

Module 1: Risk Adjustment Introduction and Overview



The image shows a course cover for "Risk Adjustment Methodology". On the left, a laptop is open, displaying a blue screen with various mathematical diagrams and formulas. The formulas include  $P=2l+2w$ ,  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ , and  $|a \times p|$ . There are also geometric diagrams with labels like  $a \times b$ ,  $b$ ,  $\theta$ , and  $\infty$  sphere. The background of the cover is a dark blue gradient. In the top left corner, there is a logo for CMS (Centers for Medicare & Medicaid Services). The main title "Risk Adjustment Methodology" is written in large white font. Below it, the subtitle "An Overview of Risk Adjustment" is written in a smaller white font. In the bottom right corner, there is a grey button with the text "ENTER COURSE".

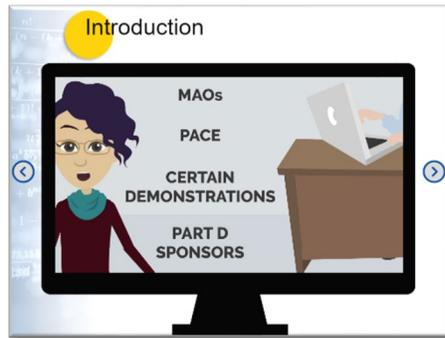
**CMS**  
CENTERS FOR MEDICARE & MEDICAID SERVICES

# Risk Adjustment Methodology

An Overview of Risk Adjustment

**ENTER COURSE**

## Introduction



Risk adjustment is used to adjust payments to Medicare Advantage Organizations (MAOs), Program of All Inclusive Care for the Elderly (PACE), certain demonstrations and Part D sponsors for the expected healthcare costs of their enrollees based on disease factors and demographic characteristics.

This course covers the foundation and history of risk adjustment, the risk adjustment models and how the CMS Hierarchical Condition Category (HCC) and Prescription Drug Hierarchical Condition Category (RxHCC) models are used to calculate risk scores.

Select the Next arrow to continue.

## History of Risk Adjustment



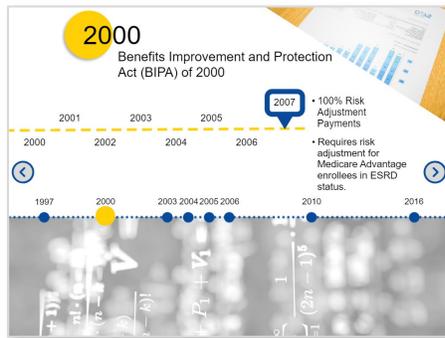
Here is a timeline from 1997 to 2016. Select each circle to learn more about the history of risk adjustment.

## 1997- Balanced Budget Act (BBA) of 1997



Risk Adjustment for Medicare Advantage (then, Medicare plus Choice) was first required by the Balanced Budget Act in 1997. The Act mandated that the risk adjustment methodology account for variations in per capita costs based on health status and other demographic factors for payments.

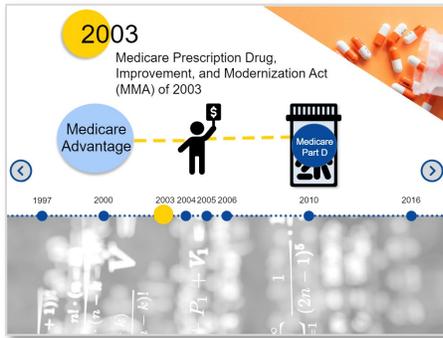
## 2000 – Benefits Improvement and Protection Act (BIPA) of 2000



The Benefits Improvement and Protection Act of 2000 established an implementation schedule to achieve 100% in risk adjustment payments by 2007, and it required risk adjustment for Medicare Advantage enrollees in End-Stage Renal Disease (ESRD) status.

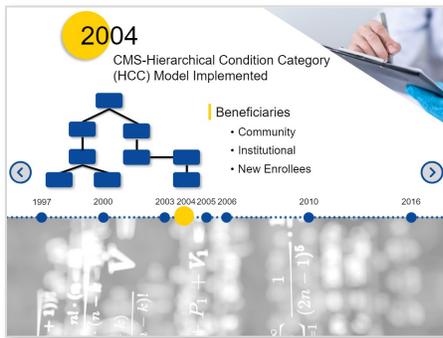
Risk adjustment was gradually phased in, starting with principal inpatient diagnoses and demographic factors (age, sex, Medicaid status, and original reason for Medicare entitlement). PACE and dual demonstration programs lagged one year behind the Medicare Advantage plans on the implementation schedule and completed their phase-in in 2008.

