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Improving Health Care in Michigan

Blue Cross Blue Shield of Michigan

Building a Statewide PCMH Program: Design, Evaluation Methods, and Results

Margaret Mason, MHSA
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Overview of BCBSM

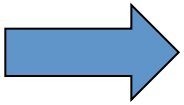
- Serving **4.4 million** Michigan members (40% in-state market share) and over **1.1 million** out of state members

- More than **7,000** employees state-wide

- Non-profit Michigan Blues have largest network in the state
  - More than **158 hospitals (100% of all MI hospitals)**
  - Nearly **30,000 physicians (95% of all MI physicians)**

- BCBSM processes over **84 million** claims and pays out over **$18.2 billion** in benefits

- Subsidiaries



- Accident Fund Holdings Inc.
- Blue Care Network of Michigan (HMO)
- BCBSM Foundation
- LifeSecure Insurance Company

Agenda

1. Overview of Blue Cross Blue Shield of Michigan Physician Group Incentive Program (PGIP) and Patient-Centered Medical Home Program (PCMH)
2. PCMH Site Visits – Sampling and Validation Process
3. PCMH Designation Methods
4. PCMH Evaluation Summary

Overview of Blue Cross Blue Shield of Michigan Physician Group Incentive Program and Patient-Centered Medical Home Program

Margaret H. Mason, MHSA
Value Partnerships Program Development

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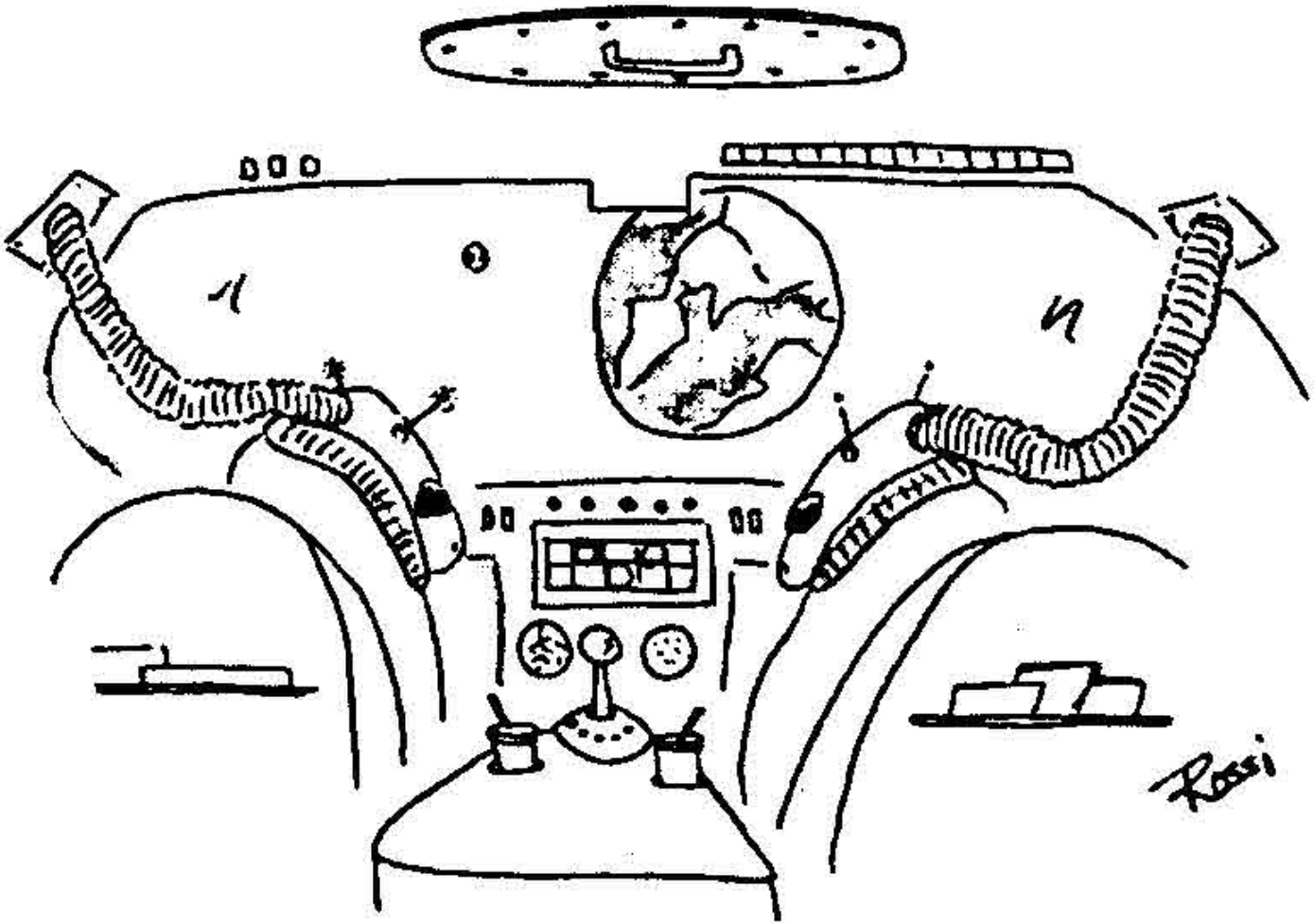

"Maybe there will be some primary care doctors available on *this* planet!"

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Physician Group Incentive Program: Catalyzing Health System Transformation in Partnership with Providers

2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014

Launch of PGIP based on Chronic Care Model → **PCMH Program** → **Organized Systems of Care (OSCs)**

- Physician Organizations have the structure and technical expertise to create highly functioning systems of care
- Design and execute programs in a customized and collaborative manner
- Measure performance at the population level and reward improvement as well as absolute performance: initial focus on GDR and building patient registries

- Launch PCMH
  - Support building of PCMH infrastructure
- Launch quality/use Initiatives
  - Measure PO performance across quality and use metrics such as preventive and evidence-based care, preventable ED use, high and low-tech imaging, IP use
- Include specialists involved in chronic care

- Building the PCMH-Neighborhood: expand PGIP to include all specialists
- Catalyze building of Organized Systems of Care – enable OSCs to assume responsibility and accountability for managing the PCP-attributed population of patients across all locations of care
  - OSC initiatives support integration of PCMH capabilities at OSC level

David A. Share and Margaret H. Mason, *Michigan's Physician Group Incentive Program Offers A Regional Model For Incremental 'Fee For Value' Payment Reform.* Health Affairs, 31, no.9 (2012):1993-2001.

Physician Group Incentive Program: Key Statistics

- As of summer 2013 the PGIP program includes:
  - Over 40 physician organizations from across the state
  - Nearly 18,000 physicians including both PCPs and specialists
    - 5,813 primary care physicians
    - 12,042 specialist physicians
    - Over 5,800 practice units
  - 30 initiatives supporting incremental practice transformation and rewarding improvement and overall performance
  - Affecting the lives of nearly 2 million people

- UM Evaluation: PGIP practices 5% lower cost compared to non-PGIP

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PGIP PCMH Program Consists of Two Components

1) PGIP PCMH Initiatives

- Opportunity for PGIP POs to participate in 12 PCMH-focused PGIP Initiatives that support implementation of 140 specific PCMH capabilities (started 2008)
- All PCPs and Specialists in PGIP may participate
- **Financial incentives based on the number of PCMH capabilities implemented during each six-month payment period**

POs work on Initiatives to achieve practice transformation.

2) PGIP PCMH Designation Program

- Opportunity for PGIP Practice Units to be PCMH- designated by BCBSM and rewarded for additional time and resources required (started in July 2009)
- Only PCPs are eligible to participate*
- **Fee for Value approach - increased fees**
  - **10% increase for E&M office visit services to PCMH-designated practices**
  - **Additional 10% increase in office visit fees for those PCMH-designated practices in POs with optimal population level cost performance**

**Note: as part of recent expansion of PGIP to include specialists, we have begun implementing fee increase opportunities for specialists delivering high-value care*

2008 Patient-Centered Medical Home Initiatives
Support implementation of:

- **Patient-Provider Partnership:** Physician, care team, and patient discussions about PCMH model and patient and provider roles and responsibilities
- **Patient Registry:** Comprehensive patient registries that enable population level management and point of care readiness
- **Performance Reporting:** Performance reporting that enables POs and providers to compare and track management of their patient population
- **Individual Care Management**: Care processes that enable patients with chronic conditions to receive organized, planned care and be empowered to take greater responsibility for their health.
- **Extended Access:** Care processes that ensures all patients have timely access to health care services that are patient-centered, culturally sensitive, and delivered in the least intensive and most appropriate setting
- **Test Tracking:** Standardized, reliable system to ensure that patients receive appropriate tests, and that test results are communicated in a timely manner.

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2009 Patient-Centered Medical Home Initiatives

Support implementation of:

- **Preventive Services:** Patient screening and education on both primary and secondary preventive care
- **Linkage to Community Services:** Community services directories and care processes to ensure patients receive needed community services
- **Self-Management Support:** Formalized care processes to enable patients to effectively manage their chronic conditions.
- **Patient Web Portal:** Web portals giving patients ability to schedule appointments, obtain test results, enter health information, and have e-visits
- **Coordination of Care:** Care processes that avoid duplication of services and effectively manage patient care transitions across settings
- **Specialist Referral Process:** Standardized referral processes to ensure patients receive needed care and all providers have timely access to the information they need to provide optimal care to the patient.

