Comparison of Risk Adjustment Systems

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The Centers for Medicare & Medicaid Services (CMS) and states have developed and implemented many different risk adjustment systems for managed care plans and other risk-bearing entities in Medicare, Medicaid, and the Health Insurance Marketplaces. In general, the goals of these risk adjustment systems are to reduce incentives for plans to attract only healthy people, to pay plans appropriately based on the health risks of the people they enroll, and to encourage plans to provide care efficiently.

This brief compares features of major risk adjustment systems currently in use in the US health care system.[1] In addition, we identify gaps in risk adjustment for high-need populations like those enrolled in both Medicare and Medicaid (dual enrollees). We focus on this population because the recently proposed DUALS Act would require CMS to develop a new risk adjustment system for integrated plans serving dual enrollees.[2]

Background

Medicare, Medicaid, and private health insurance markets take different approaches to risk adjustment. These risk adjustment systems vary because of differences in the enrollee population, the reasons for risk adjustment, data availability, the use of other risk-mitigation strategies, such as selective contracting, auto-enrollment, or reinsurance, and other stakeholder and policymaker choices and priorities. This brief compares seven risk adjustment systems, including those used by the following health insurance programs:

- Medicare Advantage (MA): Provides Medicare Part A and B benefits through private health insurance plans. CMS administers risk adjustment.[3]
- Medicaid: Provides health and long-term care benefits for children, pregnant women, and adults with low incomes or disabilities. Risk adjustment is optional and is administered by states. We focus on the Chronic Illness and Disability Payment System (CDPS) risk adjuster used in 33 states (Gilmer and Kronick 2024).[4]
- Health Insurance Marketplaces: Provide individual market health insurance options through private plans with subsidies available based on income. All states currently use the CMS risk adjustment model.[5]
- Medicare Part D: Provides prescription drug coverage to Medicare beneficiaries through private plans, including standalone Part D plans and MA Part D plans. CMS administers risk adjustment.[6]
- Financial Alignment Initiative Medicare-Medicaid Plans (FAI-MMPs): Provided integrated Medicare, prescription drug, and Medicaid coverage to dual enrollees through private plans. Risk adjustment was administered by CMS and states, with Medicaid risk adjustment systems varying across states. The program ended on December 31, 2025.[7]
- Program of All-Inclusive Care for the Elderly (PACE): Provides integrated Medicare, prescription drug, and Medicaid benefits through private entities for those who need a nursing home level of care but can safely live in the community. Risk adjustment only covers Medicare funds and is administered by CMS.[8]
- REACH Accountable Care Organizations (ACOs): A value-based payment demonstration in which ACOs bear risk for the health care costs and outcomes of the Medicare population they serve and can share in any savings they produce with CMS. CMS administers risk adjustment, which varies by ACO type. We focus on the risk adjustment approach for high-needs population ACOs.[9]

Comparison of Risk Adjustment Systems

Table 1 compares risk adjustment systems across 15 dimensions. All the risk adjustment systems we compared aim to make appropriate and accurate payments while minimizing the risk of favorable or adverse selection and maintaining efficiency incentives. However, some risk adjustment systems also have program-specific goals. For example, California's FAI-MMP risk adjustment system, which was specific to integrated plans for dual enrollees, sought to encourage plans to keep enrollees in community-based care rather than institutional care.

The risk adjustment systems we compared calculate risk scores using regression models that predict spending based on basic enrollee demographic information and diagnoses and/or prescription drug use from claims and/or encounter data.[10] Most use some version of CMS's Hierarchical Condition Categories (HCCs) to define diagnosis groups, and all have model segments (subpopulations for which the regression models are estimated separately because coefficients are expected to differ by group) to improve model predictions overall and within subpopulations. The risk adjustment systems vary in their use of policy adjustments applied directly to the model (e.g., constraints requiring that higher clinically ranked HCCs have larger coefficients) or after the calculation of risk scores (e.g., coding intensity adjustments in MA).

