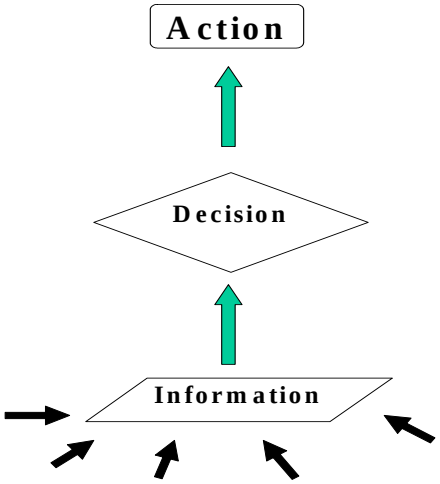
Health Sector Information System

National Strategy



Government of Nepal

Ministry of Health & Population

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TABLE OF CONTENT

1. BACKGROUND……..…. 3
   1.1 CURRENT SITUATION
   1.2 PROBLEMS & CONSTRAINTS
   1.3 INTRODUCTION TO HEALTH SECTOR INFORMATION STRATEGY
2. THE VISION, SCOPE, GUIDING PRINCIPLES & OBJECTIVE S OF THE STRATEGY……...…….6
3 INFORMATION MANAGEMENT (PRODUCTION AND DISTRIBUTION) ……..…….8
   3.1 INFORMATION GENERATION
   3.2 INFORMATION PROCESSING
   3.3 DISTRICT HEALTH INFORMATION BANK
   3.4 INFORMATION FLOW & FREQUENCY
   3.5 INFORMATION REQUIREMENT OF HEALTH SECTOR STAKEHOLDERS
   3.6 CORE INDICATORS
   3.7 EXTENT OF DISAGGREGETION REQUIRED
4. INSTITUTIONAL ARRANGEMENT FOR OPERATIONALIZATION……12
   4.1 NATIONAL HEALTH INFORMATION POLICY COMMITTEE (NHIPC)
   4..2 NATIONAL HEALTH INFORMATION CENTRE (NHIC)
   4.3 REGIONAL LEVEL
   4.4 DISTRICT HEALTH INFORMATION MANAGEMENT COMMITTEE (DHIMC)
   4.5 DISTRICT HEALTH INFORMATION BANK (DHIB)
5. HEALTH INFORMATION GOVERNANCE AND LEGISLATION……...….....15
6. HEALTH INFORMATION STANDARD AND QUALITY……...….....16
   6.1 DATA STANDARD
   6.2 TECHNICAL STANDARD
   6.3 QUALITY STANDARD
7. USE OF TECHNOLOGY IN MANAGING HEALTH INFORMATION.....17
8. SOURCES OF HEALTH SECTOR INFORMATION.....18
   8.1 CENSUS
   8.2 VITAL REGISTRATION
   8.3 SURVEY
   8.4 RAPID ASSESSMENT
   8.5 SENTINEL REPORTING
   8.6 RESEARCH
   8.7 DISEASE SURVEILLANCE
   8.8 HUMAN RESOURCE MANAGEMENT INFORMATION (HRMI)
   8.9 FINANCIAL MANAGEMENT INFORMATION (FMI)
   8.10 PHYSICAL ASSETS MANAGEMENT INFORMATION (PAMI)
   8.11 LOGISTICS MANAGEMENT INFORMATION (LMI)
   8.12 HEALTH SERVICE INFORMATION (HSI)
   8.13 DRUG INFORMATION NETWORK - DIN
   8.14 AYURVED REPORTING -DOA
   8.15 ACTIVITY REPORTS
9. ACCESS TO HEALTH INFORMATION (DISSEMINATION)……..…….21
   9.1 CLIENT HELD PERSONAL HEALTH PROFILE
   9.2 INFORMATION DISPLAY ON COMMUNITY MONITORING BOARDS
   9.3 PUBLICATION OF SEMI-ANNUAL BULLETIN
   9.4 PUBLICATION OF ANNUAL PERFORMANCE REPORT
   9.5 *GIS &* HEALTH ATLAS
   9.6 LOCAL AREA NETWORK
   9.7 DEVELOPMENT OF INTERNET BASED HEALTH INFORMATION PORTAL
   9.8 INFORMATION RESOURCES
   9.9 PROVISION OF NON-ROUTINE NATIONAL DATA FOR LOCAL USE

10. ENSURING QUALITY OF HEALTH INFORMATION..... ..23
10.1 TRAINING
10.1.1 HIS IN REGULAR PRESERVICE EDUCATION/TRAINING CURRICULUM
10.1.2 SHORT TERM TRAINING PROGRAMMES
10.1.3 PRACTICE BASED TEACHING
10.2 INTEGRATED SUPERVISION
10.3 INVOLVEMENT OF BENIFICIARIES/CIVIL SOCIETY
10.4 PERFORMANCE CRITERIA FOR BUDGET ALLOCATION
10.5 JOB DESCRIPTIONS
10.6 ACCREDITATION AND LICENSING TO PRIVATE SECTOR
10.7 DATA AUDITING/VERIFICATION
10.8 FEEDBACK
11. REQUIREMENTS FOR IMPLEMENTING THIS STRATEGY……..… .25
11.1 INFRASTRUCTURAL REQUIREMENTS
11.2 HUMAN RESOURCE REQUIREMENTS
11.3 INFORMATION GOVERNANCE REQUIREMENTS
11.4 FUNDING REQUIREMENTS
12. ACTION PLAN…….27
13. PURPOSED HEALTH SECTOR CORE INDICATOR……..36

1. Background

The national Health policy 1991 has been a bench mark in the history of Health care delivery system in the country. For operationalizing this policy several initiations were under taken. Among these include restructuring of health services introduction of SHP and PHCC in health care delivery system was SLTHP, designing and implementation of HMIS, LMIS, HuRDIS, FMIS and TIMS. Other departments under MoHP i.e. DDA, Auyrveda also streamlined there reporting system accordingly.

The development of Health Sector Strategy leading toward sector wide approach in 2002 is another milestone in Health Sector Development. Integrated and Comprehensive Management Information System was a key in move towards sector-wide approach.

1.1 Current Situation

There are already functioning different management Information systems including HMIS/LMIS/FMIS/ PMIS (HuRDIS)/DIN/DOA in MOHP. Each system is briefly described below:

Health Management Information System (HMIS) – DOHS

DOHS designed and implemented the HMIS in entire country since 1994 with continuous financial and technical support from UNFPA and some other EDPs. The current HMIS manages information on all health services mainly delivered through government's health facilities. However, some programmes still continue to obtain parallel reports directly from districts. Reporting coverage of district level health institution/facility is relatively better compared to reporting from periphery level health facilities as well as private, NGO, Zonal, Regional and National levels health facilities.

Though the upward reporting from community level to centre is on monthly basis, providing feedback from any level on monthly or quarterly basis is not regular. HMIS section in DOHS generates statistical tables in every three months and produce performance review report every year.

Human Resource Management Information System (HuRDISH) – MOHP

With technical and financial support from GTZ, the DOHS started this system from 1994. This system is designed to provide information on HR situation of each health facility including public, private and NGO sector in the country. This system has been focusing on computerized personnel record system. However, official records of employees of MOHP only is maintained the HuRDISH. Originally this system was housed in DOHS and has now been moved to Administration Division of MOHP with a new name of Human Resource Information Centre (HuRIC).

Logistics Management Information System (LMIS) – DOHS

With financial and technical support from USAID (formerly through JSI and currently through NFHP), the DOHS established LMIS at Logistics Management Division of DOHS. In this system, LMIS unit receives quarterly reports from all health facilities on supply, consumption and stock level of selected essential drugs and commodities. Information generated from this system is used for procurement and distribution planning.

Financial Management Information System (FMIS) – MOHP

Trimesterly (4 monthly) budget disbursement and expenditure records are maintained at district/Region and National Level in more than 300 Cost Centres in the country. Disbursement and expenditure reporting is channelized through Cost Centres to District Treasury and to the Account Comptroller General's Office (ACGO). Cost centre also send the financial reports to the respective Regional Directorate and Departments. Financial information is available by budget heading and Cost Centres. However, dissemination of financial information is limited. Recently established Health Economics and Financing Unit (HEFU) in MOHP has access to electronic data of 64 districts through ACGO.

Drug Information Network (DIN) - DDA

Though Department of Drug Administration (DDA) was established in 1979, drug information system started only from 1991 with the first publication of Drug Bulletin of Nepal. The DDA has also established Drug Information Network of Nepal as a strategic initiative to develop and disseminate information on proper use of drugs, possible adverse reaction, contraindication, toxicity, drug standards and efficacy, precautions and proper storage and handling, targeting to health care professionals in the public and private sector and consumers. Further, it provides information related to products, name of manufacturing company, retail and wholesalers, and professionals registered in Nepal. The DDA disseminates information at its website www.dinon.org.np as well as through a quarterly Drug Bulletin.

Ayurveda Reporting System (ARS) – DOA

Ayurveda Department has recently modified its record keeping and reporting forms. Ayurveda Service Information System (ASIS) has now 21 forms that are used to keep information on:

- Physical infrastructures,
- Patient/services
- Locally available herbs and their collection
- Inspection and quality control checklists

The DOA in Kathmandu receives monthly reports from all Ayurveda facilities in the country. Its disease statistics is disaggregated by facilities. Data is processed manually at al levels. A bulletin named "Ayurveda Sandesh is published every year.

Army and Police Hospitals

Army and Police are running a number of hospitals to serve mainly for the employees and their families as well as other people. These hospitals have their own recording and reporting system. Police hospitals service data is incorporated in HMIS, however, the information from army hospital are not yet fully linked with HMIS.

IOM and Other Teaching Hospitals

IOM and other teaching hospitals have there own health information system. However service data of these hospital are not fully reported to HMIS.

BPKIHS

Health service data from the BPKIHS is routinely incorporated in HMIS

Private Health Institutions

Private hospitals, nursing homes and clinics have there own information keeping and using system and some of them also report to HMIS. Generally, private clinics, except some poly clinics, do not keep any record of the service outputs. Therefore, no information on services provided by these clinics is available.

1.2 Problems and Constraints

Following problems and constraints have been identified:

- Significant gaps remain in information including, but not limited to health status, management support services, quality of health services for all public, private and NGO sectors.
- In some areas data are collected excessively but not analyzed, used and disseminated.
- Data is often not reliable and consistent.
- Data collection and analysis functions are undertaken by a number of public and private institutions without any coordination.
- Reporting is often delayed and incomplete
- Information/evidence based decision making is not yet a culture adopted in the health sector.
- There is a lack of skill among the health personnel to collect and use information appropriately.
- There is no functional coordination and proper linkage among different Information systems.
- There is shortage of personnel, equipment and financial resources that are essential for information collection, analysis, dissemination and use.
- The present system does not fully meet the information demand of different EDPs and stakeholders.