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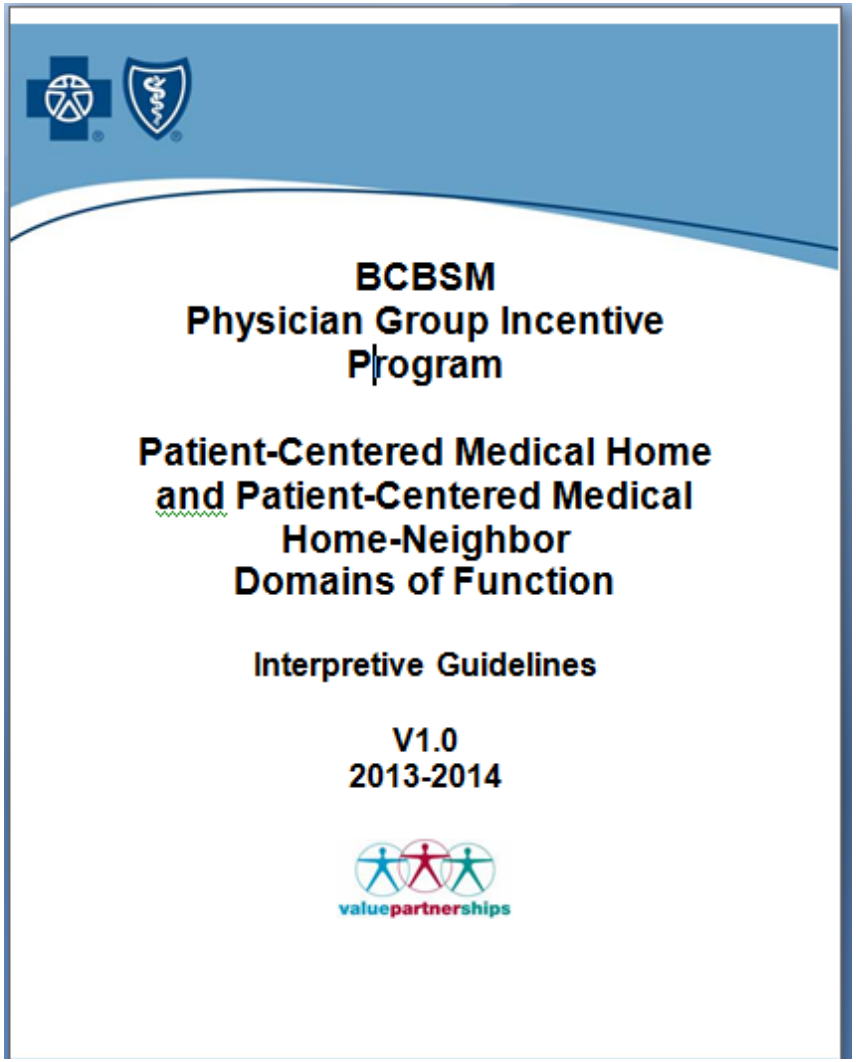
50+ Pages of PCMH Interpretive Guidelines



BCBSM
Physician Group Incentive Program

Patient-Centered Medical Home and Patient-Centered Medical Home-Neighbor Domains of Function

Interpretive Guidelines

V1.0
2013-2014

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5.0 Extended Access

5.1
Patients have 24-hour access to a clinical decision-maker by phone, and clinical decision-maker has a feedback loop within 24 hours or next business day to the patient's PCMH

Guidelines:

- Clinical decision-maker must be an M.D., D.O., P.A., or N.P. If not M.D. or D.O., clinical-decision maker must have ability to contact supervising M.D. or D.O. on an immediate basis if needed
  - Clinical decision-maker may be, but is not required to be, the patient's primary care provider
- Clinical decision-maker has the ability to direct the patient regarding self-care or to an appropriate level of care.
- Clinical decision-maker communicates all clinically relevant information via phone conversation directly to patient's primary physician, by email, by automated notification in an EMR system, or by faxing directly to primary physician regarding the interaction within 24 hours (or next business day) of the interaction
- Clinical decision-maker responds to patient inquiry in a timely manner (generally 15-30 minutes, and no later than 60 minutes after initial patient inquiry)

5.2
24-hour patient access to clinical decision-maker (as defined in 5.1) is enhanced by enabling clinical decision-maker to access and update patient's EMR or registry info during the phone call

Guidelines:

- Clinical decision-maker should routinely have access to patient's EMR or registry information for all calls
  - Occasional technical problems, such as failure of internet service in rural areas, may occur and would not constitute failure to meet the requirements of 5.2 as long as access to the EMR or registry is typically and routinely available

5.3
Provider has made arrangements for patients to have access to non-ED after-hours provider for urgent care needs during at least 8 after-hours per week and, if different from the PCP office, after-hours provider has a feedback loop within 24 hours or next business day to the patient's PCMH

Guidelines:

Annual Patient-Centered Medical Home Designation Process

- POs nominate Practice Units for designation annually
- Scores calculated based on:
  - PCMH capabilities in place (50%)
  - Performance on quality/use/efficiency measures (50%)
- PCMH review and scoring process occurs annually
  - POs and Practice Units are expected to continue to implement additional PCMH capabilities each year
  - In 2013 implemented "Honor Roll" concept for increased stability
    - Practices designated 2 years in a row will remain designated unless they have very poor performance

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Why Don't We Just Use the NCQA Program?

- PGIP PCMH program developed at the same time as NCQA**, in collaboration with our PGIP partners**
  - More emphasis on care processes, less on IT
  - Designed to support **incremental** progress in building the PCMH model

- We factor in quality/use/efficiency performance as well as PCMH infrastructure

- Our **Site Visit process** plays a key role in educating and obtaining feedback from POs and practices and supporting our PCMH and new OSC programs

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PCMH Program in 2013

- BCBSM's PCMH program includes:
  - Approximately 13,000 PCPs and specialists implementing PCMH capabilities
  - Number of participating providers increases each year

- 2013 BCBSM PCMH Designation Results
  - Over 3,600 primary care physicians in 1,243 practice units caring for more than 1.8M BCBSM members
  - Approximately $35M in annual E&M uplifts for PCMH designated primary care providers

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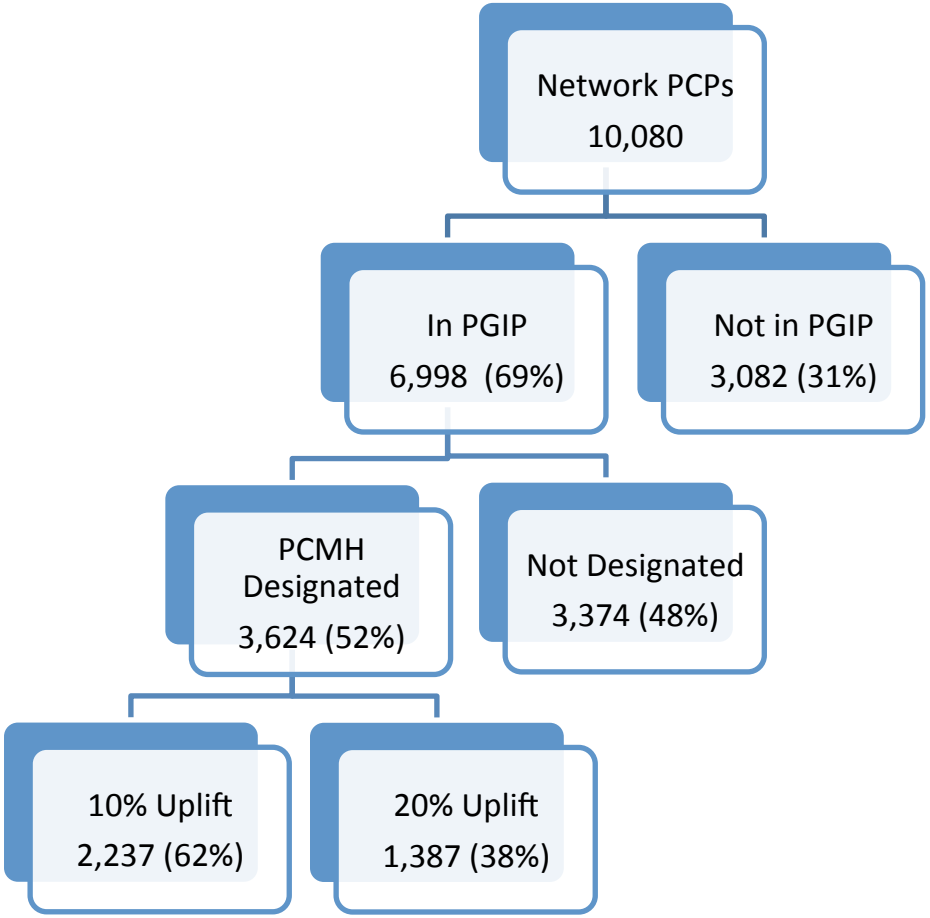
Majority of Michigan PCPs are in PGIP



