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Patient-centered Medical Home Capability and Clinical Performance in HRSA-supported Health Centers

Leiyu Shi, DrPh, MPA, MBA^{*}, Diana C. Lock, MSSW^{*}, De-Chih Lee, PhD[†], Lydie A. Lebrun-Harris, PhD, MPH[‡], Marshall H. Chin, MD, MPH[§], Preeta Chidambaram, MD, MPH^{||}, Robert S. Nocon, MHS[§], Jinsheng Zhu, MEc^{*}, and Alek Sripipatana, PhD, MPH^{||}

^{*}Primary Care Policy Center, Department of Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD

[†] Department of Information Management, Da-Yeh University, Changhua, Taiwan, Republic of China

[‡] Office of Research and Evaluation, Office of Planning, Analysis and Evaluation, Health Resources and Services Administration, US Department of Health and Human Services, Rockville, MD

[§] University of Chicago Medicine, Chicago, IL

^{||} Office of Quality and Data, Bureau of Primary Health Care, Health Resources and Services Administration, Rockville, MD.

Abstract

Objectives—To evaluate the relationship between Patient-centered Medical Home (PCMH) model adoption in health centers (HCs) and clinical performance measures and to determine if adoption of PCMH characteristics is associated with better clinical performance.

Research Design—Data came from the Health Resources and Services Administration's 2009 Uniform Data System and the 2009 Commonwealth Fund National Survey of Federally Qualified Health Centers. Clinical performance measures included 2 process measures (childhood immunization and cervical cancer screening) and 2 outcome measures (hypertension control and diabetes control). Total and subscale PCMH scores were regressed on the clinical performance measures, adjusting for patient, provider, financial, and institutional characteristics.

Results—The findings showed different directional relationships, with some PCMH domains (care management, test/referral tracking, quality improvement, and external coordination) showing little or no effect on outcome measures of interest, 1 domain (access/communication) associated with improved outcomes, and 1 domain (patient tracking/registry) associated with worse outcomes.

Conclusions—This study is among the first to examine the association between PCMH transformation and clinical performance in HCs, providing an understanding of the impact of

Reprints: Leiyu Shi, DrPH, MBA, MPA, Department of Health Policy and Management, Primary Care Policy Center, Bloomberg School of Public Health, Johns Hopkins University, 624 N. Broadway, Baltimore, MD 21205. lshi2@jhu.edu..

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PCMH adoption within safety-net settings. The mixed results highlight the importance of examining relationships between specific PCMH domains and specific clinical quality measures, in addition to analyzing overall PCMH scores which could yield distorted findings.

Keywords

primary care; patient centered medical home; community health centers; clinical performance; safety-net provider

The Patient-centered Medical Home (PCMH) model of care dates back to the 1960s, when it was originally conceived to improve care for children with special needs. The 7 core features of PCMH are: (1) a personal primary care physician, (2) a physician-directed medical practice, (3) whole person orientation, (4) coordinated or integrated care, (5) quality and safety, (6) enhanced access, and (7) payment reform.¹

In the recent years, support for the expansion of PCMH has rapidly increased.^{2,3} Currently, the model is being applied through a growing number of demonstration projects, each with its own evaluation of effectiveness.^{4,5} One such application is through health centers (HCs), which receive funds from the Health Resources and Services Administration (HRSA) to provide primary care services to medically underserved populations.⁶ As of 2012, >21 million patients were served by HRSA-supported HCs.⁷

HCs are poised to implement the PCMH model as they have proven to be effective in providing comprehensive, accessible, and continuous primary care.^{8,9} HRSA's PCMH initiative supports HCs' efforts to adopt PCMH features and gain recognition by the National Committee for Quality Assurance, by providing education, training, technical assistance, and fee waivers for gaining recognition.¹⁰ By the end of fiscal year 2014, HRSA aims to have approximately 40% of HCs recognized.¹¹

Although preliminary evaluations show that PCMHs promote improvements in health care access and quality,¹²⁻¹⁴ most report inconclusive results because of insufficient sample sizes to detect significant effects or lack of association between PCMH measures and clinical outcome.³ Large-scale evaluations of the PCMH model, particularly in safety-net settings like HCs, are needed. To address this gap, the current study evaluated the relationship between PCMH model adoption in HCs [as determined by the Safety Net Medical Home Scale (SNMHS)] and clinical performance measures, to determine if adoption of PCMH characteristics is associated with better clinical performance.

