MOH/S/RAN/69.13(GU)

Ministry of Health Malaysia

HIMS BLUEPRINT

"Towards Excellence in Health Information Management"

HEALTH INFORMATICS CENTER
PLANNING DIVISION
MINISTRY OF HEALTH MALAYSIA

MINISTRY OF HEALTH MALAYSIA

HIMS BLUEPRINT

"Towards Excellence in Health Information Management"

Health Informatics Centre
Planning Division
Ministry of Health Malaysia

MINISTRY OF
HEALTH MALAYSIA

Health Informatics Centre
Planning Division
Ministry of Health Malaysia

Date Created: November 8, 2005
First Edition: 2005 (unpublished)
Second Edition: 2013

ISBN : 978 - 967 - 0399 - 71 - 3

Printed by:
SEPANTAS KURNIA (M) SDN. BHD.
52 A, Jalan Seri Aman, Taman Seri Aman,
Batu 8,43200, Cheras, Selangor,

CONTENTS

1. PURPOSE OF THIS DOCUMENT

1.1 To outline the policies, strategies, organization, and action plan for the Health Information Management for the health sector of the country.

1.2 To be used as the reference document and basis for planning and implementation of programs and activities related to health information management in Ministry of Health (MOH) and other health related agencies, Non-governmental Organisation (NGOs) and private sectors.

1.3 To provide a platform to bring together various stakeholders involved in health and health related information to share a common vision and goals.

2. BACKGROUND

2.1 The Information Documentation System (IDS) unit in MOH was established in 1981, and the core business function at that time is for the planning and operations of Health Information Management System (HIMS) for MOH.

2.2 Since then, various programs in MOH had identified health and health related informations required for program planning, monitoring and evaluation. Data in the form of returns were collected through specific reporting formats. IDS unit was responsible for data analysis, producing annual reports and production of reports for federal and international agencies. IDS unit played a key role in ensuring relevant information and appropriate data collection and reporting.

2.3 To ensure proper governance in the management of health information in the country, a coordinating committee called the *"Jawatankuasa Penyelarasan Sistem Maklumat dan Dokumentasi (JPSMD)"* was established at the ministry level. The committee was chaired by the Director General (DG) of Health and members consists of all the Program and Divisional Heads. The role of this committee was to guide and co-ordinate the development and implementation of the HIMS at all levels in the Ministry of Health.

2.4 However over the years the demand for timely and accurate information has grown and several programs have started collecting data for specific purposes e.g. Maternal Mortality Review Report for Confidential Enquiry to Maternal Deaths (CEMD), Peri Operative Mortality Report (POMR), Neonatal Registry, Cancer Registry and others. This has resulted in certain degrees of inconsistencies, errors, inadequate and incomplete data, duplication of data collection and non standardisation of data elements used for the different reporting systems. Therefore the quality of data collected and its integrity in analysing the information for outcomes analysis and policy formulation is questionable.

2.5 In the 8th Malaysian Plan (8MP), a proposal to establish the National Health Informatics Centre was approved. The organisation of the proposed informatics center consists of various functional units of National Health Information Management and will consist of:-

- Health Information Planning and Monitoring for the country
- Domain management of health data repositories & registries
- Data Analysis and Reports
- Health Informatics Standards development and maintenance
- Research & Development
- Training
- Resource Center for Health Information Management

2.6 The proposal for the establishment of the Health Informatics Center was approved at the meeting chaired by the Director General of Health with the Program and State Directors in 2002.

2.7 In the 8MP, the implementation of the Personalised Lifetime Health Plan (PLHP), one of the projects under the Telehealth flagship applications had required the development of standard lists and nomenclature for interoperability between care providers for continuity in care. The implementation of Hospital Information System in several hospitals also required deployment of national Health Informatic Standards to allow interoperability between applications. Therefore a National Health Informatics Committee (NHIC) under the chairmanship of Director General of Health was established to coordinate all policies, requirements and standards on health and health related information for use by the various stakeholders in the country.

3. CURRENT STATUS AND ISSUES

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

3.2 The current HIMS data collected is based on formats developed for a manual system of data collection. Over time, various programs developed additional formats to monitor new activities implemented under their respective programs. This has resulted in a lot of duplication in the information collected by the various programs.

3.3 In view of the different types of information collected in different format, or same information being collected in different format, there is a considerable degree of data inconsistency collected by various agencies, e.g. inconsistency in the same data collected by MOH and Department of Statistics e.g.: maternal mortality data collected and published by Department of Statistics does not tally with the figures from the MOH.

3.4 The various programs at MOH, in recognizing the need for more information for their respective program monitoring and evaluation developed their own reporting systems for specific purposes. This has resulted in the use of data sets which are non-standardised, where the data definition used were different and values varied. Hence the same data element means differently in different formats making data analysis difficult due to inconsistency of data, questionable data integrity and different data definitions, e.g. birth record data elements used in HIMS, CEMD, PNMR and Neonatal Registry are not standardized.

3.5 Data for research is collected by different research organisations for specific purposes, e.g. Clinical Research Centre (CRC) is collecting data for Cancer Registry and Communicable Disease Division also collects data for Cancer Registry. This has resulted in duplication of efforts and double entry at the operational level. There is no National Cancer Data Set developed to ensure accuracy and quality of the registry information.

3.6 The use of Information and Communication Technology (ICT) improves data quality and integrity. However in order to ensure consistency and interoperability, standardisation of data elements is very critical. In addition not all current reporting systems in MOH are electronic. This has resulted in a lot of data merging and massaging to be done in IDS causing problems related to data quality. In addition problems related to ICT infrastructure development has resulted in the non-compliance to the use of ICT for reporting purposes.

