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 2013-2014.

Table 1. PEER-REVIEWED STUDIES: Primary care/PCMH Interventions that assessed Cost or Utilization, selected outcomes by location, 2013-2014

A blank space within a column indicates that no information (positive or negative) was reported on that metric.

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
National				
Medicare Fee-for-Service beneficiaries in NCQA-recognized PCMHs[36] ***Published:*** *Health Services Research*, July 2014 ***Data Review:*** July 2007-June 2008 (comparison group); July 2007-June 2010 (PCMH group) *Study evaluated cost and utilization*	• 4.9% reduction in total annual Medicare payment trend for PCMHs v. comparison group (62% due to decline in payments to acute care hospitals, $p<.05$) • Decline in rate of ED visits for ACSCs* ($p<.001$) and for any condition ($p<.001$) • Decline in rate of ED visits for patients in PCMHs across all 3 measured risk score groups **Among primary care practices, PCMH recognition was associated with a reduction in:** • Total Medicare payments ($325 per practice, $p<.01$) • Rate of visits to surgical specialists ($p<.05$) • Rate of ED visits for any condition ($p<.001$) • Rate of ED visits for ACSCs ($p<.001$)			
Veterans Health Administration Primary Care Clinics with Medical Home Features[37] ***Published:*** *Journal of General Internal Medicine*, Sept. 2014 ***Data Review:*** Oct. 2009-Sept. 2010 (comparison group); Oct. 2010-Sept. 2011 (PCMH group) *Study evaluated cost and utilization, but also reported on access*	• Marginally statistically significant relationship between medical home features and cost of ACSC* hospitalizations (p=.074), however average-sized clinics with "maximum" medical home adoption estimated to save as much as $83,000 annually • A "medical home adoption score" increase of 10 points associated with a 3% decreased odds of ACSC* hospitalization ($p=.032$)		• 17% lower odds of ACSC* admission for patients seen in clinics with highest access and scheduling scores ($p=.004$) • Lower risk of hospitalizations for patients in clinics with medium care coordination/ transitions scores ($p=0.020$)	

[36] Van Hasselt, M., McCall, N., Keyes, V., Wensky, S.G., & Smith, K.W. (2014). Total cost of care lower among Medicare fee-for-service beneficiaries receiving care from patient-centered medical homes. *Health Services Research*, doi: 10.1111/1475-6773.12217 This study used a longitudinal, nonexperimental design to compare cost and utilization outcomes for Medicare FFS beneficiaries served by NCQA-recognized PCMHs to beneficiaries served in practices without such recognition.

[37] Yoon, J., Rose, D.E., Canelo, I., Upadhyay, A.S., Schectman, G., Stark, R., Rubenstein, L.V., & Yano, E.M. (2013). Medical home features of VHA primary care clinics and avoidable hospitalizations. *Journal of General Internal Medicine, 28(9)*, 1188-94. This study used a cross-sectional design to evaluate data from 814 primary care clinics. Findings from this study were based on clinics' self-assessment of medical home features prior to nationwide rollout of the Patient Aligned Care Teams (PACT) implementation across all VHA clinics. "Medical home components" are defined by authors as "1) access and scheduling, 2) care coordination and transitions in care, 3) organization of practice, 4) patient-centered care and communication, 5) population management, 6) quality improvement and performance improvement and 7) use of technology."

Table 1 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
National (continued)				

Veterans Health Administration Patient Aligned Care Team (PACT)[38]
Published: *Health Services Research*, Aug. 2014
Data Review: July 2010-June 2012
Study evaluated utilization and access
	• Slight decline in rates of ED visits among PACT providers (9.7% to 8.0%) while rates increased for non-PACT providers (7.5% to 8.8%)
	• Statistically significant improvements in 2-day post-hospital discharge contact associated with:
	  • being a PACT provider ($p<.01$)
	  • effectiveness of PACT implementation ($p<.01$)
			• Specific structural changes resulted in mixed findings although use of high risk registries was associated with an increase in telephone visits ($p<.05$) and team communication was associated with obtaining an appointment within 3 days of desired date ($p<.05$)	

Veterans Health Administration Patient Aligned Care Team (PACT)[39] ***Published:*** *Plos One*, May 2014 ***Data Review:*** March 2011-Feb. 2012 *Study evaluated utilization*	• 46% lower ED utilization for patients with at least one PCP "continuity" visit compared to those without continuity ($p<.001$)			
Veterans Health Administration Patient Aligned Care Team (PACT)[40] ***Published:*** *JAMA Internal Medicine*, June 2014 ***Data Review:*** June 2012-Dec. 2012 *Study evaluated utilization, quality of care, patient satisfaction and provider burnout*	• Statistically significant reduction in ED use ($p<.001$). • Lower hospitalization rates for ACSCs* for veterans age 65 and older ($p<.001$) and veterans age 65 and younger ($p<.001$, a 13.4% decrease)	• Higher performance on 41 of 48 measures of clinical quality (19 measures were statistically significant) • Statistically significant improvements in 9 quality-of-care indicators for veterans with chronic diseases		• **Clinician satisfaction:** lower staff burnout in PCMH sites v. non-PCMH sites (emotional exhaustion subscale $p=.02$) • **Patient satisfaction** was significantly higher among sites that effectively implemented PACT v. those that did not ($p<.001$)

