



Record Recovery

New York City is home to an unrivaled number of doctors and an impressive collection of health IT companies. Can the federal government's billion dollar investment in electronic health records help stanch the loss of jobs in the city?

CONTENTS

INTRODUCTION	3
New York is home to an unrivaled number of doctors and impressive collection of health IT companies. Can the federal government's billion dollar investment in electronic health records help stanch the loss of jobs in the city?	
THE BIG PICTURE	7
Despite numerous health and cost benefits, U.S. doctors have been extremely slow to adopt health IT, but experts expect the Medicare and Medicaid incentives in the stimulus bill to reverse that trend.	
THE LONG ROAD TO STANDARDIZATION	8
NEW YORK'S HEALTH IT SECTOR	9
The health IT industry in New York is made up of a diverse cluster of businesses that provide software and services not only to health care providers but patients, medical labs, research institutions and insurance companies.	
HEALTH IT IS A HIT	12
Given the strength and size of New York's present cluster of companies, there is a strong possibility the city could become one of the leading centers nationwide in health IT.	
"YOU'VE GOT HEALTH CARE!"	14
FROM HERE TO THERE	15
New York City needs to develop a plan to help local companies meet the challenges of a rapidly growing health IT market.	
RECOMMENDATIONS	17

This report was written by David Giles and Jonathan Bowles, and edited by David Jason Fischer. Farah Rahman provided additional research.

General support for City Futures is provided by Bernard F. and Alva B. Gimbel Foundation, Booth Ferris Foundation, Deutsche Bank, The F.B. Heron Foundation, Fund for the City of New York, Salesforce Foundation, The Scherman Foundation, Inc., and Unitarian Universalist Veatch Program at Shelter Rock.

The Center for an Urban Future is a New York City-based think tank dedicated to independent, fact-based research about critical issues affecting New York's future, including economic development, workforce development, higher education and the arts. For more information or to sign up for our monthly e-mail bulletin, visit www.nycfuture.org.

City Futures Board of Directors: Andrew Reicher (Chair), Margaret Anadu, Michael Connor, Russell Dubner, Ken Emerson, David Lebenstein, Gail O. Mellow, Gifford Miller, Lisette Nieves, Ira Rubenstein, John Siegal, Stephen Sigmund, Karen Trella, Peter Williams and Mark Winston Griffith.

Cover photo: Ben Hagyard

RECORD RECOVERY

WITH THE LOCAL UNEMPLOYMENT RATE NEARLY DOUBLING BETWEEN February 2008 and February 2009 and the city's finance sector entering what many experts believe will be a long-term slump, it's become increasingly clear that New York needs to identify industries that will help reignite and diversify the city's economy. Policymakers have smartly started to focus on green jobs, digital media, life sciences and other fields that offer considerable promise. But thus far, little attention has been paid to another sector that may be the closest thing to a sure thing when it comes to the city's future economic growth: the health information technology (IT) industry.

There's little doubt that the nation's health IT sector will be a major engine of employment growth in the months and years ahead. The federal stimulus package that became law earlier this year includes an unprecedented \$19.2 billion in subsidies for health care providers to convert paper-based patient information into electronic documents. Until now, hospitals, clinics and doctors' offices have been extremely slow to embrace electronic records. But industry experts believe that this massive cash injection will prompt countless health care providers to take the plunge. The economic impact of all this could be huge: One recent report estimated that 212,000 jobs could be created nationwide.

Perhaps no other city is better positioned than New York to capitalize on the industry's expansion. The city is home to 65 hospitals, 1,300 outpatient clinics and over 30,000 doctors—and only a small fraction of them have previously converted to electronic health records (EHR). No other place in the country has as many patient records ready for automation. In addition, New York has a more developed local health IT infrastructure than most other regions: the city's Department of Health and Mental Hygiene pioneered one of the first local initiatives to help physicians adopt information technology. The city also has a modest foundation to build upon: it is currently home to an estimated 80 health IT companies and is among the top four regions that receive venture capital investments in this industry.

While there's little question that the health IT field will produce thousands of new jobs across the five boroughs, the extent to which New York develops this sector is still up in the air. Currently, no single region in the United States is home to an overwhelming share of companies in health IT. Thus, the door is open for New York to emerge as a major hub in the field. But for New York to seize this opportunity, city economic development officials will need to put health IT on its agenda, help local firms overcome existing obstacles and develop a strategy to ensure that a major share of the industry's future growth occurs in the five boroughs.

This report is the first comprehensive analysis of the health information sector in New York City. It is based on extensive data analysis and nearly two dozen interviews with executives of local health IT companies, doctors, academics, government health officials and an assortment of other local and national industry experts.

The nation's health IT sector holds incredible promise in large part because of the economic stimulus bill, the American Recovery and Reinvestment Act (ARRA) of 2009, which was passed by Congress in February and quickly signed into law by President Barack Obama. The \$787 billion stimulus package includes an estimated \$19.2 billion in subsidies for the nation's health care system to convert paper records into electronic

spread out among the providers, patients and insurers.

But Castro and other industry experts believe that the ARRA's provision of \$17.2 billion in Medicare and Medicaid subsidies and another \$2 billion in direct payments to local IT adoption programs will be a more-than-sufficient catalyst for health care providers. Though it is spread out over five years, \$19.2 billion represents a large portion of the country's total health IT spending: all U.S. expenditures on health IT were estimated to be between \$17 and \$42 billion per year as recently as 2004.¹

As part of the subsidies available through ARRA, medical practices can receive up to \$44,000 per doctor from Medicare and up to \$65,000 per

“Health IT is definitely going to grow. New York City has a huge health care infrastructure and plenty of technology companies, so why shouldn't that growth occur here? It's not like health IT companies need lab space, which can be expensive in New York. They can write software out of their apartments.”

documents. Electronic Health Records—or EHRs as these documents are sometimes called—are widely seen to be the central plank in a much broader array of applications and services in the health information technology industry.

While the money for doctors, clinics and hospitals to adopt EHRs will ultimately help contain the cost and improve the quality of health care, the process of moving the enormous health care system from paper records to EHRs will undoubtedly lead to scores of new companies and tens of thousands of jobs.

Historically, the health care industry has lagged far behind other service-oriented industries like banking and retail in adopting information technology. One reason for this is that healthcare providers previously had little incentive to invest in IT. Daniel Castro, a policy analyst at the Information Technology and Innovation Foundation (ITIF), a Washington, DC-based policy institute, explains that while hospitals and doctors paid for the technology and suffered through the implementation process, the benefits of increased efficiency and lower costs were

doctor from Medicaid, spread out over five years, if they purchase an approved EHR system.² If those subsidies succeed in changing the balance of incentives for even a fraction of doctors, then at the very least we can expect to see an economic bump similar to what occurred in 1999 when fears over 'Y2K' prompted a wave of individuals, companies and governments to invest in new computer and software systems. For in moving to an electronic record system, medical practices and hospitals will have to make significant software and hardware purchases and contract professionals to help train doctors and other office personnel in how to use the new technology. Additionally, they will need to hire short-term support staff to help scan in clinical information from the many millions of paper documents that doctors' offices and hospitals use for patient records right now.