3.7 Currently the manpower in IDS are predominantly Medical Records Officers (MRO) and Statistical Officers with minimum domain knowledge and experience in health information management. Therefore the tasks are limited to production of reports for Health Management. There is a need to increase the capacity and capability of health personnel involved in health informatics. This will include creation of posts with appropriate skill match. The need for adequately and appropriately qualified personnel in health informatics cannot be overemphasized.

3.8 The quality of information pertaining to medical diagnosis is far from satisfactory. Currently the diagnosis coding is done by the MRO in reference to the case notes. Presently there is inadequate training for staff in coding, disease classification and record management. There is also a need to train doctors in documenting accurate information to facilitate diagnosis coding.

3.9 The current system of collecting information from private sector is inadequate and less satisfactory in the analysis of the country profile. There is a need to improve the reporting system from private sector through enforcement of the Private Health Care Facilities and Services Act. In addition there is a lot of health and health related activities done by NGOs for which there is no formal way of reporting.

3.10 Infrastructure and network required for supporting communication and connectivity are inadequate in terms of coverage and its capability. Currently lease lines are used to connect MOH with state office and the other facilities are connected through dial-up lines. This has resulted in the system being slow, unreliable and also incurs additional operational cost and has caused non compliance at the operational level.

4. RATIONALE

4.1 Health System of the Future

The MOH vision of creating a nation of healthy individuals, families and communities will be realised by promoting the concept of life long wellness where the individuals and families will practice healthy lifestyle habits and will be responsible for their health and will play a major role in managing their health. The Health System of the future will be based on greater interaction between the care providers and clients, and access to health information will be readily available for decision making.

4.2 Telemedicine Blueprint

4.2.1 Malaysia's Telemedicine Blueprint "Leading Healthcare Into the Information Age" has outlined the concept to develop the most advanced health systems of the world by harnessing the power of information and multimedia technology.

4.2.2 Amongst the pilot project applications that was launched was the Lifetime Health Plan (LHP). Its objective is to develop a longitudinal health record of every individual and implement a proactive health plan thus enabling continuity in care. Among the sub applications that were conceptualized is the Healthcare Information Management and Support Services (HIMSS). The HIMSS consist of 2 repositories for lifetime health records and lifetime health plans. This part of the services termed as the Group Data Services (GDS) was proposed to provide the medical statistics and forecasts.

4.2.3 The Telehealth way forward approved in 2003 has continued to recognise the significance of Lifetime Health Record (LHR) being the focal point of integration that allows for integration and interoperability. As such in the planning for the Health Information Management in the country, the role of the LHR services will complement HIMS.

4.3 National Telehealth Policies

4.3.1 The National Telehealth Policies developed to facilitate the implementation of the MSC/KKM Telehealth flagship project provides aggregated policies applicable for the deployment of ICT project and in particular the Telehealth project.

4.3.2 Among the macro policies, the one that are relevant to the HIMS is the policy on data management. Among the areas included are:-

- Ownership, Custody and Control
- Confidentiality & Privacy
- Accuracy & Reliability
- Domain & Technical Standards

4.4 Ninth Malaysia Plan (9MP)

In 9 MP, with the theme on "Towards achieving better health through consolidation of services" six goals were identified where the 2 primary goals shown below form the overarching thrust for the plan.

- Prevent and reduce disease burden
- Enhance health care delivery system

Among the 4 supporting goals identified, strengthening of the Health Information System was amongst them. This is to enable access to timely quality information for monitoring evaluation and for evidence based health planning.

4.5 Health Care Financing

The Health Care Financing concept and principles approved in the 8MP requires data from public and private sector to make evidence based decision for the proposed financial packages. The implementation of the DRG case mix system requires for accurate and timely reports from all health facilities.

4.6 Health Planning and Evaluation

The experience gained from the evaluation of the 7MP and 8MP shows lack of information for strategic planning. Many of the indicators proposed for monitoring the progress and achievement was not done due to lack of information. The enhancement of policy to practice approach needs review of the current policies in providing direction towards achieving goals set in the 9MP. For this to happen it is essential to strengthen the health information management & reporting system.

4.7 Integrated Health Information Management

4.7.1 The current system of managing information by disparate systems responsible to the program will be transformed to provide for a mechanism where the information is collected once but made available for primary and secondary users. The coordination between Ministry of Health and other public sector agencies providing health care as well as the private sectors who are playing an increasingly important role will be the thrust for the Health Information Management in the country.

4.7.2 This will require change management process at all levels to achieve the functional and service integration. The data and application integration will be achieved through the deployment of National Health Informatics Standards including the National Health Data Dictionary.

5. LESSONS LEARNT

5.1 National Health Services (NHS), UK

5.1.1 An information strategy for the modern NHS was developed to cover the period from 1998-2005. The purpose of this strategy was to enable the use of information to improve patient care. The National NHS Policy was set out in the white paper on "The New NHS". The information strategy as outlined in the white paper was based on the following principles:-

- Information will be person based.
- Systems will be integrated.
- Management information will be derived from operational systems.
- Information will be secured and confidential.
- Information will be shared across NHS.

5.1.2 The subsequent report published in 2002 on "Delivering the NHS Plan" provides directions on the investments and reforms required to support the implementation of the plan. Specific targets were set. The document on Delivering 21st century IT Support for NHS provides the use of ICT in supporting the implementation of the NHS Plan.

5.1.3 The National Program for IT (NPfIT) was established in 2002 to implement projects vital for the modernization of the NHS and focused on the four key areas as follows:-

- Electronic Integrated Care Record services including a nationally accessible core data sets including images
- Electronic booking of appointments
- Electronic transfer of prescriptions
- Strengthen infrastructure capability including connectivity and broadband access

5.1.4 The "NHS Improvement Plan" published in 2004 sets out the priority for the next 3 years from 2005 to 2008 to support the commitment to the ongoing process as identified in the NHS Plan.