[38] Werner, R.M., Canamucia, A., Shea, J.A., & True, G. (2014). The medical home transformation in the Veterans Health Administration: an evaluation of early changes in primary care delivery. *Health Services Research, 49(4)*, 1329-1347. doi: 10.1111/1475-6773.12155 This study linked "detailed interview-based qualitative data on PACT implementation to quantitative outcomes from VHA clinical encounter data" to measure the impact of the intervention on organizational processes of care and patient outcomes.

[39] Chaiyachati, K.H., Gordon, K., Long, T., Levin, W., Khan, A., Meyer, E., Justice, A., & Brienza, R. (2014). Continuity in a VA patient-centered medical home reduces emergency department visits. *PLoS One, 9(8)*. doi: 10.1371/journal.pone.0096356 This study used a retrospective, observational cohort study design to determine the impact of continuity of care in PACT teams on ED utilization in one large VA clinic. The authors defined continuity of care as "a patient seeing their assigned primary care provider (PCP) or trainee" and a continuity index was used to assess the dose-effect of continuity.

[40] Nelson, K.M., Helfrich, C., Sun, H., Herbert, P.L., Liu, C.F., Dolan, E., Taylor, L., Wong, E., Maynard, C., Hernandez, S.E., Sanders, W., Randall, I., Curtis, I., Schectman, G., Stark, R., & Fihn, S.D. (2014). Implementation of the patient-centered medical home in the Veterans Health Administration associations with patient satisfaction, quality of care, staff burnout, and hospital and emergency department use. *JAMA Internal Medicine. 174(8)*, 1350-1358. This study used an observational design to measure "the extent of PCMH implementation" and examine "the association between the implementation (using the PACT Implementation Progress index) and examined "the association between the implementation index and key outcomes."

Table 1 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
National (continued)				
Veterans Health Administration Patient Aligned Care Team (PACT)[41] ***Published:*** *Health Affairs*, June 2014 ***Data Review:*** April 2010-Sept. 2012 *Study evaluated cost, utilization and access*	• No ROI* in study period, but authors note "trends in use and costs appear to be [moving] in a favorable direction" • 1.7% reduction in hospitalizations for ACSCs* across VHA system; 4.2% reduction for veterans under age 65 ($p<.05$) • 7.3% reduction in outpatient visits with mental health specialists across VHA system (likely due to integration of mental health in primary care) ($p<.05$)		• 3.5% increase in primary care visits for veterans over age 65 ($p<0.05$) • 1% increase in primary care visits across VHA system	
Florida				
Florida Medicaid Provider Service Networks (PSN)[42] ***Published:*** *Health Services Research*, June 2014 ***Data Review:*** 2004-2006 (comparison group); 2006-2010 (demonstration group) *Study evaluated cost, but also reported on patient satisfaction*	• $153 PMPM* reduction in expenditures for Medicaid enrollees who were SSI* recipients (have a disability) v. non-demonstration sites • $4 PMPM* reduction in expenditures for Medicaid enrollees who were TANF* recipients (receive welfare cash support) (v. increase of $28 PMPM* in control)			• Patients had slightly greater levels of satisfaction with health care, health plan, personal doctor, and specialty care

[41] Herbert, H.L., Liu, C.F., Wong, E.S., Hernandez, S.E., Batten, A., Lo, S., Lemon, J.M., Conrad, D.A., Grembowski, D., Nelson, K., & Fihn, S.D. (2014). Patient-centered medical home initiative produced modest economic results for Veterans Health Administration, 2010–12. *Health Affairs, 33(6)*, 980-987. doi: 10.1377/hlthaff.2013.0893 This study evaluated "the associations between the implementation of PACT and trends in health care use and costs between April 2010 and September 2012."

[42] Harmen, J.S., Hall, A.G., Lemak, C.H., & Duncan, P.R. (2014). Do Provider Service Networks result in lower expenditures compared with HMOs or primary care case management in Florida's Medicaid program? *Health Services Research. 49(3)*, 858-77. doi: 10.1111/1475-6773.12129 This study compares two payment reform initiatives (PSNs and Medicaid HMOs with risk-adjusted premiums) with non-demonstration sites to assess how different payment mechanisms affect PMPM expenditures. Florida Provider Service Networks (PSN) operate similar to an Accountable Care Organization (ACO) and their parent organizations are either safety-net hospitals or large physician group practices that predominately serve Medicaid patient. PSNs offer "… provision of care across a continuum to a defined population, the ability to support comprehensive performance measurement, the identification of specific performance targets, payment mechanisms that encourage quality improvements and cost reduction, strong primary care medical home base, prospective planning, and health information technology to support care coordination and quality improvement."

