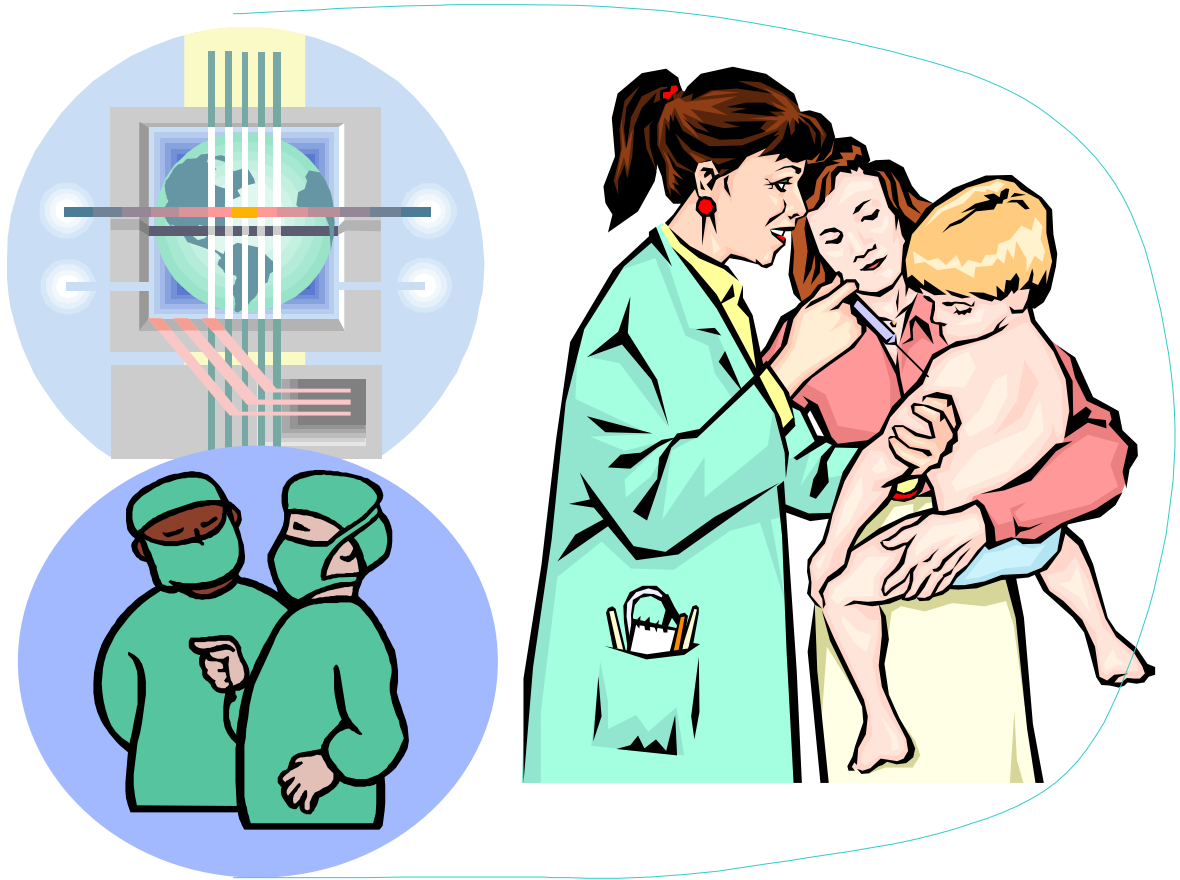# Evaluation of Health Management Information System in India

## Need for Computerized Databases in HMIS

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# BACK GROUND AND INTRODUCTION TO THE INDIAN PUBLIC HEALTH SECTOR

After independence India has made considerable progress in economic and social development. India has invested huge sums of money in the development of extensive health care system which caters to a population of 1000 million residing in 6,00,000 villages.

India, compared to other developing nations spends slightly higher amount in the health sector. It spends 6% of the GDP or $13 per capita in the health sector. However,

| INDIAN HEALTH SECTOR – FEW FACTS | |
|---|---|
| Total population | 1000 million |
| Number of villages | 0.58 million |
| Life expectancy at birth | 62.4 |
| Birth rate | 27.2 |
| Death rate | 8.9 |
| IMR | 71.0 |
| MMR | 4.37 |
| Couple protection rate | 45.4 (SERVICE DATA-97) |
| TFR | 3.5 (SRS 95) |
| State and Union territories | 25, 7 |
| Total public health budgets | 5000 $ million |
| Primary health centers | 22991 |
| Hospital beds government and private | 0.704 million |

many of the key health indicators are very low, communicable diseases continue to be a major problem; maternal mortality is high; and morbidity especially among the poor exacts a high toll. Even these indicators vary from region to region significantly.

## Organization Of Health Care Administration In The Country

Ministry of health and Family Welfare is the apex executive organization dealing with the issues of Health and Family Welfare health and in the country as per the guidelines enshrined in the constitution of India and depicted in the national health policy and in accordance with the policy decisions of the cabinet. Health is the state subject in India and the Ministry of Health and Family welfare acts as a Coordinator between the state Health departments, Planning commission, central council of Health etc. besides implementing various national programs and items under unions list and concurrent list. In the process it is aided by the Directorate General of Health Services.

Health administration at the apex level of the Government of India consists of a Secretary for health and Secretary for Family Welfare supported by Additional, Joint secretaries who are drawn from the Indian Civil Service. The rest of the organization is mostly program/project based. Adhoc project structures such as TB project or Malaria project etc., are created as and when necessary. Since state governments implement the projects and deliver the regular health services they have fairly well demarcated systems. Separate directorates or head offices usually exist at the state capital for primary, secondary and tertiary health care which includes medical
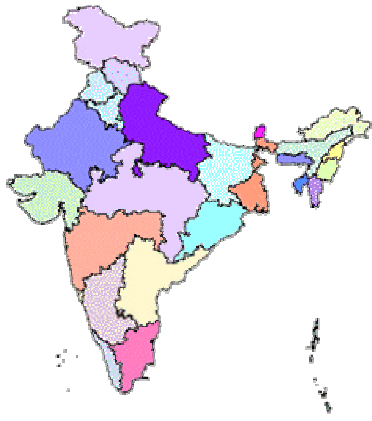
**CENTER**

Political head- minister of state
Divided into Health, Family welfare, Indian systems of Medicine each headed by a career bureaucrat
Helped by specialized national level institutions and hospitals
Mostly play advisory and supportive role in health
Total support for family welfare – RCH
Total support for national programs
Runs central government health scheme (CGHS) for Central government employees
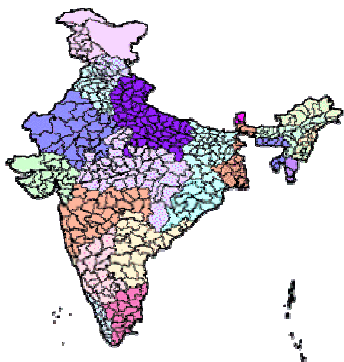
**STATE**

Political head- minister of cabinet rank
Divided into Health and Family welfare and headed by a career bureaucrat.
Organised into Directorates of Health, Family welfare, primary health, secondary health and medical education, training etc., headed by promoted doctors
Responsible for hospital care and implementer of national programs and family welfare
Concentration of financial and personal powers

**DISTRICT**

Last administrative unit ---- 1.0 to 2.5 million population
Headed by a civil surgeon. District medical officer-doctor/physician
Coordinates and controls nearly 10-15 hospitals, 40-70 PHCs
Maintains the logistics of drugs and supplies, collects the statistics
Does not have much financial and personal powers

colleges and medical education. Many states have separate structure for family welfare operations since population control through family planning is given great importance. An average Indian State will have 10 to 25 districts where from most of the revenue and civil administration is governed. District health administration consists of number of officers and doctors who on an average handle 10 to 15 hospitals, 30 to 60 primary health centers and 300 to 400 sub centers. The entire complex arrangement results in a number of vertical channels of

information, multiplicity of agencies, dual reporting systems etc., the complexity of the Indian health care system is illustrated in the following diagram.

