ISRAEL'S HEALTH IT INDUSTRY

What Does the American Recovery and Reinvestment Act
Mean for Israeli Collaborative Opportunities?

Acknowledgments

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Israel's Health IT Industry

What Does the American Recovery and Reinvestment Act Mean for Israeli Collaborative Opportunities?

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Introduction

Few people know that Israel is one of the global pioneers in health information technology, a digital revolution that began in the mid-1990s. Israel's HMOs—notably Clalit Health Services and Maccabi, which today serve about 80 percent of the Israeli population—led this revolution, which resulted in the implementation of electronic medical records used by virtually 100 percent of the country's population,[1] the vast use of laboratory and imaging information systems, computerized physician order entries,[2] and e-prescribing.

Clalit Health Services was the world's first HMO to implement a health information exchange (HIE), enabling the creation of patient files that could include data and information input from various treatment sources, such as clinics and hospitals. This has allowed for unprecedented connectivity and mobility for the 60 percent of the Israeli population currently in its system. Virtual records have eliminated inefficiencies caused by medical records previously scattered among different service providers, and they have helped promote a continuum of care, improve the quality of care, and reduce costs significantly.

Israel was also one of the first countries to use telemedicine, and to introduce electronic clinical decision support systems and online indicators for medical and service quality. The understanding that health IT requires more than just software and hardware, but involves organizational and cultural change, was essential to the successful implementation of these complex systems and generated unique knowledge on how to manage the change.

Israel's leadership, expertise in health IT, and competitive advantage could very well serve as models for the United States as it faces ... a more fully digital health-care future.

So why is it that today one thinks of Denmark or Sweden or elsewhere in Europe at the mention of cutting-edge health IT systems? How did Israel—first in the world to introduce health IT information exchange systems and with virtually 100 percent of its primary-care doctors using electronic health records—forfeit its place among nations recognized for pioneering IT leadership? And more important now, what can Israel do to change this misperception?

That question forms the basis for this paper. It is something I have considered a great deal. As the former CEO of Clalit Health Services, the world's second-largest HMO, I have spent decades leading the implementation of health IT across large institutions and bureaucracies. When I think about Israeli health IT innovation and know-how—among our national resources, really—I know they are transferable to any other country in the world and can provide models and offer solutions to different IT challenges and health systems.

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1. An electronic medical record is created and managed by licensed clinicians and staff within a single organization. An electronic health record is the aggregate electronic record of health-related information on an individual created and gathered across more than one health-care organization. By these definitions, an EHR is an EMR with interoperability (i.e., integration to other providers' systems). (Definition from the National Health Alliance for Health Information Technology.)

2. A computerized physician/provider order entry, or CPOE, allows direct entry of medical orders. Directly entering orders has the benefit of reducing errors by minimizing the ambiguity of hand-written orders, but a much greater benefit is seen with the combination of CPOE and clinical decision support tools. (http://www.cpoe.org).

It is especially imperative to examine Israel's health IT experience and expertise in light of the American Recovery and Reinvestment Act (ARRA), which President Barack Obama signed into law in February 2009. Included in the huge stimulus package, as the act is also known, is the Health Information Technology for Economic and Clinical Health Act, or HITECH Act, which authorizes between $34 billion and $42 billion[3] for Medicare and Medicaid reimbursement incentives to health-care providers using electronic medical records and system interoperability.

The United States spends more on health care than any other nation—over $7,000 per capita, versus about $2,000 in Israel.

Proponents of the HITECH Act argue that an efficient, accessible, secure, and reliable information network is the only possible way to manage—and ultimately reduce—the nation's enormous health-care expenditures.[4] The United States spends more on health care than any other nation—over $7,000 per capita, versus about $2,000 in Israel, amounting to more than 16 percent of U.S. GDP, compared with 8 percent of Israel's GDP. These unprecedented expenditures are projected to grow even further, jeopardizing U.S. economic stability. This is even truer for the individual states, whose soaring Medicaid health-care expenditures are said to play a major role in their poor fiscal situations.

How does Israel come into play here? Its leadership, expertise in health IT, and competitive advantage could very well serve as models for the United States as it faces challenges ahead in the move toward a more fully digital health-care future.

The Milken Institute has allowed me the opportunity to undertake an examination of Israel's health IT landscape and the potential for its sector firms to collaborate with U.S. firms and participate in work entailed in the American Recovery and Reinvestment Act. This project is an extension of the Institute's previous work and interest in Israeli health services. In December 2007, the Institute convened a Financial Innovations Lab, "Accelerating Medical Solutions in Israel," which resulted in a number of recommendations to bridge the capital access gap; develop greater IT infrastructure; and create a network of global collaborations to export Israeli innovations.

The current project consists chiefly of a feasibility research study focusing on a survey of Israel's health IT industry. Its goal is to identify potential opportunities for further product and infrastructure development, as well as best-practices and know-how transfer.

The inaugural meeting for the project took place in March 2009 in Israel with more than forty representatives from Israeli and multinational health IT companies, venture capital firms, and Israeli government ministries. We also initiated a series of meetings and conversations with U.S.-based experts at the Milken Institute's Global

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3. Final sums will depend on the actual reimbursements, but $34 billion to $42 billion is a generally accepted estimate.

4. The Organisation for Economic Co-operation and Development *Factbook 2009* defines health expenditure as "the final consumption of health goods and services (i.e., current health expenditure) plus capital investment in health-care infrastructure. This includes spending by both public and private sources (including households) on medical services and goods, public health and prevention programs, and administration. Excluded are health-related expenditures such as training, research, and environmental health."

Conference in April 2009. During the conference, Israel's health IT strength was examined in the session "Health Information Technology and the Health-Care Revolution." We met later with U.S. public officials, industry professionals, hospital representatives, health-care providers, and elected office-holders.

We began this undertaking with the understanding that the United States is open to learning from the experiences of other nations—but chiefly those in Europe. Thus, we have included comparative graphs that examine health-care expenditures, quality-of-health indicators, and health IT systems in six countries—Denmark, Sweden, the Netherlands, the United Kingdom, the United States, and Israel. The comparisons illustrate how Israel is positioned from a global perspective. The survey examined every company, no matter its size, in the Israeli health IT industry, and evaluated its potential to meet U.S. requirements under the stimulus package.[5] Our evaluations are predicated on the assumption that while the HITECH Act is primarily focused on two reforms—the implementation and meaningful use of electronic medical records, and the introduction of interoperability—a successive phase will allow for other IT solutions that support cost control, assist research and clinical decision-making, provide telemedicine solutions, and empower patients through the use of personal health records (PHRs). We discuss the characteristics and needs of the relevant companies for each phase, and we provide recommendations for next steps.

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5. ARRA requirements are numerous and complex. Some are still being refined. Recommendations for the definition of "meaningful use," for example, compiled by committee and submitted to the Office of the National Coordinator in August 2009, totaled sixteen pages. http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10741_888532_0_0_18/FINAL %20MU%20 RECOMMENDATIONS%20TABLE.pdf (accessed January 7, 2010).

Health-Care Quality, Expenditure, and Health IT Comparisons

How does the United States rank with other developed nations in terms of health-care expenditures, quality of health care as seen through certain indicators, and employment of broad-scale electronic health technology? How do Israel's health-care expenditures and health IT firms compete against those in other high-tech countries?

This section looks at the United States and Israel relative to Israel, Denmark, Sweden, the Netherlands, and the United Kingdom, which are considered leaders in health quality and health IT penetration in the world.[6]

Figures 1 and 2, on the following page, show that Israel's health expenditure in 2007 constituted 7.7 percent of its GDP and $2,048 per capita. Health expenditures in the United States accounted for 16.0 percent of GDP and $7,290 per capita. The U.S. totals are significantly higher than those of Israel, Denmark, Sweden, the United Kingdom, and the Netherlands. In fact, U.S. spending is the highest among all other OECD countries. Israel's totals are the best among the six countries in both measures.