Table 1 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Illinois				
Illinois Medicaid Illinois Health Connect (IHC) and Your Healthcare Plus (YHP) Programs[43] ***Published:*** *Annals of Family Medicine*, Sept. 2014 ***Data Review:*** 2004-2005 (control group); 2007-2010 (PCMH group) *Study evaluated cost, utilization, quality of care and preventive services, but also reported on provider satisfaction*	• $775 million in estimated gross savings from 2007 to 2010 (despite increase in actual costs) • Annual savings of 6.5% for IHC and 8.6% for YHP by fourth year with cumulative Medicaid savings of $1.46 billion (gross savings). • 24.9% to 45.7% increase in outpatient costs (as a result of planned payment changes). **Illinois Health Connect (IHC) members had:** • 18.1% reduction in adjusted hospitalization rate • 15.6% reduction in bed-day rate • 5% reduction in adjusted ED visit rate **Your Healthcare Plus (YHP) members had:** • 9.7% reduction in adjusted hospitalization rate • 13.4% reduction in bed-day rate • 4.6% reduction in adjusted ED visit rate	• Quality improved for nearly all metrics under IHC (significant improvement in 9 out of 10 quality metrics) • Most prevention measures more than doubled in frequency (particularly those with low levels of compliance early in PCMH intervention)		**A 2012 physician satisfaction survey reported:** • 85.8% agreed or strongly agreed that they would recommend IHC to their colleagues (2.5% strongly disagreed)
Kentucky				
Army Screaming Eagle PCMH: Ft. Campbell[44] ***Published:*** *Hospital Topics*, Sept. 2014 ***Data Review:*** Jan. 2011-Sept. 2011 *Study evaluated utilization*	• PCMH enrollees were 67% less likely to visit the ER (compared with standard primary care clinic enrollees)			

[43] Phillips, R.L, Han, M., Petterson, S.M., Makaroff, L.A., & Liaw, W.R. (2014). Cost, utilization, and quality of care: an evaluation of Illinois' Medicaid primary care case management program. *Annals of Family Medicine, 12(5)*, 408-417. doi: 10.1370/afm.1690 This study used a retrospective cohort design to compare Medicaid claims data for individuals that would have been eligible for YHP and IHC prior to the program's implementation (pre-implementation cohort) to individuals enrolled in the programs from 2006-2010 (post-implementation cohort). Illinois Health Connect (IHC) is the state's Medicaid primary care case management program and "Your Healthcare Plus" (YHP) is a complementary disease management program. Results for both programs are included because almost all YHP members are enrolled in IHC. Provider satisfaction outcomes listed above are derived from reported survey data included within the study.

[44] Fandre, M., McKenna, C., Beauvasi, B., Kim, F., & Mangelsdorff, A.D. (2014). Patient-centered medical home implementation effects on emergency room utilization: a case study. *Hospital Topics, 92(3)*, 59-65. doi: 10.1080/00185868.2014.937967 This single-site study compared ED utilization for individuals enrolled in Ft. Campbell's PCMH to the utilization of individuals assigned to a traditional medical clinic.

Table 1 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
New York				
New York-Presbyterian Regional Health Collaborative[45] ***Published:*** *Health Affairs*, Nov. 2014 ***Data Review:*** 2009 (baseline); Oct. 2010-Oct. 2013 (PCMH intervention) *Study evaluated utilization and patient satisfaction, but also reported on cost*	• Short-term ROI of 11% (related to reduction in ED visits and increased PCMH reimbursements from New York State) **Among chronically ill patient population:** • 29.7% reduction in ED visits (p<.001) • 28.5% reduction in hospitalizations (p<.001) • 36.7% decline in 30-day readmissions (p<.001) • 4.9% decline in average length-of-stay (p <.001)			• Patient satisfaction scores improved across all measures
North Carolina				

Community Care of North Carolina (CCNC)[46]
Published: *Population Health Management*, Sept. 2013
Data Review: Jan. 2007-Sept. 2011
Study evaluated cost, utilization and access
	• Statistically significant cost savings:
	  • 2008: $52.54 PMPM* ($p$=.005)
	  • 2009: $80.75 PMPM* ($p$<.0001)
	  • 2010: $72.65 PMPM* ($p$<.0001)
	  • 2011: $120.69 PMPM* ($p$<.0001)
	• Statistically significant reduction in rate of hospitalizations from 2008-2011 (despite higher risk score), while rate increased for non-enrolled (p<.001)
			• Increase in access to ambulatory physician services (p<.001)	

[45] Carrillo, J.E., Carrillo, V.A., Guimento, R., Mucaria, J., & Leiman, J. (2014). The New York-Presbyterian Regional Health Collaborative: A Three-Year Progress Report. *Health Affairs, 33(11),* 1985-1992. doi: 10.1377/hlthaff.2014.0408 This study used a pre and post-intervention design and evaluated patients with a combination of diabetes, asthma, and congestive heart failure who were served by one of seven medical homes. All reported outcomes compare the 3-year intervention to baseline. Patient experience was captured through the Press Ganey patient satisfaction survey. New York-Presbyterian Regional Health Collaborative medical homes provide care through interdisciplinary community health teams led by primary care physicians.

