PD ISO/TR 14639-1:2012

BSI Standards Publication

Health informatics — Capacity-based eHealth architecture roadmap

Part 1: Overview of national eHealth initiatives

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

Documents
Document Sharing Hub

National foreword

This Published Document is the UK implementation of ISO/TR 14639-1:2012.

The UK participation in its preparation was entrusted to Technical Committee IST/35, Health informatics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2012.
Published by BSI Standards Limited 2012

ISBN 978 0 580 76330 4

ICS 35.240.80

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 September 2012.

Amendments issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: PD ISO/TR 14639-1:2012

INTERNATIONAL STANDARD

ISO 14639-1

First edition
2012-08-15

Health informatics — Capacity-based eHealth architecture roadmap —

Part 1: Overview of national eHealth initiatives

Informatique de santé — Feuille de route de l'architecture de santé électronique fondée sur la capacité —

Partie 1: Aperçu des initiatives de santé électronique nationale

Reference number
ISO/TR 14639-1:2012(E)

Documents
Document Sharing Hub

© ISO 2012

Full document details: PD ISO/TR 14639-1:2012

COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Documents
Document Sharing Hub
© ISO 2012 – All rights reserved

Full document details: PD ISO/TR 14639-1:2012

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Terms and definitions 1

3 Abbreviations 6

4 Initiatives reviewed 7
4.1 Health Metrics Network 7
4.2 Australia 7
4.2.1 National health system 7
4.2.2 Focus of national health system 9
4.2.3 Components of the national health information system 10
4.2.4 National eHealth policies 11
4.2.5 National eHealth architecture stage of development 15
4.2.6 National data warehouse 17
4.2.7 Standards in use 17
4.2.8 Standards Development Organizations (SDOs) and Health Informatics Associations 19
4.2.9 National reporting infrastructure for individual and/or summary data 20
4.2.10 Households with Internet access 20
4.3 Brazil 20
4.3.1 National health system 20
4.3.2 Focus of national health system 20
4.3.3 Components of the national health information system 22
4.3.4 National eHealth policies 23
4.3.5 National eHealth architecture stage of development 24
4.3.6 National data warehouse 24
4.3.7 Standards in use 25
4.3.8 Standards Development Organizations (SDOs) and Health Informatics Associations 25
4.3.9 National reporting infrastructure for individual and/or summary data 26
4.3.10 Households with Internet access 26
4.4 Canada 27
4.4.1 National health system 27
4.4.2 Focus of national health system 29
4.4.3 Components of the national health information system 30
4.4.4 National eHealth policies 31
4.4.5 National eHealth architecture stage of development 32
4.4.6 National data warehouse 34
4.4.7 Standards in use 34
4.4.8 Standards Development Organizations (SDOs) and Health Informatics Associations 34
4.4.9 National reporting infrastructure for individual and/or summary data 35
4.4.10 Households with Internet access 35
4.5 India 35
4.5.1 National health system 35
4.5.2 Focus of national health system 36
4.5.3 Components of the national health information system 37
4.5.4 National eHealth policies 37
4.5.5 National eHealth architecture stage of development 37
4.5.6 National data warehouse and national reporting infrastructure for individual and/or summary data 37
4.5.7 Standards in use 37
4.5.8 Standards Development Organizations (SDOs) and Health Informatics Associations 38

Documents
Document Sharing Hub

© ISO 2012 – All rights reserved

Full document details: PD ISO/TR 14639-1:2012

4.5.9 Households with Internet access 38
4.6 Kenya 38
4.6.1 National health system; focus of national health system 38
4.6.2 Components of the national health information system 39
4.6.3 National eHealth policies 42
4.6.4 National eHealth architecture stage of development 43
4.6.5 Standards in use 43
4.6.6 Standards Development Organizations (SDO) and Health Informatics Associations 44
4.6.7 National reporting infrastructure for individual and/or summary data 44
4.6.8 Households with Internet access 44

5 International Monitoring and Evaluation frameworks 44
5.1 Overview 44
5.2 Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) 44
5.3 Joint United Nations Program on HIV/AIDS (UNAIDS) 44
5.4 Pan American Health Organization (PAHO) Framework 45
5.5 Brazilian Health Indicators Framework 45
5.6 Canadian Health Indicators Framework 45
5.7 United States Health Indicators Frameworks 45

6 Key findings 46

7 Need for an eHealth Architecture Maturity Model (eHAMM) 49

Bibliography 52

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 14639-1 was prepared by Technical Committee ISO/TC 215, *Health informatics*.

