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Exploring technology adoption in the case of the Patient-Centered Medical Home



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KEYWORDS

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Abstract

It has been shown that the use of Health Information Technology (HIT) is associated with reduced cost and increased quality of care. This paper examined the use of registries in Patient Centered Medical Home (PCMH) practices. A survey questionnaire was sent to a nationwide group of clinics certified for being a PCMH. They were asked to provide information about their payer mix, implementation barriers, registry implementation, registry use, and clinic satisfaction. The survey instrument was validated by an expert panel which included practitioners and researchers. Statistical methods including Structured Equation Modeling were used for analysis and to test the research hypotheses. The results of the analysis show that indeed payer mix, in particular Medicare and private insurance, has a significant relationship with level of registry implementation.

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Introduction

The healthcare delivery system in the United States is facing ever increasing pressure to redesign itself in order to become more efficient and affordable. Annually, trillions of dollars are spent in the U.S. healthcare system, making it the largest delivery system in the world [1]. It is widely accepted that the use of Health Information Technology (HIT) can assist in addressing some of the challenges facing the healthcare delivery system.

According to statistics compiled by researchers at the Centers for Medicare and Medicaid Services (CMS) the total U. S. healthcare spending reached \$2.8 trillion in 2012, or \$8915 per person [2]. The health spending grew 3.7% in 2012, consistent with the same rate of growth in 2009, 2010 and 2011 [2]. National health spending remains nominal, Gross Domestic Product (GDP) grew similarly in 2010 and 2011, and health spending as a share of GDP has remained stable from 2009 through 2011, at 17.9%. The total healthcare spending in the United States has increased over the years from \$75 billion in 1970 to \$2.6 trillion in 2010. Nevertheless, healthcare expenditure will keep increasing and according to recent study by the Center for Medicare and Medicaid Services (CMS) it will reach \$4.8 billion by the end of 2021 and that is about one-fifth or 20% of the U.S. GDP [2]. According to the U.S. Census

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Bureau, between 2013 and 2023 the country's population will increase by 9.5 percent [3].

78.4% of office-based physicians are using any EMR/EHR system. Similarly 48.1% of the office-based physicians have a basic system [4]. Previous reviews have shown that broad use of health IT may improve health care quality, prevent medical errors, reduce health care costs, increase administrative efficiencies, decrease paperwork and expand access to affordable care [5]. However, these benefits are not consistently seen, and have mostly been achieved in so-called 'benchmark' institutions [5] rather than the broad mass of HIT adopters.

The objective of this research was to measure the prevalence of HIT capabilities in Patient-Centered Medical Homes and their impact on delivery of care, with a focus on Patient Registries.

Literature review

Healthcare and medical homes

The healthcare crisis in the United States

Due to changing population demographics and new economic realities, the healthcare system in the United States is facing monumental challenges. For example, patients suffering from multiple chronic illnesses (3-5% of total patient population), account for approximately 75% of the nation's healthcare related expenditures. Such patients, often on Medicare, with five or more illnesses, will visit 13 different outpatient physicians and fill 50 prescriptions per year; compared to an average patient visiting two physicians per year [7]. As the number of conditions increases, the risk of hospitalizations grows exponentially [8]. While the transitions between providers and settings increase, so does the risk of harm from inadequate information transfer and reconciliation of treatment plans. A third of these costs may be due to inappropriate variation and failure to coordinate and manage care [8]. As costs continue to rise, the delivery of care must change to meet these challenges.

Annually trillions of dollars are spent in the U.S. healthcare system making it the largest delivery system in the world [1]. Unfortunately, a considerable amount of medical errors generated from this system are still paper-based, which limits achieving improvements in care coordination, quality control and patient awareness. Numerous studies have presented evidence in support of use of HIT, including one study that estimated an interoperable Electronic Medical Records (EMRS) system would produce \$142-\$371 billion dollars in productivity and safety improvements over a 15 year adoption period (2004-2018) [9]. An array of barriers to adoption have been identified: cost, standardization, privacy issues, disruptive effects on clinic practices, and the familiar dilemma of who pays for HIT vs. who sees the profits from HIT adoption. Comparative studies for usage of Information Technology (IT) in healthcare vs. other industries have also been done [9]. For example, two decades ago, banking, retail and telecommunications were some of the industries that embraced IT and recorded 6-8 percent annual productivity gain, one-third which can be attributed to IT [10].

In light of previous investments by the U.S. government in HIT [11] and its subsequent outcomes, not everyone is sold on the benefits of HIT. Critics point out that similar to early IT adopters (Retail and Banking), interoperability and data entry; two of the most labor intensive activities, will still remain a human task and forecast the same for HIT [12]. Adopters must

also be able to justify ROI based on HIT adoption startup and ongoing costs [13]. Once physician resistance to using EHRs has been overcome, some expect that the EHR business cases may not be in line with the nation's agenda of lowering costs and increasing quality [14].

One place that policymakers agree on the benefits of HIT is in Medicare and Medicaid. Medicare and Medicaid are the largest purchasers of healthcare services in the United States and as such have leverage to promote physician adoption of HIT. Recommendation for promoting HIT for Medicare and Medicaid services include: clarifying technology objectives, engaging physician communities, leading development of standards and technology certification, adopting concrete payment systems to prompt adoption of meaningful technology [15]. However, before embarking on changing the existing Medicare financing system, CMS needs to explicitly identify the technology capabilities and their impacts that physicians should incorporate into their practices.

This has brought about a renewed interest from various government, public and private entities for proposing solutions to the healthcare crisis [16], which is helping fuel diffusion research in healthcare. Technology advances and the new ways of bundling technologies to provide new healthcare services is also contributing to interest in Health Information Technology (HIT) research [17]. The promise of applying technology to healthcare lies in increasing hospital efficiency and accountability and decreasing cost while increasing quality of patient care [18]. Therefore, it's imperative to study how technology, in particular HIT, is being adopted and eventually diffused in the healthcare sector to help achieve the nation's goals. Rogers, in his seminal work, has highlighted his concern for almost an overnight drop and near disappearance of diffusion studies in such fields as sociology and has called for renewed efforts in diffusion research [19]. Others have identified diffusion as the single most critical issue facing our modern technological society [20]. This is attributed to the imperative for effectively delivering innovations to the masses, so as they benefit from the new productivities offered in their personal lives and in return contribute even more to society itself.

According to the U.S. Department of Health & Human Services definition, Health Information Technology allows comprehensive management of medical information and its secure exchange between health care consumers and providers [18]. Information Communication Technology (ICT) and Health Information Technology (HIT) are two terms that are often used interchangeably and generally encompass the same definition. It is hoped that use of HIT will lead to reduced costs and improved quality of care [21]. Policy bodies, including President Obama's administration [22] and other independent reports have called for major healthcare improvements in the United States by the year 2025 [23]. In describing these aspirations, almost always a call for accelerating the rate of HIT adoption and diffusion is stated as one of the top five levers for achieving these improvement goals [22]. Hence it is of critical importance to study and understand upstream and downstream dynamics of environments that will enable successful diffusion of HIT innovations.

Government efforts and HIT meaningful-use initiative

In order to introduce significant and measurable improvements in the population's health in the United States, various

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