Date: Mon, 28 Sep 2009 14:23:07 -0400

To: "Dr. Baruch Fischhoff - Chair, National Academy of Sciences panel on Improving Intelligence" <baruch@cmu.edu>

From: Lloyd Etheredge <lloyd.etheredge@yale.edu>

Subject: 4. Cognitive Reframing and Political Opportunity Analysis; Global Health as an Opportunity.

Dear Dr. Fischhoff:

Re the work of your new National Academy panel: Since the early Cold War the principal responsibility and questions for US intelligence agencies have involved threat assessment. Drawing upon the scientific specialities represented on your panel - which suggest that this step might be useful - you might want to design an experiment to *reframe* questions.

For example, it might be useful for the DNI to analyze Political Opportunities as part of national assessments and as a recurrent section in President Obama's Daily Brief. President Obama has made it clear that he wants to create a new era of political linkups and cooperation across a wide range of issues. Thus, a well-designed Political Opportunities assessment could support the President's priorities.

A Specific Experiment: Health as a Political Opportunity?

I suggest that you design a two-year experiment that uses opportunities to improve international health as a new, specific question to be addressed in each DNI national assessment and in its high-visibility daily alerting system for the President.

There are three justifications for selecting health: 1.) Politically, over the years, regional meetings of US Ambassadors to improve public diplomacy have produced the feedback: "It isn't more Voice of America programs that we need; give us specific initiatives that connect America to the daily lives of people in our countries;" 2.) The DNI's staff report ICA 2008-10D (the enclosed pages) includes an inspired section, "Health as Opportunity," reviewing past success and strengthening the political case for this focus.

3.) There are new, revolutionary global opportunities that will come alive as a simple add-on to the Obama Administration's commitment to a domestic rapid-learning system for health. These will arise via the new national R&D system of electronic health records that your Institute of Medicine [which is part of the National Academy system and that shares the Washington, DC building] has helped to design. One new opportunity - for all patients, worldwide, who suffer from the 6,000+ rarer diseases [several hundred million people] to benefit, from a US initiative that could begin now - is identified in the enclosed letter of 7/21/2009.

Even more strongly (re benefits to US-China linkups]: President Obama has given high political priority to develop US-China ties. The enclosed letter of 8/15/2009 and background paper analyze China's plans [formulated during the Bush-Obama transition period in the US, and perhaps unknown to President Obama] to spend $124 billion over three years to transform its own healthcare sector, an initiative in which their own shift to electronic health records (with most details still under discussion) will play a key role. If these elements were combined in a briefing to President Obama, I think his view would be that US discussions of mutual interests, interoperable coding systems for R&D collaboration, etc. with China already should be underway.

[Within a few weeks, if rumors are accurate, a coalition of US non-government organizations & NIH will announce funding for a new N=200,000 online reference biobank with 3 billion DNA base pairs and ten years of medical history for each patient. This, also - with interoperable codings and nomenclature discussions - can link with systems in China and other nations and be available for querying, via the Internet to health practitioners and patients in all countries. With creative US leadership - if President Obama sees the connections - the daily practice of medicine, in all countries, could be affected and improved, in about 12-18 months.]

Combinatorial Cognitive Processes and Opportunities for Rapid Progress

For your Report, I think it will be useful to draw the potential lessons from the scientific literature concerning scientific innovation - e.g., W. Brian Arthur's excellent The Nature of Technology: What It Is and How It Evolves (Free Press 2009) for *political innovation*/creativity. A lot of the creative engineering process requires combinatorial intelligence [and, by implication, *information systems that support combinatorial intelligence*)] not just the maximum use of scientific

hypothesis-testing methods.

Concerning the feasibility of Political Opportunity questions and a health experiment: The original suggestion of a rapid-learning international health system, based on electronic health records, was discussed with HHS during the Bush Administration. The high-level HHS response was "I am sure that there are recommendations for this, from various panels somewhere in the system, but we have our hands full just coping with the US domestic issues." There is nothing about the pieces of information that I have cited - in this illustration - about America's new high foreign policy priority for US-China linkups, the IT role in China's $124 billion healthcare system reform, the nature of evidence and databases concerning the 6,000+ rarer diseases (linked to the economics and incentives of the US drug industry), etc. that is secret or that requires spycraft to learn. But to help President Obama's leadership, and for the pieces to come together, requires reframing the question (for part of the analysis) from national security threats to political opportunities. . . . And part of the challenge for the DNI and his new $75 billion/year system will be to learn - and bring together - what the US government already knows.

