Maryland Health Care Commission

Evaluation of the Maryland Multi-Payor Patient Centered Medical Home Program

Medicaid Program Impacts

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***Submitted by*:**

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Overview

The Maryland Health Care Commission (MHCC) has contracted with IMPAQ, International, LLC and its partners[1] to conduct an independent evaluation of the Maryland Multi-Payor Patient Centered Medical Home Program (MMPP) pilot. The MMPP pilot is a three-year program testing the effectiveness of the patient-centered medical home (PCMH) model of primary care in 52 Maryland practices. A patient centered medical home is defined in Maryland law as a primary care practice organized to provide a first, coordinated, ongoing, and comprehensive source of care to patients to: foster a partnership with a qualifying individual; coordinate health care services for a qualifying individual; and exchange medical information with carriers, other providers, and qualifying individuals. The MMPP includes practice requirements to catalyze the PCMH transformation process in Maryland. In order to remain in the MMPP, practices must:

- Achieve National Committee for Quality Assurance (NCQA) PCMH recognition Level 1 by January 2012 and submit an application for Level 2 no later than September 30, 2012;
- Hire care managers to support high-needs, complex patients;
- Participate in a shared savings program in which they can receive a portion of the savings they generate through better patient outcomes;
- Report quality measures by extracting data from their own electronic health record (EHR) systems; and
- Participate with the Maryland Learning Collaborative that provides support, tools, and updated information.

A unique feature of the MMPP pilot, as compared to many other PCMH programs nationally is, that Maryland's PCMH law requires the five largest State-regulated health insurance carriers to financially support the program by providing up-front and incentive payments to qualifying MMPP practices.[2] Other state and federal payors have voluntarily joined the program.

This issue brief describes the evaluation findings that are applicable to the Maryland Medicaid program and their patients in the MMPP pilot. Specifically, the evaluation of the MMPP assessed the impact of the PCMH model on the Medicaid patients in the following domains: 1) practice transformation; 2) provider satisfaction; 3) patient satisfaction and experience, including access to care; 4) quality, utilization and costs of care; and 5) health care disparities. The findings included in this issue brief were derived from data collected and analyzed for the purposes of the all-payor MMPP pilot. Findings related to practice

[1] The IMPAQ team includes researchers from IMPAQ International, LLC, the Johns Hopkins Bloomberg School of Public Health, Healthcare Resolution Services and the University of Maryland School of Pharmacy.

[2] Maryland Annotated Code, Health-General. § 19-1A-02, enacted as Senate Bill 855, House Bill 929 (2010). Carriers with over $90 million in written premiums for health benefit plans in the State in the most recent reporting year are classified as large carriers.

transformation and provider satisfaction domains are not Medicaid-specific and include all payor sources; however, the highlighted findings are believed to be highly relevant to the Medicaid program.

Highlights of the findings include:

- MMPP practice staff felt that important factors associated with successful practice transformation into a PCMH were improved care coordination, increased communication, advancement of monitoring and reporting systems, and better standardization of policies and procedures.
- The MMPP maintained providers' high satisfaction with their job, patient care, and positive perceptions of several team-functioning measures. The MMPP practices also feature greater inclusion of medical assistants and health educators than in other practices.
- The 2014 patient experience surveys, relative to 2013, suggest growth for patient-provider communication among adult Medicaid patients and their providers. However, the program did not suggest the same growth for patient-provider communication among younger Medicaid patients (i.e., children).
- Chronic disease management of some ambulatory care sensitive conditions (ACSCs) improved, along with a reduction in emergency department visits and inpatient stays among Medicaid patients with these conditions.
- There was evidence to suggest that the MMPP may have slowed growth of some inpatient and outpatient payments among Medicaid patients.

Results

The evaluation consisted of several components, including site visits and interviews with participating practices, patient and provider surveys, and administrative data analyses. This issue brief presents selected findings of the MMPP evaluation as available. As noted previously, the results discussed in more detail below are from an evaluation of the MMPP pilot across multiple payors (commercial and Medicaid). While many of the results are Medicaid-specific and have been summarized as such, other results presented are across payors and are indicated as such.

Practice Transformation[3]

A qualitative evaluation was conducted to assess the implementation of practice transformation[4] in MMPP practices through two rounds of site visits and in-depth interviews with practice managers, care managers, clinical staff, and support staff. Most

[3] Data collected from the site visits and in-depth interviews were not collected by payor source. Therefore, results related to practice transformation include all payor sources, including Medicaid and commercial payors.

[4] Practice transformation is the process of practices using health care teams to initiate and maintain quality improvements through evidence-based care. Embedded in practice transformation are the PCMH concepts of relationships with a care team, comprehensiveness, coordination, and access.

practice staff members interviewed at nine selected practices felt that their practice transformation has been successful and remain enthusiastic about the MMPP program. They felt that important drivers of successful practice transformation to a PCMH model were improved care coordination, increased communication, advancement of monitoring and reporting systems, and better standardization of policies and procedures.

Practice characteristics can influence implementation of transformation. Especially in the early phases of implementation, smaller and medium-sized practices undergoing transformation at a single location reported success communicating transformation objectives and collaborating across roles to implement and maintain PCMH initiatives and protocols. As a result, these practices were more likely to report success in obtaining provider and staff buy-in from the onset of the pilot. Pediatric practices, which operate under a family-centered model, discussed success in engaging families in care delivery. Federally qualified health centers (FQHCs), which emphasize patient access, reported ease in adapting to access requirements, more so than other types of practices. The affiliation of practices with a hospital system positively affected their reported ability to transform, particularly in terms of staff resources and coordinating care.

Practice staff interviewees felt that the transformation's positive impact on quality of care and health outcomes has played a significant role in staff satisfaction and engagement, more so than compared to the financial outcomes associated with the program. The practices reported success in the following areas: improving current processes and developing new ones that increase efficiency; improving functionality of their EHR systems to meet the daily operations and reporting needs of the practice; and expanding quality improvement initiatives to reach new populations and further improve health outcomes. Interviewees felt that positive impact on health outcomes would play a larger role in promotion of the model to non-transformed practices than the program's financial incentives or outcomes.

Certain features separated the high performing practices from the low and moderately performing practice. High performing practices reported having a strong PCMH champion who has been actively involved in engaging staff and physicians throughout the transformation process. Also, high performing practices had integrated their EHRs prior to transformation and have been proactively working with the vendor, staff, and physicians to tailor the EHR system to meet their needs.

Improved care coordination processes had a positive impact on quality of care, which the interviewees felt led to reductions in health care costs. For example, interviewees reported that care coordination led to increased patient compliance and allowed patients to become more involved in their own health care. This led to better health outcomes, such as diabetic patients reducing their HbA1c levels and asthmatic patients getting a better handle on symptoms through the proper use of inhalers and other medications.

Multiple practices reported a reduction in hospital admissions and emergency room utilization, especially among patients with chronic conditions.

Provider Satisfaction[5]

In 2013 and 2014, the evaluator conducted provider surveys from among the following three groups of practices: (1) MMPP practices, (2) practices in another PCMH program in the state ("Other PCMH"), and (3) practices with low exposure to PCMH. The survey questionnaire covered five domains: (1) satisfaction with care; (2) staff roles in care; (3) job satisfaction and care team functioning; (4) practice team composition; and (5) perceptions of the PCMH model.

Overall, the MMPP did not improve provider satisfaction with care over and above the trend observed in non-participating practices. There were no significant differences between MMPP providers and low-exposure practices. On most satisfaction with care measures, MMPP providers finished the program with higher satisfaction than the 'Other PCMH' comparisons. This was not due to growth in MMPP satisfaction, but to either declines in 'Other PCMH' satisfaction with care or simply higher satisfaction from the start among the MMPP group.

In 2014, MMPP providers had higher job satisfaction, were more satisfied with the care provided to their patients, were more likely to agree that teams receive adequate training for their work, and felt little unpleasantness among team members compared to providers in the 'Other PCMH' comparison practices. The MMPP providers were less likely to agree that "team members have to depend heavily on one another to get work done." While providers in the 'Other PCMH' comparison practices grew more confident that the PCMH improved interaction with family members, MMPP providers' attitudes started about the same as the 'Other PCMH' group, but did not increase over time. The MMPP practices' care teams included more roles on their teams, including medical assistants and health educators, and used medical assistants for some roles covered primarily by clinicians in other practices. Effects on provider attitudes on care team functioning were mixed, with MMPP provider attitudes held constant while beliefs in the other two groups attenuated or became stronger. These findings suggest opportunities to support MMPP program sustainability, including strengthening practice teamwork and maintaining high job satisfaction that was noted as a program strength.

