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BACKGROUND

- The **patient-centered medical home (PCMH)** is an innovative primary care model designed to enhance access, continuity, care coordination, and patient-centeredness
- In similar value-based payment initiatives, providers/practices majorly serving vulnerable populations tend to underperform on quality-of-care measures
- Association of patient case mix with quality performance has not been adequately explored in the medical home setting
- Inferences from previous studies are confounded by non-standardized definitions of medical homeness, and structural differences among comparison groups at baseline

OBJECTIVE

- To characterize **differences between the patient populations** served by medical homes that majorly serve low-income patients vs. other medical homes
- To **compare changes in and levels of quality performance** between medical homes that majorly serve low-income patients vs. other medical homes

METHODS

- Study Context - Maryland Multi-Payer PCMH Program (MMPP)**
- 3-yr statewide PCMH demonstration (2011-13) involving Medicaid & large commercial payers
 - 52 primary care practices underwent NCQA PCMH certification with technical support
 - Participants received unconditional PMPM payments, performance-based shared savings

- Study Design**
- Repeated annual cross-sectional analyses of administrative data & locational socioeconomic indicators from 2010 (baseline year) to 2013 (final year of MMPP implementation)
 - 44 MMPP PCMHs propensity-score matched to 67 comparator single-payer PCMHs and non-PCMH practices in MD based on location, structural, and provider characteristics
 - Study sample:** Non-elderly adult patients continuously enrolled in Medicaid / commercial plan

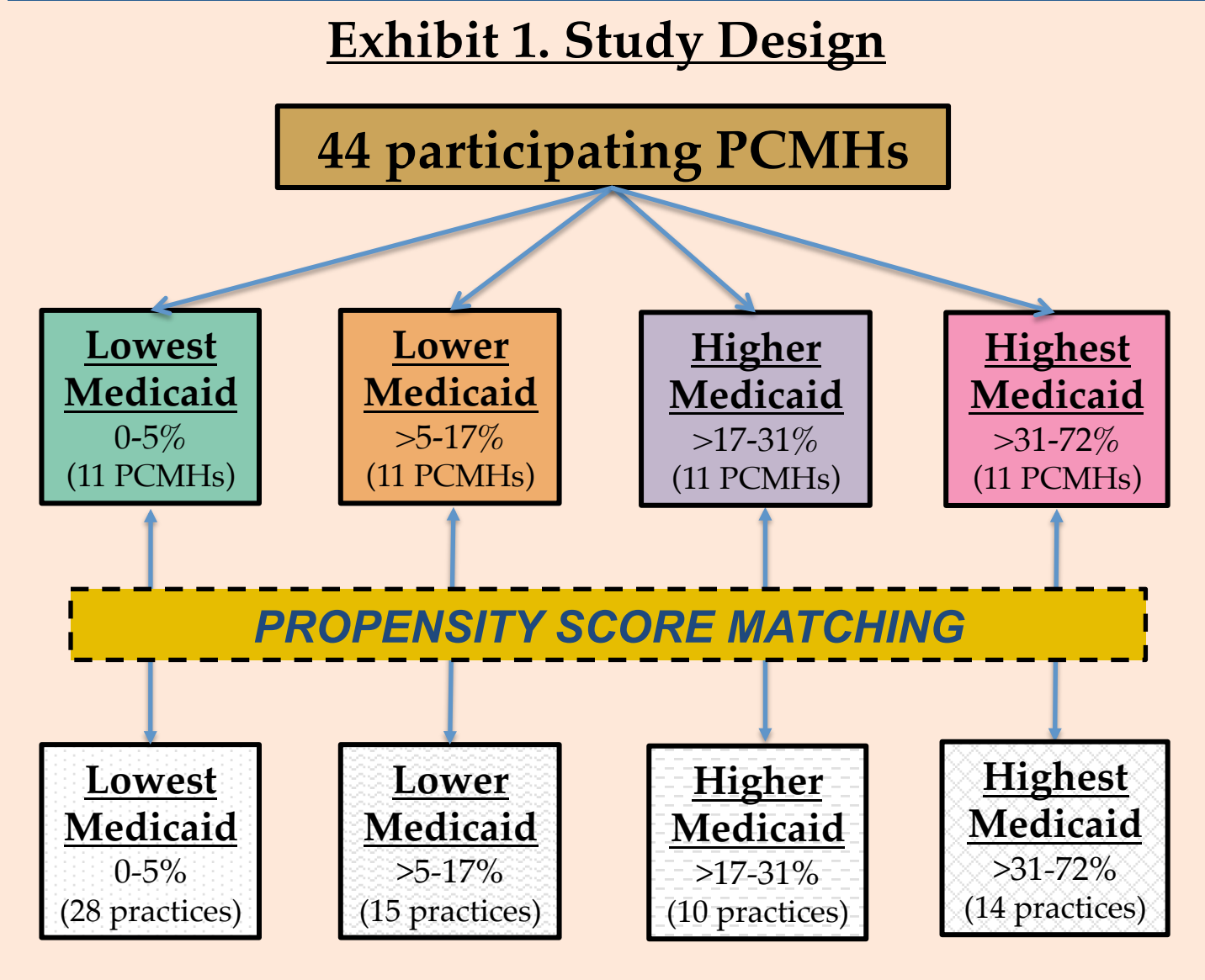
- Primary Independent Variable**
- Baseline practice-level proportion of Medicaid-insured patients, categorized into quartiles:
 - **Lowest Medicaid** (0-5%)
 - **Lower Medicaid** (>5-17%),
 - **Higher Medicaid** (>17-31%),
 - **Highest Medicaid** (>31%-72%)

