Excerpt from the Patient-Centered Primary Care Collaborative's annual publication titled, the Patient-Centered Medical Home's Impact on Cost and Quality, Review of Evidence 2014-2015.

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 (v<.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 Incentive Program[50] ***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%202014%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.

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 disorder