Improving Risk Adjustment for Payment:

Evidence and Policy Considerations

June 18, 2019
MACRA Mini Summit, Washington, DC

Eric T. Roberts, Ph.D.
Assistant Professor of Health Policy & Management
University of Pittsburgh Graduate School of Public Health

Disclosures

- My research is supported by a Career Development Award from the Agency for Healthcare Research and Quality (AHRQ, Grant #K01 HS026727) and by the Laura and John Arnold Foundation
- This work does not necessarily reflect the views of AHRQ or the Arnold Foundation
- The findings presented today appear in:
  - *JAMA Internal Medicine* (September 2018): "Assessment of the Effect of Adjustment for Patient Characteristics on Hospital Readmission Rates"
  - *Health Services Research* (In press): "State Variation in the Characteristics of Medicare-Medicaid Dual Enrollees: Implications for Risk Adjustment"

Introduction

- Risk adjustment is used to calibrate payments to health plans and providers that assume risk for patients' spending and outcomes of care
- Risk adjustment is key to mitigating favorable/adverse selection that would otherwise distort payments and exacerbate health care disparities
- Current risk adjustment models range from robust (e.g., the CMS-HCC model) to rudimentary (stratified adjustment on a limited set of patient characteristics)
  - However, as I will discuss, even sophisticated models often omit salient and measurable risk factors
- CMS uses different risk adjustment models in different contexts, but without strong conceptual or empirical reasons underpinning these differences

Today's Talk

1. Review differences in risk adjustment models routinely used in payment
2. Address the rationale for including socioeconomic factors in risk adjustment models
3. Provide recommendations for enhancing socioeconomic risk adjustment using existing administrative data sources
4. Demonstrate an application of these recommendations to the risk adjustment of hospital readmission rates

Heterogeneity in risk adjustment models

Risk adjustment model:	CMS-HCC Model	HRRP Risk Adjustment Model	Age-sex stratification
Used for:	• Risk adjustment of payments to MA plans, ACO benchmarks, MIPS spending	• HRRP • Variant used in the Hospital-Wide Readmission measure	• Adjustment of admissions for ambulatory care-sensitive conditions *
Includes	• 77+ Hierarchical Condition Categories (assessed in prior year) • Age and sex • Original reason for Medicare entitlement (age vs. disability) • Current ESRD status • Dual enrollment in Medicaid • Institutionalization	• Age and sex • 31 disease indicators reported on claims in year before admission • Primary diagnosis of the index admission • Starting in 2019, hospitals are stratified by the % of Medicare inpatients who are duals	• Age and sex

* Used in the Value-Based Payment Modifier, but phased out of providers' quality scores for the MIPS.

Heterogeneity in risk adjustment models

Risk adjustment model:	CMS-HCC Model	HRRP Risk Adjustment Model	Age-sex stratification
Not Included	• Longer-term diagnostic history • Socioeconomic characteristics (other than dual status) • Functional status • Cognition • Distinctions in dual status by state/Medicaid coverage type	• Longer-term diagnostic history • HCC indicators (from prior year diagnoses) • Disability/ESRD • Socioeconomic characteristics • Functional status • Cognition • Distinctions in dual status	• Recent and long-term diagnostic history • Disability • SES • Functional status • Cognition • …

What should we adjust for?

Mathematically:

- Characteristics of patients that explain variation in outcomes used in payment
  - "Explained variation" or R^2
- Patient characteristics whose prevalence varies across providers, health systems, health plans
  - In principle, risk adjustment wouldn't be needed if patients were randomized
  - This doesn't preclude the need for other payment provisions (e.g., reinsurance/stop loss) to mitigate the effects of unexpected "outliers"

What should we adjust for?