When the sample is limited to physicians only, the MMPP shows a program impact on providers' satisfaction with care for chronically ill patients maintaining satisfaction, while it decreased among "Other PCMH" providers. MMPP physicians' increased reporting that team members agree about expectations for behavior compared with the changes in the "Other PCMH" group. In addition, physicians in the "Other PCMH" group had greater

[5] Data collected from the provider surveys were not collected by payor source. Therefore, results related to provider satisfaction include all payor sources, including Medicaid and commercial payors.

positive changes in team member knowledge and skills compared to the MMPP physicians.

Patient Experience and Satisfaction

The evaluation team surveyed Medicaid insured patients from each participating practice early in the first year of the pilot and again post-pilot to evaluate patient experience for two groups of MMPP patients, adults and children. The survey instruments included items from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) PCMH Survey, CAHPS supplemental topics, and the Patient Assessment of Chronic Illness Care (PACIC). The surveys inquired about: delivery of health care, trust in provider, access to care and chronic illness management.

The response rate among Medicaid patients for the 2013 and 2014 patient surveys was 12.3 percent and 10.4 percent, respectively. One hundred responses to the adult survey and 126 responses to the child survey for 2013 were compared with 106 adult responses and 85 responses on behalf of children from 2013.

Exhibits 1 and 2 describe characteristics of the adult and child samples of Medicaid patients, respectively, by year. There were no significant differences between adult respondents in 2013 and 2014. For respondents on behalf of children, there was only one significant change between 2013 and 2014; fewer Medicaid respondents of behalf of children rated their health as excellent in 2014 compared to 2013. About two thirds of Medicaid insured adults reported a chronic illness requiring at least three months of health care visits or prescription medications.[6] Approximately one third of Medicaid respondents on behalf of children reported a chronic condition. The majority of patients (adults and respondents for children) reported seeing their MMPP provider for three years or more.

Consumer Assessment of Health Providers and Systems (CAHPS) Scales

Patients' responses to the 2014 patient experience surveys, relative to 2013, suggest improvement for patient-provider communication among adult Medicaid patients and their providers, but not for younger Medicaid patients (i.e., children). The results of the patient experience surveys suggest improvements occurred over time in patient-provider communication among adult Medicaid patients who were exposed to the MMPP. At the end of the pilot period, more adult patients gave positive ratings to patient-provider communication compared to early in the pilot period (Exhibit 3). In 2014, more Medicaid patients reported that their providers gave advice on staying healthy and discussed with patients how to engage a family member or trusted friend to help patients follow the treatment plan and had during than had in 2013. Likewise, more Medicaid adult patients reported a higher rating of trust in 2014 than in 2013.

[6] This includes any illnesses that require 3-month or longer periods of health care visits or medicine prescription, excluding pregnancy or menopause. Common examples include hypertension and diabetes.

Respondents for children reported high scores for overall rating of the provider, how well providers communicate with patients, giving advice on staying healthy, and trust in provider (Exhibit 4). More than 70 percent of the responses for children were in the most positive categories for these scales in both years and scores increased from 2013 to 2014. By contrast, respondents for children reported lower scores in 2014 compared to 2013 across measures related to access to care, with only about half of the respondents for children reported always receiving timely access to care and information and support from their providers in self-care. Ratings for these measures were similar or lower in 2014 compared to 2013.

Patient Assessment of Chronic Illness Care (PACIC)

The PACIC included questions in five areas: 1) patient activation; 2) delivery system design/decision support; 3) goal setting; 4) problem solving/contextual counseling; and 5) follow-up/coordination. Chronically ill adult patients rated patient activation, decision support, goal setting, problem solving and follow-up coordination similarly 2014 and 2013 (Exhibit 5), with ratings for four out of five of these ratings remaining high in both years (at or above a rating of 3). Respondents for chronically ill children rated four of the five measures the same or higher in 2014 than in 2013, with the exception of follow-up coordination, which fell to 2.8 in 2014 from 2.9 in 2013 (Exhibit 6).

Health Care Quality, Utilization and Costs

Exhibit 7 provides a summary of the practice-level descriptive statistics for patients meeting the inclusion criteria in either the baseline year (2010) or Year 1 (2011) of the MMPP implementation. The MMPP sites were statistically compared with the comparison sites on the following variables: number of providers, number of patients, patient age, and proportion of female patients. Among sites with Medicaid patients, MMPP sites had more providers and younger patients than the comparison sites.

Program impact results are presented in Exhibits 8 through 13. Results are based on the difference-in-difference coefficient.[7] In Exhibits 8, 9 and 10, a green cell indicates the coefficient was consistent with a positive program impact (favoring MMPP) as compared to the baseline year (2010). A red cell indicates the coefficient was consistent with a negative program impact (favoring comparison practices) as compared to the baseline year (2010).[8] Selected results are summarized in the sections below.

[7] The difference-in-difference approach is a robust program evaluation methodology, which subtracts the change in the non-MMPP group from the change in the MMPP group. It assumes that the change in the comparison group is what would have occurred in the MMPP practices, if they had not participated in the MMPP program. Thus, the difference in the changes seen in the MMPP and non-MMPP groups is considered to be due to the MMPP program.

[8] A positive MMPP impact (or effect) means that among the MMPP practices, the measure had, relative to the comparison practices: a) a larger increase or smaller decline for measures where 'higher is better,' such as cancer screening, diabetes monitoring, or well-care visits; or b) a smaller increase or larger decline for measures where 'lower is better,' such as emergency department visits, hospital admissions, or payments.

Quality: The MMPP had a positive program impact on quality among Medicaid patients in breast cancer screening for women, diabetes management (glycated hemoglobin monitoring) among children, and asthma-related hospital admissions. The positive breast cancer screening and diabetes management effects were observed only during the first year of the pilot, while the asthma-related hospital admissions effect was not observed until the third year of the pilot. The MMPP did not perform as well as the comparison practices among Medicaid patients over time on cervical cancer screening and adolescent well-care visits.

The MMPP had a negative impact on use of long-term control medications for asthma among Medicaid patients throughout all three years of the program; both MMPP and comparison practices declined in this measure over time, but the MMPP practices had a greater decline. The decline in long-term control medications for asthma should be further examined to understand a possible relationship to a reduction in asthma-related hospital admissions.

Utilization: Overall, the MMPP had a positive effect on the proportion of Medicaid patients with emergency department (ED) visits, relative to the comparison practices; the proportion of Medicaid patients with an ED visit held steady over time among MMPP practices, while the proportion increased over time in comparison practices. ED visits due either to asthma, congestive heart failure (CHF), or diabetes among Medicaid patients with any of these ACSCs also were positively affected among Medicaid patients at MMPP practices relative to patients at comparison sites; the proportion of Medicaid patients with ACSC-related ED visits declined over time in both MMPP and comparison practices, but the decline was greater in MMPP practices. Among Medicaid patients, the effect of the MMPP on inpatient utilization was positive for ACSC-related inpatient admissions, but negative for all inpatient stays. The MMPP had a negative impact on mean hospital length of stay and on 30-day readmissions. While it is uncertain if there is a correlation between ACSC-related inpatient admissions and hospital length of stay, perhaps a closer examination of the severity of an illness would provide additional insight into the role of a condition's acuity and the mean hospital length of stay.

Costs: The MMPP had a positive impact on inpatient payments among Medicaid patients. Over the three years of the pilot, inpatient payments declined over time among Medicaid patients in MMPP practices, while they remained relatively stable among Medicaid patients in comparison practices. Outpatient payments[9] were positively affected (i.e., either a smaller increase or larger decline) by the MMPP in Medicaid patients.

[9] Outpatient includes both facility and medical claims and encounters. A series of codes was used to assign claims to the outpatient category.

Health Care Disparities

Using administrative claims data, the evaluation team assessed heath care disparities across two disparity domains: 1) *Race* – nonwhite versus white, and 2) *Payor* - commercial insurance versus Medicaid.

This brief presents the Disparity Change Scores (DCS), which measure changes in disparity between 2010 (baseline) and 2013 (the end of Year 3). For each disparity that existed in 2010, a positive DCS means the disparity decreased over time; a negative DCS means the disparity increased over time**.** If the DCS equals zero, then there was no change in the relative disparity over time.[10]

To aid interpretation of the findings, each measure was assigned a disparity grade of A through F (Grade A is the highest, or best, and Grade F is the lowest, or worst, disparity grade) in 2010 and in 2013. A change to a higher disparity grade in 2013 compared to 2010 represents a decrease, or improvement, in disparity. Similar approaches have been used in disparity analyses and reporting in other state-level disparities evaluations.[11,12] For the purposes of this brief, only disparities at the MMPP that had a disparity grade of B through F in the baseline period (30 disparities) are presented. Exhibits 14 through 17 provide summary results from the assessment of the DCS.