ISO/TR 14639 consists of the following parts, under the general title *Health informatics — Capacity-based eHealth architecture roadmap*:

— *Part 1: Overview of national eHealth initiatives*

The following parts are under preparation:

— *Part 2: Architectural components and maturity model*

This part of ISO/TR 14639 complements and supports the general requirements for the use of information in health services which are to be set out in the proposed technical specification, ISO/TS 16555, *Health informatics — Framework for national health information systems*. ISO/TS 16555 will provide specifications defining data sources and business processes supporting the more general use of information within the delivery, operation, management and planning of health services within a country.

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

Introduction

This part of ISO/TR 14639 arises from the recognition that currently there is considerable diversity internationally in the approach and scope of development and implementation of national health information systems (HIS). Growing interest in health system strengthening in low-income countries (LIC) in the international community has led to increasing interest in and support of this activity[3].

In preparing this part of ISO/TR 14639, the original aim was to provide guidance for developing and emerging countries and for the many international groups that conduct health programs in the developing and emerging world. As the work proceeded, it became clear that the work is more widely applicable to all health services, for whom there are potential lessons to be learned as they examine the way in which information is used, produced and managed in various aspects of their work. The identification of relevant health informatics standards and the role of international standardization in support of eHealth were also important drivers.

This part of ISO/TR 14639 builds on lessons from many countries, including those whose activities are summarized in this part of ISO/TR 14639, and was largely inspired by the Health Metrics Network (HMN) activities sponsored by the World Health Organization (WHO)[1][2].

This work has been motivated in part by a recognition that countries vary in terms of readiness and resources for health system strengthening, with the expectation that it will help to provide the tools needed for policy-making, strategic planning and eHealth architecture development for robust and appropriate country HIS.

The particular focus of this part of ISO/TR 14639 is the potential for Information and Communications Technology (ICT) to assist in the collection, communication, storage, processing and use of information to support the delivery, planning and coordination of health services. However, it also recognizes the importance of initial measures that involve paper-based collection and the need for a migration path from manual to semi-automated to fully automated information management systems.

This part of ISO/TR 14639 presents a description of contemporary national enterprise-wide HIS. The resulting landscape identifies key high-level categories for different aspects of such systems which should be considered in any national architecture design endeavour. While not an exhaustive inventory of systems or necessarily a description of best practices, it is roughly representative of all income levels and strives to illustrate the diversity of HIS in different information technology environments with varying levels of capacity.

Supported by the findings from this review, this part of ISO/TR 14639 also proposes development of an eHealth architecture maturity model (eHAMM) for expressing the extent of development of HIS and eHealth architecture. The model can be used to direct planning and assess progress of national HIS towards maturity.

The maturity model will be elaborated upon in ISO/TR 14639-2 and includes a methodology for classifying HIS according to descriptions of architectural components.

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

Health informatics — Capacity-based eHealth architecture roadmap —

Part 1:
Overview of national eHealth initiatives

1 Scope

This part of ISO/TR 14639 aims to identify the business requirements of an eHealth architecture as well as providing a generic and comprehensive context description to inform architectural structuring of Health Information Systems (HIS).

This part of ISO/TR 14639 reviews international experiences in the construction of national eHealth architectures and introduces a methodology for strategic development of HIS[4], which will be elaborated upon in ISO/TR 14639-2.

This part of ISO/TR 14639 is intended to assist nations which are in the early or mid stages of developing such systems.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
architecture system
structure of components, their functions and their inter-relationships, and the principles and guidelines governing their design and evolution over time, or a description of the structure and behaviour of a system, a system's components, its functions and inter-relationships

NOTE 1 Adapted from Open Group Architecture Framework (TOGAF), 2009[14] and Blobel, B., Application of the Component Paradigm for Analysis and Design of Advanced Health System Architectures, 2000[86].

NOTE 2 This term also includes architecture and system architecture.

2.2
biosurveillance
process of active data-gathering with appropriate analysis and interpretation of biosphere data that might relate to disease activity and threats to human or animal health (whether infectious, toxic, metabolic, or otherwise, and regardless or intentional or natural origin) in order to achieve early warning of health threats, early detection of health events and overall situational awareness of disease activity

[CDC Concept Plan for the Implementation of the National Biosurveillance Strategy for Human Health[88]]

2.3
clinical information
information about a person, relevant to his or her health or healthcare

[ISO 13606-1:2008, definition 3.13]

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub

Full document details: PD ISO/TR 14639-1:2012

2.4
chronic disease
health condition of 3 months' duration or longer

[US National Center for Health Statistics]

2.5
data warehouse
grouping of data accessible by a single data management system, possibly of diverse sources, pertaining to a system or sub-system and enabling secondary data analysis for questions relevant to understanding the functioning of that system, and hence supporting proper maintenance and improvement of that system

NOTE 1 A data warehouse tends not to be used in real time; however, depending on the rapidity of transfer of data to the data warehouse, and data integrity, near real time applications are not excluded.

