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Analysis of Participation in the Medicare EHR Incentive Program

Executive Summary of Findings

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ANALYSIS OF PARTICIPATION IN THE MEDICARE EHR INCENTIVE PROGRAM

Executive Summary of Findings

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EXECUTIVE SUMMARY

ES.1 Introduction

Health information technology (health IT) is central to transforming health care in the United States from a system that frequently delivers more episodic, uncoordinated, and variable care to one that consistently achieves more preventive, longitudinal, and coordinated services. To achieve this transformation, health care providers will need information systems that capture, share, analyze, and enable action on a range of health care data. These systems include electronic health records (EHRs) in physician offices and hospitals, and a range of mechanisms to share health care information electronically among multiple health care stakeholders.

The Medicare EHR Incentive Program is one of many federal efforts to promote adoption and use of EHRs and health information exchange (HIE). Enacted through federal economic recovery legislation—the Health Information Technology for Economic and Clinical Health Act (HITECH Act) within the American Recovery and Reinvestment Act (ARRA) of 2009—the Medicare EHR Incentive Program pays eligible professionals (EPs) and eligible hospitals (EHs) according to their success in implementing and meaningfully using certified EHR technologies. Meaningful use is defined in three stages, each featuring functional and quality measures that participants must meet to receive incentive payments. Like an escalator steadily conveying people between building floors, meaningful use is designed to achieve value from EHRs by helping providers use EHRs to first capture data (Stage 1), then to change clinical processes (Stage 2), and finally to improve outcomes (Stage 3).

The Centers for Medicare & Medicaid Services (CMS) rules define what types of professionals are eligible to participate in the Medicare EHR Incentive Program. EPs include physicians, osteopaths, dentists, podiatrists, optometrists, and chiropractors. EHs include hospitals paid under the Medicare Inpatient Prospective Payment System (IPPS), critical access hospitals (CAHs), and hospitals affiliated with Medicare Advantage plans. Participation in the Medicare EHR Incentive Program is defined by (1) an EP, EH, or CAH meeting eligibility criteria but not registering; (2) registering for the program but not attesting to meaningful use measures; and (3) attesting to meaningful use.

This study analyzes EPs', EHs', and CAHs' participation in Stage 1 of the Medicare EHR Incentive Program over the first two program years (January 2011 – February 2013). It aims to help CMS better understand which EPs, EHs, and CAHs are participating in the Medicare EHR Incentive Programs, which are not, and to identify factors that predict participation and nonparticipation alike. This study also assesses to what extent the characteristics of Medicare beneficiaries may be related to EP, EH, and CAH program participation. Although others have analyzed program participation, this study is the first to consider if beneficiary characteristics differ by EP, EH, and CAH participation status. The results of this analysis will be used to help identify barriers to participation and to develop strategies to address them.

The remainder of this executive summary reviews methods, findings, and implications of EP, EH, and CAH participation in Stage 1 of the Medicare EHR Incentive Program.

ES.2 Methods

RTI began by searching the peer-reviewed literature to identify factors associated with EHR adoption. Researchers found a total of 154 studies, 32 of which ultimately met the inclusionary criteria. These studies showed that several factors have affected professional and hospital adoption and use of EHRs, including:

- Professional demographics (e.g., age, gender, specialty, years since award of degree);

- Practice characteristics (e.g., practice size, practice ownership, patient volume);

- Hospital characteristics (e.g., hospital bed size, type, ownership, bed days);

- Regional characteristics (e.g., CMS region, rural/urban location, primary care health professional shortage area, medically underserved area/population); and,

- Prior adoption of EHRs.

These factors served as a basis for our analysis—defining the types of characteristics to be assessed relative to participation status. By compiling and linking various federal and commercial data sources, RTI assessed the characteristics of EPs and EHs that are eligible, registered, or attested to Stage 1 meaningful use of the Medicare EHR Incentive Program during the first 2 program years. We created descriptive statistics (numbers and percentages) of EPs, EHs, and CAHs by various demographic, practice/hospital, regional, and technological characteristics.