Program Effects on Payor disparities: At the MMPP practices, there were four quality of care measures with a payor disparity of Grade B or lower in 2010 (Exhibit 14). There were improvements in two of these disparities, while there was no change in two disparity measures (proportion of young persons with asthma who had an asthma-related hospital admission and proportion of women with one or more breast cancer screenings). The payor disparity in the rates of young asthmatics (<40 years old) with one or more asthma related hospitalizations increased over time (DCS=-23.75), with a Grade F in both 2010 and 2013. While the rates decreased in both payor sub-groups, there was a greater decline among commercially insured patients, which widened the gap between Medicaid and commercially insured patients.[13]

[10] The rate ratio is calculated using the sub-group with the lowest rate in the baseline year as the reference group. See Drewette-Card RJ, Landen MG. The Disparity Change Score: A New Methodology to Examine Health Disparities in New Mexico *J Public Health Management Practice*, 2005, 11(6), 484–492. Also, the *Evaluation Approach* in this document has additional details on the DCS.

[11] New Mexico Department of Health. "Racial and Ethnic Health Disparities Report Card." 7th Edition, September, 2012 http://nmhealth.org/publication/view/report/437/

[12] Racial and Ethnic Health Disparities in North Carolina: Report Card 2010 http://www.schs.state.nc.us/SCHS/pdf/MinRptCard_WEB_062210.pdf

[13] It should be noted that although the payer disparity rate ratios for this measure are quite large in 2010 and 2013, the absolute sub-group rates of asthma related hospitalizations were small. See the sub-group rates and disparity rate ratios in Exhibit 14.

At the MMPP practices, nine utilization measures had a payor disparity with Grade B or lower in 2010 (Exhibit 15). There were grade improvements in four of these disparities while there was no change in the other five disparity measures (patients with one or more ED visits, patients with diabetes-related ED visits, patients with asthma, CHF, or diabetes with one or more condition-related inpatient stays, patients with inpatient stays with readmissions within 30 days, and mean home health care visits among those receiving home health care). A decrease in payor disparity for diabetes-related emergency department (ED) visits among patients with diabetes was observed at the MMPP practices (DCS=3.70). Although Medicaid patients had higher rates in 2010 and 2013 than commercially insured patients, Medicaid ED visit rates decreased over time while commercially insured ED visit rates remained constant, thus narrowing the gap.

Program Effects on Racial Disparities: At the MMPP practices, there were three quality of care measures with a racial disparity of Grade B or lower in 2010 (Exhibit 16). There were improvements in all three of these disparities, with two of the measures receiving a Grade A in 2013. These two measures with the greatest improvement were well child visits for children 3-6 years old and adolescence well-care visits for youth between the ages of 12 and 21 years old.

At the MMPP practices, five utilization measures had a racial disparity with Grade B or lower in 2010 (Exhibit 17), with improvements in all five measures in 2013. Four of these measures improved one grade. Two of the measures, the proportion of patience with asthma, CHF, or diabetes with one or more condition-related ED visits, and the proportion of patience with asthma with one or more asthma-related ED visits improved from a Grade C in 2010 to a Grade B in 2013. The greatest improvement was seen in the disparity of patients with CHF-related inpatient stays with readmissions due to CHF within 30 days. This measure received a Grade C in 2010, but improved to a Grade A in 2013.

Remarks

Overall, transformation has been a positive experience for practices and has allowed them to acquire the resources and knowledge to implement new processes and protocols. Though practices have identified areas of improvement, most believed their transformation has been successful and are enthusiastic about the program. Interviewees felt that transformation's positive impact on quality of care and health outcomes played a significant role in staff satisfaction and engagement, particularly compared to the financial outcomes associated with the program. Interviewees believed that important drivers of success have been improved care coordination, increased communication, advancement of monitoring and reporting systems, and better standardization of policies and procedures. Practices believed the program elevated their practice to the next level, allowing some to consider involvement in accountable care organizations and other CMS programs. Looking forward, the practices are eager to improve upon current processes and develop new ones that increase efficiency, improve functionality of their EHR systems to meet the daily operational and reporting needs of the practice, and expand quality

improvement initiatives to reach new populations and further improve health outcomes. As noted previously, the practice transformation observations are relevant to practices with Medicaid and commercially insured patients; however it is likely that Medicaid patients have reaped the benefits of improved care coordination resulting from the MMPP.

Findings also provide evidence that the adoption of the PCMH model by primary care practices in the MMPP improved some of the program goals on quality, utilization, and cost measures for Medicaid patients. Chronic disease management of some ambulatory care sensitive conditions improved and emergency department visits and inpatient stays declined among Medicaid patients with these conditions, evidence to suggest that the MMPP may have slowed growth of health care costs. Findings from the patient experience surveys also suggest that the program improved adult Medicaid patient's assessment of their health care, with adult Medicaid patients indicating that they relationships with their providers had significantly improved.

However, some results suggest areas for future improvement among MMPP practices as well. For example, findings suggest improvements are needed in providing timely appointments for young Medicaid patients and with follow-up and coordination of care for adults and children with chronic illnesses. Other areas for improvement include cervical cancer screening among Medicaid patients, adolescent well-care visits among Medicaid patients, and preventing 30-day readmissions among Medicaid patients. In addition, analysis of health care disparities indicate that while some progress has been made, disparities still exist among those, especially across measures related to hospital admissions.

Implications of Findings for the MMPP

The implications of these findings are that there is a good foundation for further improving partnerships between Medicaid patients and providers in MMPP practices. Providers and program implementers may wish to investigate how to continue to enhance patient experience by engaging patient representatives in discussions about their experiences.

Some changes between the 2013 and 2014 results suggest areas for greater improvement among MMPP, specifically when working with younger Medicaid patients. While a direct correlation cannot be drawn without further analysis, it should be noted that during the period of evaluation, fewer respondents on behalf of a child rated the physical health of their child as excellent. In parallel, more respondents reported greater dissatisfaction with their child's health care. These results indicate more needs to be done to ensure younger Medicaid patients are able to get timely appointments, care and information and empower them to take care of their own health. Not addressing the concerns of younger Medicaid patients may lead to adverse health outcomes as they age.

Further research is needed to understand the relationship between self-assessed health and patient satisfaction and health outcomes as well as other areas, including why Medicaid patients in MMPP practices fared better than comparison practices with reducing asthma-related hospital admissions while experiencing a greater decline in long-term control medications for asthma.

These findings should be interpreted with the following limitations in mind. First, the quality of the interview data obtained during the site visits depends on the knowledge of the interviewees. Also, survey response rates were low, raising the possibility that findings may differ for the rest of the population had they chosen to respond. Further, some results of improvement in a group that initially scored lower, and reductions in a group that initially scored higher, may be regression to the mean, or the appearance of change when in fact scores were simply artificially high or low in one sample or at one time point. It is also the case that administrative claims data only provide information for services that were paid, and claims may have limited and unreliable diagnostic information. However, this limitation would bias results only if there were differences in information by sub-groups. Finally, while these results are presented for only the Medicaid population participating in MMPP, the program effects are based on Medicaid's participation along with five of Maryland's largest state-regulated health insurance carriers.

In conclusion, the program showed numerous strengths that lead to improved health care which may possibly lead to improved health outcomes among Medicaid patients. Results from this study demonstrate the breadth of improvements from transforming practices and improving providers' job satisfaction and satisfaction with the care provided to their patients to improving relationships between patients and providers among many Medicaid patients. However, one of the greatest improvements the MMPP appears to make in the health care among Medicaid patients is in reducing health care disparities. By continuing to reduce health care disparities through the implementation of MMPP, Maryland will improve health outcomes for the Medicaid population,[14] reduce expenditures related to medical care and indirect costs [15] and continue to align Maryland's health care system with the national Healthy People initiative's goal to reduce disparities. [16, 17]

[14] U.S. Centers for Disease Control and Prevention (CDC). (2013). CDC Health Disparities and Inequalities Report- United States, 2013. MMWR 2013; 62(Suppl 3), 1-187. Retrieved from http://www.cdc.gov/mmwr/pdf/other/su6203.pdf.

[15] LaVeist, T., Gaskin, D., & Richard, P. (2011). Estimating the Economic Burden of Racial Health Inequalities in the United States. International Journal of Health Services, 41(2), 231-238.

[16] Adler, N., & Stewart, J. (2010). Health Disparities Across the Lifespan: Meaning, Methods, and Mechanisms. Annals of the New York Academy of Sciences, 1186, 5-23.