NOTE 2 Adapted from ISO/TR 22221:2006.

2.6
eHealth
the combined use of electronic communication and information technology in the health sector to enable better health and healthcare

[World Health Organization]

2.7
eHealth architecture
structure of a system of eHealth components and services

2.8
electronic health record
EHR
information relevant to the wellness, health and healthcare of an individual, in computer-processable form and represented according to a standardized information model, or the longitudinal electronic record of an individual that contains or virtually interlines to data in multiple EMRs and EPRs, which is to be shared and/or interoperable across healthcare settings and is patient-centric

NOTE Adapted from ISO 18308:2011 and the European 2011 eHealth Strategies Final Report, January 2011.

2.9
electronic medical record
EMR
electronic record of an individual in a physician's office or clinic, which is typically in one setting and is provider-centric

[European 2011 eHealth Strategies Final Report, January 2011]

2.10
electronic patient record
EPR
electronic record of an individual in a hospital or health care facility, which is typically in one organisation and is facility-centric

[European 2011 eHealth Strategies Final Report, January 2011]

2.11
health
state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

[World Health Organization 1948]

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

2.12
health condition
aspect of a person or group's health that requires some form of intervention

NOTE These interventions could be anticipatory or prospective, such as enhancing wellness, wellness promotion or illness prevention (e.g. immunization).

[Canada Health Infoway EHRS Blueprint v1.0: 2003]

2.13
health information
information about a person relevant to his or her health

[ISO 18308:2011, definition 3.28]

2.14
health information system
HIS
system that combines vital and health statistical data from multiple sources to derive information and make decisions about the health needs, health resources, costs, uses, and outcomes of healthcare

NOTE Adapted from Canada Health Infoway, Canadian Electronic Drug Messaging (CeRx) Standards 1-2010/03/29.

2.15
health worker
person engaged in actions that are primarily intended to enhance health

NOTE 1 This term also includes healthcare worker.

NOTE 2 Adapted from World Health Report, January 01, 2006.

2.16
healthcare
activities, services or supplies related to the health of an individual

[EN 13940-1:2007]

2.17
healthcare activity
activity performed for a subject of care with the intention of directly or indirectly improving or maintaining the health of that subject of care

[EN 13940-1:2007]

2.18
healthcare professional
person authorized to be involved in the direct provision of certain healthcare provider activities in a jurisdiction according to a mechanism recognized in that jurisdiction

NOTE Adapted from EN 13940-1:2007.

2.19
healthcare provider
healthcare organization or healthcare professional involved in the direct provision of healthcare

[EN 13940-1:2007]

2.20
interoperability
see semantic interoperability (2.34) and syntactic interoperability (2.36)

Documents
Document Sharing Hub

© ISO 2012 – All rights reserved

Full document details: PD ISO/TR 14639-1:2012

2.21
low income country
LIC
country where income is USD 1 005 gross national income (GNI) per capita or less, calculated using the World Bank Atlas method

NOTE 1 An LIC is part of the classification system of all World Bank member countries (187), and all other economies with populations of more than 30,000 (213 total). Economies are divided according to 2009 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $995 or less; lower middle income, $996 - $3,945; upper middle income, $3,946 - $12,195; and high income, $12,196 or more.

NOTE 2 Adapted from World Bank Country Classifications.

2.22
monitoring and evaluation
M & E
routine tracking of the key elements of programme/project performance, usually inputs and outputs, through record-keeping, regular reporting and surveillance systems, as well as health facility observation and client surveys, and the episodic assessment of the change in targeted results that can be attributed to the programme or project/project intervention

NOTE Evaluation attempts to link a particular output or outcome directly to an intervention after a period of time has passed.

[Global Fund]

2.23
notifiable diseases
list of diseases determined by the International Health Regulations used as a decision instrument for the assessment and notification of events that may constitute a public health emergency of international concern

[World Health Organization, International Health Regulations]

2.24
organization
unique framework of authority within which a person or persons act, or are designated to act, towards some purpose

NOTE Adapted from ISO/IEC 6523-1:1998, definition 3.1.

2.25
patient
individual who is a subject of care

NOTE Adapted from ISO/TR 20514:2005, definition 2.30.

2.26
personal health information
any information that concerns a person's health, health history, health treatment or genetic characteristics in a form that enables the person to be identified

NOTE Adapted from ISO/TR 18307:2001, definition 3.112.

