RAND HEALTH

RESEARCH HIGHLIGHTS

Health Information Technology

Can HIT Lower Costs and Improve Quality?

The U.S. healthcare system is in trouble. Despite investing over $1.7 trillion annually in healthcare, we are plagued with inefficiency and poor quality. Better information systems could help. Most providers lack the information systems necessary to coordinate a patient's care with other providers, share needed information, monitor compliance with prevention and disease-management guidelines, and measure and improve performance.

Other industries have lowered costs and improved quality through heavy investments in information technology. Could healthcare achieve similar results? RAND researchers have estimated the potential costs and benefits of widespread adoption of Health Information Technology (HIT). The team also has identified the actions needed to turn potential benefits into actual benefits.

Key findings:

- **Properly implemented and widely adopted, Health Information Technology would save money and significantly improve healthcare quality.**
- **Annual savings from efficiency alone could be $77 billion or more.**
- **Health and safety benefits could double the savings while reducing illness and prolonging life.**
- **Implementation would cost around $8 billion per year, assuming adoption by 90 percent of hospitals and doctors' offices over 15 years.**
- **Obstacles include market disincentives: Generally, those who pay for Health Information Technology do not receive the related savings.**
- **The government should act now to overcome obstacles and realize benefits.**

HIT's Potential Includes Significant Savings, Increased Safety, and Better Health

The RAND team drew upon data from a number of sources, including surveys, publications, interviews, and an expert-panel review. The team also analyzed the costs and benefits of information technology in other industries, paying special attention to the factors that enable such technology to succeed. The team then prepared mathematical models to estimate the costs and benefits of HIT implementation in healthcare.

HIT includes a variety of integrated data sources, including patient Electronic Medical Records, Decision Support Systems, and Computerized Physician Order Entry for medications. HIT systems provide timely access to patient information and (if standardized and networked) can communicate health information to other providers, patients, and insurers. Creating and maintaining such systems is complex. However, the benefits can include dramatic efficiency savings, greatly increased safety, and health benefits.

Efficiency savings. Efficiency savings result when the same work is performed with fewer resources. If most hospitals and doctors' offices adopted HIT, the potential efficiency savings

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for both inpatient and outpatient care could average over $77 billion per year. The largest savings come from reduced hospital stays (a result of increased safety and better scheduling and coordination), reduced nurses' administrative time, and more efficient drug utilization.

Increased safety. Increased safety results largely from the alerts and reminders generated by Computerized Physician Order Entry systems for medications. Such systems provide immediate information to physicians—for example, warning about a potential adverse reaction with the patient's other drugs.

If all hospitals had a HIT system including Computerized Physician Order Entry, around 200,000 adverse drug events could be eliminated each year, at an annual savings of about $1 billion (see Figure 1). Most of the savings would be generated by hospitals with more than 100 beds. Patients age 65 or older would account for the majority of avoided adverse drug events.

Health benefits. The team analyzed two kinds of interventions intended to enhance health: disease prevention and chronic-disease management. HIT helps with prevention by scanning patient records for risk factors and by recommending appropriate preventive services, such as vaccinations and screenings.

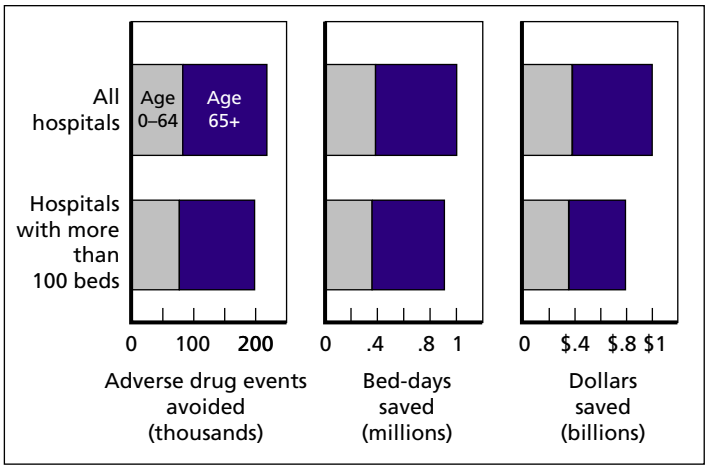
The table shows the estimated effects of increasing five preventive services: two types of vaccination and three types of screening. Together, these measures would modestly increase healthcare expenditures. But the costs are not large, and the health benefits of improved prevention are significant. For example, at a cost of only $90 million each year, between 15,000 and 27,000 deaths from pneumonia could be prevented.