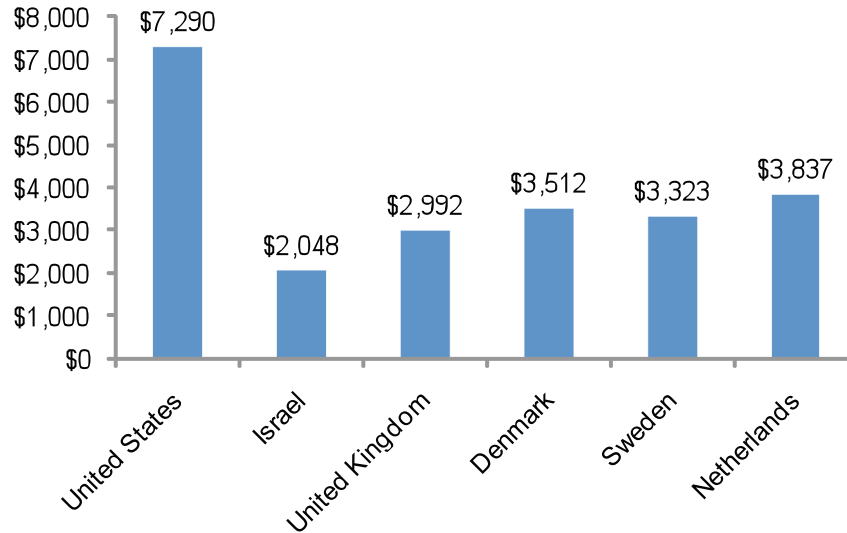**Figure 1. Total expenditure on health care, percent of GDP (2007)**
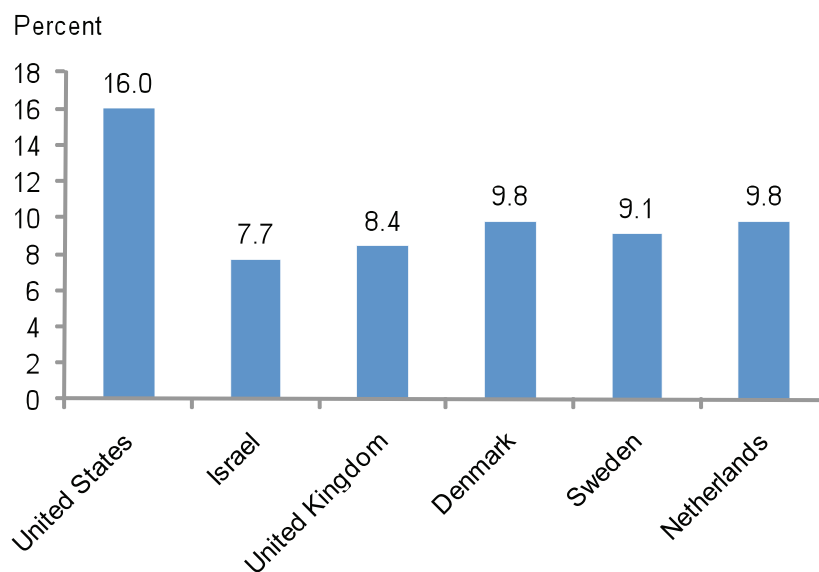
Source: OECD Health Data 2009, November 2009, and Israel Central Bureau of Statistics.

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6. Daniel Castro, "Explaining International IT Application Leadership," The Information Technology and Innovation Foundation (ITIF), September 2009, p.1, http://www.itif.org/files/2009-leadership-healthit.pdf, (accessed August 2009).

**Figure 2. Total health expenditure per capita in U.S. dollars (2007)**

Source: OECD Health Data 2009, November 2009.
Note: Data are expressed in U.S. dollars adjusted for purchasing power parities (PPPs).

Israel is also the only country in the group to show a protracted decrease in health expenditures in the past decade, as illustrated in figure 3. All five other countries show increases, with the United States showing the steepest rise over the time period.

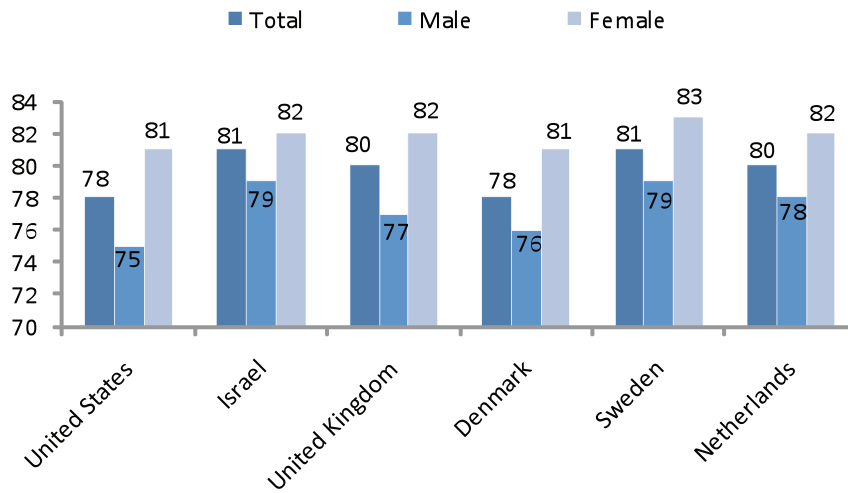**Figure 3. Total health expenditure, percent of GDP (2000–2007)**
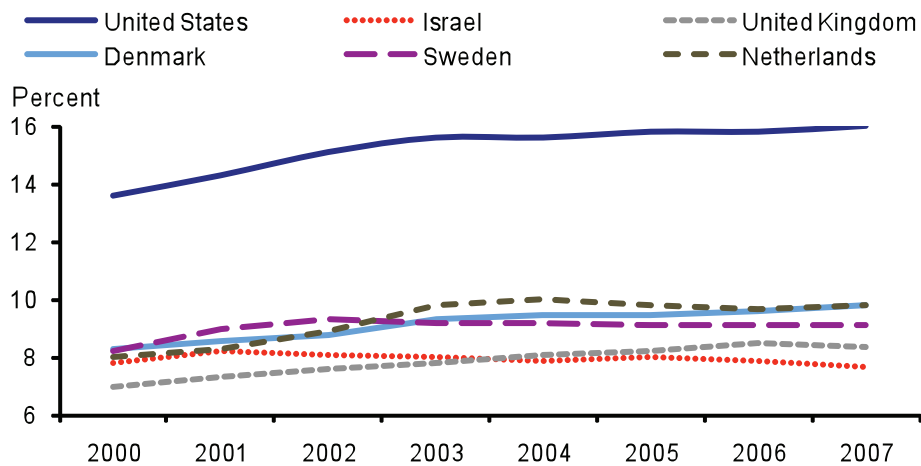
Sources: OECD Health Data 2009, November 2009, and Israel Central Bureau of Statistics.

Life expectancy at birth and infant mortality rates are indicators of the quality of health care in a country. Rates for both are better in Israel than in the United States, as shown in figures 4 and 5. In 2007, Israel's life expectancy at birth for males and females stood at 79 and 82, respectively, while the U.S figures were lower, at 75 and 81, respectively. Israel measured better for infant mortality, as well, with 3.8 deaths per 1,000 births, compared to the U.S. total of 6.7.

Figure 4. Life expectancy at birth (2007)

■ Total   ■ Male   ▨ Female

Sources: OECD Health Data 2009, November 2009 and Israel Central Bureau of Statistics.
Note: The data for the United Kingdom and United States are in 2006.

Figure 5. Infant mortality rate per 1,000 live births (2007)
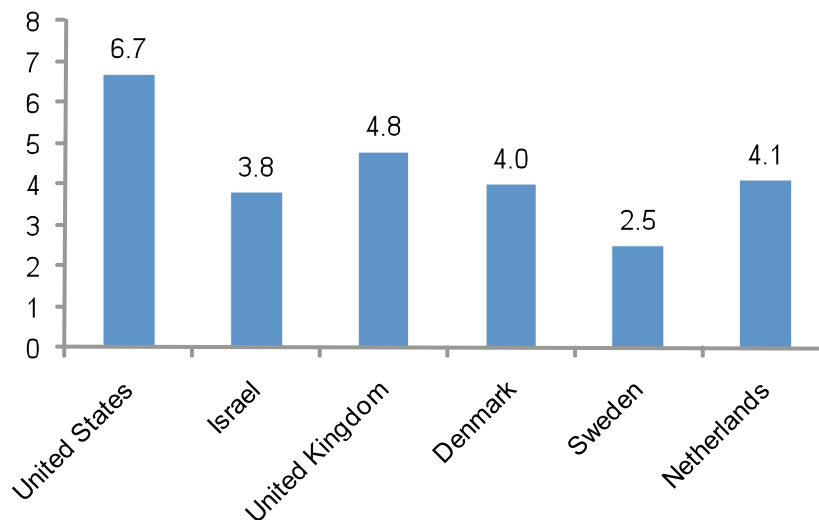
Source: OECD Health Data 2009, November 2009.
Note: The data for the United States is from 2006.

The adoption and implementation of health IT is significantly higher in Israel than in the United States, as shown in the following figures. Today, virtually all of Israel's primary-care physicians use electronic health records,[7] while only 28 percent of those in the United States do. At 95 percent, Israel also outscores the United States (20 percent) in the use of e-prescribing.

