Physician attitudes toward health information exchange: results of a statewide survey

Adam Wright,[1,2,3] Christine Soran,[3] Chelsea A Jenter,[1] Lynn A Volk,[3] David W Bates,[1,2,3] Steven R Simon[2,4]

[1]Brigham & Women's Hospital, Boston, Massachusetts, USA [2]Harvard Medical School, Boston, Massachusetts, USA [3]Partners HealthCare, Boston, Massachusetts, USA [4]Harvard Pilgrim Health Care, Boston, Massachusetts, USA

Correspondence to
Dr Adam Wright, Division of General Medicine and Primary Care, Brigham & Women's Hospital, 1620 Tremont Street, Boston, MA 02120, USA; awright5@partners.org

Received 19 April 2009
Accepted 26 October 2009

ABSTRACT

Objective To assess physicians' attitudes toward health information exchange (HIE) and physicians' willingness to pay to participate in HIE.

Design We conducted a cross-sectional mail survey of 1296 licensed physicians (77% response rate) in Massachusetts in 2007.

Measurements Perceptions of the potential effects of HIE on healthcare costs, quality of care, clinicians' time, patients' privacy concerns, and willingness to pay for HIE.

Results After excluding 253 physicians who did not see any outpatients, we analyzed 1043 responses. Overall, 70% indicated that HIE would reduce costs, while 86% said it would improve quality and 76% believed that it would save time. On the other hand, 16% reported being very concerned about HIE's effect on privacy, while 55.0% were somewhat concerned and 29% not at all concerned. Slightly more than half of the physicians (54%) said they would be willing to pay an unspecified monthly fee to participate in HIE, but only 37% said they would be willing to pay $150 per month for it. Primary care physicians and those in larger practices tended to have more positive attitudes toward HIE.

Conclusions Physicians perceive that HIE will have generally positive effects, though a considerable fraction harbor concerns about privacy. While physicians may be willing to participate in HIE, they are not consistently willing to pay to participate. HIE business models that require substantial physician subscription fees may face significant challenges.

INTRODUCTION

Delivering high-quality medical care requires that healthcare providers have access to essential information about patients' prior and current medical conditions. Moreover, lack of information—such as the knowledge about a patient's life-threatening allergy to a medication—can lead to catastrophic adverse events.[1] Thus, one of the most significant and promising trends in healthcare information technology is the emergence of health information exchange (HIE).

The National Alliance for Health Information Technology (NAHIT), under contract from the United States Department of Health and Human Services, defined HIE as "the electronic movement of health-related information among organizations according to nationally recognized standards."[2] This information might include laboratory results, clinical documents, and medication and problem lists among other clinical data types. NAHIT also defined a related term, health information organization (HIO) as "an organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards." HIOs are often organized geographically, in which case they are sometimes called regional health information organizations (RHIOs). The organizing entity for a regional health information organization may be a local or regional government agency, a non-profit entity formed for the purpose of HIE, or in some cases, a for-profit entity.

Once constituted, an HIO needs the participation of healthcare providers, such as physicians, hospitals, and medical laboratories. These providers supply the data which are exchanged over the HIO and also access and use data provided by others during the course of patient care.

A variety of benefits have been ascribed to HIE, ranging from increased quality due to better information to reduced costs due to the avoidance of duplicate testing. In addition HIE has, of late, become a topic of intense national interest. Section 4101(o)(2)(ii) of the Health Information Technology for Economic and Clinical Health (HITECH) Act requires that providers must us an electronic health record (EHR) "connected in a manner that provides, in accordance with law and standards applicable to the exchange of information, for the electronic exchange of health information to improve the quality of healthcare, such as promoting care coordination" in order to receive incentive payments under HITECH. The Office of the National Coordinator for Health Information Technology has also set aside $564 million of support for states to establish HIE under the State Health Information Exchange Cooperative Agreement Program. These funds will be provided to states or entities designated by the states to develop or expand HIE capacity.

Despite these potential benefits and new interest, there are few functioning examples of HIE outside integrated healthcare delivery systems. Two of the best known and most widely cited examples of successful HIOs are located in Indiana: the Indiana Network for Patient Care (INPC)[3–6] and the Indiana Health Information Exchange. The INPC is an HIE that unites the five major hospital systems in the Indianapolis area. INPC members share laboratory results, registration data, and summary data regarding hospital admissions and emergency department visits. The Indiana Health Information Exchange delivers laboratory results and clinical messages to 8500 physicians in Indiana and processes over one million messages each month.[7]

Another widely cited example of an HIO was the Santa Barbara County Care Data Exchange (SBCCDE).[8] In 2002, SBCCDE was cited as "perhaps the best-known example of a data exchange platform for patient information".[9] However, the SBCCDE shut down 8 years after it was founded,[10] largely due to financial sustainability issues. The exchange was spending about $500 000 per year, yet had had relied on grants and could not establish a sustainable business model.