[46] Fillmore, H. DuBard, C.A., Ritter, G.A., & Jackson, C.T. (2013). Health care savings with the patient-centered medical home: Community Care of North Carolina's experience. *Population Health Management, 17(3),* 141-8. doi: 10.1089/pop.2013.0055 This study used pre-post and matched cohort comparison models and focused on non-elderly Medicaid enrollees with a disability or multiple chronic conditions. Utilization and access outcomes included above were derived from Model 1; cost findings are from Model 2 due to the authors' assertion that it may "represent a more accurate picture of program impact" because it "better addresses the threat to validity" by matching CCNC enrollees with non-enrolled recipients.

Table 1 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Pennsylvania				

Independence Blue Cross Blue Shield PCMH practices[47]
Published: *American Journal of Managed Care*, March 2014
Data Review: 2009-2011
Study evaluated cost and utilization
	• No statistically significant cost or utilization differences for overall population
	Among high-risk patient population:
	• Adjusted total savings:
	  • 11.2% in 2009 ($107 PMPM, *p*=.004)
	  • 7.9% in 2010 ($75 PMPM, *p*=.06)
	• Reduction in inpatient admissions:
	  • 10.8% fewer in 2009 (*p*=.02)
	  • 8.6% fewer in 2010 (*p*=.03)
	  • 16.6% fewer in 2011 (*p*=.08)			

Independence Blue Cross Blue Shield PCMH Practices[48] ***Published:*** *Health Services Research*, Aug. 2014 ***Data Review:*** 2008-2012 *Study evaluated cost and utilization*	• No statistically significant cost or utilization differences for patients without chronic disease **Among patients with chronic illness transitioning to a medical home:** • Change in ED expenditures did not reach statistical significance • 5-8% reduction in ED utilization • 9.5-12% reduction in ED utilization for patients with diabetes • 3.5-9.6% reduction in avoidable ED visits			
Pennsylvania Chronic Care Initiative[1] ***Published:*** *Journal of the American Medical Association*, Feb. 2014 ***Data Review:*** June 2008-May 2011 *Study evaluated cost, utilization and quality of care*	• No statistically significant change in utilization or cost of care for overall population studied	• Statistically significant improvement in 1 of 11 investigated quality measures: increased nephropathy screening in diabetes (82.7% v. 71.7% *p*<.001) • Improved performance among other diabetes measures and colorectal cancer screening (although not statistically significant)		

[47] Higgins, S., Chawla, R., Colombo, C., Snyder, S., & Nigam, S. (2014). Medical homes and cost and utilization among high-risk patients. *American Journal of Managed Care. 20(3)*, 61-71. This study used longitudinal, case-control design to compare PCMH and non-PCMH practices and evaluate the effects of the PCMH model on costs and utilization among high-risk patients.

[48] David, G., Gunnarsson, C., Saynisch, P.A., Chawla, R., & Nigam, S. (2014). Do patient-centered medical homes reduce emergency department visits? *Health Services Research*, doi: 10.1111/1475-6773.12218 This study compared PCMH-certified practices with non PCMH-certified practices to assess the impact of the adoption of the PCMH model on ED utilization among patients with and without chronic illness.

[1] Friedberg, M.W., Schneider, E.C., Rosenthal, M.B., Volpp, K.G., Werner, R.M. (2014). Association between participation in a multipayer medical home intervention and changes in quality, utilization, and costs of care. *JAMA, 311(8)*, 815-825, doi:10.1001/jama.2014.353 This study surveyed 32 participating NCQA-recognized PCMH pilot practices "to compare their structural capabilities at the pilot's beginning and end" and evaluate the impact of the PCMH model in quality, utilization, and costs of care. While the study measured cost and utilization, it evaluated the overall patient population and did not take into account high-risk, chronically ill patients, which often have a substantial impact on cost.

TABLE 1 RESULTS:

The 14 peer-reviewed studies selected for inclusion generally demonstrate positive trends in cost and utilization outcomes. Twelve of the 13 studies that reported on one or more measurement of utilization (i.e. hospital admissions, readmissions, ED visits) saw a significant reduction in utilization of services within at least one of those measurements. The evidence in Table 1 also indicates progress in reducing the cost of care. Six of the 10 peer-reviewed studies that reported on one or more measurement of cost (i.e. cost savings, ED expenditures) reported a statistically significant reduction in cost.