## COMPLEXITY OF THE PUBLIC HEALTH CARE SYSTEM IN INDIA



**HEALTH INDICATORS**

MMR      4.36/1000
IMR       72/1000
LIFE EXPTC 62.4
CBR   27.2
CDR   8.9

**NATIONAL PROG.**

Malaria control
Tuberculosis control
Aids control
Leprosy control
Blindness control
Family welfare programs
Integrated child and safe mother program
Reproductive child health

**External Agencies**

UNFPA
UNICEF
USAID
WHO
DANIDA
DFID
WORLD BANK

**HEALTH CARE DELIVERY**

970 million Population
26 States and 6 Union Territories
600000 villages

State govts.  20 National programs  20000 hospitals  External agencies  Non govt. organisations  $4000 million budgets  1000000 Health Staff  Govt. of India

## HMIS brief overview

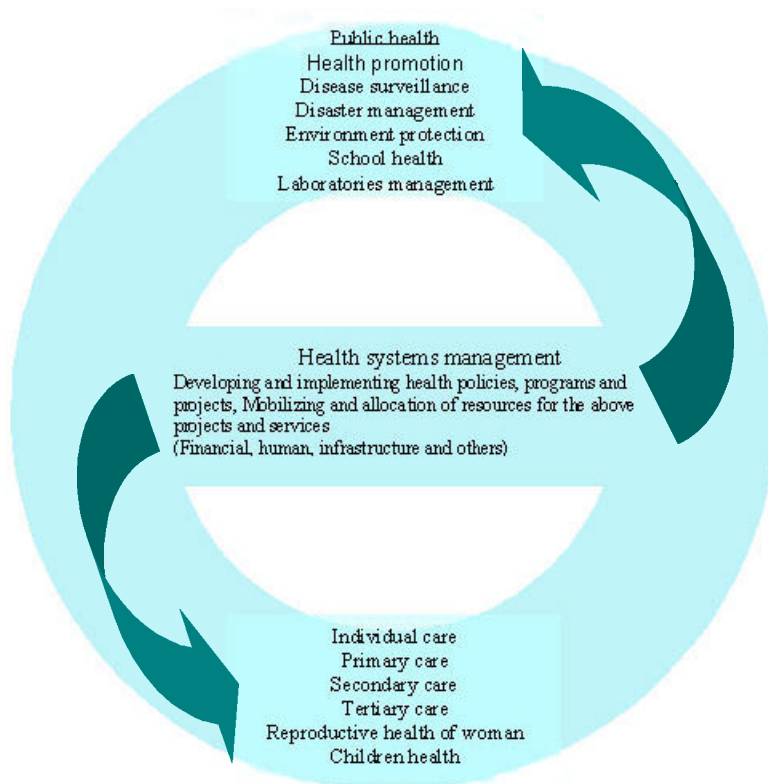Health management requires the monitoring of the health status of the population, the provision of services as to the coverage and utility, drugs stocks and consumption patterns, equipment status and availability, Finances, personnel on a regular basis. This requires timely and accurate information from various sources. Accurate, relevant and up-to-date information is essential to health service managers if they are to recognize weakness in health service provision and take actions that will improve service delivery.  Accordingly, the development of effective information systems is a necessary precursor to managerial improvement.[i]

A health information system. (HIS) is a process whereby health data (input) are recorded, stored, retrieved and processed for decision-making (output).  Decision making broadly includes managerial aspects such as the planning, organizing and control of health care facilities at the national, state and institution levels and clinical aspects which can be subdivided into (I) providing optimal patient care, (ii) training of medical personnel to generate appropriate human resources, and (iii) facilitate research and development activities in various fields of medicine.[ii]



Public health
Health promotion
Disease surveillance
Disaster management
Environment protection
School health
Laboratories management

Health systems management
Developing and implementing health policies, programs and projects, Mobilizing and allocation of resources for the above projects and services
(Financial, human, infrastructure and others)

Individual care
Primary care
Secondary care
Tertiary care
Reproductive health of woman
Children health

**The term health management information systems is generally used to describe the following subsystems**

| Various sub- components/sub-systems of Health information System | |
| --- | --- |
| **Epidemiological surveillance** | Identification/notification of diseases and risk factors, Investigation, follow-up, control measures |
| **Routine service reporting** | Hospital/health center based indicators on performance of the various services |
| **Specific program reporting** | Various programs in operation in a particular country, topically include; Reproductive child health, AIDS, MALARIA, TB, LEPROSY, Integrated Child health and many other programs under different departments, names |
| **Administrative systems** | Account and financial systems Drugs management (procurement, storage and delivery) Personnel management Asset management (equipment/buildings etc) Maintenance system |
| **Vital registration** | Birth, deaths, migration etc., |

## HMIS IN INDIA – AN INTRODUCTION

The necessity of sound information system as a support to the various developmental activities of the Health sector in India was identified as early as Bhore committee report soon after the independence. The national health policy of India (1983) inter-alia states that appropriate decision making and program planning in the health and related fields is not possible with out establishing an effective health information system and that nationwide organizational set up should be established to procure essential health information which may provide support for the local management of the health care and effective decentralization of the activities. The National Health Information Systems provide the inputs in the formulation of regional and global health policies. The call for action to improve the information infrastructure is global, and as early as 1979 an inter-regional consultation on National Health Information Systems was held in Costa Rica, on the initiative of the division of information support, world health organization.

## ORGANIZATIONAL ARRANGEMENTS FOR THE HMIS IN INDIA

The organizational arrangement of HMIS and the agencies responsible for it is discussed in the three levels namely central, state and district.

## A. Central level

At the central level there are four major agencies dealing with the HMIS.

## 1. CENTRAL BUREAU OF HEALTH INTELLIGENCE (CBHI)

Central Bureau of Health Intelligence (CBHI) is the health intelligence wing of the Directorate General Of Health Services.  At the national level it is the main organization which deals with the collection, compilation, analysis and dissemination of the information on the health conditions in the country covering various aspects  of health including the health status, health resources, utilization of health facilities etc.

| FACT SHEET | |
|---|---|
| Located in | Delhi |
| Computers | 2 old PC AT machines and one Pentium compuuter |
| Telephones and faxes | One line |
| Networks | No net work |
| Budgets | Mostly for the staff component |
| Staff | 4 technical staff and the rest genral staff |