We also assessed the characteristics of Medicare beneficiaries who lived in the areas in which EPs, EHs, and CAHs practiced. Beneficiary characteristics included age, gender, race, disability status, disease risk (through a risk score), and chronic conditions. CMS provided data on 100% of the Medicare beneficiary population (fee-for-service and Medicare Advantage) who had been eligible to receive benefits from January – December 2010. To assess the burden of chronic disease in both Medicare plans, we used Hierarchical Condition Categories (HCCs). CMS uses HCCs to group related conditions together to risk-adjust payments to Medicare Advantage plans. For this study's purposes, we used HCCs and their associated risk scores as proxies for disease burden and severity because these data were more complete and more current than other sources.

RTI then developed a set of logistic regression models to identify the most significant characteristics for program registration and attestation. Using the set of descriptive statistics as the basis for an analytic file, we estimated models for EPs, EHs, and CAHs, respectively, which included overall characteristics and subsets of variables for which we had limited data (e.g., EP age and years since award of degree). We also modeled beneficiary data using a logistic regression model. Dependent variables in all regression models included the two primary modes of participation (registration and attestation), while independent variables considered the demographic, organizational, geographic, technical, and beneficiary characteristics defined above. We developed separate regression models for EPs, EHs, and CAHs to determine factors associated with registration and with attestation. All models were developed in SAS, version

9.3, and were checked for consistency and accuracy. Regression model results were reported as odds ratios (ORs), with significance levels of 0.0001 for EP characteristics, and 0.05 EH and CAH characteristics.

ES.3   Results

We begin by reviewing the descriptive statistics for EPs, followed by those for hospitals (EHs and CAHs). For professionals and hospitals, we report the characteristics of the most frequent participants (attesters), followed by the characteristics of the least frequent (eligible but not registering). We then discuss summary results from the regression models, reported by characteristics associated with a decreased likelihood of participation, and those associated with an increased likelihood, for registration and attestation alike. For the regression results, we discuss the effects of beneficiary characteristics separately.

ES.3.1 EP Descriptive Statistics

More than 583,000 professionals were eligible to participate during the first 2 years of the Medicare EHR Incentive Program. Of these, over 40% had registered in the program, with 25% attesting to Stage 1 meaningful use by the end of the second program year (December 2012, but reported up to February 2013).

The most frequent EP attesters included those who represent the greatest proportion of practicing professionals: male professionals, family practitioners, and internists, those who were in practices of 3 to 10 professionals, and those who treated 1 to 99 patients daily. Two-thirds of all EP attesters came from one of 10 specialties that attested at a cumulative rate of 35%, compared to the 25% population average. Most attesting professionals (68%) worked in practices that were not owned by hospitals or health systems. The majority of attesting EPs were in CMS regions 3 to 5, i.e., mid-Atlantic, southern, and midwestern states, respectively. Most attesting EPs practiced in overwhelmingly urban (50%) and medically underserved areas (79%), but not in areas with medically underserved populations (35%). We did not have sufficient data to clearly determine the most common age ranges of attesting EPs, although our limited data indicate that professionals who registered and attested most often were 40 to 59 years old and 11 to 30 years post-degree. Finally, although we have incomplete data, one-quarter or more of professionals across all participation categories reported having an EHR prior to participation (i.e., registration and attestation).

Again, reflecting the general makeup of practicing providers, male professionals, family practitioners, and internists were also the largest numbers of professionals who had neither registered nor attested—although specialists such as anesthesiologists, diagnostic radiologists, obstetrician/gynecologists, emergency medicine physicians, and psychiatrists made up more than one-quarter of nonparticipating professionals in total. Reflecting the concentration of physicians in smaller practices generally, physicians in solo practices and practices of 3 to 5 professionals were least likely to participate, and more than half of professionals practiced in sites that saw less than 50 patients daily (those who saw no patients plus those who saw 1 to 49 patients).

Most nonparticipating EPs were in practices owned by entities other than hospitals, independent practice associations (IPAs) or health systems; in highly urban, medically underserved areas; and in CMS regions 2, 4, 5, and 9 (New York, New Jersey, Puerto Rico, U.S.

Virgin Islands (USVI), and southern, midwestern, and western states). Moreover, nonparticipating professionals appeared to be slightly older, between 40 to 59 years old, but still with 11 to 30 years of practice experience.