5.1.5 The NHS Information Standards Board was established in 2001 to provide an independent mechanism for the adoption and sign off for the health informatics standards for use across NHS facilities to allow for integration and interoperability. This board is part of the NHS policy framework and reports to NPfIT. Among the

major works is the revision of the procedural clinical intervention classification version 4.3 scheduled for implementation in health financing mechanism to allow for Health Care Resource Group (HRG) version 4 which supports "Payment by Result." The National Information Standards Board also provides support in forming expert groups and developing data sets, National Data Dictionary and Healthcare Resources Group (HRG) groups. Several pilot projects are being conducted before finalizing the requirements for HRG grouping for a specific condition.

5.2 Health Information Management, Australia

The Australian Health Care Delivery System has recognized the role of new and evolving information and communication technology as a powerful tool to improve health care delivery and achieve better quality of care and health outcomes for individuals and families. In response to this the Australian Health Ministers established the National Health Information Management Advisory Council (NHIMAC) and endorsed a National Health Information Action Plan for Australia. The first edition released in 1999 provided the basis for a national strategic approach to health information involving new ways for delivering health services.

The second edition revised in 2001 incorporates new strategies and projects planned for the next five years. Amongst the projects that were undertaken as a preparatory phase for the implementation of the action plan are:-

- Development of Health Information Network for Australia
- Establishment of the National Health Informatics Standards Advisory Committee in 2002
- Development of a National Health Information Standards Plan for Australia in 2001
- Development of National Action Plan for introducing E-Commerce in the Hospital Supply Chain in 2000
- Development of National Telehealth Plan for Australia and New Zealand

The Health on Line project provides a platform to promote uniform approach in the use of information communication technology in the health sector.

The development of ICD 10-AM (Australian Modification) has standardised the surgical procedures & diagnosis and has coded them for use in the Australian health sector. The Development of National Health Data Dictionary and standard data sets for specific disease conditions like diabetes and cancer provides standard data definitions and values to ensure data integrity

5.3 Health Information Management in Canada

5.3.1 In 1991, the National Task force on Health Information recommended the need for a coordinated, integrated health information system for Canada. As a result of this Canadian Institute for Health Information (CIHI) was established in 1993. In 1994, the National Forum on Health recommended the need for better tools for assessing population health and an improved information technology infrastructure to support the development of evidence based decision making. The Information Highway Advisory Council recommended the development of a National Health Information Infrastructure, as well as creation of investment funds for testing new networking technologies and the establishment of national standards for data access, protection and management. This led to the development of Canadian Health Information System and the establishment of the Minister's Advisory Council on Health Info-structure.

5.3.2 Amongst the selected national health informatics initiatives in Canada are as follows;

i) Health Canada

- **National Population Health Clearing House** will consolidate information from all health stakeholders at the federal and provincial level. It provides up-to-date information on health related issues to enable informed decision making.

- **National Health Surveillance System** will coordinate and share information between several information networks in the country to track incidence and outbreak of diseases. It will enable national and international surveillance of diseases and other potential threats to health and allows for timely response.

- **First Nations Health Information System** is a community based comprehensive computerised system that links 500 First Nations Community across the country. It will track information on a variety of issues/topics such as chronic and communicable diseases, prescription drug use, vaccinations, environmental health, substance abuse and patient records.

ii) **Industry Canada: The Canadian Network for the Advancement of Research, Industry & Education (CANARIE)** is an industry led and managed consortium. It enables collaboration between federal government, research community and the private sector in the development of Information Highway for Canada.

iii) **Statistics Canada:** The Health Statistics Division of statistics Canada is responsible for the collection and analysis of a wide range of health and health related data. Among its key project is the National Population Health Survey designed as a longitudinal survey that interviews the same panel of respondents every 2 years for two decades to measure the population health status and to understand in depth the determinants of health. The quarterly publications on health reports provides information to a wide range of clients such as health professionals, researchers, policy makers and students.

iv) **Advisory Council for Health Info Structure** provides the focus to identify and address issues related to the health and information highway. The mandate of the council is to provide the Minister of Health strategic advice on the Canadian Health Information system.

v) **HEAL Net/ RELAIS** is a multidisciplinary research initiative that partners academic, government and private sector across the country. The programs focuses on using evidence based decision support to:-

- Enhance participation from various stakeholders in the decisions of health management systems
- Develop performance indicators for achieving quality and for public accountability
- Solve fundamental problems in information system design
- Improve understanding between health, health care and other social determinants of health

vi) **Canadian Institute of Health Information (CIHI)** provides accurate and timely information to support the development of health policies as well as create public awareness on factors affecting health. In 1996, the creation of Partners in Health Informatics/Telematics bring together expertise from professionals in public and private sector which will, among other things, define and adopt emerging standards for health informatics in the country.

vii) **Canadian Organization for the Advancement of Computers in Health (COACH)** promote the understanding and effective utilization of information and information technology in the health care environment.

vii) **Provincial/Territorial:** the health care governance shift from acute encounter driven care to a community-focused care incorporates a multi disciplinary approach to primary care. The common theme in this model is the evidence based decision making.The health care service delivery requires complex decision making at the individual and population level. Improvements in the quality of decision making require continuous feedback to ensure best outcomes. Quality information, research and evaluation form important tools for decision making. At the provincial level the information systems are enhanced to integrate dispersed care providers, managers, organizations, policy makers, patients and the country as a large.

5.4 Health Information Management in Malaysia

The lessons learnt from the above three countries is that there is a absolute need to coordinate all efforts and develop a Health Information Management blueprint which will outline the business case and provides an action plan on which all future strategies and action plans will be based.

The Telemedicine Blueprint provides 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 Infrastructure framework for implementation in the country to allow for integration and interoperability. The MoH ICT Strategic Plan will provide for strategies and action plan to support the implementation of the Health Information Management Action Plan.

The National Health Information Action Plan will be 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.

6 PROBLEM STATEMENTS

The following problem analysis provides a basis on which the National Health Information Action Plan will be formulated.