best regards,
Lloyd Etheredge

Dr. Lloyd S. Etheredge - Director, International Scientific Networks Project
Policy Sciences Center
127 Wall St., Room 322 - Box 208215
New Haven, CT 06520-8215
URL: www.policyscience.net
301-365-5241 (v); lloyd.etheredge@yale.edu (email)

National Intelligence Council

ICA 2008-10D

Strategic Implications of Global Health

This Intelligence Community Assessment was prepared under the auspices of Karen Monaghan, National Intelligence Officer for Economic Issues, with the active collaboration of CIA, DIA/National Center for Medical Intelligence, and the National Counterproliferation Center. Inquiries may be directed to the NIO on 703-482-1232.

December 2008

deficiencies severe enough to disqualify them for service by US standards.[13] The National Center for Medical Intelligence estimates that mental fitness of North Koreans subject to military conscription will be at its weakest during the period 2009-2013 as children born during the severe food shortages and famine of the 1990s reach military age.

Worldwide, the capability of a government or organization to provide adequate health protection for its military will significantly impact its ability to project force abroad. Deployed militaries will likely continue to be vulnerable to the ravages of disease, despite a global trend towards forces that are more technologically sophisticated and less dependent upon large quantities of personnel.

In the case of standing militaries in southern and central Sub-Saharan Africa, however—where high HIV/AIDS prevalence has long been thought to endanger the functioning of some of the most developed forces on the continent as well as the UN and African Union peacekeeping operations to which they contribute—the risks of disease may have been overstated:

- A 2006 study by one of the world's most renowned HIV/AIDS researchers challenges assertions that military populations have a higher prevalence of HIV/AIDS than civilian populations. Many such calculations, in fact, have had little data to back them, and accounts of the ravages of HIV/AIDS on African militaries are frequently anecdotal.[14]
- Even if military populations are a high-risk population for contracting HIV, the military also provides an environment conducive to HIV/AIDS intervention. In recent years many African militaries have instituted education and awareness, condom distribution, and testing programs, often with the assistance of the US Department of Defense HIV/AIDS Prevention Program.

Health as Opportunity: A New Look at a Successful Paradigm

Health aid as provided by the developed world is most often tied to infectious diseases that are seen as posing the greatest humanitarian or security threat. HIV/AIDS, for example, garners about 25 percent of global health aid while constituting 5 percent of the disease burden in low- and middle-income countries according to an early 2008 study in the *British Medical Journal*.

- The fight against infectious diseases often appeals to international donors and affected countries alike: preventable with vaccines or treatable with courses of antibiotics, and with the efficacy of such interventions readily discernable and measurable. With infectious diseases commonly having the highest death toll in children and young adults, the question of *when* to intervene is also relatively apparent.

While such an approach may at least temporarily stem the targeted disease, however, it may or may not address other health needs in poor countries that are equally, or more, urgent.

[13] This figure does not include individuals who are mentally capable but have physical conditions disqualifying them from service.

[14] Reasons for lack of data include reluctance of many countries to collect information on HIV prevalence in their militaries or to publicize or share what data they have. Most militaries by 2004, however, had prohibited recruitment of HIV-positive personnel. In the case of UN peacekeeping operations, the UN neither conducts its own HIV/AIDS testing nor requires troop-contributing countries to conduct such testing.

- Chronic conditions, however, can be far more complicated to deal with than infectious ones. They are more likely to require prolonged interventions—public education, lifestyle changes, complex diagnoses, and life-long medication and monitoring—and success or failure of these measures may be much more difficult to fathom.

- HIV/AIDS, although an acute infectious disease that can be treated with antiretrovirals, is similar to chronic diseases in its requirements for the prolonged and complex interventions detailed above.

Developed world efforts similar to that exerted by the US in the fight against HIV/AIDS—but focused on broader global health objectives—could simultaneously help advance economic development, foster diplomacy, and improve overall health worldwide.

