Patient-Centered
Primary Care
COLLABORATIVE

The Patient-Centered Medical Home's Impact on Cost and Quality

Annual Review of Evidence 2014-2015

Published February 2016

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ABOUT THE PATIENT-CENTERED PRIMARY CARE COLLABORATIVE (PCPCC)

Founded in 2006, the PCPCC is a not-for-profit membership organization dedicated to advancing an effective and efficient health care system built on a strong foundation of primary care and the patient-centered medical home (PCMH). The PCPCC achieves its mission through the work of its volunteer members, Stakeholder Centers, experts, and thought leaders focused on key issues of delivery reform, payment reform, patient and family/caregiver engagement, and benefit redesign to drive health system transformation. For more information, or to become an executive member, visit **www.pcpcc.org**.

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EXECUTIVE SUMMARY

For nearly a decade, the Patient-Centered Primary Care Collaborative (PCPCC) has advocated a vision of an effective and efficient U.S. health system built on a strong foundation of primary care and the patient-centered medical home (PCMH) (or "medical home," used interchangeably throughout this report). The PCPCC's mission is to serve as the **unifying voice of advanced primary care** to improve delivery and payment systems. We do this by **convening** diverse stakeholders — including patients, providers, payers, and many other interested partners; **communicating** timely and accurate information to key influencers and the public; and **advocating and educating** about priority issues that show promise in improving health care delivery for all stakeholders.

The PCMH is an innovation in care delivery designed to advance and achieve the Triple Aim of improved patient experience, improved population health, and reduced cost of care.[1] Simply put, a medical home provides enhanced primary care services of value to patients, their families, and the care teams who work with them. The evolving model promises improved access to high-quality, patient-centered primary care through trusted relationships with patients, families, and caregivers; incorporates team-based care with clinicians and staff working at the top of their skill set; and provides cost-effective care coordination and population health management connecting patients to the "medical neighborhood" and to their community. By investing in enhanced primary care and ensuring that PCMHs are foundational to Accountable Care Organizations (ACOs) and/or other integrated health systems, the PCMH model is demonstrating that a cost-effective, accessible, more equitable, higher-quality health care system is possible.

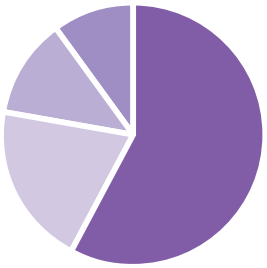
As in previous editions, this year's *Annual Review of the Evidence* provides a summary of PCMH cost and utilization results from peer-reviewed studies, state government evaluations, industry reports, and new this year, independent federal program evaluations published between October 2014 and November 2015. It reviews the recent evidence for PCMH and advanced primary care in light of new and long-awaited developments in health system payment reform including Medicare's transition to value-based payments and passage of the Medicare Access and CHIP Reauthorization Act (MACRA). In addition, significant multi-payer and state-level reforms are happening across the United States in conjunction with increasing commercial interest and investment in advanced primary care.

Key points from this year's evidence review include:

Controlling Costs by Right Sizing Care: *Advanced primary care is foundational to delivery system transformation — medical home initiatives continue to reduce health care costs and unnecessary utilization of services*

This year's 30 publications point to a clear trend showing that the medical home drives reductions in health care costs and/or unnecessary utilization, such as emergency department (ED) visits, inpatient hospitalizations and hospital readmissions. Various approaches to PCMH payment that are highlighted show potential. Those with the most impressive cost and utilization outcomes were generally those who participated in multi-payer collaboratives with specific incentives or performance measures linked to quality, utilization, patient engagement or cost savings. The more mature medical home programs demonstrated stronger improvements.

30 total studies



- 17 peer-reviewed studies
- 4 state government evaluations
- 6 industry reports
- 3 independent evaluations of federal initiatives

Aggregated Outcomes from the 30 Studies

21 of 23 studies that reported on cost measures found reductions in one or more measures

23 of 25 studies that reported on utilization measures

found reductions in one or more measures

Aligning Payment and Performance: *Payment reform is necessary to sustain delivery system changes, but alignment across payers is critical for health care provider buy-in*

As payment for primary care practices is fundamentally restructured to support value-based care, advanced primary care and medical homes must be recognized as foundational to ACOs and other integrated delivery reforms. This means explicitly rewarding primary care clinicians and their teams for meeting performance targets within ACOs, and ensuring that incentives are directly shared with practices and providers — and not just limited to the organization or health system.

Given increasing provider "measurement fatigue," alignment of both payment and performance measurement across public and private payers is key to garnering support from primary care practices transitioning to these value-based payment models. Multi-payer initiatives like the Multi-payer Advanced Primary Care Practice (MAPCP) Demonstration and the Comprehensive Primary Care (CPC) Initiative are learning how to best align local, regional, and national payer and provider interests in order to scale and spread best practices to optimize both delivery and payment reform. Although this report describes several alternative payment models that can support the PCMH, many different payment strategies are being tested. The evidence does not yet clearly point to a single payment strategy that is most successful in delivering advanced primary care.

Assessing and Promoting Value: *Measurement for PCMHs must be aligned and focused on value for patients, providers, and payers*

As part of Medicare payment reform implementation, the Centers for Medicare and Medicaid Services (CMS) will define and reward "certified" PCMH practices. Because of the variability in PCMH definition and certification in the public and private sectors, existing PCMH measures should be aligned to enhance our ability to evaluate PCMHs and understand which components of the model are most impactful. Although our inclusion criteria for this publication is limited to medical home studies assessing cost and utilization changes, several of the studies note statistically significant improvements in quality of care metrics, access to primary care services, and patient or clinician satisfaction. All are important. The PCMH definition, as well as measures to implement, recognize, and evaluate it — should be aligned and demonstrate clear value to patients, providers, and payers.

SECTION ONE: A CHANGING POLICY LANDSCAPE

Section I of this report includes a brief description of current PCMH implementation trends, followed by a description of payment reform and the emerging opportunities it creates for PCMH scale and spread.

Why PCMH? The Case for Increased Investment in Primary Care

Over the last 30 years, the U.S. health care system has grown increasingly more fragmented, inefficient, and expensive. The U.S. spends nearly 18 percent of its gross domestic product on health care annually, yet patient and population health outcomes continue to fare worse than peer nations that spend considerably less.[2,3] Notably, and not coincidentally, most countries with more efficient and effective systems prioritize primary care through more aligned payment and workforce policies. Although the U.S. spent more than 2.9 trillion dollars on health care in 2013,[4] just four to seven percent of that total spend was dedicated to primary care.[5,6,7] Despite this modest dollar outlay, primary care visits in the U.S. account for more than half (55 percent) of physician office visits each year.[8] Moreover, an estimated 30 percent of the total U.S. health care spend can be attributed to overuse, underuse, and misuse of health care resources.[9] The spread of chronic disease further compounds the issue, and threatens not only our health, but also our social and economic welfare.[10]

55% of all medical office visits are for primary care

55%

but only 4 to 7% of health care dollars are spent on primary care

4%

For most Americans, primary care serves as the entry point and touchstone of the health care system, delivering and coordinating care for patients and families, with an emphasis on promoting population health and managing chronic illness. As such, primary care is well positioned to help repair and optimize our broken care delivery system. With greater investment in and support for comprehensive patient-centered primary care through the PCMH, we can more systematically promote Triple Aim outcomes of better care, smarter spending, and healthier people. We can also make a positive impact on the Quadruple Aim, which includes improving the satisfaction and "joy of practice" of primary care teams.[11]

Definition of Medical Home: In Need of a Unified View

The PCMH is a model and philosophy of advanced primary care that embraces the relationship between a primary care team and patients, families, and caregivers. The five core attributes of the PCMH as set forth by the Agency for Healthcare Research and Quality[12] are:

- **Patient-centered:** The PCMH supports patients in learning to manage and organize their own care based on their preferences, and ensures that patients, families, and caregivers are fully included in the development of their care plans. It also encourages them to participate in quality improvement, research, and health policy efforts.

- **Comprehensive:** The PCMH offers whole-person care from a team of providers that is accountable for the patient's physical and behavioral health needs, including prevention and wellness, acute care, and chronic care.

- **Coordinated:** The PCMH ensures that care is organized across all elements of the broader health care system, including specialty care, hospitals, home health care, community services, and long-term care supports.

- **Accessible:** The PCMH delivers accessible services with shorter waiting times, enhanced in-person hours, 24/7 electronic or telephone access, and alternative methods of communication through health information technology (HIT).

- **Committed to Quality and Safety:** The PCMH demonstrates commitment to quality improvement and the use of data and health information technology (HIT) and other tools to assist patients and families in making informed decisions about their health.

While the goals or attributes for PCMH practices are often similar, the PCMH model is not "one size fits all." PCMH practices differ in terms of their implementation, measurement, and performance,[13] and the term "medical home" or PCMH is not well understood by the public.[14] Likewise, PCMH certification (or recognition) programs vary, with different meaning to patients and consumers, health care providers, and payers/health plans. As noted by Tirodkar et al.,[15] even practices with the highest level of PCMH achievement have variation in their medical home capabilities, and they excel at "different PCMH components" based in part on distinctions in capability, values, and patient needs. The authors suggest that more research is needed to identify which components of the PCMH have the greatest impact.

Payment Reform to Define PCMH

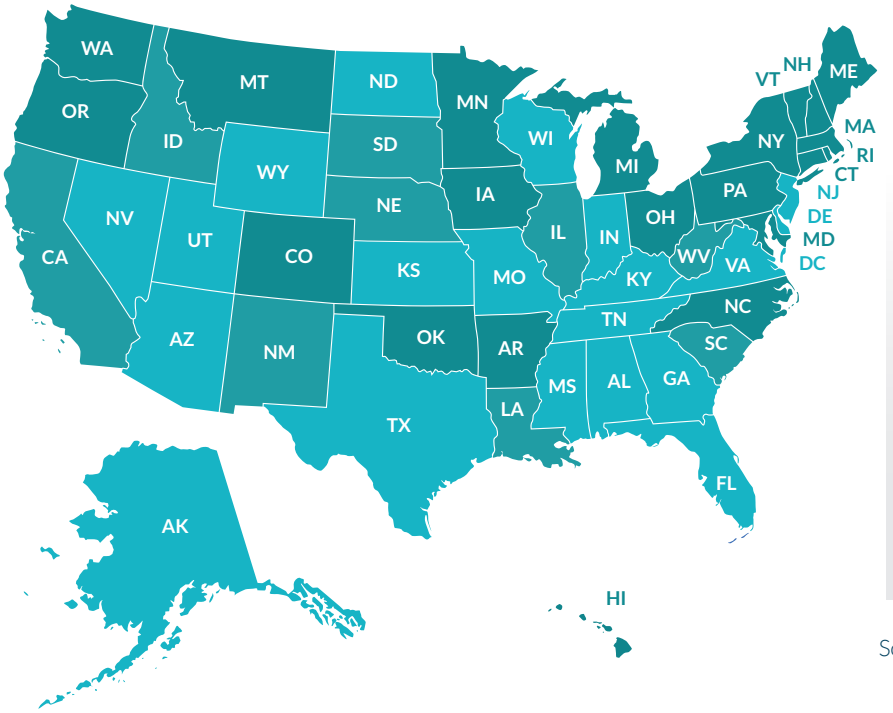
The Centers for Medicare and Medicaid Services (CMS) will define PCMH certification for the purpose of payment incentives as part of the Medicare Access and CHIP Reauthorization Act (MACRA). This provides an important opportunity to unify around a clear PCMH definition and recognition process that offers measurable value and impact to patients, providers, and payers, as well as to researchers evaluating the model.