In a January 2009 report, Castro and his colleagues at ITIF calculated that \$10 billion worth of subsidies for doctors could generate enough fresh demand to create 212,000 direct and indirect jobs nationwide.³

It isn't difficult to surmise that New York City could capture a decent share of these new jobs, as there are more doctors—and more patient records—here than any other city in the country. New York is home to more than 30,000 doctors, 1,300 outpatient clinics and 65 hospitals, and if the latest national estimates are in any indication, less than four percent have fully operational EHR systems in place.⁴

New York also already has the beginnings of a health IT cluster. According to survey information gleaned by HIMSS Analytics, a subsidiary of the Healthcare and Information Management Systems Society (HIMSS), a national industry association, there are 43 companies headquartered in New York City that provide health IT products and services to the hospitals it surveys. This compares favorably with other large U.S. cities like Chicago (47), Los Angeles (14), San Francisco (14), Boston (12) and Washington, DC (6).⁵

It's likely that there are far more than 43 health IT companies in the five boroughs. Indeed, our research has identified a sizable number of New York-based companies that weren't captured by HIMSS Analytics' hospital surveys. As a result, we estimate that the actual total of health IT firms in New York City is closer to 80.

The city's health IT cluster currently includes at least six companies that specialize in EHRs and dozens of other companies that build software platforms for medical labs, design business intelligence applications for hospitals, and provide Internet-based appointment scheduling services for health care consumers, to name just a few of the more prominent industry niches. A handful of these firms have hundreds of employees, including CureMD, one of the nation's largest and highest-rated EHR vendors; Active-Health Management, an industry leader in drug interaction alert technology; and Waterfront Media, which attracts 25 million unique visitors a month. In addition, Google and Microsoft both have plans to grow their health IT divisions in the city through partnerships with local hospitals like New York-Presbyterian.⁶

Venture capital firms clearly see the potential of health IT in New York. From the beginning of

2008 until the end of the first quarter of 2009, health IT companies in the New York City metro region have attracted more than \$61 million in VC funds, nearly 15 percent of the national total and more than all but three other regions in the country (following the San Francisco Bay Area, the Potomac region surrounding Washington, DC, and New England).⁷

New York is already well ahead of other metropolitan areas in several other ways. Both the city and state have been among the nation's leaders in promoting and supporting the digitization of health records. The city Health Department's Primary Care Information Project (PCIP) has already converted over 1,300 physicians and 226 medical practices to EHRs, while the state provides incentives for health IT through Medicaid and the Healthcare Efficiency and Affordability Law (HEAL). The city is also home to the Bronx Regional Health Information Organization (RHIO), a network of hospitals, outpatient clinics and doctors' offices dedicated to sharing electronic patient information, and to Columbia University's Center for Advanced Information Management, which specializes in developing information technologies at the nexus of biomedical and communications sciences.

"Health IT is definitely going to grow," notes Jeffrey Krauss, a managing member of Psilos Group Managers, LLC, a New York-based venture capital firm specializing in health IT. "New York City has a huge health care infrastructure and plenty of technology companies, so why shouldn't that growth occur here? It's not like health IT companies need lab space, which can be expensive in New York. They can write software out of their apartments," he says.

Farzad Mostashari, an assistant commissioner of the city's Health Department who runs the agency's PCIP program, anticipates a significant spike in the number of doctors across the five boroughs converting to electronic medical records in the coming months. He estimates that his program could more than triple its size once the federal stimulus money starts to come in.

Undoubtedly, just the process of converting mountains of patient records to EHRs will create

countless new employment opportunities that will likely be sustainable for several years, if not decades, given the size of the health care system in the five boroughs. But the health IT sector in New York is composed of much more than just EHR vendors, and experts believe that as more patient records come online new and bigger markets will emerge for companies in other health IT sub-fields as well.⁸ According to Mostashari, EHRs are like the fuel that makes any number of other technologies run. “If we had more doctors using EHRs,” he says, “there would be a whole lot more people who could have their health information in electronic format. So what are all the applications that could be built off of that? They are legion. There’s a huge market there for consumer-facing products that would have a lot more value if combined with clinical information.”

For example, one especially promising piece of technology that depends on the automation of patient information is the personal health record, or PHR. The PHR allows consumers to receive their clinical information, including prescriptions and lab results, on their computers at home, where they can use it in conjunction with Internet searches and input from online support groups to better manage their health. Missy Krasner, the product marketing manager for Google’s recently unveiled web-based PHR called Google Health, says that consumers probably won’t adopt PHRs in large numbers until they can get their health information electronically—it’s just too time consuming to retrieve photocopies from the doctor’s office and type it all in by hand. But as adoption rates increase, she sees tremendous potential not just for PHRs but for a whole slew of other consumer products such as video chats with your doctor and email reminders for medication refills. “The more data comes online,” she says, “the more doctors are rewarded for using that data, the more innovative and diverse the products are going to be.”

However, while the health IT field offers incredible promise for New York, there are also a number of challenges. While there are nearly 400 EHR vendors in the nation, only six are based in the city. In fact, the largest EHR contracts

awarded by the city’s Health Department thus far have gone to firms in other regions, an indication that New York doesn’t yet have enough health IT companies with the size or experience to compete for the most lucrative projects. Also, many of the entrepreneurs, consultants, doctors and other experts we spoke to for this report commented on the fragmented and “siloesd” character of the industry. Indeed, none of the New York-based companies we spoke with had any sense of how many other health IT firms were located here. And there is currently no local industry association or other mechanism for individuals in the sector to network and share information.

Another potential obstacle is the lack of trained personnel to take the jobs that will become available in city hospitals and doctors’ offices. According to one study conducted by the Oregon Health & Science University, the IT staff at hospitals across the country that convert to EHRs will have to expand their numbers by at least 40 percent.⁹ Despite this, there is still not one program at New York City’s community colleges that’s specifically designed to train future health IT workers.

Finally, while the city’s Health Department has been a national leader in the field, the health IT sector could benefit from more attention and support from local economic development officials. To its credit, the city’s Department of Small Business Services (SBS) is now developing a training program to help local doctors’ offices address their changing workforce needs and plans to help some physicians access the loan capital they need to purchase IT equipment. But health IT has barely begun to register on the radar of the New York City Economic Development Corporation (EDC).

New York City has all the right parts to benefit from the federal government’s unprecedented investment in health IT, but local policymakers need to develop a strategic plan to capitalize on this opportunity. In the months ahead, as consolidation occurs among the EHR vendors and the markets for other IT services start to take shape, clear winners and losers will quickly become apparent.