6.1 Policy and Governance

The thrust of the 9MP 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. The draft National Health Policy has provided directions on the role of HIMS in the MOH. In order to ensure greater compliance by all stakeholders the National Health Policy on Health Information Management should be developed. The issues that need to be address includes:-

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

6.2 Legislations and 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 Food Act and Regulations, CDC Act, Medical Act, Private Hospitals Act which regulates the information required for the enforcement of the Act. Such Acts are very much program driven and serves a specific purpose only. As such much of the information collected currently is very much dependent on the information that is gazetted for collection. Any additional information required cannot be collected due to lack of provision in the Act. The LHR being the minimum data set required for providing continuity in care should be mandatory and provided by all health care stakeholders. The use of National Health Informatics Standards should be mandatory to ensure interoperability.

6.3 Organisation

6.3.1 When IDS unit was established in 1980, it was agreed that

- There should be one source of information only
- IDS will be the servicing arm of the MOH
- HIMS was used to denote that the information system may have several systems i.e. central and supplementary
- The long term plan was for IDS to exist as a separate entity. During the developmental stage of the HIMS, it was proposed that Medical Records and Statistics Unit of the Planning & Development division to function as the central unit.

6.3.2 Unfortunately until now that is 25 years later IDS has not been upgraded to fulfill its role. Additionally at the state level, the Medical Records Officers (MRO) in the hospital reports to the Medical Services Division, and those in the Public Health Office reports to the Public Health Division. The new post of MRO established at state level reports to its own Management. This creates lack of ownership and loyalty among officers working at the state level. Whilst IDS is responsible and accountable for all health information in MOH, there is no control over the officers working at the state level.

6.3.3 When one talks about Integrated Health Information Management this calls for a greater responsibility and accountability on the part of IDS as a unit to solely provide health information. Therefore it is very urgent that position of IDS be upgraded to a Center of Health Information responsible for policy formulation, planning, implementation, monitoring and evaluation of all projects related to Health Information Management in the country.

6.4 Needs analysis

The current HIMS data is predominantly based on the needs analysis done in 1980 for MOH use only. Over the years programs have reviewed their requirements which are basically to accommodate returns for new programs and activities. However the needs analysis from a country's perspective required for health planning, monitoring and evaluation has not been undertaken on a major scale. This would be major exercise but is essential if the 10 MP has to be developed based on evidence based planning.

6.5 Operations

6.5.1 Health Information System in MOH

i) The current HIMS is operating predominantly on the manual reports sent in aggregated format which are entered and analyzed in the IDS unit. The *Communicable Disease Control Information System (CDCIS)* is a complete online reporting system. In addition several independent applications are functioning for specific purposes such as *Sistem Maklumat Rawatan Perubatan (SMRP)* for inpatients, *Sistem Laporan Penyakit Bawaan Vektor dan Wabak Penyakit (VEPRO)* for vector borne disease surveillance, *Bekalan Air dan Kebersihan Alam Sekeliling (BAKAS)* system for environmental sanitation reports, *Food Safety Information System of Malaysia (FOSIM)* for control of food safety at the entry points.

ii) Therefore, the current system does not allow IDS as a focal point for health information in the country. The combination of manual system and other disparate legacy reporting system have resulted in great inefficiency and affect the data quality & integrity.

6.5.2 Health Information System outside MOH

i) The public sector agencies includes university hospitals, Aborigine hospitals, local authority clinics, Armed Forces hospitals and clinics. The data is sent in the form of reports which is entered at the IDS to get the national data. However the information provided is incomplete.

ii) The other key care stakeholders are NGO's, such as Federation of Family Planning Association (FFPA), National Kidney Foundation and others providing specific services in relation to their core business. There is no formal way of obtaining reports from these stakeholders.

6.5.3 Health Information System in private sector

i) In compliance to the Private Hospitals Act, the 225 private hospitals in the country send the raw data in manual form as per schedule in the Act. The data will have to be entered and compiled in IDS. The voluminous data that need to be entered, and the manner in which the data is entered at the hospital level greatly affects the data quality and integrity.

ii) As for the general practitioners clinics as they are not required to be registered with MOH as yet, there are no returns to indicate the private sector workload for the outpatient services. With the enforcement of the Private Health Care Facilities Act, the reporting mechanism from this sector has to be seriously studied.

7. HIMS–BLUE PRINT PROPOSAL

7.1 Objective

a. To provide the policy and strategic framework for better health information management in the country
b. To provide directions on the legislative and regulatory changes necessary to support the action plan
c. To determine the organization and action plan to enable the translation of policy to practice
d. To clarify the responsibilities of the stakeholders and coordination activities required to support the action plan
e. To identify building blocks necessary to support the change
f. To determine the skill match and training required to support the change
g. To be used as the policy and strategic document for other related plans and blueprint such as Information and Communication Technology Strategic Plan (ICTSP)

7.2 Policies & Strategies

7.2.1 A National approach for the Health Information Management in the country shall be developed as follows;

- Develop a mechanism for National coordination and Partnership
- Ensure the building blocks such as the Health Informatics Standards, security standards, privacy protection and infrastructure readiness
- Plan and implement key national initiatives that addresses the needs of all stake holders

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

7.2.2 The Legal, Data Protection and Security Framework to be developed to ensure secured transfer of all health and health related information:-

- Review the current Data Protection Act to ensure its suitability for health and health related information
- Study relevant legislations on consent and propose recommendations on the issues related to information sharing

- Study mechanism to allow initiatives for information sharing for better coordinated care
- Study the current policy on the archiving of medical records and propose recommendations based on the current developments.
- Develop User Access Policy in relation to access to individual records, medical records by secondary users

