Rural-Urban Comparison of Hospitals Participating in the Medicare Electronic Health Record Incentive Program

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I. Introduction

The American Recovery and Reinvestment Act (ARRA) of 2009 mandated adoption of Electronic Health Records (EHRs) toward a goal of achieving Meaningful Use (MU) by the year 2014. Associated with this change in legislation were established timelines for implementation with financial incentives for qualifying healthcare providers. The goal of this legislation revolved around the implementation and use of technology to improve client care and increase patient safety. Rural healthcare professionals and organizations have lagged behind in their adoption of EHR technology, which may have negative impacts on their profitability compared to their urban counterparts. Further, we are able to examine the characteristics of the markets served by these hospitals to compare those populations being served by the hospitals with different levels of MU attestation.

II. Background

The U.S. federal government passed the Health Information Technology for Economic and Clinical Health (HITECH) Act in February 2009, which provided $18 billion for hospitals and physicians to become meaningful users of EHR systems. An additional several billion dollars was allocated for building necessary infrastructure, acquisition of EHR systems, health information exchange support, and research. Sections 4001-4201 of the HITECH Act establish Medicare and Medicaid EHR Incentive Programs for eligible healthcare organizations and professionals to adopt and utilize certified EHR systems.

In July 2010, the final rule for the Medicare and Medicaid Programs Electronic Health Record (EHR) Incentive Program was published. The final rule implemented the provision to award incentive payments to eligible Medicare participant hospitals demonstrating Meaningful Use (MU) of certified EHR as noted in the American Recovery and Reinvestment Act of 2009 (Recovery Act).[1] The Recovery Act outlined three main components where a hospital may demonstrate MU:

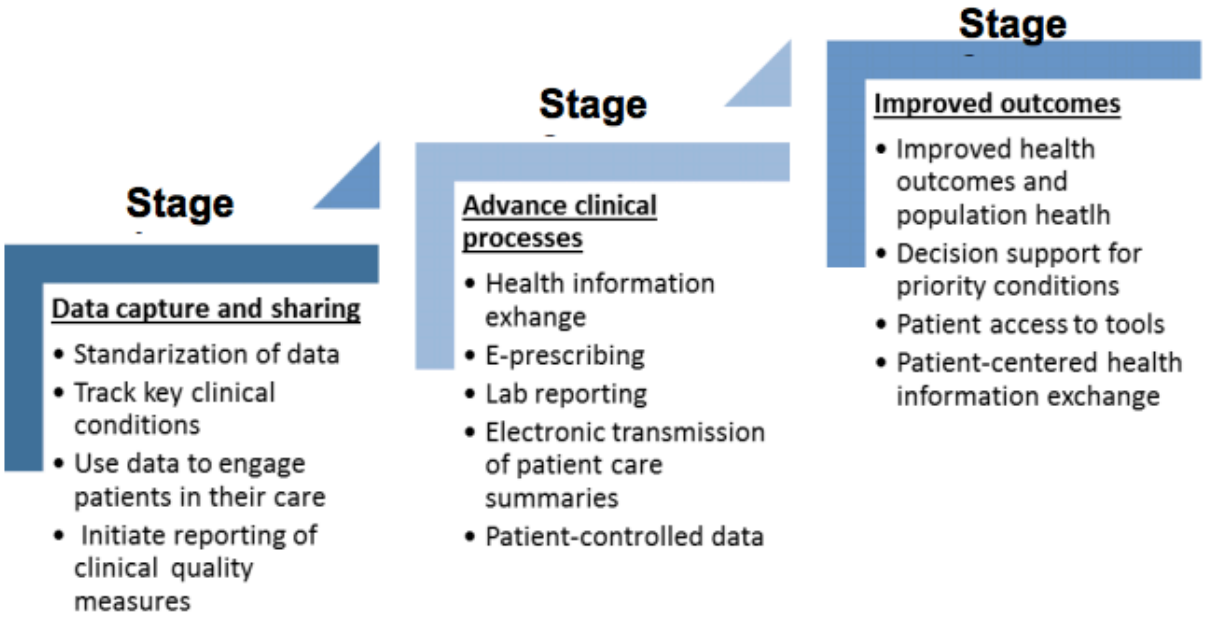
1. Use of certified electronic health records in a meaningful manner;
2. Use of certified electronic health record technology for electronic exchange of health information; and
3. 3. Use of certified electronic health record technology to submit clinical quality measures as well as other measures selected by the Secretary.[2]

The Centers for Medicare and Medicaid Services (CMS) and the Office of the National Coordinator for Health Information Technology (ONC) established standards and criteria for EHR systems to be certified for use with the Medicare EHR Incentive Program.[3] CMS states that MU of certified EHR technology should be private, secure, and result in:

- Improved quality, safety, efficiency, including the reduction of health disparities.
- Engaged patients and their families in their health care.
- Improved care coordination.
- Improved population and public health.

