Post Graduate Certificate Course in Health System and management

Module 6

Monitoring & Evaluation and Quality in Healthcare

2015

Indian Association of Preventive and Social Medicine
Gujarat Chapter

Post Graduate Certificate Course in Health System & Management (PGCHSM)

Team –2014

Advisors	Dr. Pradeepkumar Dr. P. B. Verma
Course Director	Dr. A. M. Kadri
Chief Course Coordinator	Dr. Umed V Patel
Joint Course Coordinator	Dr. Kaushik Lodhiya

Faculties

Dr. A. M. Kadri	Dr. Chandresh M. Pandya	Dr. Jitendra Gajjar
Dr. Jay K. Sheth	Dr. K. N. Patel	Dr. Pradeepkumar
Dr. Kaushik Lodhia	Dr. Niraj Pandit	Dr. Sureshchandra R. Patel
Dr. P. B. Verma	Dr. Prakash Patel	Dr. Uday Shankar Singh
Dr. Umed V. Patel		

Support and Guidance

Dr. D. V. Bala	Dr. Deepak Solanki	Dr. Dileep Mavlankar
Dr. Dipesh Parmar	Dr. Geeta Kedia	Dr. G. P. Kartha
Dr. Jayesh Kosambiya	Dr. K. N. Trivedi	Dr. M. P. Singh
Dr. Naresh Makwana	Dr. N. J. Talsania	Dr. R. K. Baxi
Dr. R. K. Bansal	Dr. S. L. Kantharia	Dr. Sheetal Vyas
Dr. Sudha Yadav	Dr. Vihang Mazumdar	Dr. Vasudev Rawal

Preface

Understanding of Health system and acquiring skills of health management are assuming importance in protecting and promoting people's health. Sound epidemiological knowledge and skills are ineffective if it is not complemented with robust Health System and Effective management. Hence it is the high time for every health manager to acquire the managerial understanding and skills.

As a professional body in Public Health; it is our responsibility to act as a catalyst in increasing the quality of health services. This course; Post Graduate Certificate In Health System and Management is an attempt to bridge the gap between technical and managerial worlds for Community Physicians and Public Health experts.

This course is covering key topics on health system, planning, managing human resources, materials and machines. Also health fineness and health economics, monitoring and evaluation, quality in health care are covered. The strength of the course lies in its faculties. Faculties are mixed of experts from the medical colleges and public's health cadres. Also it is envisage that students who are opting the course develop critical and creative thinking, reasoning power and analytical skills in Community Health with vision of applicability.

We have successfully completed two PGCHSM courses during the years 2013 and 2014.

I am sure this is a small step, but it will go a long way in creating culture for learning about health system and health management in the medical expert involved with public health. We are looking forward to your suggestions and support to further enhance the quality of this course.

Dr. K. N. Sonaliya
President – IAPSM-GC (2015-16)
Dr. A. M. Kadri
Secretary – IAPSM-GC (2015-18)

Dr. Kaushik Lodhiya
Course Coordinator (2015-16)

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Academia
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: About Module :

In recent years; scope of the duties and responsibilities of Community Physician/Public health experts have expanded from technical jobs to managerial ones. It is expected that they ensure better performance of health system and efficient delivery of the health services along with excellent technical guidance. It requires; acquiring understanding about health system and developing management skills by Community Physician and Public Health Experts. For the same they have to know about Policy, Planning, Implementation and Controlling of the Health programs/services at different levels; hence basics about management.

This module will be providing basic understanding about the concept, principles and techniques of Monitoring and Evaluation. Also differences between monitoring and evaluation are explained. Different approaches like Reporting and Feedback, Supervisory visits, Review meetings and special studies are explained in comprehensive manner with necessary examples. Finally in the chapter how a robust M&E framework can be established is explained keeping the HIV & AIDS as an example.

Chapter on Quality covers, definitions, different dimensions, determinants of the quality, different methods to assure the quality. Also different institutional mechanism created for quality improvement in health as well as District Quality Assurance Program were shared in brief.

We are hopeful this module will be a good catalyst in amalgamating the management understanding and skills with the epidemiological skills in the Community Physician and Public Health experts and will be a great help in enhancing their role as a successful Health Manager along with the current one.

The last two chapters deal with various innovative uses of Information Technology in public health along with barriers in utilization of its full potential.

Team
PG Certificate Course in
Health System and
Management
Academia IAPSM-GC.
Gujarat

Module 6: **Monitoring & Evaluation and Quality In Healthcare**

Compiled & Prepared by

Dr. A. M. Kadri

M.D.(PSM)

Dr. Kaushik Lodhiya

M.D.(PSM)

Indian Association of Preventive and Social Medicine

Gujarat Chapter

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Chapter 1:

Monitoring & Evaluation : Concept, Techniques & Framework

Learning objectives :

1. To understand the monitoring and evaluation as a managerial function.
2. To know the different approches used in monitoring.
3. To develope the insight about supportive supervison.
4. To know differences between the monitoring and evaluation.
5. To able to draw the M&E frame work for health project or program.

Monitoring & Evaluation(M&E) is one of the important managerial functions and it starts with with planning step. Monitoring & Evaluation aim to keep the all activities on track and bring on track. Though this is the simplest understanding about the M&E but it is much more complex function with various and divers objectives. M&E is for evidence-based planning. M&E should be part of the design of a program.

M&E is using indicator-based monitoring tools under which systematic data gathering is carried out. Information from Monitoring & Evaluation can be used by program managers, professional groups, policy makers, international agencies. It is used to raise awareness/numbers for advocacy. It helps in comparisons between facilities, districts, regions, countries depending on sampling, facilitates measuring trends, and provides evidence for prioritising planning and interventions. M&E shows whether a service/program is accomplishing its goals. It identifies program weaknesses and strengths, areas of the program that need revision, and areas of the program that meet or exceed expectations.

Monitoring progress and evaluating results are key functions to improve the performance of those responsible for implementing health services. It provides information for improved decision making and promotes continuous learning and improvement. It ensures efficiency and effectiveness by helping in deciding appropriate strategies/correction in actions and allocation of resources.

Monitoring :

We carry out monitoring simply because we know that things don't always go according to plan (no matter how much we prepare)To detect and react appropriately to deviations and changes to plans.

Monitoring is a planned, systematic process of observation that closely follows a course of activities, and compares what is happening with what is expected to happen. Monitorign requires periodic collection and review of information on programme implementation,

coverage and use for comparison with implementation plans, , identifies shortcomings before it is too late, provides elements of analysis as to why progress fell short of expectations, modifying original plans during implementation if required.

It is a day-to-day follow up of activities during implementation to measure progress and identify deviations. It requires routine assessment and follow up of activities and results are carried out to ensure activities are proceeding as planned and are on schedule. As a part of monitoring; tracking of inputs and outputs is kept. They are compared to see whether it is as per plan or not. Problem is identified and addressed to ensure effective use of resources, quality and strengthening accountability.

Management monitors following key areas.

- Men (human resources), Machines, Materials, Money, Space, Time, Tasks, Quality/Technical Performance.
- Inputs : Time, Money, Resources, Material Usage, Tasks, Quality/Technical Performance
- Outputs : Progress, Costs, Job starts, Job completion, Engineering / Design changes, Variation order (VO)

Monitoring process:

Monitoring is carried out from field of head office. It is carried out through meetings with clients, Stakeholders, For schedule – Update CPA, PERT Charts, Update Gantt Charts, Milestones, Record, Registers, Reports, Supervision and inspections, HMIS (Health Management Information System) Updating, episodic assessment of overall achievement and impacts.

Evaluation

A process that assesses an achievement against preset criteria. Has a variety of purposes, and follow distinct methodologies (process, outcome, performance, etc). A systematic process to determine the extent to which service needs and results have been or are being achieved and analyse the reasons for any discrepancy. It is an attempt to measure service's relevance, efficiency and effectiveness. It measures whether and to what extent the programme's inputs and services are improving the quality of people's lives.

Evaluation can focus on:

- ***Projects:*** *normally consist of a set of activities undertaken* to achieve specific objectives within a given budget and time period.
- ***Programs:*** *are organized sets of projects or services* concerned with a particular sector or geographic region

- ***Services:*** *are based on a permanent structure, and, have* the goal of becoming, national in coverage, e.g. Health services, whereas programmes are usually limited in time or area.

- ***Processes: are*** *organizational operations of a continuous* and supporting nature (e.g. personnel procedures, administrative support for projects, distribution systems, information systems, management operations).

- ***Conditions:*** *are particular characteristics or states of* being of persons or things (e.g. disease, nutritional status, literacy, income level).

Evaluation is carried out by internal evaluator or external evaluation depending type and objectives of evaluation.

- **Internal evaluation** (self evaluation), in which people within a program sponsor, conduct and control the evaluation.
- **External evaluation,** in which someone from beyond the program acts as the evaluator and controls the evaluation.

Evaluation Matrix

The broadest and most common classification of evaluation identifies two kinds of evaluation:

- **Formative evaluation**: Evaluation of components and activities of a program other than their outcomes. (Structure and Process Evaluation)

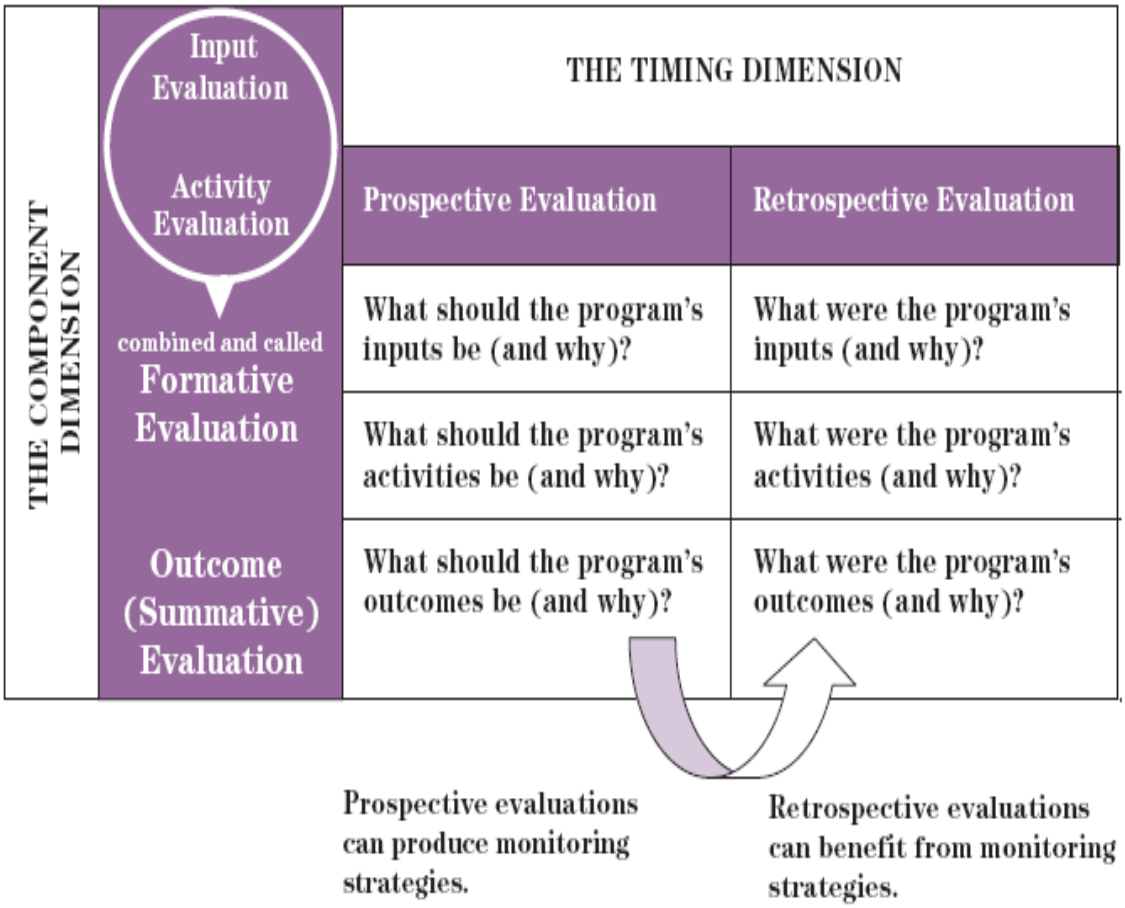
- **Summative evaluation:** Evaluation of the degree to which a program has achieved its desired outcomes, and the degree to which any other outcomes (positive or negative) have resulted from the program.

- **Program evaluation** is often used when programs have been functioning for some time. This is called Retrospective Evaluation.

- However, evaluation should also be conducted when a new program within a service is being introduced. These are called Prospective Evaluations. A prospective evaluation identifies ways to increase the impact of a program on clients; it examines and describes a program's attributes; and, it identifies how to improve delivery mechanisms to be more effective

Types of Evaluation:

Type	Purpose
Formative	Initial assessment of the target populations and contextual environment. Determines concept and design
Process	Seeks to identify the extent to which planned activities have been achieved and assesses the quality of the activities/services
Outcome	Examines specific program outcomes and accomplishments. What changes were observed, what does it mean, and if changes are a result of the interventions?
Impact	Gauges the program's overall impact and effectiveness. Aims to strengthen design and replication of effective programs and strategies



Difference between monitoring and evaluation?