METHODS

Data

HC-level data came from HRSA's 2009 Uniform Data System (UDS) and the 2009 Commonwealth Fund National Survey of Federally Qualified Health Centers. The UDS collects data on an annual basis from HCs on patient demographics, costs, revenue, provision of services, staffing, utilization rates, and clinical indicators.

In 2009, the Commonwealth Fund conducted a national survey of HCs to assess if HCs have the capacity to function as high-performing sites of care.¹⁵ The sample was drawn from a list provided by HRSA of all HCs with at least 1 site that was a community-based primary care clinic. A total of 1007 HCs were sent the questionnaire and 795 responded (79% response rate). HCs responded to questions about their patients' access to care, specialist referrals and procedures, coordination of care among providers and across settings, and engagement in quality-improvement activities, and performance reporting. The survey also assessed health information technology adoption, ability to track patient information and manage patient care, and opportunities to strengthen HC capacity to be PCMHs. Data were weighted by the number of patients, number of sites, region, and urbanicity to reflect the universe of HCs more accurately.

For this study, we merged the 2009 Commonwealth Fund dataset with the 2009 UDS, generating an analytic sample of 795 HCs. The unique combination of these 2 data sources allow us to examine the relationship between extent of PCMH achievement (from the Commonwealth Fund survey) and clinical performance (from the UDS) while controlling for HC characteristics (from the UDS).

Measures

Dependent Measures—Clinical performance measures included 2 process measures and 2 outcome measures: (1) percent of children who received all required vaccines by their second birthday; (2) percent of female patients aged 24–64 who received at least 1 Pap test in the past 3 years; (3) percent of patients 18–75 years diagnosed with type 1 or type 2 diabetes who had their blood sugar levels under control (HbA1c $\leq 9\%$ and HbA1c $< 7\%$); and (4) percent of patients 18–85 years diagnosed with hypertension who had their blood pressure under control (last blood pressure check $< 140/90$ mm Hg). All 4 measures are part of the National Committee for Quality Assurance Healthcare Effectiveness Data and Information Set tool (note that the guidelines for blood pressure control have changed since 2009).² In addition, the measures were the first to be introduced in the UDS, providing HCs the opportunity to improve their performance over time.

Independent Measures—The SNMHS, a measure comprised of subscales developed to measure PCMH adoption within safety-net settings, evidenced adequate reliability and validity in the development sample.^{16,17} The SNMHS is comprised of 52 items across 6 subscales (summarized into indexes based on the scoring algorithm provided by the developer): access and communication (ability to contact patients in a timely manner, offer translation services); patient tracking and registry (ability to list patients by clinical characteristics); care management (ability to manage patient care through reminders, education, care coordination); test and referral tracking (ability to monitor from point of order until result is received); quality improvement (ability to systematically collect performance data and improve care); and external coordination (ability to refer and receive external updates on patients).^{16,17} Each subscale is scored on a scale of 0 (worst) to 100 (best), and the average of scores across these subscales provides a total score (also on a scale of 0–100) indicating the level of adoption of the PCMH model. Using our own sample, we

performed internal consistency analyses for each subscale and found that each of the six PCMH subscales had Cronbach's alpha of at least 0.70.

Covariate Measures—Control measures included patient, provider, financial, and institutional characteristics.⁸ Patient characteristics included: total number of patients; percent of minority patients (including non-Hispanic Asian, non-Hispanic Hawaiian/Other Pacific Islander, non-Hispanic Black/African American, non-Hispanic American Indian/Alaska Native, and Hispanic/Latino); percent of uninsured patients; percent of Medicaid-insured patients; percent of patients with managed care; and percent of patients with chronic conditions (ie, HIV, asthma, chronic bronchitis and emphysema, diabetes mellitus, heart disease, hypertension).