ES.3.2 EH Descriptive Statistics

The most frequent EH attesters included medium-size hospitals (55%); not-for-profit (66%) and nonteaching hospitals (72%); and hospitals not in networks (61%). Most attesting EHs were in rural locations (combined rate of 58%) and in CMS regions 4, 5, and 6, i.e., southeastern, midwestern and south-central states, respectively. They were in primary care (73%) and dental health professional shortage areas (HPSAs) (68%); in medically underserved areas (64%) but not in areas with medically underserved populations. The most frequently attesting EHs also had a case mix index (CMI) of 1.44 or greater (54%).

The most frequent nonparticipating EHs were those with small bed size (57%); for profit (48%); nonteaching hospitals (87%); and those operating in 100% rural locations (42%). Nonparticipants had beneficiaries with supplemental security incomes (SSIs) from 0.001 to 0.149 (combined rate of 52%), and were in CMS regions 4 and 6, i.e., southeastern and south-central states, respectively. As with the attesters, the nonparticipants were most frequently in primary care (71%) and dental HPSAs (69%), and in medically underserved areas (66%) but not in areas with medically underserved populations.

ES.3.3 CAH Descriptive Statistics

The most frequent CAH attesters included small bed size (95%); not-for-profit and government (non-federal) hospitals (98%); hospitals not in networks (62%); and those located in 50 to <90% urban zip code areas (52%). Most CAH attesters were in CMS regions 5 and 7, i.e., midwestern and central plains states, respectively. As with EHs, the frequent CAH attesters were in primary care (79%) and dental HPSAs (66%), and were in medically underserved areas (66%) but not in areas with medically underserved populations.

The most frequent nonparticipating CAHs were those with small bed size (97%); not-for-profit (50%) and government hospitals (43%); nonteaching hospitals (100%); and those operating in 100% urban and 50 to <90% urban locations (44% and 40%, respectively); in CMS regions 5 and 7, i.e., midwestern and central plains states, respectively. As with the attesters, the nonparticipants were most frequently in primary care (81%) and dental HPSAs (68%), and were in medically underserved areas (67%) but not in areas with medically underserved populations.

ES.3.4 EP Regression Results

The model results indicate that EPs in a medically underserved area; specialists without patient contact; rural professionals; professionals under ages 30 or over 60; and professionals who obtained their medical degree 40 or more years ago were less likely to register for the Medicare EHR Incentive Program. The likelihood of professionals registering if they were specialists or were aged 70 and older was particularly low relative to other characteristics.

Conversely, the model indicated that EPs with one of the following characteristics was more likely to register: between ages 30 to 50, in an urban area, and who had previously adopted

an EHR. Two variables—practice ownership and practice size—were predictive of registration for all subcategories (i.e., all ownership types and all practice sizes): professionals in independently owned practices and in practices of 6 to 10 professionals were most likely to register.

For attestation, the model results indicate that female professionals, professionals in a medically underserved area, all professional types (primary care and specialists), rural professionals, professionals aged 60 and older, and professionals who obtained their medical degree between 0 to 10 years ago were less likely to attest for the Medicare EHR Incentive Program, once registered. The likelihood of professionals attesting if they were specialists without patient contact—70% less likely—was particularly low relative to other characteristics.

Conversely, the model indicated that a professional in an urban area was more likely to attest. As with the registration model, two variables—practice ownership and practice size—were predictive of attestation for all subcategories (i.e., all ownership types and all practice sizes), with professionals in independently owned practices and practices of 3 to 10 professionals most likely to attest. For practice size, all practices that had more than one professional had a greater likelihood of attesting than solo practices.

Odds ratios for significant variables in the EP attestation model typically fell into a range of 0.95 to 1.05, with a few exceptions outside this range. For example, the beneficiary characteristic Race: Unknown, indicated more likelihood of EP registration, but less likelihood of attestation. We also observed one possible trend: higher decile risk scores (i.e., greater risk) were often associated with lower likelihood of attestation. Finally, as with the EP registration model, HCCs did not appear to be strongly predictive of either less or more EP participation; the largest HCC odds ratio we found was for HCC55 (Depression − OR = 1.10), associated with a 10% increased likelihood of EP attestation.

