

Associations Between Practice Characteristics and Demonstration of Stage 1 Meaningful Use for the Electronic Health Record Incentive Program

Christopher M. Shea, Kristin L. Reiter, Mark A. Weaver, Jonathan Thornhill, Robb Malone

BACKGROUND The Medicare and Medicaid meaningful use (MU) incentive programs promote adoption and “meaningful use” of certified electronic health records among hospitals and eligible providers in outpatient settings, with a goal of improving the quality of patient care. Despite the potential importance of MU for providers and patients, little is currently known about the practice characteristics that facilitate providers’ demonstration of MU. This study examined whether selected practice characteristics were associated with providers’ meeting Stage 1 MU objectives at the end of 1 year in a single large North Carolina integrated delivery system.

METHODS Our retrospective database analysis included all 702 eligible providers from 54 ambulatory care practices on the main campus of the University of North Carolina Health Care System. We assessed associations between providers’ ability to meet Stage 1 MU objectives as of December 2012 and the following practice characteristics: practice specialty, size, and mix of Medicare- and Medicaid-eligible providers.

RESULTS The following practice characteristics were associated with providers’ ability to meet MU objectives: primary care practices as compared to specialty practices (odds ratio [OR] = 2.49; 95% CI, 1.11–5.62), small practices as compared to medium-sized practices (OR = 0.29; 95% CI, 0.09–0.89), and the presence of only Medicare-eligible providers in the practice as compared to the presence of only Medicaid-eligible providers (OR = 6.48; 95% CI, 1.08–38.97).

LIMITATIONS Because our sample was drawn from a single integrated delivery system, results may not be generalizable to all ambulatory practice settings.

CONCLUSIONS This study suggests that larger practices, primary care practices, and practices comprised of Medicare-eligible providers may be better able to meet MU objectives. Further research is needed to evaluate strategies that account for practice characteristics and other contextual factors in the MU implementation process.

The Medicare and Medicaid electronic health record (EHR) incentive programs are intended to promote adoption and “meaningful use” (MU) of certified EHRs among hospitals and eligible providers in outpatient settings. Under the programs, hospitals and providers who are deemed eligible according to MU criteria receive incentive payments for satisfying specified EHR usage objectives, which are defined in 3 stages. In Stage 1, eligible providers in outpatient settings must meet all of 14 required core objectives and 5 menu objectives selected from a set of 10 options [1]. Examples of these objectives include maintaining up-to-date medication lists for patients in the EHR (core objective) and using the EHR to provide patient-specific educational materials (menu objective) [2] (see Table 1). During the first year of participation, objectives must be met for a period of at least 90 days during the calendar year in order for a provider to attest to meeting MU objectives (and thus receive the incentive). MU criteria also require providers to report on clinical quality measures; however, there is no minimum threshold for performance for the first year of Stage 1 [3].

Although the motivation underlying MU is to improve the quality of patient care, providers’ ability to satisfy MU objectives will have substantial financial implications for provid-

ers and practices going forward. Current incentives are capped at a total of \$44,000 over 5 years of participation for Medicare-eligible providers and at \$63,750 over 6 years of participation for Medicaid-eligible providers. Beginning in 2015, Medicare-eligible providers who do not demonstrate MU will face cumulative penalties to physician fee schedule payments of 1% per year, up to a maximum of 5% [4].

Despite the potential importance of demonstrating MU to patient care and population health [5], as well as the financial implications for providers and the practices in which they work, little is currently known about factors associated with providers’ ability to meet MU objectives. To best support providers and direct limited resources where they are needed most, policy makers, health systems, and practice leaders need information about practice characteristics that

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Address correspondence to Dr. Christopher M. Shea, UNC Chapel Hill, Gillings School of Global Public Health, Department of Health Policy and Management, CB #7411, 135 Dauer Dr, Chapel Hill, NC 27599 (chris_shea@unc.edu).