The approaches to calculating risk-adjusted payments from risk scores vary more across the systems we compared. For example, the Health Insurance Marketplaces determine risk adjustment payments and charges based on the average premium within a state Marketplace, so the system is zero-sum (risk adjustment receipts from plans with lower-risk enrollees are equal to risk adjustment payments to plans with higher-risk enrollees). The MA risk adjustment system, in contrast, calculates risk adjustment payments and charges according to each plan's base payment (determined by bids and benchmarks), and the system pays out more than it takes in (MedPAC 2026).

The risk adjustment systems also use different approaches to improve predictions for high-need populations. For example, many models have specific segments for dual enrollees or enrollees receiving institutional care. The CMS Innovation Center HCC model used for the ACO REACH Model is specifically designed for high-need populations and uses current-year data (also called concurrent risk adjustment) to better reflect the variable, high costs of high-need Medicare beneficiaries. Finally, the risk adjustment system used in PACE and some MA plans includes a frailty adjustment to risk scores based on the average level of difficulty enrollees face in performing activities of daily living.

TABLE 1

Comparison of Risk Adjustment Systems

	Medicare Advantage	Medicaid CDPS	ACA Marketplaces	Part D	FAI MMPs	PACE	REACH High-Needs Population ACO
Key policy goal	Make appropriate and accurate payments to plans and minimize selection incentives	Make appropriate and accurate payments to plans and minimize selection incentives	Minimize selection incentives and reduce the influence of risk selection on premiums	Make appropriate and accurate payments to plans and minimize selection incentives	Make appropriate and accurate payments to plans and minimize selection incentives; states may have additional goals, like discouraging institutionalization (for example, CA)	Make appropriate and accurate payments to plans and minimize selection incentives	Make appropriate and accurate payments to plans; accurately predict expenditures for high-need beneficiaries; explain the variation in risk scores among ACOs
How the model calculates risk scores							
Input data	Medicare claims and encounter data for the prior year (with current-year data on institutionalization)	Medicaid claims and encounter data for the prior year; many states also incorporate prescription drug data using CDPS-Rx	Commercial claims and encounter data for the current year	Medicare claims and encounter data from the prior year	Medicare claims and encounter data for the prior year; Medicaid varies by state, but includes claims and/or health risk assessment data	For 2026, 10% Medicare claims and encounter data for the prior year (with current-year data on institutionalization) blended with 90% RAPS data; ADL counts from the HOS-M survey	Medicare claims data for the current year, with final risk scores available in the spring of the following year due to data timelines

	Medicare Advantage	Medicaid CDPS	ACA Marketplaces	Part D	FAI MMPs	PACE	REACH High-Needs Population ACO
Risk adjustment model used	CMS-HCC	CDPS and CDPS+Rx	HHS-HCC	RxHCC	CMS-HCC and CMS-RxHCC for Medicare; Medicaid component varies by state	Phasing in the current MA model; in 2026, will use 90% 2017 CMS-HCC + 10% 2024 CMS-HCC	CMMI-HCC
Number of diagnosis categories	115	56	127	84	Same as MA for Medicare, varies by state for Medicaid	66 for the 2017 model, 115 for the 2026 model	85
Patient characteristics	Diagnoses, age, sex	Diagnoses, age, sex	Diagnoses, age, sex	Diagnoses, age, sex, prescription drugs	Same as MA for Medicare, varies by state for Medicaid	Diagnosis, age, sex, contract-level total ADLs	Diagnoses, age, sex
Model segments/rate cells	New enrollees, institutional, full dual aged, full dual disabled, partial dual aged, partial dual disabled, nondual aged, nondual disabled, end-stage renal disease	Disabled, children, adults (no specific rate cell for institutional)	Adults, children, and infants	Aged, non-low income; aged, low income; disabled, non-low income; disabled, low income; institutional; new enrollee, non- low income; new enrollee, low income; new enrollee, institutional	Same as MA for Medicare; varies by state for Medicaid; for example, CA used institutional, HCBS "high," HCBS "low," and community, based on health risk assessment	New enrollees, institutional, full dual aged, full dual disabled, partial dual aged, partial dual disabled, nondual aged, nondual disabled	End-stage renal disease
Coefficient constraints	Higher clinically ranked HCCs must have at least as large incremental predicted expenditures as lower-ranked HCCs	Imposed based on the same logic as in MA	Imposed based on the same logic as in MA	Imposed based on the same logic as in MA	Same as MA for Medicare, varies by state for Medicaid	Imposed based on the same logic as in MA	Imposed based on the same logic as in MA
R-squared statistics	Ranges from 0.12 to 0.19 across segments in 2024	Ranges from 0.06 to 0.14 across segments in 2024	Ranges from 0.28 to 0.41 across segments in 2026	Not routinely reported	Not routinely reported	Not separately reported from MA overall	0.49 in 2025

