



A primary resource for reliable information on the application and use of information technology in all aspects of health and health care nationally, regionally and internationally.

## Lessons for the U.S. from the Netherlands' National Electronic Medical Records System

Leo van der Reis<sup>1</sup>

<sup>1</sup>Health Management and Informatics, University of Missouri School of Medicine

*This article is available from: <http://www.ehealthinternational.org/>*

### Abstract

This paper examines issues related to the barriers to the implementation of electronic health information systems in the United States: namely financing, privacy and safety, and lack of a standardized IT protocol. It describes the ways in which the recently established Dutch national health IT system has addressed these issues. Citing the similarities between the Dutch and U.S. health systems, the paper suggests solutions that have been successful in the Netherlands which could be employed in the U.S., and also highlights challenges that continue to limit full acceptance of health IT in the Netherlands. It attempts to identify key setbacks in Dutch health IT implementation that might be avoided in the United States through early development and acceptance of a robust and reliable information protection system; nationwide health provider education regarding the long-term nature of cost recovery; and immediate, nationally organized strategic plans to create a highly functional, interoperable, standardized IT protocol, involving all stakeholders—health care providers, insurers, health IT system vendors, consumers information safety experts, and government policy-makers. Early planning should include representatives of existing private and public initiatives aimed at sharing health information electronically.

### Introduction

The current U.S. administration has pledged an investment of \$10 billion a year over the next five years to move the U.S. health care system toward adoption of "standards-based electronic health information systems, including electronic health records" which would require "full implementation of health IT and commit the necessary federal resources to make it happen."<sup>1</sup> In addition, the U.S. Congress is currently considering adding funds for health IT to the economic stimulus package under discussion.<sup>2</sup>

Electronic medical records (EMRs), the basic building blocks of an advanced health IT system, constitute an essential tool for streamlining communication among health care providers, and are crucial to supporting a medically up-to-date, financially sound, national medical services delivery system. Yet, according to a

study conducted by the Commonwealth Fund, just 28% of U.S. primary care physicians utilize EMRs (compared to 98% of primary care physicians in the Netherlands).<sup>3</sup> An up-to-date computerized patient medical history, accessible 24 hours a day by any health provider in any location would solve some of the problems in the current U.S. health care system; reducing duplication of tests—MRI's, xrays, biopsies, etc.—and minimizing errors such as neglecting drug interactions, prescription dosage mistakes and laboratory mix-ups. The long-term benefits include improved population-based epidemiological research, along with substantial administrative cost reductions. These benefits should lead to improved access to health care.

Still, there is a general reluctance on the part of many health care professionals in the U.S. to link up to a national, computerized, health information grid. There is a fear that the cost

of a national protocol will be prohibitive, and that privacy and safety would be compromised.

### **Health IT in the Netherlands**

The Netherlands have been developing a nationally connected health IT system for many years, and the Dutch government has mandated that all health care providers connect to the national computerized scheme by September, 2009.<sup>4</sup> There are certain unique cultural attributes in the health care system of the Netherlands that have accelerated the acceptance of electronic medical records, most notably their reliance on after hours health "kiosks"—a system of all-night walk-in medical clinics open to all. These clinics rely on immediate access to a patient's medical history. But, there are also some similarities between the Dutch and U.S. health systems that can be directly applied to building a workable health IT system in the U.S. More importantly, the U.S. can learn much from the difficulties and setbacks encountered by the Dutch government as the U.S. establishes a momentum toward an advanced computerized medical information system.

### **Information Privacy and Safety Concerns**

Concern about the confidentiality of electronically stored and shared medical records is the subject of much debate. While it can be argued that the information in paper records may be more vulnerable to unauthorized viewing, because any clerk employed in a hospital, doctor's office or insurance office has easy access to confidential patient information, a fully computerized, shared medical information system is vulnerable to "hackers" or inadequate data management. According to the Employee Benefit Research Institute's 2008 Health Confidence Survey, 62% of respondents stated they were "not very confident" or "not at all confident" in the confidentiality of electronically stored, shared medical records.<sup>5</sup>