Second Long Term Health Plan (SLTHP) 1997-2017 has identified Policy and Priorities regarding health information system which are as follows:

- Develop capacity for collecting, analyzing, and using health information.
- Improve motivation for collecting, analyzing and using information appropriately.
- Integrate existing information systems into a comprehensive national health information system.
- Develop components of the information system to cover management support services, quality of health services etc for public, private and NGO sectors.
- Develop mechanism for making health sector information available to all potential users.
- Provide essential personnel, equipment, and financial resources necessary for the development and operation of the integrated information system.
- Institutionalize the integrated information system

1.3 Introduction to the Health Sector Information Strategy (HSIS)

Health information is an integral part of national health system. It is a basic tool of management and a key input for the improvement of health status in the country. The primary objective of the information system is to provide reliable, relevant, up-to-date, adequate, timely and reasonably complete information for health managers at community, facility, district and national levels. Health service organizations are more likely to achieve their goals if they have access to information on:

i) health needs,

ii) delivery of services,
iii) availability and use of resources, and,
iv) effectiveness of services

It is vital that the development of a comprehensive health sector information system is integrated into the Health Sector Strategy: an agenda for change (HSS). Information plays a central role in supporting strategic goals and in underpinning the principles of the Second Long Term Health Plan 1997-2017 (SLTHP) and HSS.

The purpose of this Strategy is to provide a framework and identified actions required to make sure that all those who need health information get the information they need and are in the position to use it competently, confidently and effectively. Access to good health information provides a tool for evidence-based decision making at all levels. It also provides the means for ensuring that best use is made of resources in delivering quality health service.

The policy context for the development of this strategy is clear. *National Health Policy* (NHP) *1991, Second Long Term Health Plan* (SLTHP*) 1997, Health Sector Strategy: An Agenda for Change (HSS) 2002, MTEF-III,* and *Nepal Health Sector Programme Implementation Plan* (NHSP-IP) *2003* all have recognized that a high-quality information infrastructure is a fundamental necessity for achieving the health sector's objectives. Each of the eight national output of *HSS (2002)* – prioritized EHCS, decentralized health management, development of NGO and private sector, sector management, financing and resource allocation, management of physical assets, human resource development, and integrated MIS and quality assurance– can only be planned, supported and evaluated through the effective use of information. It is for these reasons the HSS identifies information as one of eight outputs for change.

The establishment of a comprehensive health sector information system is one of the organizational reforms proposed by the HSS which will be carried out as part of the NHSP-IP 2004-2009.

Specifically, this strategy is required for:

- Providing practical solutions to the problems and issues that are observed in current information systems as identified in second long term heath plan
- Defining information requirements of health sector and identifying appropriate methods for collection of different information;
- Providing conceptual design of information system including institutional set-up;
- Determining course of actions for improving quality, accessibility and use of information;
- Providing an indicative resources and requirements for converting the current centralized fragmented information systems into an integrated, comprehensive, decentralized health sector information system, and
- Providing frame work for formulating national information policies for health.

2 The Vision, Scope, Principles and Objectives of the Strategy

This Strategy sets out the vision for optimizing the effective provision and use of information primarily to support the implementation of the NHSP-IP 2004-2009 in the short term and SLTHP 1997-2017 in the long term.

2.1 Definition of Health Information

The term health information is employed throughout this Strategy to refer to any information or knowledge used to make informed health-related decisions at the personal, professional, managerial or policy level.

2.2 The Vision of the Information Strategy

Highly valued health information environment will be created to enable/empower all the stakeholders for making information based decisions at various level to promote and maintain the health of individuals and of the population.

2.3 Scope of the Strategy

The scope of the strategy is to ensure production and distribution of all health related information required to encompass the needs of the stakeholders. In addition, it also guides providing information on health status and its determinants, health resources and physical assets, pharmaceutical and health care products . More specifically the strategy focuses on :

- Information for the public about health and the health services to empower them to make health-related decisions,
- Information to assist health professionals in clinical decision making and to provide quality care,
- Information to support health manager in planning, monitoring and evaluation of health services, including human resource management and resource allocation,
- Information to support policy makers in the development of policies regarding allocation and utilization of resources to promote, protect and restore the health of individuals, special needs groups and the general population,

2.4 Guiding principles of the Strategy

The development of this strategy is guided by the following principles:

- **Efficient and effective health information system**: The development and operation of information system will be driven by its usefulness to stakeholders. Data that are routinely collected as an intrinsic part of service delivery will be the primary source of information and be complemented by other sources as required.

- **Optimal health information access and use**: Available information will be fully exploited by all stakeholders as per need and shared in the support of the development and evaluation of health services, policies and high-quality care.

- **Quality assurance of health information**: Health information will be complete, accurate, reliable, consistent and timely. Data must meet the basic quality of information standards.

- **Integrated, comprehensive, and decentralized health sector information system**: Information needs of entire health sector will be addressed in holistic manner and will be made available from a single point at VDC level health facility, district, region, and central level. Information will be analyzed and used at the point of collection. The functions of collection, analysis, and dissemination of any kind of information will be fully coordinated and interlinked.

2.5 Objectives of the Strategy

The objective of this strategy is to develop well organised, comprehensive, standard and accessible national health sector information system. More specifically this strategy aims to:

- Support the implementation of NHP (1991), MDGs, ICPD, SLTHP 1997-2017, NPRS, HSS (2003) and NHSP-IP 2004-2009,

- Establish a legislative and information governance framework for optimizing its standard, reporting compliance and use,

- Adopt an integrated, comprehensive national approach to the development and expansion of information sources and systems.

- Establish processes and structures that ensure the fuller use of health information in policy making, planning and implementation processes, care provision and for underpinning quality assurance and accountability arrangements in the health system,

- Ensure improved access to quality health information for all stakeholders by exploiting modern information technology.

- Establish health information standards that ensure the quality and comparability of health information.

3. Information Management (Production and Distribution)

3.1 Information Generation

Routine health service data collection, processing and utilization are among the main responsibilities of all health personnel. Likewise, account and administrative personnel are responsible for collection, processing and utilization of administrative and financial data as prescribed. Data collection is done while delivering services or undertaking management functions. Compilation, processing and dissemination activities are carried out at all levels in regular intervals as specified in this strategy.

3.2 Information Processing

There will be ‘District Centred System' in each district with establishment of District Health Information Bank (DHIB) in which information from all stakeholders working within the district territory will be received, analyzed and disseminated in appropriate format.

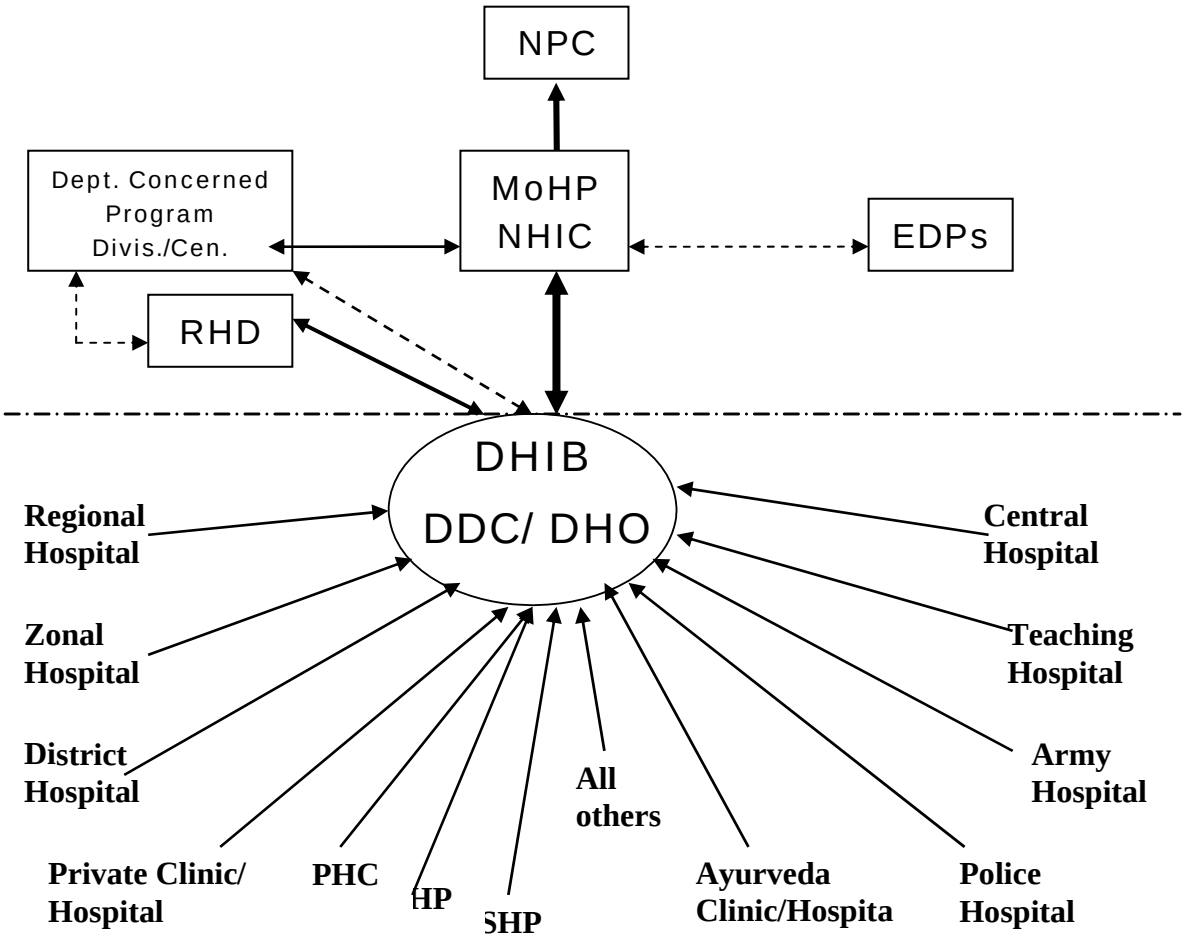
Thus, the District Health Information Bank (DHIB) will have complete information from the health institute within the district. The DHIB will receive health and management data from all health facilities located in the district, regardless of their levels. But, to get complete picture of the district, information from higher-level institutes located in the district will be presented after disaggregation.