	Medicare Advantage	Medicaid CDPS	ACA Marketplaces	Part D	FAI MMPs	PACE	REACH High-Needs Population ACO
Coding intensity adjustments	Uniform 5.9% reduction to risk scores	None	None	None	Uniform 5.9% reduction to risk scores after first year of demo	Uniform 5.9% reduction to risk scores	Model-wide coding intensity factor is applied to ensure no growth in risk score relative to the reference year, capped at 1% for 2025
Other adjustments to risk scores	Fully integrated dual eligible special needs plans (FIDE-SNPs) get a frailty adjustment if the plan has a similar average level of frailty as the PACE program	States have discretion to make other adjustments	Adjustments for enrollees in individual market cost-sharing plan variations due to possible induced demand	None	State-specific	A contract-level frailty adjustment is added to the risk score	+/-10% cap on risk score growth
How the model calculates risk-adjusted payments							
Payment calculation	The plan's bid is multiplied by their risk score, minus the coding intensity adjustment	The plan's capitation rate is multiplied by the plan's risk score; other factors (e.g., acuity adjustments) vary by state	The plan's risk score is multiplied by the statewide average premium	The plan's bid is multiplied by their risk score, then adjusted for premiums	The base payment (before savings withhold) is a weighted average of the plan's HCC-based score (averaged across enrollees) and standardized county Medicare FFS rates; weights are the proportion of the county's duals enrolled in MA/FFS prior to the demo	The plan's risk-neutral total payment is multiplied by their risk score, minus the coding intensity adjustment	The ACO's benchmark is multiplied by the risk score, geographic factors, health equity, and a quality withhold

	Medicare Advantage	Medicaid CDPS	ACA Marketplaces	Part D	FAI MMPs	PACE	REACH High-Needs Population ACO
Budget neutrality	Not budget-neutral among MA plans; intended to be budget-neutral between MA and TM	Budget-neutral across all plans within a state	Budget-neutral within a state/market	Budget-neutral among Part D plans	Medicaid portion budget-neutral to Medicaid; Medicare portion same as MA	Not budget-neutral among PACE plans	Risk scores are constrained to limit year-to-year growth, keeping risk adjustment financially consistent
Documented benefits and drawbacks							
Benefits	Reduced incentives to "cherry-pick" healthy enrollees relative to the demographic risk adjustment system that was previously in place	Used by a majority of states; focuses on conditions more common among Medicaid enrollees; designed to predict spending without incentivizing upcoding	Appears to be moving funds from insurers with lower-risk enrollees to insurers with higher-risk enrollees, helping to stabilize premiums	Reduced incentives to "cherry-pick" and is shown to generally predict well for high-risk individuals	Same as MA for Medicare portion; flexibility in Medicaid portion gave states an opportunity to incorporate incentives or achieve other goals	Same as MA, and the frailty adjustment helps account for higher health care needs in PACE plans	More accurately predicts costs for high-risk patients in the performance year than CMS-HCC, providing more stable funding for small populations with highly variable, high-cost needs
Drawbacks	Upcoding has been a persistent problem in the MA risk adjustment system. Although the model has reduced incentives to attract enrollees with no diagnosed conditions, there are still incentives to favorably select enrollees within a diagnostic group.	Not specifically designed to pay for Medicaid-covered LTSS, which can be a substantial portion of Medicaid spending for some enrollees (e.g., dual enrollees)	Concurrent models can be less predictable and encourage upcoding; use of the statewide average premium to set payments and charges can lead to payments and charges that are too high or too low	Can be sensitive to changes in the drug market or drug utilization patterns (e.g., due to recent redesign of the Part D benefit under the Inflation Reduction Act)	Because of the savings percentages deducted from capitation payments to plans, Managed Care Organizations with integrated and non-integrated plans had incentives to move duals into their non-integrated plans, where they were more profitable	The frailty adjustment is contract-wide, so it does not account for the specific needs/utilization of individual PACE enrollees	Concurrent models have stronger upcoding incentives, as upcoding has a financial benefit in the year it occurs. They can also be less predictable for plans/ACOs due to claims run-out timelines