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TABLE 1.
Eligible Professional (EP) Meaningful Use Stage 1 Core and Menu Objectives

	Core objectives	Menu objectives
1	Computerized provider order entry (CPOE) for medication orders	Implement drug formulary checks
2	Drug-drug interaction and drug-allergy checks	Incorporate clinical lab test results into EHR as structured data
3	Maintain an up-to-date problem list of current and active diagnoses	Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach
4	Generate and transmit permissible prescriptions electronically (eRx)	Send reminders to patients per patient preference for preventive/follow-up care
5	Maintain active medication list	Provide patients with timely electronic access to their health information (including lab results, problem list, medication lists, and allergies) within 4 business days of the information being available to the EP
6	Maintain active medication allergy list	Use certified EHR technology to identify patient-specific education resources and provide those resources to the patient if appropriate
7	Record patient demographics: preferred language, gender, race, ethnicity, and date of birth	The EP who receives a patient from another setting of care or provider of care or who believes an encounter is relevant should perform medication reconciliation
8	Record and chart changes in vital signs: height, weight, blood pressure; calculate and display body mass index (BMI); plot and display growth charts for children 0-20 years including BMI	The EP who transitions their patient to another setting of care or provider of care or who refers their patient to another provider of care should provide a summary care record for each transition of care or referral
9	Record smoking status for patients 13 years old or older	Capability to submit electronic data to immunization registries or immunization information systems and actual submission according to applicable law and practice
10	Report ambulatory clinical quality measures to CMS	Capability to submit electronic syndromic surveillance data to public health agencies and actual submission according to applicable law and practice
11	Implement one clinical decision support rule relevant to specialty or high clinical priority along with the ability to track compliance with that rule	
12	Provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, medication allergies) upon request	
13	Provide clinical summaries for patients for each office visit	
14	Protect electronic health information created or maintained by the certified EHR technology through the implementation of appropriate technical capabilities	

Note. CMS, Centers for Medicare & Medicaid Services; EHR, electronic health record.

Source: This table summarizes information provided by the Centers for Medicare & Medicaid Services. For a complete description of objectives and measures go to <http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/EP-MU-TOC.pdf>

may be associated with providers' success (or lack thereof) in meeting MU objectives.

This study examines whether 3 practice characteristics are associated with providers' demonstration of MU Stage 1 objectives during the first year of participation in the program. These characteristics are: primary care or specialty setting; practice size (small, medium, or large), based on the number of providers; and mix of Medicare- and Medicaid-eligible providers in the practice setting.

Regarding differences between primary care and specialty settings, evidence suggests that primary care physicians are more likely than specialists to believe that EHRs will improve the quality and efficiency of the health care system [6]. Further, although providers have some flexibility in terms of selecting menu objectives and quality measures for MU, there have been many complaints about the appropriateness and/or difficulty of meeting specific MU requirements depending on specialty. For example, some specialists have argued that maintaining the problem list falls within

the domain of the primary care provider [7]; however, maintaining an updated problem list is a core Stage 1 MU objective. Given that specialists may not value MU as much as primary care providers do, we hypothesize that providers in specialty practices will be less likely to meet MU objectives than their colleagues in primary care practices, even when all providers are part of an integrated delivery system utilizing a system-wide MU implementation strategy.

Regarding practice size, evidence from previous EHR studies indicates that providers in smaller practice settings are concerned about having the capacity to effectively install EHRs, and these providers do not use MU-relevant functionalities available in their EHRs (eg, electronic prescribing) as regularly as do providers in larger practices [8]. Such findings suggest that larger practices may have more resources (both human and financial) to dedicate to the MU adoption effort. Given the potential difference in resource availability, we hypothesize that providers in larger practices will be more likely to demonstrate MU than providers in smaller practices.

The relative mix of providers in a practice setting who are participating in the Medicare versus Medicaid incentive programs may be important because Medicare providers are required to demonstrate MU objectives for a 3-month period during the first year of Stage 1, whereas Medicaid providers are not required to demonstrate any objectives in the first year. Because individual providers who are eligible for both programs must choose one in which to participate, the implementation schedule for MU within a practice may depend on whether the practice has only providers pursuing the Medicare incentive program, only providers pursuing the Medicaid incentive program, or a combination of providers pursuing either program.