A recent survey of 145 RHIOs found that one in four were no longer functioning; half of them reported being in a planning stage.[11] Of the 145 RHIOs surveyed, only 15 medium-to-large RHIOs were actually exchanging clinical data for a wide range of patients. Of these 15, the majority were focused on delivery of laboratory test results for which they received transaction or subscription fees. This study raised additional concerns about the financial sustainability of comprehensive HIE without significant participation from some beneficiaries such as the government and/or other payers. According to the study, finding a sustainable business model is a key challenge for existing and proposed HIOs, some of which depend on subscription fees from physicians.

Given the potential clinical benefits of HIE and the challenges of their financial sustainability, we carried out a statewide survey of physicians' attitudes toward HIE and physicians' willingness to support it financially.

METHODS

Survey instrument

We conducted a mail survey of physicians in Massachusetts regarding their use of health information technology and their attitudes toward HIE. Because HIE may mean different things to different physicians, and because levels of familiarity with HIE may vary among physicians, we provided the following information as an introduction to the survey questions (note that our survey predated the NAHIT definitions):

> "For the purposes of answering these questions, our definition of HIE is the ability for clinicians to share a core set of clinical patient data across practices and entities. For example, a patient whose PCP is in Holyoke, MA goes to Springfield to the ER—her medication list, allergies, and laboratory results would be retrievable in the Springfield ER department if her PCP office and the hospital both have implemented HIE."

Physicians were then asked what effects they thought HIE would have on three areas: reducing healthcare costs, improving quality of patient care, and saving time for clinicians. Respondents rated the effect on each of these areas using a five-point scale: very positive, somewhat positive, no effect, somewhat negative, and very negative. Physicians were also asked to indicate their level of concern regarding the privacy and security of HIE as very concerned, somewhat concerned, or not at all concerned. Physicians also responded to two questions about their willingness to pay for HIE: "If participation in HIE were like a cable bill with a monthly charge, would you consider participating?" and "If participation in HIE cost $150 per month, would you sign up?" (the $150 figure was based on a discussion with a local RHIO regarding what they were likely to charge for this service).

The survey also asked about practice characteristics, access to and use of electronic health records (defined, in this survey, as "an integrated clinical information system that tracks patient health data, and may include such functions as visit notes, prescriptions, lab orders, etc") and overall attitudes about and satisfaction with the practice of medicine.

Sampling

The survey was conducted as a follow-up to a 2005 survey on physician use of health information technology in Massachusetts, the results of which have been reported previously.[12 13] The 2005 survey used a stratified random sample of practicing physicians. A total of 1345 surveys were returned in 2005, but one physician responded twice, yielding 1344 potential physicians to be followed up in 2007, of whom 169 had moved out of Massachusetts, 25 had retired, and 3 had died. This left a total of 1144 physicians who were eligible for follow-up. All 1144 were contacted and formed the "follow-up" sub-sample.

Because the original survey was conducted in 2005, all physicians in the follow-up sub-sample had been practicing in Massachusetts for at least 2 years. In order to measure the attitudes of physicians who started practicing in Massachusetts between 2005 and 2007, we also drew a second sample of newly licensed physicians. According to records of the Massachusetts Board of Registration in Medicine, 1769 physicians received regular (non-trainee) licenses to practice in Massachusetts between the two surveys. We drew a random sample of 628 physicians from this pool of 1769. Of these, 89 had subsequently moved out of Massachusetts and two had retired, leaving a total of 537 new physicians. These physicians constituted the "newly licensed" sub-sample.

Survey administration

The University of Chicago Survey Lab administered the survey by mail. Surveys were mailed out via express mail in March 2007, along with a $20 honorarium. Second and third surveys were sent to non-respondents. The Partners HealthCare Human Research Committee approved the survey instrument and research protocol.

Analysis

All analyses were carried out using SAS 9.1.3. All hypothesis tests were conducted at the 95% confidence level using Pearson's χ^2 test for independence on contingency tables. We weighted our analyses to control for the relative sizes of the two sub-samples, the original stratification strategy from the 2005 survey, and the response rates of the two sub-samples. After applying the appropriate weights, the unit of analysis for the survey was the physician practicing in Massachusetts in 2007.