HIT can also facilitate chronic-disease management. The HIT system can help identify patients in need of tests or other services, and it can ensure consistent recording of results. Patients using remote monitoring systems could transmit their vital signs directly from their homes to their providers, allowing a quick response to potential problems. Effective disease management can reduce the need for hospitalization, thereby both improving health and reducing costs.

Overall Savings Are Large Compared with Costs

Costs include one-time costs for acquiring a HIT system, as well as ongoing maintenance costs. Analysis of other industries indicates that full adoption of new technology requires about 15 years. Because process changes and related benefits take time to develop, net savings are initially low at the start of the 15-year period, but then rise steeply. Figure 2 shows the net potential savings (total savings minus total costs) for HIT implementation over a 15-year period. These savings are from increased efficiency only; health and safety benefits could double the savings.

Figure 1
Estimated Annual Benefits from Inpatient Computerized Physician Order Entry Systems, After Full Adoption

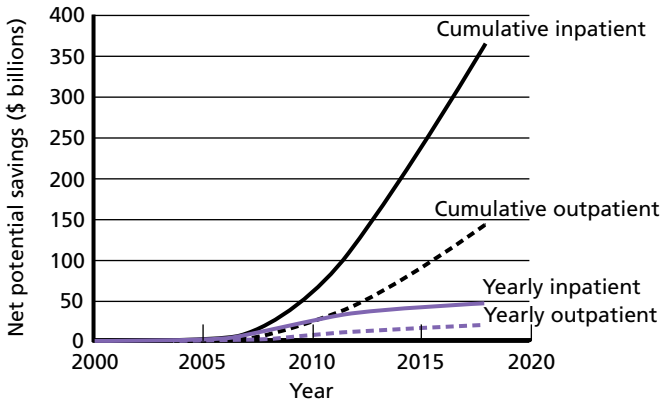


Increasing Preventive Services Could Save Lives with Only a Small Increase in Cost

Service	Annual Cost (in millions)	Deaths Avoided Each Year
Influenza vaccination	$134–$327	5,200–11,700
Pneumonia vaccination	$90	15,000–27,000
Breast cancer screening	$1,000–$3,000	2,200–6,600
Cervical cancer screening	$152–$456	533
Colorectal cancer screening	$1,700–$7,200	17,000–38,000

NOTE: Assumes 100-percent participation of all persons recommended to receive the service by the U.S. Preventive Services Task Force. This assumption is intended to set an upper bound for potential costs and benefits, not to suggest that 100-percent participation is probable.

Figure 2
Potential Net Savings from Increased Efficiency over a 15-Year Period



NOTE: Assumes full adoption (by 90 percent of hospitals and doctors' offices) at the end of the 15-year period.

Market Forces Present Obstacles to HIT Savings and Benefits

Current market conditions place serious obstacles in the way of effective HIT implementation.

- Relatively few providers have access to HIT. Only about 20 to 25 percent of hospitals and 15 to 20 percent of physicians' offices have a HIT system. Small hospitals and hospitals with half or more of their patients on Medicare are less likely to have HIT.
- *Connectivity*—the ability to share information from system to system—is poor. HIT implementation is growing, but there is little sharing of health information between existing systems. There is no market pressure to develop HIT systems that can talk to each other. The piecemeal implementation currently under way may actually create additional barriers to the development of a future standardized system because of the high costs of replacing or converting today's non-standard systems.
- Finally, one of the most serious barriers is the disconnect between who pays for HIT and who profits from HIT. Patients benefit from better health, and payors benefit from lower costs; however, providers pay in both higher costs to implement HIT and lower revenues after implementation. Figure 1 shows one part of the problem: Hospitals that use HIT to reduce adverse drug events also reduce bed-days—and reduced bed-days mean reduced hospital income.