Figure 6. Use of EHR systems by primary-care physicians (2009)
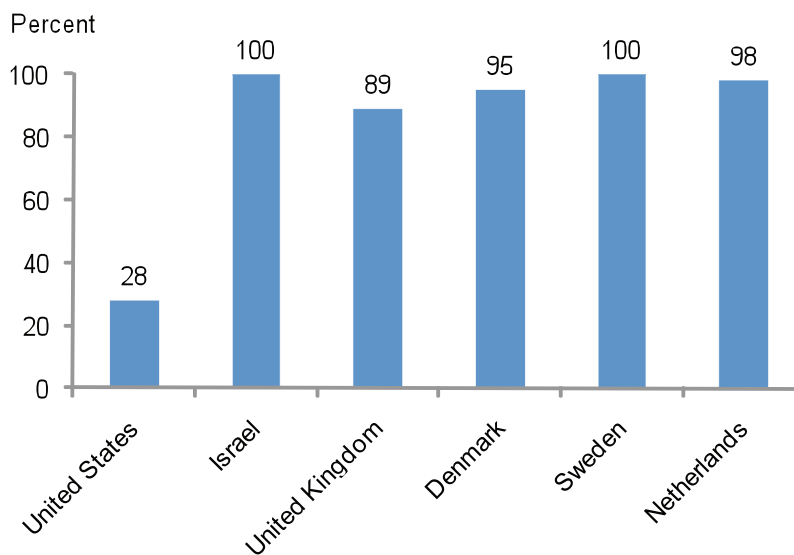
Source: The Information Technology and Innovation Foundation, September 2009.

Figure 7. Use of e-prescribing by primary-care physicians (2009)
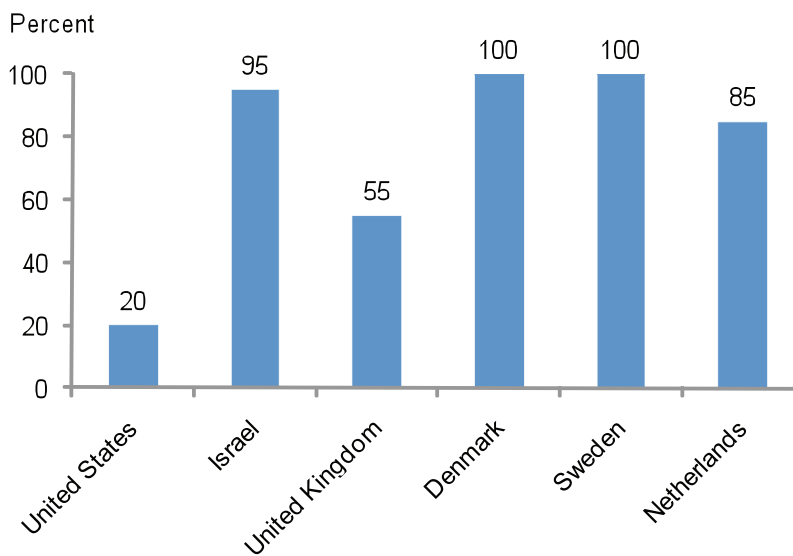
Source: The Information Technology and Innovation Foundation, September 2009.

7. Among health IT experts, the more accurate term applied to figure 6 would be EMR, but the OECD has chosen a more all-encompassing designation, as do many organizations.

Comparative Health IT

Numerous factors play into how well a country implements broad-scale health IT. As noted in a recent paper published by the Information Technology and Innovation Foundation, these factors include the state of its health-care system, the size and diversity of its population, market and governmental incentives, and the support for health IT from the national leadership, in terms of public policy, mandates, and funding.[8] This section offers a brief overview of health IT in select European countries. Much of the information has been excerpted from websites and reports.

Denmark

Virtually all of the country's primary-care physicians write electronic prescriptions, 95 percent of them use electronic health records, and 80 percent use computerized physician order entry systems. Hospitals show a lower EHR usage, at 35 percent.

By 2003, all parts of the health-care sector made use of IT to a certain extent, noted the then-Ministry of the Interior and Health in a report on the nation's IT strategy.[9] That process had begun in the 1990s, with the introduction of a nationwide electronic communications system, Medcom, that today allows hospitals workers, physicians, pharmacies, labs, and patients to sign in for access to records or to look at X-rays, administer insurance claims, write referrals, and perform a host of other functions.[10] In 2003, the ministry published an ambitious National IT Strategy for the Danish Health Care Service with the goal of full digitization of the entire service by 2007. The plan built upon earlier initiatives that sought to deliver IT to the hospital system, expanding those goals and seeking greater efficiencies in wait time, EHR user satisfaction, and overall patient care.[11]

The financing of electronic medical records is on both local and national levels. General practitioners, for example, purchase their own systems; state and local authorities finance or co-sponsor services or cross-sector services. Regions and municipalities finance their own systems.[12] The ambulatory sector is serviced by about fifteen local EHR systems, relatively small vendors, since no major vendors have taken the steps to provide the services to the general practitioner office market segment.[13]

Interoperability remains a weakness in the Danish system. The country is not yet linked to the U.S.-developed SNOMED,[14] an electronic standard cross-referencing of medical terminology used in more than forty countries that was adopted in 2007 by the International Health Terminology Standards Development Organisation.

8. Daniel Castro, "Explaining International IT Application Leadership."

9. "National IT Strategy 2003-2007 for the Danish Health Care Service." Ministry of the Interior and Health. May 2003, p. 10, http://www.sst.dk/publ/Publ2004/NATIONAL_IT_STRATEGY.PDF (accessed December 9, 2009).

10. "Electronic Health Records: A Global Perspective," Health Information and Management Systems Society. August 2008, p. 55, http://www.himss.org/content/files/200808_EHRGlobalPerspective_whitepaper.pdf (accessed January 7, 2010).

11. "National IT Strategy 2003-2007 for the Danish Health Care Service." Ministry of the Interior and Health.

12. "Electronic Health Records: A Global Perspective,"p.54.

13. Ibid.

14. Ibid., p.57.

Sweden

Long known as an innovative IT leader, Sweden has launched Phase 1 of its National Patient Summary initiative, one of the first nationwide electronic health record systems in the world. The May 2009 debut took a year of planning by the Swedish Healthcare Advisory Organization and involved a five-year software contract with a U.S. firm, InterSystems Healthshare, and a Finnish company, TietoEnator, an IT service company, as the prime contractor.[15]

Sweden instituted an eHealth Strategy that got under way in 2006 with the recognition that 95 percent of all primary-care documentation was already in the form of electronic medical records, and that 55 percent of all prescriptions were electronic, but that "most [information communication technology] systems in health care [were] built for storage of data, not exchange of data." The eHealth Strategy has focused on other areas as well: laws and regulations, information structure, technical infrastructure, access to information across organizational boundaries, and accessibility for citizens.

Also in 2007, Sweden became one of nine charter members of the International Health Terminology Standards Development Organisation, which acquired the multilingual medical terminology standardization tool from SNOMED.[16]

Today there is virtually 100 percent usage of electronic health systems by primary-care physicians; 88 percent of all medical records in hospitals are digital, far ahead of all other countries. Additionally, all primary-care physicians write e-prescriptions.[17]

Netherlands

Some 85 percent of primary-care physicians write e-prescriptions. About 98 percent use electronic health records, but hospitals report less than 5 percent usage. The use of computerized physician order entry systems by primary-care physicians stands at only 5 percent.[18] Adoption and implementation of EMR systems in hospitals have been relatively slow; as a result, community, secondary, and tertiary hospitals do not participate. All pharmacies have been hesitant to share the information they hold, and there are no incentives in place yet for them to do so. Without financial incentives, hospitals and pharmacies cannot offset their investments in systems and data integrity.[19]

The country's infrastructure provides a firm basis for its national IT strategy, which includes standardization of messaging, identification and authentication, and gradual implementation of semantic interoperability. But the country has not yet developed a national virtual EHR system because of the inability of its health-care providers to work together. According to "Electronic Health Records: A Global Perspective," published by the Heath Information Technology and Management Systems Society in 2009, because a "clear business case for sharing data is still lacking, most individual health-care providers have resisted EHR adoption."[20]

15. "Sweden launches national electronic health record." June 3, 2009. Healthcare IT News, http://www.healthcareitnews.com/news/sweden-launches-national-electronic-health-record (accessed January 7, 2010). Also: "Sweden's national EHR project gets a vendor." March 19, 2008, http://www.healthcareitnews.com/news/swedens-national-ehr-project-gets-vendor (accessed December 9, 2009). Also: "Sweden Jumps on the National EHR Bandwagon." June 10, 2009, HealthNewsDirect.com, http://www.healthnewsdirect.com/?p =546 (accessed December 9, 2009).

16. "SNOMED CT acquired by an international standards organization," April 26, 2007, http://myoscar.org (accessed December 9, 2009).

17. Castro, "Explaining International IT Application Leadership," p.10–15.

18. Ibid.

19. Dutch Ministry of Health, Welfare and Sport, www.minvws.nl/en/themes/ict_in_ healthcare.

20. "Electronic Health Records: A Global Perspective," p.27.