Prior to analysis, we categorized respondents into three groups with respect to their EHR usage: users of an advanced EHR with laboratory test results, an electronic medication list, and an electronic problem list; users of a simple EHR which was missing at least one of these three features; and non-users.

RESULTS

Response rate

In the follow-up sub-sample (n=1144), 910 physicians responded (response rate=80%). In the newly-licensed sub-sample (n=537), 386 responded (response rate=72%). The combined response rate was 77.1%, resulting in 1296 surveys completed. Of these respondents, a total of 253 physicians (20%) indicated that they did not see any outpatients. Therefore, they did not complete any questions on the survey and were excluded from further analysis. Thus, a total of 1043 eligible surveys were included in the analyses.

Characteristics of respondents

Table 1 shows the characteristics of the respondents, revealing considerable diversity of practice types and sizes, as well as years

Table 1 Characteristics of respondents and practices (N = 1043)

Characteristic	Response	%
Practice type	Solo primary care practice	11
	Solo specialty care practice	14
	Primary care group or partnership	23
	Single specialty group or partnership	31
	Multi-specialty group or partnership	19
Practice size	Small (1–2 providers)	29
	Medium (3–5 providers)	22
	Large (>5 providers)	47
Years since graduation	<5	1
	5–9	12
	10–14	19
	15–19	18
	20–29	25
	≥30	24
Students in practice	Yes	52
	No	47
EHR usage	No EHR	45
	Simple EHR	28
	Advanced EHR	20

Percentages may not add up to 100% due to missing responses.
EHR, electronic health record.

since graduation. Over half of the respondents reported having a student or resident in their practice in the last year. Slightly more than half of respondents reported using an EHR. Of EHR users, 59% reported using a simple EHR and 41.1% used an advanced EHR with laboratory test results, an electronic medication list, and an electronic problem list.

Attitudes toward HIE

Table 2 shows physicians' attitudes toward HIE. Physicians generally appeared to have positive attitudes toward HIE. Overall, 70% of physicians felt that HIE will have a somewhat or very positive effect on reducing healthcare costs, while only 6% felt that it will have a negative effect. Likewise, 86% of providers indicated that they believed that HIE will have a positive effect on quality, while only 1% felt it would be negative. Regarding time savings, 76% of physicians reported that HIE will have a positive effect, while only 9% felt that the effect will be negative. A total of 16% of physicians reported being very concerned about privacy and security of HIE, while 55% were somewhat concerned and 28% were not at all concerned (table 3).

Both primary care providers and specialists had favorable attitudes toward HIE, although primary care providers tended to be slightly more positive overall. For each of the three attitude questions (reducing costs, improving quality, and saving time), specialists were significantly more likely to report neutral feelings than were primary care practices (PCPs). The difference between PCPs and specialists was significant ($p<0.001$) using Pearson's χ^2 test for all three attitude questions as well as the privacy and security question. It is important to note that, in the case of the three attitude questions, this is a test of independence over all five possible responses. If the data are recast as binary, with providers classified as having either positive or non-positive (neutral or negative) attitudes, the difference between primary care providers and specialists becomes clearer. In these analyses, primary care providers were more likely than specialists to indicate that HIE would reduce costs (odds ratio (OR) 1.43; 95% CI 1.01 to 2.03), improve quality (OR 3.73; 95% CI 1.96 to 7.11), and save time (OR 1.75; 95% CI 1.17 to 2.61).

Practice size also had a significant relationship with attitudes toward HIE. A total of 67% of physicians in small practices (1–2 physicians) indicated that HIE would reduce costs, while 81% of physicians in medium-sized practices (3–5 physicians) and 67% of physicians in large practices felt the same (6 or more physicians; $p<0.001$ using Pearson's χ^2 test for independence). A total of 90% of physicians in small practices, 95% of physicians in medium-sized practices, and 81% of providers in large practices thought HIE would have a positive effect on quality ($p<0.001$). For saving time, 82% of providers in small practices, 85% of physicians in medium-sized practices, and 70% of providers in large practices ($p<0.001$) predicted a positive effect of HIE.

