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Incentivizing Primary Care Providers to Innovate: Building Medical Homes in the Post-Katrina New Orleans Safety Net

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**Incentivizing Primary Care Providers to Innovate:**

**Building Medical Homes in the Post-Katrina New Orleans Safety-Net**

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**Incentivizing Primary Care Providers to Innovate:  
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## **Abstract**

**Objective.** To evaluate safety-net clinics' responses to a novel community-wide Patient-Centered Medical Home (PCMH) financial incentive program in post-Katrina New Orleans.

**Data sources/study setting.** Between June 2008 and June 2010, we studied 50 primary care clinics in New Orleans receiving federal funds to expand services and improve care delivery.

**Study design.** Multi-wave, longitudinal, observational study of a local safety-net primary care system.

**Data collection.** Clinic level data from a semi-annual survey of clinic leaders (89.3% response rate), augmented by administrative records.

**Principal findings.** Sixty-two percent of the clinics responded to financial incentives by achieving PCMH recognition from the National Committee on Quality Assurance (NCQA). Higher patient volume, higher baseline PCMH scores, and type of ownership were significant predictors of achieving NCQA recognition. The steepest increase in adoption of PCMH processes occurred among clinics achieving the highest, Level 3, NCQA recognition. Following NCQA recognition, 88.9% stabilized or increased their use of PCMH processes, although several specific PCMH processes had very low rates of adoption overall.

**Conclusions.** Findings demonstrate that widespread PCMH implementation is possible in a safety-net environment when external financial incentives are aligned with the goal of practice innovation.

**Key words.** Primary Care, Health Reform, Medical Home, Implementation, Community Clinics

## **Introduction**

The 2010 Affordable Care Act highlighted the Patient-Centered Medical Home (PCMH) as a model of delivery system reform. It emphasizes primary care, coordination of care, quality improvement, enhanced access to care, and system-level payment reforms (OLC 2010; Rittenhouse and Shortell 2009). In February 2007, primary care professional societies ratified the PCMH model in seven Joint Principles defining optimal primary care delivery (AAFP 2007). A broad coalition of purchasers, payers, professional societies and consumer groups (PCPCC 2011) has endorsed the model. Currently, the PCMH is being piloted, demonstrated and implemented across the U.S by large integrated delivery systems, independent physician practices, and Federally-Qualified Health Centers (FQHCs) (Bitton, Martin, and Landon 2010). In January 2008, the National Committee for Quality Assurance (NCQA) launched a voluntary recognition program for practices functioning as PCMHs. Any interested practice can apply by completing a web-based survey with supporting documentation. Practices are scored on a 100-point scale with three recognition levels, reflecting deeper integration of PCMH processes (2011a).

Most published research PCMH focuses on demonstration projects in large integrated health systems, commercial health plans, and highly-motivated physician practices (Carrier, Gourevitch, and Shah 2009; Nutting et al. 2011; Reid et al. 2010). In 2011, Takach described initial findings in 17 states, underscoring the promise of the PCMH for lowering per-capita costs, and improving patient and physician satisfaction (Takach 2011). But studies under real-world constraints are rare—particularly in safety-net systems serving the poor and uninsured, where financing and organizational barriers may impede improvements. Here we report findings from a three-year longitudinal study of PCMH implementation in New Orleans following Hurricane Katrina. We began observing the city’s novel experiment to create a network of PCMHs in June 2008—one that used financial incentives to encourage providers to adopt PCMH processes and be recognized by NCQA as medical homes. Over five waves of semi-annual data collection on 50 primary care clinics, we studied predictors and outcomes of implementing PCMH-related health reforms citywide.