The IOM identified the following criteria for inclusion of socioeconomic factors in risk adjustment:

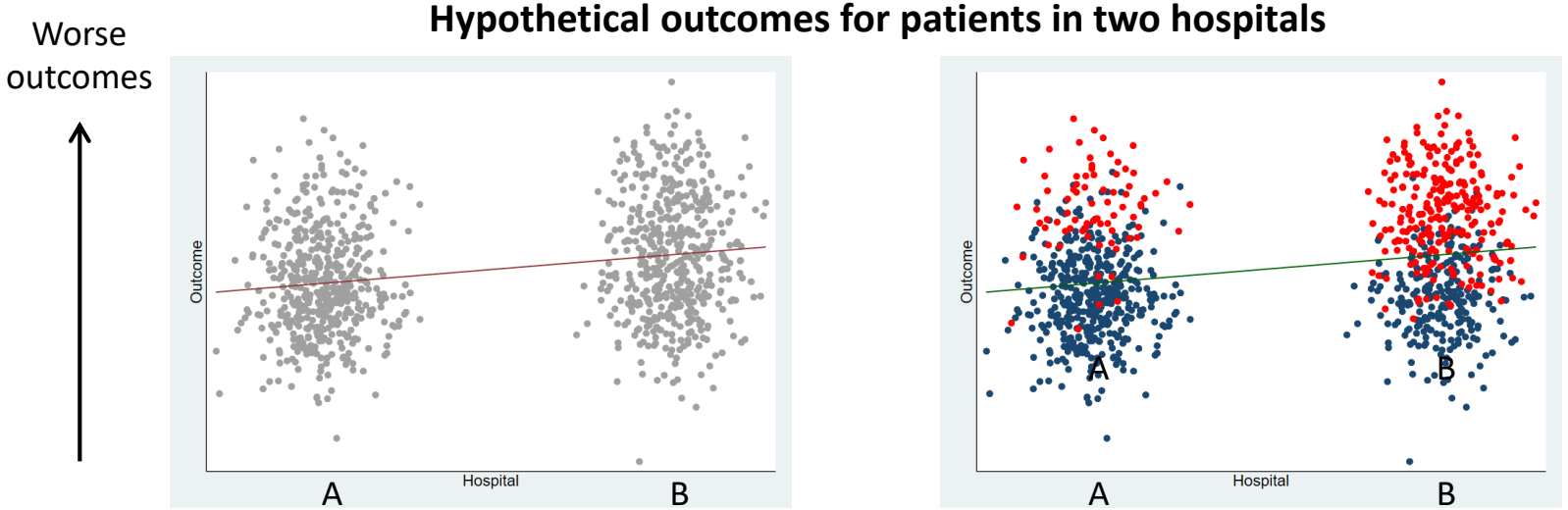
- Variables that have an empirical relationship with outcomes used in payment (e.g., spending, readmissions)
- Variables that have a conceptual relationship with the outcome
- Characteristics of patients that represent risk factors but are generally impervious to provider manipulation/upcoding
- Variables that incentivize health systems to improve quality, without setting disparate standards of care for disadvantaged patients
  - **This is where adjustment for socioeconomic factors ignites the greatest controversy**

Adjusting for socioeconomic risk factors:

Addressing and dispelling some misconceptions

- **Misconception:** Adjusting for socioeconomic factors "conceals" unequal quality
- **Fact:** Adjustment helps to isolate differences in provider/plan performance from variation in patient characteristics

Hypothetical outcomes for patients in two hospitals



Red patients: low SES

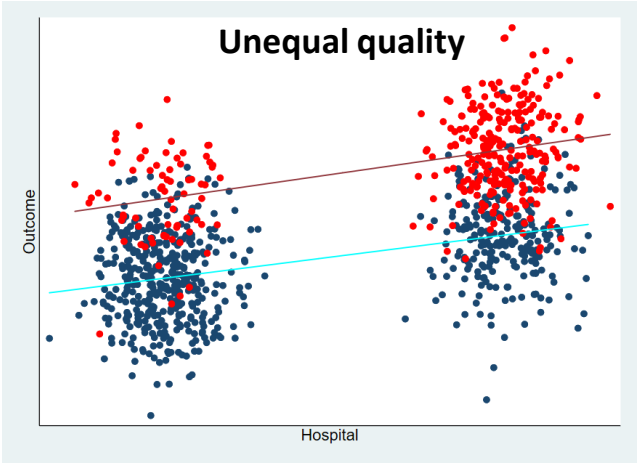
Blue patients: high SES

Adjusting for socioeconomic risk factors:

Addressing and dispelling some misconceptions

- **Misconception:** Adjusting for socioeconomic factors "conceals" unequal quality
- **Fact:** Adjustment helps to isolate differences in provider/plan performance from variation in patient characteristics

Worse outcomes



Red patients: low SES

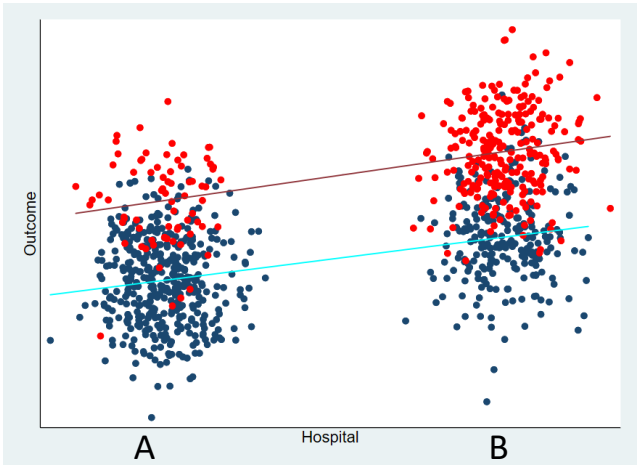
Blue patients: high SES

Adjusting for socioeconomic risk factors:

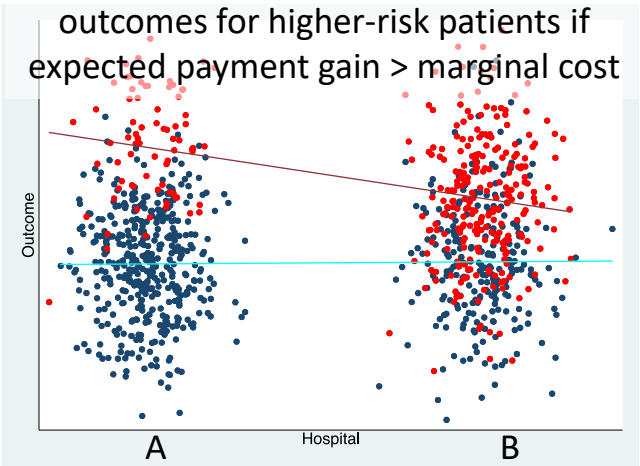
Addressing and dispelling some misconceptions

- **Misconception:** SES adjustment removes the incentive to improve care for disadvantaged patients
- **Fact:** Adjustment preserves incentives to improve care for higher risk populations; avoids penalties for organizations disproportionately serving these patients

Worse outcomes



There remains an incentive to improve outcomes for higher-risk patients if expected payment gain > marginal cost