CBHI is a compact organization with minimal staff. Main issues worrying them are the inadequate computing facilities. Presently it is relocated in an area in Delhi where some times power supply fails for days together. The old computers cannot run the latest software and packages. They do not have programmers and
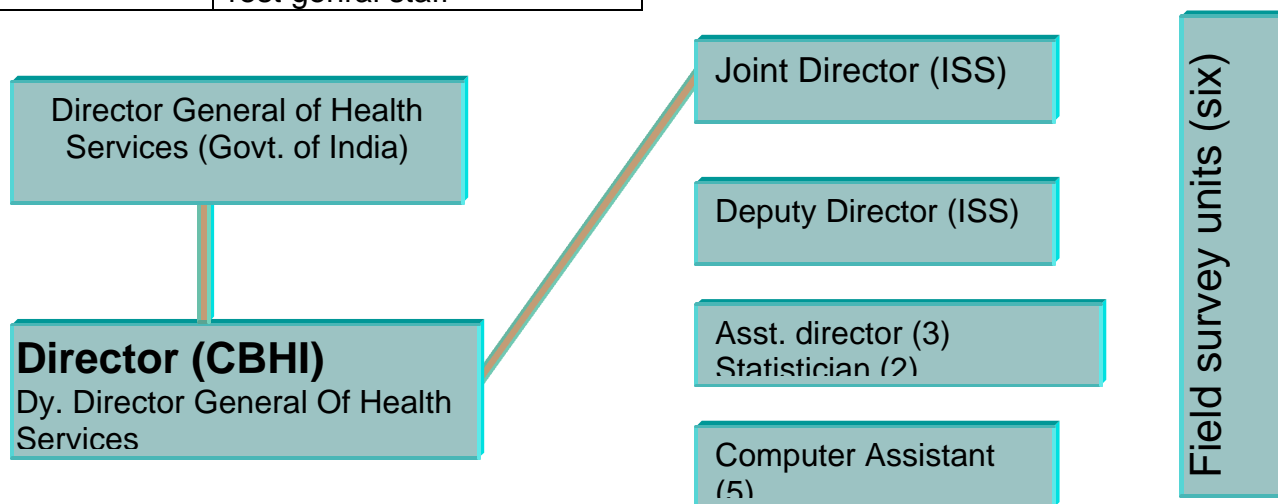
have to depend on National Informatics Center (NIC) (Govt. of India computing wing) for programming help. This usually delays the development process and they keep working with the old software. The human resource development is very minimal in the CBHI. The training inputs to the development of latest skills are very few. The staff are hardly are send to external trainings on computing and database technologies.

## 2. STATISTICS DIVISION IN THE DEPARTMENT OF HEALTH AND FAMILY WELFARE

The division is well staffed with a chief director and four joint directors. It is organised into computer unit, demography unit, performance monitoring and evaluation unit and impact monitoring unit.  Impact monitoring unit has again field evaluation  unit, concurrent evaluation unit. Since this unit is physically located in the Health ministry it self it has access to better computing facilities and office support. As there is a greater thrust on RCH program, continuous funding is assured for its surveys and studies.  The staff are exposed to statistical techniques and survey mythologies.  It brings out various publications periodically like monthly bulletin on family welfare statistics, year book on family welfare program in India.

## 3. THE SAMPLE REGISTRATION SYSTEM (SRS)

India conducts census operations once in every ten years. In between the estimates of vital statistics are based on a System called Sample Registration System. SRS is a large scale demographic survey conducted in India for providing reliable  annual estimates of birth rate, death rate and other fertility and  mortality indicators at the national and sub-national levels. The field investigation consists of continuous enumeration of births and deaths by a resident part time enumerator, generally a   teacher followed by an independent survey every six months by  an official. The data obtained through these operations are   matched. The unmatched and partially matched events are verified in the field and thereafter an unduplicated count of births and deaths is obtained.

The SRS was initiated by the Office of the Registrar General, India on a pilot basis in a few selected states in 1964-65. It  became fully operational during 1969-70 covering about 3700

samples units. Thereafter the sample size has been periodically  increased. The frame was recently updated based on 1991  Census data.

The sample unit in rural areas is a village or a segment of it if the   village has a population of 1500 or more. In urban areas the    sample unit is a census enumeration block with a population    ranging from 750 to 1000. At present SRS covers 6671 sample   units (4436 rural and 2235 urban) in all the states and union   territories of India covering 1.1 million households and a population of about 6 million.

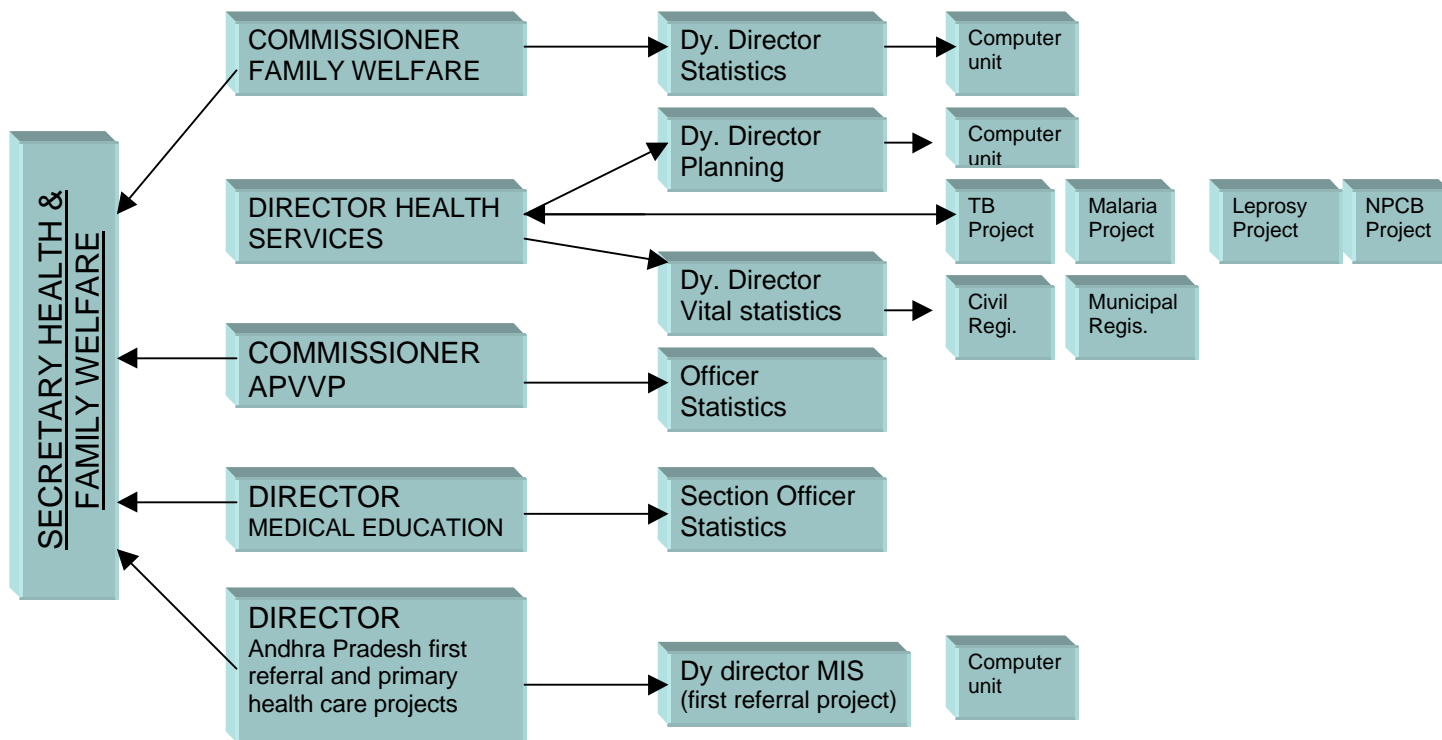## B. STATE LEVEL ORGANIZATION – an example from Andhra Pradesh

Usually every state has clearly demarcated structures in the form of directorates for primary health, secondary health and medical education. Many times the family welfare/RCH directorates are separate. Some states have directorates for training and IEC. Each of these directorates in turn will have statistics sections headed by Dy. Director or joint director etc., They in turn have computing units to help them with data. As the states are implementing many national programs and infrastructure  development projects, each of those projects will have statistical officer or equivalent.

Apart from these vital statistics are usually maintained as a separate unit again headed by a joint director or so. The vital statistics departments focus mostly on the collection of civil registration system.