United Kingdom

In the U.K., 89 percent of primary-care physicians use EHR systems, and 55 percent are e-prescribing. However, there is only 3 percent usage of EHR systems in hospitals. Primary-care physicians report 20 percent usage of computerized physician entry order systems, but for hospitals the figure is lower, at less than 5 percent.[21]

The National Health Service is one of the world's largest employers, with more than 1.3 million individuals on its payroll. The NHS's national program for IT (NPfIT) comprises one of the most expensive e-health programs in the world, with a budget of £12.4 billion over ten years. Annually, this stands for about 0.08 percent of GDP and 1.2 percent of the NHS budget.[22]

Throughout the country, there are differences in the EMR adoption and implementation level between regional and local organizations. Primary-care providers are ahead, since over the years, they have had to comply with NHS requirements. Additionally, "successful adoption has also been attributed to leadership by highly committed physician champions and carefully targeted communication, regulation, assistance, and incentives on the part of the NHS."[23]

The United Kingdom as a whole has taken steps to develop a strategy that would raise general standards of health IT; this is mainly done through a mixture of incentives and regulations. In addition, each of the five U.K. states has been developing its own strategy to improve health IT adoption.[24]

Israel

In Israel, there is a 100 percent usage of ambulatory EMR, with approximately 70 percent coverage of health information exchange. Despite a high degree of computerization, there is still a low penetration of a full EHR system in hospitals; it is estimated at about 20 percent. Primary-care physicians' usage of e-prescribing and computerized physician order entry systems are each estimated at 95 percent, and there is extensive usage of service and medical quality indicators.

Israel's health IT is "an evolving, innovative, state-of-the-art implementation of medical data exchange," according to *The Israeli Virtual National Health Record: A Robust National Health Information Infrastructure Based on a Firm Foundation of Trust* (IOS Press, 2005). The exchange is based on "the unique concept of 'virtual temporary sharing,' in which a connection of multiple caregivers and medical organizations creates a patient-centric virtual repository of information. Data are not kept centrally; instead, all information remains in its original format, location, system, and ownership. On-demand, relevant information from anywhere in the system is instantly integrated and delivered to the point-of-care. This system, successfully covering more than half of Israel's population, is currently evolving from a voluntary private-public partnership to a formal national reality."[25] In short, Israel's technical expertise and innovation are valuable assets that may export well.

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21. Castro, "Explaining International IT Application Leadership," p.10–15.

22. "Response to Taxpayers' Alliance comments on NPfIT budget," NHS Connecting for Health, July 13, 2007, www.connectingforhealth.nhs.uk/newsroom/ media/taxalliance (accessed August 2009).

23. "Electronic Health Records: A Global Perspective," p.42.

24. Ibid." p.38.

25. Esther Saiag, "The Israeli Virtual National Health Record: A Robust National Health Information Infrastructure Based on a Firm Foundation of Trust" in *Connecting Medical Informatics and Bio-Informatics*, (IOS Press, 2005), Abstract, http://iospress.metapress.com/content/7u65mnqvf8a901r0 (accessed December 7, 2009).

United States

There is about 28 percent usage of electronic medical record systems by primary-care physicians, and about 9 percent usage in hospitals. Additionally, there is a 20 percent usage of e-prescribing. While 22 percent of primary-care physicians use computerized physician order entry systems, 15 percent of hospitals do.[26]

Concern about rising costs and the need for greater use of electronic tools didn't begin, of course, with the Obama administration. In 2004, the United States unveiled a plan that included a goal to implement electronic health records for a majority of Americans by 2014. That year, the first U.S. regional health information organizations, known as RHIOs, were created to facilitate the rural health IT adoption.[27]

The siloed nature of the health-care system presents great challenges for network interoperability, consisting as it does of thousands of participants: doctors, patients, clinics, HMOs, hospitals, pharmacies, and labs, not to mention insurance firms and their private and public consumers. *The State Guide for Electronic Health Information Exchange,* released in 2009, noted that instead of elevating their importance, only a "few [RHIOs] have assumed the responsibility for building and operating the system [and] instead, different stakeholders have built information systems to address their particular needs."[28]

"As a result, development of a cohesive, patient-centric system has languished in most areas, and there is little interoperability," notes the 2009 report from the State Alliance for E-Health, a large group of state elected and appointed officials.[29] This lack of interoperability is one of the biggest challenges the American health-care system faces as it attempts to move toward large-scale adoption of health IT.

To compound difficulties, U.S. hospitals and physicians have been very slow to adopt systems for managing electronic health records. In January 2009, *The New England Journal of Medicine* reported that only 1.5 percent of U.S. hospitals had adopted a comprehensive, hospital-wide EHR system. Another 7.6 percent used basic systems limited to specific hospital units.[30]

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26. OECD report, 2009.

27. "On the Road to RHIO: What State CIOs Need to Know." National Association of State Chief Information Officers (NASCIO), http://www.nascio.org/publications/ documents/NASCIO-OnTheRoadToRhio.pdf (accessed December 7, 2009).

28. "Preparing to Implement HITECH: A State Guide for Electronic Health Information Exchange," State Alliance for E-Health, 2009, p.4, http://www.nga.org/Files/ pdf/0908ehealthhitech.pdf (accessed December 8, 2009).

29. Ibid.

30. "Use of Electronic Health Records in U.S. Hospitals," *New England Journal of Medicine*, January 16, 2009.

U.S. Opportunity: The Health-Care Stimulus Package

The American Recovery and Reinvestment Act (ARRA) includes legislation to further promote the widespread adoption of health IT to support the implementation of electronic health records and the more rapid development of a health information exchange system to permit the secure transfer of information among providers within and across regions.

The Health Information Technology for Economic and Clinical Health (HITECH) Act builds on existing federal efforts and provides financial incentives for health IT use among health-care practitioners. It establishes grant programs to provide funding for investing in health IT infrastructure and training, and it authorizes grants to states for low-interest loans to help providers finance health IT. Beginning in 2011, it will provide Medicare and Medicaid (the two most expensive programs) incentive payments to encourage doctors and hospitals to adopt and use certified electronic health records. Finally, the HITECH Act includes a series of privacy and security provisions that expand the current requirements under the Health Insurance Portability and Accountability Act (HIPAA).

Oversight of all this belongs to the Office of the National Coordinator for Health Information Technology (ONCHIT), which was created in 2004 within the Department of Health and Human Services and charged with developing and implementing a strategic plan to guide the nationwide implementation of health IT in the public and private sectors. The Office of the National Coordinator works chiefly with two advisory committees: the Health Information Technology Policy Committee and the Health Information Technology Standards Committee. The former addresses certification standards for system specifications, interoperability, and usage; the latter focuses on policy for the nationwide health IT infrastructure and ensuring its security. A description of the two major committees and their functions appears in appendix 1.[31]

One of the more important standards by which health-care providers will qualify for Medicaid and Medicare incentive reimbursements (these may total up to $65,000 or $44,000, respectively, per provider over five years) is the term "meaningful use" as it relates to electronic health records. Standards will be categorized for hospitals and the various other health-care providers. In general, "meaningful use" will likely eventually encompass the percentage use of electronic prescription use, computerized physician orders, claim submissions, quality measures reports, bar-coding drug, drug-allergy and drug-formulary checks, the maintenance of problem diagnosis lists, patient-accessible records and lab reports, stored family medical histories, and more. A complete "meaningful use" matrix, the "Health IT Policy Council Recommendations to National Coordinator for Defining Meaningful Use," was submitted to the ONC in August 2009 and covers proposed definitions to be phased in during 2011, 2013, and 2015. The recommendations, which include goals and measures, may be accessed at: http://healthit.hhs.gov/portal/ server.pt/gateway/PTARGS_0_10741_888532_0_0_18/FINAL%20MU%20RECO MMENDATIONS %20TABLE.pdf.

Electronic health records and operational systems themselves must undergo certification in order to qualify for program reimbursements. Certification falls under the purview of the Certification Commission for Health Information Technology, a nonprofit organization founded in 2004 and under contract to the federal government." More than 200 EHR products [were] certified by mid-2009, representing over 75% of the marketplace," notes CCHIT's website.[32] In October 2009, the organization introduced two versions of its certification process, the more ambitious "CCHIT Certified 2011" program and a "Preliminary ARRA 2010" program.

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31. Health Information Technology. U.S. Department of Health and Human Services, http://healthit.hhs.gov/portal/server.pt (accessed December 8, 2009).

32. "About the Certification Commission for Health Information Technology," http://www.cchit.org/about (accessed December 9, 2009).

"Changes to the interoperability and security standards from the Office of the National Coordinator's Advisory Committees were still emerging as the Commission's 2011 programs prepared to launch," notes the website's "Get Certified" link. "The Commission continues to update its certification materials and … to accommodate those changes," which it expects to be minor.[33] The site offers a "Concise Guide to CCHIT Certification Criteria" at http://www.cchit.org/sites/all/ files/ConciseGuideToCCHIT_CertificationCriteria_May_29_2009.pdf.