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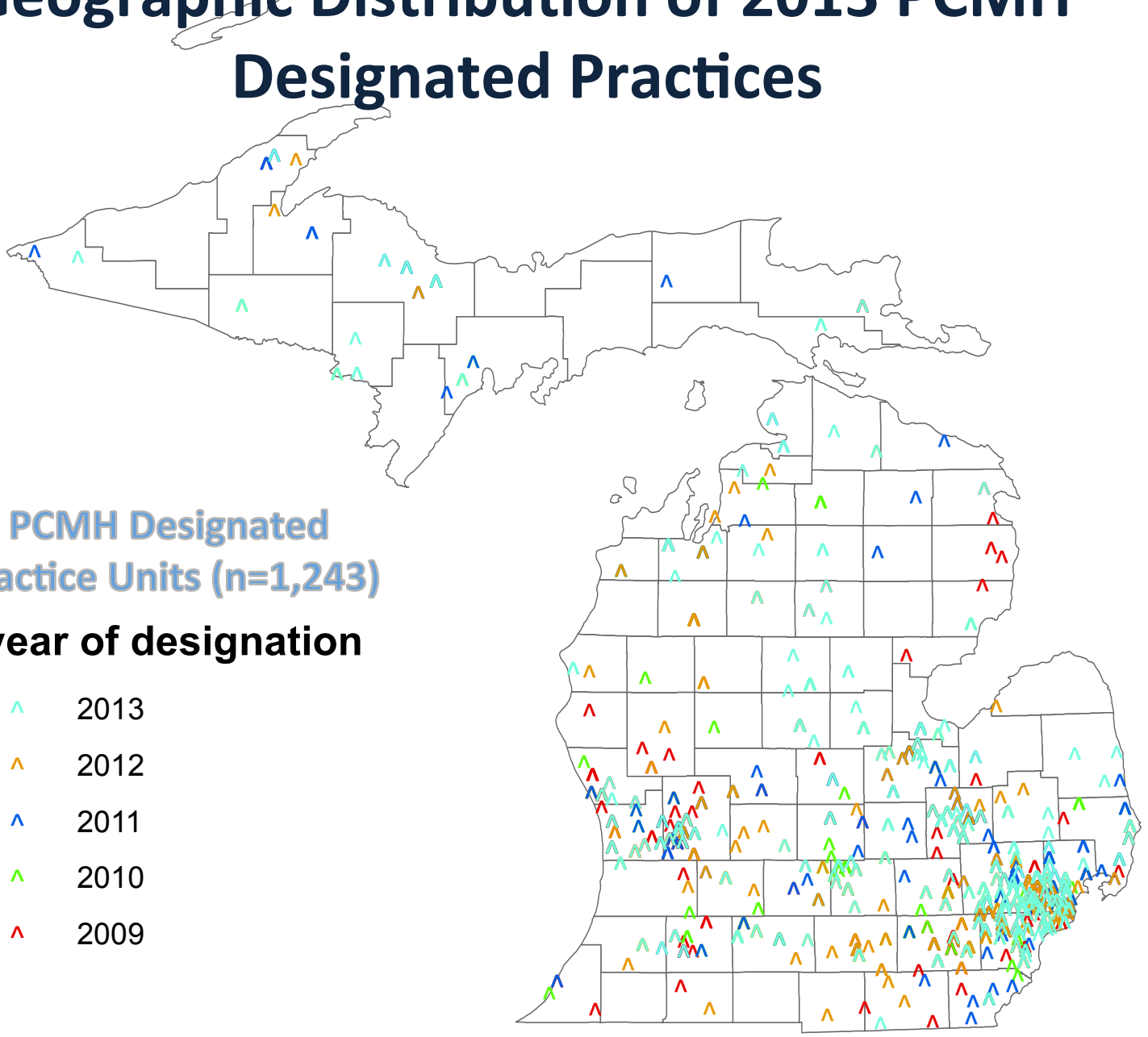
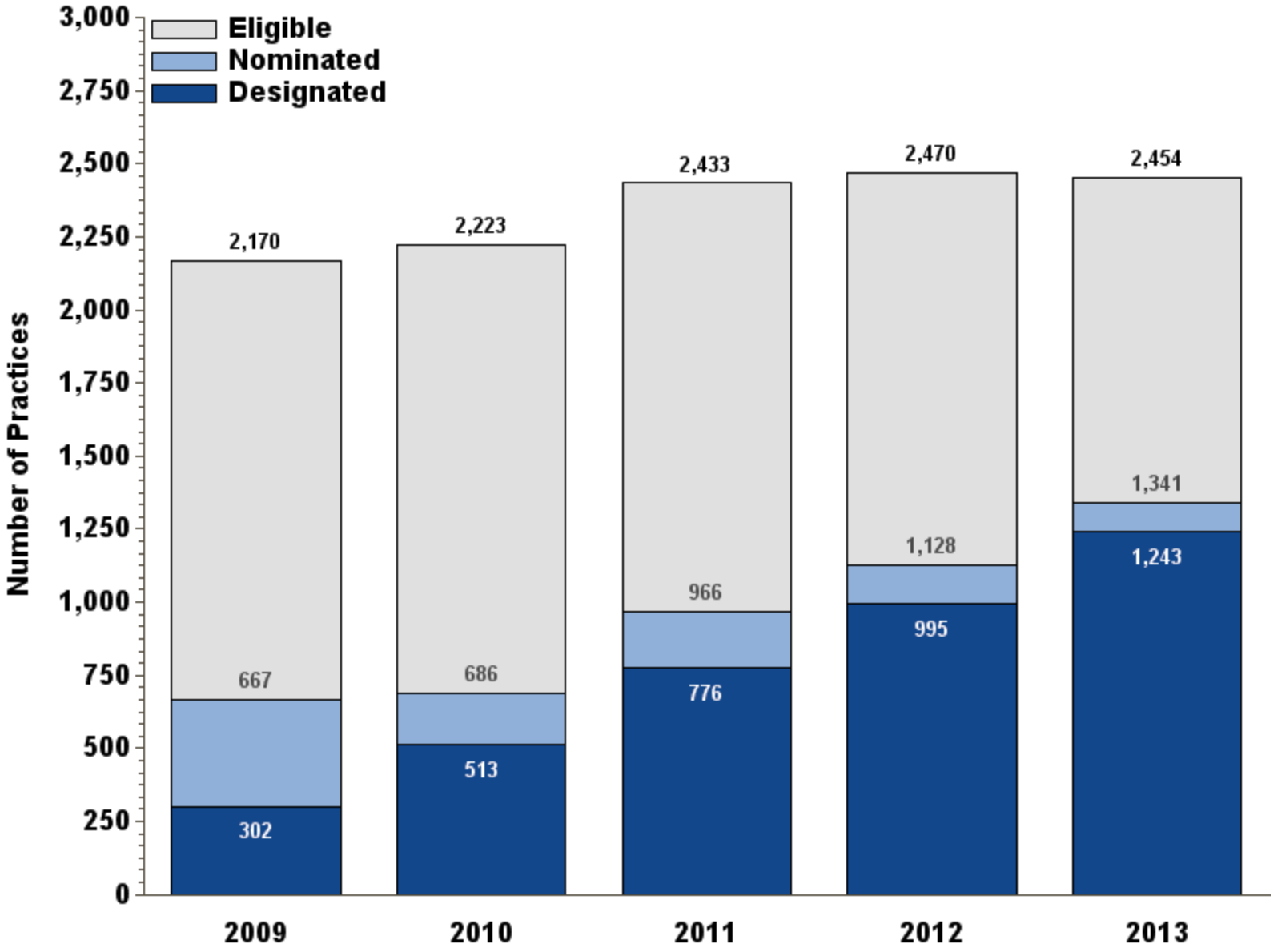
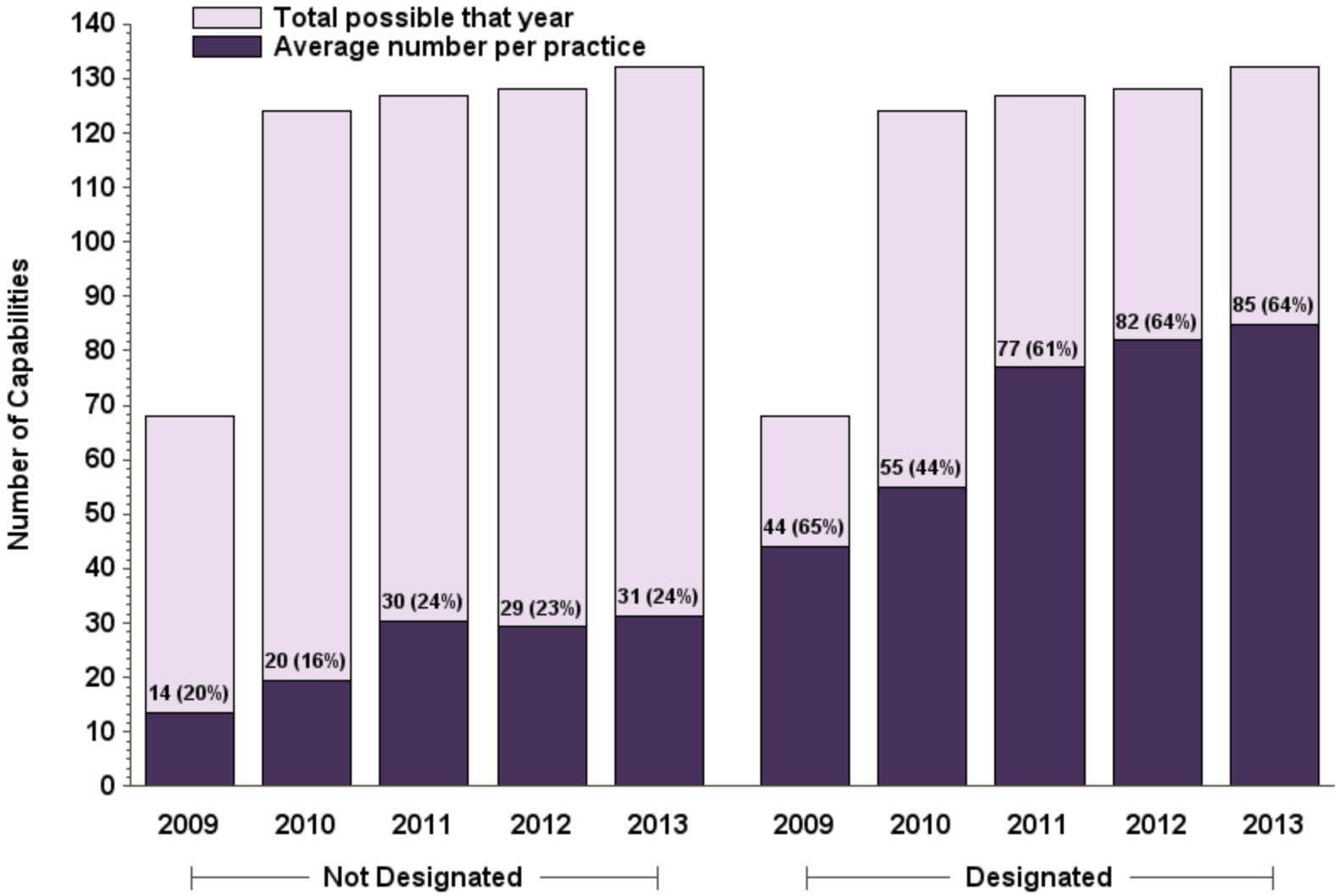
Geographic Distribution of 2013 PCMH Designated Practices