2.27
policy
set of rules such as legal, political or organizational which can be expressed as obligations, permissions or prohibitions

NOTE Adapted from ISO/TS 22600-1:2006, definition 2.13.

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

2.28
primary care
first level of care (access to first contact), characterized mainly by longitudinality, comprehensive care and coordination of care within the health system itself

NOTE It may have additional features such as family counselling and community and cultural competence.

[Starfield, B., *Primary care: concept, evaluation and policy*. New York, Oxford University Press, 1992]

2.29
privacy
freedom from intrusion into the private life or affairs of an individual when that intrusion results from undue or illegal gathering and use of data about that individual

[ISO/IEC 2382-8:1998, definition 08.01.23]

2.30
register
formal or official recording of items, names or actions

[ISO/IEC 10036:1996, definition 3.3]

2.31
registry
server capable of holding data for the systematic and continuous follow-up of information objects maintained in accordance with specific rules

[ISO/TR 21089:2004, definition 3.79]

2.32
roadmap
detailed plan to guide progress towards a goal

[Merriam-Webster Dictionary]

2.33
secure messaging
set of means for cryptographic protection of [parts of] command-response pairs

[ISO/IEC 7816-4:2005, definition 3.39]

2.34
semantic interoperability
ability for data shared by systems to be understood at the level of fully defined domain concepts

[ISO/TS 18308:2011, definition 3.45]

2.35
subject of care
person seeking to receive, receiving, or having received healthcare

[EN 13940-1:2007]

2.36
syntactic interoperability
capability of two or more systems to communicate and exchange data through specified data formats and communication protocols

[ISO 18308:2011, definition 3.48]

Documents
Document Sharing Hub

© ISO 2012 – All rights reserved

Full document details: PD ISO/TR 14639-1:2012

2.37
teleconsultation
provision of healthcare via a telehealth service, generally for the purpose of diagnosis or treatment of a subject of care at a site remote from the patient or their primary care provider

NOTE Adapted from the Medical Conditions Dictionary.

2.38
telehealth
the use of telecommunication techniques for the purpose of providing telemedicine, medical education and health education over distance

[ISO/TS 16058:2004, definition 3.13]

2.39
vocabulary
terminological dictionary which contains designations and definitions from one or more specific subject fields

NOTE Adapted from ISO 1087-1:2000, definition 3.7.2.

3 Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
CDA	Clinical Document Architecture
eHAMM	eHealth architecture maturity model
EHR	Electronic Health Record
EMR	Electronic Medical Record
HIC	Health Information Custodian
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HL7	Health Level Seven
ICD	International Statistical Classification of Diseases and Related Health Problems
ICT	Information and Communications Technology
IHE	Integrating the Healthcare Enterprise
IHTSDO	International Health Terminology Standards Development Organization
ISO	International Organization for Standardization
ISO/TC 215	ISO Technical Committee 215 (Health Informatics)
IT	Information Technology
LIC	Low Income Country
M & E	Monitoring & Evaluation

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

MoH	Ministry of Health
NGO	Non-governmental organization
PHR	Personal Health Record
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms
TB	Tuberculosis

4 Initiatives reviewed

4.1 Health Metrics Network

The Health Metrics Network (HMN), under the auspices of the World Health Organization (WHO)[1][2], is the first global health partnership that focuses on two core requirements necessary to strengthen the health system that delivers care and services in countries. It focuses on the need to enhance entire health information and statistical systems, rather than focusing only upon specific diseases. It also concentrates country efforts on strengthening country leadership for health information production and use. This Framework has been devised to coordinate and align partners to focus investments and technical assistance on standardizing health information system development.

The HMN Framework is expected to permit access to and better use of improved health information at country and global levels. The 2007 60th World Health Assembly and its nearly 200 member states passed Resolution 60.27 in which it urged stakeholders ranging from international bodies, the public and private sectors and health information and statistical communities to use the standardized norms and guiding principles of the HMN Framework in the strengthening of health information systems. All of these constituencies are expected to directly benefit from the use of the Framework by countries. To date, over 80 countries in all six continents have commenced using the Framework.

Formal vetting and publishing by ISO would help make this framework a keystone in strengthening these country health information systems. In the fall of 2010, the HMN brought a new work item (NWI) to ISO/TC 215 which passed balloting and is moving forward to become an ISO standard: ISO TS 16555 *Health informatics - Framework for national health information systems*. The aspects of standardization to be covered in the NWI include the preservation of the framework as a whole and delineation of the specifications of the framework into standardized formats. A timely follow-on work item to produce these formats could serve as a powerful catalyst to maintain the global momentum of enterprise architects and designers and users around this work, and crystallize global consensus. As the NWI specifications will be technology-neutral, present and future forms of technology will remain equally relevant. The urgency of the NWI is further exemplified by the growing global movement around the use of mobile technology (m-health) as a driver of country health information systems. It is necessary for this work to include the mHealth activities given their expected impact. The framework will also be updated to include other emerging topics such as human resources (HR), for example that may not be represented in the current landscaping.