Distribution of the Funds

Key components of the HITECH Act that will attempt to drive health information exchange and electronic health record initiatives include the following:

A. Medicaid and Medicare

Medicaid and Medicare incentive payments will be available to providers employing "meaningful use" of electronic health record systems and exchanging data. As noted earlier, the totals allocated for Medicaid and Medicare incentives are expected to range between $34 billion and $42 billion. Much of the information below is taken from the "Summary of the HHS Recovery Operation Plan" (www.himss.org) and "Medicare and Medicaid Health Information Technology: Title IV of the American Recovery and Reinvestment Act."[34]

To be eligible for Medicaid incentive payments, a certain percentage of the provider's patient caseload must be enrolled in Medicaid. The threshold in this area is generally 30 percent of patients for physicians (20 percent for pediatricians) and 10 percent for hospitals; the states will administer the Medicaid reimbursement incentives.

Eligible professionals with certified EHRs and "meaningful use" of their EHR systems may be able to receive up to $44,000 in Medicare incentive payments or up to $65,000 in Medicaid payments over five years. They may not receive both. The programs do not apply to hospital-based professionals since the hospitals will receive their own reimbursements.

Medicare payment incentives to eligible hospitals are scheduled to begin in October 2010. Payment incentives to other eligible professionals are set to begin in January 2011. Also in January 2011, eligible hospitals and professions may begin receiving Medicaid incentive payments. The Centers for Medicare & Medicaid Services will administer the Medicare and Medicaid payment enhancements.

In addition to enhanced payments, eligible providers will be reimbursed up to 85 percent of net allowable costs for EHR technology and support services, not to exceed a capped maximum amount (per provider) over five years. This reimbursement would defray the costs of purchase and implementation. Those eligible include non-hospital-based providers, federally qualified health clinics, rural health clinics, children's hospitals, and some acute-care hospitals.

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33. "Get Certified: 2011 Certification Programs Now Open," http://www.cchit.org/get_certified (accessed December 9, 2009).

34. See: http://www.cms.hhs.gov/apps/media/press/factsheet.asp?Counter=3466 (accessed December 31, 2009).

B. Office of the National Coordinator (ONC)

Total appropriated:	**$2.0 billion**
Privacy & Security:	$24.3 million
National Institute of Standards & Technology:	$20.0 million
Regional Health IT Exchange:	$300.0 million
Unspecified:	$1.66 billion

There is no clear timeline for spending this money (unlike most of the ARRA funds).

Funding will be provided for both state planning and state implementation grants.[35] To receive an implementation grant, a state must have a plan approved by the Department of Health and Human Services. Each state will decide how it prepares to adopt its health information exchange and the appropriate infrastructure, and will ask for federal grants to do so. The ONC will determine the grant amount; the state would match it according to the following ratios: 1:10 in 2011, 1:7 in 2012, and 1:3 in 2013 and beyond.

Funding will target the following goals:

1. Creation of regional extension centers to offer health-care providers technical assistance and best practices in implementing and using health IT. Provides direct funding to community health centers for infrastructure improvements, including health IT.

2. Training and education programs for health IT adoption process.

3. Shared programs with other agencies and departments, such as the Food and Drug Administration and the Social Security Administration.

4. Establishment of a loan program for certified EHR technology purchase and implementation costs. It would provide selected states or other grantees with funds to make guaranteed loans available to providers for the purchase and implementation expenses associated with adopting certified EHR.

C. Hospitals Under ARRA: Acute-Care and Critical-Care Facilities

Medicare incentives are also available through the American Recovery and Reinvestment Act (ARRA) for acute-care and critical-care hospitals.[36]

Starting in 2011, acute-care hospitals are eligible to receive payments through Medicare for up to four years if they are able to prove that they have a qualified EHR and can show meaningful use of such EHR in treating Medicare patients. The maximum amount available under this incentive has been estimated at around $11 million for the nation's largest hospitals.

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35. This material may be found at http://www.hhs.gov/recovery/reports/plans/onc_hit.pdf and http://healthit.hhs.gov/portal/server.pt?open=512&objID=1233&parentname=CommunityPage &parentid=3&mode=2&in_hi_userid=10741&cached=true (accessed August 2009).

36. This material is taken from "Medicare for Hospitals," from eHealth Initiative, http://www.ehealthinitiative.org/medicare-hospitals.html (accessed August 2009).

ARRA lays out a complicated formula for determining the size of the payment that an acute-care hospital can receive, involving: total discharges; Medicare A and C inpatient days; total inpatient days; total revenue; total charity care, and critical-access hospitals. The full formula appears in appendix 2.

Under ARRA, critical-access hospitals employing "meaningful use" are allowed to completely depreciate their certified EHR costs, starting in fiscal year 2011, allowing them to front-load the benefits of depreciation.

ARRA also alters the methodology used for determining a critical-access hospital's Medicare share in relation to the costs of EHRs, applying the formula described above, which also applies to acute-care hospitals. Finally, in addition to altering the methodology, the legislation also automatically increases the Medicare share of a critical-care hospital's EHR costs by 20 percent for fiscal years 2011–2015 as long as the payments do not exceed 100 percent of costs and do not continue for more than four years.

The hospitals can also face penalties. Currently, they are reimbursed at 101 percent of their Medicare allowed costs for inpatient services; for hospitals that are not meaningful users by 2015, reimbursements will decrease by 1/3 of 1 percent each year until it reaches 100 percent.

Israeli companies would be well advised to establish contacts at the regional and local levels, especially in less-populous states.

Role of the States

The states, too, will have expanded roles; it is they who will help implement HITECH's goals of adopting health information exchanges and the more widespread use of electronic health records. States also regulate their own Medicaid programs and, thus, the payment incentives to providers and hospitals. In addition, they will help define the term "meaningful use" as it applies to their own health systems and communities, and thus the distribution of Medicaid incentive reimbursements (they may, for example, set standards that are more strict than the federal government's, as happened in Minnesota).

State-level initiatives include a State-level Health Information Exchange Consensus Project, a forum for tracking interoperability in alignment with national goals, schedules, and measures. The State Alliance for eHealth, is chiefly composed of executive-level state government representatives who will help drive the implementation of health information exchanges and deal with inter- and intrastate issues as well. Finally, the Health Information Security and Privacy Collaboration, established in June 2006, is working to address electronic privacy and security issues.[37]

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37. This material is condensed and reprinted from the "State-Level Initiatives" link of the Health Information Technology portal of the Department of Health and Human Services, http://healthit.hhs.gov/portal/server.pt (accessed December 9, 2009).

The top-ranked states for e-prescribing in 2008 included Massachusetts, Rhode Island, Nevada, Delaware, and Michigan, according to a study by the Information Technology and Innovation Foundation. The low numbers, however, were telling: Massachusetts filed just 13.4 percent of all its e-eligible prescriptions electronically. Rhode Island followed with 9.1 percent, then Nevada (7.1 percent), Delaware and Michigan (4.2 percent).[38]

In November 2009, Iowa became the first state to receive 90 percent federal matching funds to help it set up its Medicaid reimbursement programs and its interoperable electronic health record systems.[39] In early December, California, Georgia, Idaho, Montana, New York, Texas and the U.S. Virgin Islands also qualified for the funds.[40]

Thus, Israeli companies would be well advised to stay current with implementation progress and which states qualify for funding, and to establish contacts at regional and local levels, especially in the less-populous states.

38. Robert D. Atkinson and Scott Andes, "The 2008 State New Economy Index: Benchmarking Economic Transformation in the States," The Information Technology and Innovation Foundation, p. 43, http://www.kauffman.org/uploadedfiles/2008_state_new_economy_index_120908.pdf (accessed December 9, 2009).

39. "Iowa first to receive funds for EHR incentive program," November 24, 2009. *Healthcare IT News*, http://www.healthcareitnews.com/news/iowa-first-receive-funds-ehr-incentive-program (accessed December 9, 2009).

40. "Seven more states to receive federal matching funds for EHRs," December 9, 2009. *Healthcare IT News*, http://www.healthcareitnews.com/news/seven-more-states-receive-federal-matching-funds-ehrs (accessed December 9, 2009).

Israel's Health IT Industry and U.S. Collaboration Potential

The core of this project is a feasibility survey. But before the survey could begin, it was necessary to build a database of Israeli health IT firms. Three partial databases— from the Israel Export & International Cooperation Institute, Gartner Inc., and the Israel Life Science Industry—were used to form the foundation of the updated database. The final list, including a number of previously uncited companies, now numbers 110 firms. The full list appears in appendix 3.

Questionnaires were e-mailed to all 110 companies (see appendix 4 for the questionnaire, in Hebrew), informing them of the study and hoping to gather enough information to proceed to the assessment phase and to map Israel's health IT industry and the potential for business opportunities in the United States.