PCMH and Primary Care Innovations: Growing in Size and Scope

As this report and our PCMH innovations map[16] demonstrate, the number of practices transforming to PCMHs continues to grow. Since the publication of the last PCPCC Evidence Report, there has been substantial progress in moving away from traditional, volume-driven, fee-for-service provider reimbursement toward payment models that value quality of care as described later in Section II. Multi-payer programs such as the Multi-payer Advanced Primary Care Practice (MAPCP) Demonstration, the Comprehensive Primary Care (CPC) Initiative, and State Innovation Models (SIM) exemplify this. Today there are nearly 500 programs dedicated to improving the health system through enhanced primary care. For a real-time detailed view of these initiatives — including payment models, reported outcomes, location, and participating public and commercial health plans — the PCPCC Primary Care Innovations and PCMH Map is a comprehensive up-to-date resource.

Primary Care Innovations and PCMH Map

In 2014, the PCPCC unveiled a new searchable, publicly available database that tracks the increasing number of primary care innovations and PCMH initiatives taking place across the country.



State View

National View

List View

Outcomes View

Source: www.pcpcc.org/initiatives

New Era: Delivery Reform Meets Payment Reform

Various payment innovations have been testing ways to support primary care innovation and PCMH for many years.[17,18,19] Depending on the region and the provider arrangement (e.g., a solo or small practice, an Independent Practice Association or Accountable Care Organization (ACO), or an employed provider as part of a health system), some practices that were once paid fee-for-service only, are now receiving additional per member per month payments (PMPM). Others are receiving payment incentives tied to performance metrics that measure quality, cost, or patient engagement. Medicare has been piloting various

types of payment reform — ranging from pay-for-reporting to bundled payment — but the scale and spread of delivery models that tie payment to quality for all Medicare beneficiaries is more recent.[20] As part of the Affordable Care Act, the Centers for Medicare and Medicaid Innovation (CMMI) is spearheading one of the most aggressive efforts in recent history to address delivery system reform.[21] Recent passage of MACRA can help bring these efforts to scale across the entire Medicare program, and subsequently impact the broader commercial marketplace.

Payment Reform & PCMH: Value-based Purchasing in the Public and Private Sector

Because fee-for-service does not reimburse for key PCMH features — such as facilitating information sharing and care coordination with sub-specialists and hospitals, managing web-portals and personal health records, email communication and telephone visits, developing connections to community-based organizations, and integrating behavioral health — it often fails to compensate for the complete scope of services offered by a PCMH. Smaller practices with little reserve capacity are especially challenged in offering PCMH-level care without adequate financial support.[22]

Numerous alternative payment models (APMs) are poised to support PCMH implementation and sustainability. Significant experimentation and testing of alternative payment arrangements is well underway, ranging from accountable care, to episode-based payment initiatives, to up-front payments that support primary care practice transformation, to initiatives that focus on specific populations, such as Medicaid, CHIP, or individuals dually eligible for Medicaid and Medicare.[23] In fact, the authors of a 2014 Health Affairs article[24] evaluated 114 medical home initiatives and found that medical home practices received an average of $4.90 PMPM, with many receiving some form of an additional financial incentive (64 percent receiving pay-for-performance incentives, 44 percent receiving shared savings, 12 percent receiving up-front payments, and 17 percent receiving payment for care coordinators separately from PMPM payments).

The chart below provides a snapshot of various innovative payment arrangements or models that are currently being implemented in public and private health care marketplaces nationwide to support the PCMH model.

Payment Innovation Models

Payment model	Description [25]
Enhanced Fee-for-Service (FFS)	Increased FFS payments to practices that are recognized and/or functioning as PCMHs
FFS with PCMH-specific billing codes	Practices can bill for new PCMH-related activities (i.e. care coordination)
Pay-for-Performance	Practices are paid more for meeting process measures (HEDIS), utilization targets (ED use, generic prescribing), and/or improving patient experience
Per-Member-Per-Month (PMPM) Payments	Practices are paid a capitated monthly fee in addition to typical FFS billing, often adjusted for PCMH recognition level, or degree of care coordination expected
Shared Savings	Practices are rewarded with a portion of savings if the total cost of care for their patient panel increases more slowly than a preset target and quality thresholds are met
Comprehensive or Population-based Payment	Partial or complete risk for total cost of care (risk adjusted), to include new models of "direct primary care"

Even with the flexibility and additional resources available through some alternative payment models, practices still face several potential challenges when assuming the financial risk and accountability of a PCMH. These challenges include: the need for adequate and predictable payment together with appropriate risk adjustment, especially when caring for high-cost, high-need patients; interoperable electronic health records which are integrated with the primary care workflow, population health management tools, and other technology (such as telehealth for many rural and underserved practices, or mobile applications to connect with patients); timely access to real-time, integrated data at the point of care; and alignment across multiple payers for standardized cost, quality, performance, and meaningful patient experience metrics.[26] In addition, the cost of sustaining the PCMH model can be financially challenging and administratively cumbersome for some practices. A 2015 study by Magill and Ehrenberger[27] found that the cost of sustaining a PCMH was more than $100,000 per full-time physician annually. Although the study was small, it validates previous findings[24] and underscores the necessity of adequate investment to implement and sustain medical homes. Although more research is needed to understand the costs of transformation, the evidence suggests that advanced primary care practices require time, expert coaching to acquire new quality improvement and data management skills, and sufficient resources to assume greater accountability for both quality and cost.

In addition to resources, matching appropriate payment to "practice readiness" is crucial. Specifically, value-based payments should be appropriately phased in: first, to support the practice in adopting structural and organizational leadership changes (facility, personnel, technology); next, to adopt workflow/process modifications (team building, efficiency of operations, care coordination); and finally, to focus on process and outcome improvements (quality, cost, patient experience).[28] This stepwise approach to supporting transformation is consistent with research from the University of California at San Francisco's Center for Excellence in Primary Care,[29] the American Board of Internal Medicine (ABIM),[11] the American Medical Association's STEPS Forward initiative,[30] Qualis Health's eight change concepts,[31] and the Commonwealth Fund,[32] all of which suggest that there are incremental building blocks or "change concepts" that are critical to supporting the development of high-performing primary care practices.[31]

> "Value-based payments should be appropriately phased in: first, to support the practice in adopting structural and organizational leadership changes...; next, to adopt workflow/process modifications...; and finally, to focus on process and outcome improvements..."

Multi-payer Collaboratives: Opportunities for Alignment & Health System Redesign

As the PCMH model gains traction in both public and private markets, standardization and alignment of performance measures is becoming increasingly valuable to providers. Under the current fractured payment system, primary care practices submit claims to many different health plans and payers, and they express growing concern about new and differing requirements across payers that create confusion, financial risk, and administrative burden on their care teams.[33] In a recent survey of family physicians, most reported submitting claims to seven or more payers (71 percent), with nearly four in 10 physicians currently submitting claims to more than 10 different payers (38 percent).[34] The overwhelming majority

viewed lack of staff time as a barrier to implementing value-based care delivery (91 percent). Most agreed that the absence of coordinated data and metrics were barriers, with 75 percent citing a lack of uniform reports from payers, 75 percent mentioning lack of standardization of performance measures and metrics, and 63 percent reporting that the absence of timely data impacted their ability to improve care and reduce costs.[34] A Core Quality Measures Collaborative — comprised of CMS, America's Health Insurance Plans (AHIP), the National Quality Form (NQF), and a select group of health professionals — has launched an initiative to assemble a core set of measures meant to address this "measurement fatigue" by reducing, refining and relating measures to patient health outcomes.[35]

> "Multi-payer collaboratives — which bring together private payers, Medicaid, and more recently Medicare — can address many of these concerns by coordinating efforts across multiple payers, standardizing performance measurement and payment models... and providing important opportunities for shared learning of best practices at a local or regional level."

In addition, multi-payer collaboratives — which bring together private payers (health plans, employers, and unions), Medicaid, and more recently Medicare — can address many of these concerns by coordinating efforts across multiple payers, standardizing performance measurement and payment models (without fear of anti-trust violation) and providing important opportunities for shared learning of best practices at a local or regional level.[36] This reduces administrative burden for primary care providers and offers greater transparency to payers about their own respective stake and risk in the initiative's success.[36] Early evaluations of multi-payer arrangements, including the MAPCP demonstration and the CPC initiative, demonstrate that health care providers and payers find multi-payer participation worthwhile despite the time, effort, and investment because the re-design and alignment efforts have resulted in buy-in.[37,38]

Payment Reform & Medicare

HHS Goals for Value-Based Purchasing

In January 2015, the Secretary of Health and Human Services (HHS) announced the agency's goal to move the FFS Medicare program toward valued-based payment. By the end of 2016, HHS intends to have 30 percent of traditional fee-for-service payments tied to value through alternative payment models, to include ACOs or bundled payments, and 50 percent tied to alternative payment models by 2018. In addition, HHS launched the Health Care Payment Learning and Action Network (HCPLAN) — a new public-private effort that is actively working to assist in the process.[39] A draft Alternative Payment Model (APM) Framework is intended to serve as a roadmap to describe and measure progress, establish a common nomenclature, facilitate discussions among stakeholders, and expedite evidence-based knowledge about the capabilities and results of APMs. It also describes the current stages in which practices can shift from strictly FFS (without payment tied to performance measurement), to population-based payments with specific performance measure targets.[40]

Medicare Access and CHIP Reauthorization Act (MACRA)

These goals, while ambitious, are inextricably linked to the implementation of MACRA.[41] A much-heralded legislative achievement, MACRA repeals the annual payment cuts required by the Medicare sustainable growth rate formula, shifts clinician reimbursement to value-based payments over a fixed time period, aligns performance measures, and reauthorizes the Children's Health Insurance Program (CHIP). As MACRA is implemented over the next four years, primary care practices will begin considering the payment pathway that best meets their patients' needs. Among other provisions, MACRA creates two new innovative payment pathways for PCMH, both of which acknowledge advanced primary care as critical to advancing system-wide transformation. In the Merit-based Incentive Payment System (MIPS) pathway, practices can maximize the score for their clinical practice improvement activities by becoming a PCMH (one of a four-part composite quality score to determine any annual bonus or penalty payment, in addition to fee-for-service payment). Under the APM pathway, practices that are certified as advanced PCMHs can qualify as an APM without having to put themselves at risk of financial loss (take on "two-sided risk arrangements"). As MACRA is implemented, CMS will define PCMH certification for the purpose of payment incentives, making it urgent and important to have a unified vision of the PCMH model.

SECTION TWO: NEW EVIDENCE FOR PCMH AND INNOVATIONS IN PRIMARY CARE

This section describes the cost, quality, and utilization outcomes from primary care PCMH initiatives published between October 2014 and November 2015. The data is compiled into tables and categorized by peer-reviewed studies, state government evaluations, industry reports, and independent evaluations of federal initiatives. A description of the payment model for each PCMH initiative is also included.

METHODS

Inclusion Criteria: This publication is limited to studies that assessed cost and/or utilization measures associated with the PCMH model, consistent with previous evidence reports. Using PubMed and other Internet search engines, our inclusion criteria for predictor variables included the terms: "patient-centered medical home," "medical home," and "advanced primary care." Criteria for outcome variables included the terms: "cost" and/or "utilization." Given the substantial variation among PCMH programs, we included those reports that self-identify as primary care PCMHs or use the term PCMH in the definition of the evaluated program.

Type of Study: The tables reflect differences in type of study or authorship. **Table 1** includes results published in peer-reviewed journal articles; **Table 2** includes outcomes from state government evaluations (some of which use an independent evaluator); **Table 3** includes self-reported results from industry, private payers, or not-for-profit organizations; and **Table 4** contains results from independent evaluations of three large-scale federal PCMH initiatives. While the national evaluations included state-specific outcomes, we summarized only the overall program results within the table. Additional state-specific results can be found on each program's respective page of the PCPCC Primary Care Innovations and PCMH Map and are reviewed in greater detail in the discussion section.