- Outcomes**
- Annual diabetes screenings: HbA1c, LDL-cholesterol, retinal, and nephropathy screenings
 - Annual receipt of: influenza vaccination (all adults), mammogram (women aged 40-64 years)

- Covariates**
- Practice-level:** Log(patient count), practice setting, PCMH indicator
 - Patient-level:** age category, sex, payer type, resource utilization band (Johns Hopkins ACG)

- Statistical Analyses**
- Contrasts in case mix among PCMHs by proportion of Medicaid-insured patients**
 - Wilcoxon rank-sum & Fisher's exact tests
 - Changes in quality-of-care performance among study groups vs. comparators**
 - Population-averaged hierarchical logistic models with exchangeable within-practice correlation structure and robust correction

RESULTS



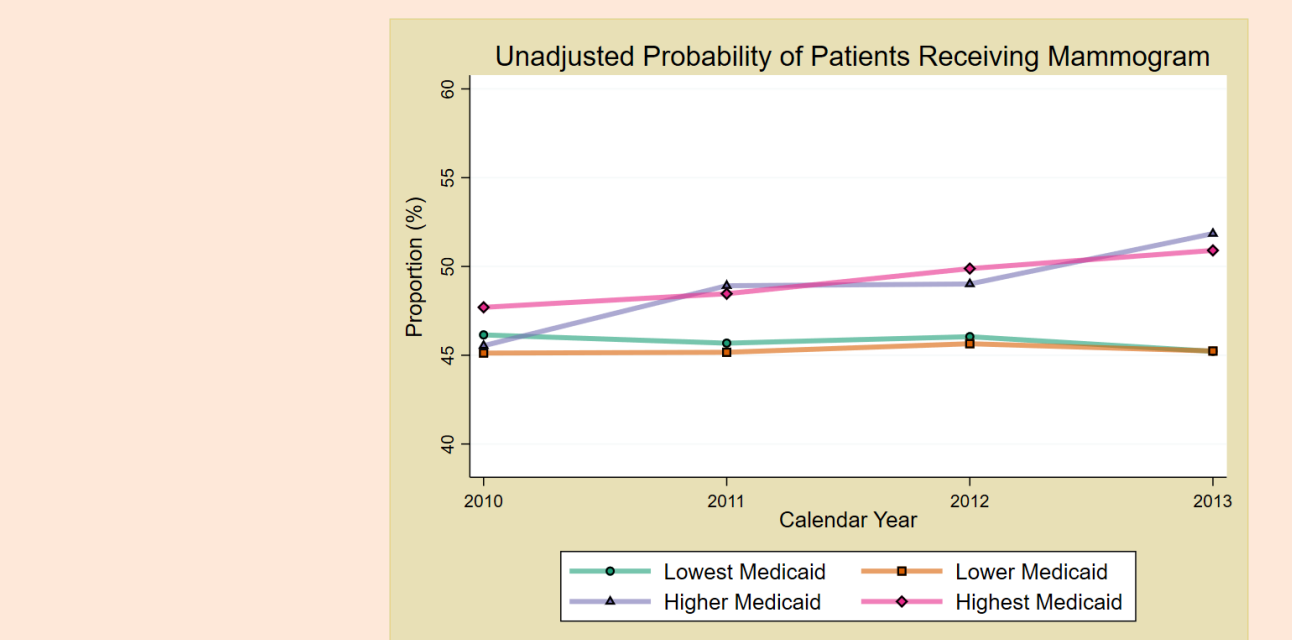
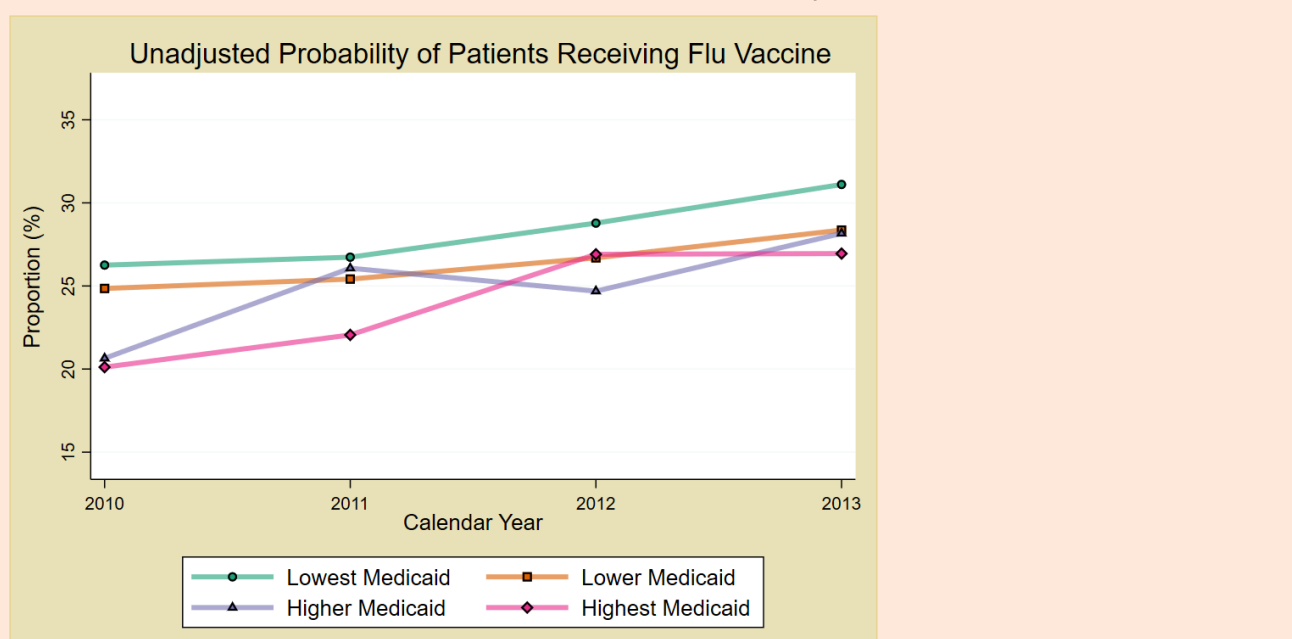
PCMH – patient-centered medical home
MMPP – Maryland Multi-Payer Patient-Centered Medical Home (PCMH) Program