In comparison, physicians in small practices expressed greater levels of concern about the privacy and security implications of HIE than physicians in medium-sized practices ($p<0.001$), who

Table 2 Physicians' attitudes toward health information exchange (N = 1043)

		Practice type		EHR usage			Practice size		
Expected effect	Overall (%)	PCP (%)	Specialty (%)	Advanced (%)	Simple (%)	None (%)	Large (%)	Medium (%)	Small (%)
On reducing healthcare costs									
Very positive	21	33	17	34	12	24	20	17	25
Somewhat positive	50	43	51	51	51	46	47	64	41
No effect	24	17	26	13	34	19	30	13	24
Somewhat negative	5	7	4	2	3	8	3	6	7
Very negative	1	1	1	0	1	2	0	1	3
On improving quality of patient care									
Very positive	45	62	40	71	35	46	48	37	45
Somewhat positive	41	33	43	28	38	47	32	58	46
No effect	13	4	16	1	26	5	19	4	6
Somewhat negative	1	1	1	1	1	2	0	1	3
Very negative	0	1	0	0	0	1	0	1	1
On saving time for clinicians									
Very positive	39	54	35	64	30	40	42	31	40
Somewhat positive	37	29	39	26	36	41	28	54	42
No effect	15	6	18	6	27	8	22	8	6
Somewhat negative	6	8	6	4	5	7	6	4	9
Very negative	3	2	3	0	2	4	2	3	4

EHR, electronic health record; PCP, primary care practice.

Table 3 Degree of concern about privacy and security as related to HIE (N=1043)

		Practice type		EHR usage			Practice size		
Degree of concern	Overall (%)	PCP (%)	Specialty (%)	Advanced (%)	Simple (%)	None (%)	Large (%)	Medium (%)	Small (%)
Very concerned	16	18	16	9	9	27	10	16	34
Somewhat concerned	55	49	57	61	57	51	66	38	47
Not at all concerned	29	34	28	30	34	22	25	46	19

EHR, electronic health record; HIE, health information exchange; PCP, primary care practice.

were in turn more concerned than those in large practices (p<0.001).

The use of EHRs was related to attitudes toward HIE, with users of advanced EHRs expressing more positive attitudes about HIE than those who do not use an EHR at all on all three attitude questions. The differences between the groups were statistically significant for the reducing costs attitude (p<0.001) and the saving time attitude (p<0.001), but not significant for the improving quality attitude (p=0.098). Users of an advanced EHR were also significantly less concerned about privacy and security than non-users (p<0.001). Users of a simple EHR appeared less positive on all four attitudes than advanced EHR users; however the difference was only statistically significant for the saving time attitude (p=0.03). Perhaps more surprisingly, users of a simple EHR were also generally less positive about HIE than EHR non-users, with a significant difference on the reducing costs attitude (p<0.001) and concern for privacy and security (p<0.001). There was no statistically significant difference between simple EHR users and non-users on the improving quality attitude (p=0.079) or the saving time attitude (p=0.292).

Willingness to pay

Overall, slightly more than half (54%) of the providers said they would be willing to pay on a monthly basis for access to HIE, but only 37% of providers said they would be willing to pay a fee of $150 per month. PCPs were more likely to be willing to pay for HIE than specialists when a dollar amount was not specified (OR 1.40; 95% CI 1.01 to 1.94), and showed a trend toward greater willingness to pay a $150 monthly fee (OR 1.35; 95% CI 0.97 to 1.87). Mirroring the attitude questions, medium-sized practices were more likely to be willing to pay for HIE than large practices (OR 3.21; 95% CI 2.29 to 4.49) or small practices (OR 4.22; 95% CI 2.83 to 6.30) at the unspecified fee level. Users of an advanced EHR were more willing to pay for HIE than non-users (OR 1.81; 95% CI 1.23 to 2.66) or simple EHR users (OR 2.32; 95% CI 1.59 to 3.40), but there was no significant difference in willingness to pay between simple EHR users and EHR non-users (OR 0.78; 95% CI 0.59 to 1.04).

Table 4 shows the relationship between physicians' attitudes toward HIE and their willingness to pay for it. Not surprisingly, providers who had negative attitudes were considerably less likely to be willing to pay for HIE.

DISCUSSION

HIE promises to provide clinicians with accurate, real-time patient information from geographically disparate locations to inform clinical-decision making. In this statewide study, we found that physicians' attitudes toward HIE were, overall, very positive. Across a range of practice characteristics, physicians agreed that HIE would have positive effects on reducing healthcare costs, increasing quality, and saving clinician time. Even when there were differences between kinds of providers (specialists vs PCPs, small vs large practices, and EHR users vs non-users), between 60% and 99% of all subgroups had positive attitudes toward HIE.