Table 1 also shows impressive trends in additional Triple Aim metrics. Of the four studies that reported on access measures to primary care services, all saw statistically significant improvements in at least one area of measurement. Some studies reported quality of care outcomes pertaining to population health and preventive services; of the three that reported on quality of care, two saw improvements in at least one area. Additionally, the evidence shows improvements in patient or provider experience; all four of the studies that reported on at least one measurement of patient or provider experience saw improved satisfaction.

Table 2. STATE GOVERNMENT REPORTS: Primary care/PCMH Interventions that assessed Cost or Utilization, selected outcomes by location, 2013-2014

A blank space within a column indicates that no information (positive or negative) was reported on that metric.

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Colorado				

Colorado Medicaid Accountable Care Collaborative (ACC)[49]
Published: *Colorado Medicaid Accountable Care Collaborative (ACC),* Nov. 2013
Data Review: 2012-2013
	• $44 million gross, $6 million net reduction in total cost of care for ACC enrollees
	• Smaller increase in ED utilization (1.9% v. 2.8% for non-enrolled)
	• 15-20% reduction in hospital readmissions
	• Reduction in hospital admissions:
	  • 9% for enrollees with diabetes
	  • 5% for enrollees with hypertension
	  • 22% among enrollees with COPD* (enrolled in the program six months or more)
	• 25% reduction in high cost imaging services
		• Increased preventive services for individuals with diabetes		

[49] Colorado Department of Health Care Policy and Financing. (2013). *Legislative Request for Information #2*. Retrieved from http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheader=application/pdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251905421476&ssbinary=true

Table 2 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Minnesota				
Minnesota Health Care Homes (HCH)[50] ***Published:*** *Minnesota Department of Health*, Jan. 2014 ***Data Review:*** 2010-2012	• 9.2% lower costs for Medicaid HCH enrollees than enrollees in non-HCH clinics	• Improved colorectal cancer screenings, asthma care, diabetes care, vascular care and follow up care for depression	• Increased access to HCHs across all regions in 2013	
Missouri				

Missouri Health Homes[51]
Published: *Department of Mental Health and MO HealthNet*, Nov. 2013
Data Review: Jan. 2012-June 2013
	• ~$2.9 million in overall cost savings ($48.81 PMPM*) due to reductions in hospital and ED use
	• 12.8% reduction in hospital admissions (per 1,000 enrollees)
	• 8.2% reduction in ED use (per 1,000 enrollees)
		• Improvement in diabetes control measures from:
		  • 22% to 47% for LDL*
		  • 27% to 59% for BP*
		  • 18% to 53% for A1c*
		• Improvement in the percentage of adults with:
		  • cardiovascular disease whose LDL levels are in control
		  • hypertension whose BP levels are in control
		• Increase in percentage of enrollees with complete metabolic screens (12% to 61% for adults, 9% to 56% for children)
		• Improvement in patient follow-up and medication reconciliation following a hospital admission		

[50] Minnesota Department of Health. (2014). *Health Care Homes: Annual Report on Implementation*. Retrieved from http://www.health.state.mn.us/healthreform/homes/legreport/2013hchlegreport.pdf

[51] Department of Mental Health and MO HealthNet. (2013). *Progress Report: Missouri CMHC Healthcare Homes*. Retrieved from http://dmh.mo.gov/docs/mentalillness/18MonthReport.pdf All adults enrolled in a CMHC Healthcare Home have a serious mental illness and all children/youths enrolled have a serious emotional disorder.

Table 2 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Oklahoma				

SoonerCare Choice Program[18]
Published: *Oklahoma Health Care Authority*, Sept. 2014
Data Review: Jan. 2009-June 2013
	• Annual PMPM* growth rate was half the national average
	• ROI* of 562% in total
	• Estimated 61,000 avoided ED visits saved over $21 million in claim costs
	• 12% reduction in ED visits
	• Statistically significant reduction in hospitalizations for CHF*, COPD* and pneumonia
	• Readmission rate was below 15% for entire evaluation period
		• Preventive service, screening and treatment rates improved for 4 HEDIS* measures for children and adolescents
		• Improved rate of treatment of asthma with appropriate medications among children and adolescents
		• Statistically significant improvement in 13 of 16 preventive and diagnostic services for enrollees with chronic conditions
		• Statistically significant increase in follow-up rate for enrollees hospitalized with a behavioral health condition (now over 40%)
			• Over 90% of children and adolescents had access to a PCP* in 2013
			• Childhood dental visits significantly above the national average
			• Increase in access to preventive/ ambulatory services:
			  • 4.4% for adults age 20-44
			  • 4% for adults age 45-64
				• High satisfaction with adult care (>70% of respondents reported satisfaction with overall care)
				• Patient satisfaction for children increased all 4 years (85% in 2013)
				• High provider satisfaction (~91% of practice facilitation providers would recommend the program to a colleague)