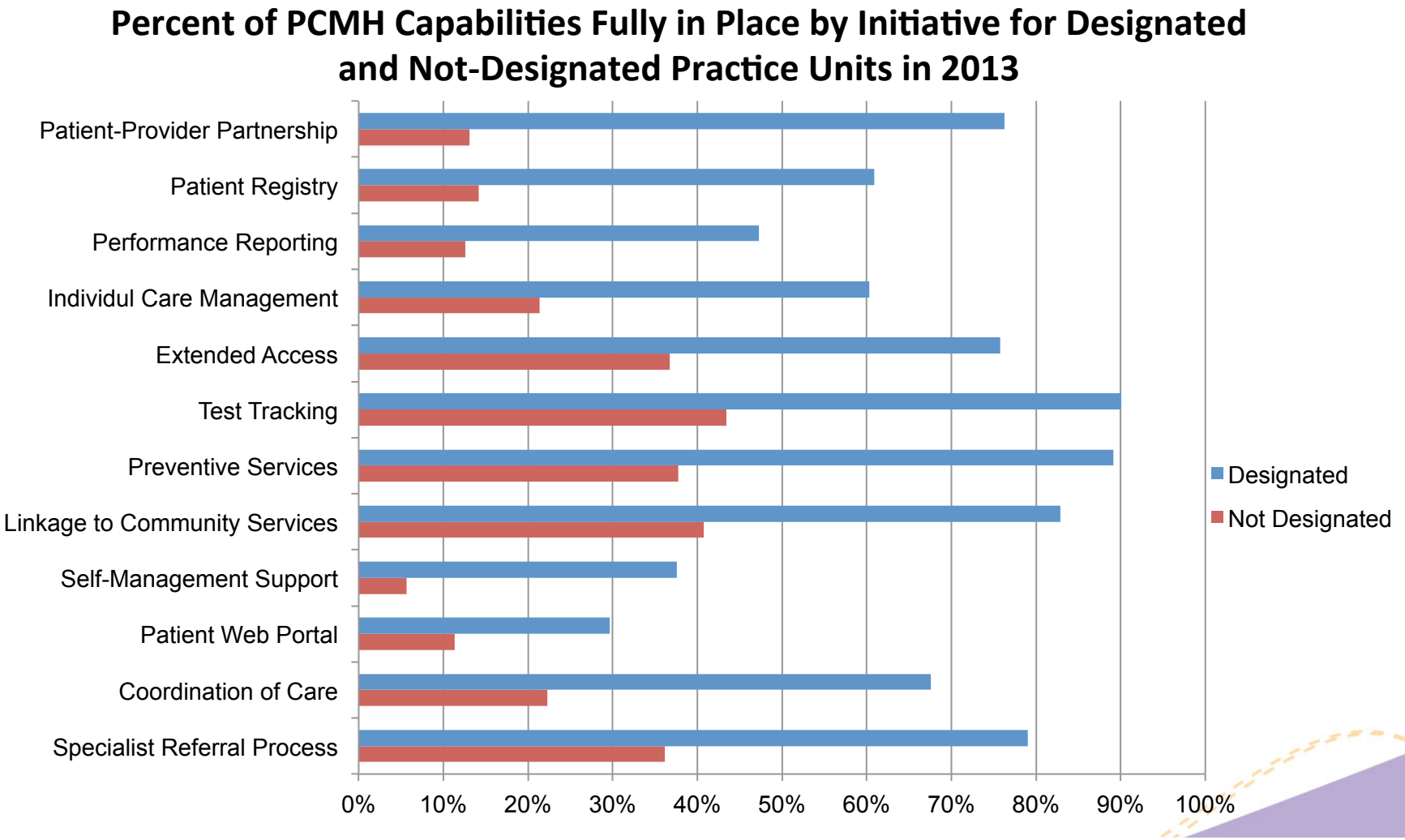
Growth of PCMH Designation Program



Growth in PCMH Capabilities Implemented



PGIP PCMH Infrastructure in 2013



* For the "not designated" cohort, only PCMH Designation eligible practice units were included in the analysis; practices not functioning as primary care providers are excluded.

***SOURCE: Winter 2012 SRD*

Site Visit Validation – Sampling & Accuracy Factor

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Overview of Site Visit Process

- What happens in a site visit?
- How are site visits selected?
- How are site visit results used?

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Annual Site Visit Process

Interpretive Guidelines Communicated to Physician Organizations

- Capability Case Definitions
- Developed with input from physician community

POs report practice capabilities

- Based on interactions with practices

Capability validation during site visits

- Capabilties observed by BCBSM field staff
- Identify opportunities for improved reporting

Revise Interpretive Guidelines

- Incorporate field staff observations and PO feedback
- Clarify poorly reported capabilities

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What happens in a PO site visit?

- **Goal:** To support Physician Organizations (POs) participating in PCMH Initiatives by discussing their implementation strategy and sharing best practices across the state of Michigan

- **Objectives:**
  - Meet with POs biweekly to quarterly, depending upon need
  - Review of PCMH Initiatives
    - Implementation strategies
    - Performance metrics (Dashboards, datasets)
  - Identify opportunities based on discussion that might help facilitate collaboration – with BCBSM or another PO

What happens in a Practice site visit?

- **Goal:** Review the progress of PCMH capability development in engaged practices pursuing patient-centeredness and to educate both POs and practices on the BCBSM model of PCMH

- **Objectives:**
  - For 4-6 months of the year, the field team goes on the road and meets with both POs and their practices to review capabilities within PCMH Initiatives
  - Field staff use an Access database with a design form template to conduct visits and record verification of capabilities
  - Used Interpretive Guidelines to help educate on the essence of each capability

Accommodating Program Growth

- Balance site visit between education and verification
- Expanding field staff from 1 team member in 2009 to 8 members in 2013
  - Weekly team meetings to share site visit experiences and aggregate feedback on capability guidelines, resolve disputes on guidelines
  - Practices could volunteer as calibration sites to help standardize field team members
- Site visit selection became a random sampling process
- Required demonstration of capabilities rather than documentation of capabilities
  - Change from interview style to hands-on observation
  - Discourage replication of paperwork, greater focus on use of capabilities
- Site visit feedback surveys

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Summary table of site visit selection process by year 2009-2013

Program year	Sampling method	Total visited practices	Total potential capabilities	Site visit purpose	Site visit duration
2009	Purposeful	114	69	PCMH designation	2-3 hours
2010	Purposeful	235	126	PCMH designation	3-5 hours
2011	Single stage	233	128	PCMH designation Accuracy factor	2-7 hours
2012	Multi-stage	323	129	PCMH designation Accuracy factor Educational	2-3 hours
2013	Multi-stage	248	130	PCMH designation Accuracy factor Educational	2-3 hours

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Accuracy factor calculation

- Sampling strategy 2011
  - Minimum 3 practices per PO, remainder probability proportional to size
  - Oversamples practices in upper quartile of capabilities
- Sampling strategy 2012
  - Minimum 3 practices per PO, remainder probability proportional to size
  - Subset of up to 40 capabilities selected for each selected practice
- Accuracy calculation
  - Focused on over-reported capabilities not on under-reported capabilities
  - Only capabilities reported in-place were considered
  - Weighted based on inverse probability of selection

Site visit results – accuracy in reporting

- 2011
  - 233 site visits
  - Overall accuracy 91.4%
  - Range by PO: 69.5% to 100.0%

- 2012
  - 323 site visits conducted
  - Overall accuracy: 95.2%
  - Range by PO: 78.4% to 100%

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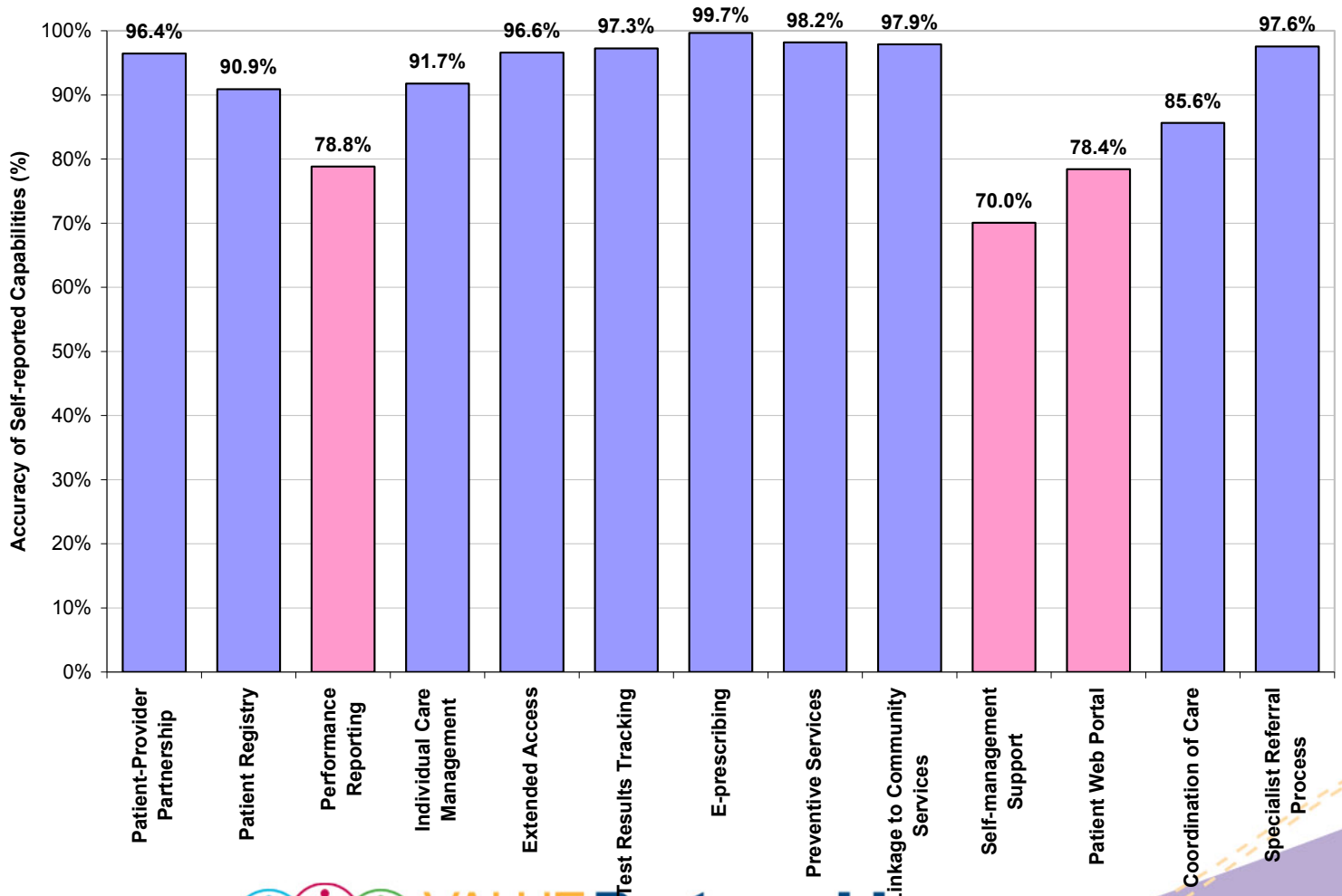
Overall domain-specific accuracy, June 2011