Practices that have only Medicare providers likely have a more aggressive MU implementation schedule than practices with only Medicaid providers, because Medicare providers must demonstrate MU in order to receive the incentive payments in the first year of Stage 1, whereas Medicaid providers do not need to demonstrate MU in the first year in order to receive the incentives. Practices with both Medicare providers and Medicaid providers must decide whether to have one implementation schedule for both programs or whether to allow providers to demonstrate MU on different schedules according to the requirements of their incentive program. In subsequent years, the MU expectations and schedule will be similar for Medicare and Medicaid providers. Therefore, how the Medicare-Medicaid provider mix impacts providers' demonstration of MU objectives will be an important aspect of assessing capacity for MU going forward; to the extent that MU impacts care delivery, demonstration of MU will also be important for assessing the quality of care provided to Medicare and Medicaid populations.

We hypothesize that providers in Medicare-only settings would be more likely to demonstrate MU in the first year of Stage 1 compared to those in Medicaid-only or mixed Medicare-Medicaid settings, even within an integrated delivery system with a common MU implementation strategy. We also hypothesize that Medicaid-eligible providers will demonstrate MU sooner if they are in settings with Medicare-eligible providers than if they are in Medicaid-only settings due to spillover caused by the system-wide MU implementation strategy.

The overall goal of this study was to determine whether the specialty, size, and mix of Medicare- and Medicaid-eligible providers at the practice-setting level are associated with providers' success in demonstrating MU Stage 1 objectives at the end of the first year of MU program participation. All of the practice settings in our study belonged to the same integrated delivery system; operated under the same system-level policies, including policies governing how MU incentives would be shared between individual providers and their practices; had access to the same MU implementation support; and used the same homegrown EHR system, which had been certified for MU. Regarding the

system-level policy for sharing of MU incentive payments between providers and their practice settings, the University of North Carolina Health Care System (UNC HCS) required both Medicare- and Medicaid-eligible providers to meet the same demonstration requirements (ie, those required of Medicare-eligible providers as specified by the MU program) in order to receive a portion of the MU incentives. This policy is notable because MU criteria require Medicaid providers only to adopt, implement, or upgrade MU-certified EHR technology in the first year of Stage 1; they are not required to demonstrate MU objectives in the first year [9].

Methods

Sample and Data Source

Our sample included all eligible providers ($n = 702$) from 54 academic ambulatory care clinics on the main campus of UNC HCS. We obtained our study data from a dashboard developed by UNC HCS to track MU demonstration status. This dashboard draws from the UNC HCS data warehouse and administrative systems. Using these data, we were able to identify how many providers were demonstrating MU (ie, meeting or exceeding required measures for the core and menu objectives) at a particular point in time within a given practice setting. Our outcome of interest was demonstration of Stage 1 MU as of December 2012.

It is important to note that demonstration of MU as of December 2012 is different than attestation status. For the Medicare program, a provider could attest to meeting the MU objectives in the first year of Stage 1 based on 90 days of performance during the calendar year. For the Medicaid program, providers could attest by adopting, implementing, or upgrading to certified EHR technology in the first year of Stage 1, which is a lower threshold than meeting the Stage 1 MU objectives. Therefore, for both programs, providers could have attested for MU but not have been demonstrating the Stage 1 MU objectives at the end of the year. We selected demonstration of MU in December as the outcome of interest for this study because we believed that Medicare providers demonstrating MU at this point in time would likely be better able to demonstrate MU for the following 12-month period, which is required for the second year of Stage 1. Further, Medicaid providers demonstrating MU in December would be ahead of schedule with respect to their demonstration requirements and therefore better positioned to meet objectives for the second year of Stage 1.

Data Analysis

We analyzed our data at the provider level using generalized estimating equation (GEE) methods with an independence working correlation matrix to account for clustering of providers within clinics. Because the downloaded data were initially aggregated at the clinic level, we were only able to include clinic-level predictors in the model. However, we chose to conduct our analysis at the provider level, rather than performing an analysis aggregated at the clinic level,

because GEE methods appropriately weight the contribution from each clinic according to clinic size [10].

We first assessed associations between demonstration of MU and the clinic characteristics by applying separate logistic regression models for each characteristic (analogous to conducting separate chi-square tests for each characteristic, albeit adjusted for clustering). We then fit a full model that simultaneously included all 3 clinic characteristics. We considered $P < .05$ to indicate statistically significant associations, with no adjustments for multiple comparisons.