	Medicare Advantage	Medicaid CDPS	ACA Marketplaces	Part D	FAI MMPs	PACE	REACH High-Needs Population ACO
Other risk mitigation policies in place in the market	None	Varies by state; could include auto-enrollment, risk corridors, or withholding to fund high-cost risk pools	19 states have reinsurance programs	Risk corridors and reinsurance	Risk corridors	The Medicaid portion can be risk-adjusted by states, but most states provide a lump sum	Risk corridors, option for ACOs to buy into stop-loss insurance

Sources: Authors' analysis and review of documentation and literature, including the following:
"Chronic Illness and Disability Payment System (CDPS)," UC San Diego Herbert Wertheim School of Public Health and Human Longevity Science, accessed February 14, 2025, https://hwsph.ucsd.edu/research/programs-groups/cdps.html; Liza Berger, "Pace Providers Gearing up for New Risk Calculation Model in 2026," McKnights Home Care, June 9, 2025, https://www.mcknightshomecare.com/news/pace-providers-gearing-up-for-new-risk-calculation-model-in-2026/; *Memorandum of Understanding (MOU) Between the Centers for Medicare & Medicaid Services (CMS) and the State of California Regarding a Federal-State Partnership to Test a Capitated Financial Alignment Model for Medicare-Medicaid Enrollees*, CMS, accessed March 26, 2026; *Programs of All-Inclusive Care for the Elderly (PACE): Chapter 13—Payments to PACE Organizations*, CMS (June 2011); *Medicare Managed Care Manual: Chapter 7—Risk Adjustment*, CMS (September 2014); *Contract Between United States Department of Health and Human Services Centers for Medicare & Medicaid Services In Partnership with California Department of Health Care Services*. CMS (June 2022); *Report to Congress: Risk Adjustment in Medicare Advantage*, CMS (December 2024); "2025 Medicare Advantage and Part D Rate Announcement," CMS (April 2024), https://www.cms.gov/newsroom/fact-sheets/2025-medicare-advantage-and-part-d-rate-announcement; "Subject: 2026 Benefit Year Final HHS Risk Adjustment Model Coefficients," CMS (January 2025), Todd Gilmer and Richard Kronick, "Updating the Chronic Illness and Disability Payment System," *Medical Care* 62 (3, 2024), 175–81, https://doi.org/10.1097/MLR.0000000000001968; John Kautter, Gregory C. Pope, Melvin Ingber, et al., "The HHS-HCC Risk Adjustment Model for Individual and Small Group Markets under the Affordable Care Act," *Medicare & Medicaid Research Review* 4 (3, 2014), https://doi.org/10.5600/mmrr.004.03.a03; John Kautter, Gregory C. Pope, and Patricia Keenan. "Affordable Care Act Risk Adjustment: Overview, Context, and Challenges," *Medicare & Medicaid Research Review*, 4 (3, 2014), https://doi.org/10.5600/mmrr.004.03.a02; "Medicaid Managed Care Capitation Rate Setting," MACPAC (March 2022); "Part D Payment System (Payment Basics)," MedPAC (October 2024); "Medicare Advantage Program Payment System (Payment Basics)," MedPAC (October 2024); Michelle Robb and Douglas Rodrigues, "Assessment of Potential Enhancements to the Part D Risk Adjustment (Rxhcc) Model: Considerations for Ensuring Risk Adjustment Adequacy in an Evolving Part D Environment," Milliman (September 2025); *Financial Alignment Initiative California Cal MediConnect: Preliminary Third Evaluation Report*, RTI International (2023); *ACO Realizing Equity, Access, and Community Health (REACH) and Kidney Care Choices Models: PY2025 Risk Adjustment*, RTI International (2024); "Medicaid Risk Adjustment Fact Sheet," Institute for Medicaid Innovation and UC San Diego (2023).
Notes: ACA = Affordable Care Act; MA = Medicare Advantage; CDPS = Chronic Illness and Disability Payment System; FAI-MMP = Financial Alignment Initiative Medicare-Medicaid Plans; PACE = Program of All-Inclusive Care for the Elderly; ACO = Accountable Care Organizations; CMS = Centers for Medicare & Medicaid Services; CMMI = CMS Innovation Center; HCC = Hierarchical Condition Categories; HCBS = home and community-based services; FFS = fee-for-service; ADL = activities of daily living.