## **Medical Homes in the New Orleans Safety-Net**

New Orleans' experience provides a unique opportunity to study PCMH implementation in safety-net clinics across an entire community. In September 2007, the US government awarded Louisiana the Primary Care Access and Stabilization Grant (PCASG) to support safety-net primary care and behavioral health clinics in four parishes comprising Greater New Orleans. This three-year, \$100 million grant was to increase access to high-quality healthcare to sustain community health into the future (LPHI 2007). Funds covered direct patient care and some clinical improvements, but prohibited other expenses, such as building repairs and health information technology infrastructure. PCASG funds were allocated in seven staggered payments over three years (2007-2010). The base payment was allocated according to number of health care provider full-time equivalents. Subsequent payments were based on a clinic's count of unduplicated patients, weighted by patient demographics, service type, and payer mix, with augmentation for pharmacy services or medication access programs. Private payers were not major contributors to care for clinic populations nor did they adopt PCMH incentive programs during the study

The Louisiana Public Health Institute (LPHI), a non-profit organization based in New Orleans, administered PCASG funds., LPHI leaders decided to adopt the 2008 *NCQA Physician Practice Connection Patient-Centered Medical Home* as a framework to encourage PCMH practice improvements (LPHI 2008). The resulting Quality Improvement Program (QIP) established minimum standards for quality and access required of all PCASG clinics by June 2008 (e.g., evidence-based guidelines, formal specialty referral arrangements, and around-the-clock phone response). They also established a voluntary Quality Improvement Incentive Payment Program offering bonus payments for clinics recognized by NCQA as medical homes. LPHI based incentive payments on number of medical home points assigned to the clinic by NCQA.

All clinics in the PCASG network were eligible for payment incentives. Although points were assigned by the NCQA, thresholds for receiving bonuses were lower than those required for NCQA recognition (see Table 1). LPHI scaled bonus payments to reflect the number of points NCQA awarded each clinic. Clinics at level QIP 1, received the base payment share. Those qualifying at level 2 received a triple payment share, and those at the highest level received six times the payment share. Three rounds of incentive payments occurred during the grant period, with clinic payments ranging from \$55,826 to \$135,053. Across all of the clinics receiving the

quality incentive payments, each clinic received, on average, \$9.39 per patient per year. Other supports for practice improvements were limited to PCASG funds disbursed directly to clinics but offered few additional resources supporting PCMH transformation or initiatives. LPHI spearheaded a technical assistance support group for clinics rolling out EPIC as their EMR system.

Ironically, Hurricane Katrina's tragedy created an opportunity for an early natural experiment with PCMH that is now at the center of health reform discussions across the U.S. While not representative of all safety-net healthcare systems, New Orleans' experience with health reform informs such efforts elsewhere. Not unlike those in New Orleans, safety-net providers in the US often seem to be working "against all odds," in resource-constrained environments with challenging patient populations, while trying to both deliver care and transform care delivery.

### **Implementing Medical Homes in the Safety-Net**

The PCMH model of delivery-system reform holds special promise for safety-net systems, where rates of chronic disease are high, where care tends to be fragmented, and patients often rely on emergency services for basic healthcare (Taylor 2010). Beal shows that medical homes, as measured from the patient perspective, can reduce or even eliminate racial/ethnic disparities in access and quality of care (Beal et al. 2007). Following suit, the Health Resources and Services Administration has launched a PCMH initiative in FQHCs and multiple PCMH initiatives are underway in state Medicaid programs (2011b; Qualis 2011; Takach 2011).

But how can primary care providers be motivated to adopt clinical PCMH process improvements, given significant resource constraints? A growing body of health services research suggests that financial incentives can drive practice innovations, so long as goals and rewards are clear, and organizations possess internal capabilities for change (Friedberg et al. 2010; Lindenauer et al. 2007; Petersen et al. 2006; Shortell, Bennett, and Byck 1998). Formal recognition and certification may also drive change by providing practices with special status as providers of high quality care, with positive "report cards" and accreditation. NCQA established the first PCMH recognition program, which was subsequently adopted by many demonstration programs around the country. However, there has been limited agreement and scant research on

the meaning of NCQA recognition. Do clinics recognized by NCQA actually sustain and enhance positive changes in healthcare delivery?