Medical Diplomacy. States such as Cuba and Venezuela garner a disproportionate amount of international influence thanks to their provision of health services worldwide. More and better-publicized developed world medical diplomacy efforts—for example, the US Naval Ship Comfort's humanitarian tour of 12 *Latin American* countries in 2007—could mitigate such influence while improving the health of citizens of poor countries.

Reconstruction and Stabilization. A recent RAND nation-building study has indicated that the ability of occupying forces or nascent governments to visibly boost public health and health-care capabilities can play a major role in enhancing the credibility of nation-building efforts.

- In *Afghanistan*, amelioration of major health challenges such as hepatitis B, drug addiction, high maternal and child mortality, and access to basic health-care could serve as means of bolstering support for the Karzai administration and the allied reconstruction effort, a greater degree of gender equality, and economic development.

- Visible Coalition fostering of better health-care in *Iraq* could have similar impacts, as well as enabling the Iraqis to develop the human capital needed to grow and diversify their economy.

- Marked health improvements in these two Muslim countries could play a role in easing frictions between the West and the Islamic world.

Smoothing Relations with Adversaries. Cooperation on health issues has historically kept international lines of communication open even at times of increased tensions among countries. Western health cooperation with *Iran* and *North Korea*—for example, assisting Pyongyang with the country's heavy health burden or encouraging Tehran to consolidate its recent improvements in health-care—could serve as a means of "diplomacy through the back door."

- Increased incidence of polio in Muslim countries or Iran's rising incidence of drug addiction could be two areas for engagement with Tehran.

Fruitful Engagement with Rising Powers. International assistance with the significant health burdens stemming from environmental degradation could provide potential opportunities for cooperation with *China*, *India*, and *Russia*.

- In the case of China, shared interests by it and the developed world in strengthening African capacities to fight infectious diseases could be an additional means of cooperation.

Easing North-South Tensions. Joint developed-developing world efforts to tackle degradation of health-care services in *poor countries*—frequently the result of South-to-North migration of health professionals in search of better pay, emphasis in some low- and middle-income countries on health tourism over provision of basic health-care, lack of affordable drugs, and the resultant proliferation of harmful counterfeit medications—could be a means of trust-building between North and South.

Advancing Economic Development. Increased developed world attention to the top three killers in the developing world—maternal and newborn mortality, infections of the lower respiratory tract, and diarrheal diseases, with their disproportionate impacts on young children—as well as highly debilitating NTDs could mitigate a tremendous portion of the health burden in low-income countries while potentially helping them out of poverty.

Significant improvements to global health are increasingly beyond the capacities of any single actor. Multilateral organizations can be effective force-multipliers, reducing financial and other costs to any one country. The global health infrastructure is under strain, however, and successful execution of programs may require a fresh look at mechanisms for delivering health aid:

- The World Health Organization is currently constrained by the fact that the bulk of monies provided by member countries are tied to the battling of single diseases. Freeing up funding for more comprehensive programs could render the WHO a more effective partner in fostering better global health—as could renewed commitments by states and private actors to multilateral health partnerships.

- An agreement by WHO member states in 2005 to revise and implement new International Health Regulations[15] (IHR) is a significant step forward for multilateral cooperation on health issues, particularly infectious diseases—even if not all member states have been fully compliant with the new regulations.

The Global Fund for HIV/AIDS, TB, and Malaria, an independent public-private partnership, has thus far been primarily focused on tackling of specific diseases, but its operating procedures offer ideas for multilateral cooperation on other health needs.

- These include fostering of multi-sector coalitions—governments, multilateral organizations, nongovernmental organizations, and private enterprise—to implement projects; heavy dependence upon local expertise for the running of programs; and placing a premium on results.

[15] The IHR requires that countries have minimum disease detection and reporting requirements with the aim of increasing transparency.

What Works? Global Health Success Stories

A recent Center for Global Development study[16] catalogued successful public health programs in the developing world.[17] *A recurring theme is the need for ownership of public health measures by local governments and populations.*

Success is possible even in very poor settings with hard to reach populations.
Cases: Guinea worm and river blindness control efforts in African and South Asia; vitamin A supplementation programs; improvement to health of mothers and children in Bangladesh and Mexico.
Mechanisms: Working through community to reach residents of remote places; sensitivity to cultural factors (e.g., women unable to venture far from home); financial incentives to take part in well-child services.