Exhibit 2. Characteristics of Study Practices & Patients

		11 Lowest Medicaid PCMHs (N = 16,379)	11 Lower Medicaid PCMHs (N = 13,680)	11 Higher Medicaid PCMHs (N = 8,336)	11 Highest Medicaid PCMHs (N = 8,863)	P*
Practice Structural Characteristics						
Baseline PCMH certification	Level 1	10 (91%)	9 (82%)	8 (73%)	9 (82%)	0.95
	Level 3	1 (9%)	2 (18%)	3 (27%)	2 (18%)	
NCQA PCMH certification in 2012	Level 1	4 (36%)	1 (9%)	2 (18%)	3 (27%)	0.43
	Level 2	2 (18%)	4 (36%)	5 (45%)	1 (9%)	
	Level 3	5 (45%)	6 (55%)	4 (36%)	7 (64%)	
EMR functionality	None	4 (36%)	1 (9%)	2 (18%)	3 (27%)	0.61
	All electronic	2 (18%)	4 (36%)	5 (45%)	1 (9%)	
	Part electronic	5 (45%)	6 (55%)	4 (36%)	7 (64%)	
Patient-Level Characteristics						
Age in years in 2010, mean (SD)		43.0 (12.0)	44.1 (12.3)	42.0 (12.9)	37.7 (13.2)	<0.001
Count of chronic conditions, mean (SD)		1.8 (2.1)	2.0 (2.2)	2.4 (2.5)	2.0 (2.5)	<0.001
Non-white % of census tract population		34.2%	29.3%	47.7%	53.2%	<0.001
Tract mean household income		\$85,756	\$81,660	\$61,858	\$53,747	<0.001
% of tract households with food stamps		3.0%	6.2%	7.8%	11.0%	<0.001

*P-values from rank-sum tests for continuous variables and Fisher's exact tests for categorical variables
EMR – electronic medical record; NCQA – National Committee for Quality Assurance

Exhibit 3. Unadjusted Probabilities and Adjusted Odds of Receiving Outcome Measures



The graphs on the left depict unadjusted probabilities of two select outcomes for the study groups. Adjusted difference-in-differences (DID), and odds ratio (OR) estimands in the table are derived from population-averaged hierarchical logistic models of binary outcomes. Models control for patient's age, sex, insurance type (Medicaid vs. private payer), ACG resource utilization band, PCMH status of practice, practice setting, and practice size. DIDs are exponents of the change in log odds of the outcome from the baseline year (2010) to the final year of program implementation (2013) among intervention practices relative to matched comparison practices. ORs represent the ratio of odds of the outcome for intervention practices relative to Lowest Medicaid practices in the final year of program implementation (2013). 95% confidence intervals for estimands are provided in brackets.