Provider characteristics included primary care team (physician, nurse practitioner, physician assistant, certified nurse midwife, or nurse) full-time equivalent (FTE) per 10,000 total patients and enabling service provider (case manager or health educator) FTE per 10,000 total patients. Financial characteristics included percent of total revenue from services (ie, insurance payments, patient self-pay fees) and net revenue.

Institutional characteristics included rural/urban status, length of HC history ("established" HCs receiving HRSA funding for at least 3 y vs. "new" HCs receiving HRSA funding for <3 y), and method for reporting clinical performance measures [electronic health records (EHR) vs. manual extraction of paper records]. HCs who reported their clinical performance indicators using EHRs reported on the universe of their target population, whereas HCs that chose manual extraction identified a random sample of 75 patients for a particular clinical indicator. Finally, HRSA operating divisions included 4 categories (Northeast, North Central, Southwest, Central Southeast).

Analysis—The unit of analysis was the HC. We conducted both descriptive and explanatory analyses. First, we obtained means and SEs on all measures included in the analyses. Next, we conducted adjusted multivariate linear regressions of SNMHS total and subscale scores (respectively) on clinical performance measures, adjusting for patient, provider, financial, and institutional characteristics. We accounted for multiple hypothesis testing using the Bonferroni correction. To ensure that the total error did not exceed a level of .05, tests of statistical significance in adjusted analyses were conducted at the 0.01 level. All analyses were performed using SAS, version 9.3.

RESULTS

HC Characteristics

Table 1 displays the patient, provider, financial, and institutional characteristics of the HCs surveyed. A total of 795 HCs were included in the analysis, each serving on average over 18,000 patients. This sample was compared with the overall population of 1131 HCs.

Surveyed HCs provided services to a large percentage of minority patients (49%), uninsured patients (40%), Medicaid patients (32%), managed care patients (17%), and patients with at least 1 chronic condition (24%). On average, there were approximately 8 primary care

provider FTEs, and 7 enabling service provider FTEs per HC. HCs received a majority (66%) of their revenue from service-related payments. Most HCs (93%) were established for at least 3 years, and over half (55%) were located in rural areas. Most HCs reported their clinical performance measures using samples of paper medical records rather than EHRs.

Surveyed HCs did not differ from the population of HCs, with 2 exceptions: surveyed HCs received a slightly greater proportion of their revenue from services, compared with all HCs, and a greater proportion of surveyed HCs were established for at least 3 years, compared with all HCs.

Table 2 shows the average rate of clinical performance measures for the selected preventive services and outcomes. The adherence rate for diabetes control was 72% using the more liberal definition (HbA1c $\geq 9\%$), and 40% using the more stringent definition (HbA1c $< 7\%$). Rates of childhood immunization and hypertension control were both 63%, and the rate for cervical cancer screening was 54%.

Among the SNMHS subscales, the lowest average score was for care management (47) and the highest scores were for test and referral tracking (68), followed by access and communication (65), and patient tracking and registry (62).

PCMH Adoption and Clinical Performance

Table 3 depicts the results of adjusted multivariate regressions of PCMH total and domain scores on clinical performance measures, controlling for patient, provider, financial, and institutional characteristics.

The relationship between total PCMH score and clinical performance measures was not significant in the multivariate analyses. However, increased scores on the access and communication subscale were significantly associated with better performance on the diabetes control measures (ie, a 10-point increase in the access and communication subscale score is associated with almost 1% improvement in the diabetes control rate). In addition, improvements in the external coordination subscale were significantly associated with the improvements in childhood immunizations (ie, a 10-point increase in the external coordination subscale score is associated with 1.1% improvement in the immunization rate), and improvements in the care management subscale were associated with improved cervical cancer screening rates (ie, a 10-point increase in the care management subscale score is associated with over 1% improvement in the Pap test rate). Finally, there was also an inverse relationship between the patient tracking and registry subscale and some clinical performance measures such as childhood immunization, Pap test, and diabetes control. After employing the Bonferroni correction to account for multiple hypothesis testing, the access/communication and patient tracking/registry domains of PCMH remained significantly associated with certain performance measures.