Beginning in Fiscal Year (FY) 2011 through FY 2015, Medicare EHR Incentive Program eligible hospitals could qualify for incentive payments totaling over $2 million over a maximum of four years. The incentives provided through the EHR Incentive Program were structured to motivate hospitals to acquire and utilize health information technology (HIT) rapidly but in a meaningful manner over three stages. These incentive payments are distributed in lag periods of two years- for example, if an eligible hospital attests to achieving Stage 1 of MU in 2011, that hospital will receive a payment in 2013.

Figure 1. Meaningful Use Priorities and Stages



Stage 1 of the CMS Incentive Program focused on the rapid adoption or upgrading of certified EHR technology in short-term, acute care hospitals in the U.S. (see Figure 1). Several studies have shown that small, non-teaching, rural, and critical access hospitals lagged behind their counterparts in EHR adoption (particularly comprehensive EHR systems) and associated CMS incentive payments.4, 5, 6, 7 Stage 1 Stage 3 Stage 2 3

A previous study also identified safety-net institutions (i.e., disproportionate share hospitals) were just as likely as their counterparts to have an EHR system, a finding that may be attributable to the policy that hospitals with a high proportion of Medicaid patients were given upfront resources to "adopt, implement or upgrade" their EHR without having to meet meaningful use criteria in the first year of program participation.

Data from recent years have shown improvements in the number of eligible hospitals achieving meaningful use and subsequently obtaining incentive payments from CMS; however, small, publicly-owned or non-profit, and critical access hospitals have had slower gains. Although more hospitals are obtaining incentive payments, data actually show a widening gap (from 2008-2011) between hospitals based on size, teaching status and location in EHR adoption rates. For example, in 2008, 10.3% of urban and 4.6% of rural hospitals reported having a comprehensive or basic EHR system. In 2011, that gap increased from 5.7% to 9.7%.

Primary care providers, while not the focus on this particular literature review, have shown remarkable EHR adoption rates, with practices in rural areas recently overtaking their urban counterparts (56% vs. 49% in 2012).[8] This trend, which seems contrary to findings among eligible hospitals, suggest that policy and outreach efforts such as the Regional Extension Centers (RECs) created by the Office of the National Coordinator may have been particularly effective at reaching primary care practices in rural areas with the needed expertise and resources to achieve meaningful use. However, MU attestation still varies dramatically among rural providers and these providers, including eligible hospitals, are more likely than urban providers to skip a year of attestation.[9]

III. Problem

There are approximately 2,300 rural hospitals1 including over 1,200 Critical Access Hospitals (CAHs). Of these rural hospitals, 11% have not achieved any stage of MU nor did they receive any payments from 2011 to 2015. Rural hospitals are about evenly split between stages with 44% in Stage 1 and 45% in Stage 2. Only 4% of urban hospitals have not achieved any stage of MU nor did they receive any payments from 2011 to 2015. Of the urban hospitals attesting to MU, only 16% are in Stage 1 while 80% are in Stage 2. From 2011 through 2015, urban hospitals were paid an average of $4.4 million while rural hospitals were paid an average of $1.3 million in incentive payments.

Table 1 shows the population characteristics of the populations served (based on hospital markets) of both rural and urban hospitals by their Stage of Meaningful Use. Rural hospitals serve a higher percent of elderly patients with rural hospitals still in Stage 1 serving the highest percentage. Rates of poverty and unemployment were similar across all hospitals. Rural hospitals served a higher proportion of individuals who are smokers or obese. Additionally, many more rural residents feel like they have no social support. The percent with no health insurance was similar across all hospitals

and stages. Understandably, urban hospitals served a higher proportion of Blacks and Hispanics than did rural hospitals. Urban residents are at a further advantage over rural in their access to broadband Internet, both fixed and mobile.

Table 1. Population Characteristics of the Markets Served by Rural and Urban Hospitals by MU Stage[10]

Variable (Medians)	*Rural Hospitals Stage 1*	*Rural Hospitals Stage 2*	*Urban Hospitals Stage 1*	*Urban Hospitals Stage 2*
Total Population	24,352	66,682	546,205	564,641
Population per Square Mile	23.1	40.1	297.4	268.6
Percent Elderly	18.4	17.8	13.8	14.8
Rate High School	86.6	84.7	86.5	87.2
Poverty Rate	10.9	12.5	11.3	11.2
Unemployment Rate	8.1	9.1	9.5	9.7
Poor Self-Rated Health	14.8	16.8	15.7	15.5
Percent Obese	31.1	31.8	27.4	27.7
Percent Smokers	17.1	18.7	15.5	16.1
Percent No Social Support	14.6	13.4	8.3	9.1
Median Household Income	$ 45,087	$ 43,499	$ 54,230	$ 53,164
No Health Insurance	13.5	14.2	13.8	13.1
Percent Black	1.4	2.6	10.8	9.5
Percent Hispanic	2.0	2.1	6.1	5.5

The policy agenda of the Obama administration placed high value on broadband internet and access. While access is certainly an issue, little research is focused on understanding disparities in use of the Internet once access is addressed.[11] According to a 2016 report on broadband progress, 39% of the rural population is without fixed broadband and there are disparities among mobile broadband as well.[12] Even when there is access, rural residents are less likely than urban residents to use the Internet. Cost of service, inexperience with the technology and terminology, as well as lack of relevance were cited as reasons rural and older residents are not using the Internet.[13, 14] Electronic health record technology is reliant on an infrastructure that can support its elements.