ES.3.5 EH Regression Results

EHs in completely rural settings and hospitals that were for-profit were significantly less likely to register. A missing SSI was associated with a very high likelihood (92%) that an EH did not register for the Medicare EHR Incentive Program.

Conversely, EHs with prior adoption of an EHR that cared for beneficiaries with an SSI of between 0–0.15, were in a medium- to large-sized hospital, and saw a relatively greater proportion of Medicare patients were more likely to register. The most highly predictive variables were being a network member (over 3 times more likely to register) and seeing beneficiaries with an SSI of greater than 0.30 (over 5 times more likely to register). This finding is potentially very positive, because hospitals that serve relatively lower-income beneficiaries were more likely to register.

As with the EP models, we included hospital characteristics and beneficiary characteristics (i.e., age, gender, race, risk scores, top 10 HCCs) and modeled noncritical access hospitals and CAH hospitals separately. For EHs, very few of the beneficiary variables were significant for registration. Variables that were significant, such as Race: Black, HCCs for Diabetes, COPD and Vascular disease, had very small effect sizes: all within the range of odds ratios 0.95–1.05. The HCC for breast, prostate, colorectal, and other cancers was most

predictive: hospitals operating in counties that had beneficiaries with this diagnosis had an 8% greater likelihood of registering.

We also modeled the results of hospital and beneficiary characteristics on EH attestation. For EHs, a missing SSI was the only variable associated with a decreased likelihood of attesting, once registered. Although the effect of this variable was quite pronounced—it was associated with a 97% lower chance of attestation—it may not be particularly meaningful, because the number of EHs with a missing SSI was very low (n =2).

Being a located in a rural area, prior EHR adoption, and being a for-profit hospital were associated with an increased likelihood of EHs attesting to Stage 1 meaningful use, once registered.

For beneficiary characteristics, only one variable was significantly associated with EHs being less likely to attest. EHs with a relatively higher proportion of beneficiaries in a county who reported their race as Black had a slightly (2%) decreased likelihood of attesting. On the other hand, two HCCs were associated with an increased likelihood of EH attestation. EHs in counties whose beneficiaries had a diagnosis of breast, prostate, colorectal, and other cancers (HCC10) had a 20% or greater likelihood of attesting, whereas those with depressive disorders (HCC55) had a 12% increase.

ES.3.6 CAH Regression Results

CAHs *less likely* to register were those with a relatively greater proportion of patients whose race was identified as Other and CAHs that treated a relatively greater proportion of diabetes patients without complication (HCC19) and beneficiaries with cancer (HCC10).

Conversely, CAHs with prior adoption of an EHR, that were network members, and that treated a relatively greater proportion of vascular disease patients (HCC105) were more likely to register. The most highly predictive variable was seeing a relatively greater proportion of Medicare (over 3 times more likely to register) or Medicaid patients (over 4 times more likely to register).

For CAHs, several beneficiary variables were significant for registration. Race: Other was most predictive with a 45% greater likelihood of not registering, whereas the HCC for vascular disease was predictive, with CAHs operating in counties that had beneficiaries with this diagnosis had a 12% greater likelihood of registering.

For attestation, CAHs that were members of a network and CAHs that operated in areas with medically underserved populations were less likely to attest.

On the other hand, CAHs that saw a relatively greater proportion of patients who were Native Americans and CAHs that were government hospitals were more likely to attest. Prior adoption of an EHR was most highly predictive (over 2 times more likely to attest) of attestation.

For CAHs, with the exception of Race: Native American, no other beneficiary variables were significant for attestation.

ES.4 Implications

Relative to CMS's primary objective, the analysis of descriptive statistics showed who was and was not participating, while the regression analyses identified characteristics associated with these same aspects. The sets of descriptive statistics (counts and percentages) reporting lower levels of registration and attestation, and regression model results indicating less likelihood of participation, suggest what types of EPs, EHs, and CAHs may need additional support and where these entities may be located. We note these below and discuss implications for supporting nonparticipating entities.