In terms of other characteristics, minority patients, primary care providers, and total service revenue had positive association with certain clinical performance measures, whereas uninsured patients, Medicaid patients, patients with chronic conditions, and the use of EHR in reporting showed negative association with certain clinical performance measures.

DISCUSSION

We sought to determine if adoption of PCMH characteristics is associated with better clinical performance, by characterizing the level of PCMH transformation in HCs as of 2009 utilizing the SNMHS, and examining the association between PCMH domains and clinical performance measures.

After adjusting for patient, provider, financial, and institutional characteristics, and accounting for multiple hypothesis testing, the findings showed different directional relationships. Some PCMH domains showed no significant effect (at the $P < 0.01$ level) on outcome measures of interest (ie, quality improvement, test/referral tracking, care management, external coordination), 1 domain was associated with improved outcomes (ie, access/communication), and 1 domain was associated with worse outcomes (ie, patient tracking/registry). The finding that access and communication stood out as a critical PCMH subdomain in influencing clinical performance highlights the importance of focusing on patients. As the relationships between PCMH domains and clinical performance measures varied by domain, the total PCMH score comprising all domains did not show any significance. The mixed results highlight the importance of examining relationships between specific PCMH domains and specific clinical quality measures, rather than analyzing overall PCMH scores which could yield distorted findings.

Furthermore, it is important to identify underlying mechanisms that drive our findings. For instance, the inverse relationship between patient tracking/registry and clinical performance maybe because EHRs track outcomes on all patients in the universe of a clinical practice, whereas manual chart reviews may be biased if a nonrandom sample of patients is selected to report on clinical measures. Similarly, the inverse relationship may be due to providers' increased comfort with patient tracking. Specifically, the SNMHS patient tracking and registry subscale is determined by the ability to generate lists of patients by diagnosis, patients by provider, and patients who are due for tests or preventive care.¹⁶ Thus, this score actually captures providers' ability to generate these lists. As providers' ability to generate these lists improves, they are better able to track and document their entire target patient population.

Likewise, the finding that access and communication stood out as pivotal in influencing clinical performance suggests that patient-centered care is important throughout the continuum of patient care, from getting them into the health care system to their ongoing care experience.

The negative association between certain patient characteristics (noticeably the uninsured, Medicaid, and chronically ill) and certain clinical performance measures suggests that extra effort at quality improvement should target these subpopulations, and points out the need for their inclusion in multivariate analysis.

The current study presents some limitations. First, the study used 2009 data, when fewer HCs were seeking PCMH recognition/accreditation. There are more PCMH-recognized HCs now and more time has passed for PCMH transformations to have an impact on clinical practice and outcomes. This study found limited associations between PCMH domains and

clinical performance measures, especially after correction for multiple hypothesis testing, suggesting that more time may be needed to examine the full impact of PCMH. Future analyses could use a longitudinal or time-lagged approach that explores the impact of PCMH on performance over time. The current study was unable to accomplish this due to the cross-sectional nature of the Commonwealth Fund survey. Finally, the unit of analysis was the HC, rather than individual patients, precluding certain analyses such as stratified analysis to examine the effects of PCMH domains on quality of care by racial/ethnic groups. Future research should identify sources of patient-level data to conduct such analyses.