## C. ORGANIZATION AT THE DISTRICT LEVEL

District medical and health officer or chief medical officer heads an average district health system. He is responsible for the Health and Family welfare in the district. Some states like Andhra Pradesh have a different arrangement of functions in the district like tow functionaries work in the direct one responsible for hospitals (District Coordinator Hospital Services) and the other for PHC system and Family welfare (District Medical Officer). The DMO is supported by Asst or additional DMOs for different national programs and  Family welfare program now RCH.  He is supported by two statistical officers one for health and the other for  Family

ORGANIZATION OF HEALTH MANAGEMENT
INFORMATION IN ANDHRA PRADESH

| | | |
|---|---|---|
| COMMISSIONER FAMILY WELFARE | Dy. Director Statistics | Computer unit |
| DIRECTOR HEALTH SERVICES | Dy. Director Planning | Computer unit |
| | | TB Project / Malaria Project / Leprosy Project / NPCB Project |
| | Dy. Director Vital statistics | Civil Regi. / Municipal Regis. |
| COMMISSIONER APVVP | Officer Statistics | |
| DIRECTOR MEDICAL EDUCATION | Section Officer Statistics | |
| DIRECTOR Andhra Pradesh first referral and primary health care projects | Dy director MIS (first referral project) | Computer unit |

SECRETARY HEALTH & FAMILY WELFARE

welfare.  These statistical officers are the key personnel in the entire HMIS chain. It depends a lot on their perseverance, support and skills to continue and sustain the HMIS. The officers are usually qualified and recruited through state level service recruitment.

| ORGANIZATION/PERSON RESPONSIBLE FOR HMIS MATRIX | |
|---|---|
| **Location/hospital** | **Person responsible** |
| Sub-center | ANM |
| PHC/Hospital | Pharmacist, computer(designation of a statistical assistant) |
| District | District statistical officer- health, family welfare Dt. TB, Malaria, Leprosy officers |
| State | Dy/Joint director Statistics- Family welfare – Dy/Joint director- Vital statistics Surveillance Unit Sample Registration system |
| Central Government | Central Bureau of Health Intelligence Statistics Division- Department of Family Welfare CGHS Statistics Division- Department of Health Sample registration system- head quartered |

## The brief outline of the development of HMIS process by WHO collaborated project

| Year and event | Content |
|---|---|
| 1982 | MIES- Management information and Evaluation system was tried to be introduced but has not taken roots. |
| 1983 national health policy | Envisaged a nationwide organizational setup to procure essential health information |
| 1986-88 | Development of HMIS with WHO collaboration and National Informatics Center (NIC) |
| 1983-85 | HMIS version 1.0 in four participating state of Gujarat, Haryana, Maharashtra and Rajastan |
| 1989 | Field testing of the HMIS in one district of Gujarat, Haryana, Maharashtra and Rajastan |
| 1990-95 | Implementation efforts in 13 states and Union Territories in phased manner |
| 1996 March review meeting | To take note of the changes suggested by the implementing states and revise the HMIS 2.0 |
| 1997 CBHI organised a work shop | Officials of Government of India, states, NIC, WHO, Planning commission and deliberated on the problems with the present HMIS version 2.0 |

## CONTENT AND FLOW OF HMIS

| From - To | Periodicity | Content |
|---|---|---|
| Sub-center to PHC | Monthly | Performance report – very exhaustive report on all aspects of performance<br>Family planning, immunization, Diarrhoeal diseases, Malaria, leprosy, Blindness, Deaths of all types,<br><br>Inventory report – Malaria drugs, Family planning, vaccines, ORS, Basic drugs and others.<br>it has column on consumption, balance and whether it is sufficient or not |
| | Others | Basic equipment facilities – quarterly<br>It basically shows the list of 20 basic equipment and in case they are out of order from a particular date |
| PHC/ hospital to District | Monthly | Family welfare—sterilizations, IUDs, Op, Condom users, MTP etc., - stock position and the details of the above- staff wise and unit wise etc.,<br>Vital statistics- Births, still berths, deaths, maternal deaths, infant deaths, neo natal deaths<br>FW performance like – AN cases, institutional deliveries, vaccination, cold chain equipment, surveillance on Diphtheria, measles etc.,<br>Medical intelligence data on 41 identified diseases from general fever to Ulcer of stomach to snake bites<br>Hospital IP and OP<br>IEC reports on contacts, group activities,<br>T.B., MALARIA, LEPROSY monthly reports. |
| District to state HQ | Monthly | Malaria, TB, Leprosy, Blindness etc., Each program sends a summary of program statistics<br>Summary statistics for family welfare services (presently RCH) |
| State HQ to center | Monthly | Malaria, TB, Leprosy, Blindness etc., Each program sends a summary of program statistics<br>Summary statistics for family welfare services (presently RCH) |

# Evaluation Of  The Existing HMIS In India

Despite many supposed to be serious attempts through different collaborations, the state of HMIS in India is week. The lack of awareness by health policy-makers and programme managers of the strategic importance and practical usefulness of health information for planning and management results in a low demand for information; (WHO guidelines). India's developmental administration is structured in such a way Key social areas like Health and primary education receive low priority. Health and Family welfare ministry is considered as lowest in the hierarchy of preferential posting for the top bureaucrats (generalists). The tendency to quickly move to other postings is high. This means that posting in the Health and Family welfare for senior bureaucrats is only a transition.  This coupled with the excessive concentration of powers in the secretariat system of governance has made the planning, monitoring as a central activity. The directorates staffed by subject experts are mere financial dependents. In India, the general administration is mostly concentrated at a district level. But, Health and Family Welfare administration has been centralized at state and central levels.

**District Health and Family Welfare management**:  An average Indian district in size and population is bigger than 60 to 70 countries in the world. It presents various regions with different levels of development, geographical spread and population mix. The district management is very much adhoc and most of the District Medical officers lack management training and approach. They are rarely considered as key personal in the chain of program management and very few times applied with inputs in human resource development.  The result is dependent district management for every initiative and week program implementation. Unless a greater amount of sophistication in planning and management is applied in program management with local initiatives, local decisions, the program outcomes will be very much inadequate as they are today.

India has been investing millions in to Health and Family Welfare sector through various programs and projects. But, the process of investment planning through several interventions is very centralized and does not account for the ground realities, relate to the complex social, economic and demographic indicators. It is based many times on the judgment of the few researchers, adhocly conducted surveys and politically motivated populist pressures.  The

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planning and policy making process remained very week in the absence of objective data and data culture. This resulted in problems of measurement. (Many times measurement is only formal in the face of the pressure from Controller and Auditor General or external agencies etc.,) Ultimately the program efficiencies remained the lowest. Many of the programs do not achieve even 50% efficiency/targets or outcomes. The fact that 50% of the money invested in that programs is gone waste is forgotten. More than the physical investments that count for a country like India, it is time— time lost in trails or extended pilot implementations and ineffective programs and policies – half a century is too big a waiting for the common man in India- a waiting of a life time.

*With this general introduction, An attempt is made in the following pages to critically evaluate the exiting HMIS in India.*

There are several problems associated with the existing HMIS in India. To facilitate elaborate  discussion, we can classify them into structural, procedural, technological and human resources related issues. The available research findings suggest that HMIS in many of the African and Asian countries is very weak and suffers the same limitations as india. Some references to the findings in other country studies have been mentioned appropriately.