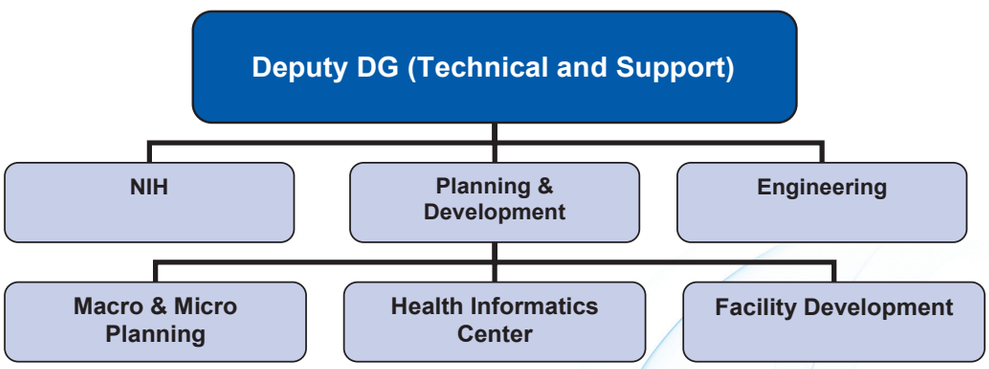
7.3 Organization

7.3.1 Health Informatics Center (HIC)

Health Information Management System (HIMS) is absolutely essential to provide information and knowledge to enhance the use of evidence-based planning, management and decision making. With the advances in computing and ICT, there is an opportunity to change the manner in which the health information is managed. The requirement of an integrated and comprehensive health and health related information system for the country demands a well structured organisation supported by highly skilled and competent personnel. Therefore it is proposed that the current IDS unit be upgraded and strengthened to function as a Health Informatics Center for the country.

The center will continue to remain under the Planning and Development Division (P & D) and will function as the focal point for all health and health related information in the country. However the restructuring of P&D will include the organisational strengthening of HIC.

Fig 1 : Propose Organization Chart

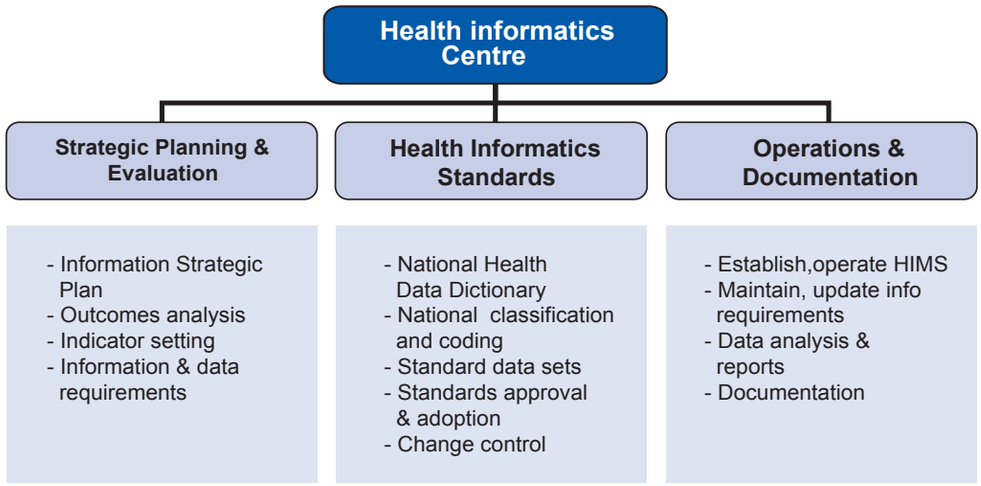


7.3.2 HIC Organization Structure

The Health Informatics Center will be headed by a medical doctor trained in public health/health planning with additional qualifications in medical/health informatics/medical/bio statistics.

The three sub units and their specific tasks are as shown in Fig. 2.

Fig 2 : Propose HIC Organisation structure



7.3.3 Roles & Responsibilities

i) Health Information Strategic Planning and monitoring for the country:

- Develop and continuously update the Information Strategic Plan (ISP) for the health informatics demands and needs in the country based on the health sector business plan. This would form the basis for Information and CommunicationTechnology Strategic Plan (ICTSP)
- Collection, collation and analysis of health status, and health performance and other related indicators to monitor health status of the country and health sector performance
- Perform situational analysis on the health scenario and profile in the country

- Evaluation of the health status of the country and in relation to the global scenario
- Health information governance in relation to information confidentiality and security
- Secretariat to the National Health Informatics committee
- Ex officio member in all health informatics association such as Health Level 7 (HL7) Malaysia, Malaysian Health Informatics Association (MHIA) and others

ii) Domain management of health data repositories & registries

- Planning the domain requirements for the establishment and operation of the National Health Data Ware House
- Coordinate and liaise domain requirements for the data marts being developed and in operations especially in terms of compliance to the health informatics standards

  - CDCIS
  - LHR
  - EMR

- Coordinate and liaise domain requirements, in terms of development of specific data set specifications for identified conditions/data groups for the establishment and operations of registries, such as;

  - Renal registry
  - Cancer registry
  - PAP registry
  - Health facility registry
  - Health provider registry
  - Others

iii) Data Analysis and reports.

