Health Service Delivery in the Information Age: 
Introduction to a Sociology of E-Health

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Abstract: Adoption of information and communications technologies within the Australian health sector presents three main themes of sociological interest: commodification of healthcare delivery; the impact of globalising healthcare on individual and collective identities, and new technologies of governance. All three cases pose significant social and cultural changes in the structure and experience of health service delivery. In this paper, I examine ICT in health as issues in technology and power at societal, social and interpersonal levels and conclude that e-health necessarily involves social, cultural and political processes through which technologies are used to transform healthcare. I also discuss the implications of a national e-health strategy, and the need for a sociology of e-health.

What is e-health?

E-health has been defined as “The application of information technology (digital data transmitted, stored and retrieved electronically) and telecommunications for diagnostic and treatment services, educational and support services and the organisation and management of health services (including health information management and decision support systems)” (Mitchell 1998). It is characterised by a convergence of information technologies and communications technologies—hence the common terms Information and Communications Technologies (ICT) and Information and Telecommunications Technologies (IT&T). Some e-health services include teleradiology, telepathology, telepsychiatry, diagnostic support, clinical information transfer, remote monitoring, virtual consultations, continuing professional education, inventory management, and service administration. A key definitional consideration for this paper, is its overlap with economic spheres in the domain of the information economy.
The adoption of ICT in Australian health administration circles reflects a national plan encompassing three main themes: Firstly as an initiative to grow the commercial potential for e-health within an Australian information economy (National Office for the Information Economy 1998), it represents a movement towards commodification of healthcare delivery in Australia. Secondly, e-health is a generic concept that is global and globalising in its impact on individual and collective identities. Thirdly, it represents new technologies of governance. In all three cases it poses significant social and cultural changes in the structure and experience of health service delivery.

The e-health environment engenders very high levels of interactivity and communication that require moderation by standards and protocols. They are also socially and organisationally significant in that they have the potential to circumvent the control of traditional gatekeepers of health information, and be instantly available anywhere in the world. Information may also be exchanged across sectors in the form of “de-identified” or aggregated data. In this environment, the principles of healthcare delivery are entering the marketplace and the principles of the marketplace are entering into healthcare delivery.

E-health is promoted as a series of economic opportunities for the “information society/economy” arising from convergence of the health and economic sectors being progressed by The National Office for the Information Economy (NOIE),¹ established in 1997. NOIE interacts with the National Health Information Management Advisory Council (NHIMAC),² which was established by the Australian Health Ministers Advisory Council (AHMAC) in April 1999, and the Australian Health Commission. NHIMAC has the overall national responsibility for determining policy and directions
for information technology and the information economy. Its membership includes representatives from Commonwealth and state governments, clinical practice, the information technology industry, the private health sector, and health consumers.

Convergence of technologies and governmentality, as demonstrated in the Electronic Health Record (EHR), is seen as the final link for incorporating evidence-based medicine (EBM) into clinical practice both by providing decision support and enabling the routine collection of (anonymous) patient data that can be shared by providers and consumers of health services. The growth in Internet-based health consumer sites such as the Better Health Channel\textsuperscript{1} involving information and treatment will present a future in health care that is about evidence-based choice and will refocus the delivery of health care services back on the patient, where Darkins & Cary (2000:275) believe it properly belongs. However, for the health consumer, this scenario suggests empowerment through control over personal health information, with increased responsibility for self regulation.

The EHR first of all inspires images of consumer empowerment because it provides consumers with access to and control of their own electronic health records. It also allows consumers, especially those with chronic conditions, greater freedom and mobility—they no longer need depend on a single provider because their complex patient data can be accessed globally over the internet by suitably authorised health and medical practitioners. For the first time, it also represents for public health the prospect of a ‘longitudinal health record’ by which the health of individuals and populations may be monitored over time and interventions planned, implemented and evaluated.
Thus, the EHR appears to potentially satisfy apparently opposing objectives. It is a means of achieving efficiencies and cost-savings in health service delivery. At the same time it promises to enhance quality of care, broaden consumer choice and improve clinical governance. For example, under current arrangements, a patient living in a regional community, who is suffering spinal injuries acquired from a motorcycle accident must be transported a total of 500 kilometres every week by ambulance to a metropolitan hospital to receive rehabilitation services and a consultation with a specialist, usually costing thousands of dollars. By using existing infrastructure, the same services can be delivered over a standard videoconference connection to the patient and his or her local GP at a fraction of the cost. The benefits accruing to the patient include receiving care in their own community, as well as avoiding the physical discomfort, and time and earnings lost from making the round trip to the metropolitan hospital. The benefits to the GP and other community health service providers include continuity of care and peer education, and for the metropolitan specialist, time savings and an automatically generated electronic audit of the consultation. Ostensibly, e-health represents a win-win situation for all involved as well as a range of opportunities to expand the beneficial scope of health service delivery.