Monitoring is the routine tracking and reporting of high-priority information about a program or project, its inputs and intended outputs, outcomes and impact. Data are obtained through recordkeeping, regular reporting and surveillance systems as well as observation and surveys. Monitoring helps program or project managers to determine which areas require greater effort and whether they achieve the intended outcomes and impact. In a well designed M&E system, the data that are routinely collected through monitoring activities contribute greatly towards evaluation. Indicators selected for monitoring differ depending on the reporting level within the health system. More information is needed for project management than is needed at the national or international level. Thus, the number of indicators for which data are collected should decrease substantially from the sub national to the national and international levels. Some indicators are, however, useful at all levels of the system. It is very important to select a limited number of indicators that program implementers and managers will actually use for effective decision-making. In addition, monitoring is used for measuring trends over time, and the methods used thus need to be consistent and rigorous to ensure appropriate comparison.

In contrast, evaluation is the rigorous, scientifically based collection of information about a program or intervention activities, characteristics and outcomes that determines the merit or worth of the program or intervention. Evaluation studies provide credible information for use in improving programs or interventions, identifying lessons learned and informing decisions about future resource allocation. Cost-effectiveness and cost-benefit evaluation is useful in determining the added value of a particular program or project. Assessing the impact of a program requires extensive investment in M&E efforts, and it is often difficult to ascertain the extent to which individual programs or individual program components contribute to overall reduction in cases and increased survival. Establishing a cause–effect relationship for a given intervention may require studies with experimental or quasi-experimental designs to demonstrate the impact. Monitoring of output or outcome indicators can also identify such relationships and give a general indication of program progress according to agreed goals and targets. The objectives and the methods used in monitoring and evaluation differ. In general, evaluation is more difficult in view of the methodological rigor needed: without such rigor, wrong conclusions can be drawn on the value of a program or project. It is also more costly, especially outcome evaluation and impact evaluation, which often require population based surveys or rigorous evaluation designs such as those including comparison groups or regions. Evaluation should leverage data and surveys that are nationally available and regularly undertaken, such as population-based surveys, vital registration or sentinel site disease data.

Comparison between Monitoring and Evaluation :

	Monitoring	Evaluation
Main Focus	On Inputs and outputs	On outcomes and impacts
Process	Collecting Data on Progress	Assessing data at critical stage of the process
Sense of Completion	Sense of Progress	Sense of Achievement
Time Focus	Continuous: day-to-day Present	Periodic: important milestones, Past - Future
Approach	Self-assessment	External analysis
Main Question	What needs to happen now to reach our goal/objectives?	Have we achieved our goal/objectives?
Attention Level	Details	Big Picture
Inspires	Motivation	Creativity
Methods	Documents progress, Review, records, registers, reports, field visits, supervision.	In-depth analysis of achievements, Survey, study.
Periodicity	Continuous throughout the whole process	Intermittent; at the beginning or end of significant milestones.
Utilization	Alerts managers to problems	Provides managers with strategy and policy options
Supports	Implementation of Plan	Designing the next planning cycle.
Output Processing	Progress Indicators needs to be closely monitored by a few people.	Evaluation results needs to be discussed, processed and interpreted by all stakeholders

Approaches to monitoring

(1) Reporting & Feedback system.
(2) Supervisory visits.
(3) Review meeting.
(4) Special studies/survey /committee.

(1) Reporting & feedback System.

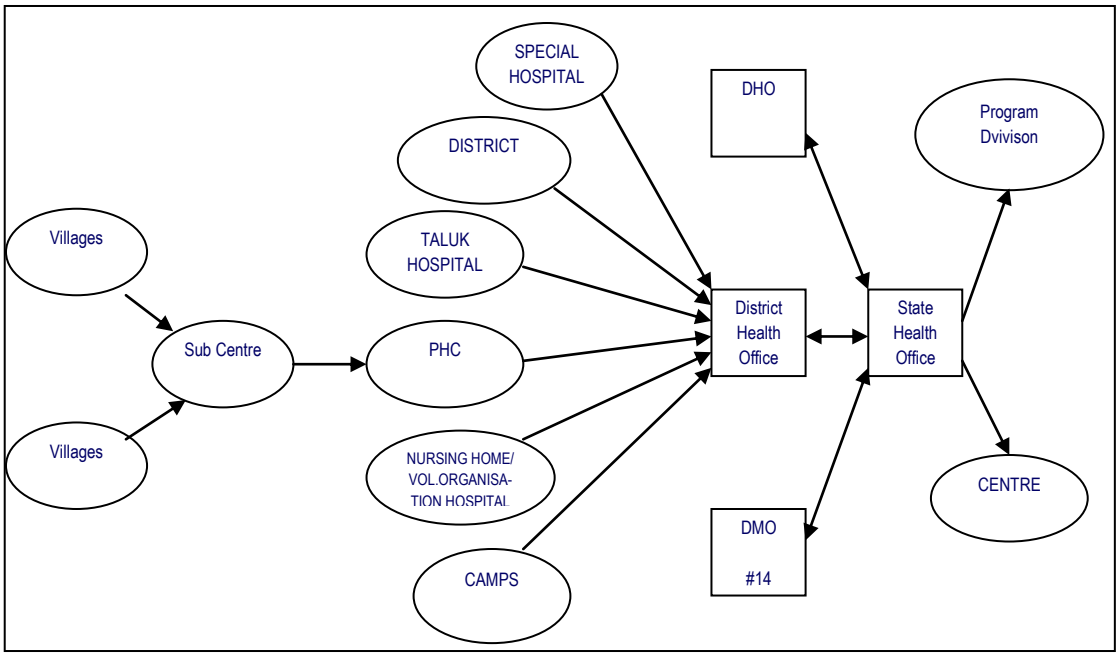
This is most common method used for monitoring. This is also renown as Management information System (MIS) In This system field (lower) organization reports data periodically (generally monthly hence many times MIS is refereed as Monthly Information System by same) on their activities and output to next higher level. Also in health system it is knows as Health Management Information System (HMIS) the higher level aggregate these data for all reporting unity and submits to its next higher level in return higher level organization gives feedback to below level organization.

The following table shows the Content included in the monthly reports under HMIS under RMNCH+A program.

From-To	Content
Sub Centre to PHC/CHC	**Performance report** – report on all aspects of performance Family planning, Immunization, Diarrheal diseases, Malaria, Leprosy, Blindness, Deaths of all types **Inventory report** – Malaria drugs, Family planning aids, Vaccines, ORS, Basic drugs and others
PHC/ Hospital to District	**Consolidated information** collected from Sub-Centre level **Family welfare**—Sterilizations, IUDs, OP, Condom users, MTP etc., - stock position and the details of the above staff wise and unit wise etc., **Vital statistics-** Births, still births, Deaths, maternal deaths, infant deaths, neo natal deaths **FW performance** like – AN cases, institutional deliveries, vaccination, cold chain equipment, surveillance on Diphtheria, measles etc., Medical intelligence data on 41 identified diseases from general fever to Ulcer of stomach to snake bites **Hospital IP and OP** statistics **Inventory report** – Malaria drugs, Family planning, Vaccines, ORS, Basic drugs and others.

	Vacancy Position
	IEC reports on contacts, group activities, T.B., MALARIA, LEPROSY monthly reports.
District to DHS	**Consolidated report** of all information collected from lower level institutions under the DMO
	Monthly summary of **program statistics** for each program - Malaria, TB, Leprosy, Blindness etc.,
	Summary statistics for Family Welfare Services (presently RCH)
	Inventory report – Malaria drugs, Family planning, Vaccines, ORS, Basic drugs and others.
	Vacancy Position
	IEC reports on contacts, group activities, T.B., MALARIA, LEPROSY monthly reports.
DHS to Centre	Monthly summary of **program statistics** for each program - Malaria, TB, Leprosy, Blindness etc.,
	Summary statistics for family welfare services (presently RCH)

Reporting Flow Chart under Reporting & Feedback System



A monthly reporting format to be reported by PHC/CHC/SDH under the NRHM is annexed fro reference. Similarly there are reporting formats from village to national level institutes to be reported on various components on different prescribed periods. Vertical Programs, like Revised National Tuberculosis Program, National AIDS Control Program, National Vector Borne Diseases are have their own set of reporting formats from peripheral institutes to national level institutes.

This system is looked very well but in practice it is having following lacunae.

(1) Too many formats and too many indicators in reporting format.
(2) Completeness, correctness & timeliness (quality) of reports.
(3) Output indicators are viewed without taking into account the input indicators.
(4) Lack of analysis of data & proper feedback from desired level.

However; with the advent & Information Technology (IT) this approach is revived. Many programs are converting their MIS from paper to computerized method. Some tell it as Computerized Management Information System (CMIS). National AIDS control program and Integrated Disease Surveillance Project (IDSP) are programs which use entire reporting through computerize techniques. Maternal and Child Tracking System in Reproductive, Maternal Child Health plus Adolescent (RMNCH+A) program use to track maternal and child immunization related services, District Logistic & supply Monitoring System (DLMI) is used for monitoring drugs and supply at district and below district.

Previously there was no assigned person or unit for collecting reports, compile them and analyze them. Somewhere if present it was vague. But in recent part, with the use of IT, at many states, program a dedicated unit / monitoring cells are created i.e. from district to central level.

(2). Supervisory visits:

"Which is not inspected is not done" Old saying

Supervision is made up of two word "super" & "vision"…. which means overseeing. It is much more then more seeing or viewing. Supervision is the process by which designated individuals or group of individuals oversee the work of others and establish the control to improve performance. The purpose of supervision is to guide and help the subordinates in discharging their duties. Supervision is not a fault finding activities or acting as a watchdog on subordinates. In hierarchical organization there is a one person over few to oversee the proper execution of tools.

Margaret Williamson has defined supervision as "a process by which workers are helped by a designated staff member to learn according to their needs, to make the best use of their knowledge and skills and to improve their abilities so that they do their jobs more effectively and which increasing satisfaction to themselves and the agency. Thus ssupervision is a formal relationship in which the supervisor imparts expert knowledge, making judgements of the trainee's performance, and acting as a gatekeeper to the profession.

Need of Supervision:-

It is at the field level goals and objectives are translated into the works. Hence it is utmost important to see that the activities being carried out are as per the set standards and procedures and in alignment with the goals and objectives. Thus; overseeing the activities at operational level one of the important managerial activities, which is called supervision.

A typical organization pyramid consists of four layers, three layers are of management, but at the bottom large base is consisting of operational staff. Plan, strategies, guidelines, standards, targets etc are prepared at higher level, these all needs to be transmitted & terms related to front line workers (field functionaries) who actually are carried out the activities. Firstly, it is important that field

functionaries need to understand the all aspects of a program/ organization from vision to action. Secondly it has to be seen that field functionaries have understood it properly and execute at the field level accordingly. If this impotent link is missed, there are all likely chances that the vision, direction, standards & targets will be missed. Hence it important to have a cadre which oversees the field level implementation, help the field function areas in caring out, the activities, through identifying mistakes, supportive for correction and getting tasks accomplished as per the standards in time bound manners. In health set up Male and Female Health Supervisor, Laboratory Supervisors, Sanitary Inspectors, Ward – incharge, Nursing Superintendent, Mukhya Sewika etc. are the typical supervisory post.

In typical business supervisors go by many titles; e.g. assistant manager, department head, Head coach, team leader, shift leader/captain, foreman,

Supervisory cadre is third level manager. Below are some examples for field supervisors

Sr.	**Program/ Institutes**	**Supervisor**	**Supervising (Operating Employees and work)**
1	Primary Health Center (RCH/NVBDCP)	FHS/FHV	Female health worker
		MPHs	Functioning at Sub Centres and below being Carried out by Male Health workers(multiple purpose health worker)
		Medical Officer	All Primary Health care related activities and health program being implemented at the PH Centre
		Block Health Officer or Taluka Health Officer	All Primary Health care related activities and health program being implemented through Primary Health Centres in the Block or taluka
		RCHO	Overall supervision and guidance for RMNCH+A Program in entire district.
2	RNTCP	LTS	Monitor the functioning and quality of Laboratory testing
		DTO	Overall supervision and guidance for RNTCP Program in entire district.
3	NACP	District Supervisor	ICTC – functioning
		Targeted Intervention Supervisors	Targeted Intervention projects being implemented by NGOs
		District Program Officers	All activities and serviced being carried out under NACP in the district.
4	ICDS	Mukhaya Sevika	All Anganwadis managed by Anganwadi Workers.
5	Hospitals	Ward In charge	Supervising the nursing and general administrative activities at words.
		Nursing Superintendent	Overall supervision of the Nursing care in the hospital.
		Sanitary Inspectors	Supervising cleaning staff for sanitation

At the level of district, Health Managers holding district supervisory post like District RCH Officer, District Tuberculosis officer, District Program Officer (HIV) District Surveillance Officer, District VBPC Officer etc. role of supervision and monitoring merges. These district level health managers are supervisory officers along with over all responsible for implementation and monitoring of the specific program/services.