## 2003 - Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003



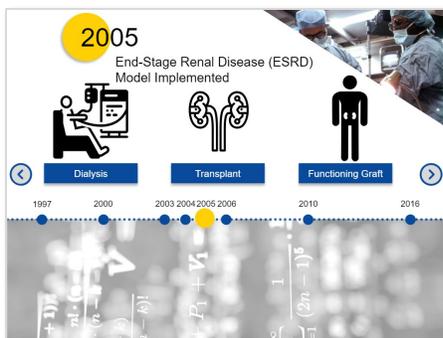
The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 created the Medicare Advantage program to replace the Medicare plus Choice program and introduce the bidding process. It also created the Medicare Part D prescription drug benefit to begin in 2006 and included risk adjusted payments.

## 2004 - First CMS-Hierarchical Condition Category (HCC) Model Implemented



The first CMS-HCC model was implemented in 2004. This model produces different risk scores for beneficiaries who reside in either the community or an institutional setting, or who are new enrollees.

## 2005 – End-Stage Renal Disease (ESRD) Model Implemented



CMS implemented a separate risk adjustment model for beneficiaries with End-Stage Renal Disease in 2005. This model produces different risk scores for beneficiaries in dialysis status, beneficiaries who have a kidney transplant, and beneficiaries who have a functioning graft.

## 2006 – RxHCC Risk Adjustment Model Implemented



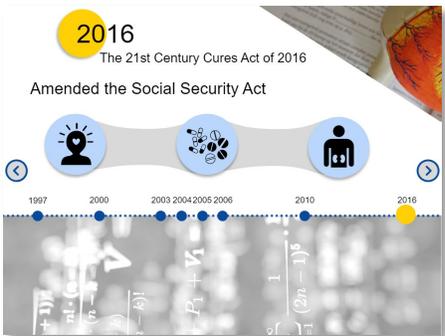
In 2006, the RxHCC risk adjustment model was implemented. Similar to the CMS-HCC risk adjustment model, the RxHCC model uses demographic characteristics and disease variables to predict costs. The RxHCC model predicts Medicare Part D plan liability costs for prescription drugs under the Part D program.

## 2010 – Patient Protection and Affordable Care Act (ACA) of 2010



The Patient Protection and Affordable Care Act of 2010 refined the Medicare Advantage risk adjustment methodology for new enrollee risk scores for Chronic Condition Special Needs Plans (snips). This methodology takes into account that enrollees in these types of snips must have certain conditions as a prerequisite to being enrolled.

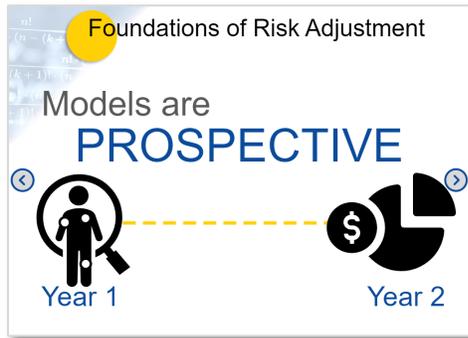
## 2016 - The 21st Century Cures Act of 2016



The 21st Century Cures Act of 2016 amended the Social Security Act by, in part, requiring CMS to make changes to the CMS-HCC risk adjustment model for 2019 and subsequent years. The

changes include the evaluation of additional diagnosis codes for mental health, substance use disorder, and chronic kidney disease into the model. These changes take into account a Medicare Advantage enrollee's total number of conditions by making an additional adjustment as the number of diseases or conditions of an individual increases. These changes will be phased in by 2022.

## Foundation of Risk Adjustment

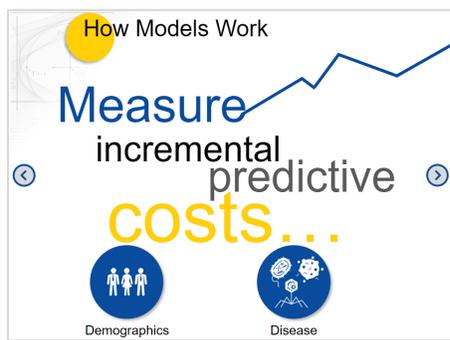


Risk adjustment is used to adjust plan bids, as well as payments to plans based on their enrollee's expected health care costs.