4.2 Australia

4.2.1 National health system

Australia has a federal system of government with the Australian Government operating at the national level alongside six state governments and two territory governments. The Australian Government collects most of the tax revenue and distributes a proportion of it back to the states and territories, which have constitutional responsibility for delivering a range of health and welfare services within their jurisdictions - including acute-care public hospitals, mental health, public health and some community-based social care and preventative programs.

Most primary care and many specialist medical and allied health services are delivered by independent private practitioners on a fee-for-service basis. A significant proportion of the cost to consumers of medical and some

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

allied health services is covered by a universal health insurance program operated by the Australian Government (Medicare).

There are also networks of Aboriginal Medical Services and Aboriginal-Controlled Community Health Services serving indigenous (Aboriginal and Torres Strait Islander) communities. These are mainly funded by the Australian Government but managed through the states and territories.

Although there is no single national authority with responsibility for delivery of healthcare services across the country, the Australian Government uses its powers over health insurance, reimbursement of private practitioners (Medical Benefits Scheme), payment for prescription medications (Pharmaceutical Benefits Scheme), aged care, indigenous health, veterans care, special-purpose programs and particularly the funding it contributes to the states and territories under the Medicare Agreement, to maintain a reasonably uniform healthcare regime across the country.

Under this regime, all Australians (including non-citizen residents) are entitled to free care in public hospitals and public contributions toward the cost of care received from private practitioners and the amount they pay for prescription drugs - with an additional safety net that limits the cost for those on low incomes and those facing higher healthcare costs.

In March 2010, the Australian Government released a report entitled *"A national health and hospitals network for Australia's future"*[5] (NHHN) which, among other things, proposed more direct involvement of the Australian Government in the funding of healthcare and hospitals and a reduced role for the states and territories in management of these services. While most Australians favour some level of reform to get more efficient and better integrated management of healthcare delivery, the proposed NHHN reforms faced significant constitutional, political and financial barriers.

Under the Australian federal system, the leaders of the Australian, State and Territory Governments regularly meet at the Council of Australian Government (COAG) to debate and, where possible, agree on common policy positions. Within the health sector, collaborative programs are also progressed through the Australian Health Ministers Council (AHMC) which is advised by AHMAC (the Australian Health Ministers Advisory Committee, made up of relevant heads of agencies responsible for health in each of the Australian, state and territory jurisdictions).

At the COAG meeting in May 2010 most, but not all, states/territories accepted the proposed NHHN reforms in principle but full agreement on the details could not be finalised before a series of elections changed the political landscape.

At a further COAG meeting in February 2011, some elements of the reform package were dropped in favour of a further heads of agreement [6] that provides the framework for a revised National Health Reform Agreement for execution in 2011. The heads of agreement reaffirms the state/territory role as managers of public hospital and public health systems within their jurisdictions but with increased funding and oversight from the Australian Government and better coordination of primary care service delivery.

Central to the reforms being proposed under the new National Health Reform Agreement are: a new national hospital funding authority, which will allocate funds directly to local hospital networks from a single consolidated pool of federal and state/territory funds, an Independent Hospital Pricing Authority (IHPA), a Health Performance Authority (HPA) and a permanent, increased role for the Australian Commission on Safety and Quality in Healthcare, which develops, monitors and implements national standards for improving clinical safety and quality to improve patient outcomes.

Australia also has a well-developed private hospital and aged care sector, which is an integral part of the national healthcare regime. There are tax incentives to encourage Australians to take out private health insurance which provides cover for private hospital and ambulance costs and, optionally, dental, optical and some other allied health services. Private practitioners are free to set their own fees and privately insured patients may choose to be treated by an approved private practitioner in a public hospital (in which case the public hospital also charges an accommodation fee set by each state/territory).

While Australians may insure against hospital costs, they must meet any additional amounts (gaps) charged by private practitioners above the public rebate out of their own pockets and are not allowed to insure for

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

these gaps. This measure is aimed at ensuring that there is some price competition moderating the fees charged for clinical services.

In summary, Australia has a national health funding regime (with healthcare costs shared between the Australian Government, state/territory governments, private insurance and the health consumer) but not a unified national healthcare delivery program. Health has recently become a major political issue with significant changes in responsibilities and greater central control having been proposed but it is too early to predict the outcomes.