[17] Braveman, P., Kumanyika, S., Fielding, J., LaVeist, T., Borrell, L., Manderscheid, R., Troutman, A. (2011). Health Disparities and Health Equity" The Issue is Justice. American Journal of Public Health, 101(S1), 149-155.

Exhibit 1: Characteristics of Respondents, by Year: Adult Survey, Medicaid Patients

	Year		
	2013 %	2014 %	p value*
Demographics			
Age (years)			
Under 35	48.5	38.6	0.255
35 – 44	17.7	24.3	
45 – 54	22.1	23.5	
55 – 64	6.6	13.1	
65 or older	5.1	0.4	
Gender			
Male	25.1	16.5	0.349
Female	74.9	83.5	
Race			
Caucasian	28.6	24.9	0.896
African American	59.7	63.8	
Other	11.8	11.3	
Education			
Some high school, but did not graduate	18.7	14.8	0.500
High school graduate or GED	45.5	39.4	
Some college or 2-year degree	21.9	38.8	
4-year college graduate	6.6	4.7	
More than 4-year college degree	7.4	2.3	
Household member			
Live alone	34.2	20.9	0.147
Live with spouse, partner, relative, or others	65.8	79.1	
Health Conditions			
Self-rated overall health			
Poor	16.8	4.1	0.222
Fair	15.8	26.3	
Good	35.0	36.8	
Very good	19.3	23.5	
Excellent	13.1	9.3	

*From Pearson's chi-squared tests.

Exhibit 1: Characteristics of Respondents, by Year: Adult Survey, Medicaid Patients (continued)

	Year		
	2013 %	2014 %	p value*
Self-rated mental or emotional health			
Poor	5.4	1.2	0.526
Fair	19.0	24.9	
Good	28.7	18.7	
Very good	19.9	27.6	
Excellent	27.0	27.6	
The respondent has chronic condition or problem			
No	29.7	35.3	0.574
Yes	70.3	64.7	
Relationship with the rated provider			
The rated provider is the respondent's usual source of care			
No	6.2	1.6	0.129
Yes	93.8	98.5	
Length of experience with the rated provider			
Less than 1 year	11.7	20.5	0.542
At least 1 year, less than 3 years	25.0	16.7	
At least 3 year, less than 5 years	24.6	18.3	
5 years or more	38.7	44.5	

*From Pearson's chi-squared tests.

Exhibit 2: Characteristics of Respondents, by Year: Child Survey, Medicaid Patients

	Year		
	2013 %	2014 %	p value*
Demographics			
Age			
0 – 4	21.7	21.9	0.874
5 – 9	31.3	37.9	
10 – 14	29.4	25.0	
15 – 17	17.7	15.2	
Gender			
Male	52.2	57.0	0.625
Female	47.8	43.0	
Race			
Caucasian	27.3	32.6	0.487
African American	58.6	47.2	
Other	14.0	20.1	
Health Conditions			
Self-rated overall health			
Poor	0.0	1.0	0.011
Fair	4.4	0.0	
Good	9.3	16.7	
Very good	15.9	34.7	
Excellent	70.5	47.7	
Self-rated mental or emotional health			
Poor	1.1	6.9	0.482
Fair	9.5	6.6	
Good	15.3	12.0	
Very good	21.1	24.7	
Excellent	53.0	49.9	
The child has chronic condition or problem			
No	64.9	62.6	0.807
Yes	35.1	37.5	
Relationship with the rated provider			
The rated provider is the respondent's usual source of care			
No	2.4	5.4	0.248
Yes	97.6	94.6	

*From Pearson's chi-squared tests.

Exhibit 2: Characteristics of Respondents, by Year: Child Survey, Medicaid Patients (continued)

	Year		
	2013 %	2014 %	p value*
Length of experience with the rated provider			
Less than 1 year	7.6	10.1	0.397
At least 1 year, less than 3 years	20.3	9.4	
At least 3 year, less than 5 years	17.0	21.8	
5 years or more	55.0	58.7	
Age			
Under 35	37.2	41.0	0.307
35 – 44	40.2	23.1	
45 – 54	17.4	28.7	
55 or older	5.2	7.2	
Gender			
Male	8.1	13.6	0.354
Female	91.9	86.4	
Education			
Some high school, but did not graduate	13.3	11.9	0.388
High school graduate or GED	44.0	31.3	
Some college or 2-year degree	33.3	47.4	
4-year college graduate	8.4	5.7	
More than 4-year college degree	1.0	3.7	
Relationship with the child			
Mother or father	90.2	79.1	0.200
Other	9.8	20.9	

*From Pearson's chi-squared tests.

Exhibit 3: Consumer Assessment of Health Providers and Systems (CAHPS) Scales, by Year: Adult Survey, Medicaid Patients (Selected Items)

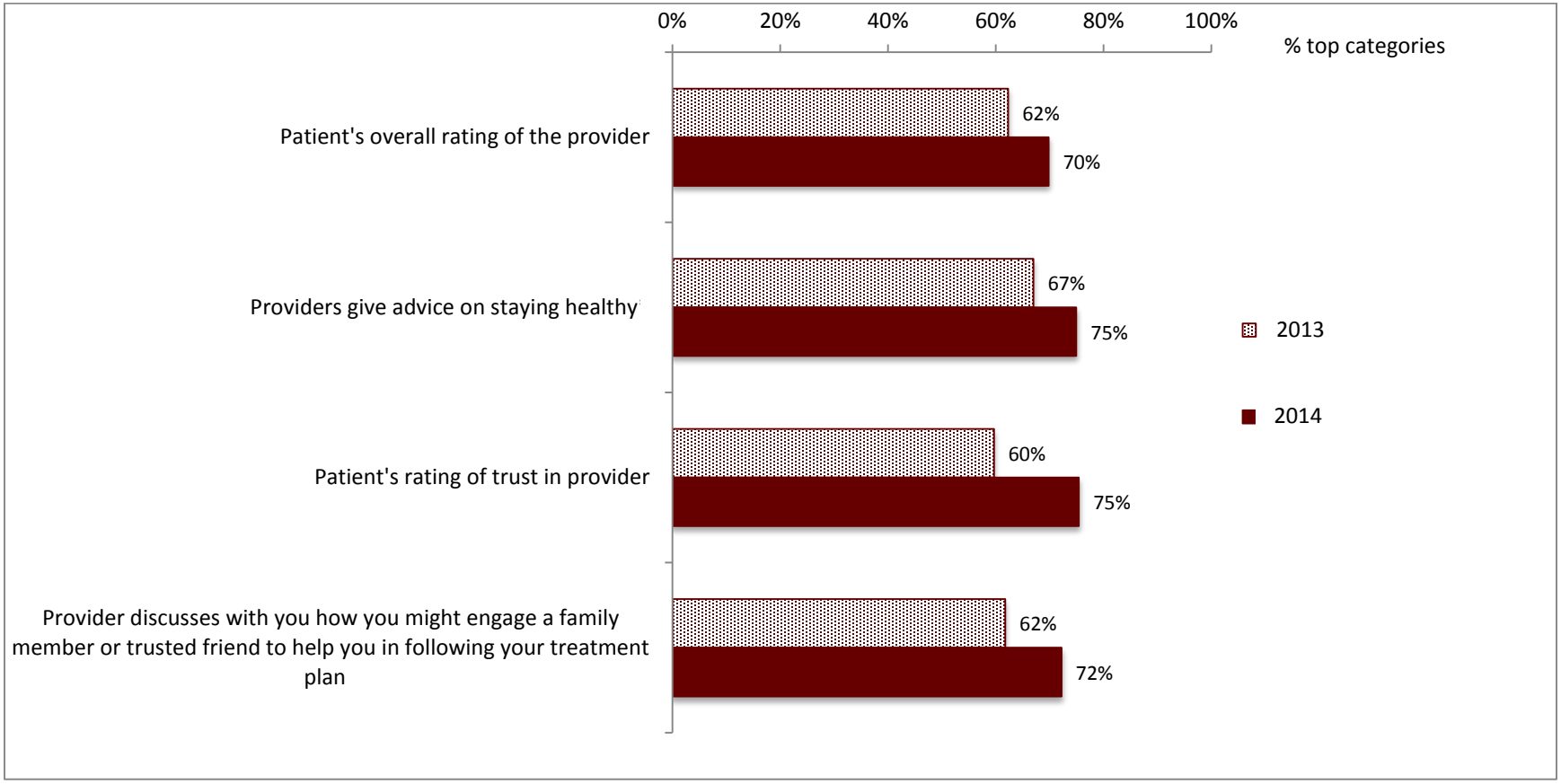

Exhibit 4: Consumer Assessment of Health Providers and Systems (CAHPS) Scales, by Year: Child Survey, Medicaid Patients

