Building Better Measures: Exploration of Pharmacy and Medication-Related Quality

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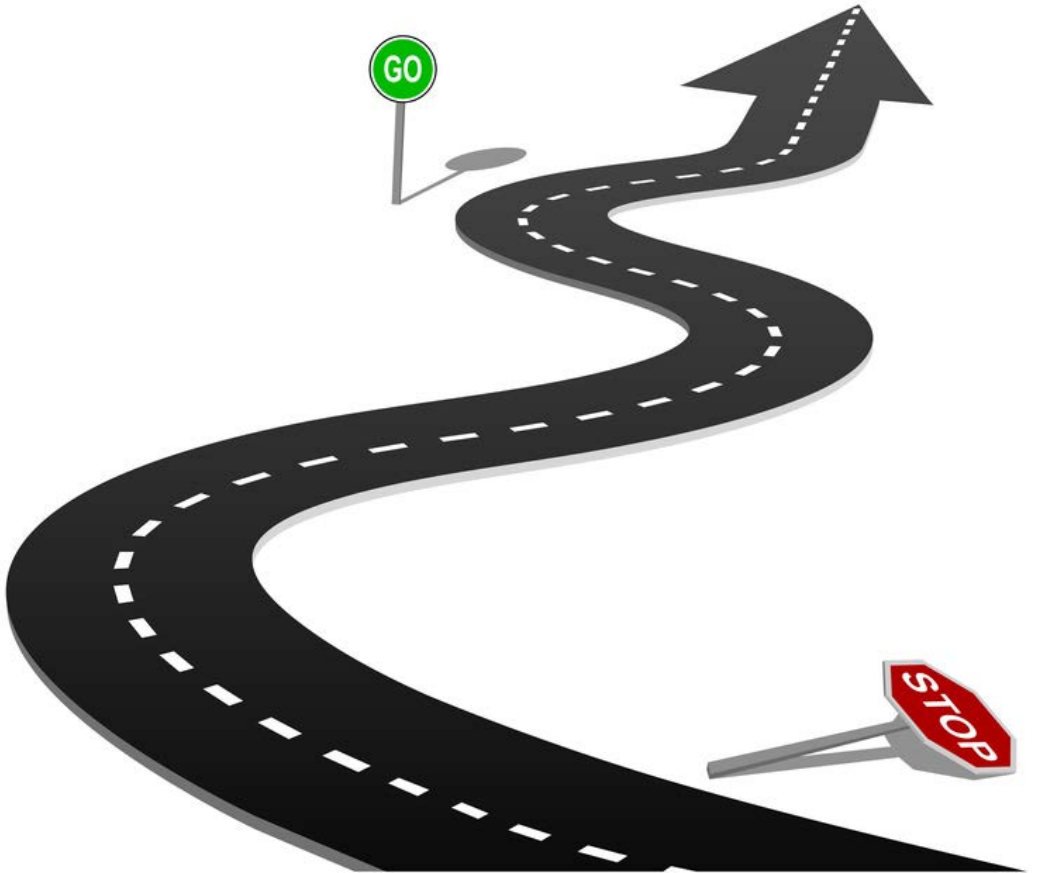
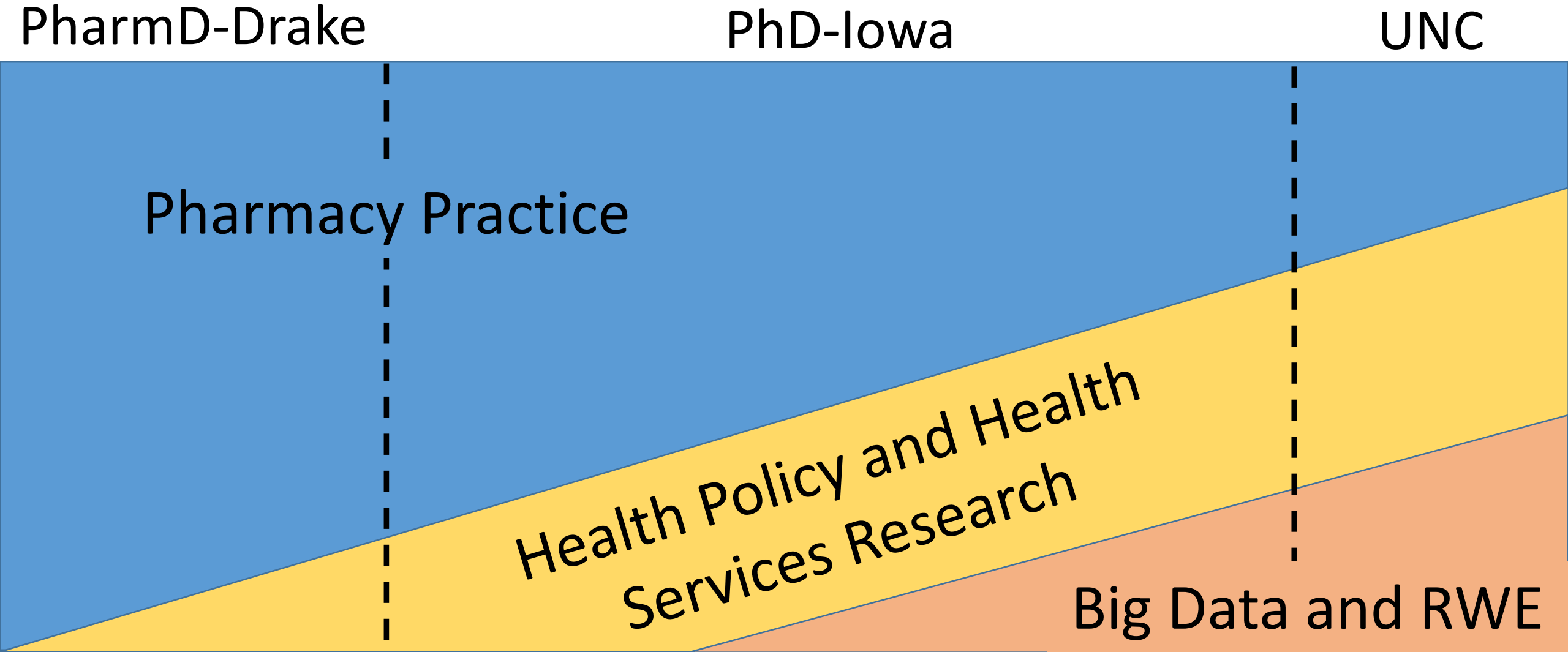
Roadmap

- Current landscape of pharmacy quality measurement
- My research on quality to date
- Takeaways and future research



Research Interests



Quality Measurement in Healthcare

- Use of quality measurement has accelerated following passage of ACA
- Quality measurement common across payers, providers, settings
- Quality measure sets supporting models often unscientific:

  "These measures were chosen after an extensive literature review, a review by a Technical Expert Panel, discussions with CMS, and consideration of alignment with other quality reporting efforts…"[1]

- Some evidence performance-based payment harms care for underserved patients[2]

1. Section 7: Quality Measures and the Performance Multiplier. In: *Oncology Care Model Performance-Based Payment Methodology.* Version 5.0. Center for Medicare and Medicaid Innovation. July 2018. Available at: https://innovation.cms.gov/Files/x/ocm-cancercodelists.zip.
2. Roberts ET, Zaslavsky AM, McWilliams JM. The Value-Based Payment Modifier: Program Outcomes and Implications for Disparities. Ann Intern Med. 2017.