THE BIG PICTURE

Despite numerous health and cost benefits, U.S. doctors have been extremely slow to adopt health IT, but experts expect the Medicare and Medicaid incentives in the stimulus bill to reverse that trend

Health IT is widely viewed as a key component in helping the Obama administration achieve its goal of greatly increasing access to health care. Administration officials and health care experts argue that creating electronic health records will save billions of dollars each year, providing the cost savings that will allow the federal government to increase health spending in other areas. For instance, the RAND Corporation estimates that the widespread adoption of health information technology could save the nation up to \$80 billion a year through reduced hospital stays, avoidance of duplicative and unnecessary testing, more appropriate drug utilization and other efficiencies.¹⁰

that these technologies make available to public health departments can aid in both pharmaceutical and comparative effectiveness research.

Yet, despite a panoply of reports touting the benefits of health IT, health care providers are way behind other service oriented industries such as banking, insurance, telecommunications, retail, higher education, utilities and even government in automating information and adopting new technologies to communicate with their customers and business partners. According to the *New England Journal of Medicine*, just 13 percent of physicians nationwide have even a basic electronic record system, which is used primarily for billing, while only four percent have a fully-func-

In its January 2009 study, ITIF estimated that \$10 billion in annual spending on health IT would generate 212,00 new or retained jobs in the United States for one year, including nearly 45,000 from direct spending by hospitals and health care providers on health IT systems.

Today, most medical records are still stored on paper, which makes them difficult to use to coordinate care, measure quality or reduce medical errors. Having these records in electronic format will result in significant savings as physicians cut down on the use of paper, printers and clerical staff, but health IT will create numerous other benefits as well. In big integrated health networks, for instance, like Kaiser Permanente, where doctors are salaried and institutional resources run unusually deep, use of EHRs has been shown to cut office visits by 26 percent;¹¹ the use of e-prescribing technology has saved state Medicaid programs hundreds of millions of dollars;¹² and the anonymous health data

tional one with diagnostic image capabilities and drug interaction alerts. Hospitals are even worse. Only eight percent of U.S. hospitals have a basic system and 1.5 percent a fully-functional one.¹³

Health care experts believe that the hefty subsidies contained in the federal stimulus package will be sufficient to substantially boost health IT adoption rates. If this occurs, it will not only deliver sizable health care benefits and cost savings; it will provide a tremendous growth opportunity for scores of companies in this field and result in thousands of jobs for communities across the country.

In its January 2009 study, ITIF estimated that \$10 billion in annual spending on health IT

would generate 212,000 new or retained jobs in the United States for one year, including nearly 45,000 from direct spending by hospitals and health care providers on health IT systems.¹⁴ The jobs would be added in IT services (27,000), software (10,600) and hardware manufacturing (5,800).¹⁵ The investment that these companies make would, in turn, indirectly lead to tens of thousands of additional jobs. Over the long run, more than 50,000 other jobs would be created as the initial investment in health IT sparks the creation of new products and services.¹⁶

The opportunity for local economic growth is immense. Just look at the recent success of eClinical Works, a Boston-based EHR vendor founded

in 1999 with just a handful of employees. Seeing that more established IT companies like GE and Siemens were focusing on developing expensive systems for more resourced hospitals, eClinical Works set out to fill a need among small independent practices and community clinics for more affordable EHRs. They were so successful in doing so that by 2005 the company had grown to over 200 full-time employees.¹⁷ They're now up to 725 employees after announcing a deal with Wal-Mart earlier this year to distribute low-cost EHR packages through its Sam's Club outlets—and that's before the stimulus funds have even begun to make their way into the market.¹⁸

THE LONG ROAD TO STANDARDIZATION

One big reason doctors have put off purchasing EHR systems is that they don't necessarily benefit from the advertised savings. Implementation can interrupt workflow for months and some doctors may actually lose revenue through the reduction of duplicative tests. But there's another less often discussed reason for the persistence of low health IT adoption rates: the lack of strong industry-wide standards governing the flow of information between different software programs and provider institutions.

In the U.S. there are over 4,000 companies that provide software and IT services to health care providers (over 400 develop EHR systems). Many of the software companies focus on a particular geographic region or specialize in specific diseases or medical practices, and partly as a result there can be a lot of variability in what their products are designed to do, how easy they are to use and how well they communicate with other software programs. According to Alan Eisman, director of healthcare solutions at Information Builders, a New York-based software development company, hospitals in particular are inundated with software. They sometimes run 100 different programs in a dozen different departments, he says, and because those programs operate on different platforms and have their own often idiosyncratic interfaces, they rarely ever "play nice" together.

This alone can breed distrust for the technology among doctors—as of course it would for consumers at large if they couldn't transfer information easily from program to program on their computers at home—but compounding the problem is the widespread use of proprietary licenses. Traditionally, when healthcare providers purchase software they don't own the system; they're licensing it from the vendor. That means if they move to a different system later on, they can't take their patient records with them without loss of information and time unless both programs are fully interoperable. "If you have true interoperability then you can move easily between vendors and avoid vendor lock in," says Fred Trotter, a health IT blogger and software developer based in Houston. But despite the industry's creation of a certifying body in 2004 called the Certification Commission for Healthcare Information Technology (CCHIT), "we haven't come anywhere near achieving that ideal," Trotter says, "and we've been doing this for 20 years."

Fortunately, however, many experts believe the stimulus bill can do a lot to help. If they set high standards for EHRs and require recipients of the Medicare and Medicaid incentives to purchase approved systems, then the American Recovery and Reinvestment Act could go beyond stimulating demand and actually improve the technology. "There are two ultimate questions here," says Trotter. "One is, how are they going to certify EHR's? How are you going to say which EHRs qualify for this bonus? And another is, what does interoperability mean? Those two questions together will define the size and character of all health IT related economic activity in the next two years and beyond."

NEW YORK'S HEALTH IT SECTOR

The health IT industry in New York is made up of a diverse cluster of businesses that provide software and services not just for health care providers but patients, medical labs, research institutions and insurance companies