The Dutch government has instituted a multifaceted approach for assuring privacy and safety of medical information. Authorized use of patient data is linked to the "civilian service number"(BSN).<sup>6</sup> Functionally, the BSN is quite similar to the U.S. Social Security number. Every Dutch citizen has a personal BSN. In addition to the BSN, a legal identification document (driver's license or passport) is required at the point of service to access patient data. Access to a patient's record is limited to those health care practitioners who are identi-

fied as part of the national health care practitioner registry, and that access is also constrained by privacy laws in which data may only be used for the provision of health care. The Dutch system does not have a central storage facility for patient information; these data stay with the originating provider and become part of a shared and encrypted master index.<sup>7</sup>

Dutch patients can opt out of the national health IT system, or they can allow access to only certain types of data. Patients have complete access to their own EMR, and they can also track who has viewed any of their electronic records at any given time.<sup>7</sup>

Ample worries and concerns are still being expressed in the Netherlands about the privacy and safety of the IT health system. One source of concern has to do with the lenient consequences for mishandling or misappropriating patient information amounting to a small fine for non-physicians, and non-payment for services to physicians.<sup>8</sup> The media have reported protests regarding security and privacy inadequacies.<sup>9</sup> For example, it seems that psychiatrists, almost as a group, do not cooperate in the health IT program. Many other Dutch physicians have expressed similar sentiments.<sup>10</sup>

### **Cost**

In a survey of California physicians, the majority of respondents cited the expense of purchasing the necessary equipment and the expense/difficulty of implementing the new system as the main barrier to utilizing EMRs in their practices.<sup>11</sup> Worries about the high cost of implementing an IT health system in the U.S. may constitute the major barrier to the adoption of EMRs. It has also been a major hurdle in the Netherlands.

While there are upfront costs to switching to a health IT system, the long-term benefits appear to, at minimum, defray these costs. Educating medical professionals about the cost savings as well as forecasts generated by trusted, independent sources has been crucial to physician adoption in the Netherlands. Most likely, it will be a key to widespread acceptance in the U.S.

Our research, including our most current study in Holland suggests that the reduction in the cost of eliminating paper trails in medical care is the most clear-cut benefit to be derived from

IT.<sup>12</sup> The Healthcare Information and Management Systems Society reported that the estimated cost reductions following implementation of early electronic medical records pilot projects in the Netherlands included 2.8 million Euro in administrative costs; 23 million Euro in patient transfer costs; and 28 million Euro in contact duplication costs. Improvements in prescription medication services and reduction in prescription errors amounted to further cost reductions of approximately 19 million Euros.<sup>7</sup>

Price Waterhouse Coopers indicated that it costs health insurance organizations an average of \$11.00 to process each claim, while HMOs average from \$8.00 to \$11.50 per claim.<sup>12</sup> The Gartner group suggests that the use of the Internet for tracking patient medical information could lower the cost of transactions now conducted manually from \$10.00 - \$85.00 per transaction to \$1.00 or less per transaction.<sup>12</sup> The ARC Consulting Group in Bellevue, Washington, estimated that about \$250 billion is spent annually on medical claims paperwork in the U.S. Conducting this same business online could reduce this cost by 90%.<sup>12</sup> These data are consistent with data from the Quincy Foundation, which indicate potential annual savings of at least \$150 billion in administrative costs, funds that could be shifted instead into direct patient care.<sup>13</sup>

In an era when many American patients see different doctors at several locations, it has become critically important to share patient information electronically between practices. One could pose the question: Can the U.S. afford not to implement a national health IT system?

### **Architecture, Communication, and Data Sharing**

A national health IT system requires that patient information be shared by and be accessible to all health providers in the system. This requirement is being mandated in the Netherlands as of September, 2009.<sup>4</sup> A large number of the existing Dutch EMR systems cannot as yet communicate across facilities or practitioner groups. This can, in part, be due to the variety of companies who offer proprietary systems irrespective of their compatibility with other systems already installed. In addition, systems vendors in the Netherlands have often included outdated standards in their implementation of regional networks, so that these regional systems do not have the strict privacy architecture mandated by the national sys-

tem.<sup>7</sup> This is one example of how some "early adopters" have had to pay the price of starting over in order to meet the Dutch government's mandated requirements.