Quality Measurement in Pharmacy

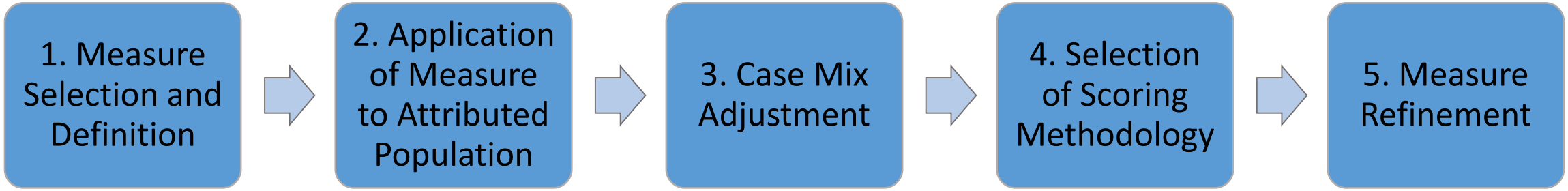
- Lags behind other healthcare sectors
- Increased rapidly since 2014
- Now more than 50% of Part D plan sponsors use quality measures to modify pharmacy payments and fees[3]
- Evidence base for pharmacy quality measures worse than measures for other entities

3. Sega T. Medicare Star Ratings Update. Paper presented at: Quality Forum Webinar; November 9, 2017.

Key Concepts of Quality Measurement

- Reliability: Extent to which quality signals can be sorted from noise[4]
- Validity: Extent to which measure variation correlates with care quality[5]

Steps for Constructing Performance Measure Set[6]



4. National Quality Forum (NQF). Reliability: NQF's Current Definition of Reliability and Related Concepts. May 2018. Available at www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=87595
5. National Quality Forum (NQF). Validity: NQF's Current Definition of Validity and Related Concepts. May 2018. Available at: www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=87594
6. **Urick BY**, Ferreri SP, Shasky C, Pfeiffenberger T, Trygstad T, Farley JF. Using Global Outcomes to Measure Pharmacy Performance: Lessons Learned from Implementing an Alternative Payment Model in Community Pharmacies. *J Manag Care Spec Pharm. Accepted and Awaiting Publication.*

Current Research on Pharmacy and Medication-Related Quality

Pharmacy Value Framework

PI: Ben Urick

Co-I: Julie Urmie

Pharmacy Value Framework

Aims

1. Design a framework to measure pharmacy value
2. Apply the framework by developing a draft pharmacy value composite measure