Traditional Role of Supervisor :

Traditionally supervisors were to fault find using the checklist to find errors. They were least bothered about day to day challenges being faced by the operating employees. Instilling fear and reduction of incentives were often used as motivators. Thus supervisors are looked upon as enforces of policies, fault finders, inspectors, disciplinary actions takers, "Do as I say, not as I do" mentality type superiors.

However this traditional type of supervision was found counterproductive as resulting in demoralization of the operational staff and "mis-reporting" of results to avoid negative consequences.

Modern Role of Supervisor: Supporting Supervision:

Now it is viewed that supervisory tasks are not fault finding but are motivating the staff, providing feedback, resolving their performance problems, blending employee goals with work requirements, improving communications and keep employees informed, imparting training and skills to the them. A good supervisor is like a good trainer, coach, facilitator and mentor rather than superior.

To fulfill theses role supervisors require, technical, interpersonal, conceptual skills. Hence for effective supervisors must have good technical understanding, be able to intelligently use their emotions, understand employee needs when attempting to manage job performance, understand the dynamics of the organization and to recognize organizational politics.

Function of supervision:-

1. Translate the goals and objectives to organization to operational employees.
2. Match the operational employees' goals & objectives with that of organization.
3. Providing on field technical support in terms of understanding and skills.
4. Identify the mistake & help works to correct.
5. Facilitate to find the reasons behind poor performance & help in solve them.
6. Reduce the work related stress and motivate them.

Effective supervision:-

Quantity (coverage) & quality are largely dependent of the effective supervisory function For good & effective supervision following qualities in supervisors are expected.

1. Technical expects for the job
2. Personal integrate high moral ground & practice
3. Good interpersonal skills
4. Impartial & open to facts & new ideas.
5. Good understanding about field situation i.e. environment
6. Out of box thinking, innovative
7. Good initiative & readier
8. Ready to more in the field & interact with people/staff

Supervisory Methods

1. Field visits & interaction with stakeholders
2. Directly deserving field activities
3. Discussion with colleague/staff
4. Review of recodes/reports
5. Review meeting
6. Training/seminars

Components of supervision:

(1) Training
(2) Guide dance
(3) Demonstration
(4) Individual counseling
(5) Checking (observing)

Supervisory visit is one of the most frequently used approaches for monitoring after reporting & feedback. It provides an opportunity to…

(1) Validate the reporting
(2) On spot detection of deviation & initiation of corrections
(3) Understanding the field challenges.
(4) Asses the capacity of field staff
(5) Providing on field training
(6) Observe the actual process which could not be possible though reporting
(7) Motivate the field staff.

Supervisory visits should not be a fault finding visits. It should be rather supportive visit. It should examine quantitative as well as quantitative aspects of process such as skills, motivation of workers, and quality of work. Structured checklist should also used for supervisory visits. Some examples of checklist are given at the end of chapter.

(1) PHC MO monitory checklist
(2) NVBDCD monitory checklist
(3) Village Health and Sanitation monitory checklist

(3) Review meetings:

Review meetings are the most rewarding (cost effective) monitoring approach. However, meeting is not the substitute of the Reporting system or supervisory visits. It should be used methodologically. Generally for effective review meeting a good preparatory exercise are to be made. Some preparatory tasks are as below…

1. Unit (Institute/Taluka/district/state) wise analysis of report.
2. Gap analysis with focus on good performing & poorly performing units.
3. A well written agenda.
4. Study of supervisory visits reports.

Principles of the Review :

1. Collective discussion i.e. one way talk from higher level but by participation of both; who are reviewed and who are reviewing) in discussion
2. Diagnose the deviation
3. Identifying the corrective necessary actions

Advantages of review meeting:

(1) Lower level organizations know the vision, priority of higher organization and received directions for the same.
(2) Higher level organizations come to know the field realities and challenges.
(3) Provides opportunity to educate the staff about technical as well administrative aspects.
(4) Cross learning between different unit Takes place.
(5) Collective reviewing help in better analysis, reasoning and feasible solutions.
(6) One to one contact between Higher and low-level creates an effective channel for team building

Conducting a review meeting :

At field level i.e. districts and unit below districts i.e. Taluka, Primary Health center etc it has to conducted monthly while at regional, state, national level it is generally quarterly.

Conducting the review meeting is an art and science, but many time such review meetings are found directionless due to lack of knowledge and skills of how to conduct review meetings.

Some common lacunae observed in conduction of review meetings in Health system are as below..

1. Not regularly conducted
2. Proper agendas are not prepared
3. Technical preparatory activities i.e. analysis of reports & comprehensive presentation on it not done
4. Agendas are not followed
5. Instead of collective discussion if becomes one Way i.e. reviewer speaks his views and give comment without understanding the problems of lower staff.
6. It becomes data collation meeting rather than performance review meeting.
7. Attempt to find reasons behind (poor) performance not done and hence identification of the correcting actions is missed out.
8. Meeting is not linked with previews Meeting i.e. Action taken report on action suggested in previous meeting not reviewed.
9. Minutes are vaguely prepare i.e. what are the discussion points, findings & action suggested who will be responsible and time limit for completion of action etc are not mentioned. It contains general statement then specificity of action.
10. Minutes are not timely prepared and circulated.

(4) Special studies/surveys/Committee :

Studies and surveys are commonly used for the evaluation of the services or programs. But it is infrequently used as a monitoring approach in case of special situations or needs.

By default routine reporting system is designed to capture few indicators. Hence to get additional information in special situations or cater special needs studies/surveys are carried out. The purposes of such studies or surveys are mainly to find out the reasons behind the gap in performance (mainly input, process, output).

Civil Registry System Sample Registry System, are the additional monitoring system of special surveys to know the special health related data, monitor fertility indicators, ascertain the maternal, infant child death and causes of death.

Committees for Maternal Death Reviews, Adverse Effect Following Immunization, Infant/Child death etc are the examples of the special committees to know the factors behind the specific event, in depth qualitative study, thus diagnosis the problem and recommend the specific measures.

Special studies mainly targeting to know the outcomes or impacts with the objectives to know that effectiveness of the programs/strategies/interventions carried out by the external agencies are part of evaluation. National Family Health Survey, District Level Household Survey, Coverage Evaluation Survey,

Brief of such special studies and surveys are given below.

Census

The Indian Census is the **largest single source of a variety of statistical information on different characteristics of the people of India**. With a history of more than 130 years, this reliable, time tested exercise has been bringing out a veritable wealth of statistics every 10 years, beginning from 1872 when the first census was conducted in India non-synchronously in different parts. To scholars and researchers in demography, economics, anthropology, sociology, statistics and many other disciplines, the Indian Census has been a fascinating source of data. The responsibility of conducting the decennial Census rests with the Office of the Registrar General and Census Commissioner, India under Ministry of Home Affairs, Government of India. The Census Act was enacted in 1948 to provide for the scheme of conducting population census with duties and responsibilities of census officers.

The **15th Indian census** was conducted in two phases, house listing and population enumeration. House listing phase began on 1 April 2010 and involved collection of information about all buildings. Information for National Population Register was also collected in the first phase, which will be used to issue a 12-digit unique identification number to all registered Indians by Unique Identification Authority of India. The second population enumeration phase was conducted from 9th to 28th February 2011. Census of 2011 marks the first time that biometric information was collected. According to the provisional reports released on 31st March 2011, the Indian population increased to 1.21 billion with a decadal growth of 17.64%. Adult literacy rate increased to 74.04% with a decadal growth of 9.21%. The motto of census 2011 was 'Our Census, Our future.

SRS (Sample registration system)

In order to unify the civil registration activities, the Registration of Births & Deaths Act, 1969 was enacted. Despite having the registration of birth & death compulsory under the statute, the level of registration of births and deaths under the Act has continued to be far from satisfactory in several states/UTs. With a view to generate reliable and continuous data on these indicators, the **Office of the Registrar General, India, initiated the scheme of sample registration of births and deaths in India popularly known as Sample Registration System (SRS) in 1964-65 on a pilot basis and on full scale from 1969-70**. The SRS since then has been providing data on regular basis.

The SRS is based on a system of dual recording of births and deaths in fairly representative sample units spread all over the country. The SRS provides annual estimates of (a) population composition, (b) fertility, (c) mortality, and (d) medical attention at the time of birth or death which gives some idea about access to medical care. The population composition from SRS coupled with the decennial census counts, enables fairly reliable estimate of population in the intercensal periods. Average time to publication of SRS annual

reports is about two years. SRS estimates are generally valid and reliable for the country as a whole and for bigger states with more than 10 million populations. Recently the sample size of SRS has been increased to allow for estimates by natural divisions within the bigger states. The last SRS report that is available is of 2010-12.

NATIONAL FAMILY HEALTH SURVEYS (NFHS)

The National Family Health Surveys (NFHS) are nationwide surveys conducted with a representative sample of households throughout the country. The Ministry of Health and Family Welfare (MOHFW), Government of India (GOI), initiated the NFHS surveys to provide high quality data on population and health indicators. The three NFHS surveys conducted to date are a major landmark in the development of a demographic and health data base for India. **An important objective of the NFHS surveys has been to provide national and state estimates of fertility, family planning, infant and child mortality, reproductive and child health, nutrition of women and children, the quality of health and family welfare services, and socioeconomic conditions**. The NFHS surveys use standardized questionnaires, sample designs, and field procedures to collect data. The information provided by NFHS surveys assists policymakers and programme administrators in planning and implementing population, health, and nutrition programmes. The MOHFW designated the International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for each of the three rounds of NFHS. Each round of NFHS has had two specific goals: a) to provide essential state and national level data to monitor health and family welfare programmes and policies implemented by the Ministry of Health and Family Welfare and other ministries and agencies, and b) to provide information on important emerging health and family welfare issues.

NFHS-1

The country's first National Family Health Survey (NFHS-1) was conducted in 1992-93. An important objective of NFHS-1 was to strengthen the survey research capabilities of the 18 Population Research Centres (PRCs) in the country.

NFHS-2

It was conducted in 1998-99, was an important step in strengthening the database for implementation of the Reproductive and Child Health (RCH) approach adopted by India after the International Conference on Population and Development (ICPD) in 1994 in Cairo. In addition to the population and health components covered in NFHS-1, NFHS-2 collected information on the quality of health and family welfare services, reproductive health problems, the status of women, and domestic violence. Height and weight measurements were extended to cover ever-married women. Ever-married women and their children below three years of age had their haemoglobin levels measured to provide the first national estimates of the prevalence of anaemia.

NFHS-3

It was conducted in 2005-06. In addition to the indicators covered in NFHS-2, NFHS-3 provides information on several new and emerging issues such as perinatal mortality, male involvement in the use of health and family welfare services, adolescent reproductive health, high risk sexual behaviour, family life education, safe injections, and knowledge about tuberculosis. A major new component of NFHS-3 is blood testing for HIV prevalence and behaviour-related information among adult men and women. NFHS-3 also included never married women age 15-49 and both ever-married and never married men age 15-54 as eligible respondents. Interviews were conducted with 124,385 women age 15-49 and 74,369 men age 15-54 from all 29 states. Throughout India, 102,946 women and men were tested for HIV in NFHS-3.

District Level Household Survey (DLHS)

The district being the basic nucleus of planning and implementation of the RCH programme, Government of India has been interested in generating district level data on utilization of the services provided by government health facilities, other than that based on service statistics. It is also of interest to assess people's perceptions on quality of services. Therefore, it was decided to undertake District Level Household Survey (DLHS) under the RCH programme in the country. It is a household survey at the district level .The Ministry of Health and Family Welfare (MoHFW), Government of India has designated the International Institute for Population Sciences (IIPS), Mumbai as the nodal agency for conducting the District Level Household and facility Survey (DLHS).

The Round 1 of DLHS survey was conducted during the year 1998–99 in two phases (each phase covered half of the districts from all states/union territories) in 504 districts. Round 2, survey was completed during 2002-04 in 593 districts as per the 2001 Census. Round 3 was completed during 2007-08 in 601districts from 34 states and union territories of India. And currently round 4 is ongoing since 2012(2012-13).

The DLHS is designed to provide information on family planning, maternal and child health, reproductive health of ever married women and adolescent girls, utilization of maternal and child healthcare services, In addition, DLHS-3 & 4 also provides information on new-born care, post-natal care within 48 hours, role of ASHA in enhancing the reproductive and child health care and coverage of Janani Suraksha Yojana (JSY). First two rounds in which only currently married women age 15-44 years were interviewed, DLHS -3 & 4 interviewed ever-married women (age 15-49) and never married women (age 15-24) also. An important component that started from DLHS-3 is the integration of Facility Survey of health institution (Sub centre, Primary Health Centre, Community Health Centre and District Hospital)

Coverage Evaluation Survey (CES)

The Coverage Evaluation Survey (CES) 2009 was conducted to assess the impact of the National Rural Health Mission on improving maternal, newborn, and child health services in India. It was conducted in all states and union territories primarily focused on immunization of women and children, maternal care services, breastfeeding practices and child nutrition, and child morbidity. MOHFW, Government of India constituted a Technical Advisory Committee (TAC) to provide oversight and coordinate various activities related to CES-2009 including sampling, survey methodology, questionnaires, quality guidance, tabulation plan, data analysis and final tabulation data presentation.

