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INFORMATION TECHNOLOGY (AND DEMOGRAPHIC NECESSITY) WILL TRANSFORM HEALTHCARE₁

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As an apprentice futurist at the RAND Corporation back in the 1960's, I worked on a project to identify the criteria by which people assess the quality of their lives. The principal investigators on the project were Olaf Helmer and Norm Dalkey, the inventors of the "Delphi" survey technique. In our study, we used the Delphi methodology to solicit quality of life (Q.O.L.) factors from a sample population. After three rounds, the responses to our initially open-ended question had coalesced around nine Q.O.L. components, whose relative importance was reflected by a consensus of numerical weights assigned by the respondents (see TABLE).

Our original sample of respondents – mid-career civil servants from a dozen Federal agencies – scarcely constituted a representative cross-section of the U.S. public. However, in our research, we found a number of scholarly papers in ethnology and cultural anthropology reporting Q.O.L. criteria remarkably similar to ours among Polish coal miners, Bedouin tribesmen and Pacific Islanders, with "Health" always the top factor by a wide margin. Since our original survey, the opinion polling industry has compiled similar sets of criteria, by which people – in all walks of life – measure how satisfied they are with their lives. "Health" consistently turns up at the head of *each* list.

If we accept all this feedback (and why shouldn't we?), it would help explain the enormous amounts of money that people – individually and collectively – are willing to spend on health and medicine. In the language of behavioral economists, the marketplace demand for health is "price elastic." That is, health is so important to the quality of our lives that increasing the price of medical care does not reduce the demand for medical care. Society's demonstrated willingness to consume growing amounts of rapidly-inflating healthcare since 1980, *in spite of stagnant or falling median household income*, can be regarded as a text book example of price elasticity. Unfortunately, price elastic demand provides little incentive for suppliers to reduce their costs or improve their productivity in order to hold prices down. As a consequence, access to healthcare in America is increasingly being "rationed" by patient income – and this situation will get predictably worse – unless there is some sort of political intervention in the marketplace.

TABLE

COMPONENTS OF THE QUALITY OF LIFE DERIVED FROM A DELPHI SELF-ASSESSMENT SURVEY	
COMPONENT OR FACTOR	MEDIAN WEIGHT
1. HEALTH	20
2. STATUS	14
3. AFFLUENCE	14
4. MEANINGFUL ACTIVITY	12
5. SOCIALITY	9
6. FREEDOM	8
7. SECURITY	8
8. NOVELTY/NEW EXPERIENCE	7
9. AGGRESSION/DOMINANCE	6

from: *Studies in the Quality of Life*, by Norman Dalkey, Daniel L. Rourke, Ralph Lewis and David Snyder, Lexington Books, 1972, p. 87.

Of course, political intervention is exactly what America’s financially strapped healthcare consumers are currently looking for. U.S. opinion polls routinely show that affordable healthcare is now the second most important voter concern (after the Iraq war), and between 2/3 and 3/4 of voters believe that equitable access to affordable health insurance should be an entitlement. How best to achieve this goal is already one of the major debating points of the 2008 U.S. elections. But, by focusing our collective national attention on finding an actuarial “fix” for the high cost of healthcare, we are failing entirely to appreciate the rapidly approaching convergence of long-term demographic, economic and technologic trends that is about to coerce transformational change throughout the nation’s largest industry.

THE REAL FUTURE OF AMERICAN HEALTHCARE

“Healthcare” is, in fact, America’s largest industry, currently accounting for 16.5% of the nation’s GDP and 15.5% of all U.S. employment. The U.S. Bureau of Labor Statistics (BLS) expects “Healthcare” to employ 18.6% of all U.S. workers by 2014, and the National Center for Medicare and Medicaid Services estimates that “Health care” will generate 20% of our GDP by 2015. Three out of 10 new U.S. workers between now and 2015 will be employed due to growth in healthcare or medicine. The continued rapid growth of healthcare is largely seen as inevitable, as a direct consequence of our aging population. And, economists cheerfully regard healthcare as a guaranteed source of future new jobs that cannot be automated or off-shored.

Many policy-makers, on the other hand, see the projected rise in healthcare expenditures and employment as an emerging crisis that will only get worse in the future. U.S. healthcare spending over the past 10 years has risen 2 to 4 times faster than overall inflation and shows no sign of moderating. Medical bills are already the primary cause of bankruptcy among older Americans, and the high health insurance costs of U.S. factory workers seriously disadvantages our manufactured goods in global competition.