The Government Should Act Now

Government intervention is needed to overcome market obstacles. RAND's recommended policy options fall into three groups: continue current efforts, accelerate market forces, and subsidize change. All three groups rely on the aggressive use of federal purchasing power to overcome market obstacles. Medicare (the Centers for Medicare and Medicaid Services—CMS) is the nation's payment policy leader, the party with the most to gain from HIT's cost and health benefits, and the healthcare system's largest payor. CMS's leadership would send strong market signals for adoption.

Continue current efforts. Actions include: Continue support for the development of uniform standards, common frameworks, HIT certification processes, common performance metrics, and supporting technology and structures. To help allay fears regarding confidentiality, expand liability protection for hospitals using HIT and for providers who comply with federal privacy regulations while using HIT networks. Promote hospital-doctor connectivity by allowing hospitals to subsidize portable, standardized HIT systems for doctors (which would require relaxing the current laws that prohibit such subsidies). These actions call for little or no new federal funding.

Accelerate market forces. Develop targeted investments and incentives to promote HIT. Set up a pay-for-use program for those providers using certified, interoperable HIT systems. Additional actions include: Create a national performance-reporting infrastructure to receive and report comparative performance data. Fund research on pay-for-performance incentives. Educate consumers about the value of HIT in improving their ability to manage their own health.

These actions require a moderate initial investment in policy and infrastructure development, with larger investments in later years. For example, pay-for-use programs, which are relatively easy to implement, could be followed by broad-based pay-for-performance programs, which require substantially more development.

Subsidize change. Direct subsidies would greatly speed HIT adoption. Subsidies may be particularly important in overcoming barriers to network development. Actions include: Institute grants to encourage the development of organizations, tools, and best practices to help HIT succeed. Make direct subsidies to help selected providers acquire HIT. Extend loans to support the start-up and early operation of HIT networks.

Convincing individual physicians and their patients of the value and safety of networking confidential data will be critical. Overcoming these challenges requires ongoing investment in framework, standards, and policy development.

Conclusions

Widespread adoption of HIT and related technologies, applied correctly, could greatly improve health and healthcare in America while yielding significant savings. A range of policy options could be used to speed the development of HIT benefits. Government action is needed; without such action, it may be impossible to overcome market obstacles. Our findings strongly suggest that it is time for government and other payors to aggressively promote the adoption of effective Health Information Technology. ■

This Highlight summarizes RAND Health research reported in the following publications:

Hillestad R, Bigelow J, Bower A, Girosi F, Meili R, Scoville R, and Taylor R, "Can Electronic Medical Record Systems Transform Healthcare? An Assessment of Potential Health Benefits, Savings, and Costs," *Health Affairs*, Vol. 24, No. 5, September 14, 2005.

Taylor R, Bower A, Girosi F, Bigelow J, Fonkych K, and Hillestad R, "Promoting Health Information Technology: Is There a Case for More-Aggressive Government Action?" *Health Affairs*, Vol. 24, No. 5, September 14, 2005.

Bigelow JH, Fonkych K, and Girosi F, "Technical Executive Summary in Support of 'Can Electronic Medical Record Systems Transform Healthcare?' and 'Promoting Health Information Technology'," *Health Affairs*, Web Exclusive, September 14, 2005.

Bigelow JH, Fonkych K, Fung C, and Wang J, *Analysis of Healthcare Interventions That Change Patient Trajectories*, RAND Corporation, MG-408-HLTH, 2005; available at http://www.rand.org/publications/MG/MG408/.

Fonkych K and Taylor R, *The State and Pattern of Health Information Technology Adoption*, RAND Corporation, MG-409-HLTH, 2005; available at http://www.rand.org/publications/MG/MG409/.

Girosi F, Meili R, and Scoville R, *Extrapolating Evidence of Health Information Technology Savings and Costs*, RAND Corporation, MG-410-HLTH, 2005; available at http://www.rand.org/publications/MG/MG410/.

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