The questionnaire for CES 2009 was constructed such that the data would align with previous large surveys including the District Level Household Survey (DLHS3), National Family Health Survey (NFHS3), and include National Rural Health Mission programs and initiatives. Two bilingual questionnaires were used to interview mothers of children aged 12-23 months and women who gave birth during the 12 months prior to the survey, and a third was used to collect a village profile.

HIV sentinel surveillance

India has one of the world's largest and most robust HIV Sentinel Surveillance (HSS) Systems. Since 1998 it has helped the national government to monitor the trends, levels and burden of HIV among different population groups in the country and craft effective responses to control HIV/AIDS. It is implemented across the country with support from two national institutes and six regional public health institutes of India.

The 13 round of HSS was implemented during 2012-13 at 763 sites, including 750 Antenatal clinics (ANC) Surveillance Sites, covering 556 districts across 34 States and Union Territories (UTs) in the country. For High Risk Groups (HRGs) and Bridge Populations, a Nationwide Integrated Biological and Behavioral Surveillance (IBBS) is being carried out as a strategic shift to strengthen the surveillance system among these groups. It provides crucial evidence base for planning and implementation of programmatic initiatives under NACP-IV. Data from HSS will be instrumental in district re-categorization and subsequent decentralized evidence-based planning and implementation. The data will be used to estimate HIV prevalence, incidence and burden, to serve as a baseline under NACP-IV and provide information.

The methodology adopted during HSS was Consecutive Sampling with Unlinked Anonymous Testing. Specimens were tested for HIV following the Two Test Protocol. A total of 2, 95,246 ANC samples were tested from 741 valid sites during HSS 2012-13.

Multiple Indicator Cluster Survey (MICS)

The MICS was originally developed in response to the World Summit for Children to measure progress towards an internationally agreed set of mid-decade goals. The first round of MICS was conducted around 1995 in more than 60 countries. Since then, the MICS has enabled many countries to produce statistically sound and internationally comparable estimates of arrange of indicators in the areas of health, education, child protection and HIV/AIDS. MICS findings have been used extensively as a basis for policy decisions and programme interventions, and for the purpose of influencing public opinion on the situation of children and women around the world.

MICS surveys are typically carried out by government organizations, with the support and assistance of UNICEF and other partners. Starting with MICS 4 (2009-11), UNICEF now provides assistance to countries at more frequent intervals - every three years instead of every five years. This provides the opportunity for countries to capture rapid changes in key indicators, particularly the MDGs.

Maternal Death Review (MDR)

Maternal Death Review (MDR) as a strategy has been spelt out clearly in the RCH – II National Programme Implementation Plan document. It is an important strategy to improve the quality of obstetric care and reduce maternal mortality and morbidity. The importance of MDR lies in the fact that it provides detailed information on various factors at facility, district, community, regional and national level that are needed to be addressed to reduce maternal deaths. Analysis of these deaths can identify the delays that contribute to maternal deaths at various levels and the information used to adopt measures to fill the gaps in service.

Out of the various approaches that can be used for the investigation of maternal death, Government of India has decided to take up Community based maternal death review (CBMDR) and the Facility based maternal death review (FBMDR) which would help in identifying the gaps in the existing health care delivery systems, prioritize and plan for intervention strategies and to reconfigure health services.

Verbal autopsy

Verbal autopsy (VA) is a method of collection of information about a deceased individual through questionnaire or interview of household members, friends and others who cared for the person at home or is familiar with the circumstances of death. When deaths occur outside of a hospital or occur in facilities with limited diagnostic capability, VA has been increasingly proposed and used to measure the cause of death patterns. It may provide important public health information about factors related to deaths and actions taken to address the medical problems and prevent the death. It is used mainly for maternal and infant death.

The past two decades have seen a proliferation of interest, research and development in all aspects of the VA process, including data-collection systems where VA is applied, questionnaires' content and format, targeting of different age groups, cause of death assignment process, coding and tabulation of causes of death and of validation of VA instruments. In 2007, needs and demands for standardization led to the 2007 publication of the WHO VA standards, which many researchers have adopted.

To summarise about monitoring techniques, it is to be kept in mind that no single approach is complete and good monitoring systems uses all the approaches, especially first three approaches.

M&E System :

A functional M&E system is one of the cornerstones, of a Health system's response to fighting a disease. It provides the strategic information needed to make good decisions for managing and improving program performance, formulating policy and advocacy messages and planning programs better. It also generates data to satisfy accountability requirements. Many countries are well underway with developing and implementing national M&E systems. Systematic M&E assessments, a recent phenomenon, have helped to determine the strengths and weaknesses of country systems and to develop M&E plans and budgets for strengthening a M&E system in a coordinated way among all stakeholders.

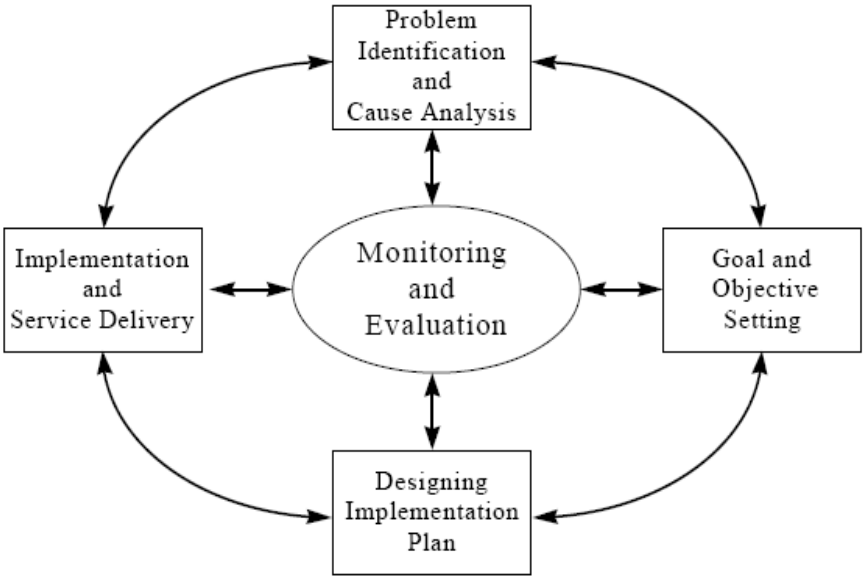
M&E framework :

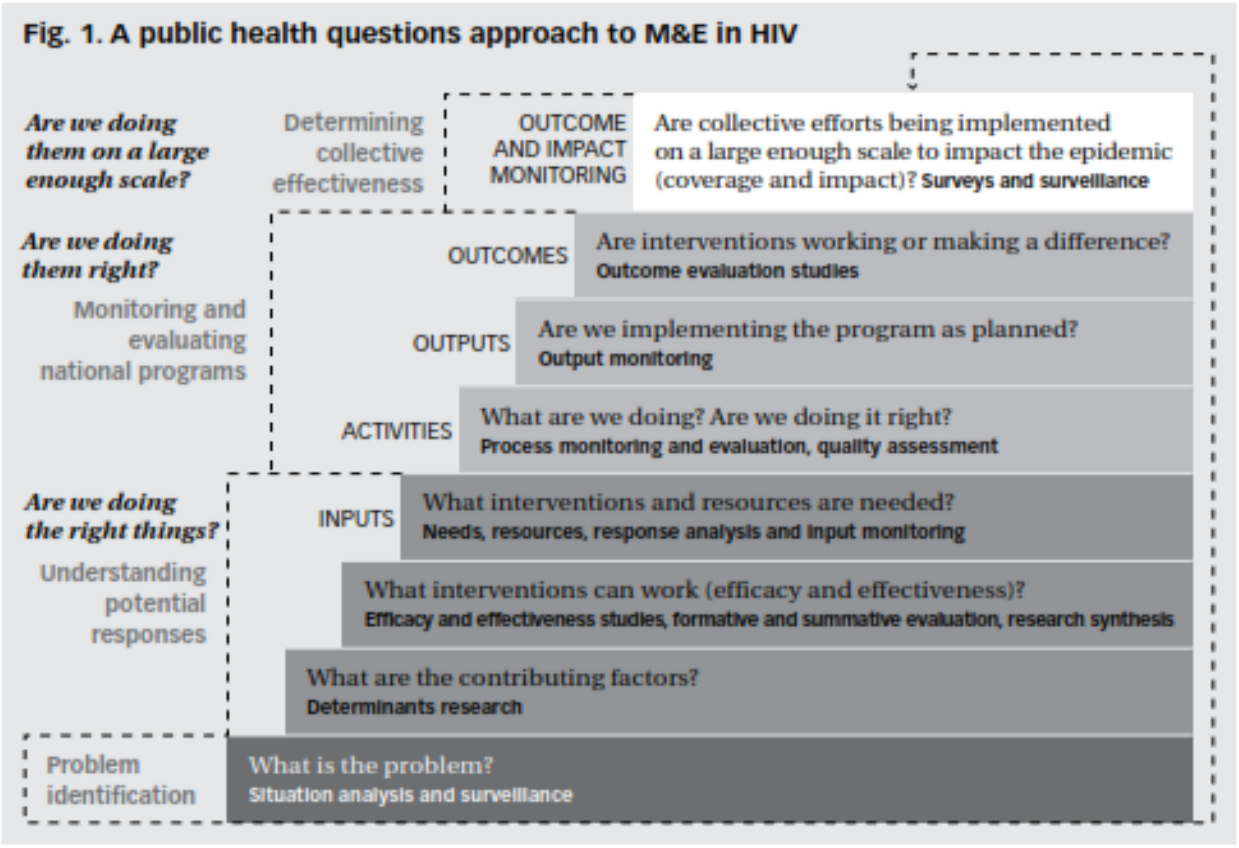
Varying frameworks are applied to M&E. During the past few years, one largely agreed framework has commonly been used: the input–activity–output–outcome–impact framework. This reflects indicators used at different levels to measure what goes into a program or project and what results are achieved. For a program or project to achieve its goals, inputs such as money and staff time must result in outputs such as new or improved services, trained staff, people reached with services, etc. These outputs are the result of specific activities, such as training for staff. If these outputs are meaningful and are achieved in the populations intended, the program or project is likely to have positive effects or outcomes in the medium or longer term, such as increased condom use with casual partners, increased use of insecticide-treated nets, adherence to TB drugs or later age at first sex among young people. These positive outcomes should lead to changes in the long-term impact of programs, measured in fewer new cases of HIV, TB or malaria and related burden of disease among those infected and affected (such as orphans and vulnerable children or widows). For HIV, a desired impact among those infected includes quality of life and life expectancy.

M&E Framework :

Level	Description	Frequency
Inputs	Resources that are put into the project. Lead to the achievement of the outputs	Continuous
Outputs	Activities or services that the project is providing. Outputs lead to outcomes	Quarterly
Outcomes	Changes in behaviors or skills as a result of the implemented project. Outcomes are anticipated to lead to impacts	2-3 years (short to medium term)
Impacts	Measurable changes in health status, e.g. reduced STI/HIV transmission and reduced AIDS impact, population growth rate, reduction in death due to TB. Impact results are effects of the intervention	3-5 years (long term)

Relationship of M&E Framework with Program Management Cycle

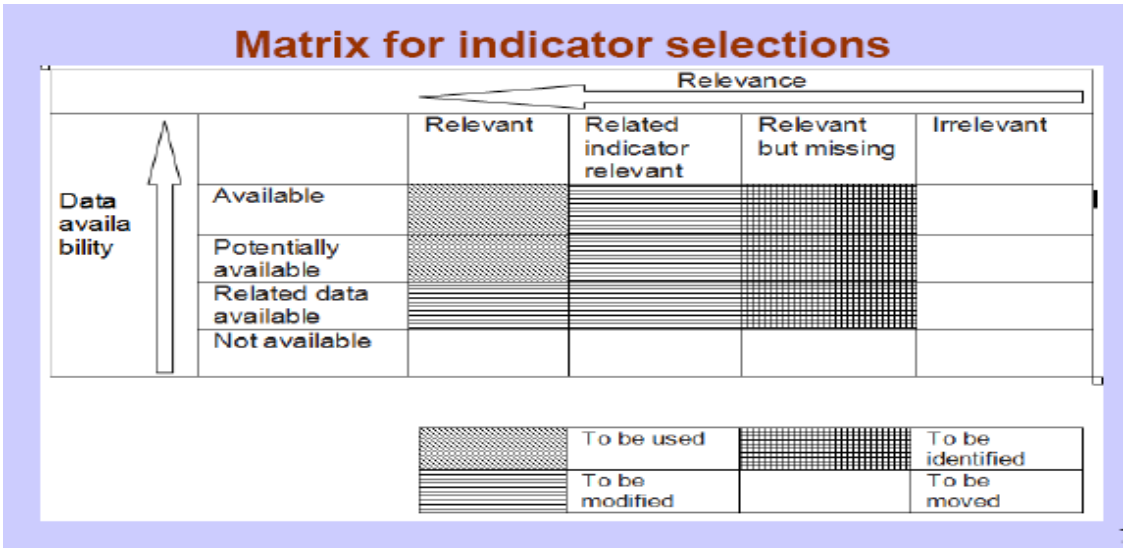




Source: Organizing framework for a functional national HIV monitoring and evaluation system. Geneva, UNAIDS, 2008 (http://siteresources.worldbank.org/INTHIVAIDS/Resources/375798-1132695455908/GROrganizingFrameworkforHIVMESystem.pdf, accessed 15 September 2008).