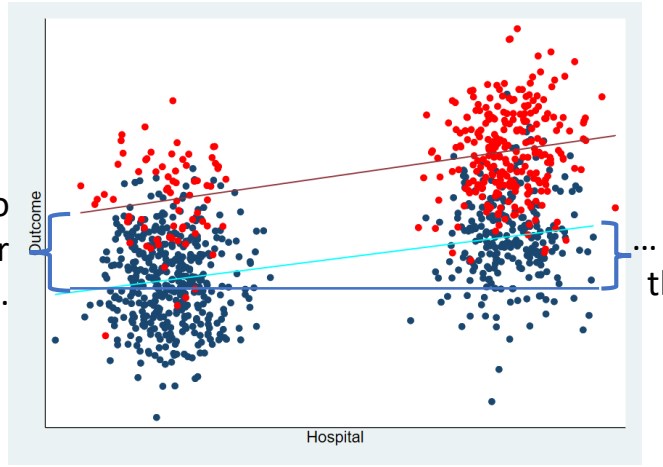


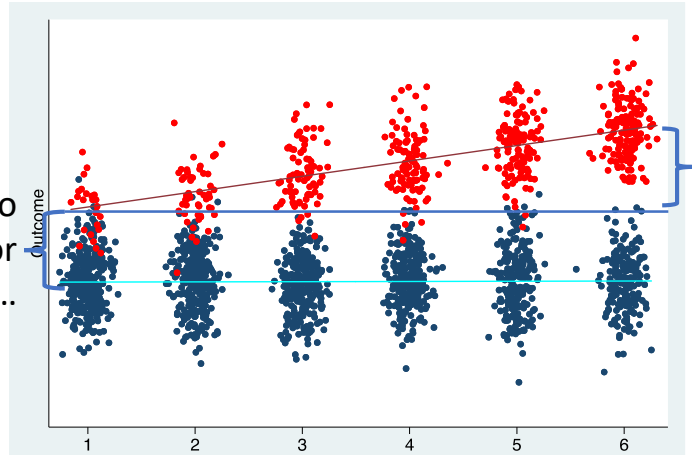
Red patients: low SES

Blue patients: high SES

Recommendations

1. Adjust for characteristics, *including socioeconomic factors,* that predict differences in costs/outcomes independent of the quality of one's health plan provider, etc.
   - Do not adjust quality differences between organizations serving more vs. fewer disadvantaged patients





Recommendations

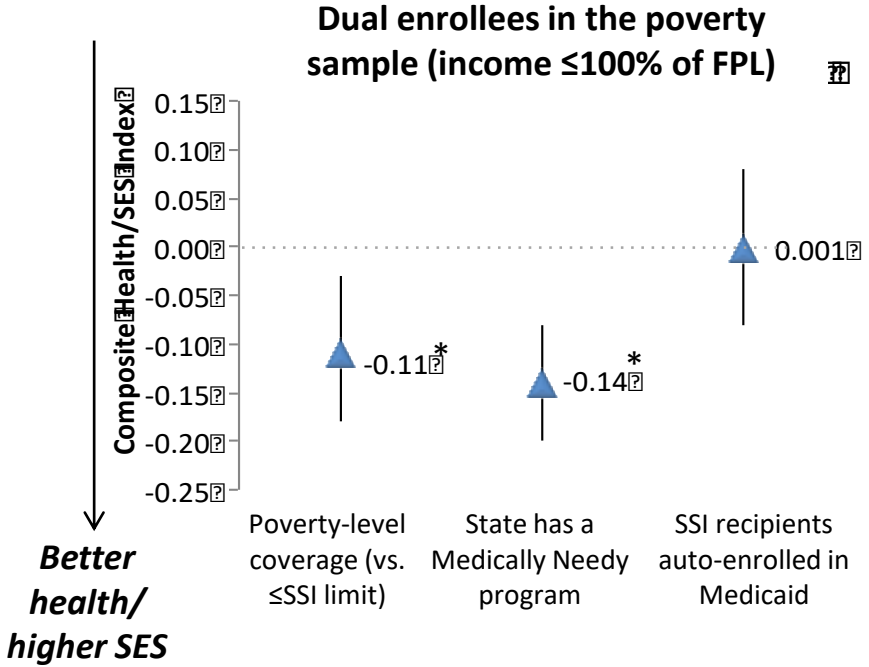
2. Improve the use of administrative data sources to measure socioeconomic and health risks