We were able to obtain information on all 110 companies through the questionnaires, meetings, phone calls with company representatives, online research, and/or interviews with experts in the field. Of the 110 companies that received the questionnaires, sixty-two elected to participate in the process. Forty-one completed the questionnaires. In addition to their responses, the companies submitted executive summaries and presentations; some sent strategic business plans. Multiple visits were made to learn firsthand about some of the companies and their products in order to decide if they should be included.

Another twenty-one companies responded but stated either that their companies weren't relevant for the purpose of the study or that they declined to participate. Forty-eight companies did not respond; we looked at available information on them but concluded that only one matched the purposes of the study. It was included in the process.

The 110 companies were divided into groups, according to their potential fit with the American Recovery and Reinvestment Act. Special emphasis was placed on the following criteria: main field of operations; an established and clear connection to the United States; a customer base in Israel and abroad, with a special emphasis on the United States; and readiness of the product for U.S. implementation and its relevance to ARRA requirements, some of which have yet to be refined.

Most of the companies were found unsuitable, given the above criteria. Many are either in early-stage product development or lack sufficient U.S. connections, or their product range lies beyond the scope of the stimulus bill. One should not infer that these companies lack business potential or sound business plans. Rather, for the purpose of ARRA, they were excluded.

Overall, twenty-two companies were identified as potentially relevant to ARRA. These were divided into two groups, based mainly on their preparedness under the U.S. initiative. As stated earlier, the first phase of the stimulus package will target electronic health records and health information exchanges (the interoperability systems), applicable only to the first group. The next phase will likely involve other areas in which additional Israeli companies, those in the second group, may be relevant. Such areas may include, in our opinion, telemedicine solutions, clinical decision support systems, cost-containment systems, personal health records, and research.

Group 1

The group includes six companies that have strong U.S. connections, whose products are ready, fall under the ARRA scope, and have already been implemented in the United States. General group characteristics are summarized in table 1.

- Bircon
- dbMotion
- eWave
- iMDsoft
- Irit Model Systems
- Medcpu

Table 1: Summary of Group 1 characteristics

Main field of operations	Most focus on electronic medical/health records. One company specializes in health information exchange.
Size	Three employ fewer than 10 workers. The biggest company is part of a group that employs 250. The remaining two companies have more than 100 employees.
Experience	Some have been operating since the 1990s; others are relatively new. Two companies split from each another in 2009, but their product experience goes back to the 1990s. The newest company was established in 2008; its creators have a significant amount of experience in the health field. All companies have implemented products both in Israel and abroad.
Customer base	All companies have customers abroad. All companies have U.S. customers. Two have customers in Europe, Asia, and Australia.
U.S. activity	All are either registered in the U.S. or act as a spin-off of a U.S. company. All have U.S. customers and have been operating in the United States for a number of years.
Company's main needs	Financial assistance is the most common need. One company responded that it might need additional capital later. Most would be interested in exploring cooperation with an Israeli partner to increase their strength. Two expressed interest in finding a U.S. strategic partner.

Group 2

This group comprises sixteen companies that may fit into successive phases of the stimulus plan, if the bill moves according to expectations and if the companies make some necessary adjustments. These adjustments include identifying U.S. strategic partners, completing the implementation of their prospective products, and complying with HITECH requirements. Group characteristics are summarized in table 2 on the following page.

- Aerotel
- ASV
- Cepco Health Management Systems LTD
- Clinicode
- Cliniworks
- Commwell
- Elad Solutions
- Exact Cost
- Matrix
- Medic4all
- MediLogos
- Mediviz
- Paradigma Systems
- SHL
- Vaica
- Walletex

Table 2: Summary of Group 2 characteristics

Main field of operations	Half of the companies work in telemedicine, while the others are in personal health records, clinical decision support systems, and clinical research.
Size	The largest company has about 400 employees. The next two companies have dozens of employees. About half have about 20 employees. Three employ fewer than 10 workers.
Experience	The oldest company was created in 1987; the newest in 2008. Five came into being in the 1990s. Three were created in the past three years. With the exception of two, all have implemented their products in Israel. The other two have done the same in Europe and the United States.
Customer base	All companies are functioning and have customers. Three have only Israeli customers. Ten have Israeli and U.S. customers. One has only U.S. customers. One has only European customers.

Table 2: Summary of Group 2 characteristics, cont.

U.S. activity	Five companies are registered in the U.S. One has sold a daughter company to a U.S. corporation. Four are not registered in the U.S. but have been operating in the U.S. market and have U.S. customers. Four do not have U.S. connections.
Company's main needs	Financial assistance is the most common need. Some companies said that this was targeted at enhancing U.S. marketing and sales capabilities. Most indicated the wish to identify a U.S. strategic partner. Half are interested in assistance to develop market penetration strategy. Half want more information about U.S. health-care reform and market needs. Two would consider cooperating with another Israeli company.

Summary and Recommendations

The adoption and implementation of health IT is significantly greater in Israel than in the United States. Primary-care physician usage of EHRs in Israel stands at 100 percent, compared to just 28 percent in the United States. In terms of CPOE and e-prescribing, Israeli usage is 95 percent, while in the United States, usage is just 20 percent. Israel was also one of the first, if not the first, to use a health information exchange (HIE) to allow interoperability among providers.

At the same time, Israel's health expenditures per capita are less than a third of those in the United States: $2,048 versus $7,290; and its health expenditures as a percentage of GDP are less than half that of the United States: 7.7 percent versus 16.0 percent. Israel, in fact, also scores slightly better in both measures against such international health-care leaders as Denmark, Sweden, the United Kingdom, and the Netherlands, while the United States scores significantly worse.

This greater efficiency in Israel has not come at the expense of quality of health care. In two important quality-of-care indicators—life expectancy at birth and infant mortality rates—Israel fares better than the United States. Israel's life expectancy at birth for males and females stands at 79 and 82, respectively, compared to 76 and 81 in the United States. The U.S. score is 6.7 for infant mortality per 1,000 births, compared to Israel's lower mortality rate of 3.8.

With Israel scoring as well as, if not better than European nations considered to be health IT leaders, it is clearly doing something right. So why is it that with its innovations in technology and its health-care efficiencies, the rest of the world thinks of Denmark, Sweden, or elsewhere in Europe at the mention of cutting-edge health IT systems and support? What happened to Israeli leadership?

Part of the answer lies in how Israel's health IT came into being. Sweden, Denmark, and the Netherlands, among other nations, instituted "top-down" government mandates for health IT implementation. Israeli industry development took a different approach, one that did little to boost its global profile. The change didn't come from the government. In fact, Israel has had little government investment in health IT. And the private sector elected to invest very little in it either, preferring to pour investment dollars into other high-tech industries.

Israel's great innovations were the products of grass-roots change, pushed first by the HMOs and other public-sector health-care providers. They were driven mainly by competition for clients (and funding) and the need to connect fragmented and disparate health systems for a competitive edge. As in the United States, the marketplace pushed the need to create interconnectivity, allow for national mobility, and work with legacy software.

What can Israel do to build a global health IT reputation and market its accomplishments? Below are a number of observations and recommendations.

- Israel boasts a vast body of knowledge in health IT; more than 100 health IT companies have been identified in this survey. But the lack of government support and the very limited availability of venture capital investment have hampered the establishment of more companies in this field. A definition of health IT as a "national resource" will raise public awareness of this valuable asset. More important, I believe, greater support for the industry will result in dynamic, even soaring growth, both in terms of the number of emerging companies and in their ability to export Israeli innovation.

- Twenty-two companies have been identified as suitable for the U.S. HITECH initiative. Moreover, there is invaluable know-how about implementation processes and management, of both the cultural and organizational change, that are so crucial for success.

- Six companies involved in electronic medical records and health information exchange platforms are targeting the original goals of the act. Another sixteen, focusing on diversified fields like cost containment, telemedicine, research, and medical decision support systems may be suitable for a later phase.

- Almost all these companies must be provided with relevant information on the evolving certification and standards requirements including those for "meaningful use" and interoperability.

- Relevant companies have to be "Americanized," i.e., they must have an American base, with American employees (one of the major goals of the ARRA) and/or business cooperation with American health IT companies. Most of the companies cannot do it on their own.

- Substantial investment is needed for the above-mentioned needs, and especially for expediting the R&D phase and building suitable marketing and sales strengths.

The U.S. health IT initiative is still in a formulation phase that is expected to last at least to mid-2010. Different committees are still at work, and it will be interesting to follow their discussions, even before their final recommendations are published. Individual states have unique responsibilities and budgets, and it is imperative to study in more depth their individual initiatives and to increase their awareness of what the Israeli health IT industry has to offer. This is especially true for "know-how" companies that could help in the planning phase and, even more so, in the management of the huge cultural change involved. Opportunity may also arise for companies involved in interface production and integration, as more states will choose their own health information exchange systems and will need to link in existing health IT systems.

