

# Health Information Management: Malaysian Experience

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## ABSTRACT

*The evolution of Health Information Management in Malaysia has started from a basic statistical reporting system through papers to an ICT enabled Health Information Management System. The building blocks to facilitate the implementation of such system are through the development of Health Informatics standards and a mechanism for the adoption of such standards. The legislative support required to enable a wider adoption by all stakeholders is vital for successful implementation. This paper provides the historical perspective of the transformation of Health Management Information System to Health Information Management System, the challenges and the way forward in realizing a National Integrated Health Information System .*

1.2 Health care in Malaysia is provided by the public and private sectors and non-governmental organizations. The major provider and financier of health services is the Ministry of Health (MOH). Basic health care through health facilities is currently available to and accessible to more than 95 % of the population of Peninsular Malaysia and about 70 % of the population in Sabah and Sarawak. Secondary and tertiary care services are now widely available in government hospitals and private hospitals across the country. In 2005, there were 2,877 primary health care clinics, 125 public hospitals (including institutions) under the MOH and 9,410 doctors working in public hospitals.

## 1. INTRODUCTION

1.1. Malaysia is composed of Peninsular Malaysia and the states of Sabah and Sarawak on the island of Borneo. The total land area is 330 252 square kilometers. Malaysia, a constitutional monarchy with a non-elected upper house and an elected lower house, is comprised of 13 states and three federal territories. In 2005 Malaysia has a population of 26, 127,700 million, more than 60% of who live in urban areas. The population is relatively young with 42.3% being below the age of 20years &6.6%aged 60years and above. Its ethnically diverse people are comprised of 65% Bumiputera, 26.1% Chinese, and 7.6% Indian. Life Expectancy (LE) at birth for both genders has increased over the years. Malaysians enjoy a relatively high overall standard of health. In 1990, the LE for males and females were 68.8 years and 73.5 years respectively. The LE for males and females in 2005 had improved further to 70.6 years and 76.4 years respectively

1.3. Over the past few decades there has been an increasing role of the private sector in the provision of health care for the country. However, there is inadequate integration between public and private health services. There were 225 private hospitals in 2005 compared with 50 hospitals in 1980, mostly located in urban areas. Doctor to population ratios in 2005 ranged from 1 doctor per 1,268 populations in Peninsular Malaysia to 1 doctor per 2,765 populations in Sabah and 1doctor per 2,115 populations in Sarawak. In 2004 there were 8,836 doctors in private hospitals accounting for 46% of total number of medical practitioners but private hospitals only accounted for 21% of the total hospital beds in the country.

1.4. The Healthcare delivery System that is strategically designed to improve the health status of the population is one that focuses on wellness and empowerment. It provides focus on the individual and community responsibility for health. Health system will be able to support the access to right information at the right time to make the right life style choices. Access to an individual's, longitudinal medical and health record will support continuity in care. The use of ICT as an enabler to further improve health care delivery is being planned within the following context:

1.4.1. Informed and knowledge individual and population that will give consumers more access and involvement in healthcare decision making and be more responsible in taking care of their own health

1.4.2. A proactive wellness and illness management through competent and knowledgeable healthcare providers

1.4.3. The delivery of service in a networked environment based on care network concept. Sharing of information and resources shall be the thrust for efficient and effective delivery of services.

1.4.4. There will be a provision for services to be offered from home where applicable where patients can have access to health information and being able to interact with healthcare providers through multimedia network.

1.5. During the Eighth Malaysia Plan (2000-2005) concerted efforts were undertaken to provide a stronger platform for the country's transition towards knowledge based economy. There was increasing effort on the promotion and use of ICT in various sector including health sector .For the Ninth Malaysia Plan ( 2006-2010) efforts will be intensified for the wider adoption and use of ICT .The government is committed to enhance ICT related skills and competencies as well as info structure expansion.