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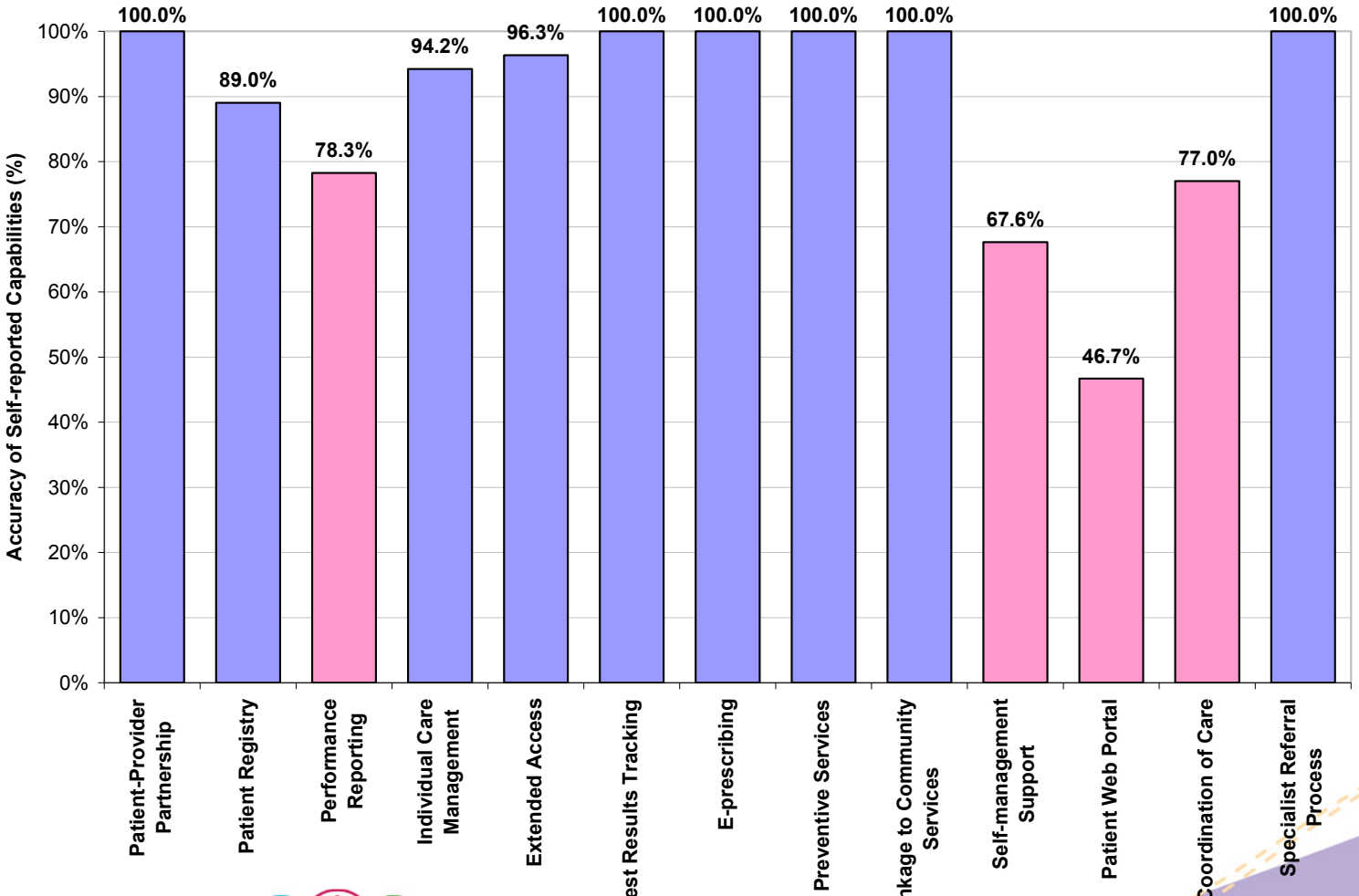
Example of PO domain-specific accuracy, June 2011



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Impacts of the site visits and routine process evaluation

- Efficient and effective use of the time during the site visit
  - Standardized the duration of site visits
  - Balance in educational and validation needs
- Addressed PO concerns about differential reporting accuracy
- Minimized adverse impact of site visits in the PCMH designation process
- Provided a resource for evaluating and improving the interpretive guidelines

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PCMH Designation Methods

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Department of Clinical Epidemiology & Biostatistics

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Overview of PCMH Designation Methods

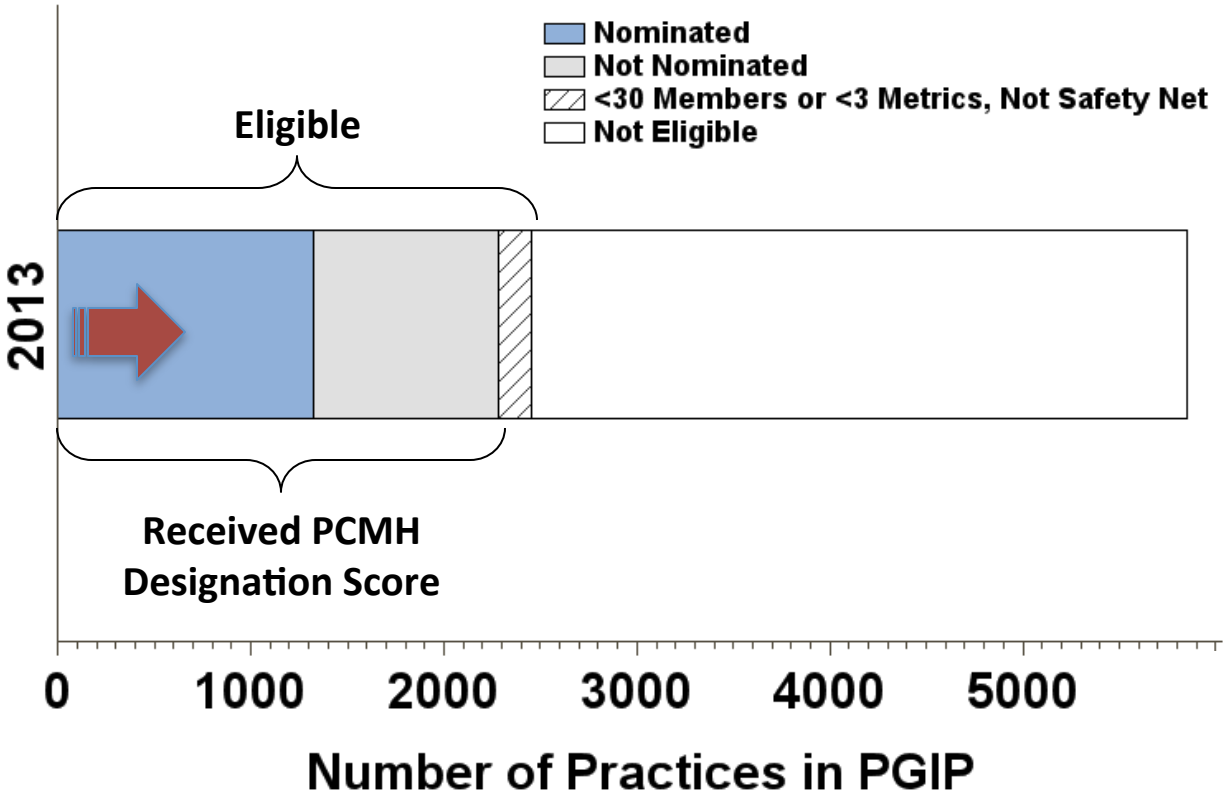
- Who is eligible for PCMH Designation?
- Calculating PCMH Capability scores
- Calculating Quality, Use, and Efficiency metric scores
- Combining these into a single PCMH Designation score

Annis-Emeott, A., et al., *Four-Year Evolution of a Large, State-wide Patient-Centered Medical Home Designation Program in Michigan.* Medical Care, 2013.

PCMH Eligibility Criteria

Requirements

General Eligibility Requirements:
1. PGIP practice in good standing
2. At least one PCP
3. At least one BCBSM attributed member
Requirements for Calculating PCMH Designation Score:
4. At least 30 attributed members
5. A large enough sample size to calculate 3 quality, use, and efficiency (Q/U/E) metrics
New 6. Safety Net practices were exempt from sample size requirements



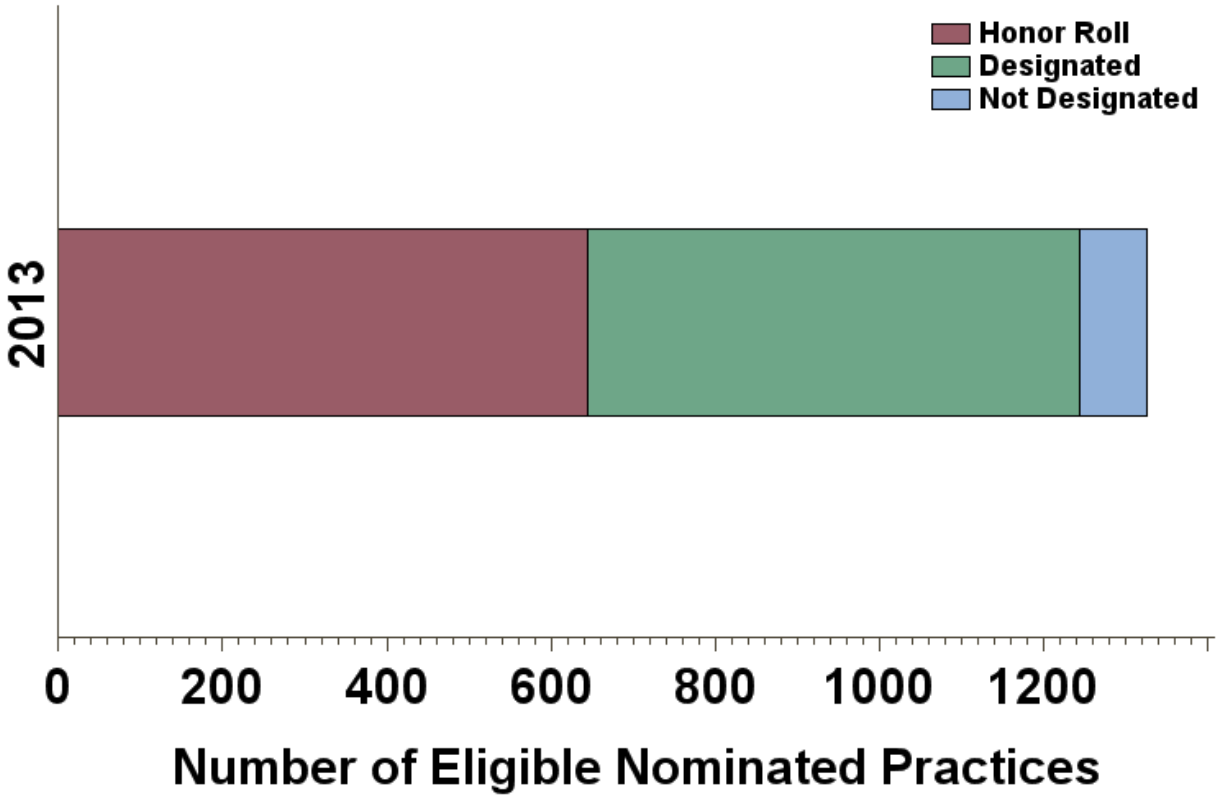
PCMH Designation Criteria

Honor Roll Practices: New

- Practices designated in both of the previous 2 years (2011 and 2012)
- Automatically designated, regardless of scores
- If Q/U/E score was below the 20th percentile, put on "probation" and are at risk for losing designation in 2014

