

Meaningful Use Attestations among US Hospitals: The Growing Rural-Urban Divide

by Ryan H. Sandefer, MA, CPHIT; David T. Marc, MBS, CHDA; and Paul Kleeberg, MD, FAAFP, FHIMSS

Abstract

The purpose of this study was to assess EHR Incentive Program attestations of eligible US hospitals across geography and hospital type. The proportions of attestations were compared between metropolitan, micropolitan, and rural hospitals and by whether a hospital was critical access or prospective payment system. From 2011 until December 2013, rural and critical access hospitals were attesting to meaningful use and receiving federal incentive payments at a significantly lower proportion than their urban counterparts. The data suggest that the digital divide between urban and rural hospitals that are adopting electronic health records and using the technology effectively is widening. These findings illustrate that the needs of rural hospitals currently and into the future are different than urban hospitals, and the meaningful use program does not appear to provide the resources needed to propel these rural hospitals forward.

Keywords: Meaningful use, critical access hospitals, rural, urban

Introduction

Electronic health records (EHRs) are touted to have the ability to improve the quality of healthcare and reduce its cost. Recent studies have demonstrated the potential for EHRs to improve caregiver decisions and patient outcomes.¹ Given the potential benefits of health information technology (IT) adoption and use, EHR proponents passed the Health Information Technology for Economic and Clinical Health (HITECH) Act to address the obstacles to the adoption of EHRs. The barriers to EHR adoption include “substantial cost, the perceived lack of financial return from investing in them, the technical and logistic challenges involved in installing, maintaining, and updating them, and consumers’ and physicians’ concerns about the privacy and security of electronic health information.”² Additionally, there are cultural and organizational barriers to EHR adoption.^{3,4} Prior to the adoption of the HITECH Act, there was low adoption of EHRs among office-based physicians and hospitals. In 2009, between 17 and 22 percent of office-based physicians had adopted EHRs.^{5,6} Similarly, hospitals had an adoption rate between 9 and 10 percent.^{7,8}

Background

The HITECH Act incentivizes providers and hospitals to adopt EHRs. Enacted under the HITECH Act is the EHR Incentive Program. Monetary incentives are provided to providers and hospitals that are able to demonstrate that they use certified EHRs to complete specific functional and process-related objectives, also known as “meaningful use.” The program does not increase the reimbursement rates from payers, but rather provides an incentive payment based on overall Medicare and/or Medicaid claims. This

program has two components. The first component of the program provides Medicaid-only financial incentives to hospitals and eligible professionals for adopting, implementing, or upgrading (AIU) their EHR software, that is, for providers and hospitals not yet able to demonstrate the functional and process requirements of the meaningful use program. The second component provides Medicare and/or Medicaid financial incentive payments to eligible professionals and hospitals for effectively using certified EHR technology. Eligible hospitals are able to receive both Medicare and Medicaid payments, while eligible professionals must choose either Medicare or Medicaid as their source of payment. The program has a total investment of more than \$27 billion dollars over a decade.⁹ The program includes specific standards, implementation specifications, and EHR certification criteria.¹⁰

The EHR Incentive Program has drastically affected the adoption of EHRs among hospitals. As of March 2014, a total of 347,230 payments have been made to Medicare/Medicaid eligible professionals, and 4,477 payments have been made to eligible hospitals. These payments have resulted in a total of \$20,937,048,827 in incentive payments for meaningful use of EHRs.¹¹

Not only has the overall rate of EHR adoption increased as a result of the EHR Incentive Program, but the sophistication of the adopted technology has increased as well. Between 2008 and 2012, the adoption of basic EHRs increased from 9.4 to 44.4 percent among nonfederal acute care hospitals. Moreover, the adoption of comprehensive EHRs increased from 1.6 to 16.9 percent in the same period.¹²