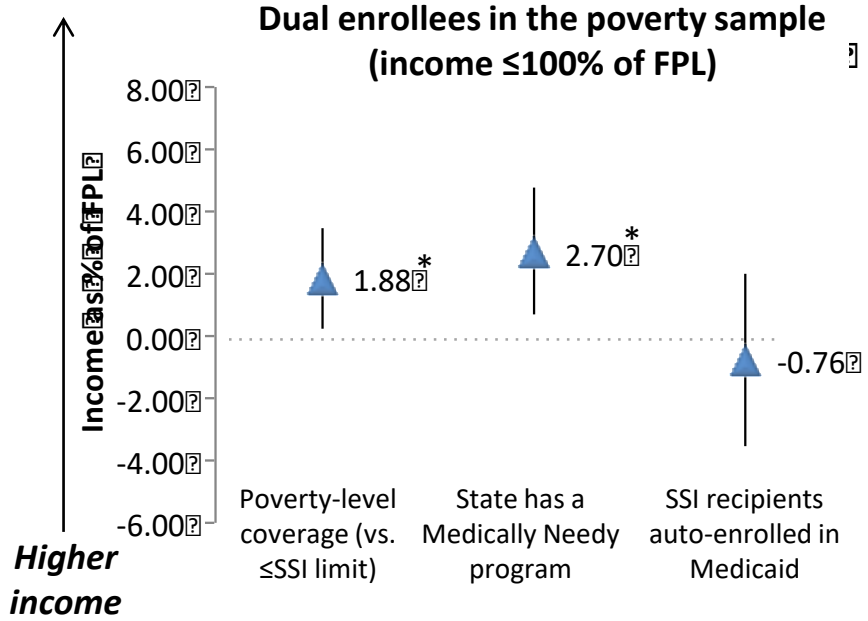
Construct	Variables not routinely used for adjustment but available in Medicare data
Established health conditions	• Chronic condition indicators from the CCW data warehouse (draws from Medicare claims since 1999 to characterize patients' cumulative disease history)
Socioeconomic status	• Enrollment in a Medicare Savings Program (partial Medicaid); available to individuals with low assets and income < 135% of FPL • Receipt of a Partial Part D Low-Income Subsidy; available to individuals with low assets and income 135-150% of FPL • Poverty, median household income, and educational attainment of individuals at the ZIP+4 level (via linked Census Bureau data) • **Distinctions in full-benefit dual status by eligibility pathway and state**
Concurrent health and social risks	• Interactions between health and socioeconomic variables

Distinctions in full-benefit dual status by eligibility pathway and state

- Different pathways for Medicare beneficiaries to qualify for Medicaid:
  1. Qualify for Supplemental Security Income
  2. Have low assets and income ≤100% of the FPL in states that provide poverty-level coverage (state option)
  3. Have high medical expenses relative to income (spend-down); often includes long-term skilled nursing facility residents
- States have different Medicaid eligibility and enrollment rules:
  - Some states provide poverty-level coverage (above SSI limit but ≤100% of FPL)
  - Some states offer spend-down pathways to Medicaid
  - Some automatically enroll SSI recipients in Medicaid; others require individuals to complete a separate Medicaid application form
- **A binary indicator of dual status obscures these differences**

Differences in characteristics of dual enrollees between states categorized by Medicaid policies





* P < 0.05. Note: models adjust for the state-level average characteristics of Medicare beneficiaries (income ≤100% of FPL), regardless of Medicaid enrollment status.