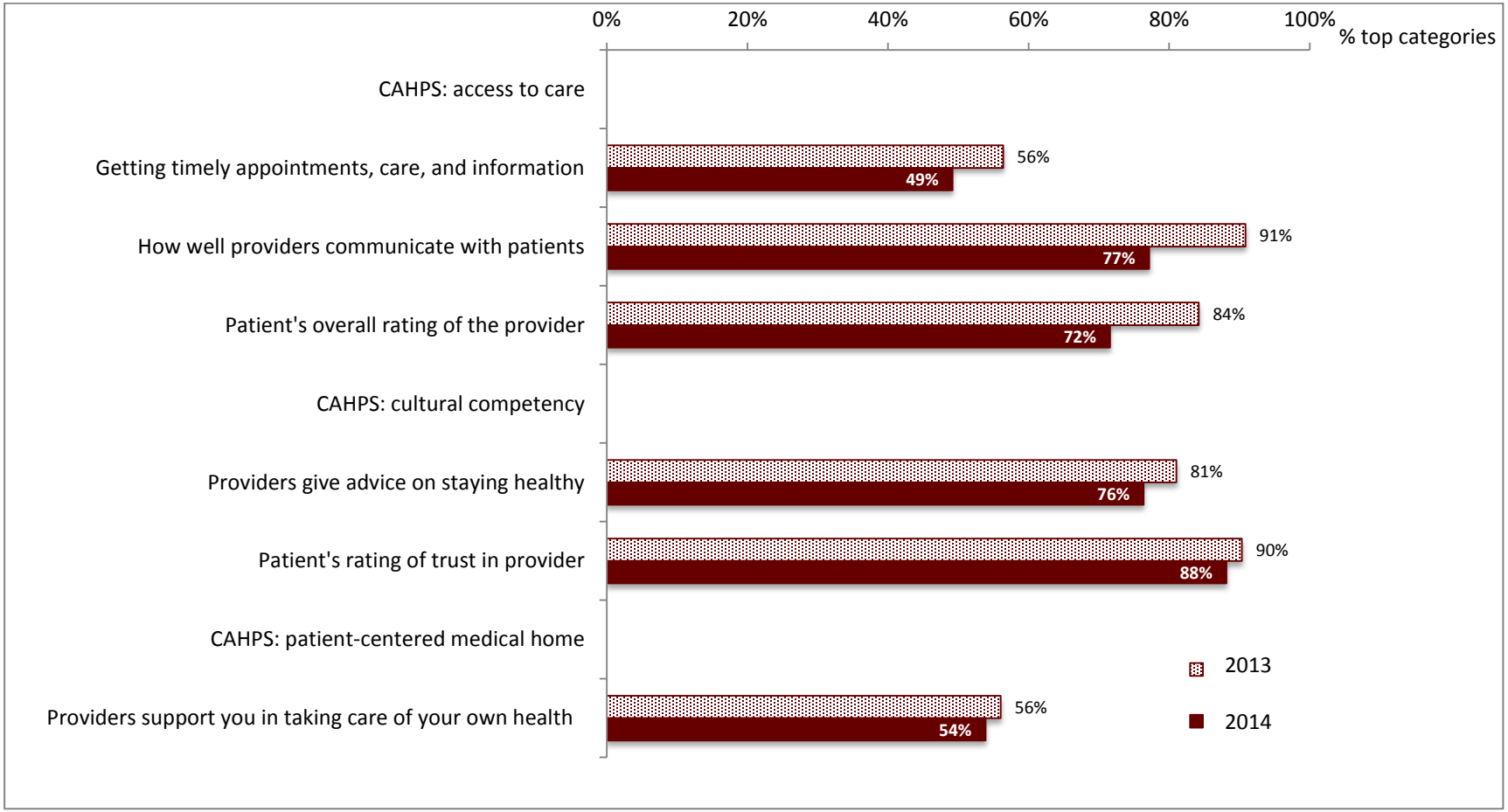

Exhibit 5: Patient Assessment of Chronic Illness Care (PACIC), by Year: Adult Survey, Medicaid Patients

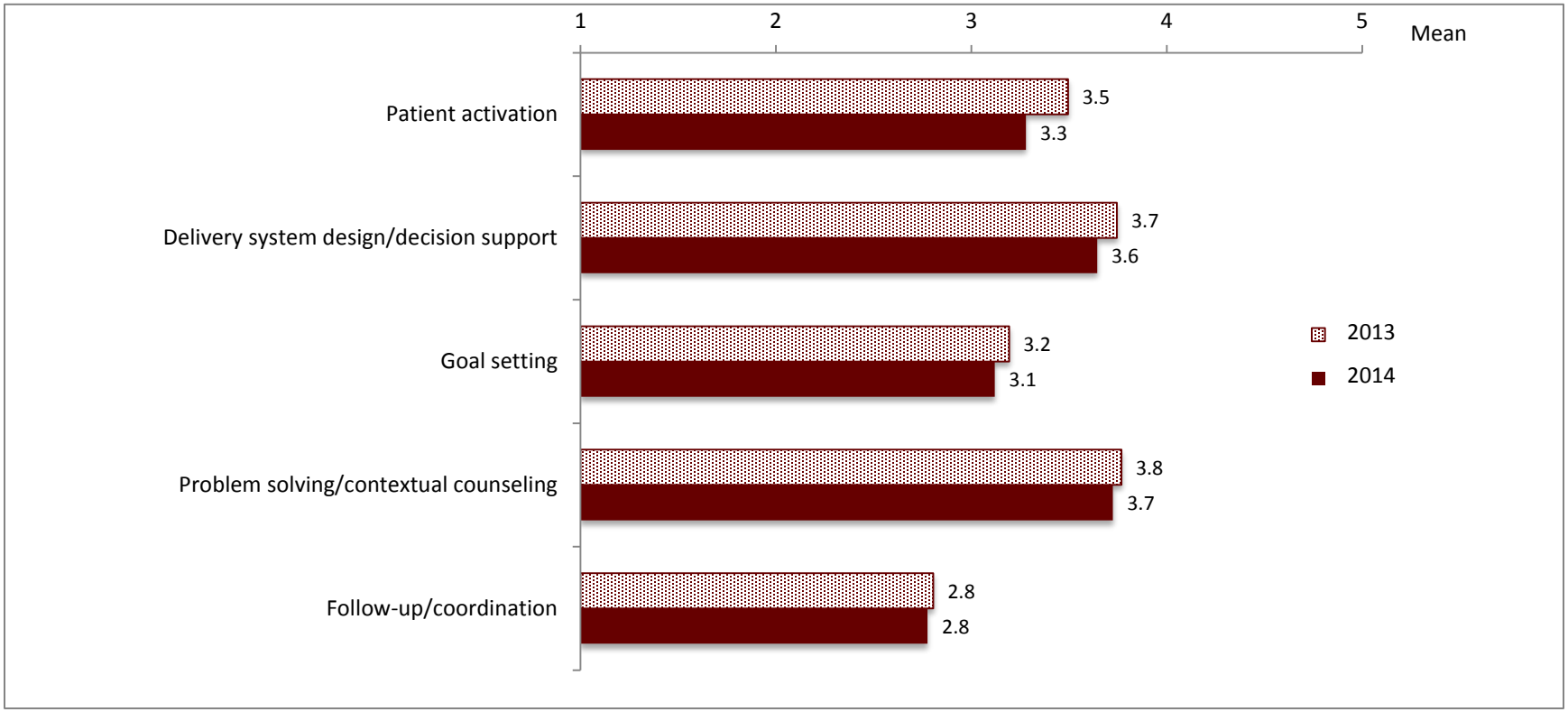

Exhibit 6: Patient Assessment of Chronic Illness Care (PACIC), by Year: Child Survey, Medicaid Patients