## **2. EVOLUTION OF HEALTH INFORMATION MANAGEMENT IN MALAYSIA**

### **HISTORICAL PERSPECTIVE**

2.1. The collection and collation of health information for routine statistics reports was developed since colonial days and which was further strengthened to a Health Management Information System. During the British Civil Administration days (1874-1941), health information and events

Were recorded and documented as a by-product of the services provided by the Medical Department. Data were generated at the services outlet, namely at hospitals, static (outdoor) dispensaries, traveling dispensaries maternal and child welfare centers, municipal clinics, leper settlements and mental institutions. Some form of procedure existed for recording into registers and collection of medical and health data on some predetermined formats. .Sanitary inspectors and public health nurses in the course of their work carried out the collection of data for the public health activities.

While in the hospitals, static (outdoor) dispensaries and institutions for special diseases this was done by hospital assistants and nurses. The data collection was coordinated by Medical Branch of the Medical Departments in each State. The annual State Health Situation Assessment Report was given to the Medical Department Headquarters (one for Straits Settlement States and the other for the Federated Malay States) to prepare an annual report on the health situation of the country as a whole.

2.2 During the period from 1948 to 1962, the gathering of health information rested with the Medical Services under the Ministry of Social Welfare. There was minimal effort at coordination of health information although the quantity and variety of data had increased as a result of more diversified health activities. In 1963, with the formation of Malaysia, the Ministry of Health and Social Welfare becomes the Ministry of Health. The responsibility for health information was still with the

Medical Services Division which continued to be involved in the collection of workload statistics for report writing purposes.

2.3. By the second half of the 1960's, a Medical Records and Health Statistics Unit were set up. It functioned as a data coordination unit for the Ministry of Health (MOH). In 1972, the Operation Research Unit was also set up. The primary function of this unit was to monitor the development of the National Health Management Information System (NHMIS). To further improve the health information system, the World Health Organization (WHO) was requested in 1975 to study and recommend improvements to the existing system. The study recommendation included the establishment of a comprehensive information system through a Health Management Information System Development Project (NHMISDP). The Information and Documentation System (IDS) Unit in the Ministry of Health was established in 1981 to replace the Medical Records and Health Statistics Unit and the Operations Research Unit.

2.4 With the establishment of the HIMS systems medical records officers were trained and posted in all large hospitals to responsible for the compilation of the hospitals statistics. The statistics for public health was continued to be compiled by public health nurses, medical assistants and public health inspectors. The IDS unit at Ministry of Health continued to produce annual reports for use at the national and international level

2.5. The last two decades saw a very rapid growth in the use of ICT in health care. The Tele-health Project launched in 2000 paved the way for the need to provide standards for data collection to provide for interoperability and to produce reports with high degree of data quality and integrity. The subsequent deployment of HIS in public and private hospitals enabled health care providers to produce reports of better quality. However this did not solve the interoperability issue as the disparate systems were using their terminology and data definitions. This again resulted in problems related to data mining and analysis at the national level

2.6 Strengthening of the Health Information Management was one of the supporting goals determined to achieve the objective of the 9MP. to ensure the Integrated Health information Management for the country. The Health Informatics Center established in 2006 at the Ministry of Health will be the custodian of all health and health related information in the country.

### **3. CHALLENGES**

#### **3.1 DATA QUALITY, ACCURACY, TIMELINESS**

In general, health information required for national and international use is not adequate and often, is not timely for effective and efficient management. The information collected is from MOH facilities only and hence incomplete for analysis for population health status from the whole country perspective.

The current HMIS data collected is based on formats developed for a predominantly annual system of data collection. Over time, additional information requirements to monitor the new activities have resulted in adhoc collection of information. This has resulted in use of data sets which are non-standardized, where the data definition used were different, values varied. Data for research is collected by different research organization for specific purposes

The private sector hospitals are required to submit returns as per Private hospitals Act regulation. However the quality and timeliness of the data is so varied between hospitals thus causing problems for meaningful data analysis. Currently there is very little provision for information collection from private clinics and NGOs.