While adoption of EHRs has increased significantly since 2009, there have been concerns that hospitals and providers in urban areas are achieving meaningful use at disproportionately higher rates than their nonurban counterparts. The gaps in adoption of EHRs based on size, location, and teaching status may leave hospitals at risk of penalties in 2015.^{13, 14} Prior to the launch of the EHR Incentive Program, the American Hospital Association reported that 66 percent of critical access hospitals (CAHs) and 56 percent of rural hospitals did not expect to meet meaningful use standards.¹⁵ According to one study, only 4 of the 15 meaningful use measures were met by the majority of rural hospitals prior to the program's launch.¹⁶ In 2012, the US Government Accountability Office analyzed EHR Incentive Program data for hospitals and reported that 18.3 percent of urban hospitals had attested to meaningful use while only 12.2 percent of rural hospitals had achieved meaningful use; 18.5 percent of acute care hospitals using the prospective payment system (PPS) attested compared to 8.2 percent of CAHs; and 21.5 percent of hospitals with more than 175 beds had done so compared to only 8.8 percent of hospitals with less than 40 beds.¹⁷ In 2012, PPS hospitals were 1.9 times more likely than CAHs to have been awarded a Medicare EHR incentive payment, and hospitals in urban areas were 1.2 times more likely than rural hospitals to have received a Medicare EHR incentive payment.¹⁸

In 2013, the Office of the National Coordinator for Health Information Technology (ONC) released a data brief indicating that 89 percent of CAHs would attest to meaningful use by January 2014.¹⁹ However, recent statistics show that of those CAHs enrolled with a regional extension center only 61 percent have demonstrated meaningful use.²⁰ There continues to be concerns regarding the ability of rural and critical access hospitals to receive incentive payments as the EHR Incentive Program transitions to the more complex and rigorous stage 2 of meaningful use requirements.²¹ Recent analysis of hospitals who have achieved stage 1 meaningful use (42 percent of hospitals) indicates that only 5 percent of these organizations could currently meet the requirements of stage 2 meaningful use.²¹

Considerable research has been conducted on the barriers to EHR adoption generally, the rates at which hospitals have adopted EHRs and the functions and features implemented, and the challenges of adoption relative to geographic location. This study formally evaluates the current impact of meaningful use on the adoption and use of EHRs across geographic regions and hospital types. This study offers an updated analysis of the types and locations of hospitals that have demonstrated achievement of meaningful use through the year 2013. The intent of the EHR Incentive Program was to ensure that hospitals and providers are not only adopting EHRs but also using them in a meaningful way to improve clinical outcomes. Therefore, if disparities exist in the demonstration of meaningful use, patients may be at risk of poorer clinical outcomes. The purpose of this study is to compare the proportion of meaningful use attestations across urban and rural hospitals, including hospital type (PPS vs. CAH) that have attested through the Medicare EHR Incentive Program through December 2013.

Methods

Data Sources

Meaningful use attestation data from Medicare-only incentive payments (i.e., Medicaid and AIU data are not included) was extracted from the Centers for Medicare and Medicaid Services (CMS) website.²² The total number of hospitals was determined using the Hospital Compare dataset made available by CMS.²³ A crosswalk file was used to link zip codes to corresponding core-based statistical areas (CBSAs).²⁴ All of the data are within the public domain and were extracted from online sources in March 2014.

Procedures

The CMS attestation data and Hospital Compare data were related on the basis of the CMS Certification Number for each listed hospital. The zip code for each hospital was related to the zip codes in the CBSA crosswalk file to determine the CBSA for each hospital.

The geographic setting of a hospital was designated on the basis of the CBSA as either metropolitan, micropolitan, or non-CBSA (rural). A metropolitan area is defined as an urbanized cluster with a population greater than 50,000 people. A micropolitan area is defined as an urbanized cluster with a population between 10,000 and 50,000 people. A non-CBSA area is defined as a rural cluster with fewer than 10,000 people. The proportion of meaningful use attainment was determined for each CBSA by calculating the proportion of hospitals that were paid for attesting as determined from the CMS meaningful use attestation data relative to the total number of hospitals as determined from the Hospital Compare dataset. The proportion of attestations was also calculated for each geographic region on the basis of the hospital type, either CAH or PPS.

Data Analysis

Descriptive data are shown as percentages and actual counts for all nominal data. Chi-square tests were used to test associations in the proportion of hospitals that attested to meaningful use based on the hospital type, geographic region, and demonstration period with an alpha of 0.05. The data were analyzed using the R statistical programming software.