VDC/ Municipalities, Health Facility and National Health Information Centre will also process and disseminate the data in the respective level.

3.3 District Health Information Bank:

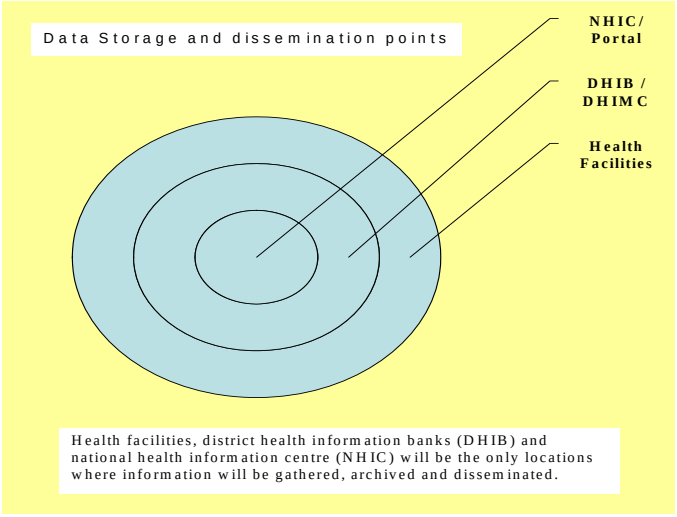
District Health Information Bank will function as a single repository. Data will be analyzed and fed back to the facilities. Different programme managers at MOHP headquarters including departments and RHDs will receive reports in electronic form, either by email or in diskette as appropriate. The diagram below can be helpful to understand this concept.

Figure-1 District Health Information Bank : A single Repository



In this system no separate information unit will be required in DOHS and DOA. However, as the DDA does not have offices in districts, it will continue with its current 'Drug Information System' at its headquarters as an interlinked component of National HIS. All the information required from district and below for functioning of DDA will be compiled in DHIB and reported to DDA and NHIC. Information from sub national and national levels will be compiled in DDA headquarters and reported to NHIC.

Figure-2 Data Storage & Dissemination Points

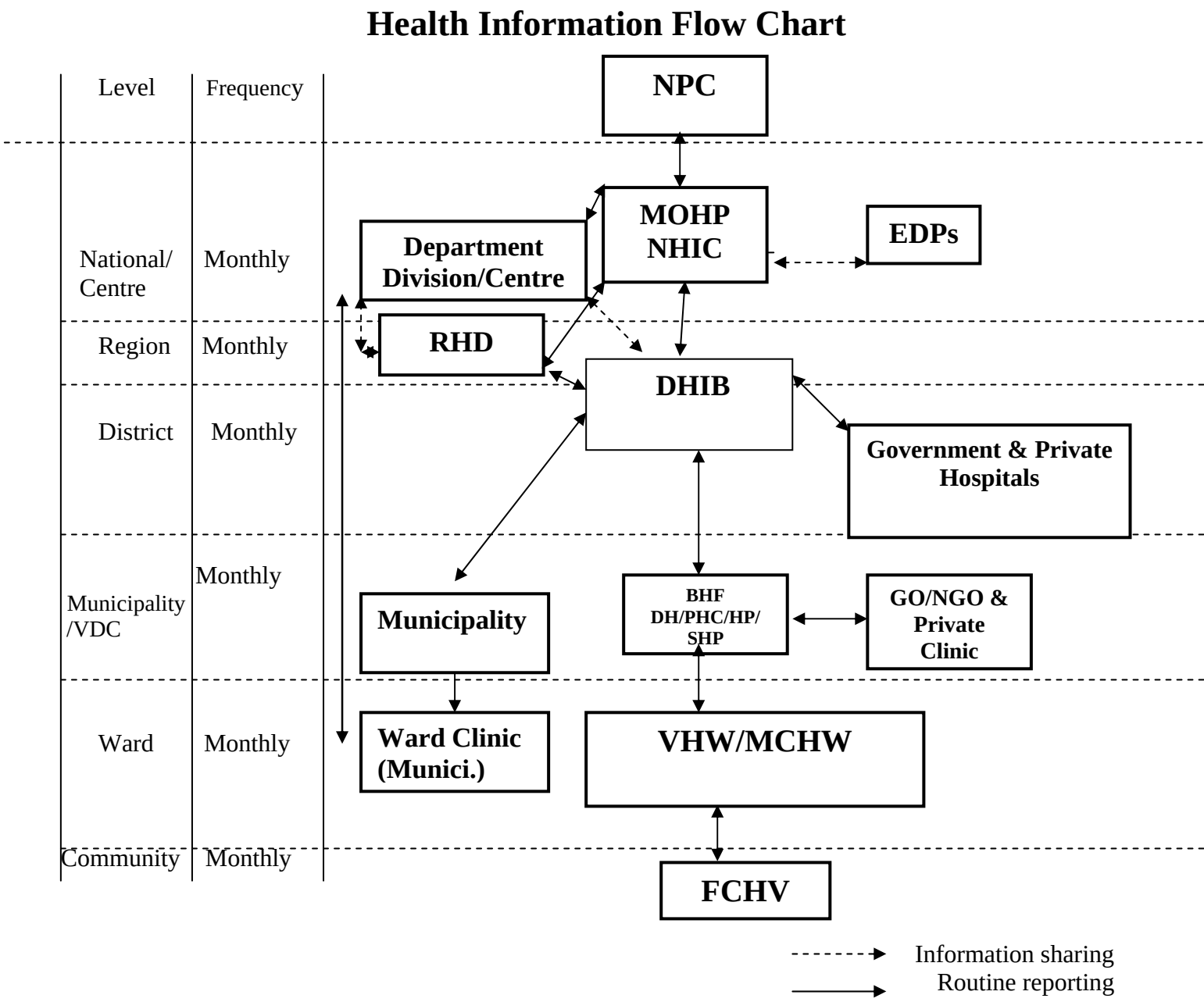


3.4 Information flow and frequency

Reporting will be always to and fro, both on vertical and horizontal directions. Utilizing the data received from the Health facilities, DHIB will generate statistical tables and analytical reports. DHIB will also provide feedback to the reporting facilities for their use in planning and management of

health services. Similarly, statistical tables will be submitted to the MOHP headquarters for their information and use in policy and strategic decision making.

Figure -3 Health service Information, Flow & Frequency



As depicted in information flow chart (figure - 3.) report generated by Female Community Health Volunteers (FCHVs) will be collected and complied by VHW/MCHW once every month . However in Municipality areas where VHWs/ MCHWs are not available FCHVs themselves will submit their report to respective health facility.

The VHWs/MCHWs/ANMs will submit their performance report on field activity during reporting day of each month along with report collected from FCHV. The SHPs, HPs, PHCs (also termed as basic health) facilities BHF) will collect information from all facilities in the VDC except from private hospital. Municipality ward clinic will first report to municipality which in turn report to

District Health information Bank (DHIB). Health functionaries operating within VDC areas will report to BHF each month. BHF will compile these report and their own service report and will forward to District Health Information Bank latest by 7th of each month. To maintain timeliness of reporting system, courier system will be established. The District Health Information Bank, the main data repository at district level , in addition to getting reports from BHF will get report from all other health functionaries operating within the district territory as illustrated in Data Bank Operation diagram. (Figure-1)

HIS is the main apex system for health sector information. In the beginning this will integrate sub-sector information (HSI, LMIS, FMIS, HRMI, PMI, DIN and DOA) at the central level. After thorough consultation with concerned programmes appropriate tools will be developed to integrate all sub-sectors right from Basic Health Facility level.

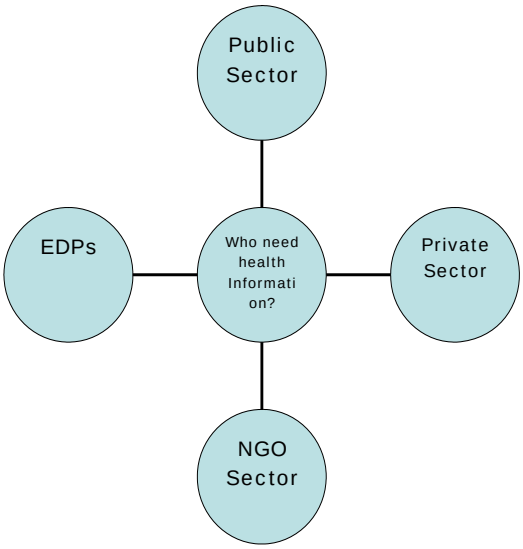
Information flow time line mentioned in figure above refers to Health Service Information (HIS) only. Reporting frequency with other sub sector information will remain as usual (e.g. LMIS trimesterly) until the system get fully integrated.

3.5 Information Requirements of Health Sector Stakeholders

Although there are many common requirements between the stakeholders groups, information requirements are different for different stakeholders at different levels of health services management network.

A comprehensive health sector information system will have to encompass all -government, private and non government- sectors. Within the government sector, besides the MOHP, Ministry of Defence (MOD) and Ministry of Home Affairs (MOHA) are also engaged in delivery of health services primarily to its employee and occasionally to general public. Within the MOHP structure, there are three departments - Health Services, Ayurveda and Drug Administration.

Figure -4 , Health sector stakeholder requiring health information



There are projects run by external development partners (EDPs). A number of medical colleges now have their own teaching hospitals. I/NGOs are running their own clinics. Ministry of General Administration (MOGA) plan to establish and new hospital for it's employee in near future.

Significant portion of secondary and tertiary level of health care especially to urban population is provided by private sector. Public private partnership (PPP) cannot be fostered without having adequate information of private sector.

The adjacent diagram shows the network structure of different sub-sectors within the health sector. All these sub-sectors are contributors and users of health sector information system.

3.6 Core Indicators

The current and possible future needs of health sector information are already identified by MDG s, Poverty Monitoring and Analysis System (PMAS) and NHSP-IP. Additionally, HMIS section of DOHS using more than 150 services indicators from different programmes within DOHS. Therefore, streamlining the MDG, PMAS and NHSP-IP, SLTHP indictors a set of core health sector indicators will be incorporated in HIS with HMIS. Monitoring requirements of NPRS using the PMAS framework and sectoral monitoring using NHSP-IP 2004-2009 will also be fully addressed.

