Effects of HIE/HIT Implementation and Coordination of Care on Health Outcomes and Quality

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Introduction
The US healthcare system is highly fragmented and fraught with attendant inefficiencies in delivery. Lack of interoperability and care coordination have resulted in duplication of care, increased error rates, adverse drug-drug interactions, reduced safety, and increased costs. It has been argued that investments in health information technologies will radically transform the healthcare sector by increasing efficiencies, decreasing expenditures and increasing quality. Prevalence of chronic diseases, and the need for improved quality of care and patient outcomes necessitates the application of Health Information Technology (HIT) and Health Information Exchange (HIE) to streamline patient care, eliminate waste, and improve care coordination, with the goal of ultimately improving patient health outcomes. This study aims at exploring the effects of HIT/HIE on the outcomes and quality of care for diabetes, asthma, acute myocardial infarction, congestive heart failure, and hip and knee fracture. We look at average length of stay, adverse drug events and 30 day readmissions as measures of quality of care. This study addresses the policy implications and areas for further research to increase the success of HIT implementation, success of HIEs and ultimately improve health care outcomes and reduce health care expenditures through improved care coordination across disparate provider entities, and readily accessible patient data across fragmented networks.

Methods
This study uses the Health Information Management Systems Society (HIMSS) IT database, coupled with the American Hospital Association (AHA) Hospital survey data and the Centers for Medicare and Medicaid (CMS), outpatient and skilled nursing facility Medicare claims data from 2006-2012, along with the standard Medicare file of patient claims for 2006-2012 as the control cohort. Using hierarchical clustering analysis methods, we construct HIT scores for measures of HIT and HIE implementation and penetration across 32 measures of HIT adoption. CMS, AHA and HIMSS data, is combined using the common Medicare Provider Number. The scores are then used as the coefficient of interest using fixed effects methods and multinomial regressions, controlling for hospital and patient characteristics, as well as time-invariant factors.

Results
This study finds that those institutions with the highest HIT scores for specific measures of clinical decision support, continuity of care documentation and clinical discharge and summary care documentation showed modest and statistically significant levels of improvement in health care quality outcomes for the 3 key outcome metrics of over the study period. Overall, more intensive use of HIT/HIE in the long run could help providers achieve better quality outcomes.

Discussion
This study has major implications for the future of HIT/HIE in coordinating care across disparate entities. Federal government initiatives aimed at improving care coordination, fostering health ecosystems, and reducing costs associated with unnecessary readmissions and length of stay and adverse drug events stand to benefit from this research in that it highlights tangible areas where HIT/HIE participation may be beneficial to achieving improved health outcomes and reduction of cost.