Results

As shown in Figure 1, metropolitan hospitals had the highest proportion of attestations, which was significantly greater than the micropolitan and non-CBSA (rural) hospitals. The proportion of hospitals that attested in micropolitan areas was also significantly greater than the proportion of hospitals that attested in non-CBSA (rural) areas. When comparing attestation rates based on the type of hospital, CAHs had a significantly lower proportion of attestations than PPS hospitals ($X^2: 398.3, p < 0.001$). As shown in Figure 2 and Table 2, this difference was present in metropolitan, micropolitan, and non-CBSA (rural) areas. Also, metropolitan PPS hospitals had a significantly lower proportion of attestations than micropolitan PPS hospitals ($X^2: 12.9, p < 0.001$; Figure 2). CAHs had a significantly lower proportion of attestations than PPS hospitals for both the 90-day and one-year demonstration period in metropolitan, micropolitan, and non-CBSA rural areas (see Table 2).

Discussion

CAHs are attesting to meaningful use and receiving federal Medicare incentive payments at a significantly lower proportion than their urban counterparts. Although this analysis only included Medicare payments, the inclusion of AIU or Medicaid payments would not affect the results. Hospitals are eligible for both Medicare and Medicaid incentive payments. By excluding hospitals that have received AIU payments only, we have limited our results to hospitals that have implemented certified EHR technology and effectively demonstrated using it to achieve meaningful use objectives.

CAH designation allows smaller hospitals to receive cost-based reimbursement from CMS, rather than the standard fixed reimbursement rates used by larger PPS hospitals. CAHs account for 60.4 percent

of all rural hospitals. Because of the dominance of CAHs in rural areas, the low proportion of attestations by these hospitals is leading to an overall drop in rural hospitals' achievement of meaningful use. Our results suggest that the gap in meaningful use attestations between rural and urban hospitals is expected to widen. In the 90-day demonstration period, approximately 1.5 times fewer CAHs attested than PPS hospitals. However, when considering the one-year demonstration period, this gap widens, with almost eight times fewer CAHs attesting than PPS hospitals. This widening gap will make it more difficult for hospitals that are not planning to attest, or at least are unable to do so in a timely fashion, to provide cost-effective and quality care in their communities and to attract new practitioners, thereby compromising their viability.

This urban-rural divide has a variety of potential causes. It is well documented that rural hospitals have been slower to adopt health IT than urban hospitals. The slower rate of meaningful use demonstration may be a result of this technology adoption lag.^{25, 26}

One of the other major issues facing rural healthcare is the lack of a skilled workforce to assist with technology adoption, provide EHR training, and support organizations' EHR integration and use over time. According to the Health Resources and Services Administration, the lack of a workforce skilled in IT is a major barrier to IT adoption in rural America. The HITECH Act intended to address this disparity by training more than 30,000 health IT professionals across two training programs—the Community College Consortia and the University-Based Training programs. The ONC was responsible for administering these training grants and has reported statistics of enrollees in the Community College Consortia programs on their website. According to the ONC Health IT Dashboard, 94 percent of all program trainees resided in urban areas (metropolitan or micropolitan), 5 percent lived in rural areas, and 1 percent were unknown.²⁷ These statistics illustrate the continuing challenge that rural hospitals face in obtaining skilled workers to assist with EHR adoption and attainment of meaningful use.

Conclusion

Rural and critical access hospitals are attesting to meaningful use and receiving federal incentive payments at a significantly lower rate than their urban counterparts. Overall, the result of this study suggests that the digital divide between urban and rural hospitals that are adopting EHRs and using the technology is widening, thereby posing a challenge for these hospitals to provide cost-effective and quality care in their communities. As suggested by their low proportion of one-year attestations, CAHs are positioned poorly to perform well on subsequent stages (e.g., stages 2 and 3) of the EHR Incentive Program. These findings illustrate that the needs of rural hospitals currently and into the future are different than urban hospitals, and the meaningful use program does not appear to provide the resources needed to propel these rural hospitals forward. Thus, as the EHR Incentive Program's technical and programmatic requirements progress, the probability of CAHs' meeting such demands is questionable. Federal agencies could use this information to generate programs and additional funding opportunities devoted to providing technical assistance to rural hospitals.