4.2.2 Focus of national health system

The national healthcare funding regime is generally broad in coverage; however, there is less public funding available for dentistry and some allied health areas, but this is under discussion.

In terms of healthcare service delivery, Australia has high levels of public health, disease control and life expectancy with world-class clinical care facilities distributed across the country and readily available to much of the population; however, the ageing of both the population and the clinical workforce and the associated rising costs of health as a proportion of GDP (9,0 % in 2008-09) are putting traditional modes of care delivery under pressure. In particular:

1. Chronic Disease. A significant and rapidly growing proportion of healthcare costs in Australia are driven by chronic disease, particularly later in a person's life. The Australian, state and territory governments all have programs aimed at improving the treatment and management of chronic disease, reducing its burden on patients and its cost to society, with a particular focus on:

    - arthritis and musculoskeletal conditions
    - asthma, chronic obstructive pulmonary disorder (COPD) and other respiratory diseases
    - cancer control – through research, early detection and prevention and continual improvement and targeting of treatment regimes
    - cardiovascular health – through research, monitoring, reducing risk factors and improved treatment. Cardiovascular disease is the leading cause of death accounting for over one-sixth of all deaths in both males and females[7].
    - diabetes mellitus – and the many co-morbidities that flow from it
    - injury prevention and control
    - mental health, and
    - reducing common risk factors – smoking, alcohol, substance abuse, obesity, diet, inactivity, hypertension

2. Indigenous health. Indigenous Australians have significantly lower life expectancy and health outcomes compared with the rest of the Australian population. This is a matter of long-standing national concern across all jurisdictions. Some years ago, the Australian Government took a strong lead in seeking to address the problem but there are many issues and interacting social factors that need to be managed before it is likely to be solved.

3. Rural and regional healthcare. Australia is a very big country with most of its population concentrated along a narrow strip along the southern and eastern seaboards and a couple of other major centres. As in many countries, there has been a drift away from rural areas to the big cities. Clinical practices and health services in many small rural towns are no longer economically viable or able to provide or access the range of services now expected for modern care delivery. It is also difficult to attract and hold clinical staff in these areas. Programs aimed at addressing these problems include greater use of Information and Communications Technologies (ICT) to support both practitioners and patients in remote areas by leveraging policies aimed at getting effective broadband services to 98% of the Australian population.

Documents
Document Sharing Hub

© ISO 2012 – All rights reserved

Full document details: PD ISO/TR 14639-1:2012

4. Clinical workforce. The clinical workforce is ageing with the population and is under ever increasing workload. For many years, much of the shortfall has been made up by use of overseas-trained clinical personnel in both a temporary and permanent capacity; however, this is an issue that Australia is addressing in several ways including:

    - Greatly increasing the number of clinical training positions – not only in medicine, but also in clinical nursing and allied health professions
    - Moving to shorter, postgraduate clinical training programs more strongly focused on clinical practice
    - Developing new models of team-based care, in which clinical nurse specialists, physician assistants, pharmacists and other clinical support personnel take on a wider range of responsibilities and there is greater collaboration between medical specialties in care delivery. To be effective these new models of care anticipate improved sharing of clinical information.

The NHHN health reforms put forward by the Australian Government in 2010 seek to address the above needs by a targeted program of activities in the following areas (see [8] for more details):

- Governance and funding of healthcare
- Hospitals
- GP and primary healthcare
- Aged care
- Mental health
- National standards and performance
- Workforce
- Prevention
- eHealth
- Stakeholder engagement

In 2010/11, for the first time, the Australian Government budget separately recognised eHealth as an enabler of health reform and allocated significant project funding to eHealth as part of its commitment to the overall NHHN reform package.

4.2.3 Components of the national health information system

There are nationally agreed and widely adopted specifications for classification of clinical information and statistical reporting of healthcare status and activities. These are applied at the level of individual healthcare facilities, state/territory and on an Australia-wide basis and are used to support statistical reporting, performance evaluation, health service planning and activity based funding - predominantly for institutional care. Under the proposed National Health Reform Agreement, most public hospital reimbursement is planned to be based on activity.

National health and welfare statistics are compiled in accordance with agreed national standards through the Australian Institute of Health and Welfare (AIHW) based on information sourced from the state and territory health authorities. These statistics include activities carried out in both public and private sectors. [For more information, see: http://www.aihw.gov.au/].

While the national health and welfare statistics contain comprehensive information on hospital activity, long-term care and some community care, there is much less information available on the health conditions addressed and the nature of care delivered in ambulatory settings including general practice, hospital outpatients, specialist consultations and allied health clinics. Obtaining better information on these activities without impeding clinical activities is one of the challenges facing health reform in Australia.