Requirements for Non-Honor Roll Practices to be Designated:

1. Q/U/E score ≥ 20th percentile
2. Implemented ≥ 20 capabilities
3. PCMH Designation Score above threshold set by BCBSM leadership



PCMH Capability Scores

- Proportion of possible capabilities implemented by the practice
  - 132 capabilities possible in 2013 (within the 12 PCMH initiatives and e-prescribing)
  - Adult-only and pediatric practices had scores calculated out of 128 capabilities that were relevant to their patient populations
  - Each capability given equal weight

- PCMH Capabilities Scores were adjusted downward for practices in physician organizations with systematic over-reporting using **accuracy factors**

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Accuracy Factor

- Based on site validation visits in Spring and Fall 2012
  - 323 total site visits in CY2012
  - 40 randomly chosen capabilities assessed at each visit
  - Overall PGIP accuracy for the year was 95.2%

- Credit given for adjusting capabilities after site visits
  - If a capability was reported to be in place, but observed to not be in place during a site visit, did the physician organization remove that capability in future reports?
  - If yes, then credit was given for making the changes, shifting accuracy upward

- After credit was given, physician organizations with accuracy < 90% were subject to the accuracy factor
  - Only two physician organizations were subject to the accuracy factor
  - Accuracy factors were applied at the PCMH initiative level

Quality, Use, and Efficiency Metrics

14 total Q/U/E metrics were used in the 2013 designation scoring. These metrics are all calculated using claims data from calendar year 2012

Metric Type	Pediatric Members (0-17)	Adult Members (18-64)
Quality	Evidence-Based Care Preventive- Adolescents Preventive- Children	Evidence-Based Care Preventive
Use	Primary Care Sensitive Emergency Department Use Low Tech Radiology	Primary Care Sensitive Emergency Department Use Low Tech Radiology High Tech Radiology
Efficiency	Generic Dispensing Rate Generic Dispensing Trend	Generic Dispensing Rate Generic Dispensing Trend

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Methods for Calculating Metrics

These methods were used to calculate Q/U/E metrics to make scores as fair and comparable as possible given the limitations, including small sample sizes

Methods Used in Metric Calculations
1. Most metrics were **risk-adjusted**
2. Metrics were **censored** if sample size was too small or if metric was considered an outlier
3. Censored metrics were **substituted** with scores calculated using larger patient populations
4. Metrics were **standardized** to the same scale
5. Metrics were **weighted** based on their importance to the final PCMH designation score

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Risk Adjustment

- Metrics adjusted for: **age**, **gender**, and Symmetry prospective **risk score**
- Answers the question: What would we expect this practice's score (ex. low tech radiology rate) to be if they treated the PGIP standard population?
- By using the same population for all practices, reduces the differences in scores due to the case mix characteristics age, gender and risk score
- We used regression models as the statistical method to risk adjust, which is an enhancement when working with small sample sizes

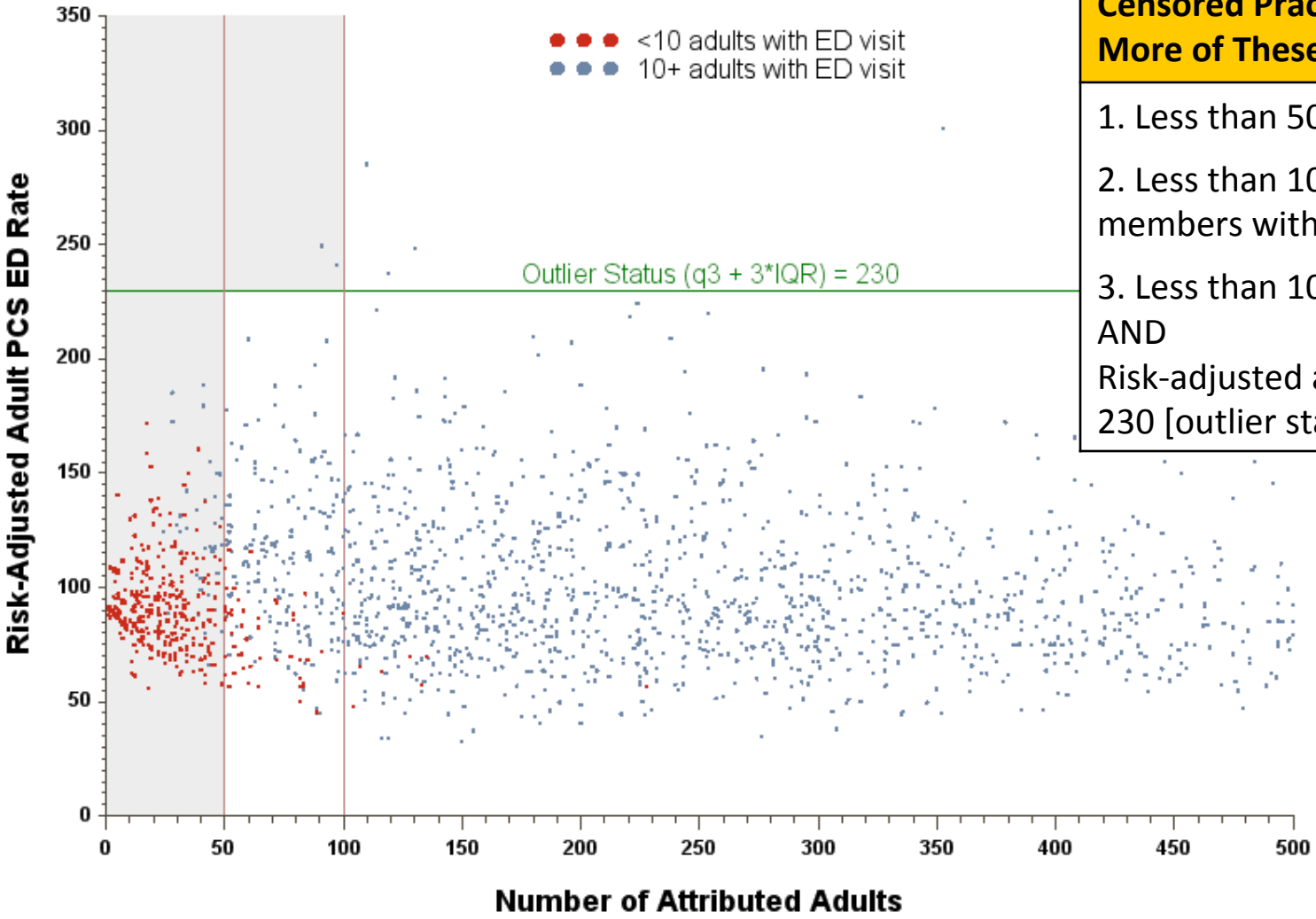
Censoring Criteria

- Metrics censored when:
  1) Sample size too small -and/or-
  2) Estimate considered an outlier -and/or-
  3) For GDR Trend only, when GDR score is so high that it would have been difficult to improve

- Censoring criteria:
  - Different for each metric
  - Chosen each year based on the distribution of metric scores

- If a metric is censored it means we feel we do not have sufficient information to evaluate the practice's performance on that metric

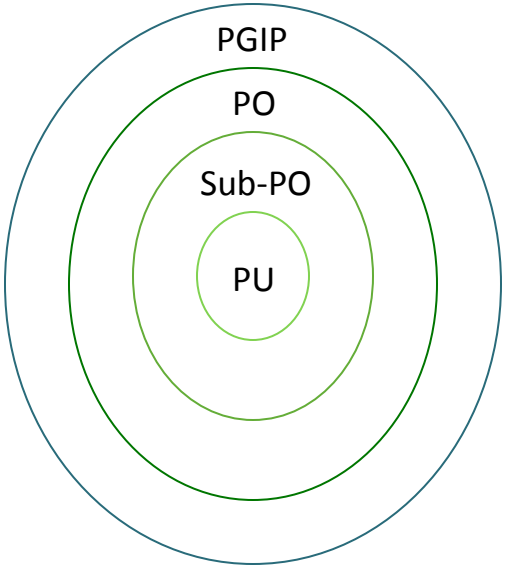
Censoring Example: Adult Primary Care Sensitive (PCS) ED Rate



Censored Practices Met One or More of These Criteria:

1. Less than 50 adult members
2. Less than 10 unique adult members with ED visit
3. Less than 100 adult members AND
   Risk-adjusted adult PCS ED rate > 230 [outlier status= q3+(3*IQR)]

Substitution



- When a practice had too small a sample size to calculate a metric score or their score was considered an outlier, the score was substituted using values calculated from larger populations from which the practice came
  - Values calculated from nominated practices in their Sub-Physician Organization (Sub-PO), PO, or, in rare cases where PO had a small sample size, with the average of all nominated practices in PGIP
  - Assumption: Nominated practices within the same Sub-PO or PO in most cases will have similar processes and administrative structures in place so a practice's performance should be similar to the average performance of their Sub-PO or PO

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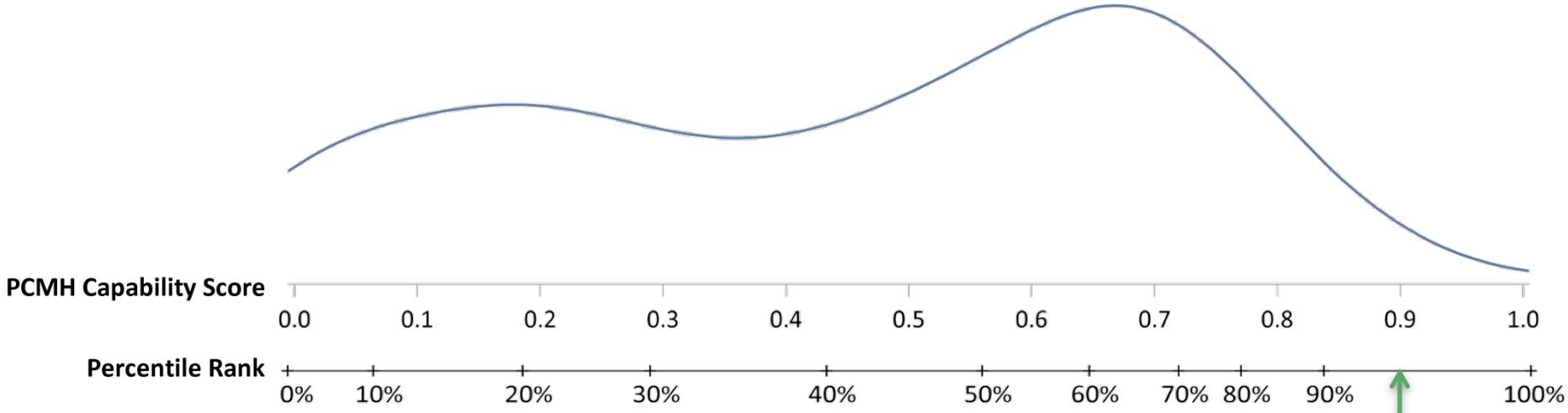
Percentile Ranking