### **Conceptual Framework and Hypotheses**

Our conceptual framework draws on research demonstrating that greater use of quality improvement tools in primary care practices depends on external influences for undertaking PCMH innovations, and organizational capabilities to develop and implement often complex changes (Casalino et al. 2003; Friedberg et al. 2009a; Rittenhouse et al. 2011; Rittenhouse, Thom, and Schmittiel 2010; Robinson et al. 2009). Our framework also draws on work on the diffusion of innovation. Diffusion is a pattern of communication among entities within a social network (Valente and Rogers 1995). Organizational research underscores the importance of local organizational networks as channels for spreading innovations, with most prior research in healthcare focused on how quality improvements spread (Cole and Scott 2000; Kennedy and Fiss 2009; Westphal, Gulati, and Shortell 1997). Internal capabilities (as indicated by size, infrastructure, and payer mix) position some organizations to adopt innovations more rapidly than others and lead to uneven timing of adoption throughout networks (Rogers and Whetten 1982).

We hypothesized that some New Orleans clinics would respond to external incentives, pursue practice improvements, and achieve high-level NCQA recognition, while others would achieve lower levels, or none at all. Our conceptual framework provided further basis for predicting which types of practices were most likely to adopt innovations in response to bonus payments. We hypothesized that practices with greater internal capabilities for change, such as larger size (e.g., larger number of providers), ownership (e.g., by large hospital or health system), and academic-affiliation would be associated with greater adoption of PCMH components after controlling on baseline PCMH status.

### **Methods**

#### **Data Sources**

We obtained data on the use of PCMH processes from a semi-annual telephone survey conducted with primary care clinic leaders by trained staff at the Louisiana Public Health Institute between June 2008 and June 2010. Respondents held positions such as medical



director, clinic directors, and/or nurse managers and were knowledgeable about clinical processes and quality improvement efforts. The survey instrument was adapted from the National Study of Small and Medium Physician Practices (NSSMPP) and the NCQA Physician Practice Connection Patient-Centered Medical Home survey tools (2011a; Rittenhouse et al. 2011). The Principal Investigator validated survey responses during one-hour telephone calls with each clinic. Although all clinics (n=56) responded to at least two of five semi-annual waves of data collection, only the 50 primary care sites with validated data are included for this paper's analyses. The six non-validated clinics were privately owned, with average patient volume was slightly smaller than that of the 50 validated clinics. Of the validated 50 sites, 32 were operating during all survey periods, eighteen were in operation during two or more survey periods.

We obtained data regarding NCQA recognition and clinic characteristics from administrative records. These data were reported to LPHI semi-annually beginning in September 2007 as a condition of federal funding and were routinely audited.

## **Variables**

### **Response to Quality Improvement Incentive Payment Program: NCQA Recognition**

We measured level of NCQA recognition in December 2009, the last opportunity for clinics to obtain incentive payments through the QIP Incentive Program. There were three possible levels of NCQA recognition: 1, 2, 3. Because only one clinic obtained Level 2 recognition, and because Levels 2 and 3 are similar (Scholle et al. 2011), we combined them analyses.

### **Clinic Capabilities and Incentives**

Based on prior research, we hypothesized that clinic size, ownership, and academic affiliation would be associated with level of NCQA recognition (Scholle et al. 2011). Because of staffing variations (use of full-time, part-time, volunteer, and resident physicians and other health care providers), size was measured by patient volume: the number of unduplicated patients served in each six-month reporting period. We used the log of the mean patient count because the distribution of counts was highly skewed. This transformation generated an approximately symmetric distribution with the highest frequencies near the modal value.

We measured ownership in three categories: 1) clinics owned by a government entity, such as a state, city or parish; 2) clinics owned by a large, private non-profit health system; and 3) independently-owned private, non-profit clinics. Academic affiliation was measured by whether or not a clinic was associated with a major teaching institution. Twelve clinics had close financial and administrative ties with the medical centers of two universities, one state and the other private. In all twelve, residents and medical students actively provided care through regular rotations.

In addition to clinic capabilities, we hypothesized that clinics exposed to external financial incentives for quality improvement—aside from federal grant funding—would be more likely to achieve NCQA recognition. Clinic leaders were asked about additional income from external entities for scoring well on measures of clinical quality, patient satisfaction, adoption of information technology, or efficient utilization of resources. We created a dichotomous “external incentive” variable, where “1” represented an external incentive during any of the first four waves of semi-annual data collection.