The following actions will improve Israeli success:

1. Immediately establish an organizational structure (to be defined), preferably within the Ministry of Trade, Labor and Industry, that will assume responsibility for the Israeli health IT opportunities in the United States. The organization will ensure that the following will take place:

    - Maintain the newly created health IT database.

        - Periodically review existing companies and adjust contact information accordingly.
        - Manage the "short list" of ARRA-relevant companies.

    - Preserve the close relations developed with the Israeli health IT companies.

        - Send out information on opportunities in the United States.
        - Share information regarding U.S. requirements on adopting and implementing health IT.

    - Continue to identify and create specific contacts for the Israeli companies with key personnel in the United States. In some cases, commercial partnerships with American companies should be identified.

2. Israel must immediately raise awareness in the United States, at regional, state, and local levels. Without direct and immediate investment in Israel's health IT assets, the U.S. focus is going to be solely on Europe, and Israeli companies will miss out on opportunities.

3. The most important way to accomplish the task of "marketing" the Israeli IT health industry is to identify and define the party responsible and allocate the needed resources for the following missions:

- Create an Israel health IT website.

- Distribute information on the latest Israeli health IT developments mainly through the Israeli commercial attachés in the United States.

- Participate in major health IT conferences, including at the local levels (states or regions), to present Israeli achievements through exhibitions and speaking opportunities, and hold meetings with key personnel and potential commercial partners.

- Lead focused health IT road shows, and help the relevant companies to participate in them.

4. Financial resources are crucial to the success of the individual health IT companies. The vast majority are too small to compete alone in the huge and highly competitive U.S. market. They need funds to expedite their R&D efforts and to invest in marketing and sales forces. The recommended model is a public-private partnership, similar to that developed lately for the biotech industry. Other models could be discussed, but they must include participation of venture capital and private equity.

It is time to look upon health IT as a national resource, as great as biotech, high tech, and other technological innovations. New applications, such as telemedicine, have potential worldwide as other nations enact health initiatives and reforms not unlike those in the United States. With greater investment at home, Israel stands to gain increased international investment, as well as market opportunities for intellectual property and knowledge transfer. This will build greater economic growth for Israeli health IT industry entrepreneurs and investors, and spur the development of related technology clusters.

Appendixes

Appendix 1: Government Offices and Advisory Committees

Office of the National Coordinator (ONC)
David Blumenthal, M.D, M.P.P., National Coordinator

The ONC is at the forefront of the administration's health IT efforts and is a resource to the entire health system to support the adoption of health information technology and the promotion of nationwide health information exchange to improve health care. The ONC is located within the Office of the Secretary for the U.S. Department of Health and Human Services.

The ONC is the principal federal entity charged with coordination of nationwide efforts to implement and use the most advanced health information technology and the electronic exchange of health information.

Health IT Standards Committee
Chair: Jonathan Perlin, M.D., Hospital Corporation of America
Vice Chair: John Halamka, M.D., Harvard Medical School

The Health IT Standards Committee is charged with making recommendations to the national coordinator on standards, implementation specifications, and certification criteria for the electronic exchange and use of health information. The committee has been tasked with developing a schedule for the assessment of policy recommendations developed by the Health IT Policy Committee, to be updated annually. The committee will provide for the testing of the same by the National Institute for Standards and Technology. Committee membership reflects a range of stakeholders: providers, health-care workers, consumers, purchasers, health plans, technology vendors, researchers, agencies, and individuals with technical expertise on health-care quality, privacy and security, and on the electronic exchange and use of health information. The committee has created work groups to analyze clinical quality, clinical operations, and privacy and security.

Health IT Policy Committee
Chair: David Blumenthal, M.D, M.P.P., National Coordinator
Vice Chair: Paul Tang, Palo Alto Medical Foundation

The Health IT Policy Committee is charged with making recommendations to the national coordinator on a policy framework for the development and adoption of a nationwide health information infrastructure, including standards for the exchange of patient medical information. The committee will make recommendations on standards, implementation specifications, and certifications criteria in the areas of meaningful use; certification; infrastructure; security; health information exchange, and public health.

The committee is composed of three individuals chosen by the secretary of Health and Human Services; thirteen members appointed by the comptroller general; four members appointed by the majority and minority leaders of the Senate and the speaker and minority leader of the House of Representatives.

Appendix 2: Acute-Care Hospitals: Calculating the Formula

Note: This material is taken directly from "Medicare for Hospitals," from eHealth Initiative.
See: http://www.ehealthinitiative.org/medicare-hospitals.html.

Every year, acute-care hospitals using health IT could qualify for incentives calculated as follows:

- First, take an annual base amount of $2 million

- Second, calculate the number of bed discharges for a hospital (all beds, not just Medicare) that fall within the range of the 1,150th discharge through to the 23,000th discharge

- Third, multiply the number of qualifying discharges by $200

- Calculate the percentage of the hospital's total number of inpatient bed-days that are paid under Medicare, then dividing that by a certain number

- This creates the initial formula: (Base pay + Qualifying Discharges) x Medicare share.

    Medicare share is found by dividing the number of Medicare bed-days by a number that is:
    total bed-days x ((revenue - charity care) / revenue))

Sample Calculation for an acute-care hospital

- 20,000 discharges
- 34,000 Medicare bed-days
- 100,000 total bed-days
- 1,000,000,000 in revenue
- 200,000,000 in charity care

Formula 1: 2,000,000 + ((20,000-1,150) x 200) = $5,770,000

Formula 2: 34,000 / (100,000 x ((1,000,000,000 – 200,000,000) / 1,000,000,000 = 0.425 (Medicare share)

First-Year Payment: $5,770,000 x 0.425 = $2,452,250

In succeeding years, a transition factor would be introduced that would reduce this number to ¾, then ½, then ¼:

Second Year: $1,839,188

Third Year: $1,226,125

Fourth Year: $613,063

Total Payments: $6,130,626

Acute-care hospitals adopting after 2013 would receive reduced payments. Starting in 2015, those not meeting requirements will begin to see three-quarters of their Medicare basket update reduced on an annual basis. The HHS secretary will have the right to exempt eligible professionals from penalties on a case-by-case basis in cases of hardship, but only for up to five years.

Appendix 3: 110 Israeli Companies Identified as Candidates for Research

	Name	Website
1	AD Medical Computerization	www.doctorwin.co.il
2	Aerotel Medical Systems	www.aerotel.com
3	Alpha Management Systems	http://alpha-ms.co.il/
4	Aman Computers Group	www.aman.co.il
5	Andante Medical Devices Ltd.	www.andante.co.il
6	Apoldea	www.apoidea-tech.com
7	Ardia Medical Products Ltd.	www.ardiatech.com
8	Arx -Algorithmic Research Ltd.	www.arx.com
9	ASV	www.asv.co.il
10	BAS – Biological Alarm Systems	www.basdetect.com
11	BioCord	www.biocord.co.il
12	BioData	www.biodata.com
13	BioGuard Components & Technologies Ltd.	www.bio-guard.net
14	BioLert Ltd.	www.biolertsys.com
15	BioResult	n/a
16	Bioterm Pharmaceuticals Ltd.	www.bio-term.com
17	Bircon Ltd.	www.practiq.net
18	Birmont Medical Ltd.	www.yozmot.org/company.asp?page=2&id=45
19	Braintech Ltd.	www.ilsi.org.il/companies_life_science_company.asp?ID=1020
20	Cadent	www.cadent.biz
21	Card Guard Scientific Survival	www.cardguard.com
22	Cardiogal	www.myv.co.il/24/Cardiogal
23	Cardiosense Ltd.	www.cardio-sense.com
24	Carmel Diagnostics (formerly Lumitest)	n/a
25	Cat Technologies Ltd.	www.cat-tc.com
26	CDP Medical Developments Ltd.	www.cdpmedical.com
27	CEPCO Health Management Systems	www.cepco.net
28	Cheetah Medical (Israel) Ltd	www.cheetah-medical.com
29	Civnet Communications Ltd.	www.civnet.co.il
30	Clinicode Ltd.	www.clinicode.com
31	Cliniworks (Israel) Ltd.	www.cliniworks.com
32	Cognifit Ltd.	www.cognifit.com
33	Commwell	www.commwell.biz
34	Comply Ltd.	www.comply.co.il
35	CritiSense Ltd.	www.critisense.com
36	Dbmotion	www.dbmotion.com
37	E&C Medical Intelligence Systems Ltd. (PeriGen)	www.e-and-c.com

Appendix 3: 110 Israeli Companies Identified as Candidates for Research, Cont.