Even governments of poor countries can take a leading role in improving the health of their populations.
Cases: Halving of maternal mortality in Sri Lanka; cross-border collaboration in South America to eradicate Chagas disease; fighting measles in southern Africa.
Mechanisms: Collaboration of affected governments with each other, NGOs or the business community; design, delivery, and monitoring of health services by local public health systems; use of local resources as opposed to international donations.

Behavior changes and good management are as important as technology in fostering public health.
Cases: Control of guinea worm in Africa; fight against diarrheal diseases in Bangladesh; cutting tobacco use in Poland and South Africa.
Mechanisms: Families learning to filter their water and to fix rehydrating solutions; in the case of tobacco use, a combination of communication, legal measures, and taxation.

International agencies can overcome institutional and bureaucratic barriers to work for a common purpose.
Cases: Guinea worm eradication; control of river blindness.
Mechanisms: Collaboration among private foundations, donor countries, the WHO and other UN bodies, NGOs, donor countries, private companies, affected rural communities and governments.

Cause-and-effect (health programs and outcomes) can be measured.
Cases: The Progresa program in Mexico, which provided education and health interventions to families.
Mechanisms: Special data collection efforts; use of conditional cash grants.

(Continued on next page…)

[16] *Case Studies in Global Health: Millions Saved, 2007*.
[17] Programs were deemed successful if they could be implemented at the national, regional, or global level; addressed a significant public health problem; had a clear and measurable impact on a population's health; had staying power; and were cost-effective.

(Continued…) **What Works? Global Health Success Stories**

Disease-specific programs and comprehensive efforts to improve health systems can be integrated.
Cases: Distribution of vitamin A; salt iodation; tobacco control; child immunization.
Mechanisms: Pairing child immunization with fundamental improvements to basic pediatric health services; boosting success of disease-specific programs through inclusion of training, logistics, surveillance, and referral systems in a country's health infrastructure.

August 15, 2009

General James Jones, National Security Adviser
The White House
1600 PA Ave., NW
Washington, DC 20500
&
Dr. Frances Collins, Director
National Institutes of Health
9000 Rockville Pike
Rockville, MD 20892

Dear General Jones and Dr. Collins:

The United States has a new, political opportunity to strengthen ties with China and provide leadership for a rapid learning international health system that touches the lives of men and women throughout the world. I enclose a letter to Dr. John Holdren reviewing the scientific issues related to this opportunity.

The US project should move very quickly, at least with respect to discussions with China. The Chinese government privatized its national health system and found the results unsatisfactory. It has decided to spend $124 billion over the next three years for major reforms. Electronic health records are to play a key, but still undefined, national role. There is a historic scientific opportunity, if the Obama Administration acts quickly, to suggest and develop translatable coding systems shaped by the research community (for China's 1.4 billion people and our 300 million people) and for health professionals in both countries to work together.

The Chinese government is finding many of the same problems of managing a complex health system for 1.4 billion people as we are finding in the United States.

Concerning strategic planning for a wider NIH initiative and international political benefits relevant to a decision by President Obama, I enclose an excerpt, "Health as Opportunity: A New Look at a Successful Paradigm," from the National Intelligence Council's report, Strategic Implications of Global Health (December 2008).

If further discussion would be useful, please call me at (301)-365-5241.

Yours truly,

(Dr.) Lloyd S. Etheredge, Director
International Scientific Networks

Cc: Dr. John Holdren – OSTP
Hon. Judith McHale, Under Secretary for Public Diplomacy

April 2009

China Healthcare ICT:

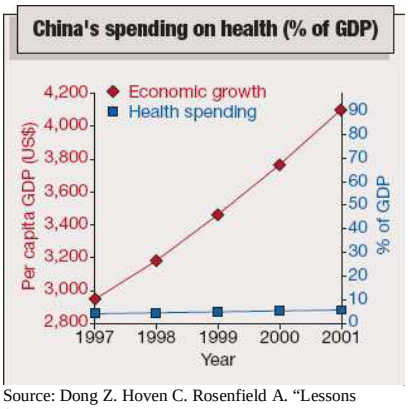
Reinventing China's national healthcare system through electronic medical records, telecom networks and advanced IT services

By Ken Zita

In January 2009 China announced a RMB 850 billion ($124 billion) stimulus package over three years to fundamentally reshape the nation's healthcare sector. A key element of the plan is to modernize healthcare services with digital hospitalization, electronic medical records, and next-generation information networks. The goal is to dramatically improve healthcare service quality and, importantly, to enable virtual healthcare services that can overcome service disparities between rich areas and poor. But the lack of technical standardization complicates take-up and adoption of unified e-healthcare solutions. The stakes are high for the government – and for international technology companies seeking position in this large and fast-moving market.