Setting Indicators :

An indicator is a standardized, objective measure that allows, a measure of the progress toward achieving program goals, a comparison among health facilities, a comparison among countries, a comparison between different time periods,.



Characteristics of Indicators : (SMART)

- ***Specific*** – target a specific area for improvement.
- ***Measurable*** – quantify or at least suggest an indicator of progress.
- **Acceptable** – Acceptable to the health system
- ***Realistic*** – state what results can realistically be achieved, given available resources.
- ***Time-related*** — specify when the result(s) can be achieved.

Tips on choosing indicators

Indicators should:

- be able to measure performance and provide useful strategic information;
- be consistent with the proposed objectives and activities;
- be few in number: up to 15 output or coverage indicators and 2–5 impact or outcome indicators;
- be clear, with well-defined numerators and denominators (ideally using standard definitions) to avoid different interpretations during their measurement and double counting;
- be consistent with the M&E plan and be supported by the workplan and budget;
- be selected according to the pace of implementation and frequency of data collection so that results are available as per the management need and planning and implementation cycle.
- be harmonized across multiple grants for the same Program, diseases and same activity; and
- include the "top ten" indicators relevant to the program.

There should also be a balance between indicators that could be reported on a routine basis and those reported through sentinel surveillance or surveys

Methods of data collection

After setting up M&E framework, the first step in M&E is systematic data collection. Generally, the data for measuring the indicators come from routine data sources. The frequency of data collection depends on the data needs at the national, sub national and service delivery levels, taking into account both a reasonable time frame for an expected change and capacity for M&E. It is particularly important to include routine data collection and reporting of program-related data for management purposes (quarterly, semiannually or annually) and to plan at an early stage for population-based data collection efforts addressing the medium-term outcomes (every one to five years).

Table below provides suggested data collection schedules and related measurement methods for the different levels of indicators in the input–activity–output–outcome–impact result chain.

Table : Suggested reporting schedules and data collection methods for different types of indicators.

Type of Indicator	Recommended Frequency of reporting	Examples of Data Collection Methods
Input or Process	Regularly, Such as monthly, quarterly, semiannually or annually,	Routine Methods • Health Services Statistics, • Administrative Records. Survey • Health Facility Surveys, Health Facility Census
Output	Regularly, such as monthly; Quarterly, semiannually or annually	Routine Methods • Health Services Statistics, • Training Records Survey • Health Facility Surveys, • Behavioural Surveillance Health Facility Census
Outcome / Impact	1-5 years (Reporting frequency depends upon data collection method and need).	Routine Methods* • Health Services Statistics, • Civil Registration(Birth & Death etc.) • Surveillance Survey • Population based survey** • Health Facility Surveys*, • Behavioural Surveillance Qualitative methods*

*Every 2-3 years, ** 3-5 Years

Table below briefly describes the most frequently used data collection methods and tools (routine and nonroutine monitoring).

Measurement tools	Main characteristics	Examples of measurement methods used
Health service statistics	Routine data reported through two main sources: • Routine data collected from established government structures but also encompassing data from the health facilities run by private sector and civil society	Data registered in health facilities including through client registers, client cards, client prescriptions, stock cards or registers, dispensing logs and tally sheets.

	• Program implementation records – source documents maintained at a service delivery point. This category mainly applies to nongovernmental organizations and civil society organizations offering services outside the health facility, but similar records may be found at established government structures and the private sector	Data registered outside health facilities, including client registers and client cards
Administrative records	Source documents that relate to the administrative running of service delivery points. This category mainly applies to civil society organizations, but similar records can be found at established government structures and the private sector.	Stock cards, inventory sheets, pre- and post- tests related to training, pharmacy records
Health facility census	An official count or enumeration of all health facilities. It collects information on the physical features of health facility, personnel, and service provision at the facility. Health facility censuses are carried out infrequently as they are extremely expensive	Direct observation Questionnaire using close-ended questions
Health facility survey	Survey targeting a representative sample of health facilities to gather information on the availability of human resources, equipment, commodities and drugs and the type of services delivered	Questionnaire using close-ended questions. Direct observation Examples of health facility surveys include: – Site-based facility surveys, such as HIV/AIDS Service Provision Assessment – SAMS (Service Availability Mapping Surveys)
Civil registration	Administrative records of vital events such as births, deaths, fetal deaths, marriages and divorces that occur among a population. Most countries have legal provisions within their constitutions to ensure that vital	Household surveys with verbal autopsy modules used to estimate proportional causes of death Birth certification

	events are recorded	
Sentinel site surveillance	Collect prevalence information from populations that are more or less representative of the general population (such as pregnant women) or populations considered to be at high risk of infection and Transmission	HIV serosurveillance in pregnant women or in identified groups at high risk. It can be linked or unlinked anonymous testing, with or without informed consent
Qualitative methods	Determine "what exists" and "why it exists" rather than "how much of it there is". Through allowing the people to voice their opinions, views and experiences in the way they want, qualitative methods aim at understanding reality as it is defined by the group to be studied without imposing a preformulated questionnaire or structure (always developed by the researchers) on the population Systematic research techniques for program decision-making to achieve a specific outcome.	In-depth interview (individuals, focus groups, key informants) Direct observation Interactive or projective technique (comments on posters, open-ended story or comment on story, role-play) Questionnaire using close-ended questions In-depth Interview (individuals, focus groups and key informants)
Operations research	Operations research provides policymakers and managers with evidence that they can use to improve program operations. It is distinguished from other kinds of research by the following characteristics: • *It addresses specific problems within specific programs, not general health issues.* • *It addresses those problems that are under control of managers, such as program systems, training ,pricing and provision of information.*	Direct observation Data registered inside and outside health Facilities Examples of operations research include: •*Coverage ,quality of services including diagnostic and dispensing services , referral systems and information, education and communication programs* •*Managerial issues including record-keeping, information dissemination and ethical issues* • *Community and societal issues including*

		stigma, affordability and participation barriers
Population based surveys	A survey based on sampling of the target or general population, generally aiming to represent the characteristics, behavior and practices of that population. It requires sufficient sample size to represent the larger population and to be analyzed in subgroups by age, sex, region and target population group.	Questionnaire using close-ended questions Testing where applicable Examples of population-based surveys include the following: Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS) and DHS+, AIDS Indicator Surveys (AIS), behavioral surveillance surveys (BSS), Priorities for Local AIDS Control Efforts (PLACE), Sample Vital Registration with Verbal Autopsy (SAVVY)
Population estimates	Population estimates are produced annually using methods that account for changes in the number of births and deaths, as well as changes in the epidemiology of diseases. Such estimates often serve as the denominators of indicators.	National bureau of statistics reports WHO disease estimates by country

Routine reporting

Routine systems for tracking the demand for and supply of services need to be in place at the national, subnational and service delivery levels. Standardized data from all providers, including those based at health facilities and those not based at health facilities (community based), should be collected on a routine basis and regularly reported. Data that need to be captured through routine reporting include inputs (resources, such as staff, funds, materials, activities and supplies), activities (interventions and services, such as training and treatment) and outputs (immediate results, such as number of staff trained and number of clients treated). The routine data reports in many countries are not comprehensive, as they largely lack data on services provided by the civil society and the private sector.

The health information system in a country should routinely track program data (inputs, activities and outputs) from all health facilities that are run by both the public and private sector and the civil society. Strengthening may be needed to ensure valid and reliable data

for all types of indicators. These include input data (information on health workforce, budget and stock management), output data and impact data (such as a patient monitoring system or sentinel surveillance information). Although significant progress has been made in setting up functional systems to track, analyze and report on service delivery through public health facilities, further and increased efforts are required for monitoring services provided in facilities run by the private sector and the civil society. To facilitate regular and complete reporting, the health information system should have the following characteristics.

- The data collection forms should be simple and user-friendly to avoid overburdening health workers, who often work across the different diseases and health programs.
- Information collection efforts across different health programs should be harmonized.
- Only information that is used for program management and decision-making should be collected.
- Data collection methods and tools should be harmonized between the public sector, private sector and civil society.
- The reporting system at the regional and national levels should be able to aggregate data from the various more localized sources (public sector, private sector and civil society).

Monitoring community-based services (outside facilities)

Community-based services in this toolkit refer to services provided outside health facilities, such as support to orphans and vulnerable children, managing fever in homes and directly observed treatment of TB. They include services provided both by government and nongovernmental service providers. Depending on country-specific scenarios, several steps need to be taken to strengthen the monitoring of services at the community level;

Surveillance system

The basis for a surveillance system is “data collection for action”. As such, the system should be useful, simple, flexible, integrated and action oriented. Surveillance focuses mostly on the main causes of morbidity, mortality and disability.

Table below shows the main sources of data for surveillance.

Sources	Diseases	Periodicity of reporting
Routine reports	All diseases	Weekly, Monthly
Epidemic reports	Cholera, meningitis, yellow fever, malaria, viral hemorrhagic fever, measles	Immediately, then weekly
Case-based reports	Malaria (in areas targeted for elimination)	As it occurs, immediately
Sentinel-site reports	HIV seroprevalence HIV seroprevalence among TB patients Malaria (drug resistance)	Monthly, quarterly or annually

Civil registration

Civil registration systems collect routine information about the number of births and deaths and, in some countries, link deaths to an established cause continuously over time. Vital statistics are essential to inform policy, planning and research and to guide interventions and evaluate the impact of the programs. Data for several impact indicators can be collected through civil registration systems, including the numbers and rates of deaths attributed to malaria, TB or HIV (with disaggregation by age and sex).

Surveys

Population-based surveys, health facility surveys or behavioral surveys are mostly used for data collection for outcome and impact indicators. Surveys require careful, detailed and long-term planning to be able to secure sufficient funding and adequate expertise (this is often underestimated). Program managers and partners should collectively discuss and endorse the data collection agenda for surveys and include it in the M&E plan (long-term) and annual workplan and budget (on a yearly basis). In this process, data needs that are carefully mapped and those that can be addressed in the same survey should be consolidated to avoid multiple disparate data collection efforts where possible. This will help managers and partners to leverage ongoing efforts and maximize opportunities to share expertise and costs. This will require strong leadership from the M&E working group or unit in the respective ministries.

Monitoring program outcome and impact

The analysis of program achievements culminates in the monitoring of outcomes and impact with the objective of assessing whether interventions are making a difference and are done on a large enough scale. At the outcome level, this includes assessing the coverage of the interventions (such as for malaria) or the change in behavior in the targeted population groups (such as for HIV). This often relies on population-based surveys, although coverage can also be assessed in terms of the number of people reached with services if the denominator (that is, those who need services) for the target population can be determined or reliably estimated. Commonly used measures for monitoring impact are mortality, incidence, prevalence and survival. Impact measurement usually relies on three main sources of information:

1. clinical, hospital or sentinel site records: these data allow the assessment of survival post-treatment, case notification and disease-related mortality for specific populations;
2. Civil registration, which provides information on mortality and cause of death; and
3. population-based surveys for assessing prevalence and mortality.

Mortality tends to be the gold standard for assessing the impact of a disease control program, as it captures prevalence, incidence and survival dimensions. Mortality also measures the reduction of disease-attributable mortality in the target population. However, mortality data are collected from civil registration systems, and the number of high-burden countries with reliable registration systems is limited. A survey (such as assessing all cause mortality among children younger than five years), possibly using verbal autopsy, is another method of collecting death-related data. Verbal autopsy is, however, often associated with various levels of bias.

Since the main objective of measuring impact and outcome is to assess the change in disease burden, change in coverage or behavior related to the interventions, having baseline data before program implementation is essential for comparison. of this toolkit presents indicators and methods for measuring outcome and impact.

Importantly, impact measurement is often complicated by the fragmentation of information systems by disease-specific programs or projects. Maximizing the integration of different systems across a disease and even programs is essential, as the instruments for data collection are often the same. This can be achieved, for example, by aligning global survey agendas with national health planning timetables. Harmonizing such timetables among the respective diseases would allow resources to be used even more efficiently. This requires institutionalizing the impact measurement agenda under national leadership and ensuring sustainable investment in systems to measure impact. This includes filling gaps in health information systems, supporting the implementation of surveys and strengthening vital and community registration systems.