Each time we combine scores we need to **standardize** to the same scale. In PCMH designation scoring, we use percentile ranking to accomplish this



Interpretation: If a practice received a PCMH Capability Score of 0.9, they did better than 94% of practices and are thus in the 94th percentile

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Combining Quality, Use, and Efficiency Metrics

Each Q/U/E metric is weighted, based on the relative importance we place on that metric, and then added up to produce the overall Q/U/E Score

	Family	Adult	Pediatric
Quality			
Evidence-Based Care Adult Members	12%	20%	
Evidence-Based Care Pediatric Members	4%		10%
Preventive Adult Members	4%	8%	
Preventive Adolescent Members	4%		8%
Preventive Child Members	4%		8%
Use			
Primary Care Sensitive ED Use Adult Members	8%	16%	
Primary Care Sensitive ED Use Pediatric Members	8%		20%
Low Tech Radiology Adult Members	6%	12%	
Low Tech Radiology Pediatric Members	6%		18%
High Tech Radiology Adult Members	12%	12%	
Efficiency			
Generic Dispensing Rate Adult Members	12%	24%	
Generic Dispensing Trend Adult Members	4%	8%	
Generic Dispensing Rate Pediatric Members	12%		26%
Generic Dispensing Trend Pediatric Members	4%		10%

Final PCMH Designation Score

- The final PCMH Designation Score:
  - 50% of the percentile-ranked PCMH Capability Score
  - 50% of the percentile-ranked Overall Q/U/E Score

- Practices ranked based on score and those above threshold set by BCBSM leadership were designated

Practices Excluded from Rankings
• Honor Roll practices (automatically designated)
• Sample size too small to calculate a PCMH Designation Score
• Not nominated
• Q/U/E score < 20th percentile
• Less than 20 capabilities

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PCMH Designated Practices Show Distinguished Performance Compared to Peers

Metric	PCMH Designees Compared to Non-PCMH Practices		
	2011 Designees (n=776)	2012 Designees (n=995)	2013 Designees (n=1,243)
Adults (18-64)	2010 Data*	2011 Data*	2012 Data*
Emergency department visits	-9.7%	-8.6%	-8.7%
Primary care sensitive emergency department visits	-11.2%	-10.5%	-11.1%
Ambulatory care sensitive inpatient discharges	-22.1%	-23.6%	-19.1%
High tech radiology services	-7.5%	-8.5%	-7.3%
High tech radiology standard cost PMPM	-5.0%	-4.9%	-3.1%
Low tech radiology services	-4.9%	-7.2%	-6.7%
Low tech radiology standard cost PMPM	-5.1%	-7.0%	-5.6%

*Same time period of claims data used for determining designation

PCMH Evaluation Summary

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Objectives

- Estimate the association between medical home capabilities and…
  - Cost
    - Pediatric medical & surgical PMPM costs
    - Adult medical & surgical PMPM costs
  - Quality
    - Pediatric preventive
    - Adult quality
    - Adult preventive

- Estimated averted claims costs associate with PCMH capability implementation

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Acknowledgments

- Partnership between…
  - University of Michigan School of Public Health
  - University of Michigan Department of Family Medicine
  - Blue Cross Blue Shield of Michigan

- External Funding: Agency for Healthcare Research and Quality

Paustian, M.L., et al., *Partial and Incremental PCMH Practice Transformation: Implications for Quality and Costs.* Health Serv Res, 2013.

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Study Design

- Study population includes all PGIP practice units with at least one primary care physician
  - June 2009 and June 2010 SRD (capabilities, physician list)

- Cross-sectional study
  - Capabilities present in June 2009
  - Change in capabilities between June 2009 and June 2010
  - Outcomes as measured from July 2009 to June 2010

Medical Home Measurement

- Each capability within a domain contributes equally to a domain score (PCMH initiatives + E-prescribing)

- Each domain score contributes equally to an overall PCMH score

- PCMH as a continuous variable
  - A value of 1 = full implementation
  - A value of 0 = no implementation

Alexander, J.A., et al., *Assessment and measurement of patient-centered medical home implementation: the BCBSM experience.* Ann Fam Med, 2013. **11 Suppl 1**: p. S74-81

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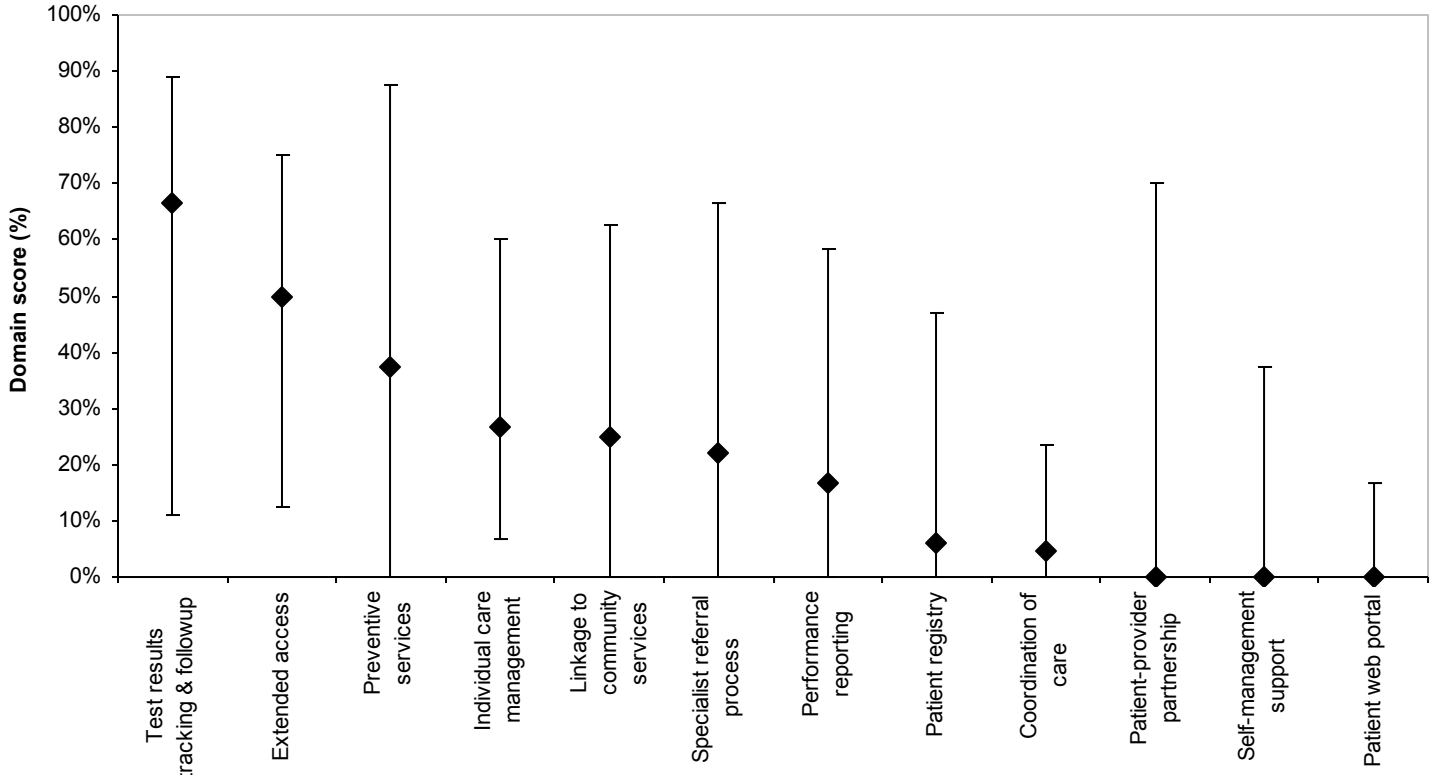
Patient Provider Agreement Example

Capability	Capability status	Capability score	Maximum score	Patient-Provider Agreement Domain Score
1.1: Practice unit has developed PCMH-related patient communication tools, …	**In Place**	**1**	**1**	1.67 / 3 = 0.56
1.2: Practice unit is using a systematic approach to inform patients about PCMH, …	**Not In Place**	**0**	**1**	
1.3: Patient-provider agreement implemented and documented for at least 10% of current patients	**In Place**	0.6 / 0.9 = 0.67	0.9 / 0.9 = 1	
1.4: Patient-provider agreement implemented and documented for at least 30% of current patients	**In Place**			
1.5: Patient-provider agreement implemented and documented for at least 50% of current patients	**In Place**			
1.6: Patient-provider agreement implemented and documented for at least 60% of current patients	**In Place**			
1.7: Patient-provider agreement implemented and documented for at least 80% of current patients	Not in place			
1.8: Patient-provider agreement implemented and documented for at least 90% of current patients	Not in place			

Median and interquartile range of practice unit PCMH domain scores by domain, June 2010



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Practice level characteristics

- Mean risk score
- Percent female
- Pediatric practice (>= 80% peds)
- Practice size (solo, 2-3, 4-5, 6 or more physicians)
- Mixed vs. primary care only
  - (Do specialists account for more than 50% of physicians?)
- Services per PCP
  - Proxy for BCBSM volume within the practice

PO & Market Characteristics

- Number of practices with at least one PCP in the PO
- BCBSM market share in the service area

- HRSA – Area Resource File (weighted based upon proportion of members from each county)
  - % Nonwhite in 2008
  - Median income in 2008
  - PCPs per 1,000 population in 2008
  - Metropolitan, Micropolitan, Rural Status in 2008 using 1990 census classifications

Study Population Characteristics

	Adult and family practices (N = 2,136)		Pediatric practices (N = 296)	
Continuous variables	**Median**	**IQR**	**Median**	**IQR**
PCMH score June 2009	0.06	0 to 0.19	0.06	0 to 0.15
PCMH change to June 2010	0.19	0.05 to 0.35	0.23	0.08 to 0.38
Median household income	$48,363	$44,843 to $58,332	$50,666	$43,929 to $55,321
Total practices in PO with a PCP	111	59 to 710	104	55 to 177
Services per PCP	1,979	1,132 to 3,209	3,054	1,870 to 5,071
PCP's per 1,000 population	0.98	0.71 to 1.26	1.04	0.77 to 1.40
Mean prospective risk score (adult)	1.6	1.41 to 1.87	0.67	0.58 to 0.77
Mean prospective risk score (pediatric)	0.45	0.38 to 0.54	0.44	0.40 to 0.50
Percent non-White attributed members	20.50%	12.1% to 26.8%	21.30%	14.0% to 25.9%
Percent female attributed members	50.80%	45.9% to 58.2%	48.60%	46.7% to 50.7%
Percent BCBSM market share	31.10%	25.7% to 34.4%	31.30%	26.0% to 34.7%

