% | 2.471 |
| B | 2.621 | 2.935 | 1.137 | 1.176 | 2.305 | 2.496 | 8.28% | 2.443 |
| C | 2.866 | 2.738 | 1.137 | 1.176 | 2.520 | 2.329 | −7.61% | 2.369 |
| Total KCE CKD Aligned* | 2.738 | 2.860 | 1.137 | 1.176 | 2.408 | 2.432 | — | 2.428 |

*Numbers shown in the total KCE Aligned row reflect the average across all individual KCEs. It is assumed that the three KCEs in this example all have the same size beneficiary population. In general, the KCE-aligned population averages will be weighted by each KCE's number of beneficiary-months.

** Equals 1.06 X (5) if the KCE Risk Growth Rate (7) > 6%, equals (6) if (7) is between −6% and +6%, and equals 0.94 X (5) if (7) < −6%.

- KCE A's mean normalized risk score grows from 2.400 to 2.471, an increase of 2.98%. Since this falls within the 6% risk score growth rate cap, KCE A's capped risk score remains 2.471.
- KCE B exhibits an 8.28% change in mean normalized risk scores, from 2.305 to 2.496. KCE B's PY risk score is capped at 106% of the RY mean normalized risk score, 2.443 (2.305*1.060 = 2.443), because the observed growth of 8.33% is greater than the 6% cap.
- KCE C exhibits a 7.61% decline in mean normalized risk score from RY to PY. Because this is below the -6% cap, the decline is limited to 6% of the RY mean normalized risk score, 2.369 (2.520*0.94 = 2.369).