Across both registration and attestation, additional assistance may be needed for EPs with the following characteristics:

- Practice types: small practices, independently owned, lower visit volume (fewer than 50 patients daily)

- Professional types: younger and older professionals, specialists without patient contact, female professionals (attestation only)

- Locations: medically underserved areas and populations, rural care settings, in CMS regions 2, 4, 5, and 9 (New York, New Jersey, Puerto Rico, USVI, and southern, midwestern, and western states)

Also, further consideration of two professional types may be warranted even though they do not appear in the lists above. Family practice physicians and internists are overrepresented in the EP population in their rates of registration and attestation; yet because of their numbers within the total provider community, they constitute more than 20% of the professionals who do not participate (i.e., register).

In considering the descriptive data and regression model results on EH participation, additional assistance for both registration and attestation may be needed for EHs with:

- Small to medium bed size

- For-profit status (registration only), lower or missing SSI ratios

- Location: primary care and dental HPSAs and medically underserved areas, rural care settings, in CMS regions 4, 5, 6, and 9 (midwestern, southeastern, south-central, and western states)

Similarly, in considering the descriptive data and regression model results on CAH participation, more assistance for both registration and attestation may be needed for CAHs with:

- Small bed size

- Not-for-profit status, members of a network (attestation only)

- Location: primary care and dental HPSAs and medically underserved areas/populations, more urban locations, in CMS regions 5 and 7 (midwestern and central plains states)

For both EHs and CAHs, prior EHR adoption is a significant predictor of greater likelihood to register and greater likelihood to attest after registration. Conversely, this predictor may suggest that late adopters of EHR technology will require greater support to guide system implementations that enable attestation.

The analysis of beneficiary data did not identify many characteristics important to EP, EH, and CAH participation. For EPs, we observed more overall significance for beneficiary characteristics (age, race, gender, risk scores, and HCCs) relative to EP program participation, but usually with small to very small effects. Odds ratios for significant variables typically fell into a range of 0.95 to 1.05, with a few exceptions outside this range. We believe that the general significance across many variables occurred because of the very large datasets that were modeled. Given the small effects observed, however, many of these variables are likely not very important in explaining EPs' participation or nonparticipation in the Medicare EHR Incentive Program. Therefore, a limited association appears to exist between beneficiaries' age, gender, race, location, and conditions and a professional's participation in the Medicare EHR Incentive Program. There may be no disparities in patients of providers who participate versus those who do not, but our methods were not able to determine this conclusively.

We observed one possible trend for EPs related to beneficiary characteristics, however: higher decile risk scores (i.e., greater risk) were often associated with lower likelihood of attestation. One implication, then, may be to identify EPs serving Medicare beneficiaries with higher decile risk scores and assess these professionals' needs for technical assistance.

The beneficiary risk scores for EHs and CAHs were not significant—using the available data, we did not observe any significant associations between Medicare beneficiaries' risk of medical expenditure and a hospital's participation (or nonparticipation) in the Medicare EHR Incentive Program. Moreover, HCCs were not very significant. HCC10 (Cancers) was the most consistently significant HCC, associated with non-CAHs being more likely to register and attest; and with CAHs being less likely to register. This finding requires more investigation, but it may suggest targeting nonregistered CAHs in regions (counties) with greater numbers of Medicare beneficiaries who have a cancer diagnosis included in HCC10. As with EPs, a limited relationship appears to exist between beneficiaries' age, gender, race, location, and conditions and hospital's participation in the Medicare EHR Incentive Program. Our analyses were not able to identify disparities in patients of hospitals who participate versus those who do not.

ES.5 Conclusions

Achieving the promise of EHRs as a tool to help transform the U.S. health care system—that is, improving quality and safety while controlling costs—begins with system adoption and use. Ensuring that all patients receive the benefits of a more efficient and equitable health care system enabled by technology is tied, in part, to professionals' and hospitals' ability to participate in the Medicare EHR Incentive Program. This analysis characterizes who is and is not participating in this program and the factors associated with participation and

nonparticipation. In a more limited way, this analysis also begins the process of assessing to what extent professionals and hospitals that do and do not participate also serve beneficiaries who are more or less ill or are at greater or lesser risk of becoming so. Developing targeted and effective means of support for all EPs, EHs, and CAHs who want to participate in the Medicare EHR Incentive Program should be informed by the results of this analysis.