- Data mining and analysis using the appropriate tools and technology for program specific information requirement
- Provide information for DG Technical report
- MOH's Annual reports
- Health indicator report
- Health status /Report card for health sector

iv) Health Informatics Standard development and maintenance:

- Plan and coordinate the development and adoption of Health informatics standards in the country
- Establish Special Interest Group/ Expert Group for the development and versioning of specific data sets for use in the country:

a. National Health Data Dictionary
   - Hospital /Clinic Visit Event Summary
   - Health Condition Summary
   - Person Demographics and Profile

b. Specific conditions such as
   - Diabetic Data Set
   - Obstetric Data Set
   - Others

c. Standard nomenclature for procedure coding
   - Surgical procedures
   - Laboratory procedures
   - Imaging
   - Rehabilitation

d. ICD 10 diagnostic coding

e. Custodian to all health informatics standards

v) Research & Development

- Plan and coordinate research projects in conjunction with local and international funding agencies
- Determine research priorities for health information management and governance

vi) Training and manpower development

- Plan and coordinate the course content and curriculum for in-service, basic and post basic courses in health informatics
- To function as a resource center for agencies involved in the planning and conduct of the course
- Plan carrier development for health informaticians
- Plan and conduct local conferences on health information

vii) Resource center for Health Information Management

- To function as a one stop center on all issues related to health informatics

viii) Affiliation with local and international organizations

- Affiliation to World Health Organisation (WHO), United Nations Children's Fund (UNICEF), United Nation Development Programme (UNDP) on all health and health information

- Affiliation to international standards organization such as HL7, International Medical Informatics Association (IMIA)

7.3.4 Management Committees

It is proposed the organization of the Health Informatics Center is governed by 2 types of committees:

i) National Health Informatics Committee, responsible for all policy directions for the adoption and use of health information in the country

ii) The operational management will be managed by several technical committees as follows;

- HIMS Technical Committee - will be responsible for the planning, review of all Health information for adoption in MOH and other agencies

- HIMS Documentation Committee - will be responsible for the information analysis, content, report and documentation.

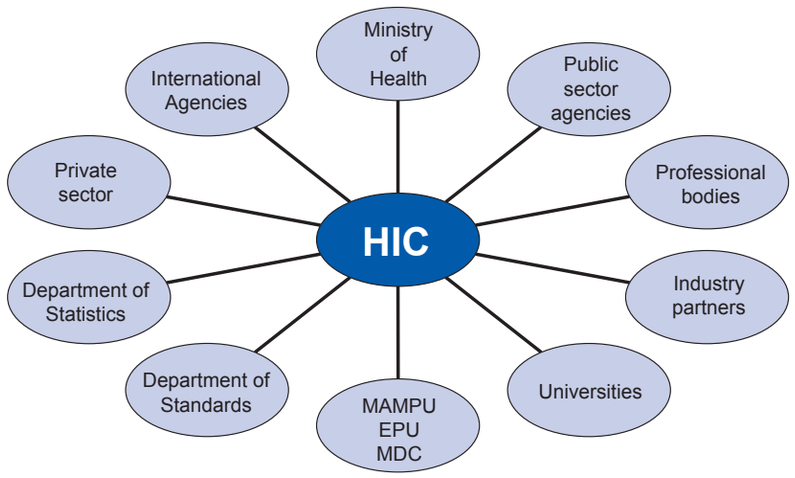
- Health Informatics Standard Committee - will be responsible for the development, review and adoption ofHealth Informatics Standard for the country.

- HIMS Research Committee - will be responsible for planning and coordination of all research projects

7.3.5 Role of stakeholders

The various stakeholders who will play a key role are as shown in Fig.3 :-

Fig 3 : Stakeholders in HIMS



i) The Ministry of Health being the lead agency for health will play the key role and will be responsible the development implementation and monitoring of the National Health Information Action Plan.

ii) The Public and Private sector agencies will participate in the development of the action plan and implementation of related activities and be responsible in ensuring its compliance.

iii) The universities and the professional organisations will be responsible for providing expert assistance in specific activities like the development of standards and carrying out research projects related to health information in the country.

iv) The universities will be also responsible for planning and conducting relevant undergraduate and postgraduate diploma in health informatics.

v) The Economic Planning Unit (EPU) and the Department of Statistics department will be responsible for coordinating all information related to population demography.

vi) The industry players will be responsible in providing support for health informatics standards development and ensuring its compliance.

vii) The Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) & Multimedia Development Corporation (MDC) will be responsible in planning the policies and strategies in providing the ICT infrastructure support to enable the use of technology tools to improve efficiency.

7.4 Building Blocks

7.4.1 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 3 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.

The work undertaken has to be continued and there should be special funding and support to ensure the future development of standard and its maintenance.

7.4.2 Infrastructure development

It appears that the vast deployment of IT in our day to day business may not be possible in view of lack of infrastructure capability and capacity. Thus investment in ICT infrastructure in terms of adequate storage space, high bandwidth Local Area Networks (LANs) and Wide Area Networks (WANs), wireless technology and planned replacement of workstations, need to be addressed. Some of the lessons learnt in the implementation of the Teleconsultation project are the communications issues that have resulted in the underutilization of the system as well as a feeling of skepticism among users. The delay in replacing the hardware which is obsolete and failure to upgrade the servers timely in Selayang Hospital has caused adverse effect such as "system hang" and poor response time, has resulted users to loss confidence in using the system. The development of ICTSP is now timely which would study the business requirements and the road map for health information management in the country and develop an appropriate ICT road map to support the National Health Information Action Plan.

7.5 e-HIMS

7.5.1 e-HIMS is an electronic reporting system for the collection, collation and analysis of health information in MOH facilities. It is proposed a web-based reporting system be developed through which all health and health related data from MOH facilities, non MOH facilities and the private sector can be transacted for timely and quality health information.

i) The scope of works for the above system will be:

- To create a database to collect data needed for statistical reporting
- To allow for data entry by the patient number (raw data) instead of cumulated data
- To conduct data quality checks

- To prepare data blinding for the purposes of data warehousing
- Create data warehouse for all reports as per MOH requirement
- Create all routine statistical and ad-hoc reports
- Develop web software to enable user to enter the data into the central system and will include certain plausibility checks such as male & female based on NRIC number
- Design and develop optimized workflows for data capture such as discharge summary
- Procure and install hardware data collection server, warehouse server

ii) It is also proposed that the operations and maintenance of the system be managed on an Public-Private Patnership (PPP) arrangement whereby the following tasks will be outsourced to the vendor for a concession period

- Quality control at the source data entry level through spot checks
- Training to staff at the operation level provided at regular intervals
- Cleaning and quality check of the database