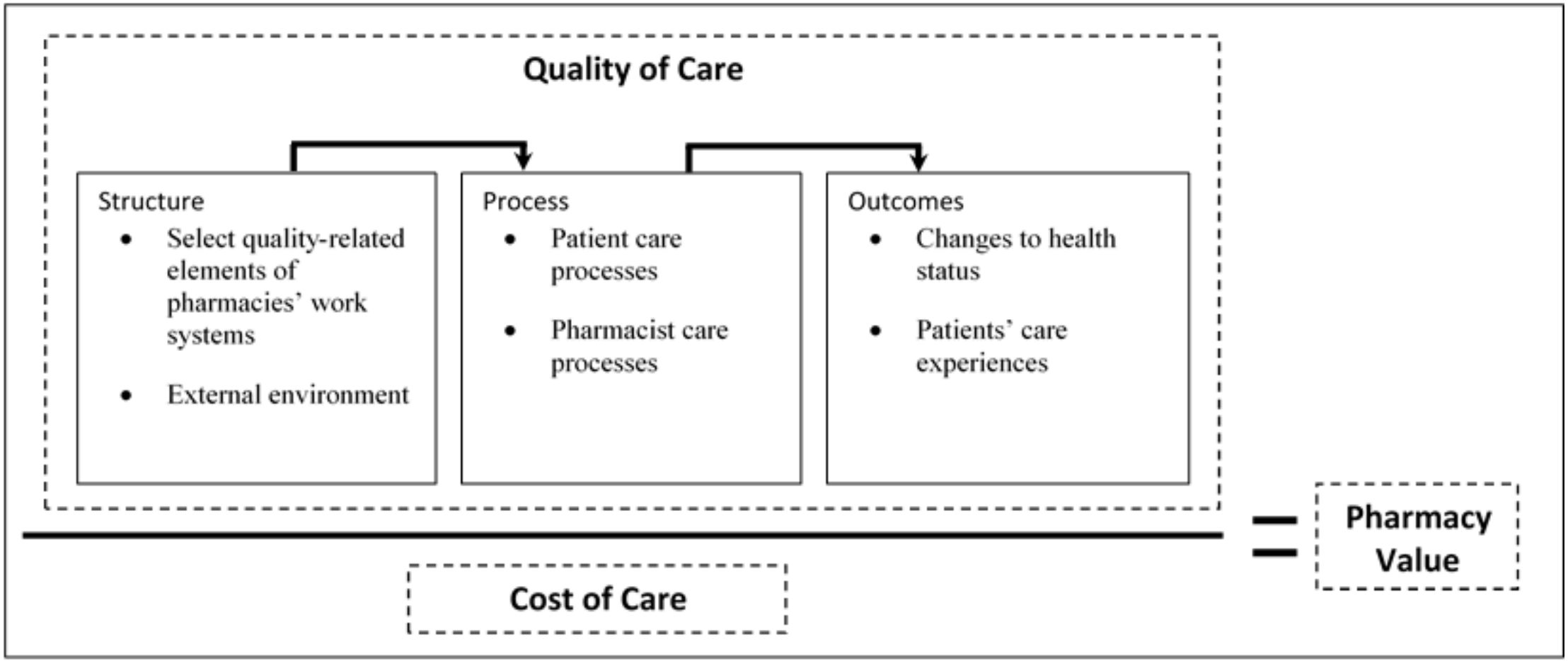
Data Sources and Population

1. Commercial medical, pharmacy claims from 1/1/2012 – 12/31/2013
2. 977 pharmacies and 191,905 patients

Methods

1. Retrospective, cross sectional study
2. Hierarchical linear models for case-mix adjustment of measures

Conceptual Model of Pharmacy Value



Score Mean, Min and Max by Quality Category

Measure	Low Quality		Typical Quality		High Quality	
	Pharmacy Frequency	Score Mean (Min., Max.)	Pharmacy Frequency	Score Mean (Min., Max.)	Pharmacy Frequency	Score Mean (Min., Max.)
RASA Adherence	44	0.594 (0.429, 0.713)	612	0.786 (0.588, 0.952)	22	0.923 (0.872, 1.000)
Statin Adherence	32	0.527 (0.310, 0.627)	603	0.703 (0.520, 0.933)	20	0.852 (0.802, 0.952)
β-blocker Adherence	20	0.54 (0.395, 0.635)	454	0.754 (0.553, 0.946)	9	0.924 (0.884, 0.970)
NIDA Adherence	7	0.505 (0.353, 0.592)	60	0.733 (0.500, 0.941)	7	0.939 (0.889, 1.000)
Med. Sensitive Hospitalizations	6	0.039 (0.032, 0.047)	159	0.021 (0.004, 0.037)	6	0.008 (0.003, 0.010)
Med. Sensitive ED Visits	17	0.128 (0.100, 0.152)	137	0.089 (0.047, 0.133)	17	0.054 (0.031, 0.074)
Composite Quality Score	43	---	92	---	36	---

RASA: Renin-angiotensin System Antagonists NIDA: Non-insulin diabetes agents

Value Matrix for Total Cost of Care (TCOC)

TCOC Spending Index Score	Combined Quality Score		
	Low Quality Outlier	Typical Quality	High Quality Outlier
Low Spending Outlier	12	26	11
Typical Spending	22	36	13
High Spending Outlier	9	30	12

Urick BY, Urmie JM. Framework to Assess Community Pharmacy Value. *Res Soc Adm Pharm*. *Accepted with Minor Revisions.*

Evaluation of the North Carolina Community Pharmacy Enhanced Services Network

PI: Joel Farley & Ben Urick

Co-I: Stefanie Ferreri, Chuck Shasky, Troy Trygstad, Trista Pfeiffenberger

Center for Medicare and Medicaid Innovation HCIA Round 2 (1R01AG050733-01A1)

Impact of Community Pharmacy Enhanced Services Network on Health Outcomes

Aims

1. Design and implement a performance measurement process for community pharmacies
2. Support implementation of enhanced pharmacy services
3. Evaluate the impact of enhanced services on patients health outcomes and utilization

Data Sources and Population

1. NC Medicaid medical, pharmacy claims from 3/1/2014 – 12/31/2017
2. Pharmacy care activity data 3/1/2015 – 12/31/2017
3. 157,051 Medicaid intervention patients, 253 intervention pharmacies

Methods

1. Patients retrospectively attributed to participating pharmacies
2. Targeted patients received a comprehensive medication review with longitudinal follow up
3. PS-matched difference-in-difference analysis to evaluate program effectiveness

Performance Measure Scoring

Background

- Pharmacies paid capitated rate for attributed patients and additional payments for service delivery
- Measures chosen based on expert opinion
- Quality measured for all North Carolina pharmacies
- Global measures normalized
- Case mix adjustment based on historic data
- Scoring based on standard deviations around grand mean

Weighting of Metrics Included in Performance Score

Metric	Outcome Category	Case Mix Adjusted?	Score Weight
PDC: NIDA	Surrogate	No	1
PDC: RASA	Surrogate	No	1
PDC: Statins	Surrogate	No	1
PDC: Multiple Chronic Medications	Surrogate	No	1
All-Cause ED Visit Rate	Global	Yes	2
All-Cause Hospitalization Rate	Global	Yes	2
Total Cost of Medical Care	Global	Yes	3

PDC=Proportion of days covered (a measure of adherence)