### **PCMH Scores**

Using a survey of clinic leaders, we created indices of PCMH process use corresponding to three Joint Principles of the PCMH: 1) care coordination/integration; 2) quality and safety; and 3) enhanced access. Sites treating adult and pediatric patients could achieve a maximum of 27 points. For sites treating only pediatric patients, we excluded items regarding breast cancer screening, for a maximum of 26 possible points. An overall PCMH index was created by summing the points on the three component indices. The proportion scored on each index was standardized to provide a distribution ranging from 0-100, with higher levels indicating greater use of PCMH processes. Baseline PCMH score was measured in June 2008.

### **Analysis**

We conducted bivariate analyses to illustrate associations between NCQA recognition and clinic characteristics. No significance tests were performed for these associations due to small cell sizes. We performed multivariate analysis using ordinal regressions with a logistic link function to analyze the probabilities of membership in one of three ordered categories: no NCQA recognition as of December 2009 vs. Level 1 recognition, and Levels 2 or 3. The odds

ratios show the shift in the odds of having NCQA recognition versus not for a unit change in the independent variable. We calculated two types of odds ratios: 1) bivariate odds ratios for a single independent variable, and 2) odds ratios for the independent variables, adjusted for patient count and baseline PCMH values. We restricted the number of independent variables in models to three in respect of parsimony and sample size constraints.

To examine the relationship between NCQA Recognition by December 2009, and the trend in use of PCMH processes within clinics over time, we classified clinics by the three levels of NCQA recognition in December 2009 and, for each level, charted the mean semi-annual scores on the PCMH index between June 2008 and June 2010. For the subset of clinics that achieved NCQA recognition by December 2009, we further examined changes in PCMH scores from wave 3 to wave 5. Twenty-seven of the 31 clinics were open during all three of these survey waves. These 27 clinics were then classified according to whether their PCMH score improved, stayed the same or decreased following NCQA recognition.

Finally, we identified the medical home processes most difficult for clinics to implement and sustain. For the subset of clinics that achieved NCQA recognition by December 2009, we examined the mean frequencies for each medical home process to identify which processes had the lowest level of use across NCQA-recognized clinics.

## **Results**

### **NCQA Recognition and Clinic Characteristics**

Thirty-one clinics (62.0%) received NCQA recognition PCMHs by December 2009 (see Table 2). Although thresholds for receiving bonus payments were lower than the floor for Level 1 NCQA recognition, all clinics receiving bonus payments did so at levels above the NCQA floor. Moreover, 11 of 31 clinics achieved NCQA Level 2 or 3. Although nearly two-thirds of public sites obtained NCQA recognition, none of them obtained Level 2 or 3.

Two-thirds of sites privately owned and independent of larger health systems did not receive NCQA recognition. But those that did were recognized at Level 3. Nearly eighty percent of the clinics succeeding were privately owned and affiliated with a larger health system. They also had higher mean patient volumes than those that were not recognized. Of the 12 academic clinics, 11 were recognized by the NCQA. Only nine clinics reported additional financial incentives for quality improvement or patient satisfaction, independent of the QIP; of

these, 100% achieved NCQA recognition. Clinics achieving NCQA recognition had significantly higher mean baseline PCMH scores than sites that did not ( $p < 0.014$ ).

Table 3, Column 1 presents odds ratios for the bivariate associations shown in Table 2. A one-unit change in the patient count on the log scale is equivalent to a change from 100 patients to 1,000 patients. Such a shift in patient count dramatically increases the odds of NCQA recognition. An equally dramatic change is associated with a 25-point change in baseline PCMH score, which generates an estimated odds ratio of 1.1 times 25 or 27.5.