.

Like the U.S., China's healthcare costs have soared in recent years. Outpatient costs were 12 times higher in 2006 than in 1990 though incomes increased by only 5-7 times during the same period. [1] Spending on healthcare amounted to about $185 billion or 5.67% of China's GDP in 2007, yet healthcare investments have clearly not kept pace with China's miraculous economic growth.



Source: Dong Z. Hoven C. Rosenfield A. "Lessons from the Past". *Nature*. 10 February 2005

To redress "imbalances" in the system, including wide discontinuities in healthcare availability and quality between rich and poor areas, the government has initiated a RMB 850 billion ($124 billion) spending stimulus for 2009-2011. Some RMB 350 billion ($52.2 billion) will be allocated from the central government budget and is targeted principally at rural investments. This direct investment – rather than a more customary cost share with provincial governments – underscores the importance Beijing places on improving living standards and ensuring social stability in the countryside. The balance of RMB 500 billion ($74.6 billion) is aimed primarily at reducing urban hospital crowding and improving primary care, and will be provided by provincial and municipal sources.

The stimulus plan seeks to address five policy objectives:

1. Increase the number and quality of healthcare facilities. China has 19,000 county-level hospitals, 45,000 at the township level, and 315,000 health organizations nationwide. Rural area facilities dramatically lag behind the cities in terms of quality, scope of services, and doctor/patient ratios. In 2000 China ranked 188 out of 191 countries in the World Health Organization's ranking for fairness of healthcare finance. The government is keenly aware that people are getting impatient. The stimulus will lead to the construction of county 2000 hospitals and 5000 township clinics.

The Ministry of Health (MoH) additionally expects to build 2400 urban community or neighborhood **primary care clinics** to alleviate pressures on big hospitals. The number of patients registering at city hospitals doubled from 2005 to 2007. Beijing's three largest hospitals each support more than 8000 new patient visits *per day*. Efforts will be made to link medical centers of excellence in the cities with outlying areas.

2. Establish universal healthcare insurance. The government hopes to provide a safety net for the uninsured. This initiative is especially important in the current economic downturn as millions of migrant laborers have lost jobs and returned to the

[1] Gu, Edward "Towards Universal Coverage: China's New Healthcare Insurance Reforms" (forthcoming), cited in *Averting Crisis*

countryside. MoH Health Minister Chen Zhu stated in March 2009 that about 77% of the population is currently covered by personal healthcare insurance, either through government, individual, or rural co-op medical schemes. The target is to reach 90% of the population in the next three years.

Industry observers doubt the government's figures. One company's research suggests that fewer than 30% of China's population has medical insurance today. It estimates that over 40% of urban and 57% of rural populations have no coverage at all.[2] Nearly 50% of healthcare costs in China are borne by individuals and are typically paid out-of-pocket. In the poorest areas, encompassing hundreds of millions of citizens, people cannot afford to pay for even basic healthcare service. Chinese commercial insurance companies have expressed interest in underwriting health policies through public-private partnerships but Beijing has been reluctant to cede control – and potentially introduce market risk. Health insurance is expected to remain administered directly by the state.

3. Reform pharmaceutical and drugs distribution. In the market reforms of the 1990s state-owned enterprises and collectives in the healthcare sector were downsized or dismantled and hospitals became independent profit centers, albeit state-owned. Hospitals were allowed to mark-up pharmaceuticals by 15% and drug distribution became a lucrative profit center. Today more than 40% of hospital revenues are derived from sales of pharmaceuticals, according to the China Hospital Information Management Association, the sector's most authoritative research source. The result is endemic over-proscribing of medications and over-charges to patients.

A proposed national drug administration and management policy, *"State-owned Hospital Procurement for Drugs,"* first vetted in 2008, is expected to require hospitals to divest drug dispensing operations. To enact this transformation the MoH is exploring how to reinvent the drug distribution supply chain, including introducing end-to-end enterprise resources planning (ERP) and centralized pricing controls.