Measures of Interest: The first column provides the name and/or description of the PCMH intervention, the publication in which outcomes were reported, and the data review period. Due to space limitations within the table, we describe each study in general terms only. For additional information, the full citation is included under each table. The second column provides reported **Cost & Utilization** outcomes for emergency department (ED) use, inpatient admissions, readmissions, expenditures, or other outcomes directly related to health care cost or utilization measures. *Our inclusion criteria specify that every intervention included in this publication reported on at least one measure of cost or utilization.* However, because some of the studies also included other measures of importance to the PCPCC — such as access to primary care services, quality of care, provider satisfaction, and patient and family experience — when they are included in the study, we also list them in the column labeled **Additional Outcomes**. The final column, **Payment Model Description**, describes the underlying payment arrangement that supports each PCMH intervention, as well as supplementary information on the intervention's participation in a multi-payer collaborative or demonstration. If the article, evaluation, or industry report did not specify a payment model, we note that there was "none specified within the publication."

Limitations: First, several peer-reviewed studies and industry reports published this year focused on quality of care and/or patient or provider experience but did NOT include cost or utilization outcome measures, and accordingly did not meet the **inclusion criteria** of this report. Although they are not included, the PCPCC tracks these outcomes on its Primary Care Innovations and PCMH Map. Other studies **not included** in this report were those focused on **disease-specific non-primary care** medical home interventions (ex. asthma, diabetes, and oncology). Second, because this is not a formal meta-analysis, the evidence summarized in Tables 1-4 generally does not include outcomes that failed to reach statistical significance or resulted in **findings outside the scope** of this report. When statistical significance was achieved and the information available, we include corresponding p-values for those outcomes. Third, it is important to note that studies varied in their design, analysis, and outcomes, and thus a blank space within a table should not be interpreted as a failure to achieve improvement for that outcome but rather an indication that no information on that outcome (positive or negative) was reported. Finally, similar to previous reports, the PCPCC attempted to **honor the original language of the study authors** and therefore minimized taking liberties in summarizing results, making calculations in the tables, or describing intervention payment models. Intervention results that include acronyms denoted with an asterisk (*) can be found in a glossary on page 34.

TABLE 1: *PEER-REVIEWED STUDIES: Primary Care/PCMH Interventions That Assessed Cost or Utilization, Selected Outcomes by Location, 2014-2015*

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Multi-State			
CHIPRA Quality Demonstration Grant Program[42] ***Published:*** *Academic Pediatrics*, May 2015 ***Data Review:*** *2010-2012 claims data* *Study evaluated utilization and access measures*	• Patients served by Illinois practices with highest NCQA* score were less likely to have non-urgent, preventable, or avoidable ED visit vs. low ($p<.05$) and medium ($p=.06$) NCQA* scores	• "Medical home-ness" not associated with receipt of well-child visit in any of the evaluated samples	**None specified within this publication**
National			
Medicare Fee-for-Service Beneficiaries in NCQA-Recognized PCMHs[43] ***Published:*** *Annals of Emergency Medicine*, March 2015 ***Data Review:*** *July 2007-June 2008 (baseline group); July 2008- June 2010 (comparison groups)* *Study evaluated cost and utilization measures*	**Compared with non-PCMH practices, PCMHs had lower rate of growth for:** • ED payments per beneficiary: ($54 less for 2009, $48 less for 2010) • All-cause ED visits (13 fewer in 2009, 12 fewer in 2010) • Ambulatory Care Sensitive Care (ACSC)* ED visits (8 fewer in 2009, 7 fewer in 2010)		**Fee-for-service**
Veterans Health Administration Patient Aligned Care Teams (PACTs)[44] ***Published:*** *American Journal of Managed Care*, March 2015 ***Data Review:*** *FY 2009 (baseline); FY 2011 (comparison group)* *Study evaluated cost, utilization and access measures*	• The only significant increase in cost was explained by high risk comorbidity ($p<.001$) • ACSC* hospitalizations per patient rose from .02 to .03 ($p<.001$) • High scores in care coordination and transitions in care decreased mean number of ED visits by 0.04 visits per patient ($p=.018$), but high quality and performance improvement increased ED visits by 0.03 visits per patient ($p=.032$)	• Avg. number of primary care visits decreased from 4.81 to 3.99, but telephone visits increased 85% ($p<.001$) • High organization of practice scores related to 0.13 fewer primary care visits vs. low-scoring practices ($p=.012$)	**Single payer**

[42] Christensen, A.L., Zickafoose, J.S., Natzke, B., McMorrow, S., & Ireys, H.T. (2015). Associations between practice-reported medical homeness and health care utilization among publicly insured children. *Academic Pediatrics, 15*(3), 267-74. doi: 10.1016/j.acap.2014.12.001. Study authors conducted a "cross-sectional analysis assessing the relationship between practice-reported medical 'homeness' and health service use by children enrolled in Medicaid in 64 practices in 3 states participating in the CHIPRA Quality Demonstration Grant Program: Illinois (IL), North Carolina (NC), and South Carolina (SC)." While reductions in utilization were realized in Illinois practices, no association was found in North Carolina or South Carolina practices.

[43] Pines, J.M., Keyes, V., Van Hasselt, M., & McCall, N. (2015). Emergency department and inpatient hospital use by Medicare beneficiaries in patient-centered medical homes. *Annals of Emergency Medicine*, 65, 652-660. doi: 10.1016/j.annemergmed.2015.01.002. The study authors used a retrospective, longitudinal, practice-level analysis to evaluate outcomes data from NCQA-recognized PCMH practices using Medicare claims data from FY2008-2010 compared to baseline claims data from July 2007-June 2008.

[44] Yoon, J., Liu, C.F., Lo, J., Schectman, G., Stark, R., Rubenstein, L.V., & Yano, E.M. (2015). Early changes in VA medical home components and utilization. *American Journal of Managed Care, 21*(3), 197-204. Study authors conducted a longitudinal study, which evaluated patients that had at least two primary care visits in FY 2009 and used any outpatient care in 2011. The study sample included 2,607,902 patients from 796 clinics. To support PACT implementation, the VA hired RN care managers for each PACT care team, as well as a full-time health promotion specialist and a health behavior coordinator at every VHA facility.

Table 1 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
National (continued)			
Veterans Health Administration Patient Aligned Care Teams (PACTs)[45] ***Published:*** *Journal of Health Care Quality,* November 2014 ***Data Review:*** *April 2009 – March 2010 (Pre-PACT baseline); June 2011 – May 2012 (Post-PACT comparison group)* *Study evaluated utilization and access measures*	**For all veterans:** • 8.61% reduction in hospitalizations ($p<.05$) • 7.54% reduction in specialty visits ($p<.05$) **Veterans under age 65:** • 9.41% reduction in hospitalizations ($p<.05$) • 2.56% reduction in specialty visits($p<.05$) **Veterans over age 65:** • 3.49% reduction in specialty visits ($p<.05$) • 18.47% reduction in urgent care visits ($p<.05$)	• 10.79% increase in primary care visits for all veterans ($p<.05$) • 11.23% increase in primary care visits for those under age 65 ($p<.05$) • 11.86% increase in primary care visits over age 65 ($p<.05$)	**Single payer**
California			
Health Care Coverage Initiative[46] ***Published:*** *Health Affairs,* July 2015 ***Data Review:*** *September 2008–August 2009 (pre period); September 2009-August 2010 (post period)* *Study evaluated utilization and access to care measures*	**Enrollees who saw their assigned primary care providers had:** • Higher probability of no ED visits (2.1%) and no hospitalizations (1.7%) **Among this population, the percent of patients with:** • 2 or more annual ED visits decreased from 4.11% to 3.13% • 2 or more hospitalizations decreased from 1.37% to 1.17%	**After the intervention, enrollees had:** • Improved continuity with one primary care provider (69.6% vs. 31.4%) • 41.8% higher probability of seeing the same provider	**Fee-for-service with potential provider "penalties"**

[45] Randall, I., Mohr, D.C., & Maynard, C. (2014). VHA Patient-Centered Medical Home associated with lower rate of hospitalizations and specialty care among veterans with Posttraumatic Stress Disorder. *Journal of Health Care Quality.* doi: 10.1111/jhq.12092 Researchers conducted a "pre–post implementation study to explore the associations between PACT implementation and utilization outcomes using clinical and administrative data from the VHA's Corporate Data Warehouse." This study only evaluated PACT participants with Post-Traumatic Stress Disorder.

[46] Pourat, N., Davis, A., Chen, X., Vrungos, S., & Kominski, G. (2015). In California, primary care continuity was associated with reduced emergency department use and fewer hospitalizations. *Health Affairs, (34)*7. doi: 10.1377/hlthaff.2014.1165 The Health Care Coverage Initiative required counties to assign patients to a "medical home". At a minimum, a medical home had to consist of a provider who was an enrollee's usual source of primary care, maintained the enrollee's medical records, and coordinated his or her care. This study evaluated the intervention using pre and post-intervention claims data. In the 3rd year of the intervention, the program declined to pay providers for the non-urgent claims submitted for non-assigned patients.

Table 1 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
California (continued)			
UCLA Health System[47] ***Published:*** *American Journal of Managed Care,* September 2015 ***Data Review:*** *May 2012-July 2013* *Study evaluated utilization measures, but reported on estimated cost and provider satisfaction*	**Compared with control practices, patients served by practices with coordinated care had:** • 20% greater reduction in pre-post ED visits ($p<.0001$) • 12% reduction in ED utilization ($p<.001$) • This led to estimated reduction of $1.4 million in total cost of care over one year, cost of staff/benefits was $950,000 over the same time	**An internal survey of 52 physicians at the time of the intervention found:** • 94% said the program was effective • 80% said their patients were enthusiastic about augmented services	**Mixed payment model** *"Although UCLA Health has population-based capitation and risk-sharing contracts, many patients are in traditional* ***fee-for-service*** *plans. The CCCs evaluated in this study support patients irrespective of insurance type"*
Colorado			
Colorado Multi-payer PCMH pilot[48] ***Published:*** *Journal of General Internal Medicine,* October 2015 ***Data Review:*** *April 2007-March 2009 (pre-intervention baseline); April 2009-March 2012 (post-intervention)* *Study evaluated cost, utilization and quality measures*	• No net overall cost savings in study period, possibly due to offsetting increases in other spending categories **Two years after initiation of pilot, PCMH practices (vs. baseline) had:** • Reduction in ED costs of $4.11 PMPM (13.9%; $p< 0.001$) and $11.54 PMPM for patients with 2 or more comorbidities (25.2%; $p<.0001$) • ~7.9 % reduction in ED use ($p=0.02$) • 2.7% reduction in primary care visits ($p=.006$) for patients with 2 or more comorbidities **Three years after initiation, PCMH practices showed sustained improvements with:** • Reduction in ED costs of $3.50 PMPM (11.8%; $p= 0.001$) and $6.61 PMPM for patients with 2 or more comorbidities (14.5%; $p =.003$) • 9.3% reduction in ED visits ($p=0.01$) • 1.8% reduction in primary care visits ($p=.06$) for patients with 2 or more comorbidities • 10.3% reduction in ACSC inpatient admissions ($p=0.05$)	**PCMH pilot practices were associated with:** • Increased cervical cancer screening rates after 2 years (12.5% increase, $p<.001$) and 3 years (9.0% increase, $p<.001$) • Lower rates of HbA1c testing in patients with diabetes (.7% reduction at 3 years, $p=.03$) • Lower rates of colon cancer screening (21.1% and 18.1% at 2 and 3 years respectively $p<.001$) • Decreased primary care visits (1.5% at 3 years, $p=.02$)	**PMPM** fees based on the level of NCQA accreditation that each practice attained **Pay-for-performance** program, which awarded bonuses to practices based on meeting both quality and utilization benchmarks This is a **multi-payer** initiative

[47] Clarke, R., Bharmal, N., Di Capua, P., Tseng, C., Manglone, C.M., Mittman, B., & Skootsky, S.A. (2015). Innovative approach to patient-centered care coordination in primary care practices. *American Journal of Managed Care, 21*(9), 623-630. Retrieved from http://www.ajmc.com/journals/issue/2015/2015-vol21-n9/innovative-approach-to-patient-centered-care-coordination-in-primary-care-practices The study authors used a multivariate regression model controlling for age, gender, and medical complexity to evaluate 10,500 unique patients in 14 of the 28 evaluated practices over a one-year period. The study authors note that the "UCLA Health System developed a transformation model that includes aspects from many PCMH domains." This model includes Comprehensive Care Coordinators (CCCs) in the care team. CCCs are embedded in each practice to support patients and help them navigate the health care system.