	Relative to matched comparison practices over the 3-year period,	Relative to Lowest Medicaid PCMHs in the final year,
Lowest Medicaid PCMHs	<p>Decreased on:</p> <ul style="list-style-type: none"> flu vaccine (DID = 0.91 [0.86 - 0.97]) A1c screen (DID = 0.72 [0.63 - 0.82]) <p>Improved on: NONE</p>	-----
Lower Medicaid PCMHs	<p>Decreased on:</p> <ul style="list-style-type: none"> mammography (DID = 0.81 [0.72 - 0.90]) LDL screen (DID = 0.74 [0.59 - 0.93]) <p>Improved on: NONE</p>	<p>Had lesser odds for:</p> <ul style="list-style-type: none"> nephropathy (OR = 0.78 [0.67 - 0.90]) <p>Had greater odds for: NONE</p>
Higher Medicaid PCMHs	<p>Decreased on: NONE</p> <p>Improved on:</p> <ul style="list-style-type: none"> flu vaccine (DID = 1.12 [1.00 - 1.26]) 	<p>Had lesser odds for:</p> <ul style="list-style-type: none"> A1c screen (OR = 0.59 [0.49 - 0.72]) LDL screen (OR = 0.66 [0.55 - 0.79]) <p>Had greater odds for:</p> <ul style="list-style-type: none"> mammography (OR = 1.41 [1.30 - 1.54]) flu vaccine (OR = 1.09 [1.02 - 1.15])
Highest Medicaid PCMHs	<p>Decreased on: NONE</p> <p>Improved on:</p> <ul style="list-style-type: none"> flu vaccine (DID = 1.17 [1.06 - 1.28]) 	<p>Had lesser odds for:</p> <ul style="list-style-type: none"> mammography (OR = 0.75 [0.68 - 0.83]) flu vaccine (OR = 0.78 [0.73 - 0.83]) LDL screen (OR = 0.64 [0.53 - 0.78]) nephropathy (OR = 0.77 [0.65 - 0.92]) <p>Had greater odds for: NONE</p>

RESULTS

- There were 347,288 patient-year observations of 217,824 individuals for this study, drawn from 44 MMPP practices and 67 comparator practices (**Exhibit 1**)
- Although participating practices were similar structurally, patients of **Higher Medicaid** and **Highest Medicaid** medical homes had greater medical severity and lower residential indicators of socioeconomic status (**Exhibit 2**)
- Higher Medicaid** and **Highest Medicaid** quartiles experienced the greatest nominal increases from baseline in odds of patients receiving mammograms and influenza vaccinations (**Exhibit 3**)
- Relative to matched practices, **Higher Medicaid** and **Highest Medicaid** practices improved significantly on influenza vaccination during the course of the MMPP, while **Lower Medicaid** and **Lowest Medicaid** groups each declined in performance on two measures (**Exhibit 3**)
- After three years of program implementation, there was a negative association between Medicaid composition and performance relative to practices with the lowest proportion of Medicaid patients:
 - **Lower Medicaid** practices lagged **Lowest Medicaid** practices on 1 measure
 - **Higher Medicaid** practices lagged **Lowest Medicaid** practices on 2 measures
 - **Highest Medicaid** practices lagged **Lowest Medicaid** practices on 4 measures

CONCLUSIONS

- Among advanced medical homes, performance on generic and disease-specific clinical quality measures varied with the share of the patient panel covered by means-tested public health insurance
- Despite improvements, practices in the highest quartile of Medicaid composition did not attain performance levels of practices in the lowest quartile for most quality measures

LIMITATIONS

- Performance was evaluated solely on claims-based process measures, and not on patients' clinical outcomes
- Reported associations of practice payer mix with quality performance may be due to separate efforts implemented by the practice, independent of the medical home intervention
- Study population comprised of patients and providers from a single US state participating in a comprehensive medical home demonstration

IMPLICATIONS

- Structural capacities conventionally assessed for medical home recognition may not be adequate to address the complex intersectionalities affecting vulnerable patients
- Practices catering to underserved populations may face unique challenges in coordinating referrals, resource constraints for quality improvement, adequacy and motivation of staff
- There is need for deeper exploration of additional supports such practices need to achieve optimal results under the medical home model
- These findings support suggestions to incorporate socioeconomic characteristics into risk adjustment of performance measurement
- Value-based payment strategies should reward providers proportionally for performance improvement in addition to meeting specified targets