The CMS-HCC based Medicare risk adjustment models are prospective: diagnoses in one year are used to predict costs in the following year.

CMS has multiple models to address differences in the beneficiary population (for example: the ESRD population) and program costs (for example: Part C versus Part D).

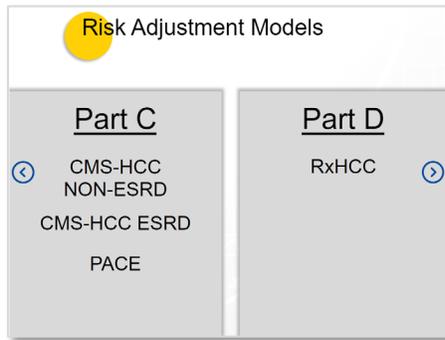
## How Models Work



Risk adjustment uses statistical models that measure incremental predictive costs of a beneficiary's demographic and disease characteristics and age, sex, and certain statuses such as Medicaid eligibility. The total predictive costs are determined by adding the coefficients of a beneficiary's demographics and health status factors.

Diagnoses are grouped into condition categories with similar Medicare predicted costs and those that are clinically related. Hierarchies are applied to these condition categories based on disease severity so that risk scores reflect the most severe and costly category of a condition.

## Risk Adjustment Models

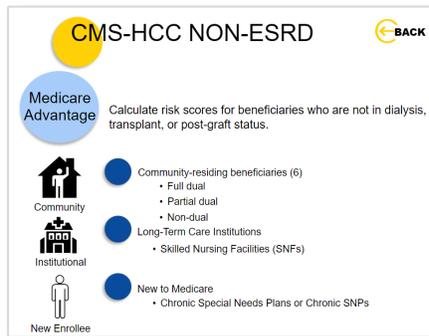


CMS has developed separate risk adjustment models for the Parts A and B benefits offered by plans under Part C and for the Part D benefits offered by Medicare Advantage Part D and prescription drug plans. Within each benefit, CMS also segments each model, creating subpopulations with distinct cost patterns.

Take some time to explore the models applicable to you and your work.

When you're done exploring, select the Next button to learn about the similarities and differences between the Part C and Part D models.

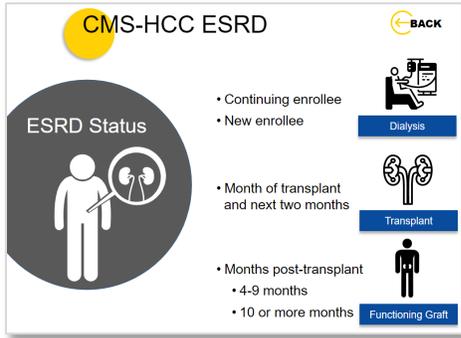
### Part C (CMS-HCC NON-ESRD)



CMS uses the Part C CMS-HCC model to calculate risk scores for beneficiaries who are not in dialysis, transplant, or post-graft status. There are multiple segments associated with this model, including the community, institutional, and new enrollee segments. For the Part C models implemented in 2017 and beyond, there are six segments for community-residing beneficiaries, one each depending on a beneficiary's aged and disabled status and their dual eligible status – whether they are full dual, partial dual, or non-dual. The Institutional segment is used to calculate risk scores for individuals who are in long-term care institutions, including Skilled Nursing Facilities (sniffs), for 90 days or more. New enrollee model segments are used for aged and disabled beneficiaries who are new to Medicare or do not otherwise have enough diagnoses to calculate a risk score – operationalized as those who do not have 12 months of Part B in the data collection period. These new enrollee risk scores do not use diagnoses to predict costs and use demographic factors only. There is also a segment for aged and disabled new enrollees in Chronic Special Needs Plans, known as Chronic snips.

Select the back button to continue reviewing the models.