Table 3, Columns 2 and 3 show the same odds ratios adjusted for patient count and baseline PCMH score. Across all combinations, of three predictors we examined, high patient counts and baseline PCMH scores were significantly associated with NCQA recognition. Of the four other predictors, only private ownership by a large system (compared to privately owned independent clinics) consistently predicted NCQA status. Controlling for patient count and baseline PCMH score, exposure to incentive payments other than those offered by QIP added no predictive power. The odds of PCMH recognition are lower for publically owned clinics compared to independent, privately-owned clinics, but are significant only when adjusted for patient count and baseline PCMH score. Finally, academic affiliation is not a statistically significant predictor in bivariate or multivariate regression analyses.

### **Trends in Use of PCMH Processes**

Figure 1 displays the trend in mean PCMH score from June 2008 to June 2010, based on our semi-annual survey of clinic leaders, for each level of NCQA recognition as of December 2009. The steepest increase in use of PCMH processes was observed for clinics achieving Level 2 or 3 NCQA recognition. PCMH processes also improved among clinics that did not receive NCQA recognition, although the improvements were delayed. The trend line for NCQA level 1 clinics is essentially flat. We found similar trends over time for the use of PCMH processes specific to care-coordination/integration and quality/safety (data not shown). For enhanced access, the pattern was different, with less variation in mean baseline scores according to level of NCQA recognition, and more modest overall levels of improvement over the study period (data not shown).

Despite substantial improvement across the community, and high levels of NCQA recognition, less than 40% of the NCQA-recognized clinics adopted specific PCMH processes

related to care coordination/integration and enhanced access to care. These include: a) use of registries and dedicated care managers to improve chronic illness care; b) electronic alerts for abnormal test results; c) open hours, weekdays beyond 8 am to 5 pm, and weekends; d) use of an interactive clinic website; and e) use of e-mail to communicate with patients.

### **Sustainability of PCMH Processes After NCQA-Recognition**

Figure 2 displays differences in the PCMH index from wave 3 to wave 5 for each clinic after achieving NCQA recognition. 74.1% of NCQA-recognized clinics stabilized the use of PCMH processes following recognition; only four clinics increased and three decreased in the PCMH score by more than 4 points following recognition (0-100 scale). Significant changes in PCMH scores after NCQA recognition were attributable to changes in use of PCMH processes for care coordination/integration, and for quality and safety; use of PCMH processes for enhanced access remained fairly stable (data not shown).

### **Discussion**

We conducted a longitudinal observational study of the PCMH model in safety net clinics across New Orleans which, post-Katrina's devastation, received a unique opportunity to rebuild its health care system in a way consistent with currently advocated health reforms. Responding to financial incentives, most primary care clinics adopted changes that resulted in NCQA recognition. More than one-fifth achieved Levels 2 or 3.

Higher levels of NCQA recognition were associated with:

- 1) Greater use of PCMH processes at baseline, as measured through clinic surveys at the study's beginning. This suggests that "early adopters" or clinics already poised for change, achieved the greatest improvements.
- 2) Larger clinic size and ownership by large health care systems, this confirming earlier published studies showing physician practices with greater internal capabilities were most likely to innovate (cite reference)

However, we also observed low levels of the adoption of some specific PCMH processes among all clinics, in particular care coordination/integration, particularly with respect to chronic disease registries and assignment of dedicated care managers. These aspects of chronic disease

management, while shown effective at improving clinical outcomes, require substantial clinic-level technical assistance and staffing change. These requirements may account for the low adoption levels we observed. Lowest adoption levels also occurred in enhancing care access via increased hours (weekends and beyond 8am to 5 pm on weekdays) and use of interactive websites and e-mails to facilitate patient-clinic communication. Note that these changes were not required to meet minimum standards of federal funding, to obtain NCQA recognition, or to receive a bonus via QIP.

Our study has several limitations.

Its observational design limits our ability to draw causal inferences because of many other potential influences on outcomes. NCQA post-Katrina recognition of primary care clinics coincided with the influx of substantial federal funding, the main public hospital closed, clinics varied in dependence on federal funds. Moreover, political and economic changes in New Orleans and increased awareness of medical homes nationally could have impacted our observations. However, given the newness of NCQA recognition program and the relatively high costs associated with applying for recognition, it is unlikely that thirty one safety-net clinics could have achieved recognition by December 2009 absent federal funding and QIP incentives. For comparison, nationwide, only 447 practices, including 31 FQHC's had received NCQA recognition as of March 2010. (Scholle et al 2011)

We could obtain validated survey data on only fifty of fifty-six primary care clinics that received federal grants. The six missing clinics were privately owned, served adult and pediatric patients in one mobile and five fixed locations, and had a slightly smaller annual average number of patients.