Oregon				
Oregon Coordinated Care Organizations (CCO)[53] ***Published:*** *Oregon Health Authority*, June 2014 ***Data Review:*** 2011 (comparison group); 2013 (PCMH group)	• 19% reduction in ED spending • 17% reduction in ED visits • 5% reduction in all-cause readmission rates **Decreased hospitalization for chronic conditions:** • 27% reduction for patients with CHF* • 32% reduction for patients with COPD* • 18% reduction for patients with adult asthma	• 58% increase in percentage of children screened for risk of developmental, behavioral, and social delays • Increase in screening, intervention and referral for treatment for alcohol or other substance abuse (from 0% to 2%) • 5% improvement in LDL screening in patients with diabetes • Increase in follow up care after hospitalization for mental illness (from 65.2% to 67.6%) • Improvement in all 3 components of medical assistance with smoking and tobacco use cessation	• 52% increase in enrollment in patient-centered primary care homes since 2012 • >20% increase in spending for primary care and preventive services • 11% increase in outpatient primary care visits • Increase in adolescent well-care visits (from 27.1% to 29.2%)	• Increase in patient satisfaction with care (from 78% to 83.1%)

[52] Oklahoma Health Care Authority. (2014). *SoonerCare Choice Program Independent Evaluation*. Retrieved from http://www.okhca.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=16471&libID=15453

[53] Oregon Health Authority. (2014). *Oregon Health System Transformation 2013 Performance Report*. Retrieved from http://www.oregon.gov/oha/Metrics/Documents/2013%20Performance%20Report.pdf

Table 2 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Rhode Island				

Rhode Island Chronic Care Sustainability Initiative (CSI-RI)[54]
Published: *Rhode Island Chronic Care Sustainability Initiative*, May 2014
Data Review: Jan. 2013 – Dec. 2013
	• Total medical spending fell 14%, and non-FFS investments continue to increase (PCMHs are the largest non-FFS investment)
	• Reduced rate of inpatient admissions in more experienced CSI-RI practices, while non-PCMHs patients experienced an increase
		• Practices collectively met every targeted patient heath outcome, including areas of:
		  • weight management
		  • diabetes
		  • high blood pressure
		  • tobacco cessation
		• Practices showing improvement over time in all targeted areas
			• Primary care spending increased 37% between 2008-2012	• Increase in positive patient experience ratings in:
				  • Access to care
				  • Communication with care team
				  • Office staff responsiveness
				  • Shared decision making
				  • Self-management support

Vermont				
Vermont Blueprint for Health[55] ***Published:*** *Department of Vermont Health Access*, Jan. 2014 ***Data Review:*** Jan. 2012- Dec. 2012	**Total annual expenditures reduced by:** • 19% for commercially insured children ($386 PMPM*) • 11% for commercially insured adults ($586 PMPM*) • 11% for Medicaid insured children ($200 PMPM*) excluding SMS* expenditures • 7% for Medicaid insured adults ($447 PMPM*) excluding SMS* expenditures **Reduction in ED visits in PCMHs v. comparison group for:** • Commercially insured adults • Medicaid insured children **Reduction in hospitalizations in PCMHs v. comparison group for:** • Commercially insured adults • Medicaid insured children • Medicaid insured adults	• Increase in breast cancer screening in commercially insured adults (78.5% v. 77.1% in control group) • Increase in cervical cancer screenings in commercially insured adults (68.8% v. 67.0%) and Medicaid insured adults (59.6% v. 55.3%) • Increase in adolescent well-care visits in commercially insured participants (59.8% v. 53.2%)	• Increase in primary care visits for commercially insured children and Medicaid adults	

[54] Rhode Island Chronic Care Sustainability Initiative (2013). *A Year of Progress Transforming Primary Care in Rhode Island*. Retrieved from https://www.pcmhri.org/files/uploads/CSI-RI%202013%20Annual%20Report_FINAL.pdf

[55] Department of Vermont Health Access. (2014). *Vermont Blueprint for Health 2013 Annual Report*. Retrieved from http://hcr.vermont.gov/sites/hcr/files/pdfs/VTBlueprintforHealthAnnualReport2013.pdf PCPCC only included statistically significant outcomes from this report.

TABLE 2 RESULTS:

Table 2 includes outcomes from seven state government reports that are uniformly positive across cost and utilization metrics. All seven of the programs reported reduction in at least one cost metric. Of the six programs that reported on utilization, all showed reduction in at least one metric. The evaluation of the Minnesota Health Care Homes program is a preliminary report and did not report on any utilization metrics. A complete evaluation of the program is expected in early 2015.

The state government reports include a robust evaluation of primary care medical home interventions and many reported on additional Triple Aim metrics including quality of care, access to primary care services, and patient or provider experience. Six of the state programs reported on quality of care measures (population health/preventive services) and all saw improvements. Of the five of the programs that reported on metrics of access to primary care services, all saw improvements. The three programs that reported on patient or provider experience all noted improvement in patient or provider satisfaction.