Evaluation and operations research

Managing the response requires frequent collection and analysis of data on the epidemic situation and the local response to assess whether the right things are being done, whether they are done right and whether there are better ways of doing them. This may include assessing the costs and benefits of the different interventions and their feasibility given the available human and financial resources. Matching the response to the current (and evolving) epidemiology of the diseases, the findings from the strategic information and the resources available will enable program planners to set priorities among interventions. It will also provide an opportunity to set ambitious, realistic and Measurable targets.

Addressing data quality issues

Data quality includes various dimensions, such as:

- **accuracy:** the data measure what they are intended to measure;
- reliability: the measures do not change according to who is using them and when or how often they are used;
- **precision:** the data have the necessary detail;
- **Completeness :** all-inclusive and not partial;
- **Timeliness :** up-to-date and available on time;
- **Integrity:** no deliberate bias or manipulation; and
- **Confidentiality :** clients are assured that their data will be maintained according to national and/or international standards for data.

Although increasing attention is being paid to the quality of data produced by M&E systems, these efforts need to be strengthened further. Without reliable data, program management will be based on less than optimal information, lead to wrong decisions and eventually result in wasting scarce resources. Limited data quality also has implications for the availability of funds from donors. Countries should develop and adopt a data quality framework and incorporate data quality assurance in routine data collection mechanisms. In addition, regular data quality audits should be performed to complement routine quality assurance procedures. Using both methods will help to identify gaps earlier on and plan for timely remedial actions. Methods such as the Data Quality Audit Tool have been developed in collaboration with partners. A Routine Data Quality Assessment Tool (RDQA) is being developed for use by countries to facilitate quality assurance of their routine data. Continued training and supportive supervision should be an integral part of the quality assurance process.

Monitoring the quality of services

The quality of services provided affects the outcomes of various health programs. Activities and services that are of poor quality and not delivered according to recognized standards will have suboptimal results, even with high coverage. This section outlines the importance of measuring the quality of services and provides recommendations on how to address the challenges associated with it. It also provides references on several quality management methods, tools and guidelines that have been developed to help improve quality.

Why measure quality?
Service quality can be measured with three mutually complementary objectives.

1 **Improving quality at the service provision level :** This concerns providing services with established international or national standards of care. Depending on the type of service, standards may be defined in various ways: standard operating procedures (such as standard operating procedures for blood safety), guidelines (such as WHO guidelines on initiating antiretroviral therapy based on CD4 count) and protocols (such as malaria treatment protocols with artemisinin based combination therapy).
2. **Improving program outcomes.** In some cases the achievement of program outcomes could be used as a proxy to assess the quality of services. Poor performance of the outcome indicator should trigger program managers to initiate detailed assessment of the quality of specific services using the output and coverage indicators.
3. **Improving accountability.** Quality can also be measured and used as a barometer. For decision makers and donor agencies to demonstrate the overall quality of their portfolios at the national, regional and global levels and to monitor changes in quality over time or compare between programs, countries and regions.

Institutionalizing the review process

The review is a comprehensive, systematic assessment of the overall response to a disease carried out and as an integral part of a national strategic programming cycle. The annual review collects results for all indicators for the period and includes a self-assessment of progress, barriers, successes and failures. It allows program managers to improve decision-making, set priorities among interventions and generate resources. In addition, donors use the results of annual review as a source of contextual information to interpret the results achieved versus the targets.

High-quality routine and non-routine data should be made available for this review to inform the analysis and decision-making process. The use of data from evaluation and operations research should be encouraged and, increasingly, the analysis of equity in access to services should be addressed, taking into account specific age groups and gender and the review of quality services delivery. Moreover, the review process is an opportunity to follow up on the progress in implementing the annual workplan, including specific interventions aimed at strengthening the health system (in particular, strengthening the M&E system). It also offers a forum to share information on trends and best practices among all stakeholders.

The findings of the review are summarized in a review team report that is shared with the relevant stakeholders for consensus and follow-up. Successful follow-up will benefit from a robust planning and preparatory phase of the review with relevant partners and stakeholders. This is when commitment to and ownership of the review process and the review recommendations can be generated. It is advisable to nominate a technical steering group that guides and oversees planning and implementation of the elements of the annual review and follow up on recommendations.

Annexure : I : Reporting formats under HMIS (Reporting & Feedback Mechanism)

Ministry of Health & Family Welfare

(Monitoring & Evaluation Division)

Monthly Format for CHC-SDH-DH and Equivalent Institutions

State:			*Due for submission on 5th of following Month*	
District:		Month:		MMM
Block:		Year:		YYYY
City/ Town/ Village:				
Facility Name				
Facility type	Public ○ Private ○			
Location	Rural ○ Urban ○			

Part A.	REPRODUCTIVE AND CHILD HEALTH	Numbers reported during the month	Ref No.
M1	**Ante Natal Care Services (ANC)**		**M1**
1	**Total number of pregnant women Registered for ANC**		*1.1*
1.1	*Of which Number registered within first trimester*		*1.1.1*
2	New women registered under Janani Suraksha Yogna		*1.2*
3	Number of pregnant women received 3 ANC check ups		*1.3*
4	**Number of pregnant women given**		*1.4*
4.1	TT1		*1.4.1*
4.2	TT2 or Booster		*1.4.2*
5	Total number of pregnant women given 100 IFA tablets		*1.5*
6	**Pregnant women with Hypertension (BP>140/90)**		*1.6*
6.1	New cases detected at institution		*1.6.1*
6.2	Number of Eclampsia cases managed during delivery		*1.6.2*
7	**Pregnant women with Anaemia**		*1.7*
7.1	Number having Hb level<11 (tested cases)		*1.7.1*
7.2	Number having severe anaemia (Hb<7) treated at institution		*1.7.2*
M2	**Deliveries**		*M2*
8	**Deliveries conducted at the facility**		*2.2*
8.1	*Of which Number discharged under 48 hours of delivery*		*2.2.1*
8.2	**Number of cases where Janani Suraksha Yogna incentive paid to**		*2.2.2*
(a)	*Mothers*		*2.2.2 (a)*
(b)	*ASHAs*		*2.2.2 (b)*
(c)	*ANM or AWW (only for HPS States)*		*2.2.2 (c)*

Part A.	REPRODUCTIVE AND CHILD HEALTH	Numbers reported during the month		Ref No.
M3	**Number of Caesarean (C-Section) deliveries**			*M3*
9	C -Section deliveries performed at facility			*3.1.2*
M4	**Pregnancy outcome & details of new-born**			*M4*
10	Pregnancy Outcome (in number)			*4.1*
10.1	**Live Birth**			*4.1.1*
(a)	*Male*			*4.1.1(a)*
(b)	*Female*			*4.1.1(b)*
	Total ({a} to {b})			
10.2	Still Birth			*4.1.2*
10.3	Abortion (spontaneous/induced)			*4.1.3*
11	**Details of Newborn children weighed**			*4.2*
11.1	Number of newborns weighed at birth			*4.2.1*
11.2	Number of newborns having weight less than 2.5 kg			*4.2.2*
12	Number of newborns breast fed within 1 hour			*4.3*
M5	**Complicated pregnancies**			*M5*
13	Number of cases of pregnant women with Obstetric Complications and attended at facility			*5.1.2*
14	**Number of Complicated pregnancies treated with**			*5.3*
14.1	IV Antibiotics			*5.3.1*
14.2	IV Antihypertensive/Magsulph injection			*5.3.2*
14.3	IV Oxytocin			*5.3.3*
14.4	Blood Transfusion			*5.3.4*
M6	**Post - Natal Care**			*M6*
15	Women receiving post partum checkups within 48 hours after delivery			*6.1*
16	Women getting a post partum check up between 48 hours and 14 days			*6.2*
17	PNC maternal complications attended			*6.3*
M7	**Medical Termination of Pregnancy (MTP)**			*M7*
18	**Number of MTPs conducted at facility**			*7.1*
18.1	Up to 12 weeks of pregnancy			*7.1.1*
18.2	More than 12 weeks of pregnancy			*7.1.2*
	Total {(18.1) to (18.2)}			
M8	**Reproductive Tract Infections/Sexually transmitted infections (RTI/STI) Cases**			*M8*
19	**Number of new RTI/STI for which treatment initiated**			*8.1*
(a)	*Male*			*8.1(a)*
(b)	*Female*			*8.1(b)*
	Total {(a) to (b)}			
20	Number of wet mount tests conducted			*8.2*

Part A.	REPRODUCTIVE AND CHILD HEALTH	Numbers reported during the month		Ref No.
M9	**Family Planning**			***M9***
21	Number of NSV/Conventional Vasectomy conducted at facility			***9.1.1 (b)***
22	Number of Laparoscopic sterilizations conducted at facility			***9.2.1 (b)***
23	Number of Mini-lap sterilizations conducted at facility			***9.3.1 (b)***
24	Number of Post-Partum sterilizations conducted at facility			***9.4.1 (b)***
25	Number of new IUD Insertions at facility			***9.5.1 (c)***
26	Number of IUD removals			***9.06***
27	Number of Oral Pills cycles distributed			***9.07***
28	Number of Condom pieces distributed			***9.08***
29	Number of Centchroman (weekly) pills given			***9.09***
30	Number of Emergency Contraceptive Pills distributed			***9.10***
31	**Quality in sterilization services**			***9.11***
31.1	Number of **complications** following sterilization			***9.11.1***
(a)	*Male*			***9.11.1(a)***
(b)	*Female*			***9.11.1(b)***
	Total {(a) to (b)}			
31.2	Number of **failures** following sterilization			***9.11.2***
(a)	*Male*			***9.11.2 (a)***
(b)	*Female*			***9.11.2 (b)***
	Total {(a) to (b)}			
31.3	Number of **deaths** following sterilization			***9.11.3***
(a)	*Male*			***9.11.3 (a)***
(b)	*Female*			***9.11.3 (b)***
	Total {(a) to (b)}			
32	Does the Institution have NSV trained doctors?	YES/NO		***9.12***
M10	**CHILD IMMUNISATION**			***M10***
33	**Number of Infants 0 to 11 months old who received the following:**			***10.1***
33.01	BCG			***10.1.01***
33.02	DPT1			***10.1.02***
33.03	DPT2			***10.1.03***
33.04	DPT3			***10.1.04***
33.05	OPV 0 (Birth Dose)			***10.1.05***
33.06	OPV1			***10.1.06***
33.07	OPV2			***10.1.07***
33.08	OPV3			***10.1.08***
33.09	Hepatitis-B1			***10.1.09***
33.10	Hepatitis-B2			***10.1.10***

Part A.	REPRODUCTIVE AND CHILD HEALTH	Numbers reported during the month		Ref No.
M10	**CHILD IMMUNISATION**			***M10***
33.11	Hepatitis-B3			***10.1.11***
33.12	Measles			***10.1.12***
33.13	Total number of children aged **between 9 and 11 months** who have been fully immunised (BCG+DPT123+OPV123+Measles) during the month			***10.1.13***
(a)	*Male*			***10.1.13(a)***
(b)	*Female*			***10.1.13(b)***
	Total {(a) to (b)}			
33.14	**Number of children more than 16 months who received the following**			***10.2***
33.15	DPT Booster			***10.2.1***
33.16	OPV Booster			***10.2.2***
33.17	Measles Rubella Vaccine			***10.2.3***
34	**Immunisation Status**			***10.3***
34.1	Total number of children aged **between 12 and 23 months** who have been fully immunised (BCG+DPT123+OPV123+Measles) during the month			***10.3.1***
(a)	*Male*			***10.3.1(a)***
(b)	*Female*			***10.3.1(b)***
	Total {(a) to (b}			
34.2	Children more than 5 years given DT5			***10.3.2***
34.3	Children more than 10 years given TT10			***10.3.3***
34.4	Children more than 16 years given TT16			***10.3.4***
34.5	**Adverse Event Following Immunisation (AEFI)**			***10.3.5***
(a)	*Abscess*			***10.3.5.1***
(b)	*Death*			***10.3.5.2***
(c)	*Others*			***10.3.5.3***
34.6	**Number of Immunisation sessions during the month**			***10.4***
(a)	*Sessions planned*			***10.4.1***
(b)	*Sessions held*			***10.4.2***
(c)	*Number of sessions where ASHAs were present*			***10.4.3***
35	**Others (Japanese Encephalitis (JE) etc. Please Specify)**			***10.5***
35.1				***10.5.1***
35.2				***10.5.2***
35.3				***10.5.3***
M11	**Number of Vitamin A doses**			***M11***
36	**Administered between 9 months and 5 years**			***11.1***
36.1	Dose-1			***11.1.1***
36.2	Dose-5			***11.1.2***
36.3	Dose-9			***11.1.3***