7.6 National Health Data Warehouse

7.6.1 The National Health Data Warehouse (NHDW) in MOH will manage the health and health related information for population health projections, predictions and analysis. This will include information from both public and private sector. In defining the business case for the NHDW the requirements of the Population Health Information requirements will be studied.

i) The core services that would be included in the functioning of the National Health Data Warehouse will encompass the various activities in the MOH and other health related agencies and are as follows;

- Population Health
  - Disease surveillance and prediction
  - Health service utilization
  - Regulation and enforcement
    - ∞ Food safety & quality
    - ∞ Occupational and environmental health
    - ∞ Tobacco control
    - ∞ Radiation safety & Protection

- Personal health
  - Outcomes
  - Satisfaction
  - Efficiency
  - Quality and audits

- Health planning monitoring and evaluation
  - Health status
    - ∞ Country and state level
    - ∞ Regional & International comparison

  - Health sector performance
    - ∞ Access
    - ∞ Equity
    - ∞ Affordability
    - ∞ Responsiveness
    - ∞ Quality

- Health governance and stewardship
  - Health financing
    - ∞ National health accounts
    - ∞ DRG/case mix

  - Resource planning and utilization
    - ∞ Health facilities
    - ∞ Assets projections and use
    - ∞ Human resource development and training

  - Regulation and enforcement
    - ∞ Pharmaceuticals
    - ∞ Health care practitioners registry
    - ∞ Health care facilities registry

  - Management
    - ∞ HRMIS

  - Financial systems

ii) NHDW Objectives:

- To establish a national electronic based data repository for health and health related information in the country
- To utilize appropriate tools and mechanisms for analysis and reporting for timely intervention of health and health related conditions
- To enable aggregation, trending and analysis including prediction and projections of population health information
- To continuously measure achievement of key performance indicators as determined by the MOH
- To function as the point of reference for all health and health related information in the country

8 THE NATIONAL HEALTH INFORMATION ACTION PLAN

8.1 To improve governance and establish national collaboration through the establishment of Health Informatics Center.

8.2 To facilitate operations at the institutional level through deployment of electronic patient management systems in all hospitals and clinics.

8.3 To improve access to timely and quality information through the implementation of electronic reporting system for all HIMS data.

8.4 To review and develop legal and security framework for compliance to the provision of health and health related information.

8.5 To develop and maintain national standards for health information management to allow for interoperability.

8.6 To develop and maintain human capital for health informatics in the country.

8.7 To foster research and best practices for the health information management in the country.

8.8 To liaise with national and international agencies on all aspects related to the health information management.

9 IMPLEMENTATION SCHEDULE

9.1 Goal: Develop HIMS business plan to provide business case and direction for the health sector information management .

Outcome: A Master Plan that forms the basis for the planning and implementation of all health information related projects in the country.

Activity	Target	Responsible unit
Establish expert group	October 2005	IDS
HIMS Blueprint Framework approval	December 2005	IDS
Consensus workshop with stakeholders	Jan 2006	IDS
Approval JDPKK	Feb 2006	IDS
Publication	April 2006	IDS

9.2 Goal: Establish Health Informatics Center.

Outcome: Establishment of a national body to coordinate the planning and implementation of all health and health related information in the country

Activity	Target	Responsible unit
Concept paper approval	February 2006	IDS
Establishment/ upgrading of posts	May 2006	Human Resource
Budget	May 2006	Finance
Establish National Health Policy	June 2006	IDS/Health planning unit
Operations	August 2006	IDS

9.3 Goal: Deployment of electronic information system for patient management in all hospitals and clinics.

Outcome: Creation of ICT enabled health care facilities to enable electronic reporting for the purposes of HIMS.

Activity	Target	Responsible unit
Develop road map for HIS deployment in the existing hospitals in 9MP	December 2005	Medical Services Development Division
Develop road map for HIS implementation in new hospitals approved for 9MP	December 2005	Planning & Development Division
Develop road map for TPC roll out in health clinics	December 2005	Family Health Development Division
Develop road map for HIS implementation in Dental clinics	February 2006	Oral Health Services division
Develop road map for infrastructure strengthening to support implementation	April 2006	BTMK
Develop implementation plan based on the road map	April 2006	BTMK
LHR pilot project implementation	2006-2008	Telehealth Unit
LHR roll out plan and implementation	2008 onwards	Telehealth Unit
Implementation, monitoring & evaluation	9MP	All units concerned

9.4 Goal: Establish electronic reporting system for Health information Management in the country.

Outcome: Access to timely, accurate and timely data for statistical reporting, outcomes measurement, predictions and alerts.

Activity	Target	Responsible unit
Develop proposal for e-HIMS	October 2005	IDS
Selection and award	November 2005	BTMK
Implementation prototype	March 2005	Vendor/IDS/BTMK
Evaluation and rollout	June 2006 onwards	Vendor/IDS/BTMK
Infrastructure strengthening	Jan 2006 onwards	BTMK
Approval for National data warehouse	June 2006	IDS/BTMK
Implementation National Health Data Warehouse	2007	IDS/BTMK

9.5 Goal: Establish legal and security framework for compliance to provision of health and health related information.

Outcome: Mechanism that allows for compliance by all stake holders for the providing minimum data set and protection of personal information.