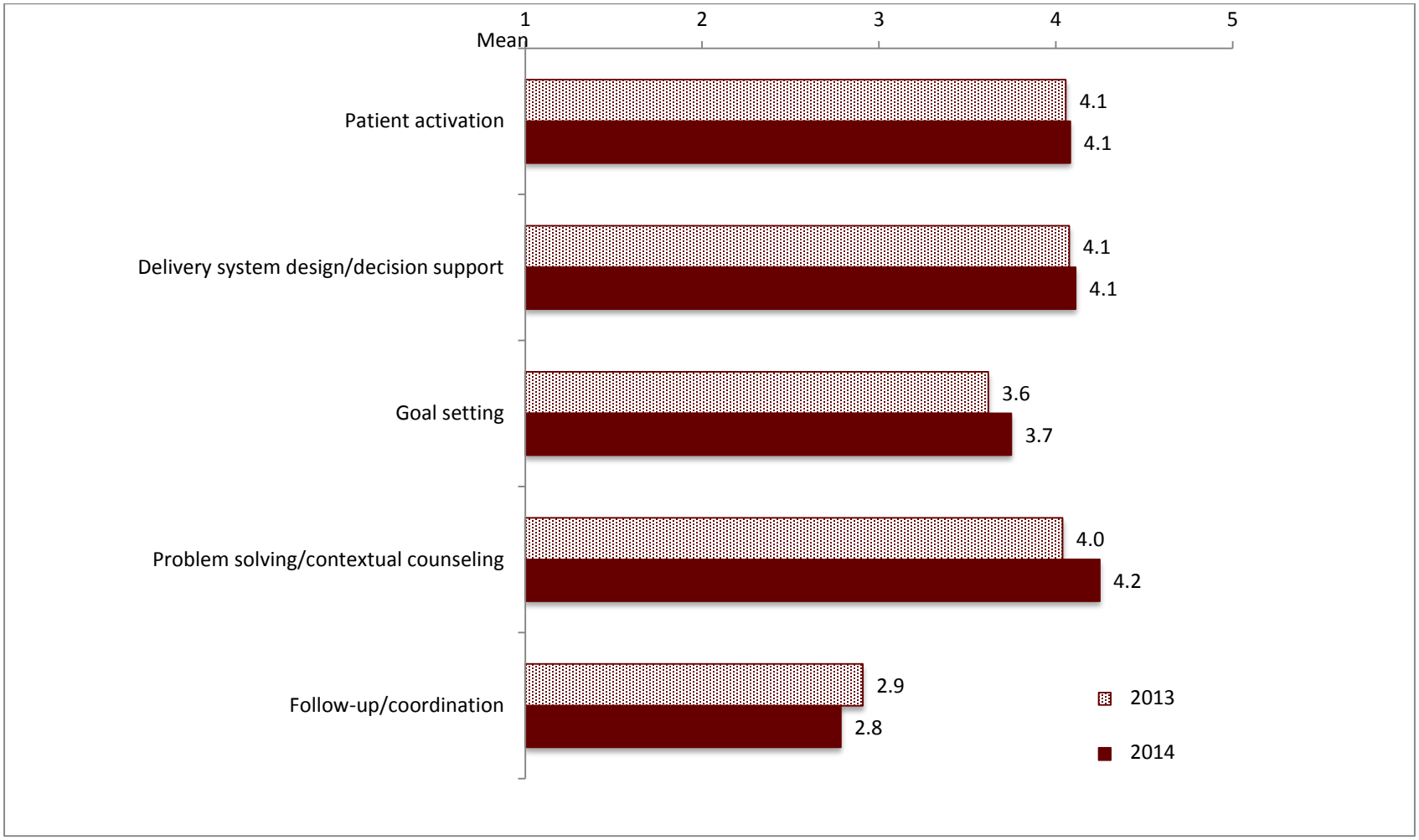

Exhibit 7: Practice Size and Patient Characteristics for Practices with Medicaid Patients Meeting Study Inclusion Criteria in the 2010 (Baseline Year) or 2011 (Year 1)

Characteristic	MMPP Sites	All Comparison Sites	Other PCMH Comparison Sites	Low exposure PCMH Comparison Sites
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Number of Providers	7.19 (5.43)	4.41* (7.53)	4.07‡ (3.63)	4.96 (11.47)
Number of Patients	735 (1,030)	464 (1,012)	503 (1,132)	401 (790)
Patient Age (years)	15.4 (13.9)	21.0‡ (15.7)	19.3‡ (15.2)	24.4‡ (16.2)
Proportion of Female Patients	0.61 (0.11)	0.64 (0.16)	0.63 (0.16)	0.65 (0.15)

Note: *p<0.05 compared to MMPP sites
‡p<0.01 compared to MMPP sites
MMPP = Maryland Multi-Payor Patient Centered Medical Home
PCMH = Patient Centered Medical Home
SD = standard deviation

Exhibit 8: Impact of the Maryland Multi-Payor Patient Centered Medical Home Program on Quality, Medicaid Patients, 2011-2013

Health Care Quality Measures	Year		
	2011	2012	2013
Proportion of young persons (≤40 years) with asthma with one or more asthma-related hospital admissions within the year	NS	NS	POS†
Proportion of people with hypertension (HTN) with one or more HTN-related hospital admissions within the year	NEG†	DNC	DNC
Proportion of diabetics (18-64 years old) with one or more HBA1c management tests within the year	DNC	NS	NS
Proportion of pediatric diabetics (0–17 years) with one or more HbA1c tests within the year	POS*	NS	NS
Proportion of women (40–64 years) with one or more breast cancer screenings within the year	POS*	NEG†	NEG†
Proportion of women (21–64 years) with one or more cervical cancer screenings within the year	NS	NEG†	NEG†
Proportion of women who had live births receiving post-partum care within the year	NS	NS	NS
Well-child visits (3–6 years), with any practice	NS	DNC	NEG†
Well-child visits (3–6 years), within attributed practice	NS	DNC	NS
Adolescent well-care visits (12–21 years), any practice	NEG*	NEG†	NEG†
Adolescent well-care visits (12–21 years), within attributed practice	NS	NS	NS
Proportion of adults (18 and older) with LVSD or HF who were prescribed ACE-inhibitor or ARB therapy	NEG†	NS	NS
Proportion of adults (18 and older) with LVSD or HF who were persistent with ACE-inhibitor or ARB therapy	NS	NS	NS
Proportion of adults (18 and older) with diabetes who were persistent with ACE-inhibitor or ARB therapy	NS	NS	NEG†
Proportion of adults (18 and older) who were persistent with beta blocker therapy following incident AMI discharge	DNC	DNC	DNC
Proportion of persistent asthmatics aged 5 to 40 years with one or more prescriptions for long-term asthma drug therapy	NEG†	NEG†	NEG†

*p<0.10, †p<0.05

Notes: POS means a statistically significant positive program impact (favoring MMPP) as compared to baseline year (2010). NEG means a statistically significant negative program impact (favoring comparison practices) as compared to baseline year (2010). DNC means that model did not converge, and NS means no statistically significant difference between MMPP and comparison practices in subsequent years as compared to baseline year. Positive findings are coded as GREEN while negative findings are coded as RED. Results are based on the difference-in-difference coefficients, and are adjusted for practice location (proximity to large/small metropolitan area), practice type (solo vs. other), practice use of electronic medical records, proportion of white practitioners in the practice and patient case-mix. Prescription drug measures are not available for commercially insured practices.

Exhibit 9: Impact of the Maryland Multi-Payor Patient Centered Medical Home Program on Utilization, Medicaid Patients, 2011-2013

Health Care Utilization Measures	Year		
	2011	2012	2013
Proportion of patients with one or more ED visits	NS	POS*	POS*
Mean number of ED visits among all patients	NS	NEG*	NS
Proportion of patients with asthma, CHF, or diabetes with one or more condition-related ED visits	POS†	NS	POS†
Proportion of patients with asthma with one or more asthma-related ED visits	POS†	NS	POS†
Proportion of patients w/ CHF with one or more CHF-related ED visits	NS	NS	NS
Proportion of patients w/ diabetes with one or more diabetes-related ED visits	NS	NS	NS
Proportion of patients with one or more inpatient stays	NEG†	NEG†	NEG†
Proportion of patients w/ asthma, CHF, or diabetes with one or more condition-related inpatient stays	NS	NS	POS†
Proportion of patients w/ asthma with one or more asthma-related inpatient stays	NS	NS	POS†
Proportion of patients with CHF with one or more CHF-related inpatient stays	POS*	NS	NS
Proportion of patients w/ diabetes with one or more diabetes-related inpatient stays	NS	NEG†	NS
Mean inpatient hospital days among patients with inpatient stays	NS	NEG†	NS
Proportion of patients with inpatient stays with readmissions within 30 days	NS	NEG†	NEG†
Proportion of patients with CHF-related inpatient stays with readmissions due to CHF within 30 days	DNC	DNC	DNC
Mean nursing home days among patients with nursing home stays (more is worse)	NS	NEG†	NEG†
Mean home health care visits among those receiving home health care	NS	NS	NS
Proportion of patients with one or more attributed practice office visits (more is better)	NS	NEG†	NS
Mean attributed practice office visits among patients with one or more attributed practice visits	NS	NS	NS
Mean non-attributed practice office visits among patients with one or more non-attributed practice physician visits (specialty visits) (more is worse)	NS	NS	NS
Average number of prescriptions within the practice, among patients with at least one	NEG†	NS	NS

*p<0.10, †p<0.05

Notes: POS means a statistically significant positive program impact (favoring MMPP) as compared to baseline year (2010). NEG means a statistically significant negative program impact (favoring comparison practices) as compared to baseline year (2010). DNC means that model did not converge, and NS means no statistically significant difference between MMPP and comparison practices in subsequent years as compared to baseline year. Positive findings are coded as GREEN while negative findings are coded as RED. Results are based on the difference-in-difference coefficients, and are adjusted for practice location (proximity to large/small metropolitan area), practice type (solo vs. other), practice use of electronic medical records, proportion of white practitioners in the practice and patient case-mix. Prescription drug measures are not available for commercially insured practices.