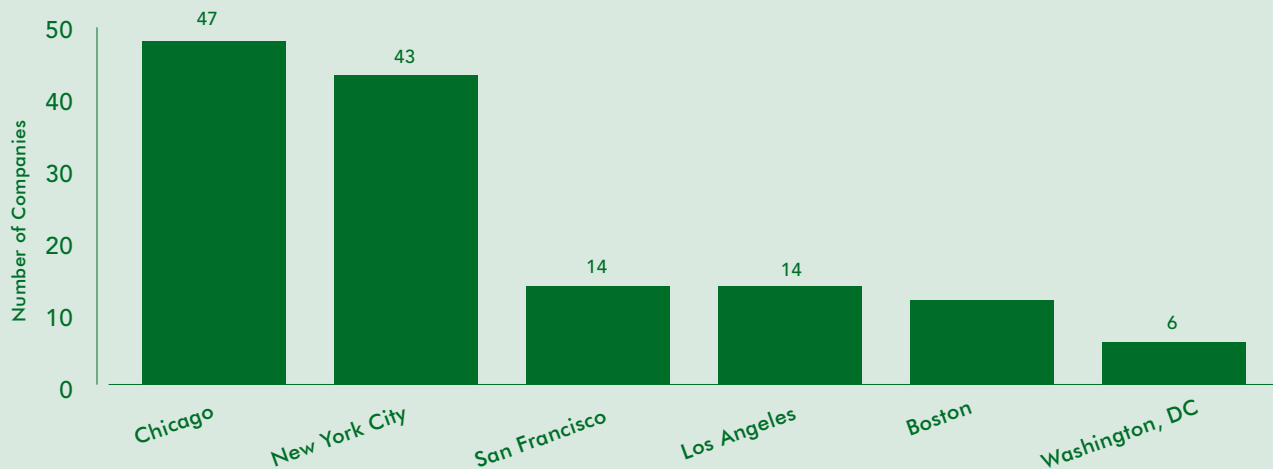
New York isn't currently home to any health IT companies that have experienced as much success and influence in the field as eClinical Works, but the city does have a number of health IT firms, some of them with hundreds of employees and loads of potential for growth.

With the sector still in its earliest stage of development, it's impossible to know exactly how many health IT companies are currently located in New York City. It's likely that there are already close to 80 firms in the five boroughs that work in some part of the health IT field, whether it's developing EHRs for providers, drug interaction alert technology for drug companies, or online appointment scheduling services for consumers. HIMSS Analytics, a subsidiary of the Healthcare Information and Management Systems Society (HIMSS), a membership organization, told us that there are 43 companies headquartered in New York City that provide products or services in the hospitals it surveys, which includes nearly

all U.S. hospitals outside the national Veterans Affairs system. Some of these companies are large corporations with relatively small health IT divisions, like Sony Corporation (a big provider of IT hardware) and PriceWaterHouseCoopers (which consults on department budgets). But a large majority are solely dedicated to health IT or rely on their health IT products as a major source of revenue. By comparison, HIMSS Analytics counted 47 health IT companies in Chicago, 14 in Los Angeles, 14 in San Francisco, 12 in Boston and six in Washington, DC.

However, since HIMSS Analytics focuses on companies that contract with hospitals, their survey data does not detect a large part of the local industry. Manhattan-based ActiveHealth Management (with over 600 employees), for example, is an industry leader in drug interaction alert technology and a developer of PHRs, but it was not included in HIMSS Analytics' list of local companies because it contracts mainly with

NUMBER OF HEALTH IT COMPANIES WITH CONTRACTS IN U.S. HOSPITALS



Source: HIMSS Analytics. Data measures the number of companies by city (not region) and was tallied in June 2009.

insurance companies. Waterfront Media, which is headquartered in DUMBO, is the largest on-line health business in the country—larger even than WebMD—with more than 25 million unique visitors a month on the websites it creates and manages, but because it markets its product to consumers directly it wasn't included either.¹⁹

Given the stimulus bill's emphasis on EHR adoption, the health IT firms that will feel the most immediate boost from the huge injection of federal subsidies are ones that sell EHRs and/or help with their implementation; these include the EHR vendors themselves but also independent technology support and consultation companies. We have identified six EHR vendors in the city, including CureMD (with 357 employees) and HCS-Health Communication Systems (with 136 employees), which have received high marks from the AC Group, an industry rating service. There are dozens of New York-based health IT consultants and tech support companies to help providers implement and manage these systems.

Many experts believe that the human capital required to make the transition to EHRs will cost even more than the necessary hardware and software purchases. Moving from paper records to electronic ones will require thousands of trained and untrained personnel to help type in patient information, smooth out disruptions in the office and meet filing deadlines. Typically, when a physician or hospital purchases an EHR, the vendor sends in on-site professionals to help train the office staff, but most transitions will require a whole lot more than that. Hospitals and community clinics that implement a new EHR system will have to expand their in-house IT staff and hire additional expertise from consultants. Even smaller medical practices will need project management support, and once their systems are up and running they'll most likely need to hire a part- or full-time staff member trained in the technology to run lists of patients and generate reminders.

However, most experts believe that as EHR adoption rates increase over the next few years, the demand for IT services and products in other market segments will increase dramatically as well. And in New York as elsewhere, the health

IT industry encompasses products and services that go far beyond EHRs. KLAS, another health IT rating service, lists a total of 80 different market segments for health-related software and 21 markets for services. But to simplify matters, one might break these down into three very broad categories. First are the software vendors, which typically sell licenses and subscriptions for support services to doctor's offices, hospitals, medical labs, insurance companies, and pharmaceutical companies, among other health care establishments. Second are online "Health 2.0" companies, which offer services such as PHRs or online appointment scheduling to health care consumers. And third are the tech support and health IT consultants that provide professional support for providers who have either already implemented an IT system or are in the process of doing so. In New York City, the health IT sector more or less breaks down in the following ways:

- **Software Vendors:** These companies develop EHRs for physicians, information systems for medical labs, business intelligence software applications for hospitals and a whole host of other programs and platforms aimed primarily at health care providers and their business partners in the insurance and pharmaceutical industries. Among New York-based companies, we have identified six EHR vendors, including CureMD, HCS-Health Communication Systems, Connexin Software, Reliable Health Systems, SynaMed and Park Avenue Medical Data Systems. In addition to EHRs, New York is home to Multidata, a prominent vendor of lab information systems; Phreesia, a promising young company that develops digital clip-boards for doctor's offices; and Medidata Solutions Worldwide, the industry leader in clinical trial software for pharmaceutical and other medical research institutions developing new drugs. Also based here is Information Builders, one of the biggest business intelligence software and consulting firms in the U.S., which has over 700 employees in the metro area (1,400 globally) and is expanding rapidly into the health care sector. According to Alan Eisman, Information Builders' director of healthcare solutions, health care is the fastest growing part of their business.

- Health 2.0 Companies:** These companies develop PHRs, doctor appointment scheduling services, health information websites, and secure email and video chat technologies among other things. Unlike the software vendors, Health 2.0 companies tend to market their products directly to patients. For example, in New York City, there are two Web-based medical appointment scheduling services: Cadit Health and ZocDoc. ZocDoc, a recent recipient of venture funding, is an Internet site that allows patients to search for last minute openings in doctors' offices while running filters based on their particular insurance plan and geographic location. Google has offices in Manhattan and, according to marketing manager Missy Krasner, has plans to follow Microsoft in growing its PHR product here as the company develops partnerships with local health care providers. Another New York company that develops PHRs is ActiveHealth Management, though since they develop software for insurance companies too they could just as easily be included in the software vendors category above. Waterfront Media runs a number of popular health related websites, including drugs.com and southbeachdiet.com. Also, Hello Health, a healthcare provider and subsidiary of the IT company Myca, offers

patients an online environment that allows them to interact with their doctor by secure email, instant messaging or video chats.