The Australian Bureau of Statistics (ABS) holds a comprehensive census every five years and has detailed information on the demographics of the Australian population and uses this to provide annual reports and population projections that are widely used for health service planning.

Well developed ICT solutions are deployed in most areas to support the use of information in health service operations and planning. This usage may be characterised as follows.

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

- In each of the major areas of health activity - hospitals, primary care, retail pharmacy, laboratory, diagnostics, aged and long-term care, indigenous health and other application environments, the majority of the health information systems (HIS) market is covered by only a few dominant vendors that specialize in that market segment.

- There is only limited support for generalized electronic interoperation or sharing of patient clinical information between different hospital groups, general practitioner (GP) organizations, retail pharmacists etc.; however, there is considerable use of point-to-point messaging for reporting of laboratory/ diagnostic results and, increasingly, for specialist referrals, discharge summaries and pharmacy prescriptions.

- At the level of operational systems, there is almost no national coordination and consistency for ICT system structures and tools. Nevertheless, each state/territory has an eHealth program – with their own enterprise architectures and various products selected for deployment in public hospitals and community health services across their jurisdiction – including systems for PAS/ADT (patient administration system/ admissions, discharge, transfer), hospital electronic medical record (EMR), community health clinics, billing, HR/payroll, general accounting, asset management, statistical reporting, emergency department, operating rooms, facility scheduling, staff rosters, pharmacy, pathology laboratory, RIS/PACS (Radiology Information System/Picture Archiving and Communications System) and some clinical specialties (such as cancer care, renal, ophthalmology).

- Some cross-jurisdictional joint development and implementation projects have been attempted – but usually result in higher costs, longer lead times and limited acceptance. The more populous states have a legacy of semi-autonomous regional health services with local HIS strategies. Most jurisdictions have adopted centralized or regionalized approaches to supply-chain management, purchasing, Human Resources (HR)/Payroll, accounting and laboratory.

- The private acute-care hospital sector includes a mix of stock-exchange-listed public companies and charitable institutions. Each of these organisations has its own HIS strategies and solutions similar to those found in the public sector, but with a greater emphasis on revenue management and interoperability with independently-run support services (e.g. labs, diagnostic imaging, pharmacy).

- Typically the aged and long-term care sector has lacked funds and is lagging in its use of eHealth systems; however, improving the flow of information between various providers involved with aged care and chronic care is seen as a major area of need – particularly as the population ages.

- Privacy and security issues have occupied a much higher priority on Australian Health IT agendas compared with countries that have made more rapid progress in the application of eHealth for the sharing of clinical information.

4.2.4 National eHealth policies

4.2.4.1 HealthConnect

The need for a national approach to eHealth was recognized over ten years ago and was progressed by the former Health*Connect* program - a joint initiative of the Australian, state and territory governments which researched the needs, systems architecture, business architecture, business case and implementation plan for sharing of health information – with a focus on better medication management and the potential for shared electronic health records (EHR). For more information on HealthConnect and the associated Medi*Connect* program, refer to the Health*Connect* archival website: http://www.health.gov.au/internet/hconnect/publishing.nsf/Content/home, from which relevant documents may be downloaded, including References [9], [10] and [11]. Under Health*Connect* (and Medi*Connect*), a range of pilot programs were carried out and evaluated including:

- Shared EHR for support of healthcare for across remote indigenous communities in the Northern Territory and remote North West of Western Australia (updated version provides increasingly valuable support for indigenous health in the communities).

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

- Sharing of clinical information to support diabetes - separate trials using different approaches and technologies for shared EHR in Queensland (openEHR) and Tasmania (vendor product).

- Healthlink - information sharing between primary care, child health, specialists and hospital services supporting child/adolescent health in Western Sydney and chronic disease management among older people in the Hunter Region – still operating and continuing to grow with over 100 000 registered participants.

- Trials of regional sharing of prescription, dispense and medication management information in rural Victoria and Northern Tasmania.

- Remote work-up and pre-admission for patients attending for orthopaedic surgery over long distances (>1 500 km) in Far North Queensland.

- Satellite-based broadband for health in the remote Eastern Goldfields of Western Australia.

In 2005, work under the Health*Connect* banner was discontinued and, following a review, the National e-Health Transition Authority (NEHTA) was formed in 2006 (initially for 3 years) as an independent joint enterprise of the Australian, state and territory governments to plan progression of a national eHealth agenda and to make recommendations on relevant policies for implementation by the health agencies at state, territory and Australian government level. Information on NEHTA's role and activities is available from the NEHTA website; see: http://www.nehta.gov.au/about-us.