We found that physicians in medium-sized practices had the most positive attitudes toward HIE, while physicians in large and small practices had comparable attitudes. It may be the case that physicians in the largest practices already receive some of the benefits of HIE because the patients they treat mainly see other providers within the same practice, so the benefit of access to outside data may not be as strong. Likewise, PCPs reported more positive attitudes than specialists. This is likely attributable to the nature of the relationship between the types of providers and their patients. PCPs provide ongoing care to patients and may interact with many specialists in the treatment of a single patient. Specialists often provide more episodic care to patients, and likely interact mainly with a single other provider (the PCP) in the management of these patients.

While privacy and security were of concern to a larger fraction of physicians than any other issue, most physicians did not report major concerns. In contrast, this has been a major issue for general practitioners in the UK, at least in part because of well-publicized breaches,[14] but perhaps also because HIE has been perceived as mandatory.[15] There have already been notable breaches in the USA as well,[16 17] and one might expect that any future more extensive breaches might increase privacy concerns in the USA. Similarly, relatively small numbers of physicians expressed concern that HIE would generate additional costs to the healthcare system.

Despite their positive attitudes toward HIE, clinicians expressed very limited willingness to pay for HIE. Just over half of clinicians said they would be willing to pay a monthly subscription fee, but when the fee was specified at $150 per month, only 37% of clinicians said they would pay it. Although

Table 4 Proportion of physicians willing to pay a monthly fee for health information exchange according to health information exchange attitudes (N=1043)

Benefit	Perceived effect	Willing to pay an unspecified fee (%)	Willing to pay $150/month (%)
Reducing healthcare costs*	Negative	28	18
	Positive	68	47
Improving quality of patient care†	Negative	13	12
	Positive	62	43
Saving time for clinicians*	Negative	27	19
	Positive	65	46

*p<0.001 for difference in willingness to pay among respondents with negative and positive perceptions at both fee levels using Pearson's χ^2.
†p<0.001 for difference in willingness to pay among respondents with negative and positive perceptions at the unspecified fee level, and p=0.017 at the $150/month fee level using Pearson's χ^2.

PCPs and advanced EHR users were more willing than others to pay the $150 fee, still fewer than half of the physicians in these groups were willing to pay this amount. Even those providers with positive attitudes toward HIE were unwilling to pay a $150 monthly fee. The discordance between positive attitudes toward HIE and unwillingness to pay for it is reminiscent of physicians' positive attitudes toward EHRs but their lack of willingness to pay for them.[12]

The financial benefits of HIE to society have been estimated to be large.[18] In one study by the Center for Information Technology Leadership (CITL), these benefits have been predicted to accrue in part to providers (43%), and also to payers and purchasers (28%) as well as to other stakeholders such as laboratories and pharmacies (29%). The 43% figure may overestimate the actual benefits to physicians, because CITL included both physicians and hospitals in their provider category, and assumed that a fairly broad array of services would be provided through HIE. The predominant business model for HIE is financial support through subscription fees. These fees are expected to come from a mix of physicians, hospitals, and payers, though all these stakeholders have reservations.

Our study has several limitations. First, many, if not most, of the physicians in our sample have never used HIE, and attitudes of non-users toward a hypothetical model for HIE may differ from attitudes of physicians who have used HIE. However, at present, because there are so few HIOs delivering HIE services in production, most physicians are making the decision as to whether or not to participate in HIE for the first time and without the benefit of prior experience. Second, as noted in our methods, our survey was limited to a single state, which may limit the generalizability of our results. Third, our survey looked only at a single specified price point and a single basic definition of HIE, and did not give respondents an opportunity to provide more granular feedback on pricing and features.

Our results have fundamental implications for current and potential organizers of HIEs. First, any HIE business model that depends on physicians in the community paying a monthly fee is likely to face significant hurdles, particularly if the fee is equal to or greater than $150 per month (not that different from cell phone or cable fees). Given the worsened economic situation since the time of the 2007 survey, physicians are likely even less willing to pay for this functionality. The converse implication, however, is that since providers generally have favorable attitudes toward HIE, gaining their participation in well designed and well operated HIOs that do not charge a fee should be feasible, although a variety of other factors (such as provider trust in the organizing entity and technical difficulty of participation) may also affect willingness to participate.

CONCLUSION

In summary, physicians' attitudes toward HIE are generally very positive. Combined with what was already known about patients' positive attitudes toward HIE[19] and its potential positive economic effects,[18] the case for adopting HIE seems simple. However, the major unanswered question is how HIE will be financed. We found that the majority of physicians in our sample are unwilling to pay a $150 monthly fee for HIE, and nearly half are unwilling to pay any fee at all, suggesting that HIE business models which depend on large fees paid by providers may face significant challenges.