3.7 Extent of Disaggregations Required

Narrowing inequalities in health and demonstrating improvements in health in line with national targets are generally not possible without having information on health status, health determinants, service utilization and the effectiveness of services on influencing the health of populations at sub-national and local levels. The link between poverty and poor health status is well established. There are attributes which on their own or through their association with poverty or social exclusion increase the risk of poor health. With consideration of above facts, the basic disaggregation requirements are identified as Gender, Poverty, Social, PPP, Age, Ecology and Geographical area and administrative hierarchy. Further disaggregation will be made as per programs need.

4. Institutional Arrangement for Operationalization

Development and operation of comprehensive health sector information system requires well established policy planning, coordination, facilitation and control mechanism. Complexity of managing information system for the entire sector and importance of comprehensive information in strategic planning and policy making demand a separate highly competent and fully dedicated body in the MOHP. Currently there is no separate institutional provision at MOHP level for management of health sector information system, therefore following institutional arrangement will be made.

4.1 National Health Information Policy Committee (NHIPC)

A Committee on National Health Information Policy (NHIPC) will be formed to oversee the development of information policy for health sector. Composition of the committee will be as follows:

- Health Secretary - chair
- Chief M&E division, MOHP- member
- Chief Population Division from MOHP - member
- Director General, DoHS, DDA and DOA - member
- Representative from MOLD, Home, Defence (joint secretary level)- member
- Representative from NPC (health & social service, joint secretary level)– member
- Director General, CBS – member
- Chairperson, DDC association - member
- Chairperson, APHIN - member
- Member- Secretary, NHRC- member
- Director: National Health Information Centre – member secretary

NHIPC can invite other guest participant in the meeting and can also form sub-committee or working group for specific purpose.

Role and Responsibilities of NHIPC

The Committee will approve the policy pertaining to:

- Capacity building for management and use of information,
- Minimum datasets for health sector,
- Measurement unit and definition of data elements,
- Data standards,
- Data access and data release protocol,
- Main source for the collection of data on each element,
- Coordination of health data collection activities carried out by NPC, CBS, MOHP, EDPs, NGOs, and all others to ensure data standard, data uniformity, to avoid duplication etc.
- Inclusion of health information related issues in Acts.

Composition of NHIIPC can be revised as decided by committee. The committee will meet generally once a year and at other times as and when required.

4.2 A National Health Information Centre (NHIC)

A centre for management of comprehensive health sector information will be established in MOHP. The NHIC will have a small group of highly professional people capable for providing managerial and technical leadership for development and sustenance of health sector information system in the country. The Current HMIS section will be upgraded so that it can respond the need effectively and efficiently.

Role and responsibility of the National Health Information Centre (NHIC)

The NHIC will have the following functional responsibilities:

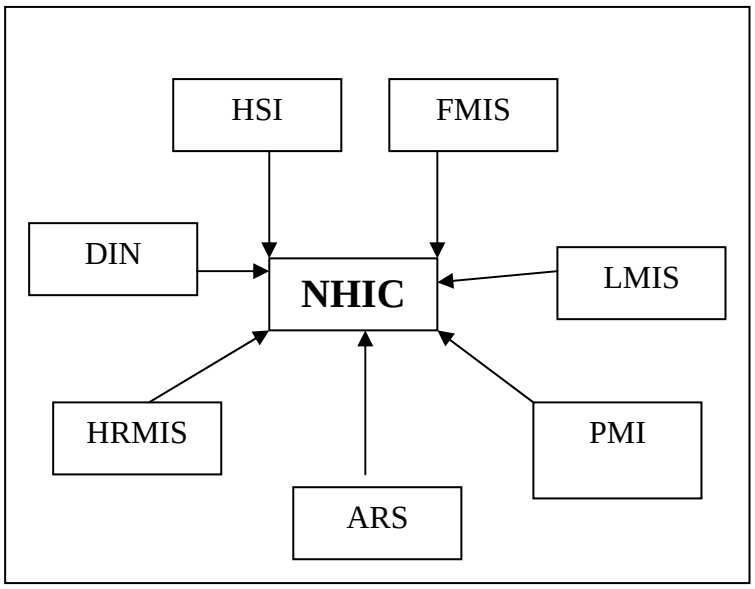
- Act as secretariat for NHIPC,
- Implement the decisions made by NHIPC,
- Maintaining a health information bank and health information resource centre and obtaining information from all sources.
- Supply information management tools,
- Generate quarterly monitoring reports using information from both the primary and secondary sources and disseminate them to target audience through all possible channels,
- Compile information from all available sources for bi-annual joint review,
- Prepare annual review report on health sector indicators ,
- Generate report on request for government's departments and EDPs,
- Ensure timely, printing and supply of approved routine information collection tools for all districts and national and sub-national hospitals,
- Plan and conduct practice-based-training for all health personnel on information collection, processing, dissemination and use,
- Provide the lead on information development, in line with this Strategy
- Specify information standards, definitions and data dictionaries to be adopted
- Develop and agree the overall Health Service Data Model and minimum datasets
- Carry out information audits

The NHIC will have a central role in the implementation of this Strategy in all its dimensions including in-depth monitoring and evaluation of the implementation process. This will involve ensuring that a national approach is taken to the collection, processing, analysis, availability, use and sharing of health information within a legislative and governance framework. This role will be enabled and empowered by means of a three yearly information action plan prepared by the NHIC in line with MTEF cycle. This will be based upon the Action Plan set out in the light of strategic priorities within the health system. The NHIC will establish processes to support a range of information functions including:

- Providing leadership and guidance in the implementation, monitoring and evaluation of the Strategy at the national, district and health facilities levels,
- Supporting and enabling the implementation of the information governance framework,
- Undertaking and providing for the analysis of information for policy and planning requirements,
- Publication of an annual report,
- Maintaining a health services data model,
- Developing a national health information database inventory,
- Identifying the priority areas for improved health information and investment,
- Demonstrating efficiency in information-related investments,
- Providing representation for the stakeholder groups in the area of health information,
- Advising on updates of the Information and IT action plans as appropriate.

In order to fulfil its role and responsibility the NHIC will need to have access to all the necessary information and data available within the health area, including information from private healthcare sources where essential to enable national policy development and integrated service delivery with the public sector. In this direction information from all other information systems will be made available electronic report on prescribed format to NHIC on routine basis.

Figure- 5, Sub-sector information sources of NHIC



Where necessary the NHIC will identify database developments to deal with gaps in the information it requires to its role. It will collect and hold data, as appropriate, where this is identified to be the best way of addressing information deficits. To better enable use of information in support of evidence based approach the NHIC will work with different divisions and departments within and outside the MOHP to ascertain and address the training needs of staff in the health services. The primary objectives will be to:

- Develop the system-wide capacity to use information to the maximum for health gain and value for money in service delivery, management, planning, policy making and evaluation
- Enhance information governance skills and knowledge at all levels throughout the system. To inform MOHP and its Departments, the NHIC will carry out audits and evaluations of information use, availability and governance arrangements in the health system generally and in specific areas as required.

4.3 Regional Level

Region will receive information on prescribed format in monthly basis from DHIB will compile interpret and decide action to be taken for monitoring, supervision and evaluation purpose . RHD will support to the district for operationalization of HIS and coordinate with NHIC and DHIB.

4.4 District Health Information Management Committee (DHIMC)

A Committee on District Health Information Management (DHIMC) will be formed as follows:

- DDC chairperson (or member nominated by chair person) – chair
- District Health & Social Committee, Coordinator -member
- LDO or Information/Planning officer (as nominated by LDO) - member
- DHO/Medical Superintendent – member
- Representative from municipality (if any) – member
- Statistical Officer from BSO – member
- One representative from Pharmacist Association - member
- Representative fromVDC Association - member
- One nominee from APHIN – member
- Chair NGO federation - member
- Chief Ayurveda Aushadhalaya - member
- Directors of Central Hospital, Regional, Zonal hospitals, (if any in the district) - member
- PHO – member secretary

As per need, committee can invite additional members /guest in the meeting.The committee will meet trimesterly and at other times as meet when necessary.

Role and Responsibilities of DHIMC

The Committee will basically have following roles and responsibility:

- Acts as a governing body for DHIB.
- Capacity building of human resources for management and use of information,
- Coordination of health data collection activities carried out by government health institutes, I/ NGO's and all other to ensure data standard , uniformity and avoidance of duplication,
- Monitoring of information collection, reporting and dissemination activities,
- Certify the authenticity of district level health figures,

One statistical & one computer assistant are minimum manpower required for DHIB. Current statistical unit in DHO will be technologically upgraded. Additional human resource, if needed, has to be managed locally**.**

4.5 District Health Information Bank (DHIB)

DHIB will be established in DDC information Centre in devolve districts or as decided by DDC and the statistical unit in DHO/DPHO function as a DHIB in remaining districts.

5 Health Information Governance and Legislation

The primary objective of the health service is to ensure that the highest levels of health and social well-being are achieved for the whole population. This strategy aims at exploiting the information to the fullest in pursuit of this objective. In doing so, it recognizes that there is a need for a set of rules to ensure availability of highest quality information and their full and proper use in planning and management of health services.

Health status of the people in the country improved
↑
Coverage and quality of health services increased
↑
Health services are effective and efficient
↑
Management and policy decisions are rationale
↑
Information is correctly interpreted and used
↑
Required information is available and accessible

Information governance refers to a strategic framework that brings coherence to the collection, analysis, dissemination and use of information. It provides the stakeholders with a practical basis for appropriate use of information. Issues such as reporting of notifiable disease by practicing health professionals, complying with reporting requirements by public and private health institutions/facilities, quality assurance of information management (collection, analysis and dissemination) are to be addressed by information governance strategic framework. The issue related to safe retaining of an individual record will also be dealt with in governance framework.

There is no framework for governance of health information. Nepal Statistics Act 2015 BS provides the CBS with a mandate of information governance in the kingdom of Nepal. Though the CBS is formed under this act, all other articles of the act are seemingly dormant. A statutory framework will lead to individual health professionals and health facilities can be reluctant to fully participate in the processes of data collection, safe keeping, dissemination and use.

MOHP will draft and process a 'Health Information Bill' encompassing the issues related to health data standard, data collection, record retention, data archival, data protection, data backup requirements, data quality, data release, and reporting compliance of general health statistics as well as notifiable diseases. Provision of a 'health information policy committee' will be made to foster a participatory approach in managing and using information in the health sector. The Bill will also designate an authority to modify the list of notifiable diseases.

6. Health Information Standards and Quality

Information standards are necessary to allow for the sharing of health data and pooling of data from a number of sources to reveal the bigger picture and allowing the comparison across the health sector.

The adoption of standards is an essential requirement for improving the quality and usefulness of information.

