

eHealth Benchmarking Good Practice Case Electronic Health Records in Ambulatory Care

Case Summary

The level of EHR adoption in the U.S. has not been studied extensively, but increased adoption has been targeted as a long-term goal for the national healthcare agenda. The survey of U.S. physicians was designed to ascertain levels of EHR use in the ambulatory setting. Its primary objectives were to survey current levels of adoption, physician satisfaction with their systems, the observed impact of system implementation on quality of care, and the perceived barriers to more widespread adoption. 2,758 physicians responded to the survey, a response rate of 62%.

The data gathered by the survey indicate that approximately 4% of U.S. physicians have a comprehensive, fully-functional EHR in use, while approximately 13% have a basic system in place. The majority of those with an EHR implemented in their practices report positive effects, such as the avoidance of medication errors, and an increase in patient interaction with the system, such as increased access to prescription refills. The survey also yielded data about barriers to adoption; generally speaking, the primary barrier is that the system is prohibitively expensive.

The survey provides important implications for future adoption of EHR technology in the United States. There exists now a clearer understanding of current levels of adoption, what has proven effective for those who have implemented it, and how to help increase access to other physicians.

Background and Objectives

Objectives

The aim of the study was to ascertain the level of adoption of electronic health records (EHR), the physicians' satisfaction with the systems they used, the observed effect of the EHR on quality of care, and the perceived barriers to more widespread adoption.

Background Information

The study was supported in part by the Office of the National Coordinator for Health Information Technology (HIT) of the Department of Health and Human Services. The results will have important implications for the federal administration as they attempt to gauge the proliferation and future of HIT.

The survey was also crafted to answer whether physicians who care for large minority and poor populations have comparable adoption of these critical ICTs.

Type of activity

- Measuring eHealth / ICT availability and use
- Measuring attitudes towards eHealth and eHealth use
- Data gathering with the aim of eHealth market sizing
- Evaluation of an eHealth application / Service

Electronic Health Records in Ambulatory Care

Executing agency



Mass General Hospital's Institute for Health Policy, George Washington University, Harvard School of Public Health, RTI

Year of publication	2008
Year(s) of available data	2008
Geographic coverage	USA

Budget

Unfortunately, the budget for the survey is not publicly available but we can make an estimate: approximately 5 professionals (physician or survey expert) individuals spent approximately 20% of their time over a six month period to develop the survey and then, the survey implementation cost was approximately \$500,000.

Main Actors

Study team: C.M. DesRoches, et al.

University researchers

Responsible for questionnaire development, fieldwork, data analyses, publication of results

Contact information: Catherine DesRoches, Dr.P.H.

Institute for Health Policy, Massachusetts General Hospital, Suite 900

50 Staniford St.

Boston, MA 02114

cdesroches@partners.org

Research Triangle Institute

Private research consultancy

Fieldwork

Implementation

Data gathering approach

The data were gathered by means of a survey questionnaire, sent by postal mail to 5,000 respondents. Included with the initial mailing was a \$40 check. Subsequent phone calls were made to non-responders, along with additional mailings, including a second check for \$20 to encourage participation. The instrument has been included as a reference.

Sampling and fieldwork

The sample was selected from the group of U.S. physicians that provides direct patient care, as identified by the 2007 Physician Masterfile of the American Medical Association. After exclusions for osteopaths, residents, physicians employed by federally-owned hospitals, and retirees, 5,000 were selected randomly. Of these 5,000, 516 were ineligible due to non-included specialties (radiology, anaesthesiology, pathology, and psychiatry), as well as those who were no longer caring for patients. Of the remaining 4,484 physicians in the sample, 2,758 responded to the survey, which represented a response rate of 62%. There were no major deviations from the sampling frame but still, the analysis included adjustments for non-response bias using a multivariable model where weights were created based on likelihood of responding across multiple characteristics.

Surveys were sent by postal mail to all respondents. The package included a paper survey, as well as a paid return envelope, which was mailed to the Research Triangle Institute

(RTI). All individual-level data were removed by RTI before data was released to the study team.

Timing

The survey was developed between October 2006 and April 2007 and was in the field between September 2007, and March 2008. Analysis was performed as soon as the survey was completed, and the results were published on July 3, 2008.

Analysis and Reporting

Analysis included two-tailed chi-square analyses to account for respondent characteristics.

The results were reported in an article entitled "Electronic Health Records in Ambulatory Care—A National Survey of Physicians" in the *New England Journal of Medicine* on July 3, 2008.