- Tech Support and IT Consulting Companies:** These companies help health care providers in the installation of new IT systems; they provide advice and help troubleshoot as the systems are installed and interfaced with other programs. According to a number of different experts we interviewed, this is the area that's likely to see the most immediate and dramatic growth in the next couple of years. For example, a Manhattan-based health IT consulting firm called NIT Connect, which was recently profiled in *Crain's New York Business*, expects a \$10 million increase in company profits next year.²⁰ Meanwhile, a Queens-based tech support firm called the Stemp Systems Group works with the city's PCIP program. PCIP director Farzad Mostashari says that right now too many doctors' offices rely on informal IT support. "A doctor will have a friend or a patient's son come around over the weekend to run anti-virus software on his computer," he says, "but with a full-fledged EHR system that won't cut it. We need much more professional, much more timely IT support."

NOTABLE HEALTH IT COMPANIES IN NEW YORK CITY

The following are just a few of the largest and most well-known health IT companies in NYC

- ACTIVEHEALTH MANAGEMENT** is a leading developer of drug interaction alert technology and PHRs. Founded in 1998 they have grown to over 600 employees. They were purchased by Aetna Insurance in 2005.
- CUREMD**, with 357 employees, is one of only eight EHR vendors nationwide to receive five stars from the AC Group, an industry rating service that tests EHR vendors using a number of criteria including usability, pricing and company stability.
- PHREESIA** develops wireless touch screen pads to replace the clipboards that doctors use when patients sign in at the office or hospital. Founded in 2005, the company has attracted over \$11 million in VC funds and grown to over 80 employees.
- WATERFRONT MEDIA**, with over 200 employees, was founded in 2002 and has quickly grown to become the largest privately held online health company in the country. They operate 24 health related websites that attract over 25 million unique visitors a month.
- MEDIDATA SOLUTIONS** is a global leader in software technology designed for planning and managing clinical trials for drugs. The company, which has over 500 employees, filed an initial public offering with the SEC earlier this year.

HEALTH IT IS A HIT

Given the strength and size of New York's present cluster of companies, there's a strong possibility the city could become one of the leading centers nationwide in health IT

Unlike in more established high-tech fields such as biotech and software development more generally, no area has emerged as a geographic hub for health IT companies. There's no Silicon Valley or Route 128 to which all aspiring health IT professionals and software developers naturally flock.

For instance, in 2008 five medical software and information technology firms based in the New York City metro area received venture capital funding.²¹ That's barely behind New England, which had eight health IT companies receiving venture funds that year, and the San Francisco Bay area, with seven firms.²² Moreover, while there are a handful of large EHR vendors across

Perhaps the city's greatest advantage is the sheer size of its health care sector. No other U.S. city has as many doctors, hospitals or patients. That translates into mountains of paper records that need to be digitized and an enormous market for various health IT services.

Another thing going for New York is that the city and state have been comparatively aggressive in laying the groundwork for a local health IT infrastructure. In 2004, the state passed the Health Care Efficiency and Affordability Law (HEAL) and since then Albany has led the nation in health IT grants, issuing nearly \$160 million to dozens of organizations across the state, including at least eight in New York City. According

Perhaps the city's greatest advantage is the sheer size of its health care sector. No other U.S. city has as many doctors, hospitals or patients. That translates into mountains of paper records that need to be digitized and an enormous market for various health IT services.

the nation that have hundreds of employees and thousands of license agreements with physicians, not one of these companies controls even one percent of the market, which in the U.S. includes approximately 800,000 health care providers, says Mark Anderson, president of the AC Group.

Without any dominant companies or a geographic center to the industry, the field is wide open for companies that have developed the right products and have the resources and wherewithal to identify opportunities in the market. And several experts interviewed for this report believe New York-based companies may even have a leg up on their competitors in a number of respects.

to researchers at Weill Cornell Medical College, New York State's health IT investments have been so successful they could serve as a model for the rest of the country.

In 2005, the city's Department of Health initiated the Primary Care Information Project (PCIP), one of two highly successful government-run EHR adoption programs in the country (the other is the Massachusetts eHealth Collaborative).²³ PCIP targets independent primary care practices, community clinics and hospitals that see a large number of Medicaid patients and helps them overcome key barriers to EHR adoption, such as a lack of start-up capital and loss of

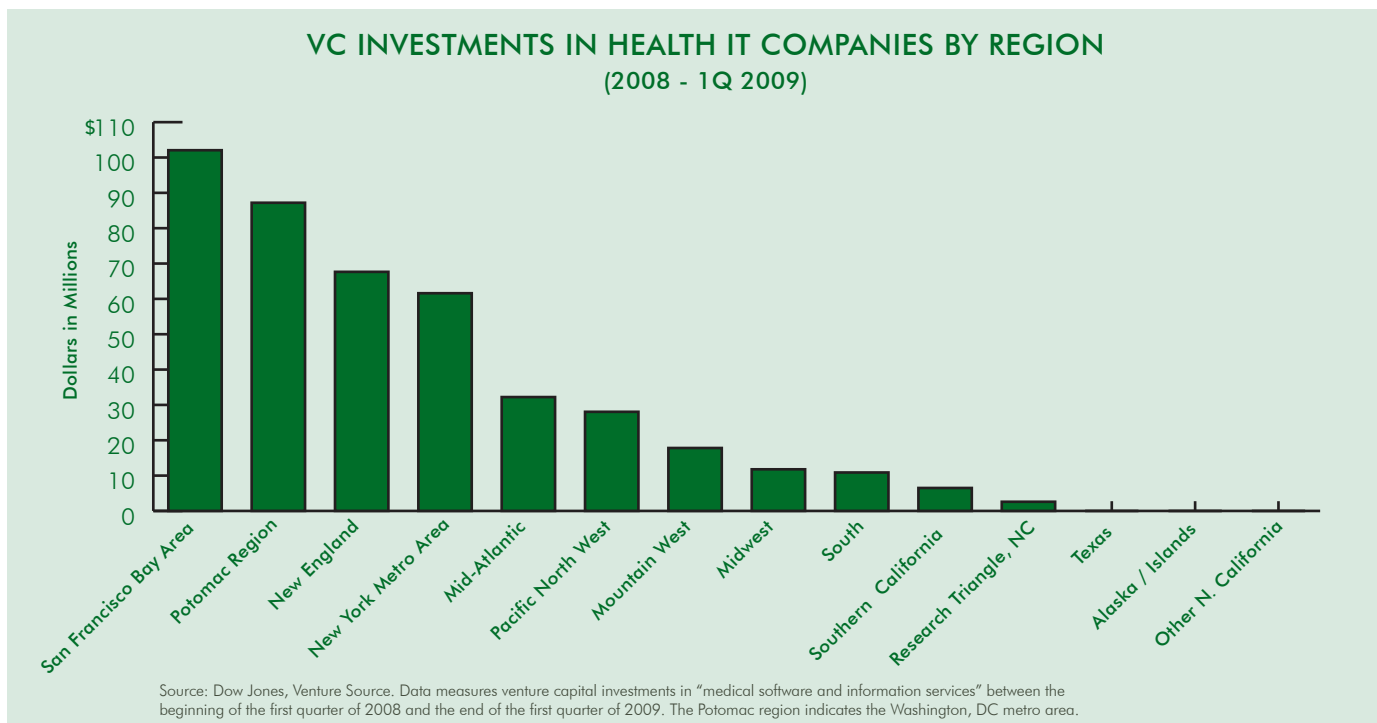
productivity during transition. The approximately 50 PCIP staff members help the physicians and administrators create a project plan; they serve as a go-between for the vendor and tech support crew and provide telephonic support as the practice transitions into the new system. “The most important thing that my staff does is provide an end-to-end project management structure,” says Mostashari, PCIP’s director. “The poor doctor’s office; they’re just trying to get through the day with ten minute patient visits. The last thing they want to be dealing with is project managing and IT.”