Results

Summary statistics for the clinics and providers are presented in Table 2. Of all providers included in the study, 87.7% demonstrated MU as of December 2012. Table 3 summarizes the logistic regression results.

Providers in primary care practices were more likely to demonstrate MU than were providers in specialty practices (OR = 2.49; 95% CI, 1.11-5.62).

Providers in small clinics were significantly less likely than providers in medium-sized clinics to demonstrate MU (OR = 0.29; 95% CI, 0.09-0.89). Providers in small clinics also appeared to be less likely to demonstrate MU than providers in large clinics, but these results were not statistically significant (OR = 0.41; 95% CI, 0.14-1.20).

Providers in Medicare-only clinics were much more likely than providers in Medicaid-only clinics to demonstrate MU (OR = 6.48; 95% CI, 1.08-38.97). Also, providers in combination Medicare-Medicaid clinics were more likely to demonstrate MU than those in Medicaid-only clinics, although the results were not statistically significant (OR = 2.89; 95% CI, 0.74-11.21). Results were similar in the full model.

TABLE 2.
Characteristics of Practice Settings in the Study Sample

Clinic characteristics	Number of clinics	Number of eligible providers	Percent of eligible providers demonstrating MU
Practice type			
Primary care	5	148	93.9%
Specialty	49	554	86.1%
Practice size			
Fewer than 5 eligible providers (small)	14	34	73.5%
5-20 eligible providers (medium)	28	252	90.5%
More than 20 eligible providers (large)	12	416	87.3%
Incentive programs within clinic			
Medicaid only ^a	9	39	71.8%
Medicare only ^b	15	70	94.3%
Both Medicaid and Medicare	30	593	88.0%

Note. MU, meaningful use.

^aMedicaid only refers to practices with 100% Medicaid-eligible providers.

^bMedicare only refers to practices with 100% Medicare-eligible providers.

Implications for Practice

Given the emphasis at the national level on using EHRs for improving health care delivery and public health, it is important to assess whether characteristics of practice settings are associated with providers' ability to demonstrate MU. Without such an assessment, it is difficult to tailor policies and allocate resources effectively to support providers in practice settings that are not as conducive to demonstrating MU. The establishment of regional extension centers, such as the North Carolina Area Health Education Centers, is an example of such support; these centers assist providers with MU, primarily those in small rural settings [11]. However, our study shows that characteristics of practice settings—even for practices within the same integrated delivery system and located in the same geographic area—are associated with variation in providers' demonstration of MU. Therefore, small, rural settings may not be the only ones in need of additional, tailored support.

Primary Care Versus Specialty Settings

Consistent with evidence that primary care providers are more optimistic about the potential benefits of EHRs for improving care delivery [6] and have adopted EHRs with MU capability more widely than have specialists [12], we observed that providers in primary care settings were more likely to be demonstrating MU than were providers in specialty settings. This finding is consistent with apparent variations in providers' beliefs about the appropriateness and difficulty of achieving some MU objectives, depending on specialty [7]. An implication of this finding for policy makers is that incorporating input from various types of providers when developing MU objectives may facilitate faster demonstration of those objectives by all providers. For health system leadership, such findings suggest that specialty practices may need additional education about the importance of MU for the health system and perhaps additional support at the practice level to achieve demonstration of MU.

Practice Size

In our sample, providers in small practices were less likely than their peers in medium and large practices to be demonstrating MU, although the latter comparison was nonsignificant. This finding may indicate that small practices have fewer resources and less slack in their operational systems to accommodate substantial process changes. These practices also may be less likely to have providers willing to champion the cause of MU because they have fewer providers. An implication of this finding for policy makers and system leaders is that small practices may continue to need external support to demonstrate MU, particularly as MU objectives require more sophisticated quality improvement activities and process changes.