#### **3.2 ICT IN HEALTH CARE**

Healthcare is an information intensive service. It is inevitable that as long as an individual has had an encounter with the health care system, the health information ought to be stored in some kind of "record", probably kept in the provider's memory, paper and computer media for recording health information. Taking cognizance that gathering and reporting healthcare

information have to be shared within a care network concept in an enterprise wide environment, all stakeholders have to take concrete steps to break the deadlock and overcome the grappling issue of data sharing and information flows that we are currently facing. One of the major impacts of ICT in healthcare is in the field of health and disease surveillance. By leveraging the technology, on-line notification of disease and incidents is made possible to support epidemiologists in their capability of pursuing early warning and alert to potential disease outbreak. Integrating IT and advancement in technology into healthcare will change the way we do things. The key issue is in addressing how IT influences the way we work and manage our patients taking into consideration the business process reengineering which is driven by the vision to achieve value-added objectives of our business functions.

### **3.3. EVIDENCE BASED PLANNING / PRACTICE**

The advent of Clinical Practice Guidelines and its use has facilitated the use of evidence based clinical practice in patient care. However the use of information for evidence based planning in measuring health outcomes requires the development of National Data Sets that allows for comparison between different health care providers. The formulation of data sets for specific diseases and conditions through a consensus driven approach is critical for wider acceptance and compliance within the clinical fraternity

### **3.4. MEDICAL INFORMATICS**

The growth of medical/ health informatics has provided a new impetus in the formulation of policies and strategies towards Health Information Management in Malaysia. This field of specialty that is rather new started with the launching of the Tele Health project. Since then there has been a considerable interest in the field both in the public and the private sector. The establishment of the Malaysian Health Informatics Association and the HL 7 Malaysia International affiliate status has provided the platform for experts to share experiences and get involved in some of the works. The government driven projects such as the Tele Health project including the Lifetime Health Record (LHR) provides the ground for all stakeholders to participate. The challenge is the extent of participation from the private sector and industry partners

### **3.5 RESOURCES**

An investment in health informatics infrastructure requires a corresponding investment in human resources to ensure that the infrastructure is appropriately developed, implemented, maintained and evaluated. It is important to have adequate numbers of skilled and competent IT staff. In view of the high cost of skilled IT personnel, the big question seems to be not only whether there will be enough ICT funds to hire them, but rather whether there is enough knowledgeable expertise and skills resource in the country. There is a need for more people, better training and development and career prospects as professionalism is fundamentally important to making ICT more attractive. Thus, the challenge is being able to identify and assign train staff on core IT competencies. Getting people on board in leading the project planning is also vital as well as retaining this “top-notch” people whose expertise is very valuable especially for future undertaking.

It appears that the vast deployment of IT in our day today business may not be still possible in view of lack of infrastructure capability and capacity. Thus investment in ICT infrastructure in terms of adequate storage space, high bandwidth LANS and WANS, wireless technology and planned replacement of workstations, need to be addressed.

## **4. DISCUSSIONS**

### **4.1. POLICY AND GOVERNANCE**

The thrust for the government to strengthen the Health information Management system in the country in order to achieve the goals set in the plan period provides an impetus in moving forward towards an Integrated Health Information Management System. In order to ensure greater compliance by all stake holders the National Health Policy on Health Information Management is absolutely essential. The issues that need to be addressed includes

- Confidentiality & Privacy
- Security & data protection
- Consent
- User access
- Role of stakeholders
- Infrastructure support
- Health informatics standards
- Capacity and Capability building

Such issues can only be addressed through a National Coordinating Body responsible for the collection and storage of all health and health related information. The membership should be drawn from all stakeholders to allow for ownership and accountability amongst all interested parties. Such a mechanism will also provide a forum to accommodate the specific needs of all stakeholders. The information needed for research, policy planning and outcomes measurement should be built integral to all operating systems developed /deployed in the country. A national approach for the coordination of health information in the country will allow for maximizing the potential of various initiatives implemented in the country and therefore will allow to maximize the ICT investments for purposes of making available accurate quality information meant for all types of user.