New York is also home to four Regional Health Organizations (or RHIOs).* A RHIO is an organization that brings what are often disparate and disconnected EHR systems into one completely interoperable information network, so that patient information can be shared seamlessly between different providers. Originally intended as the building blocks of a national health information network, RHIOs have seen limited success up to this point. But some of New York’s RHIOs, in particular one in the Bronx, have been more ambitious and successful than most. Established with the help of two New York State HEAL grants totaling \$14 million, the Bronx RHIO went live

last summer with an electronic patient record system that encompasses 80 percent of the providers in the borough, and, unlike most RHIOs, includes not only hospitals but community clinics and independent practices as well, totaling 55 different care sites.

Columbia University’s Center for Advanced Information Management is also located in the city. It is one of 15 different state-designated Centers for Advanced Technology (CATs) in New York State and serves as an intermediary between the university’s research staff and members of the health IT and bioinformatics industries. Although industry sources say the center has a mixed record so far in producing viable companies and a low profile among New York’s health IT-related venture capital community, they have an important role to play in an increasingly dynamic and innovative field. According to marketing director Paul Goldfarb, the center is in the process of designing a training program for hospital IT staff.

Although most of New York’s 30,000 doctors haven’t yet transitioned into electronic health records, efforts like these will help expedite that process. And, of course, the more doctors who adopt EHRs, the better it is for the companies



*An earlier version of this report misstated the number of RHIOs in New York City. There are four, though at the time of this writing only three were operational. They are: The Brooklyn Health Information Exchange (BHIX); Manhattan-based New York Clinical Information Exchange (NYCLIX); Queens-based Interboro; and the Bronx RHIO. [Correction added on 8/17/2009]

that sell health IT products and services, whether they're EHRs or some other related technology or service. "Once we see increased adoption and we get more and more people working in this space," says Jeffrey Krauss of Psilos, a health IT venture capital firm, "then I think we'll start to see more companies coming out of New York."

"As we transition more and more into a consumer focus on health care and increased access to technology, it's going to have a rising tide effect and help all these companies out," echoes Jesse Argon, CEO of Cadit Health.

New York City-based companies may also benefit from the large number of technology-savvy individuals that live and work in the city. These "early adopters" will provide a market for local health IT start-ups like Cadit or ZocDoc, both of which provide online medical scheduling

services, and Hello Health, which hosts doctor-patient e-visits. For instance, Hello Health targets young urban professionals who are not well served by the more traditional modes of health care delivery, either because they don't have insurance or have catastrophic insurance with high deductibles. For these patients, online video chats are a perfectly natural mode of communication and because it helps cut costs dramatically, Hello Health can offer that service for an unusually low price. (See "You've Got Health Care" below.)

"When we were deciding where to locate Cadit, the New York patient population definitely played a role. So did the physician population," says Argon. "Other cities, such as Philadelphia, have medical systems that are much more dominated by a few players than New York's."

"YOU'VE GOT HEALTH CARE!"

Software developers in health IT will often talk about a given technology's potential for "disruptive innovation." What they tend to mean by that term is the power of the technology to simplify the doctor-patient relationship. Many health IT companies consider this to be a core mission of the industry, but New York City-based Hello Health takes it one step further than most. Instead of designing a software platform to fit a medical practice, they've designed a medical practice to fit a software platform.

After signing up at a cost of \$35 per month, which gets you constant email access to your doctor as well as a selection of free generic medications, patients typically come in for an initial in-person consultation with one of Hello Health's primary care doctors. Dr. Sean Khozin, a co-founder, says that it's important for patients and doctors to meet face to face to go over the patient's medical history, but thereafter most communications are done over a secure Internet portal that supports email, instant messaging and video chats. "Where the value of our technology becomes apparent," Khozin explains, "is how we follow-up with the patients. We do 60 to 70 percent of our follow-ups online, and that includes seeing if the patient is doing well, is being compliant with their regimen and coordinating their care with specialists."

The Hello Health web page (www.hellohealth.com) was designed to function much like a social networking site like Facebook. Patients "friend" a doctor on the site and surround themselves with a care team of specialists. All communications – including evaluations, lab reports, prescriptions, and past correspondences – are available to the patient and every one of his doctors, and because all the documentation and practice management activities are automated by the software, doctors can keep down costs and avoid long lines in the waiting room. Moreover, because they operate outside the third party payment structure of most health care in the U.S. (all insurance payments are out of network), patients always know ahead of time how much a visit or X-ray or lab test is going to cost them.

Khozin thinks this model is nothing less than the future of health care: Price transparency and a streamlined, easy-to-use Internet interface to connect doctors with their patients at low cost. To that end, he says Hello Health's platform, which the company developed in conjunction with Canadian IT company Myca Health, will eventually be made available for purchase by other practices.

FROM HERE TO THERE

New York City needs to develop a plan to help local companies meet the challenges of a rapidly growing health IT market

Although the entrepreneurs and independent observers interviewed for this report were nearly unanimous in their excitement and optimism about the future of the city's health IT sector, there are notable obstacles ahead which could affect the extent to which the industry grows here.

On the local level, health IT firms will need help in training thousands of workers for the new skills needed as the field shifts from paper to electronic records. And as the industry's development accelerates, companies in the city will face increasing competition from firms in other regions, many of which have a head start because they are larger and have more experience. While the Bloomberg administration has begun to devise a strategy to help firms in the industry address their workforce needs, economic development officials have yet to embrace this sector or develop a plan to help ensure that the industry's future growth occurs in the five boroughs.

Health IT firms also face a host of industry-wide challenges that will affect the efficiency and speed with which doctors begin to adopt and implement EHR systems in large numbers. Some of these hurdles need to be addressed by federal administrators, while others will likely work themselves out as the industry develops.