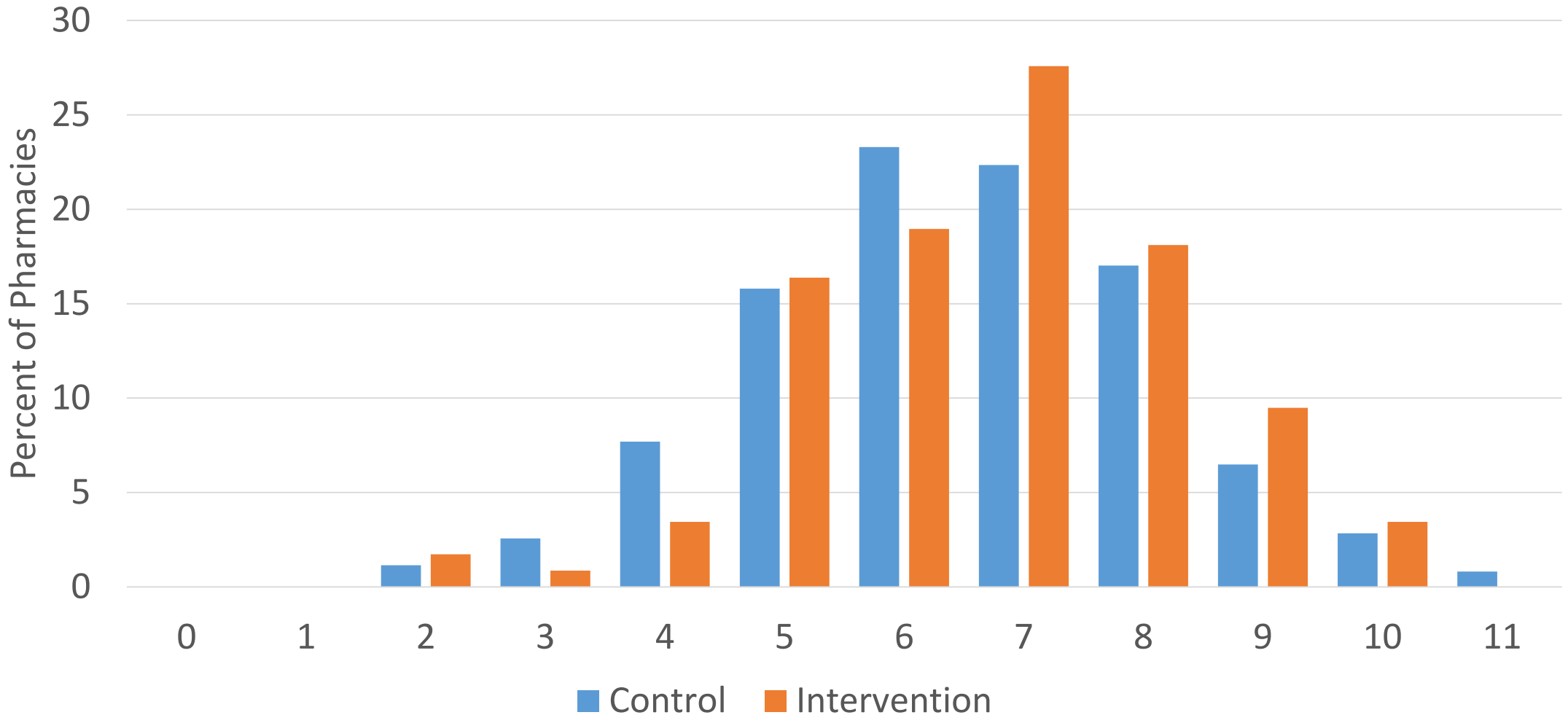
Metric Mean Score Comparisons

Metric Label	Intervention Pharmacy Score Mean (SD)	Control Pharmacy Score Mean (SD)	P-value for Comparison
PDC Score: NIDA	0.56 (0.27)	0.49 (0.26)	0.002
PDC Score: Statin	0.57 (0.22)	0.5 (0.25)	0.002
PDC Score: RASA	0.57 (0.22)	0.51 (0.24)	0.003
PDC Score: Multiple Chronic Medications	0.6 (0.25)	0.49 (0.24)	<0.001
All-Cause ED Score	1.32 (0.73)	1.37 (0.71)	0.465
All-Cause Hospitalization Score	1.45 (0.69)	1.39 (0.7)	0.372
Total Cost of Medical Care Score	1.47 (0.86)	1.55 (0.81)	0.266
Total Score	6.54 (1.59)	6.29 (1.66)	0.115

PMPM=Per-member, per-month spending

Urick BY, Ferreri SP, Shasky C, Pfeiffenberger T, Trygstad T, Farley JF. Using Global Outcomes to Measure Pharmacy Performance: Lessons Learned from Implementing an Alternative Payment Model in Community Pharmacies. *J Manag Care Spec Pharm. Accepted and Awaiting Publication.*

Pharmacy Total Score Histogram



Correlation between Pharmacy Characteristics and Outcomes

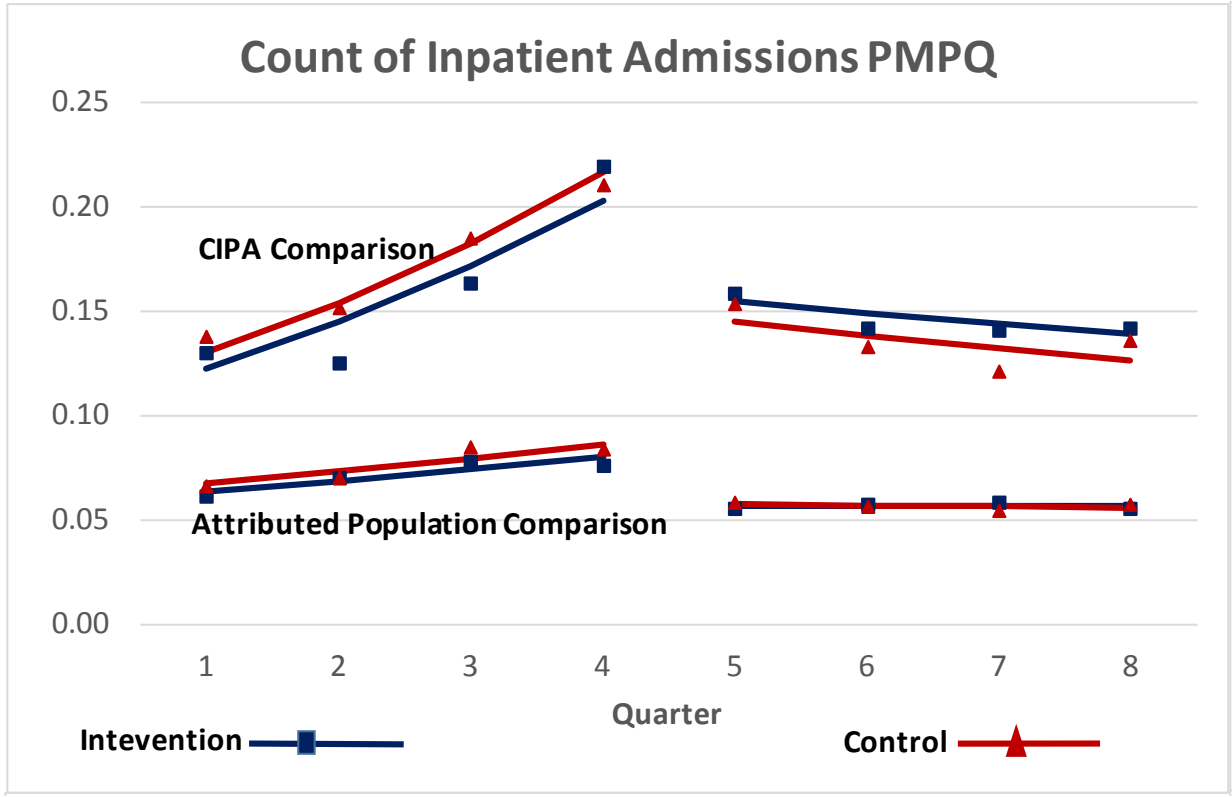
Survey Variables	ED Visit Rate	Hospitali-zation	Medical Spending	NIDA PDC	Statin PDC	RASA PDC	Multiple Chronic Medication PDC	Total Score
Pharmacist(s) allocated non-dispensing work hours clinical activities				+			+	+
Use of automated dispensing					-	-	-	
Free home delivery provided	-		-	+				
Home visits provided	+					+		+
Smoking cessation program provided					+	+	+	