The policy form of e-health is the Health Online Action Plan. The architects of Health Online and to some extent the medical and health fraternities have now passed beyond seeing e-health as a series of technical issues to be resolved, to an appreciation of the social, cultural and political considerations, and the associated expenses, underlying the organisational changes necessary to integrate e-health
modalities into health service delivery. The Australian healthcare landscape is littered with the remnants of e-health projects that have failed through lack of such considerations. However, much of the e-health fervour can be seen in terms of technological determinism, or the imputed ability of technologies to bring about social change, and the related need to focus on the social and cultural shaping of technological ends.

The processes through which new technologies are adapted and accepted are not well understood. Rogers ‘diffusion of innovation’ model (Rogers 1983, 1995) has become the touchstone for social marketing approaches to adoption of new technologies, employing the terminology that distinguishes between ‘early adopters’ as positive and ‘laggards’ as negative and focusses on opinion leaders as the most likely conduit through which to gain early acceptance of a technology. Adoption of new technologies is in fact often lead by opinion leaders in positions of power and influence, but often the technologies are introduced without an understanding of their impact on the people who use them, their appropriateness to the context in which they are introduced, or an evaluation of their capacity to bring about the desired outcomes.

**Changing space, time and interaction**

There is certainly space however for consideration of ‘soft technological determinism’ evidenced in the ways in which individuals and groups are using ICT to change their own lives. The nature of services is also constantly changing as the uptake of new technologies by health consumers creates opportunities for new forms of interaction. The counselling service for youth Kids Helpline for example has shifted to an automated text based query-processing system as its telephone service has been
surpassed by its email service. Freeman (2002) and Stewart (Stewart 2000) have argued that information policy in health care can be thought of as a kind of state building in which government is defining and defending new administrative territory, and building an infrastructure that will allow new and sophisticated kinds of social and economic activity to take place.

Lisa Cartwright (2000) adopts Bruno Latour's concept of action at a distance to reflect on the benign forces of population management that characterise the play of power and politics of health care in late capitalism (Latour 1987). By suggesting that e-health ‘imagines its world’, Cartwright emphasizes the view that the forces of globalization are not ineluctable market- and technology-driven trends, but culturally produced. Therefore, e-health is neither a discipline in its own right nor a disciplinary set of techniques. E-health is rather a set of actuarial techniques and practices for reordering social life (populations, communities and identities) within an imagined world for the management of health care capital, labour, markets, and knowledge for the 21st century in which health information and its management become the organising principles of health service organisation and administration.

Relevant changes can be seen in the forging of a new set of geographical coordinates and new definitions of remote peoples in the process of e-health development. In a dialectic of images and imaging, the use of Geographic Information Systems technology (including Global Positioning Systems), remote satellite images, epidemiological data and other complex technologies are producing new client populations. A case in point is the ARIA (Accessibility/Remoteness Index of Australia), which replaces population density as a standard measure of remoteness of
a site from the nearest health service centre (DHAC 2001). It’s use for assessment of the viability funding for rural aged care homes for example, contributes to redefining remoteness and hence “community”.

The e-health paradigm stands to transform an organisational rationale based on physical geography to a social geography in which the spatialisation of communities is determined by the requirements of the e-health plan. As cheaper and more effective ICT infrastructure allows cost effective service delivery to the most remote areas of Australia, the ARIA will be replaced by a new spatialisation of client groups ordered within the requirements of the new system.

Outcomes from the application of these technologies include the possibility for increased social isolation and stigmatisation of mentally ill people, and contributing to the physical isolation of populations from health services. Most evaluations of the appropriateness of e-health are made by service providers in remote communities, rather than community members. Obversely, access to ICT enables formation of communities around shared concerns such as chronic illness.

The question of consumer and community empowerment however, has only begun to be explored. Anecdotally, trends in the uptake of virtual health and medical consultations suggests higher than expected levels of acceptence (or in other words, low levels of consumer resistance) and even preferences for virtual modalities of interaction with the healthcare system, indications that challenge the taken for granted assumption of the preference for face to face interactions.

The development of EBM and decision-support systems may be the driver for patient empowerment by enhancing the performance and accountability of practitioners, but
it may just as easily develop a culture of compliance around the use of technologies which restrict choice. We need to anticipate the consequences of this as we head down the road to fully integrated systems that will extend traditional diagnosis and patient management beyond the doctor's clinic into the everyday living environment. However, this raises questions regarding the liability of practitioners once they actively involve patients in decision-making.

From this perspective, e-health may be viewed as engendering changes in the ways individuals understand their own identities and their own sense of what community means, and what relevance geography has in relation to community. As a set of techniques that reconfigures the relationships between providers and consumers of health services, e-health simultaneously redistributes and redefines populations in terms of the new economic and spatial requirements of health service delivery that are at the same time created and required by new technologies.