## Structural issues

Besides the excessive concentration of administrative powers at the state and central levels, there is a multiplicity of institutions/departments, which work in their own hierarchies posing series problems for integration and co-ordination. The following paragraphs debate these issues.
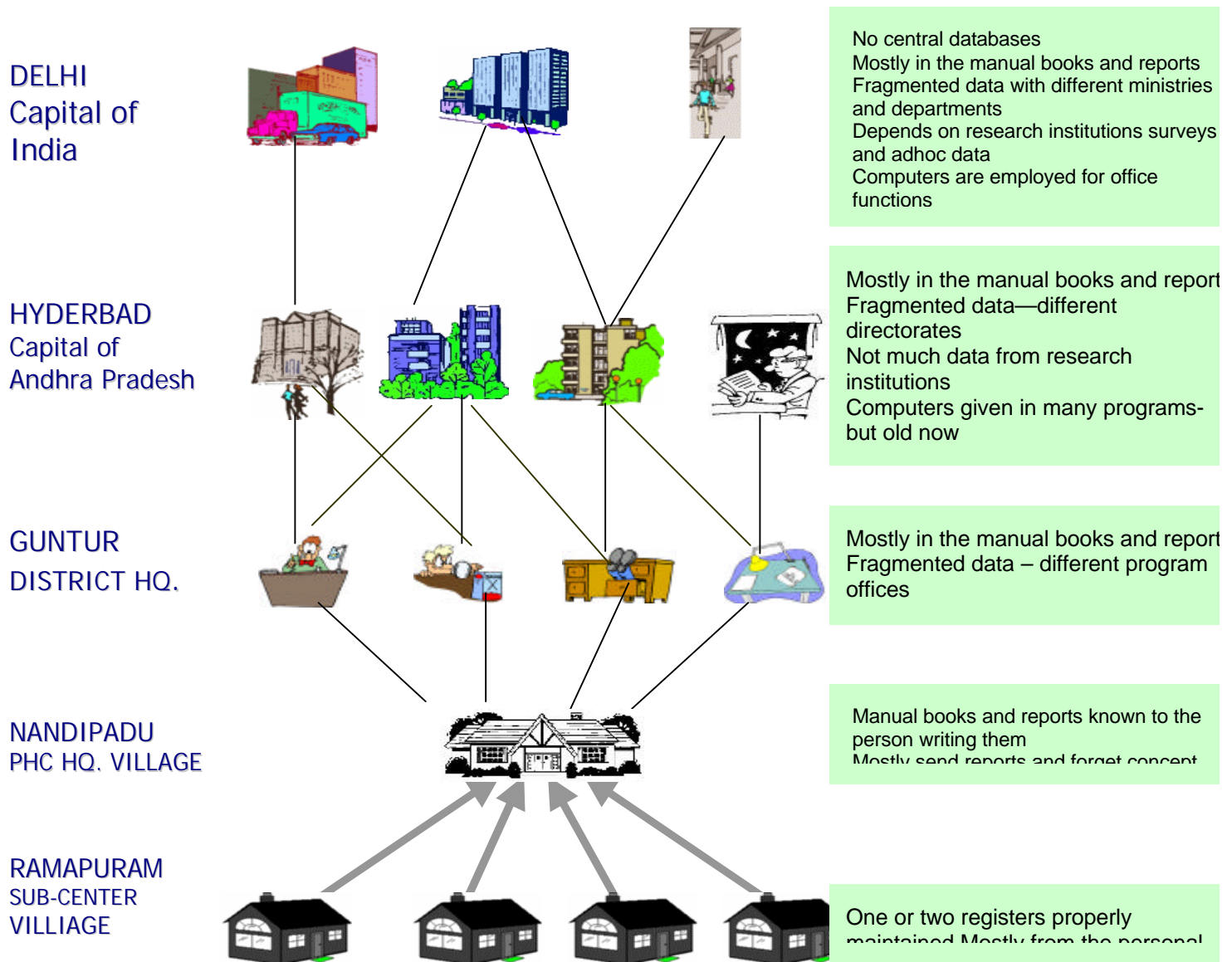
### Multiplicity of institutions and fragmented data

The number of institutions dealing with collection and storage and transmission of Health and Family Welfare information is large. Their size, complexity and requirement is too specific. There is no coordinating effort in district, state and central level.  At the central level it is dealt by at lest four major agencies like CBHI, DGHS, FW dept, Health Dept. At the state level usually 4 to 5 directorates operate with their own systems. District level is in to 3 to 4 agencies or institutions do the job.

Various departments, programmes and institutions within the health sector tend to develop their own data collection systems without consulting each other. It is often observed that the vertical programs in India like Malaria control, TB control, leprosy etc., operate their information systems through their functional offices. In the sense there is no single institution responsible for HMIS. Effective coordination of health information is often lacking which results in duplication and gaps in data collection, reporting, use and management of data; (WHO report). Often in the implementation of

the different national programs different departments at all levels develop their own

systems of data collection, storage and maintenance (either manual or computerized).

This is more so in India. This results in duplicity of effort and perpetuates dependence

on their own system of data collection and maintenance. Since the sources, timing and

channels are different,  data over laps and crucial differences occur. A systematic

periodic reconciliation of the data with various departments is not practiced.

## PICTORIAL DIAGRAM DEPICTING THE FLOW AND PROBLEMS WITH EACH LEVEL OF HMIS IN INDIA



**DELHI**
**Capital of**
**India**

No central databases
Mostly in the manual books and reports
Fragmented data with different ministries and departments
Depends on research institutions surveys and adhoc data
Computers are employed for office functions

**HYDERBAD**
**Capital of**
**Andhra Pradesh**

Mostly in the manual books and report
Fragmented data—different directorates
Not much data from research institutions
Computers given in many programs- but old now

**GUNTUR**
**DISTRICT HQ.**

Mostly in the manual books and report
Fragmented data – different program offices

**NANDIPADU**
**PHC HQ. VILLAGE**

Manual books and reports known to the person writing them
Mostly send reports and forget concept

**RAMAPURAM**
**SUB-CENTER**
**VILLIAGE**

One or two registers properly maintained Mostly from the personal

## Procedural

This section deals with the procedural issues like excessive information, encryption issues, problems with hospitals, absence of feedback and others.

### Exhaustive information collected but hardly used

The information requested and collected from the PHC and other hospitals every month is exhaustive and not warranted. Every possible information in different levels of depth is collected. This ignores the logical information principle that there should not be any collection of information that is not used. Excessive information collection only creates load on the system and generates into carelessness and "some how to fill it and forget concept". The information system designed as a management tool requires an enormous number of registers to be maintained, and for each vertical health program there is a separate target population register, different registers for each process and encounter and a separate register for each inventory item[iii]

The monthly report of the PHC (it is called a book, since it is so bulky) runs into 31 pages. The information is so densely packed into complex tables that for example on page 8 table −1 there are 17 columns with equal number of rows. There are built into complex depths like age wise distribution and no of children wise distribution.

The average time spend to record various registers was nearly 2 hours per day. Monthly 3 to 4 days for the monthly returns. This means that 1/3 of the available time (after providing for leaves, holidays and other things) to the field staff is spent only on maintaining and filing the forms and registers.  Data collection becomes a preoccupation to a level of distraction, so much so that the process of primary health care implementation is ignored. [Chabot-84]

In India, data are collected in vast amounts but are mostly incomplete, unreliable and unused. The number of health programmes has increased over the years, and the people who

implement them at grass-roots level often feel overburdened with the collection and recording data.[iv]

Current health information systems generate large amounts of data which often are incomplete, or inaccurate, and therefore are little used by planners.  They may include data on activity and on resources, but indicators are poorly harmonized with those applied elsewhere and thus difficult to use for inter-district comparisons.[v]

## Extra effort by PHC staff in compiling the reports

Not only the number of reports are large but also the reports are not in a easily collatable form from the existing registers. There has to be a  separate effort in culling out the information from the registers to prepare reports. The reporting formats are developed in such way and time that they are oriented to reduce the effort in writing the computer program. Today the computer applications have developed and become user-friendly and they do the entire transactions. They take the data mostly from the available regular registers and culls out, run calculations and present the information required to the users. But in the HMIS system in India is from the UNIX/DOS based simple programs wherein the good computer logic is not used. The load of processing/calculation is unfortunately shifted to the field, which is sending the report. The user has arrange, calculate and cross tab the data to fill the reports.