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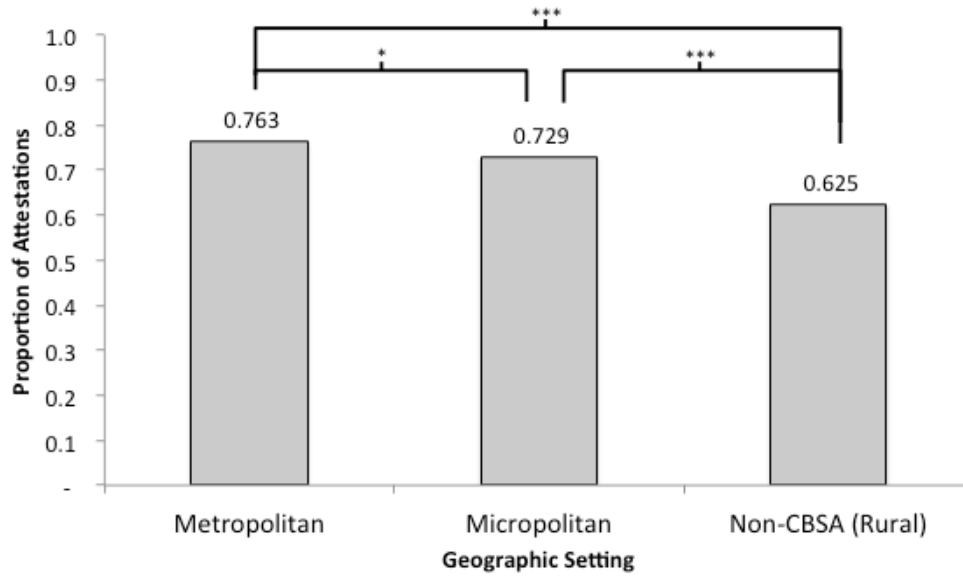
Notes

1. Blumenthal, D., and M. Tavenner. "The 'Meaningful Use' Regulation for Electronic Health Records." *New England Journal of Medicine* 363, no. 6 (2010): 501–4.
2. Blumenthal, D. "Stimulating the Adoption of Health Information Technology." *New England Journal of Medicine* 360, no. 15 (2009): 1477–79.
3. Blumenthal, D., and M. Tavenner. "The 'Meaningful Use' Regulation for Electronic Health Records."
4. Kazley, A. S., and Y. A. Ozcan. "Organizational and Environmental Determinants of Hospital EMR Adoption: A National Study." *Journal of Medical Systems* 31, no. 5 (2007): 375–84.
5. Blumenthal, D., and M. Tavenner. "The 'Meaningful Use' Regulation for Electronic Health Records."
6. Hsiao, C. J., E. Hing, T. C. Socey, and B. Cai. "Electronic Health Record Systems and Intent to Apply for Meaningful Use Incentives among Office-based Physician Practices: United States, 2001–2011." *NCHS Data Brief* 79 (2011): 1–8.
7. Blumenthal, D., and M. Tavenner. "The 'Meaningful Use' Regulation for Electronic Health Records."
8. Jha, A. K., C. M. DesRoches, P. D. Kralovec, and M. S. Joshi. "A Progress Report on Electronic Health Records in U.S. Hospitals." *Health Affairs* 29, no. 10 (2010): 1951–57.
9. Blumenthal, D., and M. Tavenner. "The 'Meaningful Use' Regulation for Electronic Health Records."
10. Department of Health and Human Services, Office of the National Coordinator for Health Information Technology. "Health Information Technology: Initial Set of Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology. Final Rule." *Federal Register* 75, no. 144 (2010): 44589–654.
11. Centers for Medicare and Medicaid Services. "January 2014 EHR Incentive Program: Active Registrations." 2014. Available at http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/January2014_SummaryReport.pdf (accessed March 13, 2014).
12. Charles, D., J. King, V. Patel, and M. Furukawa. *Adoption of Electronic Health Record Systems among U.S. Non-federal Acute Care Hospitals: 2008–2012*. ONC Data Brief, 2013.
13. DesRoches, C. M., C. Worzala, and S. Bates. "Some Hospitals Are Falling Behind in Meeting 'Meaningful Use' Criteria and Could Be Vulnerable to Penalties in 2015." *Health Affairs* 32, no. 8 (2013): 1355–60.
14. DesRoches, C. M., C. Worzala, M. S. Joshi, P. D. Kralovec, and A. K. Jha. "Small, Nonteaching, and Rural Hospitals Continue to Be Slow in Adopting Electronic Health Record Systems." *Health Affairs* 31, no. 5 (2012): 1092–99.
15. American Hospital Association. "The Road to Meaningful Use: What It Takes to Implement Electronic Health Record Systems in Hospitals." *Trendwatch* (April 2010). Available at <http://www.aha.org/research/reports/tw/10apr-tw-HITmeanuse.pdf>.
16. McCullough, J., M. Casey, I. Moscovice, and M. Burlew. "Meaningful Use of Health Information Technology by Rural Hospitals." *Journal of Rural Health* 27, no. 3 (2011): 329–37.