[48] Rosenthal, M.B., Alidina, S., Friedberg, M.W., Singer, S.J., Eastman, D., Li, Z., & Schneider, E.C. (2015). A difference-in-difference analysis of changes in quality, utilization and cost following the Colorado Multi-Payer Patient-Centered Medical Home Pilot. *Journal of General Internal Medicine.* doi: 10.1007/s11606-015-3521-1 Authors conducted difference-in-difference analyses evaluating 15 small and medium-sized practices participating in a multi-payer PCMH pilot. The authors examined the post-intervention period two years and three years after the initiation of the pilot.

Table 1 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Michigan			
Blue Cross Blue Shield of Michigan Physician Group Incentive Program[49] ***Published:*** *Health Affairs*, April 2015 ***Data Review:*** *2008 claims data (pre-intervention period); 2009-2011 claims data for cost analyses and 2009–2010 claims data for quality analyses (post-intervention period)* *Study evaluated cost and quality measures*	• PCMH practices decreased total PMPM spending by $4.00 more than control practices (a 1.1% difference) • However practice PMPM spending increased by $5.95 in year 1. Practices did not see net savings until second year • PCMH providers spent $5.44 PMPM less for pediatric patients, a savings of 5.1%	Program practices achieved same or better performance over study period on 11 of 14 quality measures	**Pay-for-Performance** *"Participating PCPs:* • *were eligible for up to 20% increased reimbursement for office visit fees* • *could bill for care coordination and care management services provided by ancillary providers* • *had opportunity to earn an additional 5% in EM* fees for achieving high performance on quality measures"* Michigan BCBS participates in a **multi-payer** demonstration (MAPCP)
Blue Cross Blue Shield of Michigan Physician Group Incentive Program[49] ***Published:*** *Medical Care Research and Review*, August 2015 ***Data Review:*** *July 2009-June 2012* *Study evaluated cost and quality measures*	Practices beginning the study with high implementation scores ("full implementation") versus those with low implementation scores ("no implementation") had $16.73 PMPM lower costs for adult patients after 3 years (4.4%, $p = .02$)	• Practices beginning the study with high implementation scores "full PCMH implementation" vs. those with low scores "no PCMH implementation" had higher adult quality composite scores (4.6%, $p<.001$) and higher adult preventive composite score (4.0%, $p<.001$) after 3 years • Practices that changed their PCMH implementation score had higher adult quality composite scores (4.0%, $p<.001$) and higher adult preventive composite score (2.3%, $p<.001$) after 3 years	**Pay-for-Performance** *"The program provides financial incentives to physician organizations when their member practices implement PCMH capabilities"* Michigan BCBS participates in a **multi-payer** demonstration (MAPCP)
New York			
Hudson Valley Initiative[51] ***Published:*** *American Journal of Managed Care*, May 2015 ***Data Review:*** *2008-2010 claims data* *Study evaluated utilization measures*	• Patients in a PCMH had 6% reduction in specialist visits vs. non-PCMHs after one year of implementation, without increasing ED visits or hospital admissions		*"This study evaluates part of the Hudson Valley Initiative, a **multi-payer** program in which six health plans agreed to provide financial incentives ranging from **$2 to $10 PMPM**, to practices that implemented Level III PCMHs based on 2008 NCQA standards"* This is a **multi-payer** initiative

[49] Lemak, CH., Nahra, TA., Cohen, GR., Erb, ND., Paustian, ML., Share, D., & Hirth, RA. (2015). Michigan's fee-for-value physician incentive program reduces spending and improves quality in primary care. *Health Affairs, (34)*7. doi: 10.1377/hlthaff.2014.0426 Study authors used a difference-in-differences design to evaluate more than 3.2 million patients under age 65 served by Blue Cross Blue Shield of Michigan.

[50] Alexander, J.A., Markovitz, A.R., Paustian, M.L., Wise, C.G., El Reda, D.K., Green, L.A., & Fetters, M.D. (2015). Implementation of Patient-Centered Medical Homes in Adult Primary Care Practices. *Medical Care Research and Review, 72*(4), 438-67. doi: 10.1177/1077558715579862 This study uses a longitudinal design and a validated PCMH implementation instrument to assess the impact of PCMH implementation on three patient related outcomes — use of preventive services, quality of care, and cost of care.

[51] Kaushal, R., Edwards, A., & Kern, L.M. (2015). Association between the patient-centered medical home and healthcare utilization. *American Journal of Managed Care, 21*(5), 378-86. This study used a longitudinal, prospective cohort study design to evaluate primary care physicians in the Hudson Valley region of New York over 3 years (2008-2010). The authors note, "this study evaluates part of the Hudson Valley Initiative, which seeks to transform healthcare delivery through health information technology, practice transformation, and value-based purchasing." This study evaluated 7 measures of utilization, but only one yielded statistically significant results (as depicted in the table above).

Table 1 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
New York (continued)			
Rochester Medical Home Initiative (RMHI)[52] ***Published:*** *Medical Care,* November 2015 ***Data Review:*** *August 2007-July 2009 (comparison group); August 2009-July 2012 (intervention group)* *Study evaluated cost, utilization and quality measures*	• Drug spending decreased by $11.75 PMPM, despite increasing utilization of prescription drugs over study period (*p*=.015) • Pilot practices had higher spending on inpatient services ($4.71 PMPM, *p*=0.015) **RMHI pilot associated with reductions vs. baseline in:** • ACSC* ED visits (*p*=.013) • Overall count of imaging tests (400 fewer per 1000 member months *p*<.001)	• RMHI pilot increased primary care visits (*p*<.001) and laboratory tests (*p*=.037) • Decrease in preventable hospitalizations, as measured by Prevention Quality Indicator (PQI) (*p*=.027) • 2.6% increase in breast cancer screening (*p*=.005) • 3.8% increase in LDL diabetes tests (*p*=.048)	**Blended payment model:** • Model includes **fee-for-service** and a **pay-for-performance** program focused on quality and cost • Payment levels were set so as to support practice costs related to the intervention, including support of a Nurse Care Manager
Pennsylvania			
Geisinger Health System patient-centered medical home (ProvenHealth Navigator)[53] ***Published:*** *Health Affairs,* April 2015 ***Data Review:*** *January 2006-June 2013* *Study evaluated cost measures*	• Avg. of 7.9% total cost savings across 90-month study period (an avg. of $53 savings in PMPM total cost of care per site) • $34 PMPM savings for acute inpatient care (19% savings PMPM) • Acute inpatient cost savings account for ~64% of the total estimated savings • Longer implementation time associated with greater cost savings		**Fee-for-service** **Pay-for-performance** based on quality outcomes **Shared savings** model based on performance
Pennsylvania Chronic Care Initiative[54] ***Published:*** *JAMA Internal Medicine,* June 2015 ***Data Review:*** *October 2007–September 2012 (2 years prior to and 3 years after the pilot inception date)* *Study evaluated utilization, access and quality measures*	**By year 3, pilot participation was associated with lower rates (per 1000 patients per month) for:** • All-cause hospitalization (-1.7) • All-cause ED visits (-4.7) • Ambulatory-care sensitive ED visits (-3.2) • Ambulatory visits for specialists (-17.3)	• Higher performance in all 4 examined measures of diabetes care quality (HbA1c testing, LDL-C testing, nephropathy monitoring, eye examinations) and breast cancer screening • By year 3, pilot was associated with higher rates of ambulatory primary care visits (+77.5) per 1000 patients per month	**Participating practices received:** • **$1.50 PMPM** in care management payments • **$1.50 PPPM** in "practice support payments" • **Shared savings** bonuses contingent on meeting quality benchmarks (bonus payments could range from 40% to 50% of calculated savings in each year This is a **multi-payer** initiative

[52] Rosenthal, M.B., Sinaiko, A.D., Eastman, D., Chapman, B., & Partridge, G. (2015). Impact of the Rochester Medical Home Initiative on primary care practices, quality, utilization, and costs. *Medical Care, 53*(11), 967-73. doi: 10.1097/MLR.0000000000000424 Study authors conducted a difference-in-difference analysis with a matched comparison group using claims data from Excellus Blue Cross Blue Shield and MVP Health Care. In addition to the results included above, the authors note "estimates on other utilization and spending measures, including total spending per patient per month were not statistically significant, which means we cannot determine whether the effect of transforming into a PCMH has a positive or negative effect on these outcomes."

[53] Maeng, D.D., Khan, N., Tomcavage, J., Graf, T.R., Davis, D.E., & Steele, G.D. (2015). Reduced acute inpatient care was largest savings component of Geisinger health system's patient-centered medical home. *Health Affairs, (34)*7, 636-644. doi: 10.1377/hlthaff.2014.0855 This study focused on the impact of the ProvenHealth Navigator on the elderly Medicare Advantage patient population. Researchers used a set of multivariate regression models to examine the program and break down the total cost savings associated into its major components (outpatient, inpatient, professional, and prescription drugs) and establish the associations separately between a clinic's exposure to the Navigator and each of the cost components.

[54] Friedberg, M.W., Rosenthal, M.B., Werner, R.M., Volpp, K.G., & Schneider, E.C. (2014). Effects of a medical home and shared savings intervention on quality and utilization of care. *JAMA Internal Medicine, 175*(8), 1362-1368. doi:10.1001/jamainternmed.2015.2047. The authors used a "difference-in-differences design to compare changes during a 3-year period in the quality and utilization of care for patients attributed to practices that participated in the northeast PACCI and comparison practices that did not participate in this medical home intervention." In the Northeast Region, participating practices were required to achieve NCQA recognition within 18 months of implementation.

Table 1 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Pennsylvania (continued)			
Pennsylvania Chronic Care Initiative[55] ***Published:*** *American Journal of Managed Care,* January 2015 ***Data Review:*** *2008 (baseline); 2009-2011 (comparison group)* *Study evaluated cost and utilization measures*	• Lower total costs in PCMH practices in all 3 follow-up years ($p<.05$) driven by significantly lower inpatient ($p<.01$) and specialist ($p<.0001$) costs • Relative to baseline, overall PMPM costs were: • $16.50 lower in 2009 • $13.00 lower in 2010 • $13.70 lower in 2011 • In 2009, adjusted costs for PCMH were 17.5% lower than those in non-PCMH practices. • PCMH practices maintained lower utilization for hospital admissions ($p<.0001$) and specialist visits ($p<.01$) each follow up year		*"To facilitate transition to the PCMH model, practices received supplemental financial incentives"* This is a **multi-payer** initiative
Texas			
Texas Children's Health Plan[56] ***Published:*** *Journal of Health Care for the Poor and Underserved,* May 2015 ***Data Review:*** *August 2011–August 2012* *Study evaluated utilization measures*	• Having a usual source of care per parent-report was associated with lower rate of documented ED visits and hospitalizations • Higher mean score for organizational capacity was significantly associated with both lower rates of ED visits and hospitalizations • Higher data management mean score was significantly associated with lower rates of ED visits		**None specified within this publication**

[55] Neal, J., Chawla, R., Colombo, C., Snyder, R., & Nigam, S. (2015). Medical homes: cost effects of utilization by chronically ill patients. *American Journal of Managed Care, 21*(1), e51-61. Study authors used a longitudinal observational design and analyzed the impact of the PCMH model on PMPM costs using a generalized linear regression model. This study evaluated a "cohort of chronically ill members—defined as patients having asthma, coronary artery disease, congestive heart failure, chronic obstructive pulmonary disease, diabetes, and/or hypertension—which was created from administrative medical claims in the baseline year, 2008."