## Even general information is collected every time and reported afresh.

The computer programs of the national Informatics center (NIC) which run in district NIC offices do not built up any information for further checking and helping the processing of information. Every month many things are entered afresh. Information declared once is not stored in to the formats. It has to be supplied every month increasing  the sense scope for error.

Example: Location of the PHC, Type, Beds (for hospital), Population, number of villages, area etc., are repeated every month in the reports.

## Codes for every thing

The programs are based on code for every thing. There are long lists of codes for every item. It was the old way of programming and the latest computes (even 5 years old) running in windows system can be set to codeless way of data entry and build in checking and auto fill counters.

Example – the instruction manual on the HMIS version 2.0 to private  nursing home runs in to several pages says—

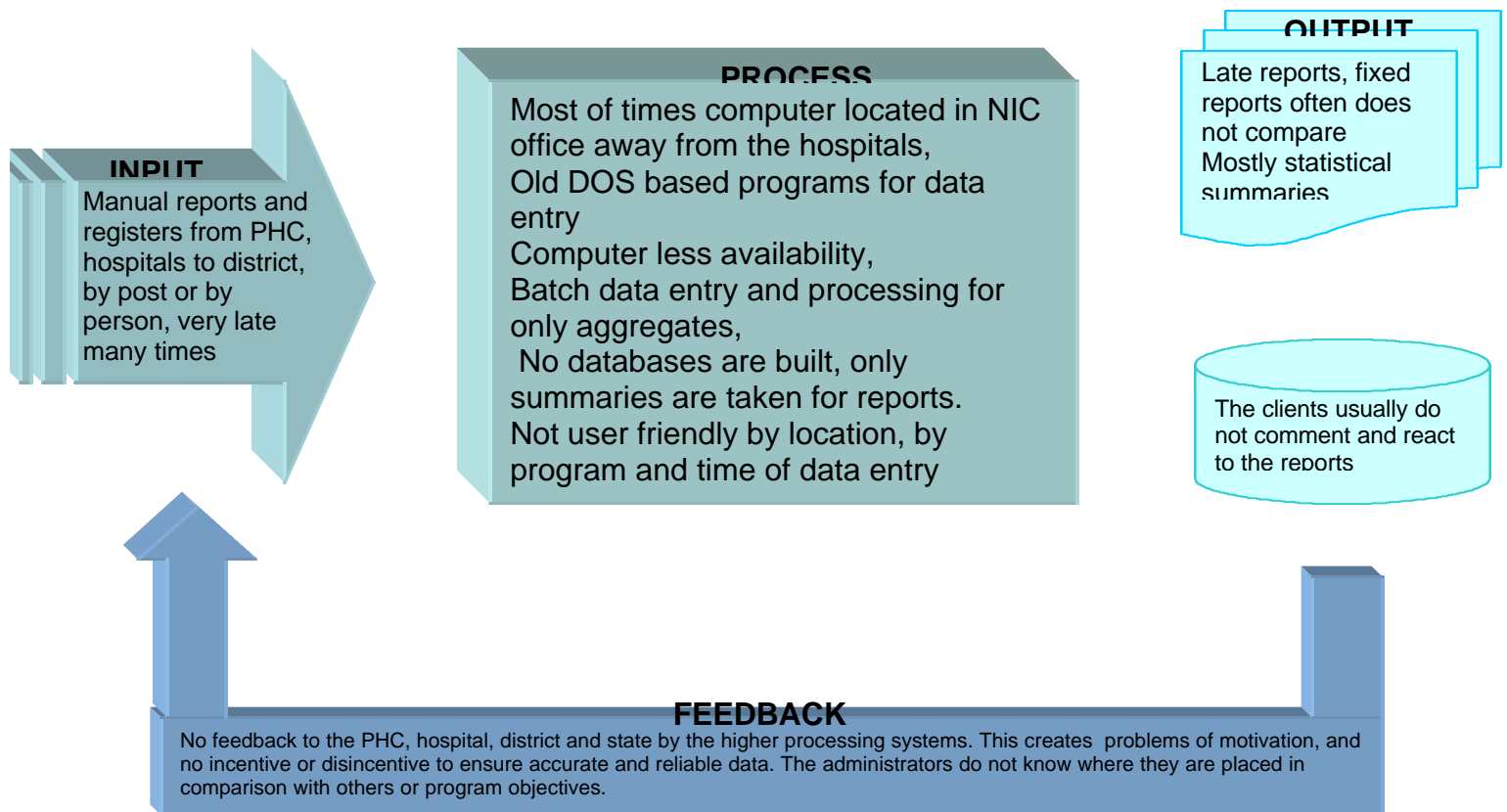Write  "T" for trust ship, 'V" for voluntary etc.,
Write the name of PHC in full and indicate the PHC code as obtained from the district NIC unit. (A private nursing home is supposed to know the code of some PHC again from the NIC unit)

## Absence of feedback defeats the purpose of information collection

Systems Model is based on the core principle that input is processed into output and fed back to the input. It is a complete process where in each and every stage is important and contributes to the overall improvement of the system.

But the information collected from the PHCs in never fed back to them after processing. It is just supplied to the top tiers of administrative hierarchy. This genuinely affects the willingness of the PHC to correct the process or activity. They are never clear about their relative position of the PHC in comparison with the others and their standing in the national program implementation. Feedback is the right way of ensuring the conformity

## SYSTEMS MODEL ON THE PROBLEMS OF HMIS

**OUTPUT**

Late reports, fixed reports often does not compare Mostly statistical summaries

**PROCESS**

Most of times computer located in NIC office away from the hospitals,
Old DOS based programs for data entry
Computer less availability,
Batch data entry and processing for only aggregates,
 No databases are built, only summaries are taken for reports.
Not user friendly by location, by program and time of data entry

**INPUT**

Manual reports and registers from PHC, hospitals to district, by post or by person, very late many times

The clients usually do not comment and react to the reports

**FEEDBACK**

No feedback to the PHC, hospital, district and state by the higher processing systems. This creates  problems of motivation, and no incentive or disincentive to ensure accurate and reliable data. The administrators do not know where they are placed in comparison with others or program objectives.

and as well it builds up the sense of responsibility and ensures data reliability. Since any information is never feedback to the lower levels of service delivery, it is assumed by the levels that what every they fill in would go into the black hole. The whole process results in to ritualistic way of sending some data upwards may be, in time. Recognizing this, the Independent Evaluation Committee of NLP, Governing of India, 1987 recommended

that the tendency to compile data only for onward transmission should be discouraged and assessment should be backed up by complete and relevant feedback.[vi]

Reports should be sent only as often as the recipient is able to take action, and for every report sent, there should be some form of feedback whether written, verbal or during supervision.[vii]

One-way system of reports constantly traveling upwards has one more limitation. Usually the district is supposed to know more about the demography, sociology and economic aspects of the population through several surveys and state level research inputs. This information is hardly passed down the system. If this information is passed to the PHCs and suggested to use the information or update the information, it gives a clear sense of direction to the PHC management and staff.

For example in Andhra Pradesh in the last 12 months 1999 there are no reports to any PHC indicating the feedback to them. They are also content in not asking for nay thing lest it may create a problem for them.

Some districts have been sending the reports for years with glaring gaps like IMR – 0, MMR – 0 and so. Even the cumulative column shows the zero. There has been no feedback from the state or the center on this totally inadequate and incorrect data.