Exhibit 10: Impact of the Maryland Multi-Payor Patient Centered Medical Home Program on Health Care Costs, Medicaid Patients, 2011-2013

Health Care Cost Measures	Year		
	2011	2012	2013
Mean total payments among all patients	POS†	NS	NS
Mean total inpatient payments among patients with an inpatient stay	POS†	POS†	POS†
Mean total outpatient payments among patients with outpatient services	POS†	POS†	POS†
Mean total ED payments among patients with an ED visit	NS	NS	NS
Mean total attributed practice office visit payments among patients with attributed practice visits	NS	NS	DNC
Mean total home health payments among patients with a home health services	NS	NS	NS
Mean total nursing home payments among patients with a nursing home stay	NS	NEG†	NS
Mean total hospice payments among patients with hospice care	DNC	DNC	DNC
Mean total non-attributed practice office visit payments among patients with one or more non-attributed practice office visits (specialty office visits)	NS	NS	NS
Mean total radiology payments among patients with radiology visits	NEG*	NS	NS
Mean total laboratory payments among patients with laboratory visits	NS	NS	NS
Mean total other costs among all patients	POS†	NS	NS
Average total prescription drug payments, among those with at least one prescription fill	NS	NS	NS

*p<0.10, †p<0.05

Notes: POS means a statistically significant positive program impact (favoring MMPP) as compared to baseline year (2010). NEG means a statistically significant negative program impact (favoring comparison practices) as compared to baseline year (2010). DNC means that model did not converge, and NS means no statistically significant difference between MMPP and comparison practices in subsequent years as compared to baseline year. Positive findings are coded as GREEN while negative findings are coded as RED. Results are based on the difference-in-difference coefficients, and are adjusted for practice location (proximity to large/small metropolitan area), practice type (solo vs. other), practice use of electronic medical records, proportion of white practitioners in the practice and patient case-mix. Prescription drug measures are not available for commercially insured practices.

Exhibit 11: Unadjusted Means and Adjusted Difference-in-Difference Estimates for Selected Measure, Quality

Measure	MMPP or Comparison Practices	Unadjusted Means				Adjusted Difference-in-Difference: MMPP vs. Comp Ratio of ORs (CI) or Estimate (SE)		
		Baseline (2010)	Year 1 (2011)	Year 2 (2012)	Year 3 (2013)	Year 1 vs. Baseline	Year 2 vs. Baseline	Year 3 vs. Baseline
Proportion Of Women Age 40-64 Years With One Or More Breast Cancer Screening Within The Year	MMPP	0.25	0.29	0.28	0.28	1.13 (1.01,1.26)*	0.72 (0.62, 0.85)†	0.78 (0.68, 0.90)†
	Comparison	0.25	0.26	0.29	0.28			
Proportion Of Young Persons Age 0-40 Years With Asthma With One Or More Asthma-Related Hospital Admissions Within The Year	MMPP	0.024	0.017	0.016	0.015	1.28 (0.95, 1.73)	0.77 (0.53, 1.14)	0.49 (0.30, 0.82)†
	Comparison	0.029	0.019	0.023	0.030			
Number Of Adolescent (Age 12-21 Years) Well-Care Visits, Any Practice	MMPP	0.44	0.45	0.40	0.42	-0.034 (0.019)*	-0.084 (0.025)†	-0.089 (0.025)†
	Comparison	0.40	0.43	0.43	0.46			
Proportion Of Women Age 21-64 Years With One Or More Cervical Cancer Screening Within The Year	MMPP	0.38	0.37	0.35	0.31	0.91 (0.81, 1.03)	0.67 (0.57, 0.80)†	0.76 (0.65, 0.88)†
	Comparison	0.39	0.39	0.40	0.35			
Proportion Of Persistent Asthmatics Age 5 To 40 Years With One Or More Prescriptions For Long-Term Asthma Drug Therapy	MMPP	0.76	0.63	0.54	0.44	0.81 (0.74, 0.87)†	0.56 (0.41, 0.76)†	0.60 (0.50, 0.71)†
	Comparison	0.68	0.58	0.57	0.47			
	Comparison	0.57	0.53	0.53	0.54			
	Comparison	0.43	0.38	0.42	0.38			

Exhibit 12: Unadjusted Means and Adjusted Difference-in-Difference Estimates for Selected Measure, Utilization

Measure	MMPP or Comparison Practices	Unadjusted Means				Adjusted Difference-in-Difference: MMPP vs. Comp Ratio of ORs (CI) or Estimate (SE)		
		Baseline (2010)	Year 1 (2011)	Year 2 (2012)	Year 3 (2013)	Year 1 vs. Baseline	Year 2 vs. Baseline	Year 3 vs. Baseline
Proportion Of Patients With One or More Emergency Department Visits	MMPP	0.40	0.41	0.42	0.40	1.04 (0.95, 1.14)	0.92 (0.85, 1.00)*	0.91 (0.84, 0.99)*
	Comparison	0.56	0.57	0.60	0.58			
Proportion Of Patients W/ Asthma, CHF, or Diabetes With One Or More Condition-Related Emergency Department Visits	MMPP	0.11	0.10	0.08	0.08	0.89 (0.82, 0.96)†	0.86 (0.72, 1.04)	0.81 (0.70, 0.94)†
	Comparison	0.11	0.11	0.10	0.10			
Proportion Of Patients With One or More Inpatient Stays	MMPP	0.08	0.08	0.10	0.09	1.16 (1.03, 1.30)†	1.38 (1.17, 1.61)†	1.34 (1.17, 1.55)†
	Comparison	0.17	0.14	0.16	0.14			
Proportion of patients w/ asthma, CHF, or diabetes with one or more condition-related inpatient stays	MMPP	0.028	0.023	0.023	0.021	1.04 (0.93, 1.15)	1.02 (0.84, 1.24)	0.68 (0.52, 0.88)†
	Comparison	0.038	0.030	0.030	0.035			
Mean Inpatient Hospital Days Among Patients with Inpatient Stays	MMPP	5.59	5.79	6.34	6.43	0.34 (0.31)	0.92 (0.40)†	0.25 (0.37)
	Comparison	6.80	6.57	6.71	7.32			
Proportion of Patients with Inpatient Stays with Readmissions Within 30 Days	MMPP	0.23	0.21	0.21	0.22	0.93 (0.78, 1.12)	1.51 (1.22, 1.86)†	1.51 (1.17, 1.95)†
	Comparison	0.30	0.28	0.23	0.22			
	Comparison	0.12	0.11	0.11	0.12			

Exhibit 13: Unadjusted Means and Adjusted Difference-in-Difference Estimates for Selected Measure, Costs

Measure	MMPP or Comparison Practices	Unadjusted Means				Adjusted Difference-in-Difference: MMPP vs. Comp Ratio of ORs (CI) or Estimate (SE)		
		Baseline (2010)	Year 1 (2011)	Year 2 (2012)	Year 3 (2013)	Year 1 vs. Baseline	Year 2 vs. Baseline	Year 3 vs. Baseline
Mean Total Inpatient Payments, Among Patients With An Inpatient Stay	MMPP	21,178	12,962	14,670	15,616	-6,242 (2,577)†	-5,873 (2,315)†	-6,447 (2,423)†
	Comparison	15,334	13,228	14,419	15,735			
Mean Total Outpatient Payments Among Patients With Outpatient Services	MMPP	2,694	1,800	2,325	2,450	-701 (2623)†	-789 (271)†	-737 (273)†
	Comparison	2,291	2,103	2,372	2,382			

Exhibit 14: MMPP Practices: Health Care Payor Disparities in Quality, 2010 versus 2013

