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Editorial

Evidence for building a smarter health and wellness future—Key messages and collected visions from a Joint OECD and NSF workshop☆

1. Introduction

In all developed economies health systems are under intense and increasing pressures due to the combination of a number of phenomena: the increased treatment needs of an ageing population, long-term survival of persons with chronic diseases needing on-going health care, availability of a wide range of new and expensive treatments, and increased consumer expectations. Governments and organisations are increasingly anxious to find ways to address these challenges, which coincide with economic and fiscal pressures and also a reduction in the workforce available for health and other care sectors.

Many other sectors of these economies have embraced information and communications technologies (ICTs), and related radical redesign of fundamental systems and processes, as a key means of increasing productivity and service quality. Sectors such as banking and civil aviation are now totally ICT-based in their core processes, and provide service patterns which are now the expected norm, yet would not be possible without an ICT foundation. Other core economic sectors too, including manufacturing and retail sectors, strongly embrace ICT-based processes, enabling higher levels of efficiency and service responsiveness.

By contrast the health sector, though strongly science- and technology-based in many respects, has not embraced the ICT opportunities to anything like the same extent. Over many decades healthcare has developed specialties and expertise areas which have become increasingly embedded in their own processes, while traditional safeguards of quality and ethics have built on these structures and in the process reinforced them.

Now, as the pressures become more urgent and as technology advances, significant new ICT applications are emerging, including ubiquitous, mobile, and pervasive methods for real time monitoring of patients' conditions, analysis and transmission of health data; telemedicine as a means of delivering remote care; and new data capture and management systems as a means of re-engineering patient records and for improved public health surveillance. New means of mining recorded data mean that better use can be made of it, to the benefit of individual patients and to overall health systems.

In short, opportunities and needs coincide to indicate that health systems must become smarter, utilising ICT in new – yet ethical and person-friendly – ways. This is the driving force behind the Organisation for Economic Co-operation and Development (OECD)'s Smarter Health and Wellness initiative, which was developed jointly with the United States' National Science Foundation (NSF) [1].

2. An international expert workshop and its outcomes

A central means of pursuing the OECD and NSF initiative, in order to consider the evidence on how best to develop and implement smarter models of care to enable the health and wellness services needed and expected, was the holding of an OECD expert workshop hosted and sponsored in Washington, DC by the NSF in February 2011. This brought together some 40 speakers and over 150 participants,

☆ This is a Work based on themes outlined in Papers from an OECD and US National Science Foundation Workshop: Building a Smarter Health and Wellness Future (http://www.oecd.org/sti/smarterhealth). It has been subject to editorial work and subsequent analysis. This report was edited by Prof. Michael Rigby (Keele University, UK), Dr. Elettra Ronchi (OECD) and Dr. Susan Graham (Berkeley, CA, USA). Any opinions, findings, and conclusions or recommendations expressed in this report do not necessarily reflect the views of the National Science Foundation (NSF has not approved or endorsed its content), the OECD and its member countries.

including researchers, economists, policy makers, social scientists, and representatives of private sector, professional and other associations.

The goal of the workshop was to consider strategic directions for the future of health and wellness, from both technological and policy viewpoints. A number of key themes were identified in advance, principal among which were identification of the key drivers of the emergent new technologies, smart models of care, networks and social behaviours, and consideration of what are the associated challenges and opportunities. It was important to discover how these developments are accommodating innovation at different levels of the healthcare value chain, from new product development to medical practice, and what can hinder or slow down innovation. Healthcare takes place in a socio-political setting, and so the roles of economic, social and regulatory factors, and of government, in driving and enabling these developments are important, as are issues of ethics and governance, and the conundrum of protecting privacy while ensuring a responsive service which also learns from its outcomes at a fine granularity.

An initial document summarising the key points at the workshop has already been published [2]. A further and fuller OECD policy document is in preparation. The third, more scientifically detailed output from the event is the on-line Special Issue of the International Journal of Medical Informatics introduced by this editorial. This Special Issue comprises an overview of the key health informatics messages from the discussion, combined with enhanced evidence and discussion on a selection of key topics represented by six papers. These papers are based on presentations to that workshop and include aspects which would benefit from further elucidation. The following sections of this editorial first outline the key issues as discussed at the workshop and reported in [2], and then give an overview of the selected papers.

3. Addressing the expanding and deepening needs of health and social care systems

Smarter health and wellness systems are needed to support better and more efficient care, encourage greater system-wide accountability and facilitate the promotion of healthy lifestyles and independent living, where 'smartness' is a combination of innovative ICT technologies and their use as the enabler of more focussed, purposeful, and lean service delivery. Introduction of 'smart' technologies can assist governments to tackle the current weaknesses in key components of health systems. Four particular areas stand out which call for smarter solutions and new models of care made possible by appropriate innovative use of (ICTs). They are as the following sections:

3.1. *Rising health costs and lack of effective and preventive care*

Across all OECD countries the use of more and intensive treatments, including those resulting from new research and development, and those resulting from misuse, overuse and/or underuse of care, combine to increase costs. Furthermore, poor prevention, unhealthy life styles and lack of early effective care add to these costs – for instance, in the United States 75 cents of every dollar spent on health care is spent on patients with chronic diseases, many caused or aggravated by unhealthy lifestyle or lack of applied prevention. More and better information is needed to support wide-ranging improvements not only in the quality and value of care, but across the health care system, particularly in targeting preventive services and promotion of healthy lifestyles. Smart use of data can also improve quality and effectiveness of care, and can also support other needed changes such as improvements in medical product safety.

3.2. *Demographic changes and increasing proportions of elderly and of very old/frail elderly*

In the next four decades the OECD countries face a strong and steady growth in the proportion of population in the 'older elderly' group – the proportion over 80 years of age – which is anticipated to increase by 2.5 times between 2008 and 2050. In Japan, the proportion of over 80s in the population is expected to rise from a current 7% to 17% by 2050, while the EU 27 countries' percentage is expected to grow from a current 5% to 11.5% – namely, a greater than doubling in 40 years. While by no means all these citizens will have chronic health problems, the expanding cohorts of elderly will include a significant proportion of persons with chronic diseases. The number of older people with a long-term care need in Japan is estimated to almost double from 2.8 million in 2000 to 5.2 million in 2025; in the United States the number of people aged 65 and over with Alzheimer's disease is expected to increase by more than 50% over a 30-year period, reaching 7.7 million in 2030.

3.3. *Increasing demand for home care, concurrent with declining health workforce availability*

Enabling dependent, older people to stay in their own homes is a matching of most persons' preference to be cared for in their own homes for as long as possible, recognition of the health risks of unnecessary hospitalisation, and a response to the need to reduce healthcare spending. This living at home will create more demand for home support workers, which is already a stretched workforce. The traditional solution of many wealthy countries, that of importing workers from lower wage economies, is not sustainable as a solution either ethically or practically, as each country's health and care needs will expand. Recent studies from the OECD point to a possible long term care workforce crisis, resulting in a heightened need for greater efficiency. Technology can enable this and also upskilling through remote support. Home care arrangements account today for more than 30% of the public resources spent on long-term care in many OECD countries, and expectations are for an increasing amount of home care.

3.4. *Demand for more responsive, patient-centric services*

Not only will the number of people needing support increase both in absolute numbers and proportionally, but they will