6.1 Data Standards

A key requirement for health information systems is to have consistent coding and classification systems for the data items, ranging from the most objective and quantitative to the more subjective and descriptive. Standards are essential for clinical terminology since they must mean exactly the same thing in any health facilities. As a first step to implementing this strategy, minimum data sets will be decided and defined.

6.2 Technical Standards

Technical standards are required to connect computers and information systems so that they can exchange data in a transparent way. A data release protocol will be developed to this effect. Efforts will be made to provide free access to the information on all indicators. Nonetheless, the system may require password to access any sensitive information.

6.3 Quality Standards

The quality of health information is closely related to the issue of data standards described above. Data quality includes coverage in terms of the capture of all relevant records, comprehensiveness with respect to the information collected and accuracy of coding and data entry. The concept of quality can be extended to include timeliness of data and well-specified procedures for its dissemination and use.

The objective for health information system is to create a reinforcing cycle where improved data quality results in benefits to end-users and positive feedback to data providers. Regular audits of data to assess quality with respect to coverage, comprehensiveness, consistency, accuracy and adequacy of validation procedures and the timeliness, use and dissemination of information will be ensured for quality assurance in information system.

7 Use of Technology in Managing Health Information

Information technology (IT) is a tool to facilitate the collection, analysis, dissemination and use of health information. It includes hardware and software for the support of health information. IT offers many ways to improve the quality of care, help staff to make better use of their time and expertise and promote greater efficiency.

In DDA, IT provision is significant and provides sophisticated network support while in DOHS system, use of IT is limited. DOA still handles huge data manually. DHO and different programme sections in central offices do have computers but due to lack of software and appropriate training their use is confined to word processing.

There is a need for a national, cohesive and integrated approach to the implementation of modern IT solutions in response to priority health information requirements. Developments of IT in health sector will take account of National IT framework developed by Ministry of Science and Technology and RONAST and other relevant organizations as appropriate.

Management of information (storing, analyzing, disseminating) at district, region and national levels will be computerized in a phased manner.

<u>District Health Offices</u>

Each district will have electronically maintained comprehensive database in which information from all sources will be compiled, stored, processed and reported to all stakeholders.

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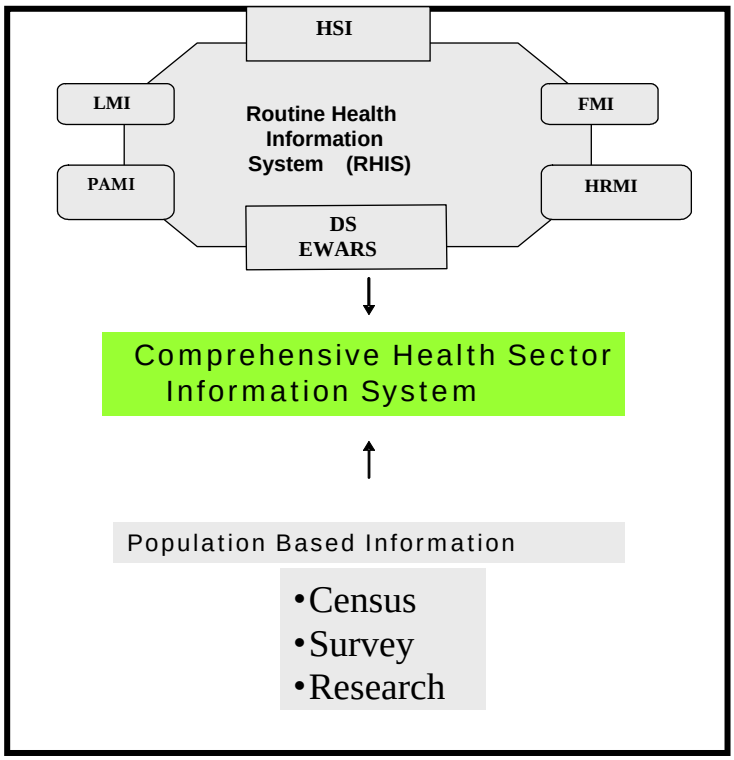
Figure- 6, Comprehensive Health Sector Information System



Each district health office will be provided a set of computer, printer, fax, scanner, serge protector, modem and all necessary equipment to collect, analyze, print, and electronically transmit information to RHD and MOHP.

Sentinel Surveillance Sites

Each sentinel site will be provided with computer equipment and accessories to perform in-depth analysis of sentinel data.

Programme Managers at MOHP and Departments

All programme managers will have a computer and a modem to download and analyze data of their programmatic interest. Such data will be available from either of the following media:

- LAN in MOHP and DoHS Complex
- Website
- Diskette (from National Health Information Center)

8 Sources of Health Sector Information

Health Information System will obtain required information from several direct sources as well as other systems within and outside the health sector, which is diagrammatically presented in the figure below. Different information system will be strengthened to link with HIS.

8.1 Census

The population data is the foundation of health information system. Up to date population figures must be available for ward, VDC and district in order to plan health services and measure changes. Health system in Nepal will continue to obtain population data from the national census. Target population for each year will be projected for each level using the inter-census growth rate for that particular level.

8.2 Vital Registration

The vital registration is the responsibility of MOLD which is done through VDC and municipality. The current vital registration in the country needs to be improved. It is mandatory by law but registration rate is still low. VHW and MCHWs will support for vital registration in VDC & Municipalities. Vital registration data of birth, death, marriage and migration will also be utilized by HIS.

8.3 Survey

Demographic and Health Survey and Nepal Living Standard Survey carried out periodically (once in every 5 years) will be source of population data on health outcome and impacts indicators. Such survey will be generally commissioned by NPC for monitoring of NPRS goals. The information on the following impact indicators will be generated and utilised from such surveys.

- Life expectancy
- Total fertility rate
- Crude death rate
- Maternal mortality ratio
- Infant mortality rate
- Under five mortality rate
- Neonatal mortality rate
- CPR

Other health information will also be included in the survey to verify the quality of information generated from routine sources and additional information that are not routinely available.

8.4 Rapid Assessment

Surveys are very expensive methods of data collection. Therefore, several ***rapid assessments*** will be carried out as required in order to furnish quantitative and qualitative data on concurrent health issues

8.5 Sentinel Reporting

A representative sample of selected hospitals (based on ecological regions) will be used to generate more comprehensive information on specifically disease surveillance in order to obtain trends in common conditions based on ICD-10. Effort should be made to make sure the sites to be representative of development and ecological regions and uniform to response the needs of all programmes including HIV/AIDS. The criteria for selection would be standard physical infrastructures, standard equipment, full staff according to norms, adequate patient flow. The sites selected meeting these criteria will have to further equip with computer, personnel trained in computerized medical record keeping system. Morbidity and mortality data generated from sentinel sites will be generalized for the respective ecological and development region. Remaining hospitals and other health facilities in the entire country will continue to collect morbidity and mortality data by broad age band and sex. Quality of data gathered from well equipped sentinel sites will obviously high and which can provide strong basis for setting health sector's priorities.

8.6 Research

Health research plays a crucial role in the ongoing development and provision of quality healthcare that best meets the needs of individuals and the population. Nepal Health Research Council (an apex body with mandate to promote scientific study and quality research on health problems in Nepal), in collaboration with NHIPC/NHIC and different health service programmes, will elaborate the area of essential health research. This strategy supports collection and management of information for health research purposes as well.

8.7 Disease Surveillance

Communicable diseases continue to be a major cause of morbidity and mortality in Nepal. To curve it down, occurrence of disease of public importance will be timely analyzed, investigated and fed to the management at facility, district and national levels for their appropriate response on timely manner. Currently, three vaccine preventable and three vector borne diseases are under early warning and response system (EWARS). The diseases on eradication/elimination target and the diseases of highly epidemic nature but preventable will be included in the list of notifiable diseases. The following seven diseases will be included in surveillances.

1. Acute Flaccid Paralysis
2. Measles
3. Neo-natal tetanus
4. Malaria (falciparum)
5. Kalazar
6. Japanese Encephalitis
7. Cholera
8. Unusual occurrence of a disease

The 'Health Information Act' will make the notification of above diseases mandatory for all practitioners and provide authority to health secretary to modify the list as and when needed. Such surveillance will be coordinated by Epidemiology Division of DOHS.

8.8 Human Resource Management Information (HRMI)

HR information is required for broader human resource planning and management purpose. In the context of decentralized management of health services there is a need for a comprehensive human resource database maintained in each district for each government, private and non-government facility within the district. With this arrangement HR data that are updated in the districts will be electronically fed to the MOHP. This component of information system will generate the following information for each facility, district and the entire health system:

- Health Personnel by professional cadre, by facility, district and for entire nation
- Establishment vs. filled positions
- Population providers ratio by district and for entire country
- Personnel attrition rate by professional cadre and by cause
- Human resource production ratio by professional cadre
- Health personnel trained in different technical and management support programmes
- Human resource intake ratio by professional cadre
- Estimated attrition rate for next five years by cause of attrition.

Note: HR information will be disaggregated by sex as and when appropriate. Other information will be collected as required by HRMI.

8.9 Financial Management Information (FMI)

The government's finance management procedure requires routine reporting on disbursement and expenditures. The system should feature data sets to measure progress towards equity and efficiency in the delivery of services. The financial management component of the information system will generate information on the following indicators:

- Annual budget by Cost Centres and by programme/sub-programme
- Cumulative budget disbursement by district and sub-programme
- Population budget ratio by district
- Cumulative expenditure by district and sub-programme
- Expenditure by cost centre by category of expenditure (salaries, drugs, medical equipment, building, vehicle etc.)
- Percentage of contribution of cost sharing in total expenditure by district and central hospital

8.10 Physical Assets Management Information (PAMI)

A record of government health facilities and equipment (medical and non-medical) will be established for each health facility in the country. The record will contain current status, remaining life span and rehabilitation needs. Each health facility under public sector will establish and maintain such records. The DHO will maintain electronic record by facility for entire districts and the Ministry will combine electronically established records from all districts and analyze current situation and plan for future. Such record will be routinely updated when there is change due to construction, supply and rehabilitation. However, a thorough comprehensive updating will take place at least in every five years. This component of the information system will generate information on the following indicators:

- Health facility building requirements, current situation and gaps by facility, district and entire country
- Forecast of next five years construction and rehabilitation requirements of the health facility buildings
- Electricity, communication, water supply situation by facility by district

- Equipment requirements vs. availability by facility
- Capital investment by district for the current fiscal year
- Comparative capital investment plan for primary, secondary and tertiary care
- Plan vs. completion of buildings and equipment

8.11 Logistics Management Information (LMI)

Each GO health facility and District/Public health office collects, compiles and uses information on:

- Estimate annual requirements of drugs, vaccines, contraceptives, essential medical supplies by health facility, district and for the entire country
- Supply drugs, vaccines, contraceptives, essential medical supplies by health facility, district and for the entire country
- Estimate per capita expenditure on drugs, vaccines, contraceptives, essential medical supplies by health facility, district and for the entire country
- Maintain quality of drugs and commodities.
- LMIS will be linked to DHIB and HIS.