Evaluation of implementation aspects

Quality Criteria	Score	Explanation
1. Relevance and transferability		
"The indicators clearly refer to eHealth."	●●●●	The survey focused on functionalities that comprise an EHR
"The indicators cover the respective issues/topics in sufficient depth."	○●●●	The survey asked detailed questions about individual functionalities
"The indicators allow regular measurement in the same context in the future".	●●●●	The survey will now be part of an ongoing annual assessment activity
"The indicators can be applied to a different national context."	○●●●	Because the questions are focused on functionalities, they are able to be translated to other national contexts.
2. Accessibility of information		
"The publication of the study presents enough methodological information to enable the reader to judge its validity. (i.e. information on sample size, weighting etc.)"	○●●●	The study explains in modest depth the analytic approach. More detailed information can be obtained directly from the authors.
"The research results have been published in English"	●●●●	True
3. Validity of measurement		
"The concept of eHealth used by the study is clearly expressed and therefore understandable for a variety of survey respondents."	●●●●	The survey is clearly focused on eHealth and is understood as such by the respondents, as demonstrated in the cognitive testing prior to the implementation of the survey
"The operationalisation of the indicators has been validated before use."	○●●●	The indicators have been used previously in other surveys but also represent updates and changes that have not been externally validated.
"The likelihood of social desirability bias/context bias is avoided as much as possible"	○●●●	The survey is very fact-based and mostly avoids questions that might lead to social desirability bias. However, there may be some amount of this bias in answers to barriers and facilitators of EHR adoption.
"In the case of a multinational study: appropriate translation procedures of survey instruments are used."	NA	
"The instrument follows the general rules for questionnaire design:" Question wording: simple, unambiguous, defining unclear terms Question wording: single stimuli Question wording: factual, not hypothetic Question wording: clear time and actor reference	●●●●	The survey clearly follows these general rules of questionnaire design.

Question wording: neutral, not suggestive

Question content: respondent has necessary knowledge and information in order to answer the questions

Population validity

Sampling frame quality: The survey was taken as a random sample from a master file of all U.S. practicing physicians and therefore, the sampling frame is of a high quality.

Data collection quality: The survey achieved a response rate of 62% using a combination of phone and mail outreach and should be considered high quality data collection.

Non-response rate documentation: Although the respondents closely mirrored the full sample, the study authors used statistical corrections for non-response bias to account for any deviations from the sampling frame.

Respondent load

Pre-testing of the survey suggested that the typical respondent should be able to finish the survey in less than 30 minutes. This represents a modest burden in terms of time for the respondent.

Conclusions and learning points

From the point of view of the ordering customer / funding organisation

Strengths

The most valuable feature of this survey was that it broke out each functionality separately so we could discern which functions are most likely to be adopted and which ones were likely to be adopted first. This allowed us to create a standard definition of EHR adoption that can be replicated in the future by other studies. Another important feature of this survey is that this was the first survey to identify which EHRs meet certification standards endorsed by our Certification Commission for Health Information Technology which endorses standards to ensure interoperability of EHRs.

Weaknesses

There were a few weaknesses with this survey. First of all, there is a likelihood of a response bias in spite of a fairly high response rate. Second, we questioned both the office manager and the physician whose practice we were surveying. In several cases, the responses did not coincide. Finally, there was a great deal of confusion about certain features such as results viewing where respondents were not clear if this meant the ability to view the written results or the actual lab /xray/ etc. Likewise, when we asked if a provider used e-prescribing, some interpreted this to mean that their physician asked the nurse to send an email requesting a prescription drug rather than the physician actually submitting the electronic prescription drug request him or herself.

Facilitators

The most important feature of this survey was the ability to break the survey down by functionality so that multiple definitions of EHR could be utilized. This allowed us to create a new definition of EHR adoption but also to continue to trend the rate of adoption using previously utilized definitions.

From the point of view of the implementing organisation

Strengths

The survey was straightforward in its language and clarity and easy to implement

Weaknesses

It is always challenging to achieve a high response rates from physicians.

Facilitators

There were adequate resources allocated to ensure we could perform repeated follow-up to achieve a high response rate

Learning points

The information on barriers obtained by the survey is quite interesting. However it is not meaningful enough to come to clear conclusion as to what the main barrier might be. Therefore it would be also very difficult to derive intervention strategies from this type of information.

Develop surveys that are short, concise and clear for respondents

Allocate enough resources for a robust follow-up to ensure high response rate

Provide as much clarification as possible to avoid misinterpretation;

Identify key features and ask about each one individually

References

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The eHealth Benchmarking Study

The “eHealth Benchmarking” study is carried out by empirica on behalf of the European Commission, Information Society and Media Directorate-General. The study aims to collate and analyse existing eHealth monitoring and benchmarking sources in order to identify best practice in data gathering and to develop a framework for an EU-wide eHealth benchmarking activity. The intention is not only to help better understand eHealth progress but also to identify the main gaps, obstacles and barriers in relation to eHealth monitoring / benchmarking to be overcome in the next few years. In doing so, the study covers the Member States of the European Union, Norway, Iceland, Canada and the United States.

The benchmarking sources were identified by means of a combination of different research methods, including a survey among the experts of the EEA Working Group on Information Society statistics, desk research on sources of eHealth data and measurements on a supranational and European level, and research on the national level carried out by a network of national correspondents.

More information on the study is available online at <http://www.ehealth-benchmarking.eu/> or from the project coordinator:



empirica Gesellschaft für Kommunikations- und Technologieforschung mbH
Oxfordstr. 2, 53111 Bonn, Germany
Phone: +49 228 98 53 00
E-Mail [ehbench \(at\) empirica \(dot\) com](mailto:ehbench@empirica.com)

Authorship

This case was written by the case owner institution.

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