ICT are innately disrespectful of conventional geo-political boundaries and consequently have the capacity to test long held and cherished assumptions about acceptable patterns of health care delivery. By enabling care delivery in a manner that transcends conventional boundaries of distance, hierarchies, institutional structure and occasionally time, it can act as both an enabling and a destabilising force. As Nancy Milio (1996) argues, there is a role for IT in changing practitioner-patient communication. Health professionals often do not always communicate well with their clients in face-to-face encounters, and professionals are not necessarily available when and where they are needed. The status of ICT as mediators of the doctor-patient relationship in healthcare contexts is ambiguous and requires more sociological investigation.
Globalisation and e-health

In the dynamics of medical power, information transmission is usually an unequal exchange between locations and players. The new possibilities for communication in the e-health environment allows exchanges between under-served populations and typically metropolitan experts, while practitioners in places of greater expertise may reach out to care for populations they did not previously serve (Cartwright 2000:351). It enables physicians in first world countries to ‘reach out’ to physicians and their patients in the third and emerging worlds to provide expert knowledge and skills through telemedicine applications. On a large scale, it allows the first world to export entire healthcare systems on a global scale. However, it is clear that this strategy also involves Australia becoming an outlying market in new opportunities enabled by new technologies a global health market—themes recently touched upon by Australian health sociologists.

One of the most powerful images driving the enthusiasm for e-health is its promise to reduce inequalities of access to health services and information, particularly for underserved populations by providing a means of increasing the supply of services and specialised programs such as mental health. Rural and remote areas globally continue to suffer considerable disadvantage in terms of access to and cost of telecommunications infrastructure and access to health services. Communities characterised as under-served including the aged, non-English-speaking, mentally ill, indigenous Australians and the illiterate are also at risk of further marginalisation from the health mainstream under an e-health regime.

It can be used to increase the acceptability of services so that they can better meet the special needs of individuals and communities through for example, culture-and
However, if resources are distributed according to free market principles, the distribution may not be equal (Swanson, 1998). In an e-health environment where health outcomes are predicted to be increasingly linked to access to infrastructure and technologies, the inequalities of the ‘digital divide’ are poised to become more than a measure of access to new technologies, but as health service delivery is increasingly mediated by ICT, access could become one more element in the global patterns of widening inequalities in health opportunities (United Nations Development Program 1999).

The practices and experiences of health service providers and consumers also stand to be shaped by the social technologies implicit in the development of e-health policies and projects tied to an agenda of social change. This is to emphasise the point that the introduction of ICT into health service delivery is not only about the material technologies of information and communications technologies, but also the scale of organisation change required to accommodate the use of these technologies. Thus, for example, the adoption of videoconsultations into ambulatory care services requires a reconfiguring of the clinical pathways of traditional services delivery that may entail the elimination of certain procedures, health personnel, or entire services. Achieving acceptable outcomes for all stakeholders is a highly complex sociotechnical exercise (Clarke, Jones et al. 2001).

The social construction of (health) technology

The ways in which we consider the relationships between communication technologies and health depends on the ways we define technology. MacKenzie and Wajcman (1985) define technology in terms of a three-level layer of meaning. They
argue that technology can refer to objectives, activities, and knowledge. The notion of technology as having an object Mechanic (2002) points out, includes organisational structures, strategies, and ideologies directed towards defined purposes.

Technological innovations are therefore seen as social products; they do not "impact" on social organisation, but instead arise out of effective social relationships.

Kinsella (1993:4) argues that ‘technology is a product of social and cultural activities in an ongoing dialectic of stability and change. Technologies and attitudes toward technologies are socially constructed within particular contexts and must be analysed in terms specific to those contexts. While technological relationships are governed by interpretative processes of discourse and practices, people tend to gravitate towards a deterministic view ‘because it appears to provide a simple explanation of a complex and often-mystified phenomenon.’ The rhetoric of technological determinism is often an asset to interest groups who have aligned themselves with particular technologies and who benefit from perceptions of these technologies as ‘irresistible’ or ‘inevitable’ (1993:8).
As a program of rationalising health service delivery within an efficiency of means, and disciplines that include EBM (White and Willis 2002) and clinical governance aimed at integrating e-health modalities into health practices, a national e-health policy raises questions about the emergence of a commitment to technological solutions to healthcare problems. As Coiera argues:

Solutions must be identified in the context of culture as well as technology, because the use of technology is shaped by society...Non-technical solutions can be used to improve communication. These include education and policy (Coiera, 2000:29).

The technological context cannot be considered separately from the social and cultural context in which technologies, that include Foucauldian notions of social technologies, are implemented and the context is often one in which traditional structures of power and authority control the pace and direction of change. Such inputs and how they are used arise from socio-cultural conditions and in turn influence social behaviour and values. A sociology of e-health would explore these relationships and contribute a critical stance on health technology evaluation.

Endnotes

1 NOIE <://www2.dcita.gov.au/ie/framework >

7 See for example, the Lady Swinfern Charitable Trust <http://www.uq.edu.au/swinfen/?page=17936>

8 See Health Sociology Review, 2000, 10 (1).

References