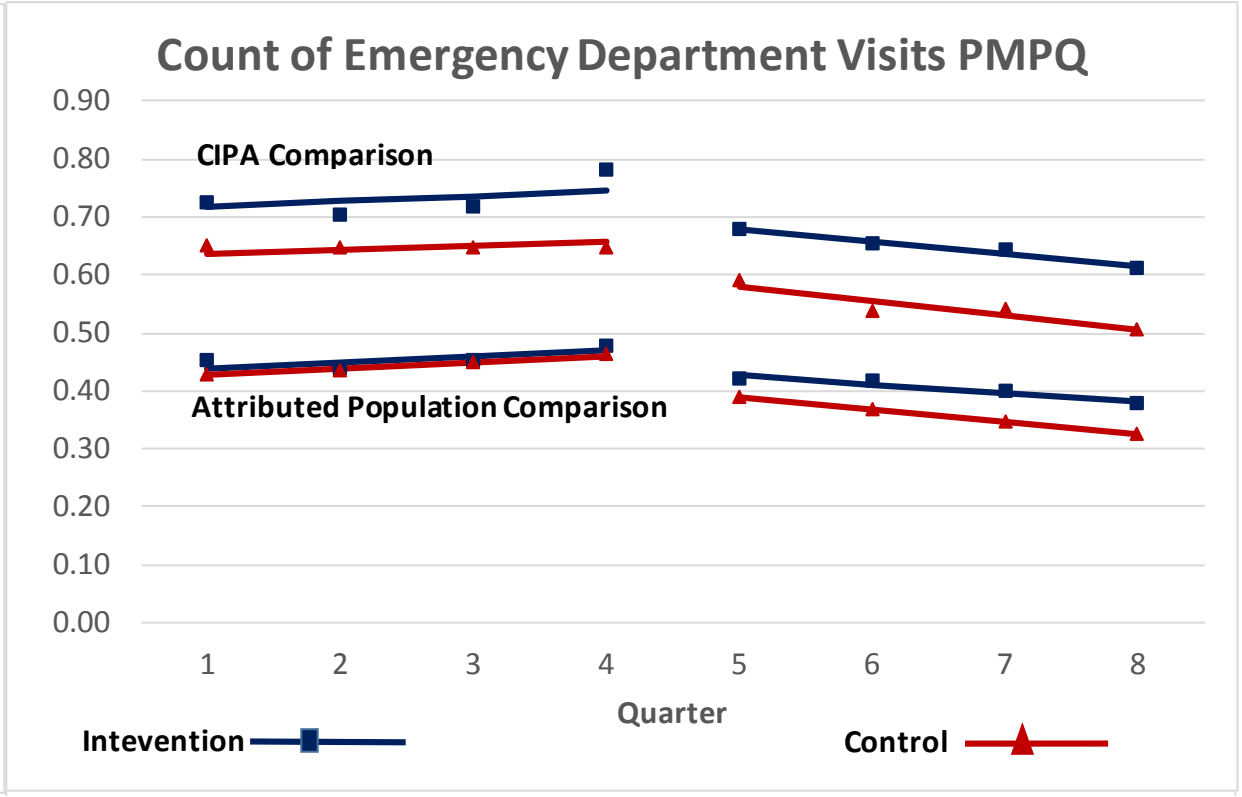
Renfro CP, **Urick BY**, Mansour M, Ferreri S. Relationship between Pharmacy Characteristics and Pharmacy Performance. *J Am Pharm Assoc. Under Review*.

Evaluation of Program Impact

- Two primary cohorts:
  - Patients attributed to study pharmacies
  - Patients who received a comprehensive initial pharmacy assessment (CIPA)
    - CIPA = comprehensive medication review with additional follow up
- Inclusion:
  - Medicaid enrolled 10/12 months before and after index
  - Chronic medication users
  - Attributable at least one month
- Exclusion:
  - Enrolled in Medicare
  - Age <18 or >64
- Propensity score matched difference-in-difference models used to evaluate differences in trends over time