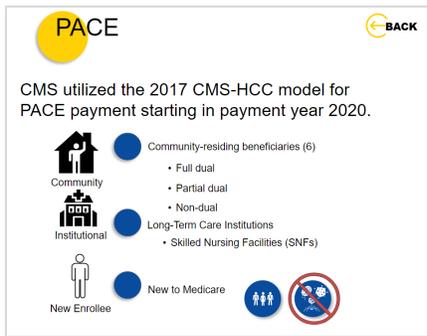
### Part C (CMS-HCC ESRD)



The ESRD model has similar characteristics as the CMS-HCC model, but it differs in that it predicts medical (Parts A and B) costs for the population in ESRD status. The ESRD model is a suite of models that produce risk scores for beneficiaries in Dialysis, Transplant, and Functioning Graft statuses. The Dialysis Model is segmented by continuing enrollee – those with 12 months of Part B in the data collection period -- and new enrollee. The Transplant model covers the month of transplant and the next two months. The Functioning Graft Model includes segments for beneficiaries with a functioning kidney graft based on the number of months post-transplant, whether it be 4 to 9 months or 10 or more months.

Select the back button to continue reviewing the models.

### PACE



CMS pays PACE organizations similar to MAOs using risk adjustment that reflects beneficiary health status. We typically use the same models to calculate risk scores for beneficiaries enrolled in PACE organizations as we use to pay Medicare Advantage, and starting in 2006, for Part D costs.

CMS utilized the 2017 CMS-HCC model for PACE payment starting in payment year 2020.

Similar to the 2020 CMS-HCC model used in the risk score calculations of non-PACE Part C plans, there are six segments for community-residing beneficiaries. Each segment depends on a beneficiary's aged and disabled status and their dual eligible status—whether they are full dual, partial dual, or non-dual.

The Institutional segment is used to calculate risk scores for individuals who are in long-term care institutions, including Skilled Nursing Facilities (sniffs), for 90 days or more. New enrollee model segments are used for aged and disabled beneficiaries who are new to Medicare and do not otherwise have enough diagnoses to calculate a risk score – operationalized as those who do not have 12 months of Part B in the data collection period. These new enrollee risk scores do not use diagnoses to predict costs and use demographic factors only.

Select the back button to continue reviewing the models.

## Part D (RxHCC)

**RxHCC** ← BACK

Predicts plan liability for prescription drugs under the Part D program.

- Continuing enrollee, community
- Aged, non-low income
- Aged, low income
- Disabled, non-low income
- Disabled, low income
- Continuing enrollee, institutional
- New enrollee, non-low income
- New enrollee, low income
- New enrollee, institutional

New Enrollee

CMS uses a separate risk adjustment model to predict plan liability for prescription drugs under the Part D program. The Part D risk adjustment model (RxHCC model) shares many of the characteristics of the CMS-HCC model. Note we will discuss similarities and differences in the next section. There are separate segments based on aged vs disabled status, and low income vs. non-low-income status, and continuing vs new enrollee.

Select the back button to continue reviewing the models.

## Comparing Part C and D Models

**Comparing Part C and D Models**

Similarities Differences

Source of Diagnosis Predicting Expenditures Additive and Hierarchal Model Adjusting Payment Amounts Expected Costs

Select each tab to learn more about the Part C and D similarities and differences.

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## Source of Diagnosis

Comparing Part C and D Models

Source of Diagnosis

Similarities Differences

Risk Scores | Predict costs

Diagnosis Codes | Model Calibration  
Calculate risk scores for payments

Each beneficiary is assigned their own risk score for Part C and for Part D. Since these models predict different costs, a beneficiary's Part C and Part D risk scores may differ.

Using the International classification of diseases codes -- are used for both the calibration of the models, and to calculate risk scores for payment. CMS uses diagnoses from both MAO's and from Fee-For-Service providers.

## Predicting Expenditures

Comparing Part C and D Models

Predicting Expenditures

Similarities Differences

CMS-HCC --> Full Part A and B Medicare

RxHCC --> Prescription drug costs

Both models predict benefit costs for which the plans are responsible for covering. The CMS-HCC model predicts medical expenditures covered under Parts A and B Medicare. The RxHCC model predicts the drug costs for which the Part D plan is liable – in other words, it does not include cost sharing amounts for which the enrollee or costs for which the government is responsible for paying.

## Additive and Hierarchical Model

Comparing Part C and D Models

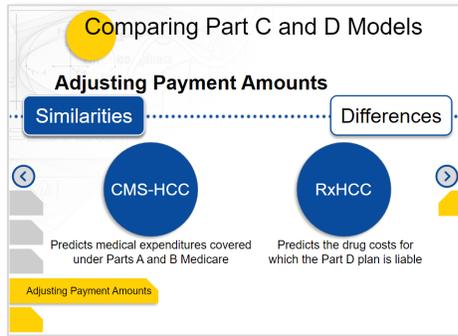
Additive and Hierarchical Model

Similarities Differences

**Hierarchies** – Use the most severe manifestation of a condition to be considered for risk scores.

The two models generate enrollee risk scores by adding relative risk factors for each HCC or RxHCC associated with each beneficiary. Both models use hierarchies. Hierarchies use the most severe manifestation of a condition to be considered for risk scores.