[56] Raphael, J.L., Cooley, W.C., Vega, A., Kowalkowski, M.A., Tran, X., Treadwell, J., Giardino, A.P., & Giordano, T.P. (2015). Outcomes for children with chronic conditions associated with parent-and provider-reported measures of the medical home. *Journal of Health Care for the Poor and Underserved, 26*(2), 358-76. doi: 10.1353/hpu.2015.0051 Study authors conducted a cross-sectional, retrospective analysis of administrative claims data from Texas Children's Health Plan, a managed care organization. The study evaluated 240 children with chronic diseases from 122 practices. The authors define organizational capacity as "the practice's commitment to patient-centered care as demonstrated by solicitation of patient feedback, multiple mechanisms for communication with families, patient access to medical records, and continual staff education and training."

Table 1 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Utah			
University of Utah Care By Design[57] ***Published:*** *Journal for Healthcare Quality,* January 2015 ***Data Review:*** *June 2010-May 2011 (baseline); June 2011 – September 2013 (intervention period)* *Study evaluated utilization measures*	• All-cause 30-day hospital readmission rate decreased from 17.9% to 8.0% ($p<.05$) • Mean time to hospital readmission within 180 days was delayed from 95 to 115 days ($p<.05$)		**None specified within this publication**
Vermont			
Vermont Blueprint for Health[58] ***Published:*** *Population Health Management,* September 2015 ***Data Review:*** *Review of annual outcomes from 2008-2013* *Study evaluated cost, utilization, access and quality of care measures*	• Participant expenditures were reduced by −$482 PMPY* ($p<.001$) • Reduction in inpatient (−$218 PMPY*; $p<.001$) and outpatient hospital expenditures (−$154 PMPY*; $p<.001$) • Increase in expenditures for dental, social, and community-based support services ($57 PMPY*; $p<.001$) • Total annual reduction in expenditures was $104.4 million • Medical expenditures decreased by approximately $5.8 million for every $1 million spent on the Blueprint initiative • Reduction in inpatient discharges reduced by 8.8 per 1000 members ($p<.001$) • Reduction in inpatient days reduced by 49.6 per 1000 members ($p<.001$) • Significant reduction in standard imaging, advanced imaging, echography	• Higher rates on 9 of 11 effective and preventive care measures • Higher screening rates for breast cancer and cervical cancer ($p<.001$) and appropriate testing for pharyngitis ($p<.001$) • Participants with diabetes had higher rates of eye testing and LDL-C testing ($p<.001$) • Participants had significantly higher rates of adolescent well-care visits ($p<.001$)	**Fee-for-service + capitated payments** *"Two payment reforms were implemented to support PCMH and CHT* operations:* • *a **capitated** payment that went directly to the practice based on its NCQA PCMH score* • *a **capitated** payment that went to the administrative entity in each service area to operate the CHT*"* Vermont Blueprint for Health is a **multi-payer** initiative that participates in the MAPCP demonstration

[57] Farrell, T.W., Tomoaia-Cotisel, A., Scammon, D.L., Brunisholz, K., Kim, J., Day, J., … Magill, M.K. (2015). Impact of an integrated transition management program in primary care on hospital readmissions. *Journal for Healthcare Quality, 37*(1), 81-92. doi: 10.1097/01.JHQ.0000460119.68190.98. Study authors note that the "University of Utah Community Clinics (UUCCs) developed and implemented the "Care By Design" (CBD) model, which is 'UUCCs' version of the PCMH'… the three organizing principles of CBD — Appropriate Access (AA), Care Teams (CTs), and Planned Care (PC) — correspond to core PCMH principles."

[58] Jones, C., Finison, K., McGraves-Lloyd, K., Tremblay, T., Mohlman, M.K., Tanzman, B., … Samuelson, J. (2015). Vermont's community-oriented all-payer medical home model reduces expenditures and utilization while delivering high-quality care. *Population Health Management.* doi:10.1089/pop.2015.0055 This study used a sequential cross-sectional design to review annual outcomes from 2008 through 2013 for participants versus a comparison population at each stage of program implementation and maturation.

TABLE 2: *STATE GOVERNMENT EVALUATIONS: Primary Care/PCMH Interventions That Assessed Cost or Utilization, Selected Outcomes by Location, 2014-2015*

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Arkansas			
Arkansas PCMH program[59] ***Published:*** *Arkansas Department of Human Services*, October 2015 ***Data Review:*** *2014 claims data*	• In 2014, the state avoided $34 million in Medicaid costs in 2014 • 19 providers received shared savings payments for a total of over $5 million		**Fee-for-service + PMPM** payments for care coordination and enhanced access Opportunity to qualify for **shared savings** The Arkansas PCMH program is a **multi-payer** program that participates in the CPC initiative
Colorado			
Colorado Accountable Care Collaborative (ACC)[60] ***Published:*** *Colorado Department of Health Care Policy and Financing*, November 2014 ***Data Review:*** *FY 2013-2014*	• $92-$102 million in gross program savings ($29-$33 million in net savings) • ~$14 million reinvested into providers by program (including incentive payments) • 8% fewer ER services for adult ACC enrollees in program more than 6 months vs. non-enrolled • Slightly higher use of ER services for ACC enrollees with disabilities vs. non-enrolled • Fewer readmissions for children and adult ACC members without disabilities vs. non-enrolled **Fewer high cost imaging services for ACC enrollees vs. non-enrolled:** • 3% fewer for ACC members with disabilities • 16% fewer for adult ACC members • 12% fewer for children ACC members		**Fee-for-service base + additional incentives** ACC uses hybrid of several payment strategies with a base of **fee-for-service**: • RCCOs* and PCMPs* receive incentive payments for reaching key performance indicator (KPI) targets **(pay for performance)** • PCMPs get PMPM payments for achieving 5 of 9 standards of enhanced PCMH **In FY 2014-2015:** • RCCOs and PCMPs will receive a share of the savings when the ACC saves on medical expenditures • ACC is testing full-risk **capitation** in one region and increasing PCMP* PMPM payments

[59] Arkansas Department of Human Services. (2015). *Arkansas Medicaid Rewarding Primary Care Providers for Prevention, Disease Management.* Retrieved from http://humanservices.arkansas.gov/pressroom/PressRoomDocs/DMSpatientcentermhawardsNRoct15.pdf To determine cost avoidance, the state first evaluated baseline costs for 2010, 2011, and 2012. It gave each year a weight: 10% for 2010, 30% for 2011 and 60% for 2012 and used this formula to determine 2014's projected cost.

[60] Colorado Department of Health Care Policy and Financing. (2014). *Creating a Culture of Change: Accountable Care Collaborative 2014 Annual Report.* Retrieved from: https://www.colorado.gov/pacific/sites/default/files/Accountable%20Care%20Collaborative%20 2014%20Annual%20Report.pdf Primary care providers contracted with a RCCO to serve as medical homes for ACC members.

Table 2 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Oregon			
Oregon Coordinated Care Organizations[61] ***Published:*** *Oregon Health Authority,* June 2015 ***Data Review:*** *2011 (comparison group); 2014 (PCMH group)*	• Oregon is meeting its CMS commitment to reduce growth in spending by 2 percentage points (PMPY) • PMPM costs for inpatient hospital services have decreased by 14.8% since 2011 • 13 out of 16 CCOs earned 100% of their quality pool payments • Reduction in all-cause 30-day readmissions (from 12.8% in 2013 to 11.4% in 2014) • Reduction in ED visits (44.7 per 1000 member months in 2014 vs. 50.5 in 2013, 61 in 2011) • Reduction in avoidable ED visits **Since 2011 baseline:** • 22% reduction in ED visits • 26.9% reduction in admissions for patients with diabetes and short-term complications • 60% reduction in admissions for patients with COPD or asthma • Almost 50% reduction in avoidable ED visits	• Increased SBIRT* intervention (2.0% to 7.3%) • Percentage of individuals able to access care quickly when needed remained steady • Childhood and adolescent access to primary care providers declined **Since 2011 baseline:** • Increased appropriate testing for children with pharyngitis • Increased well-care visits • PCPCH enrollment increased 56% • Increased satisfaction with care	**Fee-for-service + Pay-for-performance** **To earn full incentive payment, CCOs must:** • Meet benchmarks or improvement targets on at least 12 of 17 incentive measures; • Meet benchmark or improvement target for EHR adoption; AND • Have at least 60% of members enrolled in a PCPCH **CCOs earn "challenge pool funds" for meeting benchmark of improvement target on:** • Alcohol and drug misuse (SBIRT); • Diabetes HbA1c poor control; • Depression screening and follow-up plan; • PCPCH enrollment
North Carolina			
Community Care of North Carolina (CCNC)[62] ***Published:*** *State Auditor Report,* August 2015 ***Data Review:*** *July 2003-December 2012*	• Savings of ~$78 per quarter per beneficiary, ~$312 a year (~9% savings) • Decreased spending in almost all categories, with largest reduction in inpatient services • CCNC saved the state Medicaid program about $134 million • Reduction in readmissions, inpatient admissions for diabetes (although not statistically significant), and ED visits for asthma • ~25% reduction in inpatient admissions • Approximately a 20% increase in physician services	• Approximately a 10.7% decline in prescription drug use	**Fee-for-service + Care coordination fee** Medicaid paid an adjusted administrative fee ranging from $2.50 to $13.72 from 2004 through 2012 CCNC formerly participated in the **multi-payer** MAPCP demonstration

[61] Oregon Health Authority. (2015). *Oregon's Health System Transformation: 2014 Final Report.* Retrieved from: http://www.oregon.gov/oha/Metrics/Documents/2014%20Final%20Report%20-%20June%202015.pdf This final report outlines the progress of Oregon CCOs in 2014. 81 percent of CCO members are enrolled in a recognized patient-centered primary care home. PCPCC did not include all evaluated measures in the table above. Follow the link for comprehensive program results.

[62] Office of the State Auditor. (2015). *Community Care of North Carolina.* Retrieved from: http://www.ncauditor.net/EPSWeb/Reports/FiscalControl/FCA-2014-4445.pdf The study population is limited to non-elderly, non-dual Medicaid beneficiaries. All cost findings are estimated in 2009 inflation-adjusted dollars.

TABLE 3: *INDUSTRY REPORTS: Primary care/PCMH interventions that assessed cost or utilization, selected outcomes by location, 2014-2015*

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Multi-state			
Anthem Enhanced Personal Health Care (EPHC)[63] ***Published:*** *Anthem industry report*, 2015 ***Data Review:*** *Results from program year 1 (vs. matched control group)*	• $130 million in savings over 12 month period • Gross medical savings of $9.51 Per Attributed Member Per Month (PaMPM)*; net savings of $6.62 PaMPM* • Overall pharmacy savings of $.79 PaMPM* • 3.3% lower ER costs • 3.5% reduction in inpatient costs, driven by a 7.8% reduction in acute inpatient admissions • 3.5% decrease in allowed ER costs, driven by 1.6% reduction in ER utilization • 1.2% reduction in office visit costs • 2.3% increase in primary care visit costs for high-risk population • 1-3% reduction in referrals to elective procedures and high cost radiology	**Compared with non-EPHC peers, EPHC providers performed:** • 9.6% better in pediatric prevention • 4.8% better in annual monitoring of persistent medications • 4.3% better in diabetes care • 4.3% better in cervical and breast cancer screening • 3.9% better in other acute and chronic care measures	**Fee-for-service +** PMPM Clinical Coordination Reimbursement **(care coordination payment)** Additional opportunity for **shared savings** through its incentive program Anthem participates in **multi-payer efforts** (CPC and MAPCP)
Louisiana			
Blue Cross Blue Shield of Louisiana Quality Blue Primary Care (QBPC) Program[64, 65] ***Published:*** *Blue Cross Blue Shield of Louisiana Press Release, "Quality Blue Primary Care Collaborative" presentation slide deck*, October 2015 ***Data Review:*** *2013-2014 claims data*	**QBPC program vs. comparison practices:** • Reduced total costs by ~$25 PMPM • Reduced overall cost of office-based visits, largely due to reduction in specialty visits • Reduced inpatient admissions overall and among patients with heart disease, hypertension, diabetes, and chronic kidney disease • Increased overall and ACSC ED visits	• Increased office-based primary care visits **From January 2015 to September 2015, the program showed:** • 25% improvement in diabetes quality measures • 31% improvement in hypertension quality measures • 40% improvement in vascular disease quality measures • 69% improvement on chronic kidney disease measures	**Fee-for-service + Care Management Fee (CMF)** *"Twice a year, Blue Cross evaluates CMFs for adjustment, based on how each QBPC-enrolled practice performed on the program's core measures"*

[63] Anthem, Inc. (2015). *Innovation with proven results: Enhanced Personal Health Care.* Retrieved from https://www.pcpcc.org/sites/default/files/EPHC_WhitePaper_Anthem.pdf According to the program description modified 7/1/2015, the Anthem EPHC Program builds upon the success of PCMH programs and fosters a collaborative relationship between Anthem and its contracted providers. The results in this study reflect care for Anthem members in its affiliated plans in California, Colorado, Ohio, New York, and Virginia.