## Higher the level of hospital and the lesser the information send up wards.

Very interestingly PHC and in sub-centers send information regularly how ever difficult it is. They have been trained and systems have developed to this extent. But hospitals and many times the big tertiary hospitals hardly furnish any data to the state directorates. They send only OP, IP, Major operations and minor operations etc., very few indicators they will be passing on to the state level directorates. Usually they

handle good loads of patients and many times since they are better staffed and have facilities etc., the patients prefer to visit the referral hospitals first. The case with the tertiary hospitals is still worst and they should be  generating good quality of data. But in practice despite the presence of good number of staff for the bio-

Besides the above there were shortage of printed forms and preprinted stationary for many registers and reports. They usually resort to their own ruled hand made forms and consistency can not be maintained in the process.

## The primary supplier and user of information in general has not much interest in the information

The principle user and supplier of the information is the primary health center it self. But usually medical officers (the in-charge of the PHC) do not show any interest in verifying the data and of course trying to reflect on the data and finally using the data to take corrective action on any of the anomalies. They are observed to passively sign whatever is prepared by the data assistant called by various names like, computer, clerk etc., To achieve maximum participating from health workers collecting the data, three issues are of extreme importance; they should feel that they own the system, the system should not involve them in extra work, and it should be perceived as useful.[viii]
Information for the managerial process HMIS evolution in developing countries is usually reactive at best and information systems often serve the interests of bureaucrats and institutions rather than the front line health workers and clients.[ix]
This problem is more the result of Medical Officers generally not attending the PHC and taking active role in the management of PHC.  Unfortunately majority of them do not understand the registers and various kinds of information. The second level of information users are the supervisors who are supposed to guide and supervise the activity of the ANMs. They too share a sense of indifference to the data. At all levels of Health and Family

Welfare administration, there is excessive concentration on Family planning targets.

(through formally we are operating under target free approach.

## Content related

This section debates on the issues of content in the existing system.

## Aggregates only.

The HMIS system processes the information in such a way that only summaries reach the higher levels. The details miss the attention of the policy makers and managers. This series limitation could be attributed to the lack of databases. Aggregates may not mean much in many instances. For example, Immunization coverage of 90% will sound very impressive. But the individual coverage of a particular vaccine may vary and some may be as low as 10 – 30%. Coverage in a particular region could be as low as the above. There may be misses in different dosages. Still the aggregates will not come down steeply to reflect these issues. Because conditions vary widely in India, detailed information is necessary on small geographical units and the different segments of the population.  At present the country's health information system mostly generates data at the state level on socio-demographic matters.  There are no useful data on the incidence of many diseases and disabilities.  Long delays occur in the processing of data.[x] Most of the health and other indicators available are of state level. This means for 50 to 100 million populations is considered as a single unit for planning purpose. This kind of planning failed to take into account the district wise and block wise developmental differentials and health seeking behavior. We need at least block level indicators, if not village level  for focused attention and efficient targeting of the needy populations.

## Mostly service statistics

The current HIS in India generates data mostly at the state level, that too for limited indicators confined largely to socio-demographic aspects, mortality and fertility.  Except for some widely prevalent diseases such as tuberculosis and leprosy, no worth while data are available on the incidence or prevalence of various diseases or disabilities.   No nationwide community based estimates are available, not even at the state level, on coronary artery disease, diabetics

mellitus, cancers and AIDS nor on common infections such as malaria, typhoid, diarrhoea, and sexually transmitted diseases[xi]

Existing health information systems in developing countries are managed and used mainly by biomedically trained personnel and by general healthcare administrators. They focus on epidemiology, service utilization and finance ; they generate little of the socio-cultural data needed for developing and adjusting health services and disease control programme to local health related perceptions, values and resources.[xii]

## Human resources related

## Absence of training and motivation.

Different levels of staff involved in the HMIS process have series inadequacies as far as training and development efforts are concerned. This applies to key functionaries at district and state level. Usually 50 to 70% of the district statistical officers constitute promote officers from clerical cadres. They are not properly oriented to the new jobs which include motivating the staff at PHC and Hospitals and provide a sense of direction. They have been so long in the system before their promotion as statistical officer that often, there is a tendency to maintain statuesque. They usually pick up the skills only on the job. This added with the lack of positional power (they are only staff position) makes their role difficult in extracting information. State level officers are a bit exposed, but they too lack the computer skills to help guide the data building efforts at the state level.

## Technological issues

## Manual paper based systems – no databases

Unfortunately, the entire HMIS in India is in black and white. Now there is a wide availability of hardware at state levels and at central level. Computers have been supplied to almost all the districts. Computers are used only to summarize and collate the data at state level. At district level it is still worst and they use it for word processing and other printing works. Any information system these days means DATABASES. Databases help collect and store the details of every transaction or the detailed record. They give the ability to process the data in a way that is required for a specific task, project or purpose. They help relate and integrate huge sets of data on an identical fields. But for the database technology, banking, transport and every service and manufacturing sector would not have been as they are today.

But the scenario in Public health management is very dismal. Many times even the names of the hospitals are not available in any database format.  The entire HMIS process produces only some aggregates at different levels. Aggregates in paper form do not facilitate any query, sorting, relating etc.,

Where as India has disease control programs for the last 4 decades, there are hardly any GIS mappings of the diseases or facilities, not even preliminary information is available in the Internet. Geographical information systems have been fairy developed and applied to the health context to map diseases, patterns, process access and delivery issues and hoard of many other topics.

Absence of even minimum facilities and other information in the database format prompts the conduction of surveys(facilities) and other forms of estimates for any new intervention/project planning. Substantial costs are involved for every project in those studies in the absence of reliable data not forthcoming from the HMIS.

## Surveys As A Method Of Colleting Baseline Information

Policy makers and external donors place greater reliance on the survey data and hence the surveys are encouraged. The major surveys that are conducted in regular intervals and their brief descriptions are mentioned in the following table

| Name | Periodicity | Size and target | Description |
|---|---|---|---|
| National Family Health Survey USAID sponsored | Once in 4 or 5 years | 80000 households in the country | Very systematically collected survey |
| Facilities survey For RCH program By GOI | Continuous Launched in 1998 | All the health care facilities in the country | Survey conducted through separate agencies. Usually the data is not available to the state governments in database formats. Reports are supplied after a long time and there is hardly any follow-up. |
| Household survey for RCH program By GOI | Continuous Launched in 1998 | 2000 house holds from each state | Survey conducted through separate agencies. Usually the data is not available to the state governments in database formats. Reports are supplied after a long time and there is hardly any follow-up. |

# HMIS Practices of other agencies

## Bilateral and multilateral agencies

The external donor agencies life DFID and others usually conduct elaborate studies before launching a program. They engage consultants and organise surveys and collect lot of base line data and utilize for the program planning and monitoring. The information they seek and collect would have been available through the normal channels of information system. But the information available with government is so fragmented that no particular officer or individual would know where and with whom the data lies.  Again  the data available with governmental agencies is not relied upon and would not suit  the donors particular requirement. As the donors implement the program they generate and built up large sets of information. Experience shows that they also do not employ large database program which systematically relate data, but use Excel or Dbase type of programs. They to many times depend on adhoc irregular processing of the data by partly employed computer assistants.

This is in total contrast to governmental funding and programs including the world bank loans. The programs are easily conceived and adhoc proposals are prepared and based on them the projects are launched. Towards the end of the project the assessment becomes very difficult and base line data is manipulated to convince results.  Unfortunately they even would not keep proper books of accounts for the amounts spend and variance of budgeting.