The problems encountered in the Dutch system provide important lessons regarding the importance of early and robust strategic planning to create a highly functional, interoperable, standardized IT architecture in the U.S. There are several issues that need to be addressed in a national health IT system. These include questions such as the definition of "what exactly is an EMR? Whether the IT health system in the U.S. should be web-based; and the standardized medical terminology that will be utilized. Explicit standards and criteria are critical in all of these parameters prior to a national roll-out. These will save health providers millions of dollars in false starts and obsolete equipment.

Participants in this early strategic planning and system design must include all stakeholders in a national health IT system, including health care providers, insurers, health system vendors, consumers, information safety experts, and government. Early planning should also bring together representatives of existing private and public initiatives aimed at sharing health information electronically in order to learn from their successes and avoid repeating mistakes.

### **Conclusion**

Most everyone who is involved in health care—physicians, nurses, legislators, corporate entities, and insurers—have come to realize that implementation of EMRs in the U.S. is not merely a convenience but an essential tool in reforming health care. The advantages are generally well recognized. Yet, acceptance of IT in medical practice has been disappointingly slow. Lack of understanding, skewed communications between vendors and users, cost and, most importantly, lack of leadership and guidance are among the factors that have stood in the way of widespread, coordinated and integrated national use. Within recent weeks and months, the government of the Netherlands, a country with a medical delivery system that, in many ways, is similar to the U.S., declared that, henceforth, there shall be national access to each citizen's medical file. This was an abrupt introduction of a national medical IT system, which was considered necessary to sustain the health system. Time will tell whether this approach by the Dutch

Minister of Health is the proper way to introduce IT on a national basis. Now, serious and significant steps are being taken in the U.S. to introduce IT on a large, integrated, coordinated scale, such as the recently established California Center for Connected Health. Valuable lessons from scenarios such as we've described in the Netherlands can ease the introduction of IT in medicine.

**Address reprints to:**

*Leo van der Reis, M.D.  
70 San Pablo Avenue  
San Francisco, CA 94127*

**E-mail:** *vanderreis@health.missouri.edu*

**References**

- 1.** Obama, B. and Biden, J., Barack Obama and Joe Biden's Plan to Lower Health Care Costs and Ensure Affordable, Accessible Health Coverage for All. . [web] 2008; Available from: [www.barackobama.com](http://www.barackobama.com).
- 2.** Leavitt, M., Connecting the Dots, in *Washingtonpost.com*. 2008. p. A21.
- 3.** Schoen, C., et al., On The Front Lines Of Care: Primary Care Doctors' Office Systems, Experiences, And Views In Seven Countries. *Health Affairs*, 2006. 25(6): p. w555-w571.
- 4.** VWS, Het elektronisch patiëntendossier (EPD). 2008.
- 5.** Helman, R., M.G. Associates, and Frontsin, P., The 2008 Health Confidence Survey: Rising Costs Continue to Change the Way Americans Use the Health Care System, in *EBRI Notes*. 2008.
- 6.** VWS, Burgerservicenummer in de zorg (BSN-Z). 2008.
- 7.** HIMSS Steering Committee, et al., *Electronic Health Records: A Global Perspective*. 2008.
- 8.** Chavannes, M., Dreigende privacyramp is gevolg van blind politiek dossierdenken. *NRC Handelsblad*, 2008.
- 9.** *NRC Handelsblad*, Klink krijgt 15.000 bezwaren tegen patiëntendossier. 2008.
- 10.** Luyendijk, W., De proef strandde voordat hij kon beginnen. *NRC Handelsblad*, 2008.
- 11.** California Healthcare Foundation, *The State of Health Information Technology in California*. 2008.
- 12.** van der Reis, L., Frey, W.R., *A Bi-National Study of the Role of Information Technology in National Healthcare Systems: The Netherlands and the United States*. Quincy Foundation for Medical Research-Charitable Trust. 2001.
- 13.** van der Reis, L., *International Journal of Health Care Quality Assurance*. 20. 2007.