One of the looming challenges is the lack of trained personnel for the number of high-tech clinical jobs that will come from increased EHR adoption. According to one recent workforce study, there will be a need for at least 40,000 additional IT staff members in hospitals across the country—a 40 percent increase over present levels—once a conversion to EHRs is made, and that doesn't include the need for increased staff in all non-hospital settings and at the EHR vendors or outside consulting firms.²⁴ In ambulatory (or outpatient) settings, PCIP's Mostashari says

there will be a need for so-called "panel managers" who understand how the EHRs work and can come in and, for example, run a quick list of all the patients who missed their flu shots and call them to schedule an appointment.

These are likely to be well-compensated jobs, but like most jobs that offer family-supporting wages, they require education beyond high school. "A panel manager would have a bachelors' or associates' degree," says Mostashari. "They would learn how to use the computer program and would be in charge of generating reminders." The stimulus package includes \$250 million for education programs, but right now very few exist across the nation. For instance, not one community college in New York City has a program designed specifically for health IT support staff.

The city's Department of Small Business Services (SBS), which coordinates adult workforce development programs in the five boroughs, has smartly begun to focus on the sector's training needs. In recent months, SBS has reached out to physicians across the city and met with Mostashari's group at the city's Department of Health and Mental Hygiene to get advice and sketch out options for collaborating. "We're working with [the Health Department] to come up with a standardized program to deliver more robust training around things like electronic health records, medical billing, coding and even just computer skills," says David Margalit, SBS's deputy commissioner for business development and agency strategy. "For a lot of these doctors' offices, it's literally a question of, How do I use a mouse? Everything has been so paper based."

Margalit says the agency decided to embrace health IT earlier this year in large part because they realized that "offices of physicians have a fairly good growth possibility, they're growing in

New York City and they tend to be medium sized.” While the agency just started to concentrate on this field, Margalit hopes to put together a specialized program to help these doctors’ offices by the fall or winter of this year.

Much of the SBS plan will revolve around workforce training, but the agency also intends to offer physicians other business services, such as helping them access loans to buy new equipment and upgrade their technology. “These guys are great doctors, but not necessarily great business managers,” says Jackie Mallon, another SBS staffer. “We can plug them into our existing services, including helping package their business for a loan application.”

While it’s important that SBS will be helping some local medical offices become more competitive, health IT still doesn’t appear to be on the radar of the city’s main economic development agency—the New York City Economic Development Corporation (EDC). EDC could provide valuable strategic support to the range of health IT businesses that have growth potential, help some of these local firms compete for major EHR projects and help market the city as a major player in the field.

Not all of the industry’s challenges are local in nature. Much of the sector’s growth will depend on how quickly doctors implement EHR systems, but many unanswered questions remain about how efficiently and quickly that process is likely to go.

Later this year, the Office of the National Coordinator for Health Information Technology will specify the requirements for qualifying for Medicare and Medicaid reimbursements. Much depends on these rulings, which will tell those in the field about what kinds of EHR systems they can purchase with federal help and what must be done to fully implement them into the workflow patterns of a medical practice. On the one hand, if doctors are required to purchase higher-end EHRs with patient messaging capabilities and to prove that they’re using these systems “meaningfully” as is prescribed in the ARRA bill, then the likely result will be much more rapid development in Health 2.0 technologies than we

otherwise might expect. On the other hand, the more ambitious EHRs can sometimes cause even longer disruptions in an already stressful work environment.

Some within the field suggest that the mom and pop character of the health care industry—where each office, clinic and hospital makes its own choices and depends on its own human and financial resources—will lead to painful complications in implementing EHRs. Michael Slater, the CEO of Multidata, points out that when major multinational corporations like McDonald’s implement big information systems to keep track of the number of burgers they sell, they do it from the top down. “If each McDonald’s franchise was given \$40,000 to implement its own system and then was told to interface it back up to the mother ship—that would be ridiculous,” Slater says. “Yet that’s precisely the scenario we have here. Nobody wants to get their medical care from McDoctor like McDonald’s, but having so many small practices each trying to adopt and maintain their own EHR, it’s a serious IT challenge.”

Slater, like Mostashari, believes that professional IT support and consultation services will be absolutely necessary. The doctors are attending to dozens, even hundreds of patients a day and needing to keep logs of every procedure; most have large administration staffs to sign in patients and help parse the byzantine billing protocols demanded by insurance companies. Under these demanding conditions, implementing a radically different system of record keeping can be like rebuilding a ship at sea. The stimulus bill provides \$2 billion in direct payments to adoption programs like PCIP to help ameliorate both the financial and psychological costs of this process. The question is whether the services they provide can be sustained after the government subsidies dry up. IT budgets, even in major hospitals, are traditionally very small compared to other industries like finance and telecommunications.²⁵ In order for tech support and consultation services within health IT to become profitable, provider institutions will have to expand significantly what they are willing to pay for their services.

RECOMMENDATIONS

With the unprecedented \$19.2 billion federal investment in electronic health records, the health IT industry is certain to grow rapidly in the next few years. New York City could easily capture much of this growth. The city is home to over 30,000 doctors and 65 hospitals, and with a modest cluster of local health IT companies—some of them global leaders in their field—there is already a promising foundation on which to build. The following recommendations will better position New York to capitalize on a unique opportunity.

Promote and support the conversion from paper to electronic health records by local doctors, health clinics and hospitals. The city's health IT sector will take off when more of the city's health care providers start digitizing their patient records, thereby providing a steady stream of clients for local medical software firms and IT consultants. The federal stimulus bill will provide an attractive incentive for doctors and health care administrators to adopt electronic health records, but city officials could help accelerate the process by conducting a marketing blitz that touts the benefits of EHRs and offering technical assistance to providers who take the plunge. The city might also expand the work of the city Health Department's Primary Care Information Project (PCIP), which has a good track record of helping primary care physicians to convert to EHRs but has only assisted a fraction of the city's health care providers.

The city's Economic Development Corporation (EDC) should make health IT a key element of its effort to diversify New York's economy. In recent months, EDC has smartly initiated new programs to diversify the city's economy, embracing everything from green jobs to the digital media industry. Yet, despite its obvious potential for growth, health IT has largely flown under EDC's radar. This must change. EDC should create a division focused on maximizing the economic development opportunities that health IT presents for the five boroughs. The agency could assist local firms compete for federal stimulus grants and contracts with city-run hospitals and health clinics, bring entrepreneurs in the sector together with New York-based angel investors and venture capital firms, help firms in the sector form a local industry association and market the city as a major hub for this field. EDC might also partner with the Health Department's PCIP program; for example, they could share information and resources about upcoming city RFPs as part of efforts to prepare local IT firms to win those contracts.