Table 3. INDUSTRY REPORTS: Primary care/PCMH Interventions that assessed Cost or Utilization, selected outcomes by location, 2013-2014

A blank space within a column indicates that no information (positive or negative) was reported on that metric.

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
Multi-state				
UnitedHealthcare Patient-Centered Medical Home Program[22] ***Published:*** *UnitedHealthcare Industry Report*, Sept. 2014 ***Data Review:*** 2009-2012	• Average gross savings of 7.4% of medical costs in third year compared with control group • Every dollar invested in care coordination produced savings of $6 in the third year (ROI* of 6 to 1) • On average, programs saved 6.2% of medical costs (including cost of intervention) • Larger annual reductions in cost growth for individuals enrolled throughout the entire study period (ROI* of 7 to 1)			

[15] UnitedHealth Group. (2014). *Advancing Primary Care Delivery: Practical, Proven, and Scalable solutions.* Retrieved from http://www.unitedhealthgroup.com/~/media/UHG/PDF/2014/UNH-Primary-Care-Report-Advancing-Primary-Care-Delivery.ashx UnitedHeathcare operates 13 medical home programs in 10 states. The results included above are derived from an actuarial evaluation of the programs in Arizona, Colorado, Ohio, and Rhode Island based on three full years of operation. The report also mentions independent third-party evaluations completed for 4 medical home programs in RI, CO, and OH, which showed improvement on quality measures for preventive and chronic care, access, care coordination, use of HIT, and patient satisfaction.

Table 3 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
California				
California Academy of Family Physicians and Community Medical Providers PCMH Initiative[56] ***Published:*** *California Academy of Family Physicians Report*, Feb. 2014 ***Data Review:*** 2012-2013	• 16% reduction in cost for high-risk patients • 9% reduction in cost of total claims (gross savings of $972,000) • 3.1% reduction in ED visits • 21.6% reduction in inpatient admissions	• 50% increase in the number of patients with diabetes with controlled blood sugar • 7% increase in medication adherence among high-risk employees • Increase in breast cancer screening and body mass index counseling across entire patient population • Significant increase in BP* and LDL* control among patients with diabetes and artery disease		• Overall patient satisfaction improved
Maryland				
CareFirst Patient-Centered Medical Home Program[57] ***Published:*** *Blue Cross Blue Shield Press Release*, July 2014 ***Data Review:*** 2011-2013 claims data	• $130 million in savings (3.5%) in 2013 compared with projected spending under standard FFS • Slowed rate of medical care spending from average of 7.5% per year in 2011 to 3.5% in 2013 • 6.4% fewer hospital admissions • 11.1% fewer days in hospital • 8.1% fewer hospital readmissions for all causes • 11.3% fewer outpatient health facility visits			
Michigan				
Blue Cross Blue Shield of Michigan Patient-Centered Medical Home Designation Program[58] ***Published:*** *Blue Cross Blue Shield Press Release*, July 2014 ***Data Review:*** 2013-2014 claims data	• 11.8% lower rate of adult primary care sensitive ED visits • 9.9% lower rate of adult ED visits • 14.9% lower rate of ED visits overall (for pediatric patients) • 8.7% lower rate of adult high-tech radiology use • 27.5% lower rate of hospital stays for certain conditions		• 21.3% lower rate of ER visits "expressly due to pediatric patients receiving appropriate and timely in-office care"	

[56] California Academy of Family Physicians. (2014). *Patient-Centered Medical Home: Community Medical Providers' Success.* Retrieved from http://www.familydocs.org/f/FresnoPCMHPilotReport2014.pdf

[57] Blue Cross Blue Shield. (2014). *Patient-Centered Medical Home Program Shows Promising Quality Trends and Continued Savings On Expected Costs.* Retrieved from http://www.bcbs.com/healthcare-news/plans/pcmh-program-shows-promising-quality-trends-and-continued-savings-on-expected-costs.html Reductions in utilization are based on comparison with CareFirst members under the care of non-PCMH physicians.

[58] Blue Cross Blue Shield of Michigan. (2014). *Blue Cross Blue Shield of Michigan designates more than 1,400 physician practices to patient-centered medical home program for 2014 program year.* Retrieved from http://www.bcbsm.com/content/microsites/blue-cross-blue-shield-of-michigan-news/en/index/news-releases/2014/july-2014/bcbsm-designates-more-than-1400-physician-practices

Table 3 continued

Location/Initiative	Cost & Utilization	Population Health & Preventive Services	Access to Primary Care Services	Patient or Clinician Satisfaction
New Jersey				

Horizon Blue Cross Blue Shield New Jersey Patient-Centered Programs[59]
Published: *Horizon Blue Cross Blue Shield Press Release*, July 2014
Data Review: 2013 claims data
	• ~$4.5 million in savings (due to avoidance of 1,200 ED visits and 260 inpatient hospital admissions)
	• 4% lower cost for patients with diabetes
	• 4% lower total cost of care
	• 4% lower rate of ED visits
	• 2% lower rate of hospital admissions
		• BCBSNJ's Patient-Centered Medical Home Program enrollees had:
		  • 8% higher rate in breast cancer screening
		  • 6% higher rate in colorectal screening
		  • 14% higher rate in improved control of diabetes
		  • 12% higher rate in cholesterol management		