8.12 Health Service Information (HSI)

Each health facility whether it is government or private requires record keeping of services it provides. Each facility will compile service data and analyze quality and coverage of services.

The minimum record keeping requirements will be inclusive of

- identification of the person served (Given and family name, age, sex, cast, address-ward, VDC, district),
- provisional diagnosis,
- services given, and,
- outcome
- continuity of treatment ,

8.13 Drug Information Network (DIN)

Though Department of Drug Administration (DDA) was established in 1979, drug information system started only from 1991 with the first publication of Drug Bulletin of Nepal. The DDA has also established Drug Information Network of Nepal as a strategic initiative to develop and disseminate information on proper use of drugs, possible adverse reaction, contraindication, toxicity, drug standards and efficacy, precautions and proper storage and handling targeting to health care professionals in the public and private sector and consumers. Further, it provides information related to products, name of manufacturing company, retail and wholesalers, and professionals registered in Nepal. The DDA disseminates information at its website www.dinon.org.np as well as through a quarterly Drug Bulletin.

8.14 Ayurved Reporting (AR)

Ayurveda Department has its own reporting system focusing on Ayurveda Service Information System (ASIS) on:

- Physical infrastructures,
- Patient/services
- Locally available herbs and their collection
- Inspection and quality control checklists

The DOA receives monthly reports from all Ayurveda facilities in the country. Its disease statistics is disaggregated by facilities. Data is processed manually at al levels. A bulletin named “Ayurveda Sandesh is published every year.

8.15 Activity Reports

Besides information from the above mentioned sources, reporting on implementation of different activities will be required for comprehensive monitoring of NHSP-IP.

9. Access to Health Information (Dissemination)

Emphasis is on the need for significant improvements in the accessibility and usefulness of health information for all stakeholder groups. As outlined in earlier chapters many sources of health information exist, many having been developed in recent years. Application of information in evidence-based decision making is the best means of ensuring that its quality is monitored, maintained and improved. Various ways of information dissemination are prescripted in this strategy

9.1 Client Held Personal Health Profile

A client held personal health profile system for male and female (Personal Health Booklet hereafter referred as booklet) will be introduced in all public and private health facilities. The booklet will contain records of updated client history, assessment of problems and types of care given. The booklet will be issued at birth or on the first contact of an individual with a health service provider. This booklet will be made available to health facilities in reasonable and affordable price to ensure sustainability and its retention by the client.

This booklet will replace contact cards, prescription booklet/slips that are being used in government and private sector. Its use by all providers will be made mandatory through 'Health Information Act'.

Use of booklet containing complete history of the client will help make correct diagnosis and provide right care. As the booklet will be proof for the diagnosis and care given to the client, the provider will be more careful and obviously the quality of care will be improved. The booklet will serve as a self-education tool for a literate client who will be able to monitor changes in the health status of family members.

This personal health profile system will be carefully implemented after piloting in selected districts.

9.2 Information Display on Community Monitoring Boards

Trends on health status of people and utilization of important services will be displayed at health facilities using community monitoring boards. Community monitoring board will be substituted and complemented by paper based wall chart or flip chart as appropriate. These boards and charts will be updated as the updates are available.

9.3 Publication of Semi-annual Bulletin

Each district and MOHP together with representatives of all stakeholders group will conduct semi-annual self-review meeting and produce a semi-annual bulletin on the performance of the first half-year of the current fiscal year. Such bulletin will be brief and focus on concurrent issues.

9.4 Publication of Annual Performance Report

Each district and MOHP will conduct annual self-reviews and publish performance review report. A committee representing all stakeholder groups will be provisioned for district as well as for national levels for preparation and review. Such annual report will contain analytic information on all health sector indicators.

9.5 GIS and Health Atlas

Most baseline data on the spatial dimensions of health are currently available for most districts. NPC, MOLD and Department of Survey have VDC boundaries in digital form. Health Atlas with mainly the following information will be published for each district on every fifth year.

- Health facilities (public and private including any regular clinics)
- Key services including EOC, BOC, VCT, ARV, CS etc.
- Distribution of diseases on eradication target
- Endemic areas

Spatial data will be updated annually and attribute data will be updated quarterly and at other times as and when available. Respective DHO will be responsible for updating the geographic information. Required software can be available from DDC.
A GPS will be provided to each DHO for collection of geo-referenced data on new health facilities and disease outbreaks.

9.6 Local Area Network

DDA has LAN for sharing information within its Department. DOHS also has LAN but needs substantial re-structuring. DOA has not yet entered even to a computerized data processing system. As the DOHS and DOA are located within a short sphere and the cabling for connectivity is already half-way all the sections in Teku complex of MOHP/DOHS/DOA will be connected through LAN.

9.7 Development of Internet Based Health Information Portal

Modern technology, and in particular internet-based technology, provides a practical solution to the delivery and use of health information for those who require it, when they require it and in appropriate formats. An internet-based Health Information Portal will be established to provide a range of information services for the public, for health professionals, for researchers and for policy makers.

A key objective of the Health Information Portal will be to facilitate access to statistical data and databases to serve the needs of policy analysts, service planners, researchers, epidemiologists and others with health data requirements. General access to aggregate statistics will be available online, and restricted/authenticated access to disaggregated data for more in-depth research will be authorized in line with information governance requirements. The new and extended access offered through the Health Information Portal will take the form of a National Health Atlas. This will be developed on a phased basis and, over time, is envisaged to link with regional health atlases to allow more detailed drill-down into district and VDC as appropriate. Development will take place in partnership with the Central Bureau of Statistics, NPC, MOLD, Department of survey, Ministry of Science and Technology (MOST), RONAST and other relevant stakeholders.

In addition to providing for national and sub-national access to health data and analysis tools, the Portal will also be linked with other national and international health information systems. National links will include the Nepal-Info hosted by Central Bureau of Statistics, other Government Departments, relevant agencies, academic and research institutes. Since many factors, including environmental and social factors, are relevant to health, the range of cross-sectoral links can be expected to be extensive. International links will include WHO systems among others.

9.8 Information Resources

A concept of information corner/library will be implemented throughout health sector. Each health facility will designate a location (corner) for safe keeping and dissemination of collection of information resources. The resources that are directly useful in managing different programmes and

services like clinical protocols, case definitions, guidelines and manuals, semi and annual reports will be made available at all facilities.

9.9 Provision of Non-routine National Data for Local Use

NHIC will provide to each DHIB the population and health related data that are collected through national census, surveys and researches. Such data will be disaggregated to a maximum possible extent.

10 Ensuring Quality of Health Information

The NHIPC will have the responsibility of setting standards, controlling quality and overseeing the use of information. Periodic assessment will be carried out to measure the extent of information use and to devise measures for improvement. The main strategy regarding improvement of data quality and use will be as follows:

10.1 Training

To update the knowledge and skills of health workers appropriate training packages will be designed and training programmes will be conducted at different levels.

10.1.1 HIS in Regular Pre-service Education/Training Curriculum

HIS will be included in curriculum for all pre-service education and training programmes in health. Follow-up will be made to ensure the allocation of adequate credit hours for information, monitoring and evaluation component.

10.1.2 Short term Training Programmes

Special training programme packages will be developed and training programmes will be conducted for GO/NGO/Private sector health workers/professionals.

10.1.3 Practice Based Teaching

Experience has shown that theoretical teaching has very limited impact on information management and use. Therefore, besides the integrated supervision sessions, special sessions will be organized as and when needed at district and facility level for practice- based training where people will go through the process of recording, analyzing and using information in the real setting.

10.2 Integrated Supervision

Integrated supervision will be the one of the strategy for the improvement of quality of data and use. Supervision will be carried out using an integrated checklist to ensure adequate coverage of all aspects. Duly filled checklists will be submitted to the responsible higher authority. The supervision will also serve the purpose of information audit.

10.3 Involvement of Beneficiaries /Civil Society

Beneficiaries and Civil society organizations will be involved at all levels in monitoring the coverage of health services and health status. VDC/Municipalities, HF committee, district assembly, and the Parliamentary Committee on Health will be served with semi-annual bulletin and annual reports generated at respective levels.

10.4 Performance Criteria for Budget Allocation

Budget is allocated using certain formulae. Size of the population to be served and magnitude of health problems to be resolved and HDI will certainly be major criteria for allocation of resources. Performance will also be used as a criterion for annual budget allocation to the district and different level of hospitals.

10.5 Job Descriptions

Job descriptions of all health and support personnel working under government sector will be revised in the light of management of health information (collection, analysis, and reporting) and use of information in planning and management of health services (refer to 6.1). Follow-up will be made, during integrated supervision sessions, to ensure proper understanding and use of job descriptions.

10.6 Accreditation and Licensing to Private Sector

Recording and reporting of services it generates will be mandatory for all NGOs, private clinics and hospitals. All health workers practicing medicine will require reporting of notifiable diseases. Thus, the health sector information will be more accurate and usable. Each public and private health facility will require to be accredited for renewal of license. Reporting compliance will be one of the basic criteria for a health service institution to be accredited.

10.7 Data Auditing/Verification

Data of each health facility will be annually audited to assess quality with respect to coverage, comprehensiveness, accuracy and adequacy of validation procedures and the timeliness, use and dissemination of information. Within the national data quality framework, the NHIC and DHIMC will carryout annual data auditing activities

10.8 Feedback

Routine feedback will include information regarding the quality of data

11 Requirements for Implementing this Strategy

This Strategy is an integral part of the overall NHSP-IP 2004-2009. Its implementation will require a range of developments and changes in legislation, organization, management and culture. This will present significant challenges throughout the sector, and effective change management processes will be of particular importance. Success of this strategy is dependent upon a strong central driving force and district and local mechanisms that ensure its consistent, effective and timely implementation. As described below, in human resources capacity development, introduction of information technology and change in management is required.