What's more, labor demographers forecast that the growing demand for health workers will substantially exceed the supply, causing an untenable shortage of professional care givers – including a projected deficit of 1 million nurses in 10 years. Such shortages would not only compromise the quality of American healthcare, but economists estimate that the resulting wage inflation among care providers would cause annual health spending increases to double – from 7.7% *p.a.* in 2006 to 15% *p.a.* or more – by 2020.

The most promising practical approach to reducing U.S. healthcare costs and labor requirements involves using information technology (IT) to create an electronic medical records system (EMRS), which proponents argue would cut healthcare costs by at least 20%, while reducing medical errors by 50% or more. In 2005, President Bush announced a Federal initiative to complete a nationwide EMRS by 2014.

Mr. Bush had good reason to promote EMRS. Over the preceding decade, the U.S. Veterans Administration (VA) had installed EMRS as part of a 10-year modernization of its 1,400 hospitals, clinics and nursing homes. As a consequence of the modernization, the VA has been able to double the number of patients it treats each year (from 2.5 million to 5.3 million), while maintaining an average annual per-patient cost of \$5,000. During the same period, the cost of comparable private care rose 40% to \$6,500 per patient. Not only was the VA able to reduce staffing by 13% (10,000 employees), but its over-65 year old patients have a 40% lower risk of death than do over-65 Medicare patients in private facilities.

In spite of its proven benefits, there is widespread opposition to EMRS throughout the medical profession and healthcare industry in general. Most practitioners refuse to accept the standard forms and definitions required by an automated system, while privacy advocates fear compromising patients' medical records and pharmaceutical companies are concerned (justifiably) that a single nationwide data base of patient records would reveal the side-effects and relative effectiveness – or ineffectiveness – of their medications. In fact, some policy makers worry that more accurate data on the nation's health would reveal shortcomings in the current system that would ultimately require even more expenditures on medical treatment. Overarching this debate is the fact that no source of funding has been identified to underwrite the billions of dollars that EMRS would cost.

MORE PATIENTS, FEWER BEDS

Absent any productivity-enhancing innovation, the prognosis for U.S. healthcare clearly indicates continuing employment growth. But the BLS biennial 10-year jobs forecasts reveal shifting employment within the industry itself. In particular, comparison between BLS 2002 and 2004 10-year projections indicates a sharp decline in the forecast employment growth of "Nursing and residential care facilities," which is off-set by a projected increase in employment by "Home healthcare services." The principal clientele for both of these segments of healthcare are the elderly.

Because Americans have been staying healthier longer, a declining share of elderly is requiring institutional care until late in life. However, because the average U.S. life-span is continuing to increase, growing numbers of older Americans are finding that the high cost of institutional elder-care often

consumes their retirement savings long before they die. These twin realities are leading a growing share of elderly people and their principal care providers – their children – to opt for *aging at home*. And, because home care costs are considerably less than those for institutional care, state and Federal funders of elder care have altered their policies to underwrite home care for the elderly – in response to both public demand and mounting political pressure.

The movement to care for the chronically ill and elderly at home has been accelerating since the Internet made possible the remote monitoring of patients by doctors and hospitals. In 2000, Medicare and Medicaid changed their funding criteria to cover the costs of “telemedicine” services and their associated technologies. Major IT firms Honeywell and Philips Electronics are each introducing a line of home health monitors, while Intel is developing specialty microchips for use in telemedicine.

Early assessments of telemedicine clearly show that it reduces both the cost and staffing of comparable institutional care, while significantly improving patient outcomes. In anticipation of making wider use of telemedical monitoring to oversee the post-operative recovery of patients at home, US hospitals have reduced the nation’s inventory of hospital beds by 2% (18,000 beds) since 2000. Over the coming decade, costly institutional care will increasingly be reserved for the critically ill, and for patients undergoing major surgery, while the care of convalescent and chronically ill people will largely take place in the home. Telemedicine will enable millions of people to care for themselves – or be cared for by others – in their homes rather than being institutionalized.

LONG-TERM PROMISES VS. NEAR-TERM NECESSITIES

We frequently hear that the future of medicine will be an exciting, hopeful place, filled with genetically engineered vaccines, cancer fighting nanobots, biomimetic prostheses and drugs that cure mental illness. But most of these breakthroughs are still works-in-progress. In the near-term future, innovation in healthcare will be driven by demographic necessities, and the need to provide quality care for a rapidly growing patient population with a slowly growing labor pool.

Some medical diagnostics and clerical work – as well as some surgery – will be off-shored to modernizing 3rd world nations. In 2004, *The Wall Street Journal* reported that in 2003, 600,000 patients from developed nations traveled to South Asian and Middle Eastern countries for low-cost operations. The *big* innovation in U.S. healthcare, however, will be the “outsourcing” of chronic and convalescent care to patients’ homes. Telemedicine via the Internet will permit hospitals, nursing homes and individual practitioners to serve more patients throughout a community, while producing superior patient outcomes.