4. Improve public healthcare. With the outbreak of SARS in early 2003 China profoundly improved capabilities related to infectious disease surveillance, mitigation and control. It has implemented a four-tier disease surveillance and response system utilizing a variety of devices, sensors, incident management and decision support systems and operational procedures, some of which were developed with assistance from the US Centers for Disease Control and Prevention (CDC). The system is reportedly highly resilient and proved effective with the subsequent Avian Flu outbreak. It remains a cornerstone to monitoring seasonal influenza and for bio-terrorism surveillance. With the advent of TB/HIV, China has also begun to address blood safety, particularly following well-publicized incidents of contamination in recent years. Curiously, analysts suggest that in response to the SARS crisis China may have *over*-invested in complex public health systems at the expense of basic healthcare reform. All the same, MoH plans 330 new emergency medical centers around the country.

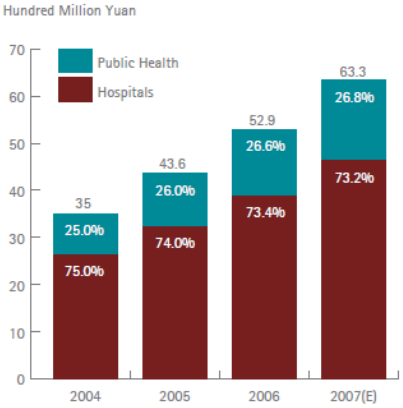
5. Hospital reform is aimed at better training for professionals[3] as well as increased investment in healthcare IT. An essential dimension of hospital reform is to establish "digital hospitals" through investments in healthcare IT as well as adoption of electronic medical records. According to Wang Caiyou, Vice Director of the Center for Health Statistics at the Ministry of Health, "Our vision is to move toward a person-centric – or patient-centric – healthcare network and IT is one of the main

> *"Our vision is to move to a person-centric – or patient-centric – healthcare network and IT is one of the main supporting tools."*

[2] The corporate statistics are supported by *Averting Crisis,* a white paper prepared for the Carnegie Endowment for International Peace, *"Averting Crisis: A Path Forward for China's Healthcare System,"* by Meredith Wen.

[3] MoH statistics indicate that only 2.9% of healthcare personnel working in township (rural) healthcare centers hold a BA degree; 24.9% have received a junior college education; 56.5% have secondary technical school backgrounds; and 15.8% have received a high school level of education or below. For hospitals, the figures are: 38.8%, 33.2%, 20.7% and 3.6% respectively.

supporting tools." Aspects of the reform agenda depend on new structural capabilities that can only be made possible through comprehensive application of information and communications technologies. Improved transparency, lower costs, higher efficiency, remote healthcare, universal insurance, and interoperability among systems and shared resources all depend on new information technology platforms.



Source: *The White Paper on China's Hospital Information Systems*, CHIMA and Accenture (May 2008)

Interestingly, Beijing's stimulus package dedicates only a single paragraph to the enabling information infrastructure required to achieve the strategic policy goals. No mention is made of funds that will be allocated specifically for ICT. MoH and private sector players alike are scrambling for position to earn favor and define funding proposals for the money.

The Healthcare IT Market

Healthcare IT spending hit RMB 6.5 billion ($970 million) in 2007, up 62.7% from the previous year, according to CHIMA. Growth has averaged about 20% per year since 2004. Compound annual growth for 2007-2012 is estimated at 21.2%. Sales could reach $1.2 billion this year, before the addition of new investment from the stimulus package.

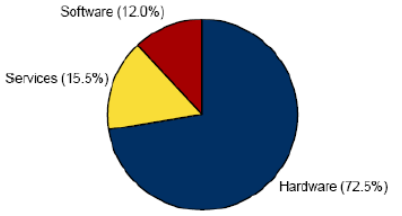
Network Dynamics estimates China will allocate 1.2% to 1.8% of the total $124 billion stimulus budget toward healthcare IT, or approximately $1.45 billion to $2.6 billion incremental investment for 2009-2011. Total healthcare IT spending could thus top $2 billion per annum in the years ahead.