11.1 Infrastructural Requirements

A number of infrastructural developments are required to support the implementation of this Strategy, as it is essential that a clear mechanism exists for implementing all of its dimensions. The NHIC will have to play the lead role in the whole process, and its empowerment as the central driving force for implementation of this Strategy is of critical importance.

Upgrading of DOHS based HMIS section into The National Health Information Centre will be the first step towards implementing this strategy. Necessary physical facilities will be made available for this purpose.

11.2 Human Resource Requirements

The availability of appropriately skilled and trained staff to support the potential of information within health sector is critical for the implementation of this Strategy. Developing the capacity of the health system to deliver on the actions set out in this strategy requires significant and sustained investment in human resources.

- Establishment of a small team of highly competent people at NHIC
- Readjustment of Assistant Statistician and Medical Recorder positions according to the number of government and private health facilities in the districts and service delivery output of hospitals

- Training of Statistical personnel with at least one back-up person for each district and sentinel site
- Training of staffs involved in Collection, Analysis, Implementation of the information including reporting

11.3 Information Governance Requirements

A clear and supportive legislative and information governance framework will be established for the appropriate management (collection, analysis, dissemination) and use of health information throughout the sector.

11.4 Funding Requirements

Current fragmented systems can be developed into a national integrated and comprehensive system only with a provision of basket funding to the **comprehensive information system** rather than hand picking of a sub-component by a specific donor. A total of US $ **1,959,570** has been estimated for synchronization of currently fragmented system into a comprehensive and integrated district based national health sector information system. Estimated cost breakdown by year and major input areas is shown in the table below:

Total cost estimated for 5 years (salaries of HMGN not calculated)					
2005	2006	2007	2008	2009	Total
33,600	612,586	268,135	1,013,999	31,250	1,959,570

12. Action Plan

This strategy will be implemented on an incremental basis and priority will be given to developing the necessary information infrastructure and processes. Emphasis will also be placed on improving access to and making better use of available information. The development of standards in the area of clinical terms and clinical coding and classification systems is an essential prerequisite to the implementation of this strategy. It is, therefore, essential that the National Health Information Policy Committee (NHIPC) be established as early as possible in order to advance this work. The information governance framework which will underpin the overall implementation of the Strategy will be put in place with a legislative basis provided by the Health Information Bill. The Health Information Portal will be developed to meet many of the priority health information requirements of all stakeholders.

An integrated and comprehensive national health information system will be fully operational nationwide by 2009. A Gantt-chart and activity budget which can be found in annex-2 provides only a strategic direction. A detailed annual implementation plan will have to be elaborated every year. This chapter provides an elaboration to be under taken for operationalizing action and activity:

Action 1: Endorse National Comprehensive Health Sector Information Strategy including the National Core Health Sector Indicators

This strategy will get official status once it is endorsed by HMG.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Processing for endorsement	MD/DoHS	-	Oct. 2005
b.	Final Consultation with line ministries	MoHP	-	Oct. 2005
c.	Cabinet approval	MoHP	-	Nov. 2005

Action 2 : Dissemination of the approved strategy:

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Translate into Nepali	MD/DoHS	1000	Nov/Dec 2005
b.	Printing the strategy documents	MD/DoHS	1350	Dec. 2005
c.	I. Dissemination among line ministry II. Dissemination of EDPs	MD/DoHS	900	Jan. 2006

Action 3: Formation of National Health Information policy Committee (NHIPC) in MoHP and establishment of National Health Information Centre (NHIC).

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Processing for formation of NHIPC and NHIC	MD/DoHS	-	Dec. 2005
b.	Assign concern staff	MoHP	-	Feb. 2006
c.	Equip and furnish NHIC	MoHP	12000	Feb/May 2006
d.	Training for NHIC professional	MoHP	100000	Dec. 2006

Action 4: Revision and development of data collection, monitoring and reporting tools trainer's guidelines and training package.

Information requirements will be solely determined by the approved health Sector Core Indicators. Data collection and reporting forms must contain the data that are required for calculating indicators. The contents of tools in current use may not be coherent with newly emerged data needs. Therefore, revision and development of tools will take place separately for the following components;

1. Health services (Modern/Ayurveda -Public /Private)
2. Disease surveillance (EWARS and Sentinel)
3. Logistics and supplies
4. Human resource
5. Physical assets
6. Finance

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Form a technical working group to revise and develop information management tools & training package	NHIC	-	Feb. 2006
b.	Hire consultant	MoHP	3000	Feb. 2006
c.	Develop revised information management tools and trainers guidelines for entire Health Sector including sentinel purpose	TWG	1200	March 2006
d.	Pre test and finalized of revised tools	TWG/ NHIC	1350	April 2006
e.	Printing of revised tools	MoHP	8500	May 2006
f.	MTOT training for piloting districts	MD, NHTC, NHIC	5000	June –July 2006

Action 5: Piloting Health Information System in selected district and sentinel reporting sites

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Selection of three districts	NHIC	-	Mar 2006
b.	Formation of DHIMC	NHIC	300	May 2006
c.	Orientation to DHIMC	NHIC	1300	June 2006
d.	Assign staff	NHIC		Mar-June 2006
e.	I. TOT training for focal person of piloting districts II. Training of other districts and below level staff	NHIC	12000	June-July 2006
f.	Computer training for related staff	NHIC	5000	July 2006
g.	Equip and furnish the district	NHIC	30000	May-July 2006

Action 6: Establish the currier system for data collection in piloting district

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Develop currier system	Dist./NHIC	500	July 2006
b.	Functionalise currier system	Dist./NHIC	9000	July 2006

Action 7: Establish the supervision and monitoring mechanism in the pilot district

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Purpose a supervision plan (NHIC to District and district to below)	DHIMC/NHIC	-	July 2006
b.	Functionalise supervision plan	NHIC	5000	Aug. 2006
c.	Provide vehicle for supervision purpose	MoHP	50000	Aug. 2006

Action 8: Monitoring and Evaluation of piloted districts

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Trimisterly review in pilot districts	DHMIC, NHIC	5000	Nov. 2006
b.	Half yearly Data Verification in pilot districts	DHMIC, NHIC	5000	Jan. 2007
c.	Annual review Workshop	DHMIC,NHIC	5000	Aug 2007
d.	Final assessment by external consultant	NHIC	3000	Aug 2007
e.	Incorporate recommendation and findings	NHIC	3000	Sept. 2007

Action 9: Develop curriculum for inclusion of HMIS in all relevant training program in health (pre-service, in-service; VHW to MD)

Service of public health person, trained in Epidemiology and Curriculum development, should be utilized in developing curriculum for the following categories:

- Community health workers i.e. VHW, MCHW etc.
- Paramedical workers i.e. AHW, HA, Vaidya, Kabiraj etc.
- Public health professional i.e BPH, MPH etc.
- Nursing professionals from ANM to Masters
- Medical professionals i.e MBBS, BAMS etc.
- Pharmacy
- Medical technology
- Other cadres as required
- Programme supervisor (FPA,DTLA etc.)

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Hire a consultant to identify training needs of different cadre and design curriculum to meet specific training needs.	NHIC	5000	Sep. 2007
b.	Develop Curriculum	Consultant	-	Sept.-Nov. 2007
c.	Make curriculum available to concerned agency (printing)	NHIC	1000	Dec. 2007

Action 10: Enforce 'Information Management' curricula in all pre education and training programmes.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Organize a workshop of IOM,CTEVT,KU,EU,PU and other universities that are providing affiliation to health training schools	NHIC	10000	Jan. 2008
b.	Follow up through MOE for implementation of curriculum by individual school	NHIC	-	On going

NHIC through MOE will implement the curriculum. Follow-up will require for optimizing the quality of training.

Action 11: Develop software for management of information (collection, analysis, reporting) at district, region and central level

District and sentinel surveillance sites will require two different types of software. Robust software will require for data entry in the districts, report generation and exporting data to RHD, respective programme and NHIC. This need can be addressed by adapting the software that has been evolved in South Africa over the last 10 years. With technical and financial help of US and Norwegian institutions the University of Western Cape has developed this versatile open source software for accommodation by the country like Nepal. This software has already been adapted in many countries like Malawi, Mozambique, India and many others. It can accommodate data by VDC, district, region

and link with GIS map, generates several reports, import data from lower level and merge into database and export the whole or a segment to anyone.

It has also a separate TB module which can be adopted for Leprosy control programme too. Software technician experienced in database designing in Access could adapt it for Nepal. As this software is free, tested for many years with a lot of technical and financial inputs, it has versatile functionality and much less problem than any newly developed software could have.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Identify and hire a software consultant extensively experiences in designing software in Access, Oracle etc.	NHIC	-	
b.	Adapt the DHIS software for processing health information at district, regional and national levels	Consultant	3000	Jan.-Aug. 2006
c.	Test the software for one year in 3 pilot districts	NHIC	-	1 Yr.
d.	Introduce software in all 75 districts, 5 RHD and National head quarters	NHIC	-	July 2008
e.	Adapt Med Quest software for recording and processing of sentinel surveillance data at 15 sentinel sites	NHIC	3000	Jan.-Aug. 2006
f.	Test the software for 1 year in 3 Hospitals from ecological zones	NHIC	-	Jan.-Aug. 2006
g.	Launched software in all 15 sentinel sites in remaining 12 districts	NHIC	-	July 2008

Action 12: Develop national health information portal

Design website and interactive reporting tools for generation of user's needs specific reports. This should utilize the data mainly from the above two software and all other authentic sources of research and survey data.

Ministry of Science and Technology could provide ISP address and web hosting services. The portal will include annotated bibliography of all health resources that are relevant to Nepal and web-links to electronic resources.