In 2008, NEHTA's charter was renewed and strengthened to establish pre-requisites for effective interchange of personal health information. Several foundation components for eHealth building blocks progressed by NEHTA since this time include:

- Establishment of a national clinical terminology service - managing national distribution of SNOMED CT, maintaining the Australian Medicines Terminology (AMT) and representing Australia at IHTSDO.

- A secure individual healthcare identifier (IHI) service, providing a unique healthcare identifier for every Australian citizen or permanent resident and, when required, for visitors needing care in Australian healthcare facilities.

  Australia does not have and is most unlikely to ever adopt a unique multi-purpose national personal identifier (as in some other countries). However, every Australian is entitled to receive Medicare benefits – for which they are issued a Medicare card (issued to either an individual adult or to a family). There are now many more people identified on these cards than in the country; however, Medicare Australia has largely resolved this issue by using its database of internal identifiers to link the various appearances of an individual on the various cards (and to use this information to regulate safety net benefits). Legislation was passed allowing the Medicare identifiers to be used as a cross-check when issuing an IHI – greatly reducing the likelihood of duplicates and mismatches.

- A national health identifier service for healthcare providers – a universal token-based healthcare provider identifier (HPI-I) for all clinical staff and a unique identifier (HPI O) for each healthcare provider organisation (i.e. hospital, practice, clinic etc.).

- Identifier services (for HPI-I, HPI-O and IHI) have been developed for NEHTA and the Australian Government by contractors working through Medicare Australia and were put into initial production in 2010, with some improvements being considered for incorporation as a result of initial stakeholder feedback. Use of healthcare identifiers is protected by amendments to national privacy legislation.

- A national eHealth privacy framework - backed by laws to protect individuals from mis-use of their identities and personal health information.

- Specification and demonstration/test of secure message delivery (SMD) service - based on unique identification, authorisation and message security to provide the safest and optimally secure method of exchanging healthcare information.

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012

- Development of programs to specify information content and interchange protocols for key requirement areas - eDischarge Summary, eReferral, ePathology and eMedication Management.

- Supply chain management - seeking significant efficiency gains and cost savings, particularly in procurement through a National Product Catalogue (NPC) information system

- Designing and contracting for delivery of a National Authentication Service for Health (NASH) for implementation in 2011 to provide token-based and certificate-based authentication of healthcare providers (individuals and organisations) to complement their use of healthcare identifiers and ensure more secure and accountable access to emerging national eHealth capability.

- Working toward a Compliance and Conformance Assessment (CCA) Scheme and conformance test specifications to support the secure messaging service and other NEHTA building blocks.

- New generation of eHealth interoperability based on development and profiling of eHealth standards, working closely with the Standards Australia IT 014 health informatics committee, HL7 Australia, HL7 International and IHE Australia.

In 2010, NEHTA's charter was again renewed as part of the activities being jointly supported by the Australian, state and territory governments under the NHHN reforms and was endorsed with priority being given to: continuing the development of eHealth foundations; coordination of national eHealth solutions and processes; and accelerated adoption of eHealth in Australia.

Under the eHealth component of the 2010 NHHN reforms, delivering the foundations for a personally-controlled electronic health record (PCEHR) has become a new national eHealth priority. The Australian Government is investing a total of AUD 66,7 million in the 2010/11 and 2011/12 financial years toward this end (with the expectation that states/territories will complement this by continuing their current investments in eHealth).

Some of these investments are being channelled into lead sites for PCEHR implementation building on different eHealth components, working in different geographic areas and addressing functional parts of the Australian health sector, with the purpose of:

- deploying and testing national eHealth infrastructure and standards in real world healthcare settings;

- demonstrating tangible outcomes and benefits from funded eHealth projects;

- building stakeholder support and momentum behind the national PCEHR system work program; and

- providing a meaningful foundation for further enhancement and roll-out of the national PCEHR system.

The Australian Government is also investing over AUD 400 million in telehealth services by introducing Medicare rebates for online consultations, incentives for GPs and specialists to participate and take part in online training; and extensions to upgrade the GP After Hours Helpline to include videoconferencing.

4.2.4.2 Electronic Health Record

As outlined above, funding put forward by the Australian Government in support of the 2010 National Health and Hospitals Reform (NHHR) package included AUD 466,7 million toward initial implementation of shared personally–controlled PCEHR capability as a national eHealth priority.

Prior to this initiative, there had been no funded policy aimed at delivery of a national system of electronic health records, although trials were conducted and proposals put forward under the former Health*Connect* program. Nevertheless, the subject remained under review as a desirable policy outcome with the concepts continuing to be developed within the Australian Government Department of Health and Ageing (DoHA) and NEHTA.

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 14639-1:2012