Conclusion

The risk adjustment systems we examined are quite similar in their approach to calculating risk scores. However, the broader payment systems in Medicare and Medicaid are more variable, including whether risk adjustment is budget-neutral, whether other risk-mitigation programs like reinsurance are in place, and how base payment rates are set prior to risk adjustment. In designing new risk adjustment models, it will be important to consider how risk adjustment will fit into the payment system for the program, as well as how the program's payment system will fit into the broader set of systems already in place—particularly if the risk adjustment model is being designed for high-need populations like dual enrollees.

Overall, each risk adjustment system has tradeoffs, and some systems have been studied more thoroughly than others to identify problems and potential solutions. The positive and negative incentives created by a particular system depend on the populations and plans participating in the program, as well as on the specific design of the risk adjustment model and the broader payment system. It is important that risk adjustment in integrated plans for duals, in particular, captures both high acute care needs and needs for institutional and community-based long-term services and supports, which make up the bulk of Medicaid spending for this population. Approaches like including functional status in risk adjustment (such as PACE frailty scores derived from the Health Outcomes Survey) or having a reinsurance program to further mitigate the risk of unexpectedly high spending (as in the Health Insurance Marketplaces and Part D) could help reduce incentives for plans serving dual enrollees to risk select and upcode. A detailed analysis of risk adjustment for integrated plans for dual enrollees is available in our companion research brief (Skopec et al. 2026).

Methods

We reviewed the literature on risk adjustment approaches using PubMed and Google Scholar. We also reviewed state, CMS, and model developer documentation of each risk adjustment model. We compared models based on features that fall into four categories: key policy goals, how the model calculates risk scores, how the model calculates risk-adjusted payments, and the documented benefits and drawbacks of each model.

Notes

[1] There are other risk adjustment models in Medicaid and Medicare that we do not cover here. Our analysis is not exhaustive but is intended to cover the major risk adjustment systems in use at the federal and state levels.

[2] DUALS Act of 2024, S. 3950, 118th Cong. (2024).

[3] "Your Health Plan Options," Medicare.gov, accessed March 26, 2026, https://www.medicare.gov/health-drug-plans/health-plans/your-health-plan-options.

[4] "Medicaid," Medicaid.gov, accessed March 26, 2026, https://www.medicaid.gov/medicaid.

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[6] "What's Medicare Drug Coverage (Part D)?," Medicare.gov, accessed March 26, 2026, https://www.medicare.gov/health-drug-plans/part-d.

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[8] "Program of All-Inclusive Care for the Elderly (PACE)," CMS.gov, accessed March 26, 2026, https://www.cms.gov/medicare/medicaid-coordination/about/pace.

[9] "ACO REACH Model," CMS.gov, accessed March 26, 2026, https://www.cms.gov/priorities/innovation/innovation-models/aco-reach.

[10] The Medicaid component of risk adjustment for Medicare-Medicaid plans under the Financial Alignment Initiative did not necessarily include regression-based risk adjustment using diagnoses and demographics. Instead, some states assigned beneficiaries to pre-determined rating cells. See MACPAC 2022.

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