[64] Blue Cross Blue Shield of Louisiana. (2015). *Blue Cross getting better results for customers.* Retrieved from: http://www.bcbsla.com/AboutBlue/mediacenter/news/Pages/BlueCrossGettingBetterHealthResultsforCustomers.aspx Results published in this press release were validated by Tulane University's School of Public Health.

[65] Shi, L. (2015). QBPC Program Evaluation. Presentation at the Quality Blue Primary Care Collaborative. The study used a difference in difference approach to evaluate outcomes associated with the QBPC program.

Table 3 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Maryland			
CareFirst Blue Cross Blue Shield PCMH Program[66] ***Published:*** *CareFirst Blue Cross Blue Shield Press Release*, July 2015 ***Data Review:*** *2014 claims data*	• Costs for members in a PCMH were $345 million less than projected in 2014 and $609 million less than expected since 2011 • ~84% of provider panels earned Outcome Incentive Awards (OIA) averaging $41,000 -$49,000 **Since 2011, PCMH members have had*:** • 19% fewer hospital admissions (5.1% fewer in 2014) • 15% fewer days in the hospital (10.7% fewer in 2014) • 20% fewer hospital readmissions for all causes (8.5% fewer in 2014) • 5% fewer outpatient health facility visits (12.5% fewer in 2014)		**Fee-for-service +** All PCMH providers earned a 12 percentage point participation fee **(risk-adjusted PMPM)** Primary care panels can earn Outcome Incentive Awards (OIAs) based on both the level of quality and degree of savings they actually achieved against projections, paid prospectively
Michigan			
Blue Cross Blue Shield of Michigan Physician Incentive Program[67] ***Published:*** *Blue Cross Blue Shield of Michigan Press Release*, July 2015 ***Data Review:*** *2015 claims data*	• Estimated $512 million in savings over 6 years • PCMH practices had an 8.7% lower rate of adult high-tech radiology use **Patients that visited PCMH practices:** • 26% lower rate of hospital admissions for common conditions • 10.9% lower rate of adult ER visits • 16.3% lower rate of pediatric ER visits • 22.4% lower rate of pediatric ER visits for common chronic and acute conditions (i.e. asthma)		**None specified within this publication** BCBS Michigan participates in **multi-payer** efforts (MAPCP)

[66] CareFirst BlueCross BlueShield. (2015). *Quality Remains Strong as Cost Increases Slow Dramatically for Members in Patient-Centered Medical Home Program.* Retrieved from: https://member.carefirst.com/individuals/news/media-news/2015/quality-remains-strong-as-cost-increases-for-members-in-patient-centered-medical-home-program-slow-dramatically.page

[67] Blue Cross Blue Shield of Michigan. (2015). *Michigan continues to lead nation in patient-centered health care, thanks to Blue Cross Blue Shield of Michigan Patient-Centered Medical Home program.* Retrieved from: http://www.bcbsm.com/blue-cross-blue-shield-of-michigan-news/news-releases/2015/july-2015/blue-cross-patient-centered-medical-home-program.html

Table 3 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
New Jersey			
Horizon Blue Cross Blue Shield New Jersey Patient-Centered Programs[68] ***Published:*** *Horizon Blue Cross Blue Shield Press Release*, August 2015 ***Data Review:*** *2014 claims data*	**Compared with members served by traditional primary care practices:** • 9% lower total cost of care • 8% lower rate of hospital admission • 5% lower rate of ED visits	**Compared with members served by traditional primary care practices:** • 6% higher rate in improved diabetes control • 7 % higher rate in cholesterol management for diabetic patients • 8% higher rate in colorectal cancer screenings • 3% higher rate in breast cancer screening	**Fee-for-service +** PCMH practices have an opportunity to receive outcome-based or **shared-savings payments**, provided they meet specified goals for achieving better health outcomes, improving the patient experience and lowering the cost of care. Horizon BCBS participates in **multi-payer** efforts (CPC)
Rhode Island			
Blue Cross Blue Shield of Rhode Island PCMH program[69] ***Published:*** *Blue Cross Blue Shield of Rhode Island Press Release*, November 2015 ***Data Review:*** *2009-2014 claims data*	• PCMH practices were 5% less costly and saved $30M vs. standard primary care providers • 250% return on investment **Patients with complex medical conditions were:** • 16% less likely to be hospitalized or need an ED visit • 30% lower readmissions to hospitals		*"BCBSRI and partners have shared financial incentives to improve access to care, coordination among clinicians"* BCBS Rhode Island participates in **multi-payer** efforts (MAPCP)

[68] Horizon Blue Cross Blue Shield of New Jersey. (2015). *Patient-centered care continues to deliver on promise of better quality care at a lower cost.* Retrieved from: http://www.horizonblue.com/about-us/news-overview/company-news/horizon-bcbsnj-patient-centered-care-on-promise-of-better-quality

[69] Blue Cross Blue Shield of Rhode Island. (2015). *New Study Shows Patient Centered Medical Homes Improve Health, Lower Costs.* Retrieved from: https://www.bcbsri.com/about-us/news-events/news/new-study-shows-patient-centered-medical-homes-improve-health-lower-costs The report tracked more than 89,000 commercial and 14,000 Medicare Advantage members within BCBSRI's PCMH over the 2009 – 2014 time period.

TABLE 4: *INDEPENDENT EVALUATIONS OF FEDERAL INITIATIVES: Primary care/PCMH interventions that assessed cost or utilization, selected outcomes by location, 2014-2015*

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
Multi-state (7 regions)			
Comprehensive Primary Care (CPC) Initiative[37] ***Published:*** *Mathematica Independent Evaluation,* January 2015 ***Data Review:*** *Performance Year 2013* *Participating practices located in Arkansas, Oklahoma (Greater Tulsa region), Oregon, Colorado, Ohio (Cincinnati-Dayton region and Northern Kentucky region), New Jersey, and New York (Capitol District-Hudson Valley region)* *Report evaluated cost, utilization, quality, access, and patient satisfaction measures*	**Cost and utilization outcomes for the CPC program varied across regions; <u>overall program results include</u>:** • Across the 7 regions, CPC reduced Medicare Part A and Part B expenditures by $14 PBPM*, with care management fees excluded (median of $70,045 per clinician) • 2% reduction in hospital admissions and 3% reduction in ED visits • 4% CPC-wide decline in unplanned 30-day readmissions (not statistically significant) • Majority of savings generated by patients in the highest-risk quartile, but favorable results were also seen in other patients	**Quality outcomes for the CPC program varied across regions**	**Medicare payments:** • **Fee-for-service + care management fee.** In the first two years of CPC, the Medicare risk-adjusted PMPM payment rates are $8, $11, $21, and $40, depending on a patient's HCC* score (average rate is $20 PBPM*) • Opportunity for **shared savings** in 2nd, 3rd, and 4th year if net savings in Medicare Part A and B health care costs is achieved + quality performance **Other participating payers:** • Provide enhanced payments for each of their members attributed to a practice (almost always a PMPM care management payment.) This is a **multi-payer** initiative
Multi-state (8 regions)			
Multi-payer Advanced Primary Care Practice (MAPCP) Demonstration[70] ***Published:*** *RTI International Independent Evaluation,* January 2015 ***Data Review:*** *Performance Year 2013* *8 states began MAPCP in 2011: Maine, Michigan, Minnesota, New York, North Carolina, Pennsylvania, Rhode Island and Vermont (5 continuing to participate through 2016: ME, MI, NY, RI, VT)*	**Cost and utilization outcomes for the MAPCP program varied by state, <u>overall the program</u>:** • Generated an estimated $4.2 million in savings in its first year through the use of advanced primary care initiatives		**Fee-for-service +** • Each state has its own payment levels and established its own methodologies • CMS makes monthly MAPCP payments to PCMHs for assigned demonstration beneficiaries • States instructed that the avg. Medicare PMPM payment should not exceed $10 and that payment methods should be applied consistently by all participating payers—but not necessarily at the same dollar level This is a **multi-payer** demonstration

[37] Taylor, E.F., Dale, S., Peikes, D., Brown, R., Ghosh, A., Crosson, J.,...Shapiro, R. (2015). Evaluation of the Comprehensive Primary Care Initiative: First Annual Report. *Mathematica Policy Research.* Retrieved from: http://innovation.cms.gov/Files/reports/CPCI-EvalRpt1.pdf Mathematica Policy Research conducted an independent evaluation of the first performance year of the CPC initiative (through September 2013). The CPC initiative is a multi-payer partnership between Medicare, Medicaid private health care payers, and primary care practices in four states (Arkansas, Colorado, New Jersey and Oregon) and three regions (New York's Capital District and Hudson Valley, Ohio and Kentucky's Cincinnati-Dayton region, and Oklahoma's Greater Tulsa region).

[70] RTI International. (2015). *Evaluation of the Multi-payer Advanced Primary Care Practice (MAPCP) Demonstration: First Annual Report.* Retrieved from: https://downloads.cms.gov/files/cmmi/MAPCP-FirstEvaluationReport_1_23_15.pdf RTI International conducted an independent evaluation of the eight participating MAPCP states in the first performance year. The evaluation uses a mix of qualitative and quantitative methods to capture each of the states' unique features and to develop an in-depth understanding of the transformative processes that occur within and across the states' health care systems and participating PCMH practices. The evaluation used a mixed-method design, with both quantitative and qualitative methods and data. Chapter 2 includes a summary of cross-state findings (page 42).

Table 4 continued

Location/Initiative	Cost & Utilization	Additional Outcomes	Payment Model Description
48 States			
Federally Qualified Health Center Advanced Primary Care Practice Demonstration FQHC [71] ***Published:*** *Rand Corporation*, July 2015 ***Data Review:*** *November 2011- October 2014* *Report evaluated cost, utilization, access and quality measures*	**Relative to 4 baseline quarters, claims-based analyses across 9 quarters show significantly more utilization and costs for demonstration FQHCs vs. comparison FQHCs. Demonstration FQHC users had significantly more:** • Total Medicare payments (4 quarters); • Hospital admissions (2 quarters); • Readmissions (1 quarter); • ED visits (6 quarters)	• The demonstration FQHC group significantly outperformed comparison group for at least 8 quarters for HbA1C tests, retinal eye exams, and nephropathy testing • In year 2, demonstration FQHCs associated with a ~1% decrease in continuity when looking across all primary care provider visits and when looking at primary care and specialist care together	**Fee-for-service +** CMS provides participating FQHCs with a quarterly **care management payment** of $18 for each eligible Medicare beneficiary

[71] Kahn, K.L., Timbie, J.W., Friedberg, M.W., Lavelle, T.A., Mendel, P., Ashwood, J.S.,....Setodji, C.M. (2015). *Evaluation of CMS FQHC APCP Demonstration: Second Annual Report.* Rand Corporation. Retrieved from: https://innovation.cms.gov/Files/reports/fqhc-scndevalrpt.pdf RAND Corporation conducted an independent evaluation of the FQHC Advanced Primary Care Practice (APCP) demonstration and assessed the effects of the APCP model on access, quality, and cost of care provided to Medicare and Medicaid beneficiaries currently served by FQHCs. For this demonstration, CMS recognizes advanced primary care as the type of care that is offered by FQHCs that have achieved Level 3 NCQA recognition as a PCMH.