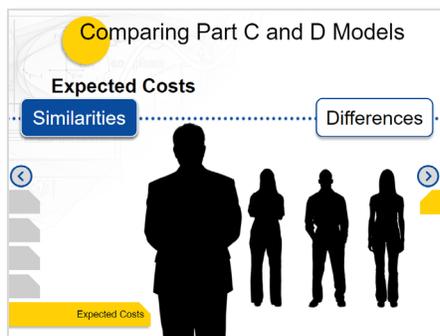
## Adjusting Payment Amounts



Risk adjustment is intended to adjust capitated payment amounts to pay plans accurately for groups of beneficiaries, thereby increasing incentives for health plans to enroll all beneficiaries, regardless of health status. Both models adjust payments for the expected costs, based on underlying health status, of the beneficiaries enrolled in the plan.

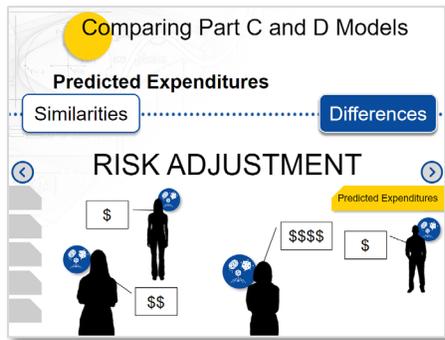
The CMS-HCC model adjusts Part C monthly payments to Medicare Advantage plans, PACE organizations, and certain demonstrations. The RxHCC model adjusts the monthly Part D direct subsidy.

## Expected Costs



Each beneficiary's risk score is calculated to estimate that specific beneficiary's expected costs, relative to the average beneficiary. For each model, a risk score of 1.0 reflects the Medicare-incurred expenditures of an average beneficiary. An RxHCC risk score of 1.0 indicates the beneficiary is expected to incur the average liability amount for prescription drugs when covered by the standard Part D Medicare benefit. A CMS-HCC risk score of 1.0 indicates the beneficiary is expected to incur the average Medicare program expenditure for Parts A and B services.

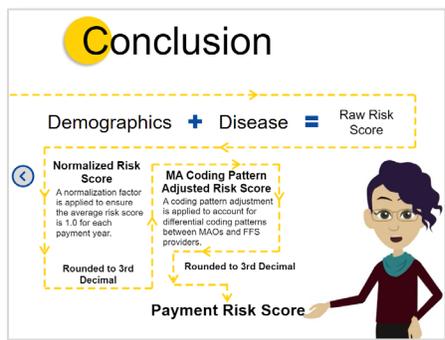
## Predicted Expenditures



While both the CMS-HCC and the RxHCC models use health status or diagnoses and demographic characteristics to predict expenditures, the total expenditures that each model is predicting are quite different (medical versus prescription drug) and, therefore, may result in different weights on similar HCCs and RxHCCs, as well as different Part C and Part D risk scores for a beneficiary.

Risk adjustment attempts to account for the differences in expenditures incurred by a plan due to differences in the health status of the beneficiaries enrolled in the plan. Since the impact of health status factors, and the benefit design, are different between Parts C and D, the two risk adjustment models have been designed to predict the relevant costs.

## Conclusion



The risk Score formula is equal to the sum of the demographic factors and the disease factors. The sum of those factors equals the raw risk score. CMS then applies several methodological adjustments to the raw risk score. These adjustments are the normalization factor, used to keep the average risk score at 1.0, and the Medicare Advantage coding pattern adjustment, to account for differential coding patterns between MAOs and Fee-For-Service providers. The result is the Payment Risk Score.

We will discuss these adjustments more in Module 2, where we will introduce how risk scores are calculated, including the steps in the process to access the information that you will need to calculate the Risk Score. A future module will provide detailed calculations for each of the Risk Score Models.

If you have questions, you can submit them to [RiskAdjustmentPolicy@cms.hhs.gov](mailto:RiskAdjustmentPolicy@cms.hhs.gov).