Funding This work was supported by R01 Grant #1UC1HS015397 from the Agency for Healthcare Research and Quality as well as funds from the Massachusetts eHealth Collaborative. The funding agencies had no role in the design of the study, analysis of the data, interpretation of the results, or the decision to publish. AW had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1. **Smith PC,** Araya-Guerra R, Bublitz C, *et al*. Missing clinical information during primary care visits. *JAMA* 2005;**293**:565–71.
2. **National Alliance for Health Information Technology**. Report to the Office of the National Coordinator for Health Information Technology on defining key health information technology terms. http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10741_848133_0_0_18/10_2_hit_terms.pdf (accessed 16 Oct 2009).
3. **Overhage JM,** Tierney WM, McDonald CJ. Design and implementation of the Indianapolis Network for Patient Care and Research. *Bull Med Libr Assoc* 1995;**83**:48–56.
4. **Overhage JM,** Dexter PR, Perkins SM, *et al*. A randomized, controlled trial of clinical information shared from another institution. *Ann Emerg Med* 2002;**39**:14–23.
5. **McDonald CJ,** Overhage JM, Barnes M, *et al*. The Indiana network for patient care: a working local health information infrastructure. An example of a working infrastructure collaboration that links data from five health systems and hundreds of millions of entries. *Health Aff (Millwood)* 2005;**24**:1214–20.
6. **Regenstrief Institute Inc**. Indiana Network For Patient Care. http://www.regenstrief.org/medinformatics/inpc (accessed 29 Aug 2008).
7. **Indiana Health Information Exchange**. IHIE Services—Docs 4 Docs and Quality Health First Service 2009. http://www.ihie.com/Services (accessed 17 Nov 2009).
8. **Brailer DJ,** Augustinos N, Evans LM, *et al*. Moving toward electronic health information exchange: interim report on the Santa Barbara County Data Exchange. *California HealthCare Foundation* 2003.
9. **Corrigan J,** Greiner A, Erickson SM. Committee on Rapid Advance Demonstration Projects: Health Care Finance and Delivery Systems, Institute of Medicine (U.S.), Board on Health Care Services. Fostering rapid advances in health care: learning from system demonstrations. Washington, D.C. The National Academies Press, 2003.
10. **Miller RH,** Miller BS. The Santa Barbara County Care Data Exchange: what happened? *Health Aff (Millwood)* 2007;**26**:w568–80.
11. **Adler-Milstein J,** McAfee AP, Bates DW, *et al*. The state of regional health information organizations: current activities and financing. *Health Aff (Millwood)* 2008;**27**:w60–9.
12. **Simon SR,** Kaushal R, Cleary PD, *et al*. Physicians and electronic health records: a statewide survey. *Arch Intern Med* 2007;**167**:507–12.
13. **Simon SR,** Kaushal R, Cleary PD, *et al*. Correlates of electronic health record adoption in office practices: a statewide survey. *J Am Med Inform Assoc* 2007;**14**:110–17.
14. **Espiner T.** Government loses 25m confidential records 2007. http://news.zdnet.co.uk/security/0,1000000189, 39290951,00.htm (accessed 6 Nov 2008).
15. **British Medical Association**. Focus on funding for information management and technology—third update. http://www.bma.org.uk/images/FocusITfund3_tcm41-20235.pdf (accessed 20 Oct 2009).
16. **Blankstein A.** Digging into celebrity medical records has a long history. *Los Angeles Times* 2008.
17. **Stout D,** Zeller T Jr. Vast data cache about veterans is stolen. *The New York Times* 2006;Sect. A1.
18. **Walker J,** Pan E, Johnston D, *et al*. The value of health care information exchange and interoperability. *Health Aff (Millwood)* 2005(Suppl Web Exclusives):W5-10–18.
19. **eHealth Initiative Foundation**. A majority of consumers favor secure electronic health information exchange. http://toolkit.ehealthinitiative.org/assets/Documents/eHISummaryofResearchonHealthInformationExchange05.01.07Final001.pdf (accessed 17 Nov 2009).

Physician attitudes toward health information exchange: results of a statewide survey

Adam Wright, Christine Soran, Chelsea A Jenter, et al.

JAMIA 2010 17: 66-70
doi: 10.1197/jamia.M3241