Part A.	REPRODUCTIVE AND CHILD HEALTH		Numbers reported during the month		Ref No.
M12	**Number of cases of Childhood Diseases reported during the month(0-5 years)**				***M12***
37	Diphtheria				***12.1***
38	Pertussis				***12.2***
39	Tetanus Neonatorum				***12.3***
40	Tetanus others				***12.4***
41	Polio				***12.5***
42	Measles				***12.6***
43	Diarrhoea and dehydration				***12.7***
44	Malaria				***12.8***
45	Number admitted with Respiratory Infections				***12.9***
Part B.	**Other Programmes**				
M13	**Blindness Control Programme**				***M13***
46	Number of Patients operated for cataract				***13.1***
47	Number of Intraocular Lens(IOL) implantations				***13.2***
48	Number of School children detected with Refractive errors				***13.3***
49	Number of children provided with free glasses				***13.4***
50	Number of eyes collected				***13.5***
51	Number of eyes utilised				***13.6***
Part C.	**Health Facility Services**				
M14	**Patient Services**				***M14***
52	Is the facility functioning as an FRUs?		Yes/ No		***14.01***
53	Does the facility have a Rogi Kalyan Samiti		Yes/ No		***14.04***
53.1	If so, Number of RKS meetings held during the month				***14.05***
54	Does the facility have Ambulance services (Assured Referral Services) available		Yes/ No		***14.06***
54.1	If so, number of times it was used for transporting patients during the month				***14.07***
55	Whether Facility has Operational Sick New Born and Child Care Units?		Yes/ No		***14.08***
56	Number of functional Laparoscopes in the Facility				***14.09***
57	**Inpatient**				***14.10***
57.1	**Admissions**	**Children (<19 yrs.)**	**Adults**		***14.10.1***
(a)	*Male*				***14.10.1(a)***
(b)	*Female*				***14.10.1(b)***
	Total {(a) to (b)}				
57.2	**Deaths**				***14.10.2***
(a)	*Male*				***14.10.2(a)***
(b)	*Female*				***14.10.2(b)***
	Total {(a) to (b)}				

				Ref No.
			Numbers reported during the month	
Part C.	Health Facility Services			
M14	Patient Services			M14
57.3	In-Patient Head Count at midnight			14.11
58	Outpatient			14.12
58.1	OPD attendance (All)			14.12.1
59	Operation Theatre			14.13
59.1	Operation major (General and spinal anaesthesia)			14.13.1
59.2	Operation minor (No or local anaesthesia)			14.13.2
60	Others (Include other services like dental, Ophthalmology, AYUSH etc.)			14.14
(a)	*AYUSH*			14.14.1
(b)	*Dental Procedures*			14.14.2
(c)	*Adolescent counselling services*			14.14.3
(d)				14.14.4
(e)				14.14.5
M15	Laboratory Testing			M15
61	Lab Tests Details			15.1
61.1	Total Number of tests for Hb			15.1.1 (a)
61.2	*Of which Number having Hb < 7 mg*			15.1.1 (b)
62	HIV tests conducted	Number Tested	Number Positive	15.1.2
(a)	*Male*			15.1.2(a)
(b)	*Female-Non ANC*			15.1.2(b)
(c)	*Female with ANC*			15.1.2(c)
	Total {(a) to (c)}			
			Number Tested	
63	Widal tests conducted			15.2
64	VDRL tests conducted			15.3
(a)	Male			15.3.1
(b)	*Female-Non ANC*			15.3.2
(c)	*Female with ANC*			15.3.3
	Total {(a) to (c)}			
65	Malaria tests conducted			15.4
65.1	Blood smears examined			15.4.1
65.2	Plasmodium Vivax test positive			15.4.2
65.3	Plasmodium Falciparum test positive			15.4.3

		Numbers reported during the month		Ref No.
Part D.	Line Listing of Deaths			
66	**Mortality Details** - Each case is to be entered in a separate line. Only deaths occuring at the facility to be reported.			
M16	Details of deaths reported during the month with probable causes:			

Sl.No.	Name and Village of deceased	Sex	Age	Cause Code
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Code	Probable Causes of Death Description
	Infant Deaths (upto 1 year of age)
C01	Within 24 hrs of birth
C02	Sepsis
C03	Asphyxia
C04	Low Birth Weight (LBW) for Children upto 4 weeks of age only
C05	Pneumonia
C06	Diarrhoea
C07	Fever related
C08	Measles
C09	Others
	Maternal Deaths by major cause
M01	Abortion
M02	Obstructed/prolonged labour
M03	Severe hypertension/fits
M04	Bleeding
M05	High fever
M06	Other Causes (including causes not known)
	Adolescents & Adults
A01	Diarrhoeal diseases
A02	Tuberculosis
A03	Respiratory diseases including infections (other than TB)
A04	Malaria
A05	Other Fever Related
A06	HIV/AIDS
A07	Heart disease/Hypertension related
A08	Neurological disease including strokes
A09	Trauma/Accidents/Burn cases
A10	Suicide
A11	Animal bites and stings
	Other Diseases
A12	Known Acute Disease
A13	Known Chronic Disease
A14	Causes not known

Note : Above one example is for understanding only. Every level of institute and every program are having their respective reporting formats. For further understanding, it is advised to refer respective guidelines.

Annexure : II : Monitoring Checklists

Check list : 1 : Sub Centre level Monitoring Checklist

Name of District: _____ **Name of Block: _____** **Name of SC: _____**

Catchment Population: _____ **Total Villages: _____** **Distance from PHC: _____**

Date of last supervisory visit:_____

Date of visit: _____ **Name & designation of monitor:_____**

Names of staff posted and available on the day of visit: _____

Names of staff not available on the day of visit and reason for absence : _____

Section I: Physical Infrastructure:

S.No	Infrastructure	Yes	No	Remarks
1.1	Subcentre located near a main habitation	***Y***	***N***	
1.2	Functioning in Govt building	***Y***	***N***	
1.3	Building in good condition	***Y***	***N***	
1.4	Electricity with functional power back up	***Y***	***N***	
1.5	Running 24*7 water supply	***Y***	***N***	
1.6	ANM quarter available	***Y***	***N***	
1.7	ANM residing at SC	***Y***	***N***	
1.8	Functional labour room	***Y***	***N***	
1.9	Functional and clean toilet attached to labour room	***Y***	***N***	
1.10	Functional New Born Care Corner (*functional radiant warmer with neo-natal ambu bag*)	***Y***	***N***	
1.11	General cleanliness in the facility	***Y***	***N***	
1.12	Availability of complaint/ suggestion box	***Y***	***N***	
1.13	Availability of deep burial pit for waste management / any other mechanism	***Y***	***N***	

Section II: Human Resource:

S.no	Human resource	Numbers	Specify the Training received	Remarks
2.1	ANM			
2.2	2nd ANM			
2.3	MPW - Male			
2.4	Others, specify			

Section III: Equipment

Mark (√) in appropriate column

S.No	Equipment	Available and Functional	Available but non-functional	Not Available	Remarks
3.1	Equipment for Hemoglobin Estimation				
3.2	Blood sugar testing kits				
3.3	BP Instrument and Stethoscope				
3.4	Delivery equipment				
3.5	Neonatal ambu bag				
3.6	Adult weighing machine				
3.7	Infant/New born weighing machine				
3.8	Needle &Hub Cutter				
3.9	Color coded bins				
3.10	RBSK pictorial tool kit				

Section IV: Essential Drugs:

S. No	Availability of at least 2 month stock of essential Drugs	Yes	No	Remarks
4.1	IFA tablets	Y	N	
4.2	IFA syrup with dispenser	Y	N	
4.3	Vit A syrup	Y	N	
4.4	ORS packets	Y	N	
4.5	Zinc tablets	Y	N	
4.6	Inj Magnesium Sulphate	Y	N	
4.7	Inj Oxytocin	Y	N	
4.8	Misoprostol tablets	Y	N	
4.9	Antibiotics, if any, pls specify	Y	N	
4.10	Availability of drugs for common ailments e.g PCM, anti-allergic drugs etc.	Y	N	

Section V: Essential Supplies

S.No	Essential Medical Supplies	Yes	No	Remarks
5.1	Pregnancy testing Kits	Y	N	
5.2	Urine albumin and sugar testing kit	Y	N	
5.3	OCPs	Y	N	
5.4	EC pills	Y	N	

5.5	IUCDs	**Y**	**N**	
5.6	Sanitary napkins	**Y**	**N**	

Section VI: Service Delivery in the last two quarters:

S.No	Service Utilization Parameter	Q1	Q2	Remarks
6.1	Number of estimated pregnancies			
6.2	Percentage of women registered in the first trimester			
6.3	Percentage of ANC3 out of total registered			
6.4	Percentage of ANC4 out of total registered			
6.5	No. of pregnant women given IFA			
6.6	Number of deliveries conducted at SC			
6.7	Number of deliveries conducted at home			
6.8	No. of neonates initiated breast feeding within one hour			
6.9	Number of children screened for defects at birth under RBSK			
6.10	No. of sick children referred			
6.11	No. of pregnant women referred			
6.12	No. of IUCD insertions			
6.13	No. of children fully immunized			
6.13 a	Measles coverage			
6.15	No. of children given ORS + Zinc			
6.16	No. of children given Vitamin A			
6.17	No. of children given IFA Syrup			
6.18	No. of Maternal deaths recorded , if any			
6.19	No. of still birth recorded, if any			
6.20	Neonatal deaths recorded, if any			
6.21	Number of VHNDs attended			
6.22	Number of VHNSC meeting attended			
6.23	Service delivery data submitted for MCTS updation			

Section VII: Quality parameters of the facility:

Through probing questions and demonstrations assess does the ANM know how to…

S.No	Essential Skill Set	Knowledge		Skill		Remarks
7.1	Correctly measure BP	**Y**	**N**	**Y**	**N**	
7.2	Correctly measure hemoglobin	**Y**	**N**	**Y**	**N**	
7.3	Correctly measure urine albumin and protein	**Y**	**N**	**Y**	**N**	
7.4	Identify high risk pregnancy	**Y**	**N**	**Y**	**N**	
7.5	Awareness on mechanisms for referral to PHC and FRU	**Y**	**N**	**Y**	**N**	

7.6	Correct use of partograph	**Y**	**N**	**Y**	**N**	
7.7	Provide essential newborn care(*thermoregulation, breastfeeding and asepsis*)	**Y**	**N**	**Y**	**N**	
7.8	Correctly insert IUCD	**Y**	**N**	**Y**	**N**	
7.9	Correctly administer vaccine	**Y**	**N**	**Y**	**N**	
7.10	Adherence to IMEP protocols	**Y**	**N**	**Y**	**N**	
7.11	Segregation of waste in colour coded bins	**Y**	**N**	**Y**	**N**	
7.12	Guidance/ Support for breast feeding method	**Y**	**N**	**Y**	**N**	
7.13	Correctly identifies signs of Pneumonia and dehydration	**Y**	**N**	**Y**	**N**	
7.14	Awareness on Immunization Schedule	**Y**	**N**	**Y**	**N**	
7.15	Awareness on site of administration of vaccine	**Y**	**N**	**Y**	**N**	

Section VIII: Record Maintenance:

Mark (√) in appropriate column

Sl. No	Record	Available and Upto-date and correctly filled	Available but non-maintained	Not Available	Remarks
8.1	Untied funds expenditure (Rs 10,000)*Check % expenditure*				
8.2	Annual maintenance grant (Rs 10,000-Check % expenditure)				
8.3	Payments under JSY				
8.4	VHND plan				
8.5	VHSNC meeting minutes and action taken				
8.6	Eligible couple register				
8.7	MCH register (as per GOI)				
8.8	Delivery Register as per GOI format				
8.9	Stock register				
8.10	Due lists				
8.11	MCP cards				
8.12	Village register				
8.13	Referral Registers (In and Out)				
8.14	List of families with 0-6 years children under RBSK				
8.15	Line listing of severely anemic pregnant women				
8.16	Updated Microplan				
8.17	Vaccine supply for each session day (check availability of all vaccines)				
8.18	Due list and work plan received from MCTS Portal through Mobile/ Physically				

Section IX: Referral Linkages in last two quarters:

S. no		Mode of Transport (Specify Govt./ pvt)	No. of women transported during ANC/INC/PNC	No. of sick infants transported	No. of children 1-6 years	Free/Paid
9.1	Home to facility					
9.2	Inter facility					
9.3	Facility to Home (drop back)					

Section X: IEC display:

S. no	Material	Yes	No	Remarks
10.1	Approach roads have directions to the sub centre	**Y**	**N**	
10.2	Citizen Charter	**Y**	**N**	
10.3	Timings of the Sub Centre	**Y**	**N**	
10.4	Visit schedule of "ANMs"	**Y**	**N**	
10.5	Area distribution of the ANMs/ VHND plan	**Y**	**N**	
10.6	SBA Protocol Posters	**Y**	**N**	
10.7	JSSK entitlements	**Y**	**N**	
10.8	Immunization Schedule	**Y**	**N**	
10.9	JSY entitlements	**Y**	**N**	
10.10	Other related IEC material	**Y**	**N**	

Section XI: Previous supervisory visits:

S. no	Name and Designation of the supervisor	Place of posting of Supervisor	Date of visit
11.1			
11.2			
11.3			
11.4			
11.5			

Note: *Ensure that necessary corrective measures are highlighted and if possible, action taken on the spot. The Monthly report of monitoring visits and action points must be submitted to the appropriate authority for uploading on State MoHFW website.*

To be filled by monitor(s) at the end of activity

Key Findings	Actions Taken/Proposed	Person(s) Responsible	Timeline

Note : Above one example is for understanding only. Every level of institute and every program are having their respective monitoring checklist. For further understanding, it is advised to refer respective guidelines.