Quality Measure	Disparity sub-group	Sub-group rate (2010)	Disparity Rate Ratio (2010)	Disparity grade (2010)	Sub-group rate (2013)	Disparity rate ratio (2013)	Disparity grade (2013)	DCS
Proportion of young persons (0–40) with asthma with one or more asthma-related hospital admissions within the year	Medicaid	0.024	12.00	F	0.01	35.75	F	-23.75
	Commercial insurance	0.002			0.0004			
Proportion of pediatric diabetics (0–17 years old) with one or more HbA1c tests within the year	Medicaid	0.62	1.53	B	0.65	1.01	A	0.51
	Commercial insurance	0.41			0.64			
Proportion of women (40–64 years old) with one or more breast cancer screenings within the year	Medicaid	0.25	1.82	B	0.27	1.72	B	0.10
	Commercial insurance	0.45			0.47			
Two well-child visit(s) for first 15 months, to attributed practice	Medicaid	0.15	1.67	B	0.07	1.35	A	0.32
	Commercial insurance	0.24			0.10			

Exhibit 15: MMPP Practices: Health Care Payor Disparities in Utilization, 2010 versus 2013

Utilization Measure	Disparity sub-group	Sub-group rate (2010)	Disparity rate ratio (2010)	Disparity grade (2010)	Sub-group rate (2013)	Disparity rate ratio (2013)	Disparity grade (2013)	DCS
Proportion of patients with one or more ED visits	Medicaid	0.40	2.27	C	0.40	2.35	C	-0.07
	Commercial insurance	0.18			0.17			
Proportion of patients with asthma, CHF, or diabetes with one or more condition-related ED visits	Medicaid	0.11	4.70	F	0.08	2.98	F	1.71
	Commercial insurance	0.02			0.03			
Proportion of patients with asthma with one or more asthma-related ED visits	Medicaid	0.12	2.83	D	0.09	2.00	C	0.83
	Commercial insurance	0.04			0.04			
Proportion of patients with diabetes with one or more diabetes-related ED visits	Medicaid	0.01	10.00	F	0.0063	6.30	F	3.70
	Commercial insurance	0.001			0.001			
Proportion of patients with asthma, CHF, or diabetes with one or more condition-related inpatient stays	Commercial insurance	0.03	2.55	D	0.02	1.97	C	0.58
	Medicaid	0.01			0.01			
Proportion of patients with asthma with one or more asthma-related inpatient stays	Medicaid	0.02	2.18	C	0.01	1.51	B	0.68
	Commercial insurance	0.01			0.01			
Patients with inpatient stays with readmissions within 30 days (count)	Medicaid	0.24	1.91	B	0.22	1.59	B	0.32
	Commercial insurance	0.12			0.14			
Mean nursing home days among patients with nursing home stays	Medicaid	36.37	1.97	C	35.52	1.50	B	0.47
	Commercial insurance	18.48			23.63			
Mean home health care visits among those receiving home health care	Medicaid	9.50	3.36	F	14.23	3.65	F	-0.28
	Commercial insurance	2.82			3.90			

Exhibit 16: MMPP Practice: Health Care Racial Disparities in Quality, 2010 versus 2013

Quality Measure	Disparity sub-group	Sub-group rate (2010)	Disparity rate ratio (2010)	Disparity grade (2010)	Sub-group rate (2013)	Disparity rate ratio (2013)	Disparity grade (2013)	DCS
Proportion of young persons (0–40) with asthma with one or more asthma-related hospital admissions within the year	Non-white	0.03	1.80	B	0.02	1.62	B	0.18
	White	0.02			0.01			
Well child visits (3–6 years old), to any practice	Non-white	0.61	1.69	B	0.61	1.28	A	0.41
	White	0.36			0.47			
Adolescence well-care visits (12–21 years old), to any practice	Non-white	0.52	1.83	B	0.47	1.39	A	0.44
	White	0.29			0.34			

Exhibit 17: MMPP Practice: Health Care Racial Disparities in Utilization, 2010 versus 2013

Utilization Measure	Disparity sub-group	Sub-group rate (2010)	Disparity rate ratio (2010)	Disparity grade (2010)	Sub-group rate (2013)	Disparity rate ratio (2013)	Disparity grade (2013)	DCS
Proportion of patients with asthma, CHF, or diabetes with one or more condition-related ED visits	Non-white	0.13	2.07	C	0.09	1.82	B	0.25
	White	0.06			0.05			
Proportion of patients with asthma with one or more asthma-related ED visits	Non-white	0.14	2.15	C	0.10	1.89	B	0.27
	White	0.07			0.05			
Proportion of patients with asthma, CHF, or diabetes with one or more condition-related inpatient stays	Non-white	0.03	1.63	B	0.02	1.35	A	0.28
	White	0.02			0.02			
Proportion of patients with asthma with one or more asthma-related inpatient stays	Non-white	0.03	1.80	B	0.02	1.48	B	0.32
	White	0.02			0.01			
Patients with CHF-related inpatient stays with readmissions due to CHF within 30 days	Non-white	0.29	2.27	C	0.32	1.27	A	1.00
	White	0.67			0.40			

Evaluation Approach

The evaluation approach was both quantitative and qualitative in nature and consisted of: (1) site visits and interviews to evaluate practice transformation; (2) web-based surveys to evaluate provider satisfaction; (3) telephone surveys to evaluate patient satisfaction; (4) administrative data analysis to evaluate quality, utilization, and costs and (5) multiple modes to evaluate changes in health care disparities. The provider survey and administrative data portions of the evaluation used two comparison groups. Comparison practices included a group participating in another PCMH program (referred to as 'Other PCMH') in Maryland and a group that was less exposed to the PCMH concept (referred to as 'low exposure' practices). Comparison practices were chosen to be as much like the MMPP practices as possible using a statistical matching technique. The variables used for the matching included practice characteristics, provider characteristics aggregated to the practice level, and characteristics of practice location.

Site visits were conducted on a sample of nine MMPP practices selected from varying practice sizes, geographic settings, ownership types, and specialties to ensure representation of different practice characteristics. During each round of site visits, the evaluation team conducted four to six in-depth interviews at each site with staff directly involved in or affected by transformation: practice managers, PCMH leads, care managers, clinical staff, and support staff. The qualitative analysis focused on trends over the course of the pilot, aspects that had the most influence on PCMH goals, best practices, and lessons learned. The qualitative evaluation explored respondent perception of five important themes: (1) the transformation process, (2) staff perceptions of transformation, (3) health outcomes and disparities, (4) care coordination, and (5) financial costs and savings. In addition to identifying key findings for each research theme, the evaluation team used two variables—shared savings data and NCQA recognition—to investigate which types of practices were the most successful in implementing the model and site characteristics that were associated with better performance and advancement. These data were used to generate a measure to identify high, medium, and low performers. Interviewee responses were transcribed and systematically coded for key themes and patterns. Main points and quotations from the coded data were pulled to identify the primary findings from each site visit across all respondents.

An online survey was used to collect information on provider satisfaction from physicians, physician assistants, and advanced practice nurses in MMPP practices, as well as from physicians in comparison practices. Provider survey questions assessed perceptions of practice transformation to the PCMH model, provider satisfaction with chronic illness management, and aspects of teamwork and culture in the practices.

To evaluate patient satisfaction, computer-assisted telephone surveys were conducted among a sample of patients attributed to MMPP practices. There were two patient survey instruments, one for adults (>18 years of age) and one for children (<18 years of age). The child's caregiver answered the questions about the child under his/her care. The surveys evaluated patient satisfaction and experience of care, including delivery of health care, trust in provider, and access. The instruments included items from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) PCMH Survey, CAHPS supplemental topics, and the Patient Assessment of Chronic Illness Care.

Medicaid administrative claims data of patients meeting the evaluation criteria at the MMPP or comparison practice sites were used to construct measures of quality, utilization, and costs. Quality measures were selected from established quality measures from the PCMH Evaluator's Collaborative, the Agency for HealthCare Research and Quality, the National Quality Forum, the National Committee on Quality Assurance (NCQA), and the Healthcare Effectiveness Data and Information Set.

A difference-in-difference (DID) approach was used to estimate the impact of the MMPP on provider satisfaction and on quality, utilization, and costs. The DID approach is a robust policy analysis tool used as an alternative when randomization is not possible or practical. The DID approach compares changes in measures at the MMPP practices to changes at comparison practices; that is, it accounts for outcome changes that would have occurred over time regardless of the MMPP intervention. To further strengthen the validity of the estimates for the claims analysis, the evaluation team controlled for case-mix of participating and comparison sites using the Adjusted Clinical Group case-mix risk adjustment suite of tools (see http://www.acg.jhsph.org).

Data collected from the site visits, patient surveys, and analyses of claims data were used to evaluate whether the MMPP has an impact on health care disparities. Disparity change scores (DCS) are reported, which allow for a simple presentation of changes in disparities. A positive score indicates a "good" change in disparity, where the disparity is decreasing, while a negative score indicates that the disparity is increasing over time (see Drewette-Card RJ, Landen MG. J Public Health Management Practice, 2005, 11(6), 484–492.)