SNAPSHOT OF THE EVIDENCE

Aggregated Outcomes from the 30 Studies

21 of 23 studies that reported on cost measures found reductions in one or more measures

23 of 25 studies that reported on utilization measures

found reductions in one or more measures

SECTION THREE: DISCUSSION OF FINDINGS AND IMPLICATIONS

The report concludes with an analysis and discussion of the evidence and its implications in light of payment reform. Although the primary care PCMH interventions included in this report varied substantially in size, scope, geographic location, PCMH implementation strategy, and payment model, trends in the reported results are clear and encouraging. Across the various studies, the PCMH model was associated with largely positive and consistent trends on cost and utilization measures — the major focus of this annual evidence report.

Peer-Reviewed Studies (Table 1)

Overall, the results from 17 peer-reviewed studies associate PCMH implementation with general improvements in cost and utilization measures. Of the 10 studies that designated cost as an outcome variable, nine showed an improvement in one or more cost measures, such as emergency department (ED) costs or inpatient spending. The Vermont Blueprint for Health found impressive reductions in inpatient (−$218; $p<.001$) and outpatient hospital expenditures (−$154; $p<.001$) while simultaneously increasing spending for dental, social, and community-based support services ($57; $p<.001$), which resulted in total cost savings for the state and a return on investment of nearly 6 to 1 (annualized cost/gain ratio).[58] Both peer-reviewed studies from Blue Cross Blue Shield Michigan identified total cost of care savings, with one study reporting a 4.4 percent lower cost among adults,[50] while the Geisinger study identified an impressive 7.9 percent total cost savings across a 90-month study period.[53] One of the two peer-reviewed studies describing the Pennsylvania Chronic Care initiative found statistically significant cost savings associated with PCMH practices serving those with chronic illness in all three follow-up years ($p<.05$) driven by significantly lower inpatient ($p<.01$) and specialist ($p<.0001$) costs.[55]

Not all nine studies, however, reported on total cost of care. The Colorado Multi-payer PCMH pilot study, which reported lower ED costs especially for those with chronic illness, measured but did not find net overall cost savings.[48] Most studies did not assess the total cost of care, but the trend across these 17 peer-reviewed studies suggests that the longer the PCMH program had been implemented and subsequently evaluated, improvements in cost or utilization were demonstrated. This was specifically suggested by the Blue Cross Shield Michigan studies, the Geisinger Provenhealth Navigator program, the Pennsylvania Chronic Care initiative, and the Medicare Fee-For-Service NCQA study.

"The trend across these 17 peer-reviewed studies suggests that the longer the PCMH program had been implemented and subsequently evaluated, improvements in cost or utilization were demonstrated."

Fourteen studies reported on utilization measures, 13 of which showed favorable reductions in one or more measures. Measures of "upstream" utilization — such as improvements in "usual source of care" found in the Texas Children's Health Care study or increased use of primary care in one of the two VA PACT studies — resulted in "downstream" utilization changes, as demonstrated by lower ED visits and hospitalizations, such as that reported by the CHIPRA Quality demonstration. These utilization measure changes (ED use, hospitalization, specialist visits) were similar across the majority of the peer-reviewed studies. A handful of studies reported reductions in primary care visits,[44,48] which may be attributed to increased use of email communication, telephone consultations, and group visits. Further, highly organized practices may also conduct more systematic care planning, which may lead to more productive and meaningful visits and possibly reduce the need for return visits.[48] Another measure of utilization — continuity of care — was demonstrated in the California Health Care Coverage Initiative,[46] which evaluated the value of assigning and incentivizing Medicaid enrollees to manage their care through a primary care medical home. To incentivize providers to promote and embrace this model, the program declined to pay primary care providers who treated non-urgent patients not assigned or empaneled to their practice. Despite appropriate caution about the unintended consequences of policies or programs that limit access to care, this innovative approach resulted in changing both provider and patient behavior and a subsequent reduction in inappropriate and costly utilization of health care services.

> "'Nature' refers to the health care ecology of the region including practice size, practice culture, and patient population, whereas 'nurture' refers to the intervention design and its components (including technical assistance, provider participation, PCMH incentive payments, and shared savings incentives, etc.)."

Another example of a multi-payer collaborative that resulted in both significant cost savings and utilization improvements came from Pennsylvania. The Pennsylvania Chronic Care Initiative (Pa-CCI) demonstrated positive results, contrasting with last year's widely cited JAMA study[72] that reported no association between the PCMH model and cost and utilization improvements. This year's two Pa-CCI peer-reviewed studies report that PCMH implementation resulted in significant reductions in unnecessary health care utilization, as well as notable improvements in quality of care. In a 2015 *Health Affairs* article, authors Friedberg, Sixta and Bailit[73] refer to the "nature" and "nurture" characteristics of the Pennsylvania medical home initiative, which was rolled out differently in various regions of the state. "Nature" referred to the health care ecology of the region including practice size, practice culture, and patient population, whereas "nurture" referred to the intervention design and its components, (including technical assistance, provider participation, PCMH incentive payments, and shared savings incentives, etc.). The table on page 30 compares the regional differences and the subsequent contrasting results, which may provide important lessons not only for payment reform, but also for PCMH intervention design.

NATURE VS. NURTURE: Factors Driving PCMH Outcomes in Two Regions of Pennsylvania[73]

		Southeast Region	Northeast Region
Nature	**Practices**	• Mostly small, independent practices • A few very large academic medical centers and FQHCs	• Several "right-size" (medium-sized) practices • Solo practices often belonged to larger medical group • Strong relationship with hospitals
	Patient population	• Many had significant economic hardship	• Less diverse, fewer with economic challenges
Nurture	**Quality improvement focus**	• QI focused almost exclusively on diabetes care	• Focused on multiple chronic conditions
	Implementation	• Fairly rushed implementation, 1st region in the initiative to launch • Only 1/3 of practices had EHRs at the beginning of implementation	• Had opportunity to learn from other regions • All practices had EHRs at beginning of implementation
	Payment model	• Practices received PMPM **after** earning NCQA recognition • Payments not contingent upon hiring care manager	• Practices were not required to have NCQA recognition until 18 months into implementation **2 streams of payment:** • 1 for care management and • 1 for practice transformation
		No opportunity for shared savings until year 4 (after initial JAMA study[72] was published)	Opportunity for shared savings tied to quality improvement
	Payer support	In many practices, no data and no technical support provided	Provided practices with ED and inpatient notification and reports from the beginning of implementation
Findings	**Evaluation**	Focused on first 3 years of implementation, but years 4 and 5 had greater success	Evaluated data from 2 years prior to and 3 years after the pilot inception date
	Results	• Limited improvement on diabetes care • No reductions in utilization • No cost savings	• Reductions in unnecessary/ inappropriate utilization • Improvements in care quality measures/ screenings

Source: Friedberg, M.W., Sixta, C., & Bailit, M. (2015). Nature and nurture: what's behind the variation in recent medical home evaluations? Health Affairs Blog. Retrieved from http://healthaffairs.org/blog/2015/06/19/nature-and-nurture-whats-behind-the-variation-inrecent-medical-home-evaluations/

State Government Evaluations (Table 2)

All four state government evaluations provide valuable insight on state-sponsored primary care PCMH initiatives, and each reported improvement in one or more cost metric. The Colorado Accountable Care Collaborative reported an overall net savings to the state of $29-$33 million over a two-year timeframe.[60] In North Carolina, an independent state auditor report evaluating the Community Care of North Carolina program found that reductions in ED visits, inpatient admissions, and readmissions saved the state Medicaid program approximately $134 million.[62] Of note, the auditor evaluated the program over nine years, further supporting the notion that the longer a PCMH practice is implemented, the stronger the results. In addition, all of the state government evaluations that reported on utilization measures found improvements in one or more area. In Oregon, the state's Coordinated Care Organizations (CCOs) found remarkable reductions in inappropriate and avoidable ED use. The evaluation largely attributed utilization improvements to "emergency department navigators" who refer patients presenting with non-urgent conditions to more appropriate care settings, including Patient-Centered Primary Care Homes.[61]

Industry Reports (Non Peer-Reviewed) (Table 3)

Results from various industry reports are uniformly positive and speak to the sizable investment private payers are making in enhanced primary care and the PCMH. All six industry publications report reductions in both cost and utilization, and three detail important improvements in quality of care measures. The Anthem Enhanced Personal Health Care Program — Anthem's PCMH program that is rolling out nationally — reported net cost savings of $6.62 per attributed member per month (PaMPM) in its affiliated plans in California, Colorado, Ohio, New York and Virginia.[63] Blue Cross Blue Shield of Michigan — one of the largest and longest-running PCMH programs in the country — estimates $512 million in savings over six years[67] by aligning providers and payers and using its own regional peer-reviewed accreditation program. CareFirst's unique PCMH program that virtually connects non-affiliated providers through nurse care managers resulted in $345 million in savings from its projected spend in 2014, and $609 million less than its expected spend since 2011, with 84 percent of its provider panels earning Outcome Incentive Awards (OIA).[66] Horizon Blue Cross Blue Shield in New Jersey was able to reduce total cost of care by 9 percent, reduce the rate of hospital admission by 8 percent, and reduce the rate of ED visits by 5 percent, while at the same time improving on a number of quality measures related to diabetes, cholesterol, and cancer.[68] These favorable results are influential in not only advancing further expansion of existing commercial payer programs, but also in promoting private sector engagement in multi-payer collaboratives.

Independent Evaluations of Federal Initiatives (Table 4)

Three major federal primary care transformation programs were included in this year's report. Due to the expansive scope of these evaluations, only overall programmatic results are included in the table, but state-specific outcomes (when reported) are available on each program's respective page and on the online PCPCC Primary Care Innovations and PCMH Map. Further, we summarized state specific trends below.

The Multi-Payer Advanced Primary Care Practice (MAPCP) Demonstration, as described in Table 4, combines eight unique state-sponsored initiatives together with Medicare to promote the adoption of the PCMH, allowing for substantial flexibility in PCMH implementation and payment. The evaluation focused on the first performance year only and measured clinical quality of care and patient safety, access to and coordination of care, special populations, beneficiary experience with care, patterns of utilization, Medicare and Medicaid expenditures and budget neutrality. It reported an overall estimated $4.2 million in Medicare cost savings.[70] A deeper dive into the evaluation highlights the limitations of early data reviews and the variability across states, with only two of the eight MAPCP states (Vermont and Michigan) achieving net cost savings, driven by reduced growth in expenditures for short-stay, acute-care hospitalizations. Both states, as described in the peer-reviewed studies above, have had mature PCMH programs for several years. The evaluation found even fewer utilization measure changes, with only Minnesota demonstrating reductions in ED visit rates. As suggested by the independent evaluators, health system transformation takes time and the limited findings here are likely a result of this early review.[70] The decision by CMS to extend the program (from 3 to 5 years) in five of the eight states appears to underscore this understanding.