Study Population Characteristics, Continued

	Adult and family practices (N = 2,136)		Pediatric practices (N = 296)	
Categorical variables	**N**	**%**	**N**	**%**
Practice size				
Solo physician practice	1,274	59.6%	137	46.3%
2 to 3 physicians	500	23.4%	87	29.4%
4 to 5 physicians	189	8.8%	43	14.5%
6 or more physicians	173	8.1%	29	9.8%
Practice specialty				
Mixed	83	3.9%	13	4.4%
Primary care only	2,053	96.1%	283	95.6%
Metropolitan Statistical Area status				
Metropolitan: 1,000,000 or more persons	754	35.3%	121	40.9%
Metropolitan: 250,000 to 999,999 persons	514	24.1%	84	28.4%
Metropolitan: 100,000 to 249,999 persons	406	19.0%	49	16.6%
Metropolitan: below 100,000 persons	69	3.2%	5	1.7%
Micropolitan	208	9.7%	23	7.8%
Rural	177	8.3%	14	4.7%

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Preventive Care Outcomes

- Adult composite
  - Breast cancer screening
  - Cervical cancer screening

- Pediatric composite
  - Adolescent well visits
  - Adolescent immunizations
  - Child well visits, 3-6 years
  - Infant well visits
  - Child immunizations

Adult Quality of Care Composite

- Diabetes
  - HbA1C, LDL, Nephropathy, Lipid Use, Statin Use, ACE/ARB use with CHF, Nephropathy, Hypertension
- CAD
  - LDL, Lipid use, Statin Use, Beta Blocker after AMI
- CHF
  - LDL, ACE/ARB use, ACE/ARB persistence
- COPD
  - Spirometry testing
- Low back pain
  - Imaging within 28 days of first diagnosis
- Acute bronchitis
  - Appropriate antibiotic use
- Medication management
  - Antidepressants, persistent medication usage (ACE/ARB, Digoxin, diuretics, anticonvulsants)

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Medical Cost Outcomes

- Includes member liablility
- Does not include pharmacy costs since pharmacy is a separate benefit that is not universal across the members with medical coverage
- Two outcomes
  - Adult PMPM medical & surgical costs
  - Pediatric PMPM medical & surgical costs

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Exclusion Criteria

- Missing data on a predictor or outcome
- Sample size
  - 50 members for cost
  - 30 care opportunities for composites
- Statistical Outliers
  - 3 interquartile range units from the median for cost
  - 2 interquartile range units from the median for composites
- Overly influential observations – regression diagnostics
- Pediatric practices excluded from adult outcomes

Modeling Approach

- Generalized Estimating Equation
  - Estimate the mean effect of PCMH across practices
  - Effect estimate interpreted as the difference in outcome between a practice that has fully implemented all PCMH capabilities and a practice that has implemented no PCMH capabilities

- Random intercept linear mixed models to determine if results varied by PO

Modeling Results

Outcome variable	Baseline PCMH Score - June 2009 Beta estimate	95% CI (Lower)	95% CI (Upper)	p-value	PCMH change from June 2009 to June 2010 Beta estimate	95% CI (Lower)	95% CI (Upper)	p-value
Preventive Composite Scores								
Adult Preventive Composite	5.1%	0.5%	9.7%	0.0316	3.3%	1.1%	5.4%	0.0028
Pediatric Preventive Composite	12.2%	5.1%	19.3%	0.0008	4.9%	0.6%	9.3%	0.0260
Quality Composite Scores								
Adult Quality Composite	3.5%	-0.4%	7.4%	0.0806	5.2%	2.6%	7.8%	<0.0001
Medical & Surgical PMPM costs								
Adult PMPM Cost	($26.37)	($53.08)	$0.33	0.0529	($3.08)	($18.07)	$11.91	0.6868
Pediatric PMPM Cost	($1.72)	($13.13)	$9.70	0.7682	$7.45	($1.33)	$16.24	0.0964

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Strengths and Limitations

- Strengths
  - Generalizable to a substantial portion of the primary care community (~70% of PCPs in Michigan) and to the state (82 of 83 counties)
  - Wide variety of contexts (urban/rural, low SES/high SES, large and small practices)
  - PCMH as continuous measure instead of 'All-or-none' enables estimation of effects from incremental improvements

- Limitations
  - Cross-sectional study
  - Cannot control for physician motivation to provide higher quality, low cost care
  - BCBSM's program has similarities to NCQA, but still is unique

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Next Steps

- Do results persist longitudinally?
- Are there contexts where the PCMH model is more or less effective?
  - Practice contexts?
  - Socioeconomic contexts?
- What specific areas of utilization were impacted?
- Can we apply what we've learned here to evaluating the PCMH-neighborhood and ACO models of care?

Estimating Averted Claims Costs

- Apply model results to the self-reported capability data from 2009-2012

- Key Assumptions
  - Requires one year for the capability to achieve its full effect on averted claims costs
  - Medical home implementation is relatively minimal in Michigan outside of PGIP
  - Parameter estimates do not vary with time
  - Association remains linear at higher levels of implementation

Estimating Adult PMPM averted costs

For the i^{th} practice, averted costs from capabilities at the start of the time period are estimated by the following:

$$Costs_i = \beta_{Starting\ PCMH\ Score} * (PCMH\ score_i - PCMH_{it=0}) * Adult\ member\ months_i$$

For the i^{th} practice, averted costs from capabilities implemented during the time period are estimated by the following:

$$Costs_i = \beta_{PCMH\ Score\ Change} * PCMH\ score\ change_i * Adult\ member\ months_i$$

Finally, sum averted costs across all practices for capabilities in place at the start of the time period and those implemented during the time period

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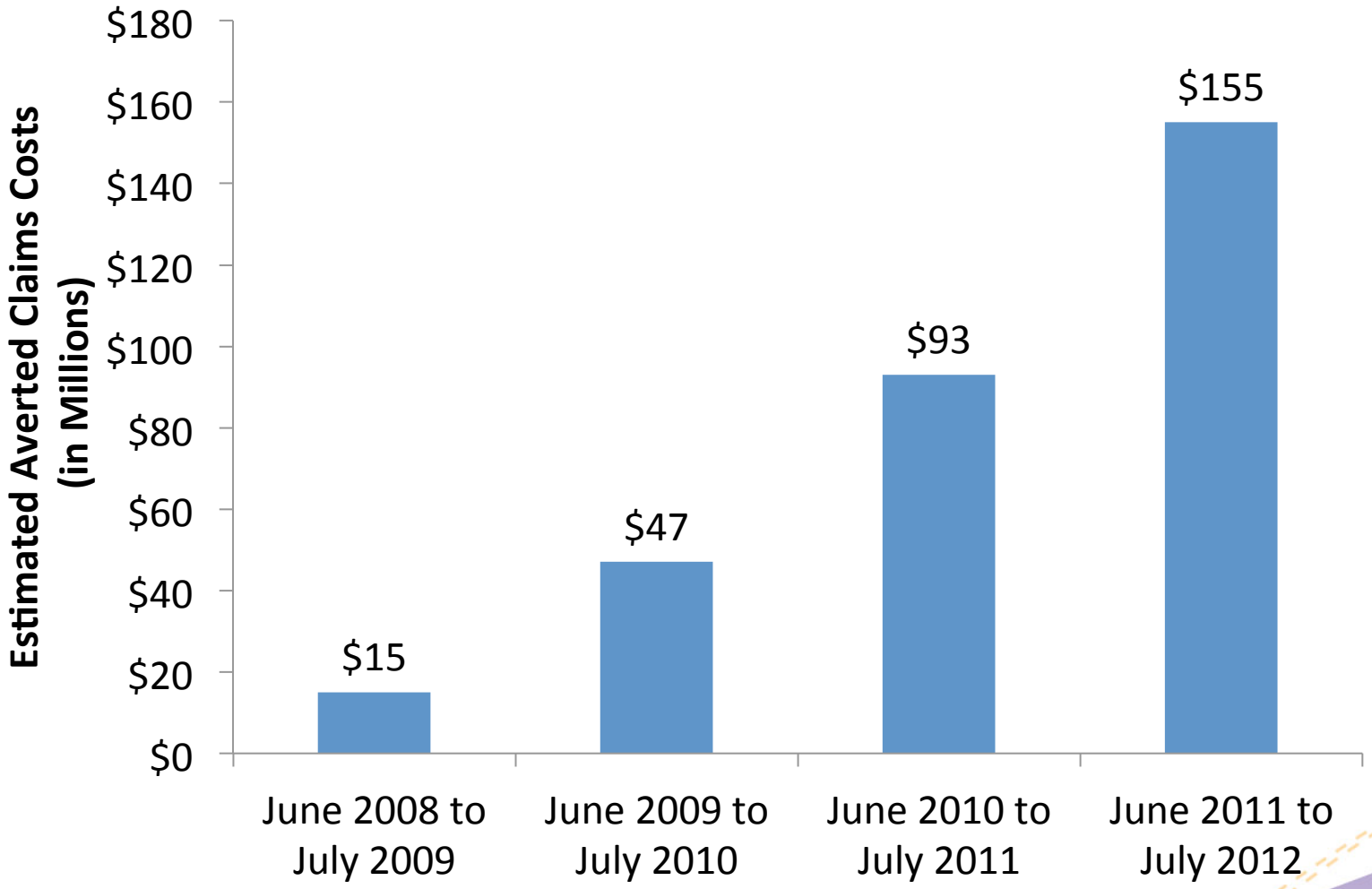
Estimated PCMH-related averted costs



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Summary Observations

- Small practices can successfully implement PCMH with adequate support from their physician organizations
- Several years were needed to standardize interpretations of capabilities across providers
  - Bidirectional feedback from site visits to educate providers and the health plan
- Routine process evaluation is important to adapt the program to meet provider and programmatic needs
- We used three different PCMH scoring approaches for specific purposes
  - Promote incremental improvement
  - Reward practices with extensive uptake of the model
  - Evaluate the association with cost and quality outcomes