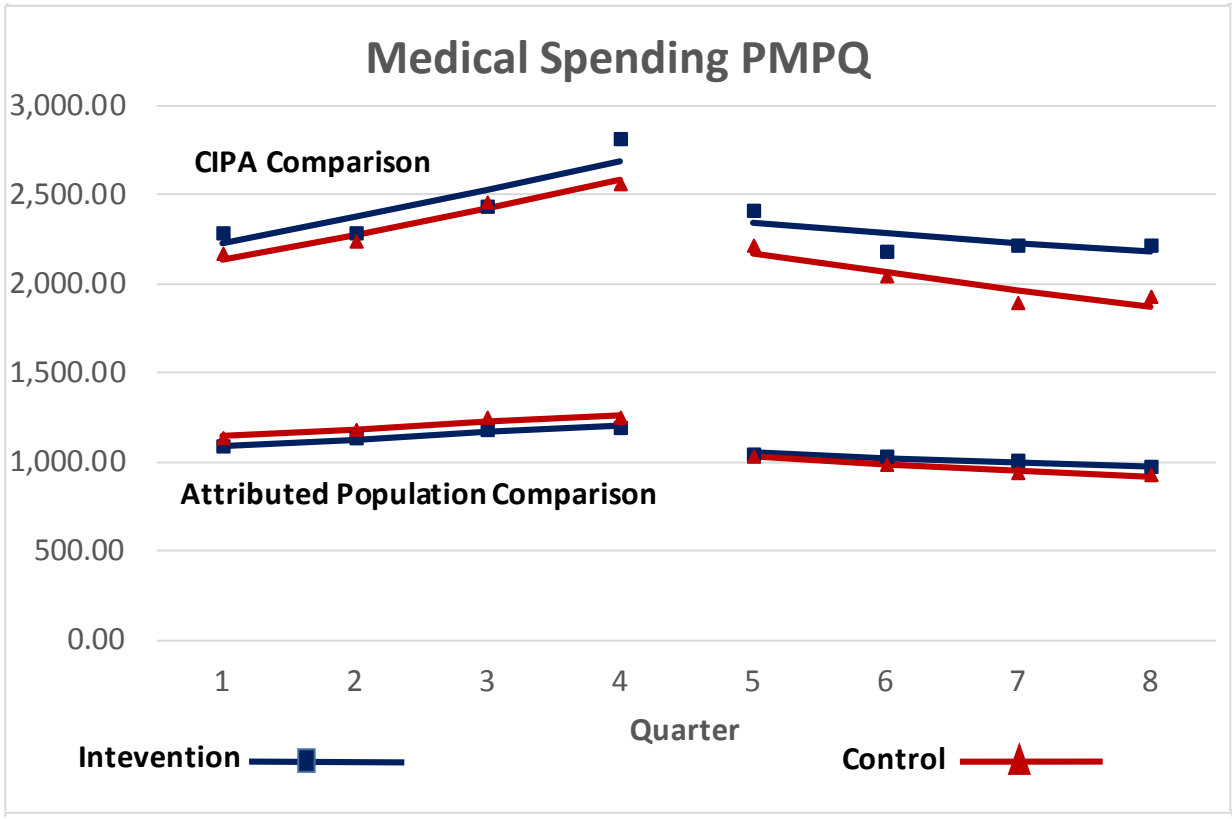
Evaluation of Program Impact

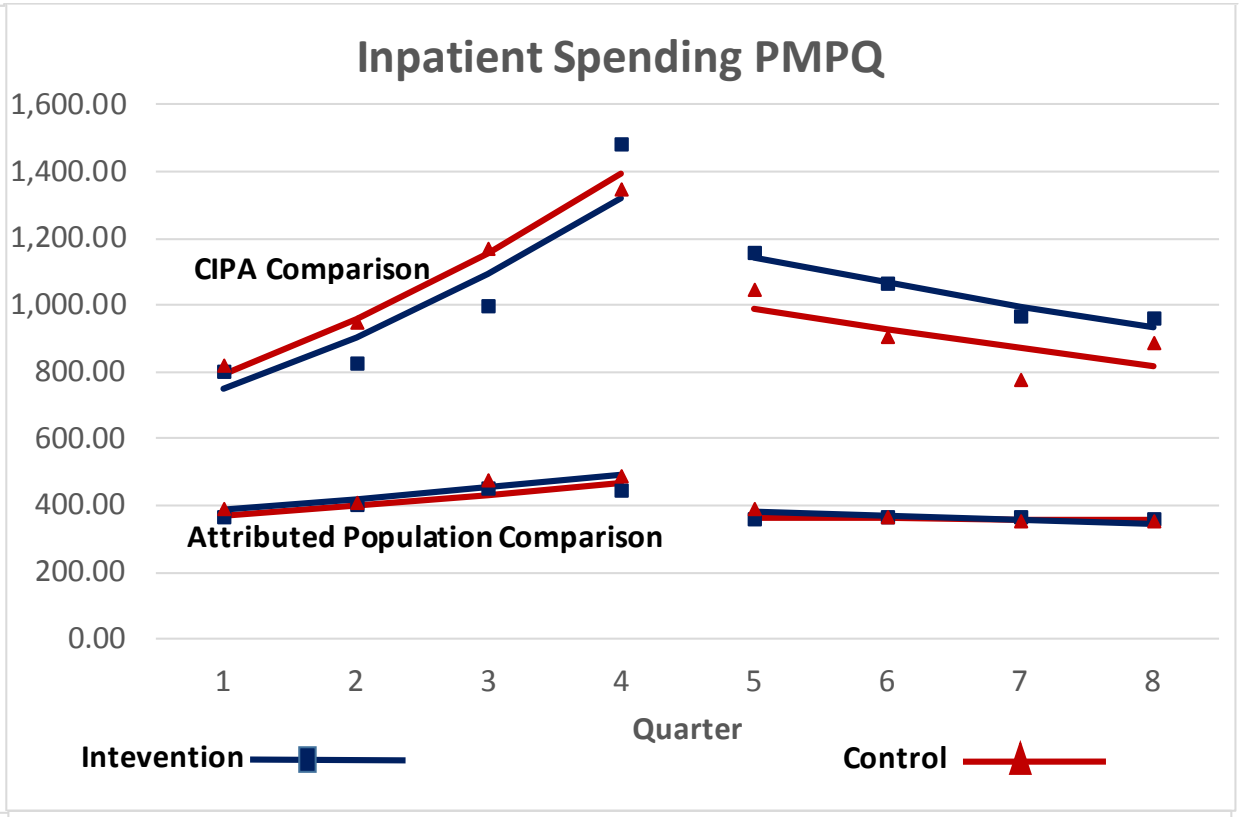




PMPQ: Per Member, Per Quarter CIPA: Comprehensive initial pharmacy assessment

Evaluation of Program Impact





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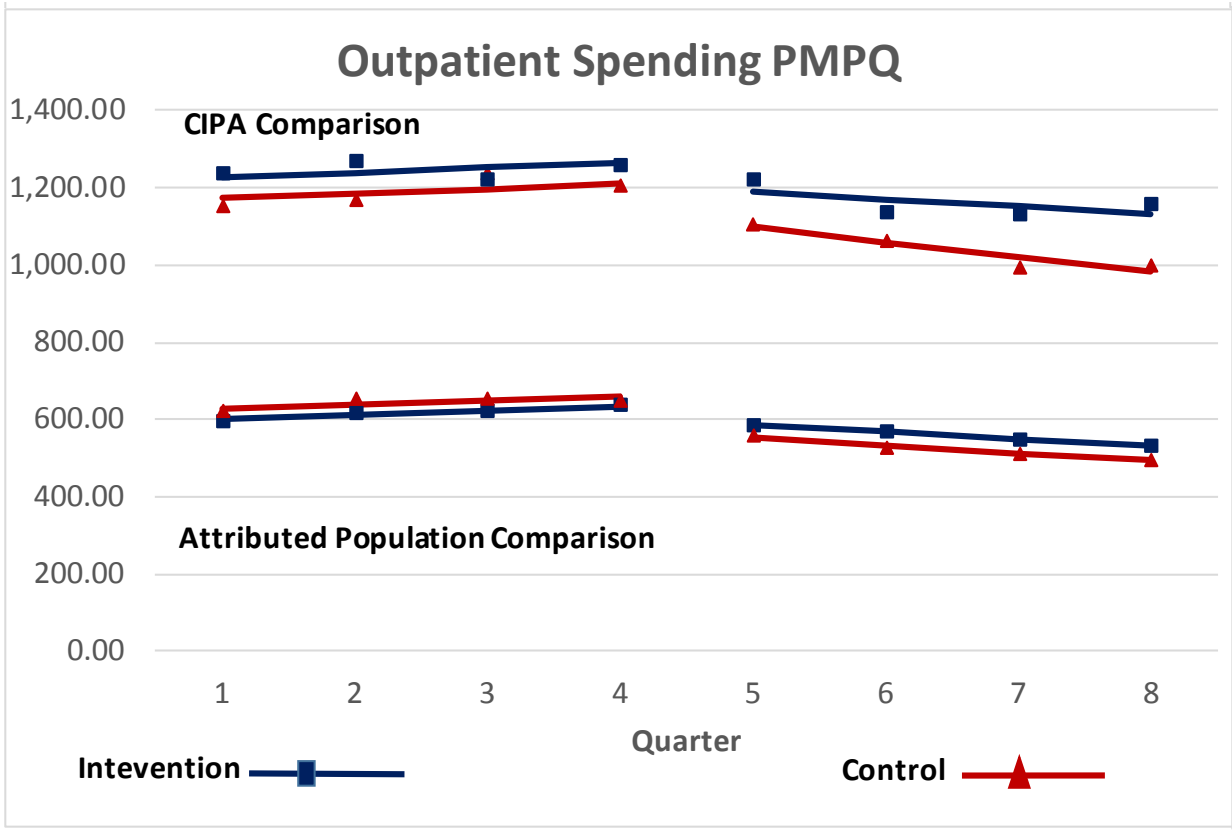
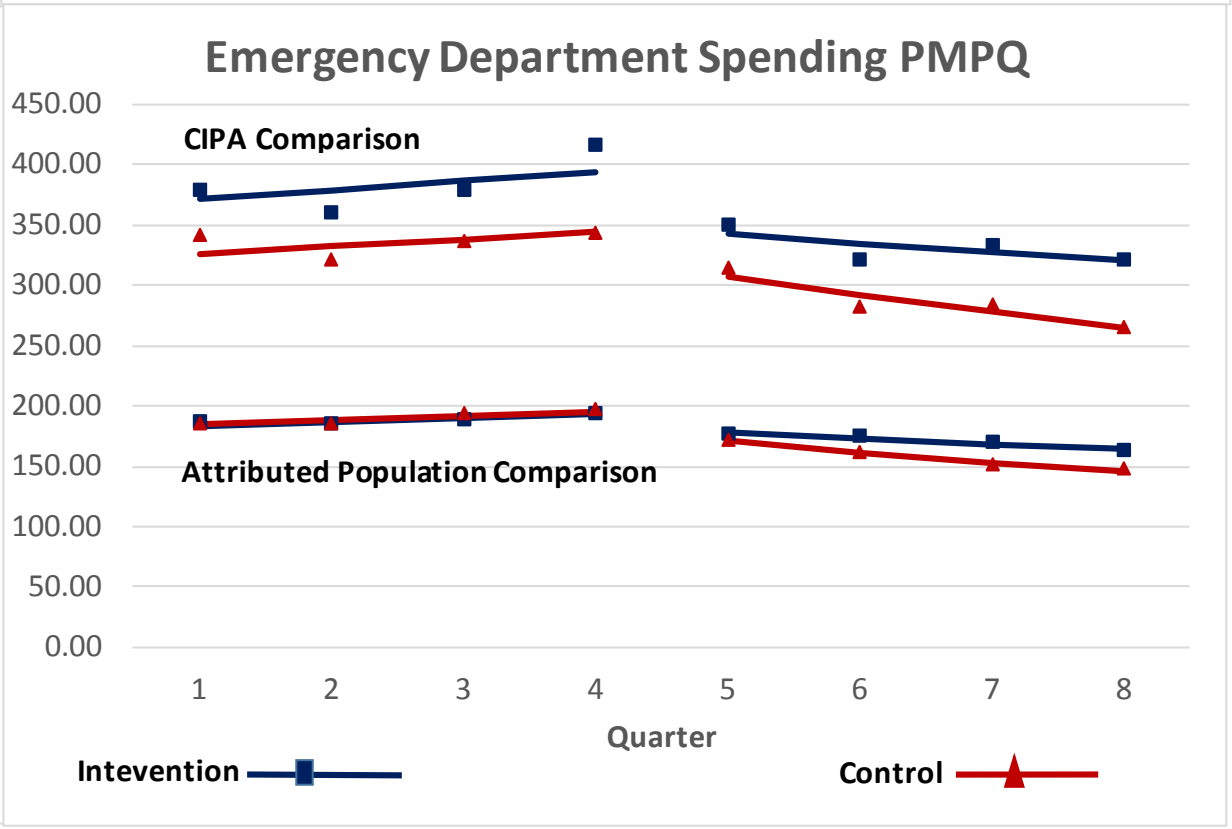