Create a comprehensive approach to workforce development in the health IT sector. Training and retraining workers for health IT jobs will be one of the key challenges for New York in the coming months as more doctors, clinics and hospitals convert to electronic health records. The city should work with health IT firms and health care providers to understand the industry's specific workforce needs and develop a comprehensive approach to addressing current gaps. It should consider creating a health IT component to CTE programs and team with the city's community colleges and technical schools to design programs that train health IT workers.

Harness the work of Columbia University's Center for Advanced Information Management. New York City is home to the state's only Center for Advanced Technology (CAT) that specializes in developing medical information technologies. But more could be done to make the Columbia CAT a spark for innovation and entrepreneurship in the local health IT field. Officials at the CAT should facilitate linkages between Columbia researchers and local entrepreneurs and investors.

Require that all EHRs qualifying for federal subsidies meet high standards of interoperability and functionality. Not all EHR systems and vendors are very good at sharing information, and not all EHRs can support doctor-patient communication through PHRs and secure email. But the Office of the National Coordinator for Health Information technology, which has broad powers under ARRA, should require that all physicians receiving incentive payments through Medicare and Medicaid purchase EHR systems that meet high standards in both senses: standards of interoperability governing the flow of information and standards of functionality determining the kinds of tasks a system can support. Patient messaging capabilities, in particular, could be critical to the further development of health 2.0 technologies like PHRs. Also, federal regulators should make sure providers are compliant with new rules that require them to issue an easy-to-use electronic copy of a patient's health record upon request. This digital copy should be easy to upload into a PHR or incorporated into another provider's EHR, and it should be made available for free or at very low cost to the patient.

ENDNOTES

1. The Lewin Group, "The Health Information Technology Leadership Panel, Final Report," March 2005, p. 26. www.hhs.gov/healthit/HITFinalReport.pdf
2. The American Recovery and Reinvestment Act of 2009. The Medicare and Medicaid incentive payments are explained in pages 353-380. Payments begin in 2011 and expire in 2015. Early adopters are rewarded with higher initial payments in 2011 and 2012, and no payments will be made to physicians who first adopt after 2014. In the case of Medicare, eligible physicians can receive up to \$18,000 in payments for the first year (or \$15,000 after 2012); \$12,000 the second year; \$8,000 the third; \$4,000 the fourth; and \$2,000 the fifth. And in the case of Medicaid, incentive payments are determined by the mix of Medicaid patients seen by the provider; for physicians to qualify at least 30 percent of their patients have to be Medicaid recipients.
3. Robert Atkinson, Daniel Castro and Stephen Ezell, "The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America," The Information Technology and Innovation Foundation, January 2009.
4. "Electronic Health Records in Ambulatory Care – A National Survey of Physicians," *The New England Journal of Medicine*, July 3, 2008. The 4% figure refers to ambulatory care providers. According to another study published in the same journal, only 1.5% of hospitals in the U.S. have fully functional EHRs. See "Use of Electronic Health Records in U.S. Hospitals," *The New England Journal of Medicine*, April 16, 2009. Number of NYC doctors, hospitals and clinics is from New York State Department of Health.
5. HIMSS Analytics
6. Steve Lohr, "A Hospital is Offering Digital Records," *New York Times*, April 5, 2009
7. Figures are from Venture Source, a subsidiary of Dow Jones.
8. According to a recent survey of health care consumers, more than 70 percent of respondents said they wanted their physicians to provide internet access to their medical records and offer online options for scheduling appointments and communicating with their doctor. See "Many U.S. Consumers Want Major Changes in Health Care Design, Delivery," Deloitte, September 3, 2008.
9. William Hersh and Adam Wright, "Characterizing the Health Information Technology Workforce: Analysis from the HIMSS Analytics Database," April 17, 2008.
10. Federico Girosi, Robin Meili, Richard Scoville, "Extrapolating Evidence of Health Information Technology Savings and Costs," Rand Corporation, 2005.
11. Catherine Chen, Terhilda Garrido, Don Chock, Grant Okawa, and Louise Liang, "The Kaiser Permanente Electronic Health Record: Transforming and Streamlining Modalities of Care," *Health Affairs*, March/April 2009.
12. Maria A. Friedman, Anthony Schueth and Douglas S. Bell, "Interoperable Electronic Prescribing in the United States: A Progress Report," *Health Affairs*, March/April 2009.
13. "Electronic Health Records in Ambulatory Care – A National Survey of Physicians," July 3, 2008. "Use of Electronic Health Records in U.S. Hospitals," April 16, 2009. For the difference between basic and fully-functional EHR systems see: Fred Trotter, "What Does it Mean to Have a Hospital EHR?" www.fredtrotter.com, December 8, 2008.
14. "The Digital Road to Recovery"
15. Ibid.
16. Ibid.
17. Robert Higgins and Mark Rinnella, "eClinical Works: The Paths to Growth," *Harvard Business School Cases*, 2006.
18. Steve Lohr, "Wal-Mart Plans to Market Digital Health Records System," *New York Times*, March 10, 2009.
19. "40 under 40: New York's Rising Stars, Ben Wolin 33," *Crain's New York Business*, 2009.
20. Steve Weinstein, "Health Tech Firm Expects Stimulus Spike," *Crain's New York Business*, April 8, 2009.
21. Dow Jones Venture Source.
22. Ibid.
23. Farzad Mostashari, Micky Tripathi and Mat Kendall, "A Tale of Two Large Community Electronic Record Extension Projects," *Health Affairs*, March/April 2009.
24. "Characterizing the Health Information Technology Workforce: Analysis from the HIMSS Analytics Database."
25. "The Health Information Technology Leadership Panel, Final Report." In 2005, institutional expenditures on health IT as a percentage of revenue was estimated to be 4-5%. The financial services industry, by comparison, was 7%.

SOURCES AND RESOURCES

Office of the National Coordinator for Health Information Technology: www.healthit.hhs.gov

The Congressional Budget Office Director's Blog: cboblog.cbo.gov

The American Recovery and Reinvestment Act of 2009: frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h1enr.pdf

Onvia Tracking Recovery: www.recovery.org

New York State Office of Health Information Technology Transformation: www.health.state.ny.us/technology

New York City Economic Development Corporation: www.nycedc.com

Columbia University Center for Advanced Information Management: www.cat.columbia.edu

The New York City Primary Care Information Project: www.nyc.gov/html/doh/html/pcip/pcip.shtml

The Bronx Regional Health Information Organization: www.bronxrho.org

The New York eHealth Collaborative: www.nyehhealth.org

The Certification Commission for Healthcare Information Technology: www.cchit.org

The Healthcare Information and Management Systems Society: www.himss.org

The AC Group: www.acgroup.org

KLAS: www.klasresearch.com

Fred Trotter: www.fredtrotter.com

The Healthcare Blog: www.thehealthcareblog.com

Crossover Healthcare: blog.crossover.com

Life as a Healthcare CIO: geekdoctor.blogspot.com