The bulk of spending, about 73%, has been within hospitals themselves. [4] Future spending will be concentrated in establishing Regional Healthcare Information Networks (RHIN): data centers and telecommunications networks to share data and clinical services among geographically dispersed communities. Few hospitals and regional health authorities have begun implementing RHINs – sometimes referred to in China as "regional collaborative medical services" – though regional health is a centerpiece of the government's reform effort. Most healthcare IT investments have been in systems and hardware rather than software and applications (see pie chart).

China will allocate 1.2% to 1.8% of the $124 billion stimulus budget toward healthcare IT, or approximately $1.45 billion to $2.6 billion incremental investment for 2009-2011. Total healthcare IT spending could top $2 billion per annum in the years ahead."

Chinese hospitals invest 2%-5% of operating revenues on average into IT compared to 12%-15% in the US, according to CHIMA estimates. It bears noting that there is wide disparity in spending levels by geography, with most extensive commitments having been made in the wealthy Eastern provinces. Rural spending on healthcare IT is minimal.

Healthcare market Segment by Solution, 2007



Source: IDC China Healthcare Industry IT Solution Forecast

Hospital capital spending is highly decentralized with each facility making its own purchasing decisions. A lack of standardization has led to a plethora of unique or customized technical systems, with limited interoperability. The inability to transfer data effectively restricts patient and clinical care options and raises overall healthcare costs. Most systems in place today are associated chiefly with administrative management. Only the largest, wealthiest and most sophisticated hospitals have expanded their information systems to include clinical diagnosis, decision support, and electronic patient records.

[4] CHIMA and Accenture, *"The White Paper on China's Hospital Information Systems,"* May 2008

Competition in the HIT market is heavily fragmented. Spending decisions are local and made at the discretion of hospital information management departments. Consequently there are many niche players competing for market share. CHIMA estimates that fewer than 20 out of the 300 Chinese independent software vendors (ISVs) involved in health informatics have more than 100 staff. Even the largest ISVs – Bsoft, Kingstar Winning, Neusoft – have failed to earn more than 8% market share. With so many buyers of hospital systems, and so many sellers, there are few industry norms. The notable exceptions are hospitals associated with the People's Liberation Army, which have a unified technological approach for many IT platforms and services.

"Interoperability between data formats and systems by adapting proven international standards is critical to achieving universal healthcare for all."

Healthcare IT Standards

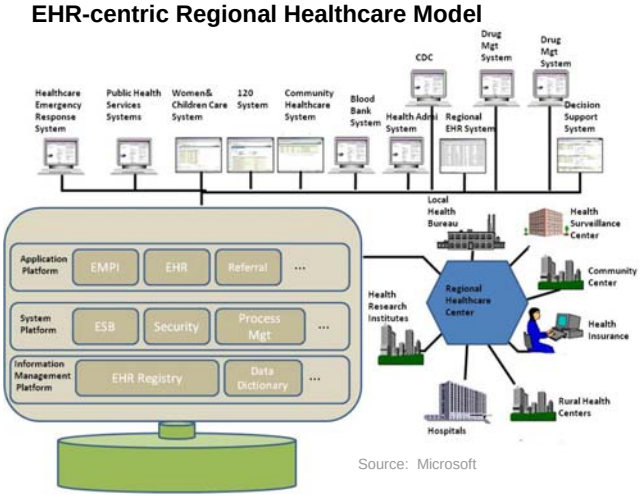
The lack of standardization complicates take-up and adoption of unified e-healthcare solutions. Unlike the U.S. – where the Obama Administration's proposal to include electronic medical records in the stimulus package has led to partisan hand-wringing – China is determined to overhaul its healthcare system with aggressive adoption of information technology. It has the funds to invest. The challenge is agreeing the finer points of standards definition.

China has been struggling in recent years to define standards for two important technical frameworks: Electronic Medical Records (EMR), the data standard for formatting "cradle-to-grave" patient medical history information; and, Electronic Health Records (EHR), the standard to govern the transmission and interoperability of medical data between healthcare facilities and insurers, doctors, pharmacies and the wider healthcare establishment. EHR is coupled closely with the need to develop regional health information networks (RHIN) Both the EMR and EHR/RHIN standards are crucial to widespread adoption of healthcare information technology in China.

"Interoperability between data formats and systems by adapting proven international standards is critical to achieving universal healthcare for all," according to Dr. Li Baoluo, CHIMA's Executive Director. But reaching commonality of the scope of standards has proven elusive.