17. US Government Accountability Office. *Electronic Health Records: First Year of CMS's Incentive Programs Shows Opportunities to Improve Processes to Verify Providers Met Requirements*. Washington, DC: Government Accountability Office, 2012.
18. US Government Accountability Office. *Electronic Health Records: Number and Characteristics of Providers Awarded Medicare Incentive Payments for 2011–2012*. Washington, DC: Government Accountability Office, 2013.
19. Gabriel, M. H., M. F. Furukawa, E. B. Jones, J. King, and L. K. Samy. *Progress and Challenges with the Implementation and Use of Electronic Health Records among Critical Access Hospitals*. ONC Data Brief, 2013.
20. Office of the National Coordinator for Health Information Technology. "Percent of REC Enrolled Providers in an Organization/Site and Area Type Live on an EHR and Demonstrating Meaningful Use." 2015. Available at <http://dashboard.healthit.gov/quickstats/pages/FIG-REC-Providers-Live-MU-Organization-Site-Area-Type.php>. February 2015.
21. DesRoches, C. M., D. Charles, M. F. Furukawa, M. S. Joshi, P. Kralovec, F. Mostashari, C. Worzala, and A. K. Jha. "Adoption of Electronic Health Records Grows Rapidly, But Fewer Than Half of US Hospitals Had at Least a Basic System in 2012." *Health Affairs* 32, no. 8 (2013): 1478–85.
22. Centers for Medicare and Medicaid Services. "EH Recipients of Medicare EHR Incentive Program Payments." 2014. Available at <http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/DataAndReports.html>.
23. Centers for Medicare and Medicaid Services. "Official Hospital Compare Data." 2014. Available at <https://data.medicare.gov/data/hospital-compare>.
24. US Census Bureau. "[2010 ZCTA to Metropolitan and Micropolitan Statistical Areas Relationship File](https://www.census.gov/geo/maps-data/data/zcta_rel_download.html)" 2011. Available at https://www.census.gov/geo/maps-data/data/zcta_rel_download.html.
25. DesRoches, C. M., C. Worzala, and S. Bates. "Some Hospitals Are Falling Behind in Meeting 'Meaningful Use' Criteria and Could Be Vulnerable to Penalties in 2015."
26. DesRoches, C. M., C. Worzala, M. S. Joshi, P. D. Kralovec, and A. K. Jha. "Small, Nonteaching, and Rural Hospitals Continue to Be Slow in Adopting Electronic Health Record Systems."
27. Office of the National Coordinator for Health Information Technology. "Community College Consortium to Educate Health IT Professionals." 2013. Available at <http://dashboard.healthit.gov/college/>.