PMPQ: Per Member, Per Quarter CIPA: Comprehensive initial pharmacy assessment

CPESN Program Evaluation Summary

- Successfully built pharmacy network
- Implemented performance scoring system based on broad outcomes
- Varied pharmacy payments based on outcomes
- Improved adherence (9.5% RASA, 10.3% multiple chronic medications)
- Did not impact hospitalizations, ED visits, and spending
- Lack of impact may be due to:
  - Bias and confounding
  - Implementation heterogeneity
  - Patient heterogeneity

Diabetes Medications as a Proxy for Claims-Based Diagnosis of Diabetes

PI: Ben Urick

Co-I: Seth Cook, Dan Gratie

Funding: NC TraCS Institute Pilot Grant (2KR1011816)

Diabetes Medication Proxy

Aims

1. Assess the validity of diabetes medications as a proxy for a claims-based diagnosis of diabetes

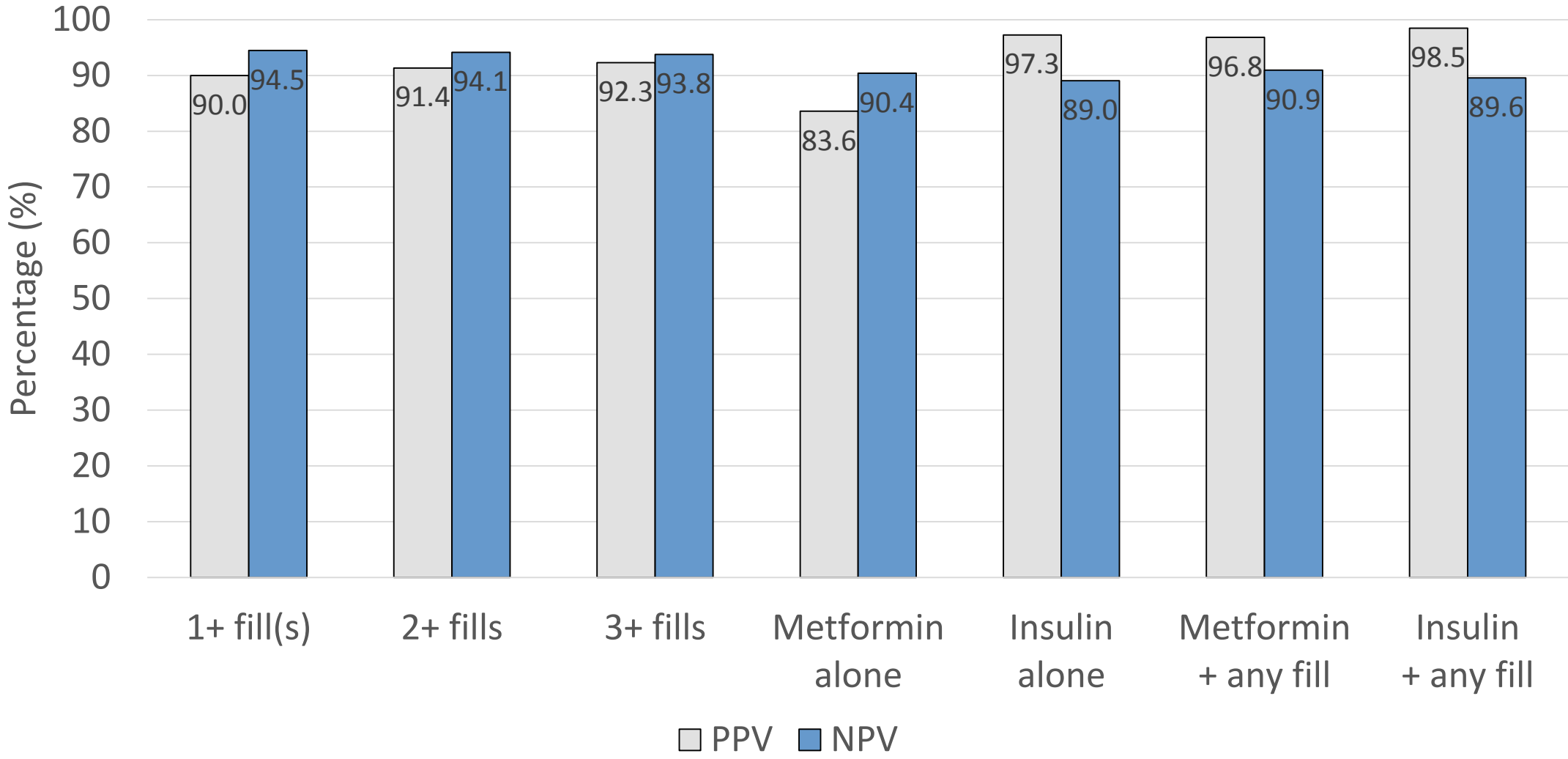
Data Sources and Population

1. MarketScan 1% sample, 1/1/2014 – 12/31/2014
2. 152,411 patients aged 40-64 with at least 10 months of enrollment
3. 17,942 claims-based diagnosis; 10,018 medication-based diagnosis