38	Earlysense Ltd.	www.earlysense.com
39	Elad Software Systems Ltd.	www.elad.co.il
40	Elitr Advanced Systems Ltd.	www.elitr.com
41	E-Magine UMS	www.emagine-ums.com
42	Ewave Ltd.	www.ewave.co.il
43	Exactcost (Israel) Ltd.	www.exactcost.com
44	EZQuant	www.ezquant.com
45	Fourier Systems (1989) Ltd.	www.fourier-sys.com
46	Haldor Advanced Technologies	www.haldor-tech.com
47	Healarium	www.healarium.com/
48	Hisense Ltd.	www.babysense.net
49	HMU 24	www.hmu24.com
50	HomeFree Systems	www.homefreesys.com
51	IC Biolink Communication Ltd.	www.ilsi.org.il/companies_life_science_company.asp?ID=385
52	I-Dent Imaging For Implants Ltd.	www.ident-surgical.com
53	IDesia Biometrics	www.idesia-biometrics.com
54	Ilex Medical Ltd.	www.ilexmedical.com
55	Image Navigation	www.image-navigation.com
56	Imdsoft Ltd.	www.imd-soft.com
57	iMedix	www.imedix.com
58	Imexco General Ltd.	www.imexco.com
59	ImmuneArray Ltd.	http://www.ilsi.org.il/companies_life_science_company.asp?ID=1057
60	Integrity Applications Ltd.	www.integrity-app.com
61	Irit Model Systems Ltd.	n/a
62	Itamar Medical	www.itamar-medical.com
63	Jetguide Ltd.	www.jet-guide.com
64	Kbis Ltd.	www.sigmaknowledge.com
65	Keter Medical	www.meytavti.co.il/Companies.asp?Page=Keter%20Medical
66	Labonnet	www.labonnet.com
67	GMN	www.globalmedicalnetworks.net
68	Lims Laboratory Information Management Systems Ltd	www.starlims.com/
69	Logitag Systems Ltd.	www.logi-tag.com/
70	Matrix	www.matrix.co.il
71	Mdg Medical Inc.	www.mdgmedical.com
72	Medasense Biometrics	www.medasense.com
73	MedCPU	www.medcpu.com

Appendix 3: 110 Israeli Companies Identified as Candidates for Research, Cont.

74	Medic4all (Israel) Ltd.	www.medic4all.com
75	Medical Opinion Services	www.m-opinion.com
76	Medicalis Development	www.medicalis.com
77	Medics File	www.medicsfile.co.il
78	MediLogos Ltd.	www.medilogos.com
79	MediRisk Solutions Ltd.	www.the-medirisk.com
80	MediTouch	www.meditouch.co.il
81	Mediviz Systems (Israel) Ltd.	www.mediviz.net
82	MedSim Advanced Medical Simulations	www.medsim.com
83	Mennen Medical Ltd.	www.mennenmedical.com
84	Ness Technologies	www.ness.com
85	Nexense	www.nexense.com
86	OncoPro (Dsit)	www.dsit.co.il/products/oncopro.asp
87	Oridion Medical 1987 Ltd.	www.oridion.com
88	Orsyx	www.orsyx.com
89	Orthocrat	www.ortho-cad.com
90	Paradigma Systems Ltd.	www.paradigmacare.com
91	Phamos	www.phamos.com/
92	Procedureware Ltd.	www.users.actcom.co.il/~edit
93	Rcadia Medical Imaging	www.rcadia.com
94	RealTimeImage	www.realtimeimage.com
95	Roshtov Software Industries	www.roshtov.com
96	RxDrugOn	www.rxdrugon.com
97	RZ Software Services	www.roniza.com/
98	Second-Opinion	www.second-opinion.com
99	SHL TeleMedicine	www.shl-telemedicine.com
100	Sigma Health Care Ltd.	www.sigma-hc.co.il
101	Simbionix	www.simbionix.com
102	Softov Ltd.	www.netlims.com
103	Sonarion	www.sonarion.com
104	Sparklix Bio-computing	www.sparklix.com
105	SpinCal	www.spincal.com
106	SpiroJet Medical Ltd.	www.spirojetmed.com
107	Techdent (former IC Biolink Comm)	n/a
108	Vaica Medical	www.vaicamedical.com
109	Walletex Microelectronics Ltd.	www.walletex.com
110	XML Applications	n/a

Appendix 4: Israeli Companies Questionnaire

שאלון

<div dir="rtl">

א. יצירת קשר עם החברה

1. שם מנהל החברה
2. שם איש הקשר
3. תפקיד בחברה
4. מספר טלפון
5. מספר פקס
6. כתובת אי-מייל

ב. על מבנה החברה ושלוחותיה

1. מתי הוקמה החברה?
2. על ידי מי הוקמה החברה?
3. היכן ממוקמת החברה? אנא ציינו את כל המשרדים והנציגויות
4. מהו מספר המועסקים בחברה?
5. אם יש לכם נציגות בארה"ב או שותפות עם חברה אמריקנית, אנא הרחיבו ופרטו עד כמה שניתן

ג. על תחום עיסוק החברה

1. כיצד הייתם מגדירים את החברה שלכם?
2. מהו התחום המרכזי בו אתם עוסקים?
3. אם רלוונטי: מהם תחומים נוספים/משניים בהם אתם עוסקים?
4. אם רלוונטי: מהם התחומים אליהם אתם חושבים להיכנס בעתיד הקרוב?
5. האם אתם מאמינים שיש לחברה יתרון יחסי על חברות אחרות בתחומך? אם כן, מהו היתרון?

ד. ניסיון ויישום

1. האם כבר יישמתם את המוצר שלכם בארץ?
2. אם כן: היכן? מתי? אנא פרטו תגובות ותוצאות
3. האם כבר יישמתם את המוצר שלכם בחו"ל?
4. אם כן: היכן? מתי? אנא פרטו תגובות ותוצאות

ה. על הלקוחות של החברה

1. האם יש לכם לקוחות משלמים?

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2. באילו תחומים עוסקים הלקוחות שלכם? אנא פרטו עד כמה שניתן

3. היכן ממוקמים הלקוחות שלכם מבחינה גאוגרפית?

4. האם יש לכם לקוחות אמריקנים? אם כן, אנא פרטו עד כמה שניתן

ו. תקשורת

1. האם המוצר שלכם הוזכר בתקשורת הבינלאומית? אם אפשרי, אנא צרפו כתבות בנושא

ז. על קשרי החברה עם ארה"ב

1. האם אתם מוכרים מוצרים בארה"ב?

2. אם לא, האם אתם מעוניינים להיכנס לשוק האמריקני?

3. האם אתם חושבים שהמוצר שלכם מוכן לכניסה לשוק האמריקני? אם עדיין לא (אך יש עניין בכך), מתי להערכתכם זה יקרה?

4. אם רלוונטי, לאיזה שוק ספציפי בארה"ב אתם מכוונים?

5. האם יש לכם נציגות בארה"ב? אם כן: היכן? כמה זמן היא קיימת? מה גודלה? מי מאייש אותה? אנא פרטו עד כמה שניתן

6. האם החברה רשומה בארה"ב?

7. האם יצרתם קשר ראשוני עם לקוחות אמריקנים פוטנציאליים?

8. אם רלוונטי, מה דרוש לכם כדי למכור את המוצר שלכם בארה"ב?

9. מי המתחרים העיקריים שלכם? אנא פרטו ספציפית לגבי ארה"ב, אם אפשרי

ח. השקעה

1. כמה כסף הושקע בחברה עד היום?

2. השקעה נוספת נדרשת?

ט. למה אתם זקוקים (ניתן לסמן יותר מאחד):

-- למידע על המתרחש בשוק האמריקני?

-- להשקעה כספית?

-- לעזרה בגיבוש אסטרטגיה לכניסה לשוק האמריקני?

-- לעזרה במציאת שותף עסקי בשוק האמריקני?

-- לשיתוף פעולה עם חברה ישראלית נוספת כמכפיל כח לשוק האמריקני?

**אם ברשותכם, אנא צרפו מצגת קצרה על החברה ו/או תמצית מנהלים

תודה רבה על שיתוף הפעולה

About the Author

Yitzhak Peterburg is a Milken Institute Senior Visiting Fellow focusing on health information technology and knowledge transfer within large-scale, fragmented networks. He is also a professor in the School of Business Administration at Ben-Gurion University, Beer-Sheba, and a board member of the Israel National Institute of Health Policy and Health Services Research. He is an entrepreneur and board member of Teva Pharmaceutical Industries Ltd., the world's leading generic pharmaceutical company. He was previously president and CEO of Cellcom, the leading Israeli cellular company. As the CEO of Clalit Health Services, the leading health-care provider in Israel, considered to be the second-largest HMO in the world, he led the health IT reform of Clalit services. Before heading Clalit, Peterburg was the director of Soroka University Medical Center, Beer-Sheba. He holds a medical degree from Hadassah Medical School at Hebrew University of Jerusalem and is board-certified in pediatrics. He has also a doctorate in health services administration from the Columbia University School of Public Health in New York and a master's degree in information systems from the London School of Economics.