This study is among the first to examine the association between PCMH transformation and clinical performance in HCs, providing an understanding of the impact of PCMH adoption within safety-net settings. Merging 2 national datasets with a large and nationally representative sample of HCs provided sufficient statistical power to detect differences, even in models that included multiple covariates and after adjusting for multiple testing. The study applied a PCMH measure that was psychometrically validated in safety-net settings, and emphasized the importance of examining specific subdomains of PCMH. The use of PCMH subscale scores (from 0 to 100) operationalized the degree of PCMH adoption on a continuum, rather than a dichotomous (yes/no) basis, and provided a more specific interpretation of the mixed association between PCMH subscales and clinical performance. The mixed results highlight the importance of examining relationships between specific PCMH domains and specific clinical quality measures.

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TABLE 1

Characteristics of Surveyed Health Centers and Population of Health Centers

	Surveyed HCs (n=795)		Total HCs (n=1131)	
	Mean (SE)	N	Mean (SE)	N
Patient characteristics				
Total patients	18,237.45 (688.71)	795	16,581.66 (546.38)	1131
Minority patients (%)	49.05 (1.13)	795	50.19 (0.94)	1130
Uninsured patients (%)	39.58 (0.70)	795	40.91 (0.63)	1130
Medicaid patients (%)	32.27 (0.55)	794	32.16 (0.49)	1129
Managed care patients (%)	17.09 (0.73)	706	16.27 (0.61)	994
Patients w/chronic conditions (%)	23.82 (0.35)	795	23.89 (0.32)	1130
Provider characteristics				
PC team FTE per 10,000 total patients	8.38 (0.12)	795	8.56 (0.11)	1130
Enabling service provider FTE per 10,000 total patients	7.1 (0.29)	780	7.18 (0.26)	1105
Financial characteristics				
Total revenue from services (%) [*]	66.26 (0.52)	795	64.24 (0.48)	1131
Net revenue (\$, in millions)	5.03 (0.40)	795	4.42 (0.29)	1131
Institutional characteristics [n (%)]				
Rural	436 (54.84)	—	590 (52.17)	—
Urban	356 (44.78)	—	537 (47.48)	—
Unknown	3 (0.38)	—	4 (0.35)	—
Established (funded ≥3y) [*]	740 (93.08)	—	984 (87)	—
New (funded <3 y)	55 (6.92)	—	147 (13)	—
Childhood immunization completion [n (%)]				
EHR	104 (13.08)	—	137 (12.11)	—
Non-EHR	691 (86.92)	—	994 (87.89)	—
Cervical cancer screening [n (%)]				
EHR	148 (18.62)	—	205 (18.13)	—
Non-EHR	647 (81.38)	—	926 (81.87)	—
Hypertension control [n (%)]				
EHR	167 (21.01)	—	221 (19.54)	—
Non-EHR	628 (78.99)	—	910 (80.46)	—
Diabetes control [n (%)]				
EHR	190 (23.90)	—	253 (22.37)	—
Non-EHR	605 (76.10)	—	878 (77.63)	—
HRSA division [n (%)]				
Northeast	209 (26.29)	—	301 (26.61)	—
North Central	208 (26.16)	—	291 (25.73)	—
Southwest	193 (24.28)	—	289 (25.55)	—
Central Southeast	185 (23.27)	—	250 (22.10)	—

^{*} $P < 0.05$ based on t test for continuous measures or χ^2 test for categorical measures.

EHR indicates electronic health records; FTE, full-time equivalent; HC, health center; HRSA, Health Resources and Services Administration; PC, primary care

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TABLE 2**Clinical Performance Measures and Patientcentered Medical Home Scores**

	Mean	SE	n
Clinical performance measures			
Childhood immunization (%) [*]	63.11	0.83	783
Pap test (%) [†]	54.43	0.72	792
Hypertension control (%) [‡]	62.84	0.46	791
Diabetes control (HbA1c < 7%) (%) [§]	40.20	0.42	792
Diabetes control (HbA1c 9%) (%) [§]	71.56	0.45	792
Patient-centered Medical Home scores (0–100)			
Total Patient-centered Medical Home score	58.44	0.46	795
Subscales			
Access and communication	64.71	0.55	795
Patient tracking and registry	62.23	0.90	795
Care management	47.39	0.68	795
Test and referral tracking	67.96	0.87	795
Quality improvement	58.28	0.57	795
External coordination	50.05	0.68	795

^{*} Percent of children receiving all required vaccinations by their second birthday.