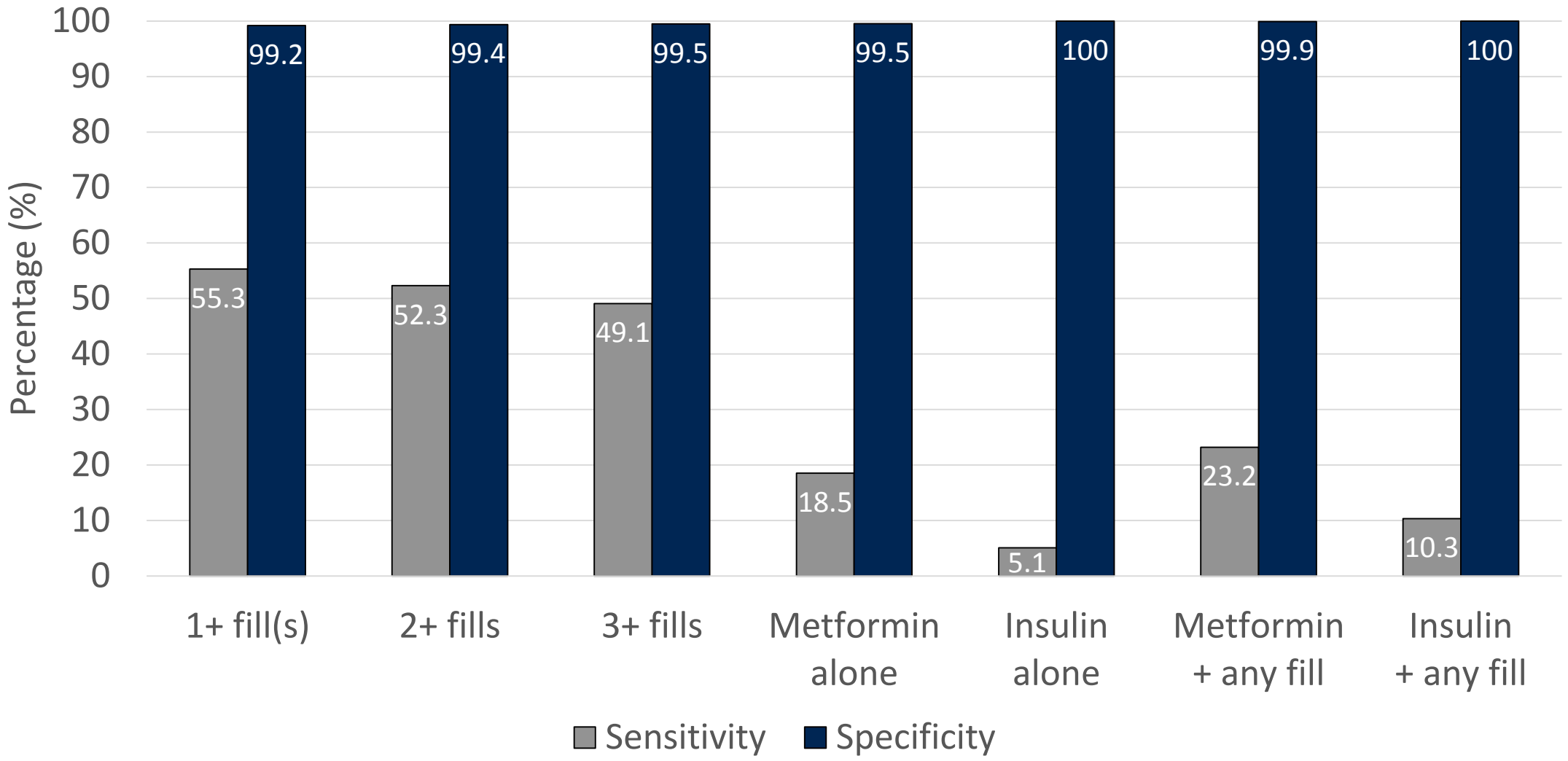
Methods

1. Using claims-based diagnosis as the gold standard, calculated positive predictive value, negative predictive value, sensitivity, and specificity

Positive Predictive Value and Negative Predictive Value



Sensitivity and Specificity



Cancer, Care Coordination, and Medication Use for Multiple Chronic Conditions

PI: Justin Trogdon

Co-I: Jennifer Lund, Katie Reeder-Hayes, Ben Urick, Stephanie Wheeler

Funding: National Institute on Aging (1R01AG050733-01A1)

Who Did What to Whom? Estimating the Relative Contribution of Pharmacists and Primacy Care Providers to Quality Measures

PI: Matt Pickering (Pharmacy Quality Alliance) & Ben Urick

Funding: Community Pharmacy Foundation

Relative Contribution of Pharmacists and Primacy Care Providers to Quality Measures

Aims

1. Develop and apply selection criteria for medication-related quality measures
2. Estimate the relative contribution of pharmacists and primary care physicians to medication-related and non-medication-related quality measures

Data Sources

1. Medicare 20% sample, 1/1/2014 – 12/31/2015
2. Medicare Data on Provider Practice and Specialty (MD-PPAS), 2015

Methods

1. Attribute patients to pharmacies, physician group practices
2. Construct multi-level models and estimate residual intraclass correlation coefficient (RICC) for both groups
3. Calculate RICC ratio to estimate relative contribution

Relationship between Telepharmacy Care and Healthcare Quality

PI: Ben Urick

Funding: Cardinal Health (Pending)

Telepharmacy and Healthcare Quality

Aims

1. Assess differences in medication adherence and medication appropriateness between telepharmacies and traditional pharmacies

Data Source

1. Dispensing data from first 18 months of telepharmacy operation
2. Dispensing data for same period from support pharmacies

Methods

1. Cross sectional design
2. Quality measures comprised of RASA, NIDA, and statin adherence as well as high-risk medications in the elderly and statin use in persons with diabetes
3. Hierarchical mixed models comparing quality measures across pharmacy types

Takeaways and Future Work

Key Takeaway Points

- Use of quality measurement growing
- Stakes for performance are getting higher
- However:
  - Very complex systems
  - Many decisions are arbitrary or based on expert opinion
  - Little research has evaluated reliability, validity of component, composite measures
  - Performance-based payments may not correlate to actual performance
- More research is needed to refine these systems

Future Work

- Continued work on reliability, validity of pharmacy quality measures
- Development of reliable, valid composite measures
- Refine quality measure for multiple chronic conditions adherence
- Assessment of impact of implementation of community pharmacy enhanced services network on outcomes for Medicare, dually enrolled beneficiaries
- Maintenance of adherence to chronic medications throughout cancer journey

Building Better Measures: Exploration of Pharmacy and Medication-Related Quality

Questions?

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