Since 2010, a number of studies examining hospitals' use of HIT and their adoption of EHR systems have suggested that rural, critical access, and other small hospitals may be disadvantaged. HIT and EHR systems are rapidly evolving functionality and their user interface to effectively and efficiently support a clinical environment. As these systems are advancing, the adoption and implementation of EHR can place significant strain on a hospitals' finances and resources.[15] Rural and other small hospitals were found to lag behind in the adoption of EHR systems and continued attestation of MU, leaving them vulnerable to penalties.[16, 17] The up-front and ongoing costs associated with EHR system adoption was cited as a significant factor in failure to meet MU criteria.[18] Due to their size and patient mix, among other variables, rural 5 hospitals are traditionally poor financial performers compared to urban hospitals. A recent

examination of hospital profitability showed that the profitability of rural hospitals has decreased while the profitability of urban hospitals has increased since 2012.[19]

The Office of the National Coordinator (ONC) creates the Regional Extension Centers (RECs) program to inform and assist providers in adoption and optimization of EHR technology. The program awarded over $30 million in funding for the 62 RECs in every state to provide assistance to small rural hospitals and CAHs, as these hospitals have inadequate financial, technical, and human resources to quickly adopt and implement EHR technology.[20] The RECs provided service to over half of rural hospitals and approximately 80% of CAHs and were positively associated with the adoption of EHR and the receipt of incentive payments by providers.[21] The REC program will conclude by January 1st, 2017 and ONC funding for the program will end. Many RECs are expected to continue operation, but it is unclear how many will retain free or low cost services without federal subsidies.

Financial distress of rural hospitals is a tremendous concern to rural stakeholders as closures continue to increase. The proportion of rural hospitals at high risk of financial distress continues to rise and these hospitals face a greater risk for closure.[22] In the event of a hospital closure, displaced patients would fare better with an adequate EHR system in place for a seamless transition of care. Given these social, financial, and technical barriers, researchers and policy makers are concerned by the possibility of a widening rural-urban digital divide.[23, 24]

IV. Recommendations

1. State governments should establish a Meaningful Use monitoring and evaluation system for rural hospitals using resulting data to inform future policies unique to the needs of populations served by rural hospitals.

Financial and technical barriers are causing rural hospitals to lag behind urban hospitals in their adoption of EHR across all stages of Meaningful Use criteria. Some rural hospitals have adjusted to these barriers by implementing streamlined EHR systems that are simpler to use and easier to maintain than what is more common in urban hospitals. Still, some rural hospitals are not able to overcome these barriers and are without an EHR system or with an inadequate EHR system that would never allow for achievement of MU as the criteria are currently defined. State Offices of Rural Health (SORHs) in addition to local and state agencies can observe and evaluate the MU practices of rural hospitals and use that information to drive policy formation unique to the rural populations in their state.

Further, this data could help inform federal policy, ensuring that it is relevant to rural areas. Additionally, this monitoring and evaluation system can also be utilized for peer learning and benchmarking among rural hospitals in promoting best practices in EHR technology adoption and demonstration of Meaningful Use. Community partnership and

regional networks are proven effective in rural communities where policies lacking incorporation of rural issues can create shortfalls.

2. The federal government should ensure the availability of financial and technical support necessary for the Meaningful Use of Electronic Health Records as supported by state-specific data on rural hospitals.

Disparities in resources disadvantage rural hospitals compared to urban hospitals when it comes to establishing MU of EHR. While it is likely that these disparities were overlooked during the formation of the EHR Incentive program, after implementation, they were addressed through the development of grants and other programs aimed at assisting disadvantaged hospitals. RECs are specially focused on assisting rural hospitals (among others) with health IT adoption and delivery transformation and have made substantial progress in EHR adoption and MU.[25] As the RECs are already established in every state, the federal government should use this resource to continue funding technical support of rural hospitals.

The federal government should continue to extend grant funds to RECs to allow them to provide low-cost or free services to rural hospitals in their states. State-specific data identifying the number of rural hospitals in need and the extent of EHR capabilities could inform the funding levels and increase efficiency of dollars spent.

3. Federal and state governments should provide outreach and education to individuals residing in rural communities to increase awareness and knowledge of broadband Internet, digital literacy, and the associated benefits.

Expansion of broadband internet access was a policy agenda of the Obama administration that has faced many roadblocks and given the uncertainty of the Trump administration, policy recommendations targeted at infrastructure, investments, and competition are not feasible. Additionally, we previously highlighted a potential “rural resistance” to Internet use among other technology demonstrating a need for outreach and education. The federal government should create a rural technology campaign designed to educate rural residents on broadband Internet and health information technology. States should be allocated funding to take the campaign beyond education to outreach. States’ departments of health should hold outreach events where rural residents are taught digital literacy and are provided demonstrations on the benefits of broadband access and HIT.

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