The specialized data generated by the donor agencies most of the times is owned by them and many times passed on to the research institutions and researchers. Some of the researchers depend and grow in consultancies based on their ability to collect data and monopolies it for publication and personal consultancies. Governments usually lack the sophistication in procuring and preserving the data. Data for them even now is mostly a report or a register. Even if the data is passed on to a senior official, he would most probably personalize it and many times ignore the value of it.

VOLUNTARY AND PRIVATE AGENCIES IN THE DATA COLLECTION AND PUBLICATION

The health data situation has become very weak and it has led to the voluntary effort in collecting and publishing the information to the benefit of the research. Every big research institution has some form of publication giving some set of information from their sources and research. Agencies like Voluntary health Association of  India (VIHAI), Delhi and Foundation for health information, Bangalore are active in the health information dissemination.

## Conclusion and discussion

Way back in 1983, Indian Journal of Public Health commented in the editorial on the need for HMIS in India. "A good health service superstructure can be built only on a solid base provided by the reliable health statistics collected through a well organised infrastructure".[xiii] The several inadequacies in the HMIS system make it very unreliable and undependable.

## HMIS Means Database

Technology of computing has developed extensively in the last decade. Industry has progressed from private networks running server/client based proprietary programs to Internet based applications which are platform independent, accessible anywhere, user friendly, cheap and universally available. Every sector either in developing countries or developed countries has begun using the extensive availability and cheaply managed web based systems.

Unfortunately the Public health management is the last one to employ the technology. It is common practice in developing countries the priorities in the health sector are set by government, in the light of political pressures. In a sustainable system for health-care policymaking and planning, the major role of new computerized technologies for the improvement of national health-care policy making and planning, the major role of new computerized technologies for the improvement of national health care and for socio-economic development should be understood.[xiv] There is a very strong bias with policy makers (though slowly disappearing) on the use of computers. Cost escalation of major projects by 50% to 100% delays of programs by 2 to 5 years, non- achievement of objectives of programs are the common features of the projects. This means that the billions of public money invested in this programs is producing(has produced) half or less than half the results. By employing computers, by building databases, by monitoring effectively and by improving the planning ability to focus and attack issues, we will be able to reduce the wastages, time delays and save few billions in the minimum. Computers certainly do not cost not more than couple of millions.

- Databases are the key to track the health expenditure all states in different programs/projects at field and head quarters across time and geography.

- Databases help identify patterns in the disease occurrences in different places and aid the disease surveillance process. This is possible through data mining technologies, which are employed by the industry in a huge way to look for trends and patterns and similarities in the vast amounts of data that is generated in the business.

- Finally databases help ease the mundane tasks of salary administration, inventory management, accounting and finance, equipment management and the whole chores of routine office management.

This is on the physical side of the issue. Lack of data culture is the core issue.

## Use Of Information For Decision Making

Every level in the government is used to adhocism and decisions based on personal and value-based observations. The critical cycle in the HMIS process is the use of the information supplied by the HMIS system. Users are again of all levels right from the first generator of information (ANM at the sub-center) to the principle secretary of health in Delhi. On applying the information for decisions, the user knows its validity, limitation or timeliness. His feed back on his requirement refines the system and tunes it to decision making requirements. Unfortunately, the data culture is very limited in all levels of administration.

Where management is weak data will not be used to plan, to control or to evaluate services. The starting point of any health information system development at the primary health care level should therefore be the strengthening of the managerial function.  Managers should be able to formulate questions to be addressed by the health information system, should grasp the information presented to them and should use it to plan, evaluate and control the health services.[xv] As long as this does not occur,  the HMIS remains as a mere data based system.

In public health the resources are few, time is extremely limited (with AIDS kind of epidemics, out breaks of plague (it is  an emerging epidemic in India now) and results have to be achieved in a limited time frame, there is need for more and more tools, implements and what ever that makes these tasks easy and efficient. India spends 85% of the budget on the personnel and personnel alone. Employment of some personnel or creation of one department or a post will not automatically ensure achievement of the set objectives. Public health is to licensing or regulating (even these are now slowly disappearing in the liberalized India). It is a proactive and developmental function. The personnel need some implements, tolls, training and others to effectively discharge their duties. Often the series criticism on computers is that 'we need drugs first" .  Drugs are certainly needed and also the capability to know how much are needed, where are they needed, in what quantities they are needed how are they going to be spend. These questions having not been addressed for all these years have costed the country billions. We need effective systems to utilize the available resources.  The key to the success of the countries lies in effective utilization of available resources for the benefit of the communities. Whatever tool and technology that facilities these process should be welcomed and adopted in real time.

# ANNEXURE

<u>HMIS VERSION 2.0</u>

<u>Basically a set of reports and registers. The following features are  mentioned about the system</u>

Based on minimal set of indicators

Data inputting is at the district computing system of the NIC

Generation of PHC report, District/Sub-district/Special hospital report, private hospital report, camp information report.

Main thrust on the aggregation of the data and only out put tables to various users

# Endnotes

[i] Richard E. Cibulskis, Paul R, Crouch-Dhivers, Enoch Posonai, Coleman Moni and Jane A Thomason, A knowledge based system for monitoring immunization coverage in Papua new Guinea, International Journal of Health Planning and Management, Vol. 8, 59-69, 1993

[ii] R. Chawla, A.K. Bansal, A. Indrayan, Informatics technology in health care in India, Thenational Medical Journal of India, Vol.10, No.1, 1997.

[iii] Narayana G, Auxila P. Management information Systems in Health and Family Welfare in India. Hyderbad, Administrative Staff College of India, 1989.

[iv] Rajesh Kumar, Streamlined records benefit maternal and child health care, World Health Forum, Vol.14, 1993.

[v] Erik Nordeberg, Rapid Assessment of An African District Health System. A Test of a Planning Tool, International Journal of Health Planning and Management, Vol.8, 219-    233, 1993.

[vi] C.R. Reankar, Nivedita Goyal & Birte H Sorensen,   Management Information System for leprosy eradication programme - an alternative information system, Leprosy Review (1989), 60, 129-134.

[vii] A.B.  Heywood, B.C. Campbell, Development of Primary Health Care Information System in Ghana : Lessons Learned, Methods of Information in Medicine, 1997 : 36 : 63 - 68.

[viii] P.De. L.G.M. Ferrinho, E. Buch, D. Robb, G. Phakathi, Developing a health information system for primary health care centre in Alexandra, Johannesburg, South African Medical Journal, Vol. 80, No.7, 1991.

[ix] A.B.  Heywood, B.C. Campbell, Development of Primary Health Care Information System in Ghana : Lessons Learned, Methods of Information in Medicine, 1997 : 36 : 63 - 68

[x] A. Indrayan, Informatics: the key to efficiency, World Health Forum, Vol.16, 1995

[xi] R. Chawla, A.K. Bansal, A. Indrayan, Informatics technology in health care in India, Thenational Medical Journal of India, Vol.10, No.1, 1997.

[xii] David Nyamwaya, Erik Nordberg, Elly Oduol, Socil Cultural Information in support of Local Health Planning : Conclusions From a Survey in Rural Kenya, International Journal of Health Planning and Management,  13, 27 - 45, 1998.

[xiii] Editorial, Health Information Service in India, Indian Journal of Public Health, Vol 27, July-Sep, 1983, No 3

[xiv] G.Kahen, Health Care Technology Transfer Expert and Information Systems for Developing Countries, Methods of Information in Medicine 1997.

[xv] P.De. L.G.M. Ferrinho, E. Buch, D. Robb, G. Phakathi, Developing a health information system for primary health care centre in Alexandra, Johannesburg, South African Medical Journal, Vol. 80, No.7, 1991.