Activity	Target	Responsible unit
Review current legislations to make LHR mandatory	2006	Telehealth unit /PUU
Establish security framework to ensure data protection	2006	Telehealth unit /BTMK/PUU
Review mechanism and business flow for provision of health information from outside MOH	2006	IDS/Programs/PUU
Develop security standards for approval by Department of Standards	2006	Telehealth Unit/BTMK/IDS

9.6 Goal: Establish and maintain Health Informatics Standards.

Outcome: Mechanism that ensures a coherent approach to the development, adoption and deployment of health informatics standards in the country

Activity	Target	Responsible unit
Establish National Health Informatics Committee	December 2005	IDS
Approval of functional standards endorsed by expert group by Department of Standards	March 2006	IDS
Development of new functional standards for deployment in HIS hospitals scheduled for implementation	2006	IDS/Planning & Development Division/hospitals concerned
Endorsement by expert committee and approval by Department of Standards	2007	IDS
Approval by standards department of procedure list and coding standards endorsed by expert group	March 2006	IDS
Development of new list and codes for deployment in the new hospitals scheduled for implementation in 9MP	2006	IDS/Planning & Development Division/Expert Group
Approval by Department of Standards	2007	IDS
National Health Data dictionary version 2 completion	Jun 2006	IDS/Telehealth unit
National Health data dictionary approval Department of Standards	August 2006	IDS
Health facility codes and classification version 2 complete	March 2006	IDS/Telehealth unit
Health Facility codes approval Department of Standards	June 2006	IDS
Development of data sets for LHR	December 2006	Telehealth unit/IDS

9.7 Goal : Develop and maintain human capital for health informatics in the country.

Outcome: Knowledge workers with appropriate and adequate skills for data management and analysis to ensure quality health information.

Activity	Target	Responsible unit
Review the roles and responsibilities of the Medical Records officers	2006	IDS/Medical Service Development division
Review the course content of MRO with relevant institution of higher learning	2006	IDS/training division
Develop post basic courses in health informatics	2007	IDS/training division
Review/Develop postgraduate courses in health informatics	2007	IDS/Allied health division
Organize National Conference in health informatics	2006	IDS/telehealth/MHIA

9.8 Goals: To foster research and best practices in Health Information Management in the country.

Outcome: Use of research findings and best practices to improve the use of health information and its management.

Activity	Target	Responsible unit
Identify research priority areas in health information management	2006	IDS/BTMK/Telehealth Unit/ MDC
Establish a national clearing house for all research projects in health information management	2008	IDS
Establish Center of Excellence in Health Informatics	2009	IDS

9.9 Goals: Establish international alliances and affiliations with related agencies and professional organizations

Outcome: Mechanism to share experiences and provides a platform to enlist participation from health care stakeholders in other countries

Activity	Target	Responsible unit
Create an international health information network with other countries such as Australia, UK, Singapore and other Asean countries	2008	IDS/telehealth
Establish international affiliate status with international standards bodies e.g. HL7 Malaysia	2007	IDS/telehealth
Work towards establishing WHO collaborating center in Health Informatics	10MP	IDS

10. 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 System (HIMS) becomes a crucial and compelling issue. The role of other stakeholders in providing care becomes critical for the development of an integrated Health Information System. A strong political will and governance through the establishment of National Institute of Health Information will pave the way for the national approach in the management of health 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 and operations of this national collaborating network will require highly knowledgeable and skillful people. The international networking and affiliations will provide the country with case studies and lessons learnt that will form the basis of the future action plan. The National Health Information Action Plan will be reviewed every 5 years to monitor progress and plan for future strategies.

Reference:

1. *Ministry of Health Malaysia; Malaysia's Telemedicine Blueprint "Leading Healthcare into the Information Age"; published 1997*

2. *Ministry of Health Malaysia; National Telehealth Policies; First edition published 2001*

3. *Ministry of Health Malaysia; Ninth Malaysia Plan "Transforming Healthcare Services" through ICT: the Way forward; 2005; unpublished document*

4. *National Health Information Management Advisory council, Australia; A Health Information Action Plan for Australia; second edition Sep 2001*

5. *Department of Health, UK; "The NHS Plan;" A Plan for Investment, "A Plan for Reform"; July 2000*

6. *Department of Health UK; Delivering 21st Century IT Support for NHS; National Strategic Programme; 2002*

7. *Department of Health, UK; Delivering the NHS Plan-Next Steps on Investment, Next Steps on Reforms;2002*

8. *Department of Health UK; NHS Improvement Plan;"Putting People at the Heart of Public Service"; June 2004*

9. *Department of Health UK; National Programme for IT; National Programme Initiation Document; December 2004*

10. *Canadian Institute of Health Information; "Navigating the Swirl: An Overview of Canadian Health Informatics Initiativest"; 1998*

Abbreviations

BAKAS	(*Bekalan Air dan Kebersihan Alam Sekeliling*) Rural Environmental Sanitation Programme
CRC	Clinical Research Center
EPU	Economic Planning Unit
FFPA	Federation of Family Planning Association
FOSIM	Food Safety Information System of Malaysia
CDCIS	Communicable Disease Control Information System
GDS	Group Data Services
HIMS	Health Information Management System
HIMSS	Healthcare Information Management and Support Services
HRG	Healthcare Resources Group
ICT	Information and Communication Technology
IMIA	International Medical Informatics Association
LHP	Lifetime Health Plan
LHR	Lifetime Health Record
MAMPU	Malaysian Administrative Modernization and Management Planning Unit
MDC	Multimedia Development Organization
*PL*HP	Personalised Lifetime Heath Plan
PPP	Public-Private Partnership
MHIA	Malaysian Health Informatics Association
MoH	Ministry of Health
MRO	Medical Record Officer
NHIC	National Health Informatics Committee
NGO	Non-governmental Organization
NHS,UK	National Health Services, United Kingdom
SMRP	*(Sistem Maklumat Rawatan Perubatan)* Medical Care Information System
VEKPRO	Sistem laporan Penyakit Bawaan Vektor dan Wabak Penyakit
WHO	World Health Organization
UNICEP	United Nations Children's Fund
UNDP	United Nations Development Programme
7MP	7th Malaysia Plan
8MP	8th Malaysia Plan
9MP	9th Malaysia Plan
10MP	10th Malaysia Plan

HIMS BLUEPRINT

ISBN 978 - 967 - 0399 - 71 - 3

9 789670 399713