New York				

Aetna PCMH Program: WESTMED Medical Group[60]
Published: *Aetna Press Release*, July 2014
Data Review: 2013 claims data
	• WESTMED physicians earned over $300,000 in incentive payments in the first year
	• 35% reduction in hospital admissions
	• Reduction in ED visits
	• Reduction in readmissions
		• WESTMED physicians met or exceeded 9 of 10 targeted goals on:
		  • cancer screenings
		  • diabetes management and screening
		  • heart disease management and screening		

Pennsylvania				

Highmark Patient-Centered Medical Home Program[61]
Published: *Highmark Press Release*, Oct. 2014
Data Review: 2013 claims data
	When compared to the market, program members had:
	• Lower ED use:
	  • 16% (adult care)
	  • 14% (Medicare advantage)
	  • 13% (pediatric care)
	• 1% lower readmission rate for commercial members
	• 2% lower readmission rate for Medicare Advantage members
	• 12% lower inpatient surgical utilization (adult care)
	• 9% lower inpatient surgical utilization (Medicare Advantage)
	• 25% lower inpatient medical utilization (Medicare Advantage)			

[59] Horizon Blue Cross Blue Shield of New Jersey. (2014). *Horizon BCBSNJ's 2013 study results demonstrate patient-centered program improves patient care and lowers costs.* Retrieved from http://www.horizonblue.com/about-us/news-overview/company-news/horizon-bcbsnj-2013-study-results-demonstrate-patient-centered Horizon Patient-Centered Programs include "Patient-Centered Medical Homes (PCMHs), Accountable Care Organizations (ACOs) and practices focused on Episodes of Care across New Jersey". The study compares members in traditional primary care practices with those practices participating in Horizon BCBSNJ's patient-centered practices.

[60] Aetna. (2014). *Patient Health Improving from Collaboration between Aetna and WESTMED.* Retrieved from http://news.aetna.com/news-releases/patient-health-improving-from-collaboration-between-aetna-and-westmed/

[61] Highmark Inc. (2014). *Highmark Inc.'s Patient-Centered Medical Home Program Shows Positive Results, Improves Patient Care, Reaches Milestone 1 Million Members.* Retrieved from https://www.highmark.com/hmk2/newsroom/2014/pr102814MedicalHome.shtml The data above was obtained from a sample of more than 152,000 Highmark members in western and central Pennsylvania.

TABLE 3 RESULTS:

Table 3 includes reports from private payer and not-for-profit organizations that predominately evaluate cost and utilization metrics. Six of the seven evaluations reported reductions in at least one utilization metric and four reported reductions in one or more cost metric.

Three of the industry reports also included outcomes data regarding improvements in quality of care (population health/preventive services) and one published data on increased access to primary care services. The California Academy of Family Physicians' report is the only industry report to include data on patient satisfaction; none of the private payer reports included data on patient or provider experience.

28 STUDIES: OVERVIEW OF PCMH EVIDENCE, 2013-2014

14 PEER-REVIEWED STUDIES

- 10 reported on cost, 6 found improvements
- 13 reported on utilization, 12 found improvements
- 3 reported on quality, 2 found improvements
- 4 reported on access, 4 found improvements
- 4 reported on satisfaction, 4 found improvements

"Reported on" indicates that a peer-reviewed study either evaluated that measure as an outcome variable, or the article reported additional information on that measure outside the scope of the study.

7 STATE GOVERNMENT EVALUATIONS

- 7 reported cost savings
- 6 reported reductions in utilization
- 6 reported improvements in population health/preventive services
- 5 reported improvements in access
- 3 reported improvements in patient or clinician satisfaction

7 INDUSTRY REPORTS

- 4 reported cost savings
- 6 reported reductions in utilization
- 3 reported improvements in population health/preventive services
- 1 reported improvement in access
- 1 reported improvement in patient or clinician satisfaction

GLOSSARY

ACSC ambulatory care sensitive condition

BP blood pressure

CHF congestive heart failure

COPD chronic obstructive pulmonary disease

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

LDL low-density lipoprotein

PCP primary care provider

PMPM per member per month

ROI return on Investment

SMS "Special Medicaid services" are typically non-medical services covered by Medicaid, but not usually covered by commercial plans including: transportation, home and community-based services, school-based, and Department of Education Services, etc.

SSI "Supplemental Security Income" is a federal income assistance program funded by general tax revenues that provides cash for basic needs to eligible individuals

TANF "Temporary Assistance for Needy Families" is a federal assistance program that provides supplemental cash to indigent American families with dependent children