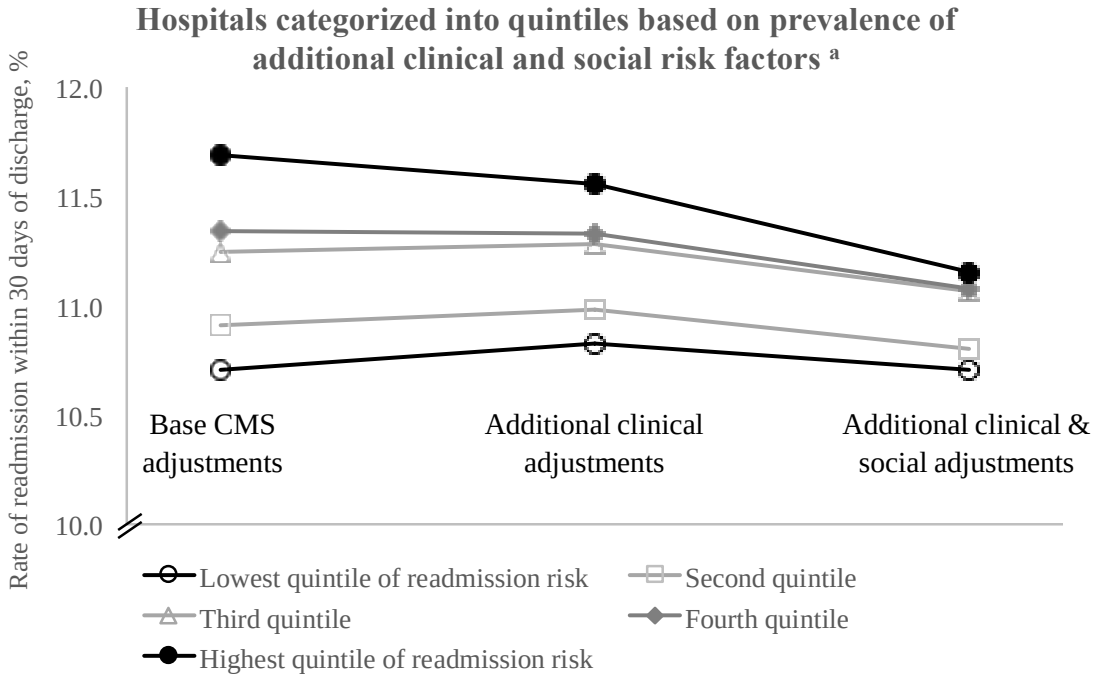
Application to the HRRP

We assessed the effect of adjusting for additional risk factors on readmission rates and HRRP penalties

Risk adjustment model:	Variables:
CMS risk adjustment	▪ Age and sex ▪ 31 disease indicators reported on beneficiaries' claims in the prior year ▪ Primary diagnosis of index admission
Additional clinical characteristics	▪ HCC indicators ▪ Chronic Conditions Data Warehouse (CCW) conditions ▪ Disability was original reason for Medicare enrollment ▪ End-stage renal disease ▪ Long-term residence in a nursing home
Additional social characteristics	▪ Dual Medicare and Medicaid enrollment ▪ Recipients of a Medicare Savings Program ▪ Recipients of the Part D Low-Income Subsidy ▪ No subsidies or prescription drug coverage ▪ Interaction between Medicaid enrollment and state Medicaid eligibility thresholds ▪ Poverty rate, household income, educational attainment, and proportion of residents living alone in the beneficiary's ZIP code and Census tract ▪ Interactions among clinical and social variables

Application to the HRRP

Changes in readmission rates for hospitals serving higher vs. lower risk patients



- Additional adjustments narrowed performance differences between hospitals serving the most vs. fewest high-risk patients by 54%

Application to the HRRP

Changes in readmission rates and penalties expected from further adjustments

- We estimated the change in hospitals' risk-adjusted readmission performance expected from further adjustments :
  - For the 10% of hospitals most affected by additional adjustments, readmission rates would be expected to change by 0.37 – 0.72 percentage points (30.3% - 58.9% of the distribution of hospital-level differences)
- Penalties reduced in half for hospitals most affected by the additional adjustments:

Percentile reduction in readmission penalties	Number of hospitals	Mean initial penalty (percentage points)	Mean change in penalty (percentage points)
1% of hospitals most affected by additional adjustments	23	2.29	-1.20
5% of hospitals most affected by additional adjustments	111	1.77	-0.81

Conclusions

- CMS uses different risk adjustment models for different payment programs, omitting relevant risk factors from some models
- Existing administrative data sources can be leverage to capture richer information on patients' health and socioeconomic characteristics
  - Particularly important to consider differences by state Medicaid policies and eligibility pathways
- Adjusting for socioeconomic factors neither obscures or nor institutionalizes disparities, provided that the adjustment is isolated to patient characteristics that contribute to spending/outcomes independently of provider/plan quality
- In the context of the HRRP, the risk adjustment methods we recommend would:
  1. Reduce the variation in hospital readmission rates by nearly 10%
  2. Reduce penalties (by ~50%, in relative terms) for hospitals serving the highest risk patients

Thank You

Twitter: @eric_t_roberts

Email: eric.roberts@pitt.edu