Survey respondents could have over-reported usage of PCMH reforms. To mitigate against this, we focused on clinic changes over time, validated the data and focused comparisons on associations with level of NCQA recognition as directly reported by NCQA to Louisiana Public Health Institute.

Our study does not cover all components of the PCMH model. Omitted are personal physician and team-based care, (because most clinics had only small numbers of providers), whole-person

orientation (because our study is limited to primary care clinics), and payment reform (because such reform is largely outside the control of individual clinics).

### **Policy Implications**

Our study suggests that despite oft-cited obstacles, substantial community-wide progress in implementing elements of the PCMH model is achievable even in safety-net settings with limited resources. Despite some unique attributes, New Orleans shares the challenges of many communities in delivering high quality care to vulnerable patients via diverse clinic settings (i.e. small vs. large, ownership by government, large health systems or by non-profits, affiliation or not with medical schools).

By adopting a framework for improving quality and marking a clear path leading to public recognition and bonus payments, local leaders in New Orleans were able to use federal funding to stimulate substantial changes in primary care for vulnerable patients. Changes occurred among “early adopter” clinics with high levels of NCQA recognition, clinics which won incentive payments via lower levels of NCQA recognition, and clinics whose improvements came too late for recognition or bonuses, but met minimum standards of quality and access. These are important findings because most demonstrations tend to focus on early adopters and practices eager for change. For widespread implementation of PCMH we need to understand how innovations diffuse throughout a community of diverse clinic settings.

Our survey-based index of PCMH processes can also be used to validate the NCQA recognition process, and somewhat alleviate the concern that isolated site visits by agencies provide only “snapshots” of the clinics they evaluate, when personnel put their best foot forward and may or may not maintain practice reforms. We observed improvements before and after clinics received NCQA recognition, over three years. Our results show a strong – though not perfect – correlation between our research definition of “medical home” and NCQA status /level. This suggests there is some validity to the 2008 NCQA scoring system for identifying clinics and their trajectories of practice reform. Note however that we found substantial improvements even among clinics not recognized by NCQA—which suggests that sole reliance on number of clinics with NCQA recognition to indicate reforms in primary care practice may underestimate the extent of change underway nation-wide. As recognition programs emerge (Burton, Devers,

Berenson 2011) we need a better understanding of their role in transforming clinics into medical homes.



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Table 1: Comparison of Requirements for Clinics to Achieve NCQA Recognition and to Qualify for PCASG Quality Incentive Payment

| <u>NCQA Recognition Program</u> |                |                             |  |
|---------------------------------|----------------|-----------------------------|--|
| <u>Level</u>                    | <u>Points*</u> | <u>Must Pass (Required)</u> |  |
|                                 |                | <u>Elements</u>             |  |
| 1                               | 25-49 points   | 5 of 10                     |  |
| 2                               | 50-74 points   | 10 of 10                    |  |
| 3                               | 75+ points     | 10 of 10                    |  |

| <u>PCASG Quality Incentive Payment Program</u> |                |                             |                      |
|--|----------------|-----------------------------|----------------------|
| <u>Tier</u>                                    | <u>Points*</u> | <u>Must Pass (Required)</u> | <u>Payment Share</u> |
|  |                | <u>Elements</u>             |                      |
| 1  | 20-24 points   | 4 of 10                     |                      |
| 2  | 25-49 points   | 5 of 10                     |                      |
| 3  | 50+ points     | 8 of 10                     |                      |
|  |                |                             | X                    |
|  |                |                             | 3X                   |
|  |                |                             | 6X                   |

\*In all cases, points were assigned to clinics by the NCQA, upon review of application for PCMH recognition