Also described in Table 4, the Comprehensive Primary Care Initiative is a multi-payer program that unites public sector (both federal and state) as well as private sector payers (health plans, employers, and unions) to support primary care practices in transforming care delivery. It is unique in its effort to drive a more standardized delivery and payment reform effort in four states (AR, CO, NJ, and OR) and three regions (New York's Capital District and Hudson Valley; Ohio and northern Kentucky's Cincinnati-Dayton region; and Oklahoma's Greater Tulsa region).[37] Participating primary care practices receive technical assistance for quality improvement, care management fees to support the costs of non-visit-based services, and an additional opportunity to participate in shared savings. While preliminary results from the CPC initiative

show promising cost and utilization outcomes, evaluators note that it is still too early to determine several outcomes related to quality of care and patient experience.[37] In its first year, the results were more favorable than expected, with reductions in hospitalizations and emergency room utilization, however the savings did not fully offset the care management fees. From this early review, New Jersey and Oklahoma's Tulsa region demonstrated favorable impacts on several cost and utilization outcomes, while New York reduced rates for hospitalizations and Oregon reduced outpatient ED visits.[74]

The FQHC demonstration showed less favorable results. The initiative encountered several barriers to success, including a significant rate of attrition. The evaluation reported that 69 percent of the clinics earned NCQA level 3 PCMH recognition (the goal was 90 percent) but many did not attain recognition until late into the demonstration.[75] Relative to the baseline, FQHCs in the demonstration had higher utilization and care costs, potentially related to the expanded services needed for the safety net patient population that FQHC clinics serve. Other studies suggest that the significant effort required by practices to become recognized as a PCMH can undermine efforts to focus on meaningful transformation and/or serve as a distraction to patient care without adequate resources to support transformation.[76,31,54] FQHC clinics participating in the demonstration were however able to improve on a number of quality measures related to diabetes. As noted earlier, payment incentives for successful transformation are important. The FQHC demonstration evaluation underscores this point and suggests that the median investment of $26,000 per clinic per year was inadequate to support PCMH transformation that was expected to result in cost or utilization improvements.

Payment Model Insights and the Importance of Multi-Payer Initiatives

This year's report includes a new column with a description of the payment model for each PCMH study (to the extent that the information was available.) No single payment model stood out as definitive during this time of experimentation. However, the PCMH initiatives with the most impressive cost and utilization outcomes were generally those that participated in multi-payer collaboratives with specific incentives or performance measures linked to quality, utilization, patient engagement and/or cost savings. Distinct from the independent evaluations of the large federal programs, which had limited findings based on preliminary results, these more robust studies evaluated PCMH initiatives that were a part of a larger multi-payer effort. For example, six of the eight MAPCP demonstration states (Michigan, Pennsylvania, New York, North Carolina, Rhode Island, Vermont) were represented as part of a study achieving notable cost and/or utilization improvements. Five of the seven regions of the CPC (Arkansas, Colorado, Hudson Valley New York, New Jersey, and Oregon) were represented in the studies described here, with individual studies also reporting positive cost and/or utilization measures associated with the PCMH. With the exception of a few PCMH programs built on a FFS structure, many of the successful PCMH initiatives had innovative payment

"The PCMH initiatives with the most impressive cost and utilization outcomes were generally those that participated in multi-payer collaboratives with specific incentives or performance measures linked to quality, utilization, patient engagement and/or cost savings."

models that incorporated pay-for-performance, shared savings, and/or population-based payments, thus shifting away from volume-driven services and toward value-based payment.

Challenges in Evaluating Primary Care PCMH Interventions

The PCMH evaluations included in Tables 1-4 generally link the PCMH model of care delivery with significant reductions in cost and utilization, *as well as* improvements in clinical quality measures and access to care. Programs with mature PCMH implementation showed more favorable results. More Return on Investment (ROI) or "total cost of care" research is needed that assesses the costs associated with PCMH transformation (or "upstream" spending) that results in "downstream" savings, through reduced ER visits or hospitalizations. This would demonstrate the extent to which spending on primary care results in long term ROI to the overall health system.

As in past years, there was a dearth of studies that evaluated cost or utilization measures together with patient experience or provider satisfaction and health outcomes, essential elements of the Triple Aim. As we evaluate cost outcomes associated with the model, we must increasingly evaluate the model as a whole to ensure that cost savings and better patient care go hand in hand. The CPC, MAPCP, and SIM initiatives will allow us to explore these variables over time and in different regions of the country, providing a rich and much-needed understanding of the PCMH model and the context in which it is most likely to make a positive impact on the Triple Aim.

CONCLUSION

A major barrier in reforming our fragmented care delivery system is in how we pay for care: the predominant fee-for-service payment system is piecemeal, inflationary, administratively burdensome and technically complex. While states and commercial payers have for many years piloted various forms of payment alignment to support primary care and the patient-centered medical home (PCMH), the Medicare program has been slower to adopt and scale similar care delivery and payment reforms. With some notable exceptions, payment reform has been embraced on a relatively small scale. That is about to change. This year, champions of innovative delivery reform and payment alignment enjoyed two landmark victories. First, a substantial commitment — with specific and aggressive timelines — from the U.S. Department of Health and Human Services (HHS) to shift Medicare fee-for-service (FFS), toward value-based payment models. The announcement included the launch of the Health Care Payment Learning and Action Network (HCPLAN), a public-private effort to help advance adoption of alternative payment models.[39] Second, the much-anticipated passage of the Medicare Access and CHIP Reauthorization Act (MACRA),[41] repealed Medicare's flawed sustainable growth rate (SGR) payment formula in favor of reimbursement that values the quality of care delivered, aligns existing performance measures, and incorporates PCMH and value-based reimbursement in the Medicare FFS program.

The PCMH model is ready for payment reform. The mounting evidence outlined in this year's review of 30 peer-reviewed, industry, and state and federal evaluations suggests a consistent trend between the PCMH model of care and cost and utilization improvements. However, for the medical home to be sustainable and brought to scale, comprehensive payment reform is an increasing necessity. This year's review demonstrates that the PCMH can be supported by various alternative payment models. That said, the studies included vary substantially in size, scope, geographic location, payment model, and the specific PCMH strategies implemented. Payment reform will help catalyze delivery system changes, especially through models that incentivize care coordination services, patient communication, telephone and email encounters, population health management, and quality improvement.

> "As CMS defines the PCMH and supports it through value-based purchasing arrangements, the medical home will be scaled and spread. Accordingly, it is critical to unify patients/consumers (including families/caregivers), health care providers, and payers around the value of advanced primary care and the PCMH. Critical too is a unified multi-stakeholder voice that speaks to the importance of alternative payment reforms to support the model."

Alignment of payment and performance measurement are also central in driving successful outcomes, as evidenced by the number of peer-reviewed and industry PCMH studies associated with multi-payer initiatives. As the regional differences in the Pennsylvania Chronic Care Initiative demonstrate, context around how and where the medical home program is implemented also matters. While the goals or attributes for the PCMH model are largely the same, the model is not "one size fits all," and careful consideration is warranted regarding its implementation, assessment, and payment. As CMS defines PCMH and supports it through value-based purchasing arrangements, the medical home will be scaled and spread. Accordingly, it is critical to unify patients/consumers (including families/caregivers), health care providers, and payers around the value of advanced primary care and PCMH. Critical too is a unified multi-stakeholder voice that speaks to the importance of alternative payment reforms to support the model.

GLOSSARY

ACSC Ambulatory Care Sensitive Condition

CMF Care Management Fee

CI Confidence Interval

EM Evaluation and Management

FQHC Federally Qualified Health Center

HEDIS "Healthcare Effectiveness Data and Information Set" is a resource for measuring performance on dimensions of care and service

IE Incremental Effect

LDL Low-density Lipoprotein

NCQA National Committee for Quality Assurance

OIA Outcome Incentive Award

PaMPM Per Attributed Patient Per Month

PBPM Per Beneficiary Per Month

PCP Primary Care Provider

PCMP Primary Care Medical Provider

PCPCH Patient-Centered Primary Care Home

PMPM Per Member Per Month

PMPY Per Member Per Year

RCCO Regional Care Collaborative Organization

SBIRT Screening, Brief Intervention, and Referral to Treatment is an approach to the delivery of early intervention and treatment to people with substance use disorders and those at risk of developing these disorders

APPENDIX 1: EDUCATIONAL INFOGRAPHIC FOR PATIENTS AND FAMILIES

Patient-Centered Primary Care COLLABORATIVE

What Is a Patient-Centered Medical Home (PCMH)?

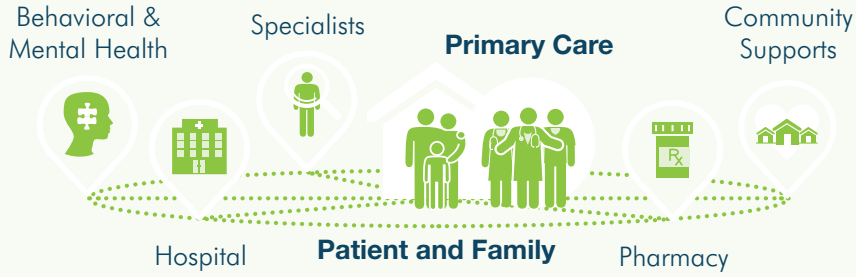
It's not a place… It's a partnership with your primary care provider.

PCMH puts **you** at the center of your care, working with your health care **team** to create a **personalized plan** for reaching your goals.

Your **primary care team** is focused on getting to know you and earning your trust. They care about you while caring for you.

Technology makes it easy to get health care when and how you need it. You can reach your doctor through **email**, **video chat**, or after-hour **phone calls**. **Mobile apps** and **electronic resources** help you stay on top of your health and medical history.

As you pursue your health care journey, you may make stops at different places:



Wherever your journey takes you, your **primary care team** will help guide the way and coordinate your care.

Studies show that PCMH:

Provides better **support** and **communication**

Creates **stronger relationships** with your providers

Saves you **time**

To learn more about the PCMH, visit **www.pcpcc.org**

A Patient-Centered Medical Home is the right care at the right time. It offers:

Personalized care plans you help design that address your health concerns.

Medication review to help you understand and monitor the prescriptions you're taking.

Coaching and advice to help you follow your care plan and meet your goals.

Connection to **support and encouragement** from peers in your community who share similar health issues and experiences.

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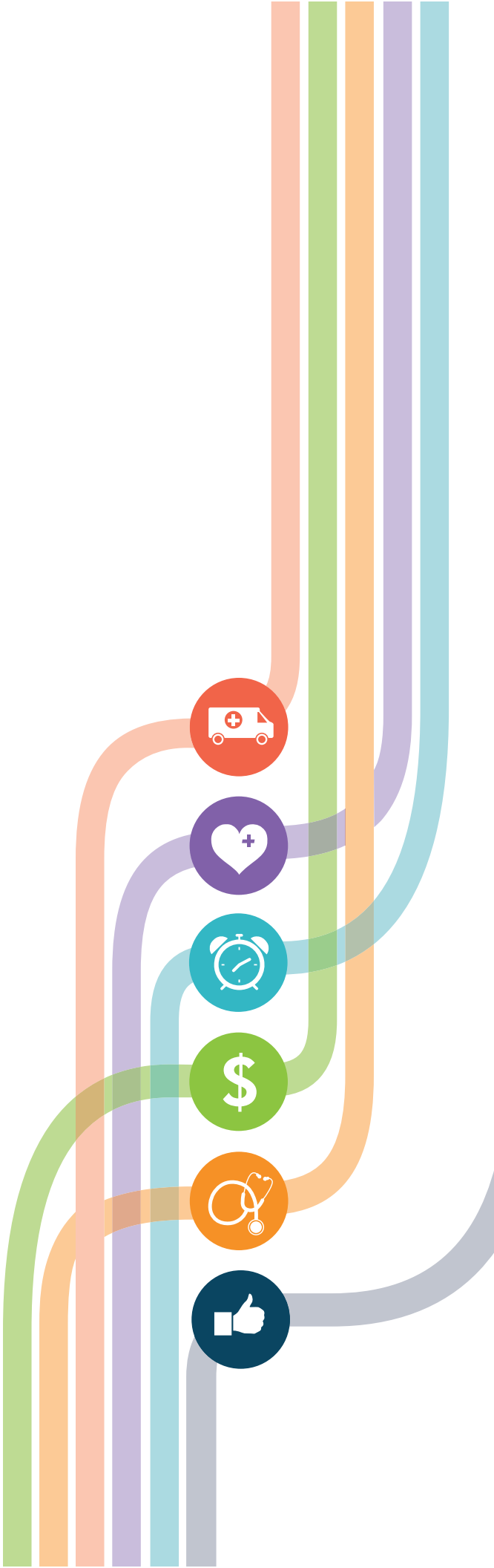

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