Factors Influencing Progress of Health Information Exchange Organizations in the United States

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Abstract

Progress is being made toward improved healthcare interoperability in the United States, but exchange between electronic health records alone is insufficient. Using data from the eHealth Initiative's Annual Survey of Health Information Exchange, we developed models of HIE financial and operational progress. Our analysis suggests that organizations that focus on enabling exchange thorough education and policy need to be considered separately from those focused on the actual exchange. The associations between characteristics and progress in data exchanging HIEs suggest that diversity of participants as both originators and receivers of data and breadth of data are important underlying success factors.

Keywords:

Health information exchange; Program evaluation; United States

Introduction

Health Information Exchange organizations (HIEs) have emerged as one component of a multifaceted approach to enabling interoperablity in the US. Some, however, have questioned the viablity of HIEs [1, 2]. In order to understand the factors that may be important in sustainability of HIEs, we undertook an analysis of data from the eHealth Initiative's annual survey of organizations and initiatives working in the area of health information exchange in order to validate other's findings and to model the progression of HIEs using longitudinal, contemporaneously collected data.

Methods

We used data from the eHealth Initiative's (eHI) annual survey on Health Information Exchange. We used responses to the questions which were the same or, that we judged to be sufficiently similar, from the surveys in 2006, 2007 and 2008 – a total of 334 in all. In order to establish useful and meaningful taxonomy of HIEs, we reviewed previous publications describing HIEs, created multidimensional visualizations and then used a modified Delphi process to define taxa.

We grouped initiatives reporting their progress stage as 1 through 3 as not yet operational; those reporting stage 4 as pilot and HIEs that characterized themselves as stage 5 through 7 as operational. Because HIEs might be optimistic in their self-classification, we adopted a data driven definition as well. We calculated Spearman correlations using SAS® to find correlation coefficients for the predicted stages of HIEs.

Results

Based on our definitions we found that only 117 (76%) of the 154 HIEs responding to the survey we focused on exchanging data and of those only 42 (27%) were operational in 2008. Progress is, however, not linear. Only a minority (16%) of HIEs regressed year to year with approximately 40% progressing. A large majority of the HIEs were able to correctly predict their own developmental stage on eHI's maturity model for the upcoming year with Spearman correlation coefficients of 0.89, 0.88 and 0.93 for 2006, 2007 and 2008 respectively. The variables with the highest odds ratios in association with financial progression from highest to lowest were hospital as a receiver of data, one time or recurring fees from participants, receiving grants, laboratory or radiology as a data provider and ambulatory physician as a receiver (all p<0.01). The variables associated with operational progression were hospital as receiver, ambulatory physicians as receivers, laboratory or radiology as a data provider, one time or recurring fees, having received grants and sum of the unique types of participants (all p<0.01).

In the multivariate analysis, using all the independent variables of interest to predict the two outcomes, none of the independent variables had significant impact. When we examined pairwise correlations among the independent variables most of them are significant, which indicates strong multi-collinearity (highly correlated predictor variables) making simple interpretation of the regression coefficients as measuring marginal effects from the multivariate model unwarranted.

References

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