Table 2: Level of NCQA Recognition by Primary Care Clinics,  
According to Clinic Capabilities and Incentives (N=50 Primary Care Clinics)

| <i>Variables</i>  | <i>Percent (no.) that Achieved<br/>NCQA Recognition</i> |                 |                   |
|---|---|-----------------|-------------------|
|   | No NCQA   | NCQA<br>Level 1 | NCQA<br>Level 2/3 |
| <b>Ownership</b>  |   |                 |                   |
| Public  | 36.4%<br>(4)  | 63.6%<br>(7)    | 0%<br>(0)         |
| Private – Large system  | 20.8%<br>(5)  | 54.2%<br>(13)   | 25.0%<br>(6)      |
| Private – Independent   | 66.7%<br>(10)   | 0%<br>(0)       | 33.3%<br>(5)      |
| <b>Academic-Affiliation</b>                                   |   |                 |                   |
| Yes   | 8.3%<br>(1)   | 75.0%<br>(9)    | 16.7%<br>(2)      |
| No  | 47.4%<br>(18)   | 28.9%<br>(11)   | 23.7%<br>(9)      |
| Log patient count (mean)                                      | 2.5   | 3.1             | 3.3               |
| <b>Any Financial Incentives for Practice<br/>Improvements</b> |   |                 |                   |
| Yes   | 0%<br>(0)   | 44.4%<br>(4)    | 55.6%<br>(5)      |
| No  | 46.3%<br>(19)   | 39.0%<br>(16)   | 14.6%<br>(6)      |
| PCMH score at baseline (median)                               | 33.3  | 39.7            | 55.6              |

NOTE: Ownership and Academic Affiliation and Baseline PCMH score were measured at baseline (June 2008). Patient count was measured as the average over four semi-annual waves of data collection (June 2008-December 2009). Financial incentives were exclusive of the federal Primary Care Access and Stabilization Grant Quality Improvement Program, and were measured over 4 semi-annual waves of data collection (June 2008-December 2009).

Table 3: Odds Ratios and Adjusted Odds Ratios from Ordinal Regressions of NCQA Status\* as of December 2009 (N=50 Primary Care Sites)

| <i>Predictor</i>   | <i>Odds Ratio</i> | <i>p-value for null test***</i> | <i>Adjusted Odds Ratio**</i>  | <i>p-value for null test***</i> |
|--|-------------------|---------------------------------|---|---------------------------------|
| Patient count (log of average count waves 1-4)   | 26.2              | <.001                           | Patient counts and baseline PCMH scores used as controls to adjust odds ratios of the other predictors. |                                 |
| Baseline PCMH score (scale=0 to 100)   | 1.1               | .003                            |   |                                 |
| Public ownership**** (1 if yes; 0 otherwise)   | 0.6               | ns                              | 0.2   | .040                            |
| Private Ownership, Large Entity**** (1 if yes; 0 otherwise)                            | 2.8               | .056                            | 4.0   | .040                            |
| Academic Affiliation (1 if yes; 0 otherwise)   | 2.2               | ns                              | 1.8   | ns                              |
| Any incentive payments for practice improvements, Waves 1 to 4 (1 if yes; 0 otherwise) | 9.7               | .004                            | 3.6   | ns                              |

\* The ordinal regression models the cumulative probabilities associated with the following ordered states: no NCQA recognition, level 1 recognition, and levels 2 or 3 recognition.