[†] Percent of female patients aged 24–64 who received at least 1 Pap test in the past 3 years.

[‡] Percent of patients aged 18–85 years diagnosed with hypertension who had their blood pressure under control (last blood pressure check <140/90mm Hg).

[§] Percent of patients aged 18–75 years diagnosed with type 1 or type 2 diabetes who had their blood sugar levels under control (HbA1c < 7% or 9%).

Multiple Regressions: Association of PCMH and Health Center Characteristics With Clinical Performance

TABLE 3

	Childhood Immunization (%)	Pap Test (%)	Hypertension Control (%)	Diabetes Control (HbA1c <7%) (%)	Diabetes Control (HbA1c 9%) (%)	Childhood Immunization (%)	Pap Test (%)	Hypertension Control (%)	Diabetes Control (HbA1c <7%) (%)	Diabetes Control (HbA1c 9%) (%)
Total PCMH score	—	—	—	—	—	0.017 (0.070)	0.107 (0.058)	0.051 (0.040)	0.067 (0.032) *	0.017 (0.036)
PCMH domains										
Access and communication	−0.091 (0.061)	0.0002 (0.050)	0.005 (0.035)	0.089 (0.028) **	0.089 (0.032) **	—	—	—	—	—
Patient tracking and registry	−0.108 (0.042) **	−0.079 (0.035) *	−0.033 (0.024)	−0.028 (0.020)	−0.053 (0.022) **	—	—	—	—	—
Care management	0.086 (0.061)	0.102 (0.050) *	0.015 (0.035)	0.005 (0.028)	−0.003 (0.032)	—	—	—	—	—
Test and referral tracking	−0.003 (0.041)	0.029 (0.034)	0.029 (0.023)	0.033 (0.019)	0.021 (0.021)	—	—	—	—	—
Quality improvement	0.107 (0.058)	0.002 (0.047)	0.045 (0.032)	0.011 (0.026)	0.004 (0.030)	—	—	—	—	—
External coordination	0.100 (0.050) *	0.079 (0.042)	0.012 (0.029)	−0.015 (0.023)	0.008 (0.026)	—	—	—	—	—
Patient characteristics										
Total patients	0.00001 (0.0001)	0.0001 (0.0001) *	0.00001 (0.00004)	−0.00001 (0.00003)	−0.00001 (0.00003)	−0.000001 (0.0001)	0.0001 (0.0001) *	0.00001 (0.00004)	0.00001 (0.00003)	−0.000003 (0.00003)
Minority patients (%)	0.185 (0.039) ***	0.172 (0.032) ***	0.025 (0.022)	−0.073 (0.018) ***	−0.021 (0.020)	0.161 (0.039) ***	0.150 (0.032) ***	0.019 (0.022)	−0.077 (0.018) ***	−0.031 (0.020)
Uninsured patients (%)	0.011 (0.076)	−0.033 (0.062)	−0.103 (0.043) *	−0.176 (0.035) ***	−0.198 (0.0390) ***	0.002 (0.076)	−0.035 (0.062)	−0.102 (0.043) *	−0.171 (0.035) ***	−0.198 (0.039) ***
Medicaid patients (%)	0.123 (0.089)	−0.018 (0.072)	−0.066 (0.050)	−0.130 (0.040) **	−0.142 (0.045) **	0.138 (0.089)	−0.014 (0.072)	−0.058 (0.050)	−0.121 (0.040) **	−0.13 (0.045) **
Managed care patients (%)	0.061 (0.055)	0.071 (0.045)	0.015 (0.031)	0.004 (0.025)	0.002 (0.029)	0.069 (0.055)	0.080 (0.045)	0.014 (0.031)	0.006 (0.025)	0.007 (0.029)
Patients w/chronic conditions (%)	−0.002 (0.102)	−0.321 (0.084) ***	−0.077 (0.058)	0.084 (0.047)	0.055 (0.052)	0.016 (0.102)	−0.308 (0.083) ***	−0.069 (0.057)	0.084 (0.047)	0.056 (0.052)
Provider characteristics										