Current patterns of social, institutional and technological adaptation strongly suggest that the foregoing scenario is already gathering momentum. Moreover, a growing impatience in Washington with the healthcare profession’s reluctance to use electronic patient records has forged a bi-partisan coalition committed to forcing the issue. To “jump start” EMRS, the Federal government can be expected to issue “smart cards” to all Medicare/Medicaid recipients by 2010-12, and to mandate electronic reporting by large care-providers – in hopes of capturing some of the improved patient outcomes and cost efficiencies experienced by the Veterans Administration. If the nation’s private health practitioners and providers were able to achieve a performance improvement approximating that of the VA care delivery system, it would be the public health equivalent of reversing global warming.

Once national EMRS reporting standards have been established, scientists and statisticians will quickly set up on-line networks to access and share the newly available data reflecting the actual collective practices and outcomes of American healthcare. Early revelations will lead to numerous

changes in medical practices and procedures, and provoke widespread support for a national health information network (“HealthNet”) that would mobilize all EMRS performance data to provide timely feedback for “evidence-based” public health policies and practices.

HealthNet would obviously be an invaluable asset when we confront future pandemics (epidemiologists are certain this is just a matter of time). Of course, if we do not have a HealthNet when the first pandemic hits, we are sure to have one in time for the second pandemic. A HealthNet would also be a powerful medium for “preventive care,” providing public access to reliable medical information and wellness education. Best of all, a national HealthNet will require no new technologic breakthroughs: it can be done with commodity systems and software.

The creation of a U.S. HealthNet would represent a national commitment on the scale of the Interstate Highway System. However, since sectoral economic projections commonly show that healthcare will be generating one-quarter to one-third of our GDP well before 2050, such an investment would be entirely appropriate. Given the scale and complexity of such an undertaking, it is probable that any national HealthNet/EMRS project would best be organized like the on-line collaboration of user volunteers that created the superior open-source (OS) software system (Linux), which is currently capturing a growing share of high volume commodity IT applications world wide.

If we start now, an OS HealthNet/EMRS could be operational by around 2015, about the time that some of today’s promising medical breakthroughs will finally be reaching the marketplace. But, before we enjoy the promised benefits of the long-term future of healthcare in America, we will have to get there first. And because health is the most valuable quality of life, the successful management of healthcare’s near-term future will be a more important achievement for society than any medical breakthrough.

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POINTS FOR THE CLASSROOM (send comments to forum@futuretakes.org):

- *What will healthcare support look like in your part of the world in 2020? Employer-subsidized? Tax-subsidized? Individual fee-for-service? The traditional Chinese system, in which the doctor is paid only when a patient is healthy and not when he/she is ill? To what extent will the fee structure be matched with medical necessity?*
- *Will the demographic, economic, technological, and social trends identified by Snyder lead to widespread utilization of complementary and alternative healthcare services? Preventative healthcare? If so, who will pay the fees?*
- *The author notes that medical costs are the primary cause of bankruptcy among older Americans. In 2020, what will be the primary challenges that elderly people face in your part of the world and elsewhere? Also, what will be the leading causes of (personal) financial insolvency, by age bracket, at that time?*
- *In the US, people are living longer on average (sometimes outliving their savings), and they are also working longer, often to maintain healthcare coverage or because of retirement plan failure. However, the “senior years” are when health challenges are often greatest, notwithstanding the fact that Americans are on average staying healthier longer. In addition, the workplace and work culture itself can be a source of unhealthy stress for some (albeit a social network for others). What are the long-term implications*

of this seeming mismatch? Will the next generation have more or fewer retirement years than the present generation?

- *Related question: considering also the demise of “careers for life” in some occupations, will the pattern of postponing retirement migrate to other parts of the world, or will another working-living-retirement pattern become more prevalent?*
- *Snyder points out that the health insurance costs of US factory workers puts the US manufacturers at a disadvantage in the global marketplace. To what extent is this disadvantage a factor in the US transition to a service economy (with healthcare itself a key service), especially considering that the US has been relatively attractive to outside investors in recent years? In which nations or regions will most manufacturing be found in 2020 – and with what implications?*
- *Related question: what long-term challenges will face nations that are primarily industrial economies? Service economies? Agricultural economies?*
- *As Snyder observes, labor demographers project a deficit of healthcare providers – in nursing alone, a deficit of one million in ten years. What countertrend, if any, will reverse this deficit?*
- *In addition to the trends discussed in the article, what other trends and developments will impact healthcare in the next 15 years?*