TABLE 3.
Estimated Associations of Structural Characteristics With Demonstrating Meaningful Use

Clinic characteristics ^a	Unadjusted		Full model ^b	
	OR (95% CI)	P-value	OR (95% CI)	P-value
Practice type				
Primary care versus specialty	2.49 (1.11–5.62)	.027	2.63 (1.13–6.10)	.025
Practice size				
Small versus medium	0.29 (0.09–0.89)	.042	0.22 (0.06–0.79)	.020
Small versus large	0.41 (0.14–1.20)	.102	0.37 (0.10–1.39)	.139
Medium versus large	1.39 (0.60–3.23)	.448	1.65 (0.74–3.71)	.223
Incentive programs within clinic				
Both versus Medicare-only	0.45 (0.12–1.64)	.224	0.29 (0.07–1.15)	.078
Both versus Medicaid-only	2.89 (0.74–11.21)	.125	2.58 (0.53–12.44)	.239
Medicare-only versus Medicaid-only	6.48 (1.08–38.97)	.041	8.82 (1.58–49.26)	.013

Note. CI, confidence interval; OR, odds ratio.

^aFor each characteristic, all pairwise comparisons were estimated from the same logistic regression model by specifying appropriate linear combinations of the model parameters. Thus, no single characteristic level need be specified as a “reference level.”

^bFull model simultaneously includes all 3 characteristics.

Medicare-Eligible Versus Medicaid-Eligible

With respect to the mix of Medicare-eligible and Medicaid-eligible providers, those in Medicare-only practices were much more likely than those in Medicaid-only practices to have demonstrated MU. There are several reasons that may explain these findings. First, the MU program does not require providers in the Medicaid program to demonstrate any Stage 1 objectives to attest for incentive payments in the first year of Stage 1. However, UNC HCS had an internal policy that required Medicaid providers to demonstrate the same Stage 1 MU objectives as Medicare providers in order to receive their portion of the MU incentive payments. Despite policies to tie Medicaid incentives to meeting Medicare expectations, Medicaid providers are not at risk of penalties for their Medicaid reimbursement (although they are at risk of penalties for Medicare reimbursement if they see Medicare patients). Therefore, Medicare providers had more of a personal financial stake in demonstrating the objectives than did their Medicaid peers.

It is notable that the majority (71%) of eligible providers in Medicaid-only clinics did demonstrate MU. This finding suggests promise for an organized effort to support MU within an integrated delivery system, including institutional policies governing whether individual providers receive a portion of MU incentives. In this case, these policies required Medicare- and Medicaid-eligible providers to meet the same demonstration requirements (ie, those for Medicare) in order to receive a portion of the MU incentives.

Limitations

This study has some limitations. First, practice-level contextual factors (eg, leadership, culture) and provider-level characteristics (eg, age) could influence providers' demonstration of MU, but such factors were not measured in this study. Although our database did not capture provider-level characteristics, our analysis accounted for practice-level

factors by clustering providers within practices. Second, because our data come from an integrated delivery system that has a system-wide approach to providing MU support to practices, our results may not be generalizable to practices that do not have similar policies or support. Further, the efforts of one provider to demonstrate MU may have positive spillover effects on other providers who see the same patients; therefore, results may differ in a practice setting where specialists and primary care providers do not share an EHR. Finally, because practices in our study were all using the same EHR, our results do not account for design differences across EHR systems that may influence providers' ability to successfully demonstrate MU.

Conclusions

Our study indicated that practice characteristics were associated with providers' success in demonstrating MU objectives at the end of the first year of Stage 1, even when these practices are part of an integrated delivery system with a system-wide MU implementation strategy. Policy makers and health system leaders should account for such structural differences when specifying MU objectives and allocating resources to support providers in their MU efforts. Future research could evaluate strategies that aim to account for these differences, providing a foundation for evidence-based MU implementation strategies tailored to practices with different structural characteristics. **NCMJ**

Christopher M. Shea, PhD, MPA assistant professor, Department of Health Policy and Management, Gillings School of Global Public Health; research fellow, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Kristin L. Reiter, PhD associate professor, Department of Health Policy and Management, Gillings School of Global Public Health; research fellow, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Mark A. Weaver, PhD research assistant professor, UNC School of Medicine; research assistant professor, Department of Biostatistics, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Jonathan Thornhill, MHA, MS director of quality improvement and analytics, Department of Practice Quality and Innovation, UNC Health Care, Chapel Hill, North Carolina.

Robb Malone, PharmD, CPP vice president, Department of Practice Quality and Innovation, UNC Health Care, Chapel Hill, North Carolina.

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