	Childhood Immunization (%)	Pap Test (%)	Hypertension Control (%)	Diabetes Control (HbA1c <7%) (%)	Diabetes Control (HbA1c 9%) (%)	Childhood Immunization (%)	Pap Test (%)	Hypertension Control (%)	Diabetes Control (HbA1c <7%) (%)	Diabetes Control (HbA1c 9%) (%)
PC team FTE per 10,000 total patients	0.166 (0.318)	0.832 (0.260)**	0.074 (0.178)	0.103 (0.145)	0.107 (0.163)	0.167 (0.320)	0.868 (0.260)***	0.067 (0.178)	0.110 (0.146)	0.118 (0.164)
Enabling service FTE per 10,000 total patients	0.165 (0.128)	0.083 (0.099)	0.005 (0.068)	-0.003 (0.055)	0.051 (0.062)	0.160 (0.128)	0.071 (0.099)	0.005 (0.067)	-0.010 (0.055)	0.039 (0.062)
Financial characteristics										
Total revenue from services (%)	0.275 (0.081)***	0.117 (0.067)	0.041 (0.046)	0.071 (0.037)	0.078 (0.042)	0.267 (0.081)**	0.103 (0.067)	0.037 (0.046)	0.070 (0.037)	0.076 (0.042)
Net revenue (\$, in millions)	-0.155 (0.117)	-0.152 (0.099)	-0.047 (0.067)	0.027 (0.055)	-0.016 (0.061)	-0.095 (0.117)	-0.112 (0.098)	-0.039 (0.066)	0.016 (0.054)	-0.016 (0.061)
Institutional characteristics										
Urban (reference: rural)	-1.893 (2.086)	0.714 (1.729)	-0.938 (1.182)	0.071 (0.963)	-0.513 (1.081)	-1.732 (2.085)	0.984 (1.725)	-0.933 (1.173)	0.218 (0.963)	-0.238 (1.082)
Established (reference: new)	1.558 (3.514)	-2.158 (2.926)	-3.566 (2.026)	0.886 (1.632)	1.104 (1.833)	2.613 (3.526)	-1.765 (2.924)	-3.482 (2.018)	0.672 (1.636)	1.035 (1.838)
Non-EHR (reference: EHR)	3.730 (2.613)	8.128 (1.967)***	1.322 (1.307)	0.968 (0.984)	2.012 (1.106)	4.505 (2.597)	8.801 (1.928)***	1.73 (1.262)	1.379 (0.963)	2.742 (1.083)*
HRSA division (reference: Central Southeast)										
Northeast	2.968 (2.766)	8.601 (2.289)***	5.23 (1.571)***	-0.090 (1.278)	1.509 (1.435)	2.503 (2.775)	8.387 (2.287)***	5.250 (1.563)***	0.218 (1.279)	1.847 (1.438)
North Central	4.038 (2.631)	4.028 (2.187)	3.795 (1.497)*	-0.032 (1.22)	2.714 (1.37)*	3.770 (2.651)	3.908 (2.194)	3.803 (1.495)*	0.113 (1.227)	2.846 (1.379)*
Southwest	1.535 (2.645)	4.562 (2.201)*	3.239 (1.512)*	-1.137 (1.228)	-1.688 (1.38)	0.749 (2.646)	4.365 (2.193)*	3.236 (1.5)*	-0.642 (1.227)	-1.259 (1.379)
R ²	0.126	0.206	0.072	0.244	0.194	0.105	0.194	0.066	0.228	0.176

Regression coefficients and SEs (in parenthesis) are shown.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

FTE indicates full-time equivalent; HER, electronic health records; HRSA, Health Resources and Services Administration; PC, primary care; PCMH, Patient-centered Medical Home.