Serious technical debate – and serious bureaucratic competition – prevails within the industry. At MoH there is tension between those advocating fundamental adoption of international standards, which can be modified for the Chinese market, and those who prefer to develop and mandate a Chinese standard from scratch. International firms strongly prefer to have the Chinese adopt standards that comply with globally accepted international approaches, for example HL7 CDA and IHE XDS[5]. A "China standard", by contrast, could raise concern about barriers to trade.

EHR-centric Regional Healthcare Model



Source: Microsoft

As the Ministry attempts to specify "national" standards, provincial authorities are moving ahead with regional field trials. They hope their efforts become accepted as "golden pilots": demonstration projects that become *de facto* standards – in effect putting the market ahead of government decree. Each project is competing against other regions (and in some cases against Beijing) for first-mover advantage.

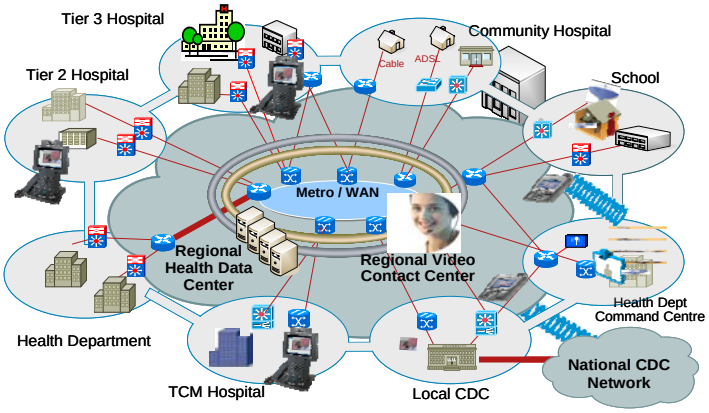
The MoH created the Electronic Records Standards Technical Steering Committee in 2006 with international information technology companies to develop draft national standards for EMR and EHR/RHIN. In April 2009 MoH published a 170-

[5] For reference, see: http://www.hitsp.org/

page "EHR Guidebook"[6] to steer debate but observers note that it falls short of codifying a national EHR standard.

EHR/RHIN is vital, in part, because of pressures on social services created by increased personal mobility within China. The pace of internal migration is accelerating compared to stringent restrictions on travel just a few years ago. As many as 300 million rural residents will move to the cities by 2020, according to the World Health Organization. Today it is virtually impossible for a person from one province to gain access to medical reimbursements, social security, pensions and so on in another. Technical medical standards would ensure that healthcare data is portable.

Regional Healthcare Information Network (RHIN)



Source: Cisco

From a technical perspective, the challenge is defining the data vocabulary and structure that can capture the myriad of approaches to data reporting already in use by hospitals and health administrators. But the greater obstacle to EHR/RHIN, perhaps, is supporting take up and adoption of a national standard while regional and local solutions continue to proliferate. This applies equally to efforts to create a new standard for EMR.

Essential to the EHR/RHIN vision is the potential for enabling the next generation of "tele-medicine" services: powerful telecom networks, shared applications and data centers that allow patients in poor areas to obtain clinical services "virtually" from rich ones, using advanced information and communications technologies. Tele-radiology, video diagnosis, drugs databases, public health disease surveillance, and proved management of medical emergencies are just a few applications that can be provided electronically to remote regions. By leveraging shared infrastructure, poor areas will be able to participate in modern medical network services without having to replicate capital investments locally.

The opportunities are excellent for international firms to supply China's emerging market for healthcare networks and applications. Best prospects, which Network Dynamics has examined in detail, will be found in:

- Data center platforms
- Telecom networking
  - Network security
  - Decision support systems
  - Databases
  - Emergency response
  - Solutions integration
  - Insurance systems
  - Drug retailing
  - Enterprise resource planning (ERP)
  - Hospital management systems.

* * *

Ken Zita is President of Network Dynamics Associates (www.ndaventures.com), a management consulting and project development firm that provides strategic direction to the global telecommunications and information networking industry. Research for this note was compiled while conducting a Definitional Mission for the U.S. Trade and Development Agency on China's healthcare information technology and disaster management sectors in March-April 2009. Terry Graham, Senior Consultant, contributed to the reporting.

[6] *Scheme for the Construction of a Regional Health Information Platform for Medical Records (For Discussion)*