MOST shall provide each programme manager with subscription of free email account.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Hire a consultant experienced in designing internet based interactive information portal	NHIC	-	
b.	Develop information portal software interfacing with a data manage by district and sentinel software as well as providing linkages to all other relevant data base and documents	Consultant	2000	July 2008
c.	Launch the web based information portal	NHIC	-	July 2008

Action 13: Establish computerized data processing system in MOH, departments, districts and sentinel sites

Computer, serge protector, modem, and 4 in one printer will be purchased for all districts and 15 sentinel hospitals. Specification of these items should accordance with national IT strategy. However, the computer must be Pentium IV with 100 GB hard-disk, CD read/write drive, 500+ RAM, 21" colour monitor and 56 kbs modem.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Procure and install 75 desktop accessories for 75 districts with 2 sets of each region for emergency. The equipment computer, serge protectors (high quality to form lightening etc,) printer, scanner, etc.(in 3 phases: 30,20 and 25)	contractor	170,000	July 2006 - June 2008
b.	Procure and install computer and DO	contractor	12,000	July 2006 - June 2008
c.	Procure and install computer, modem, scanner , protector, etc. for 15 sentinel sites emergency reserve for each.	contractor	34,000	July 2006 - June 2008
d.	Hardware maintenance to be contracted else appropriate modality to be	contractor	30,000	July 2006 - June 2008

Action 14: Provide training to computer and software users

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Develop and produce reference and training manuals	consultant	1,000	May 2006-June 2008
b.	Train Assistant Statistician in managing data using software. The training should include minor maintenance of hardware plus minor adjustment of software	consultant	55,000	May 2006 – June 2008
c.	Train medical recorder on how to manage sentinel data using software.	consultant	8,800	May 2006 – June 2008
d.	Train all programme managers in MOH,DOHS,DOA,DDA and RHD on how to access health sector information from health information portal , how to retrieve electronic reports sent from DHO and how to generate reports etc.	consultant	25,286	May 2006 – June2008

Action 15: Enact health information Act

Draft the Bill and present to the legislative body for approval. (The Bill should encompass, among other things, reporting requirements of government and private facility, notification of disease, data release protocol, information authority etc.

Reference should be made of Nepal Statistic Act 2015 while drafting the bill. Reference should also be made of similar act of other countries. Instead of bringing a separate act for management of health information, amendments should be made in existing health service act.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Hire a lawyer to draft the health information bill	Health Secretary	-	July 2007
b.	Draft a health information bill through a consensus building approach	Consultant	1000	July 2007 – June
c.	Submit the bill for approval from parliament	Health Secretary	-	
d.	Disseminate the health information act through all ongoing health training and other relevant opportunities	NHIC	714	July 2007 – June

Action 16: Provide training to all section heads in MOH, DoHS, DOA, DDA, and RHD on how to receive electronic report of their specific programme from DHIB and generate report of their interest.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Develop and produce reference and training manuals	TWG	1857	June 2008
b.	Conduct training	NHIC	-	June 2008

Action 17: Provide training to DHMT and DDC officials on management and use of information in planning, supervision, monitoring and evaluation of health services

All DHMT and DDC officials member will require training on better management of information and optimum use in planning and management of health services.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	revised/refine reference and training manuals,building or experience in pilot districts	TWG	58214	July 2007-June 2008
b.	Conduct training of trainers	NHIC	5100	July 2007-June 2008
c.	Provide practice based training to DDC, DHMT, DHIMC	Trainers	148000	July 2007-June 2008
d.	Provide practice based training to all facility in charge	DHMT	-	July 2007-June 2008

Action 18: Publish semi-annual Bulletin and Annual Report of the Health Sector

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Prepare semi annual Bulletin & annual report	Committee	-	Feb. & Aug. each Yr.
b.	Publish the reports and disseminate through prined and electronic media	NHIC	125000	Feb. & Aug. each Yr.
c.	Establish a system of data/information displaying at facility levels	NHIC,DHIMC	550000	July 2008-June 2009
d.	Establish resource counter at facility level	NHIC,DHIMC	275000	July 2008-June 2009

Action 19: Institute 5 yearly publication of updated 'Health Atlas'

Data on geo-address of each health facility will be collected and compiled by respective district. A GPS will be provided to each district for this purpose. An update health atlas will be published by DHIMC in every five year. The Atlas will encompass VDC-wide information on:

1. Access to key services like VCT, ARV, EOC, BOC
2. Health Status
3. Utilization of 10 most important services

From the above district updates, the NHIC will compile the information into national Atlas with district breakdown.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Purchase the digital spatial data from NPC for all districts	NHIC	214	July 2008-June 2009
b.	Purchase GPS for each district to record geo- address of health facilities	contractor	11,250	July 2008-June 2009

	with different service provision			
c.	Purchase license of Arc view software for use by DHO,NHIC,Departments (can be done in coordination with MoLD or special agreement can be made with software company)	contractor	20,000	July 2008-June 2009
d.	Training 75 Assistant statisticians on managing spatial and attribute data as well generating Health Atlas for the district (coordinate with Geographic Department of TU)	Contractor	53571	July 2008-June 2009
e.	Update attribute data for the catchments area of each health facility, nationwide	DHMT	-	July 2008-June 2009
f.	Printing of District Health Atlas showing VDC disaggregation (100 copies for each district in average ranging from 50-200copies)	DHIMC	53571	July 2008-June 2009
g.	Printing of Country Health Atlas showing district disaggregation	NHIC	7143	July 2008-June 2009

Action 20: Annual Data Audit and collection of gender, poverty and socially disaggregated data

Annual data audit will be undertaken for quality assurance of health information. Randomly selected 2 facilities, from randomly selected one district from each ecological and development region will be visited each year. Criteria will be developed to determine the quality of data. During the same visit socially disaggregated data will also be collected.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Develop information audit guidelines	NHIC	-	July 2007 on wards
b.	Carryout annual information audit at all levels during six monthly supervision visit	NHIC, DHIMC	-	July 2007 on wards
c.	Disaggregate data on specified indicators	Trainers	-	July 2007 on wards

Action 21: Work out identification details for all public and private health facilities

A database will be developed with identification details of each public and private health facility in the country. HuRDISH database will be used as basis for this exercise. All health facilities will be assigned with codes, and these codes should be a composite of the district code, the village code and the ward code, matching with the census codes of 2001 and NLSS as both used the same coding scheme. The database should include facility type, owner of the facility, level of services provisioned like partial EHCS, full EHCS, BEOC, CEOC and other relevant features.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Develop identification details for each health facility nationwide	Consultant	-	July 2006 on wards
b.	Verify identification details through respective district health office	NHIC	-	July 2006 on wards

Action 22: Establishment of basket funding system for management of health sector information system

The process of managing health sector information system will be different from managing the several sub-systems in isolation as in the past. The management of health information system is fully decentralized to the district. District Health Information Management Committee collects analyzes and disseminates health information in holistic manner. Health data from public and private institutions is gathered at one place, entered into computer, analyzed and disseminated to all relevant stakeholders from community to national levels. Hand pick funding as currently practiced will not be much helpful to run the system in holistic manner. Therefore, a basket funding arrangement will be made in which the stakeholders that have been supporting different systems will be asked to pledge funds to the basket.

Activity no.	Major Interventions	Responsibility	Cost in US $	Timeline
a.	Workout 3 yearly detailed budget for management of health sector information in the country	NHIC	-	Tie up with
b.	Seek Government's and EDPs basket funding commitment for strengthening of integrated and comprehensive health information system	Health Secretary	-	Tie up with
c.	Implement the basket funding	NHIC	-	Tie up with

13. Purposed Health Sector Core Indicators

ID	Name of indicator
1	% of Government budget allocated to health sector
2	% of health budget allocated to EHCS
3	National health expenditure per capita in USD
4	% of health budget to lowest Human Development Index (HDI) districts
5	% of recurrent allocation to non salary costs
6	% of health facilities with community drug programme
7	% of expenditure in public health facilities borne by elected local bodies
8	% of expenditure borne by local communities in public health facilities through CDP, CHI etc.
9	% of contribution from private sector
10	Percentage of population covered by community health insurance
11	% of budget utilized
12	Percentage of transfer after completion of tenure in the post
13	Percentage of MCHW upgraded to ANM
14	Annual output of training health personnel
15	% of positions filled
16	% of Government's health facilities with full staff as per approved positions
17	Health personnel attrition rates
18	Availability of drugs as % of national standard drug list
19	Population per registered pharmacy (Allopathic and Ayurveda)
20	Average number of drugs per prescription
21	Percentage of district level health facilities authorized for procurement
22	% of public health facilities without stock outs of EHCS drugs for more than a week at a time
23	% of private health facilities visited at least 3 times in a year by MOHP personnel
24	% of health facilities supervised by DHMT members using integrated supervision checklist
25	% of hospitals under autonomous management board
26	Number of districts with fully deconcentrated management responsibility providing effective support to local bodies in fulfilling their health roles
27	% of district having own 5 year health plan
28	Number of districts undertaking planning, budgeting and management of health services in capable, responsible and accountable manner
29	Percentage of health facilities managed by local bodies
30	% of hospitals contracted out to private/NGO
31	Number of service delivery contract with NGO and private sector
32	% of clients satisfied with services
33	% of health facilities (HP, PHC, Hospital) upgraded
34	% of health facilities up to physical standard
35	% of health facilities up to equipment standard
36	Life expectancy
37	% of district and below level facilities providing complete EHCS as per standard
38	Population health facilities ratio (DH, PHC, HP, SHP, AA)
39	Bed utilization rate
40	Patient attending OPD at modern health facilities as % of total population
41	Patient attending OPD at Ayurveda health facilities as % of total population
42	% of deliveries receiving adequate postnatal care
43	% of pregnant women receiving at least 4 antenatal care visits
44	% of deliveries conducted by skilled health personnel
45	Number of BEOC and CEOC facilities per 500,000 population

46 Met need of EOC
47 Contraceptive prevalence rate
48 Total fertility rate
49 % of fully immunized under one children
50 % of pregnant women receiving adequate TT dosage
51 % of LBW
52 Prevalence of underweight children
53 Proportion of population below minimum level of dietary energy consumption
54 Proportion of malnourished women
55 Vitamins A coverage amongst 6-59 month population
56 % of pregnant women receiving adequate Iron tablets
57 % of under 5 children with ARI who received appropriate treatment
58 % of under 5 children with diarrhoea who received appropriate treatment
59 % of respondents correctly identifying one correct method of preventing HIV transmission
60 HIV Prevalence among 15-24 year pregnant women
61 HIV Prevalence in general population
62 HIV Prevalence in high-risk population
63 % of 15-49 years old men using condoms
64 Prevalence of Leprosy
65 TB detection rate per 100,000 populations
66 Prevalence of TB
67 Tuberculosis death rate
68 Cure rate among smear positive TB cases (Under DOTS)
69 Leprosy case detection rate per 100,000 populations
70 Insecticides treated mosquito nets use rate
71 Malaria cases detection and treatment rate (including clinical malaria)
72 Malaria death rate
73 % of HH with access to improved sanitation
74 Annual incidence of morbidity due to infectious disease
75 Annual incidence of morbidity due to non-communicable disease
76 Neonatal mortality rate
77 Infant mortality rate
78 Under-five mortality rate
79 Maternal mortality ratio
80 Crude death rate
81 Annual incidence of mortality due to infectious diseases
82 Annual incidence of mortality due to non-communicable diseases
83 Reporting coverage of health information