Figure 1

Comparison of the Proportion of Meaningful Use Attestation for Hospitals by Geographic Setting

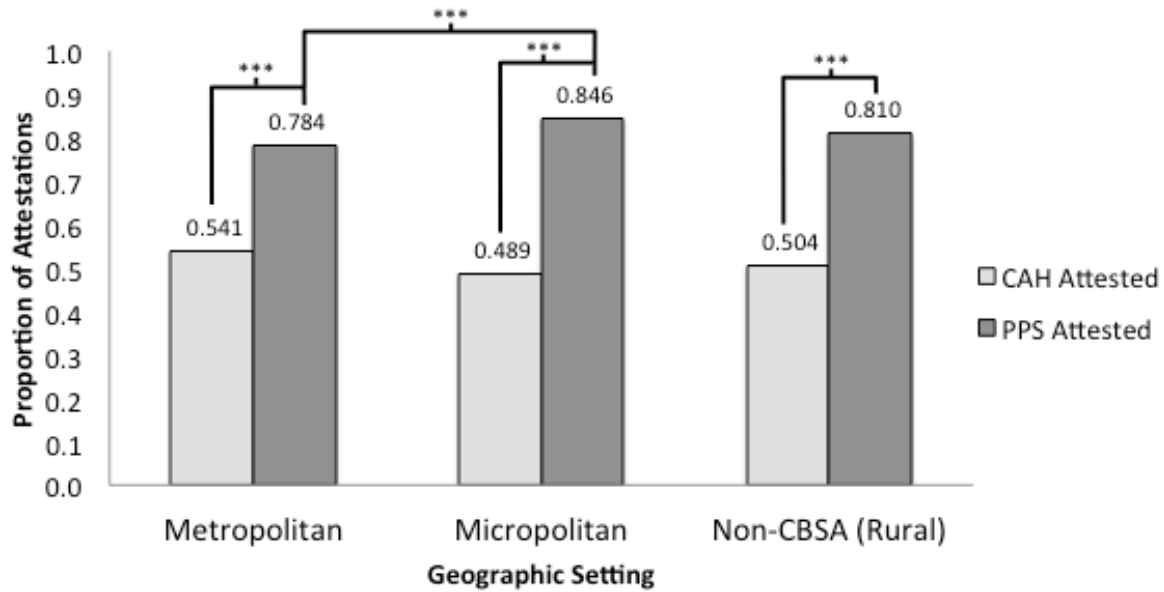


*** $p < 0.001$; * $p < 0.05$

Note: CBSA, core-based statistical area.

Figure 2

Comparison of the Proportion of Meaningful Use Attestation for Hospitals by Geographic Setting and Hospital Type



*** $p < .001$

Notes: CAH, critical access hospital; CBSA, core-based statistical area; PPS, prospective payment system.

Table 1

Chi-Square Test Statistics Comparing Meaningful Use Attestation by Geographic Setting

	Metropolitan	Micropolitan	Non-CBSA (Rural)
Metropolitan	-	$X^2: 4.53$ $p = 0.033$	$X^2: 73.7$ $p < 0.001$
Micropolitan	$X^2: 4.53$ $p = 0.033$	-	$X^2: 26.5$ $p < 0.001$
Non-CBSA (Rural)	$X^2: 73.7$ $p < 0.001$	$X^2: 26.5$ $p < 0.001$	-

Note: CBSA, core-based statistical area.

Table 2

Proportion of Critical Access Hospitals (CAHs) and Prospective Payment System (PPS) Hospitals That Attested for the 90-Day and One-Year Demonstration Periods by Geographic Setting

	90-Day		One-Year	
	CAH	PPS	CAH	PPS
Metropolitan	0.541 (126/233)	0.784 (1,922/2,451)	0.056 (13/233)	0.330 (808/2,451)
	$X^2: 68.4$ $p < 0.001$		$X^2: 73.9$ $p < 0.001$	
Micropolitan	0.489 (171/350)	0.846 (610/721)	0.026 (9/350)	0.316 (228/721)
	$X^2: 150.7$ $p < 0.001$		$X^2: 113.7$ $p < 0.001$	
Non-CBSA (Rural)	0.504 (336/667)	0.810 (354/437)	0.043 (29/667)	0.339 (148/437)
	$X^2: 104.4$ $p < 0.001$		$X^2: 168.7$ $p < 0.001$	

Note: CBSA, core-based statistical area.