## 4.2 LEGISLATIONS & REGULATIONS

Currently there is no single legislation that mandates the provision of health and health related information for compilation and analysis of medical statistics in the country. There are several Acts and regulation such as the Tele Medicine Act, Private Health Care Facilities Act, CDC Act, Medical Act, etc which regulates the information required for the enforcement of the Act. Such Acts are very much service driven and serves the specific purpose. As such much of the information collected currently is very much dependent on the information that is gazette for collection. Any additional information required cannot be collected due to lack of provision in the Act. There is no provision for incentives for care providers to deploy IT to facilitate information provision. In addition the issue of consent and confidentiality in relation to information sharing within an enterprise has to be adequately addressed through the Data Protection Act. Experiences from other countries show that legislative support facilitative the

Implementation of ICT initiatives for e.g. which passed several legislations prior to the implementation of the EHR project. As much of the information is collected from patient encounters by various stakeholders the need for a national minimum data set to made mandatory will assist in ensuring appropriate information provided for continuity in care and measuring outcomes analysis. The advent of HIS hospitals has created a new generation of electronic medical records for easy collection, maintenance and storage. the medico-legal implications and legal requirements on the use of electronic records as against paper medical records has to be adequately addressed .this becomes increasingly important inn care network sharing information between private and public sector .therefore privacy protection arrangements have to be made to provide assurance on the consistency in which records are handled at the public and private sector

## 4.3 HEALTH INFORMATICS STANDARDS

Standards for health sector data and communication technology is critical for the implementation of interoperable services. A substantive amount of work has been done in coming up with health informatics standards required for integrating health information over the past 5 years. However, there is much more to be done in view of the sheer volume of the standards. Immense effort is made to set up different workgroups to look into the various field of health informatics standards development, in which the National Health Data Dictionary is one of them. What is more challenging is the maintenance and updating of these standards, and necessitating constant review and changes to those standards which have been developed so that they are current. The setting up of the National Health Informatics Committee should be able to facilitate the enhancement of this development of standards, protocols and other governance issues related to health informatics standards and its utilization. Further more, affiliation and collaboration with the International Standards Bodies and IT industries have to be promoted so as to enhance further the widespread adoption of the data guidelines and rules for global information sharing.

The approach that Malaysia took in realizing the value of health informatics standards as the vital element of integration is through the establishment of a working committee on the Health Informatics Standards. The preliminary effort undertaken by this committee is to establish Special Interest Groups (SIGs) on specific areas to develop the Business Functional Model. A National Health Data Dictionary (NHDD) has been developed to provide standard definition of terms for health care industry. The Malaysian Drug Codes (MDC) has been formulated to make available standardized codes for medication orders for use in the health care facilities. The clinical procedures have been listed and coded by the stake holders who are involved in health care business. All standards have been approved through consensus building held amongst relevant stakeholders. Currently work is underway to convert these standards into national standards through Malaysian standards Department that is affiliated to ISO.

#### **4.4. HEALTH INFORMATION MANAGEMENT – Way Forward**

A Health information Management blueprint has been developed that outlines the business case and provides an action plan on which all future strategies and action plans will be based. The Telemedicine Blueprint 1996 has provided a conceptual framework on the health care delivery system of the future and the use of ICT in achieving it. The LHR project will provide the overriding concept for info structure framework for implementation in the country to allow for integration and interoperability. The Information Technology Strategic plan (ITSP) will provide for strategies and action plan to support the implementation of the Health Information Management Action Plan.

The National Health Information Action Plan is being developed in consultation with all health information stakeholders in the public and private sector. Thus it will provide the thrust for all health information initiatives in the country. Amongst the key areas that will be included in the action plan are to ;

- Establish a mechanism for National Coordination and Partnership
- Ensure the building blocks such as the Health Informatics standards, security standards, privacy protection and infrastructure readiness
- Implement key national initiatives that addresses the needs of all stake holders and includes

- LHR services
- Electronic Reporting system :HIMS e
- National Health Data Warehouse

- Ensure the legal, data protection and security framework is in place to ensure secured transfer of all health and health related information

## **5. CONCLUSION**

In Malaysia's commitment towards a paradigm shift in the health care delivery system and with the increasing use of ICT health information management becomes a crucial and compelling issue. The role of other stakeholders in providing care becomes critical for the development of Integrated Health Information system. A strong political will and governance through the establishment of Health Informatics Center will pave the way for the national approach in the management of health and health related information. The establishment of the National Health Data Warehouse which manages information in compliance to health informatics standards will allow for evidence based health planning in the country. However the human capital required for planning, operations of this national collaborating

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