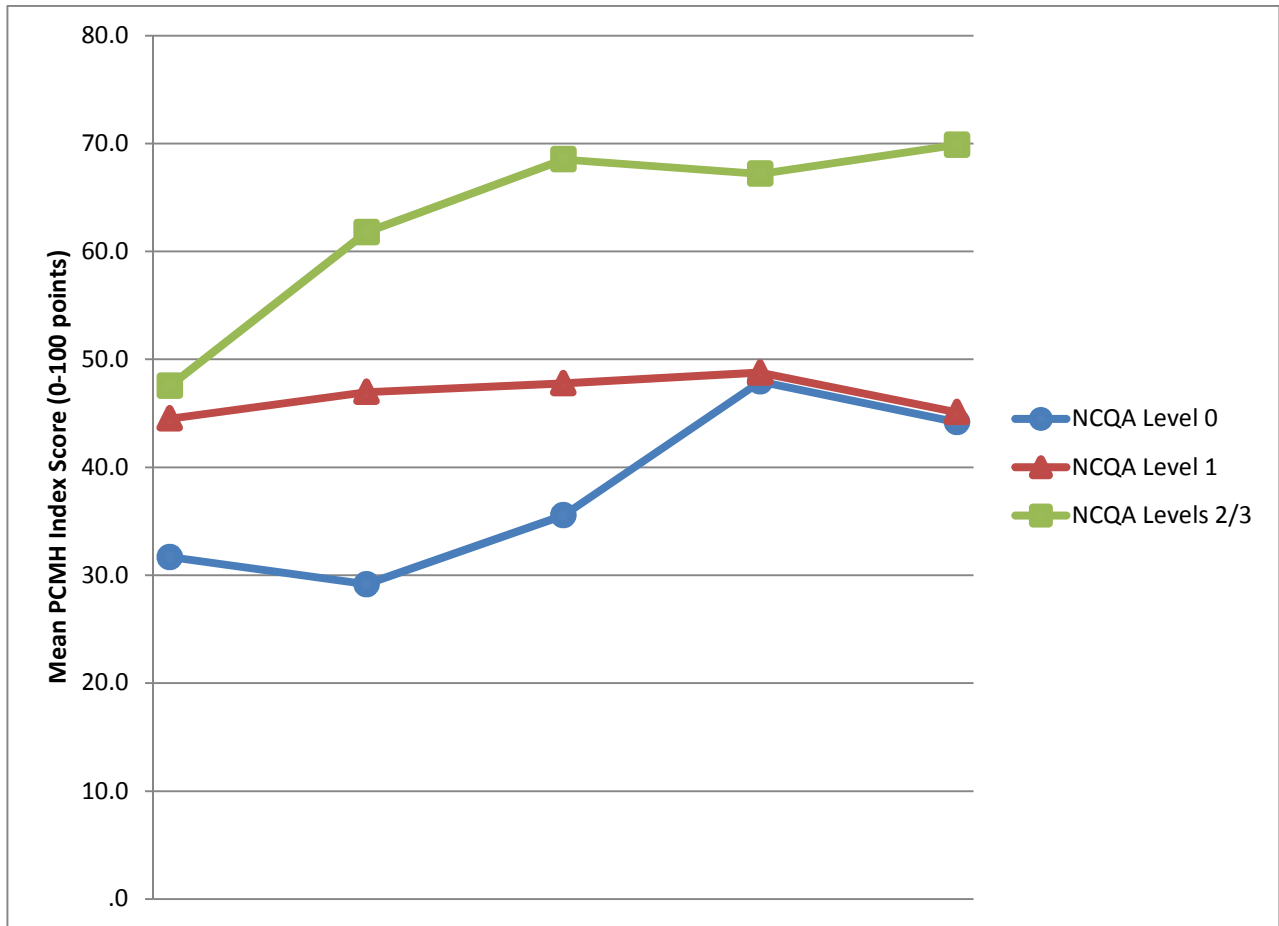
\*\* These are the odds ratios for selected predictors, controlling for patient count and baseline PCMH status.

\*\*\* The null hypothesis tested is that the odds ratio equals 1.0 against the alternative that the odds ratio is different from 1.0 in either direction.

\*\*\*\*For ownership, the omitted category is Private Ownership, Independent Clinic.

ns = non-significant p-value

Figure 1: Trends in Use of PCMH Processes from June 2008 to June 2010 (N=50 Primary Care Sites)



*Note.* Clinics are classified according to their final of NCQA recognition in December 2009. PCMH average scores are plotted against dates of measurement: June 2008, December 2008, June 2009, December 2009, and June 2010.



Figure 2: Change in Use of PCMH Processes After NCQA Recognition (N=27 Primary Care Clinics)