Chapter 2:

Quality in Healthcare: Quality Control, Improvement, and Assurance

Learning Objectives:

1. **To know quality and its importance in Healthcare**
2. **To understand different dimension of the quality.**
3. **To know different methods for quality improvement and assurance.**
4. **To know various institutional mechanism carried out for quality in India**
5. **To get insight about District Quality Assurance Program.**

Introduction:

Quality is a relatively newer concept in the health care, and being focused more and more in recent past. Quality is "felt" but difficult to "define" or "quantify".

Oxford dictionary defines the quality as "**the degree or grade of Excellence".** WHO defines Health Care Quality as a **"degree to which the resources for health care or the services included in health care correspond to specified standards".**

Consensus on the importance of quality of care in population programmes emerged in the International Conference on Population and Development (ICPD) held in Cairo in 1994. Provision of a package of quality reproductive health services and addressing unmet reproductive health needs of couples and individuals became the central theme. Quality of care (QOC) was perceived as an integral and major component of people's reproductive rights. This was considered as a landmark development wherein there was a paradigm shift from a demographic approach to responding to the reproductive health needs of the clients. National population policy document 2000 mentioned that health care centre's are over-burdened and struggle to provide services with limited personnel and equipment. Absence of supportive supervision, lack of training in inter-personal communication, and lack of motivation to work in rural areas, together impede citizens' access to reproductive and child health services, and contribute to poor quality of services and an apparent insensitivity to client's needs.

Till recent past in government health care services "Quantity" was superseding the "Quality". Government health system was more concerned to cover wide geographic area and provides adequate health care. It's all efforts were towards increasing network of service delivery points, ensuring adequate manpower availability and supply. But after a relative saturation of coverage (quantity) and a long period of service delivery; importance of quality has emerged.

The purpose of a quality assurance is to improve the outcomes or effectiveness of the programs quality always leads to greater acceptance (quantity). It is both, the quantity of services and quality of the services which determine the overall impact. Poor quality of the services ultimately results in poor demand and resistance from the community whereas good quality increases demand and hence utilization.

Quality assessment and improvement activities have burgeoned in the recent years, stimulated by the diversified rationale, experiences and perspectives. Most interventions are driven by the fact that provision of services should reflect on the providers' management and clients' perspectives. There is also increasing recognition of insistence on adhering to service delivery protocols by the providers so as to achieve desired health outcomes from services. Inevitably, there is also emphasis on measuring service quality on a continuing basis. Quality management models from industry, demands from providers' professional associations, focus on clients' perspectives and satisfaction, and emphasis on achieving efficiency in programme settings are the basis of this manual.

Under the RCH programme, special emphasis is placed on good quality of care. This, in turn, is expected to increase satisfaction about the services received. This will increase acceptance of the services further.

Quality of Care

Quality of Care as applied to a public health system is defined as **"attributes of a service programme that reflect adherence to professional standards, in a congenial service environment and satisfaction on the part of the user" – (UNFPA technical report 1999)**

Thus quality is carrying out interventions correctly according to pre-established standards and procedures, with an aim of satisfying the customers of the health system and maximizing results without generating health risks or unnecessary costs.

Quality broadly defines on four dimensions:

1. **Technical :** Medical Effectiveness
2. **Physical** : Infra structure, cleanliness, amenities etc.
3. **Consumer perspectives (Interpersonal):** Client satisfaction on various parameters.
4. **Administrative** : Effective and efficient delivery.

Determinants of Quality in Health Services

There are three dimensions of quality requiring measurement using a systems approach– Inputs, processes and outputs.

A) Inputs–It includes all programme efforts that facilitate the readiness of the facilities to provide services when a client visits the clinic. Inputs include

- **Physical infrastructure**: it is necessary to provide quality service to client. It affects a lot to the health seeking behavior. It includes availability of clean waiting area with sitting facility, separate rooms for consultation, examination, dressing, immunization, counseling and discussion activities with adequate amount of space, light, ventilation and cleanliness. Privacy and confidentiality also affects the continuation of treatment from patient side.
- **Staffing**: Adequate man power is must for quality service. Shortfall of manpower leads to increase workload, decrease in efficiency and effectiveness of work done. It also leads to improper counseling, decrease patient-doctor interaction time, no detailed history, no confirm diagnosis, presumptive treatment, no radical cure and thus patients lose trust on government facility. The staff availability should be accompanied by proper and regular training in various aspects for up gradation of knowledge and skills for provision of quality service to clients.
- **Supplies:** It includes the supplies of essential drugs, logistics, stationery etc, the supply should be regular. Unavailability leads to improper treatment which eventually leads to discontinuation of treatment.
- **Equipment:** Unavailability or improper working of an equipment leads to irrational diagnosis and treatment which obviously affects the quality of service but also leads to discontinuation of treatment and wastage of resources. Equipment availability and its working condition is a resource quality indicator. (3)
- **Access to service:** Access means that health care services are unrestricted by geographic, economic, social, cultural, organizational, or linguistic barriers. Geographic access may be measured by modes of transportation, distance, travel time, and any other physical barriers that could keep the client from receiving care. Economic access refers to the affordability of products and services for clients. Social or cultural access relates to service acceptability within the context of the client.s cultural values, beliefs, and attitudes. For example, family planning services may not be accepted if they are offered in a way that is inconsistent with the local culture. Organizational access refers to the extent to which services are conveniently organized for prospective clients, and encompasses issues such as clinic hours and appointment systems, waiting time, and the mode of service delivery. For example, the lack of evening clinics may reduce organizational access for day laborers. Where travel is difficult, lack of home visits or village-based services may create an access problem. Linguistic access means that the services are available in the local language or a dialect in which the client is fluent.

***B)* Processes**–Refers to the actual process of care giving and services received. Processes include

- **Technical:** Technical competence refers to the skills, capability, and actual performance of health providers, managers and support staff. A lack of technical competence can range from minor deviations from standard procedures to major errors that decrease effectiveness or jeopardize patient safety.

- **Interpersonal dimensions:** The dimension of interpersonal relations refers to the interaction between providers and clients, managers and health care providers, and the health team and the community. Good interpersonal relations establish trust and credibility through demonstrations of respect, confidentiality, courtesy, responsiveness, and empathy. Effective listening and communication are also important. Sound interpersonal relations contribute to effective health counseling and to a positive rapport with patients. Inadequate interpersonal relations can reduce the effectiveness of a technically competent health service. Patients who are poorly treated may be less likely to heed the health care provider.s recommendations, or may avoid seeking care.(3)

C) Outputs: Outputs can be seen from the perspectives of clients, providers and managers. Outputs from service delivery will result in better reproductive health outcomes leading to achievements of the programme goals.

Patient satisfaction reflects the extent to which expectations of service standards have been met and is typically operational zed by asking patients about general satisfaction with care received. Perceptions of quality record patient ratings about specific aspects of service quality. Satisfaction reflects personal preferences much more than ratings of specific aspects of quality. Furthermore, ratings of specific aspects of quality offer much more actionable information for quality improvement than general satisfaction with services.

Quality monitoring

1 Management information system, (Recording & Reporting system)
2 Supervision
3 Special Studies/ surveys of the health services/ Client satisfaction (household) survey.
4 Patient survey (Exit Interview)

(1) Management information system :

In routine monthly reports some indicators on quality may be included i.e. % early registration of pregnant women, no of antenatal visit completely immunized children etc. indicates quality of the services.

(2) Supervisory visits :

By experienced and qualified supervisor, observation of activities can help in monitoring the quality. Interpersonal communication, techniques of vaccination, health education session, water supply, sanitation condition etc can be directly observed for quality check during supervisory visits. Structured monitoring formats will enhance the supervisory visits monitoring.

(3) Special studies or survey :

Through community based studies in addition to health studies, service coverage. Health related behavior, knowledge and belief can be assured. Such surveys may help in know the perception of client about services, client satisfaction, behavior and attitude of the staff.

(4) Patient survey :

This type of the survey is also called Exit interview, whereas client are interviewed on various aspects of quality on leaving the health centres, i.e. Health care services, facility, inter personal aspects. It is done when patient comes out of the facility so that his/her is fresh will experiences.

Quality Control Process

It is an eight-step process for monitoring and evaluating performance. It must include the following steps :

1. Establish control criteria.
2. Identify the information relevant to the criteria.
3. Determine ways to collect the information.
4. Collect and analyze the information.
5. Compare collected information with the established criteria.
6. Make a judgment about quality.
7. Provide information and if necessary, take corrective action regarding finding to appropriate source.

1. Determine when there is a need for re-evaluation.

Quality Assurance

Quality Assurance approach is one way to improve quality through systematic monitoring and improvements in delivery of services.

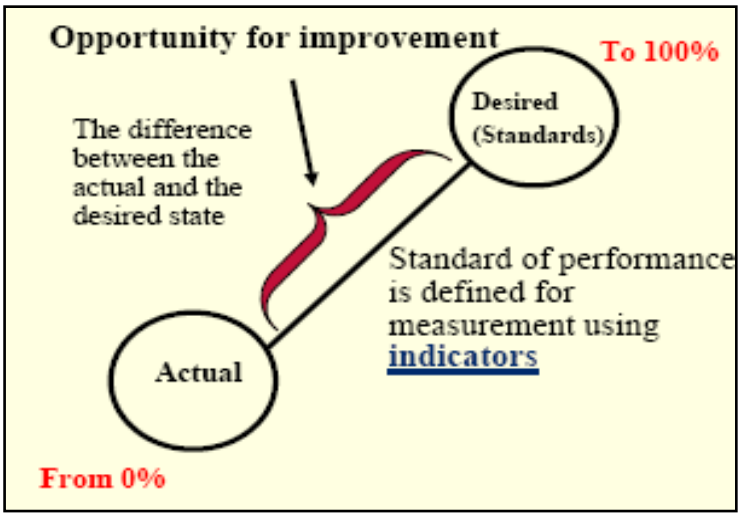
It is also defined as "the process for objectively and systematically monitoring and evaluating the quality and appropriateness of patient care, for pursuing opportunities to improve patient care for resolving identified problem".

Quality assurance (QA) can be defined as mechanism/process that contributes to defining, designing, assessing, monitoring, and improving the quality of healthcare. These activities can be performed as part of the accreditation of facilities, supervision of health workers, or other efforts to improve the performance of health workers and the quality of health services. Hence QA applies broadly to an entire cycle of assessment which extends beyond problem identification, to verification of the problem, identification of what is correctable, initiation of interventions/improvements, and continual review to assure that identified problems have been adequately corrected, quality of services improved and no further problems have been engendered in the process.

When assessment of quality is built into the routine monitoring of services, there will be more likelihood of attention being devoted to the processes in delivery of services.

The focus of quality assurance is the discovery and correction of errors. These activities are carried out by, quality assurance personnel or department personnel.

Quality Improvement: It involves identifying an area where there is an opportunity for improvement then outline the sequence of activities that should occur in order to solve that problem, and implementing them. Once the cycle is completed it has to be determined whether the problem has been solved. If the problem continues, the cycle should be repeated.



Continuous Quality Improvement (CQI) CQI is a cyclical process: There are seven steps involved in implementing CQI cycle:

Steps	Activities
Step 1 :	Identify an area where opportunities for improvement exist.
Step 2 :	Define a problem within that area, and outline the sequence of activities (the process) that should occur in that problem area.
Step 3 :	Establish the desired outcomes of the process and the requirements needed to achieve them.
Step 4 :	Select specific steps in the process, and for each step list the factors that prevent the achievement of desired outcome.
Step 5 :	Collect and analyze data about the factors that are preventing the achievement of the desired outcomes of the desired steps.
Step 6 :	Take corrective action to improve the process.
Step 7 :	Monitor the results of the action taken

Quality assurance mechanisms in the health sector/MCH in India

- **Continuous quality assessment under RCH-II:** This includes monitoring of service quality at the health centre level and systematic efforts to improve quality through training, behaviour-change communication, evaluation and feedback. Concurrent equity monitoring is also undertaken through ad hoc surveys.
- **Quality Assurance Committees (QACs):** QACs at the district and state level have been set up under RCH-II with the mandate of continuous quality monitoring through periodic facility visits and feedback for corrective action. A quality assurance manual has been prepared to assist these committees assess facilities on quality parameters such as equipment and supplies, professional standards, technical competence and continuity of care. NRHM Concurrent Review Missions have, however, pointed out that QACs are not functioning effectively in several states.

Principles/Methods of Quality Assurance :

Total Quality Management (TQM) :

Total quality management has evolved from the quality assurance methods that were first developed around the time of the First World War.TQM is an approach that seeks to improve quality and performance which will meet or exceed customer expectations. This can be achieved by integrating all quality-related functions and processes throughout the company. TQM looks at the overall quality measures used by a company including managing quality design and development, quality control and maintenance, quality improvement, and quality assurance. TQM takes into account all quality measures taken at all levels and involving all company employees.

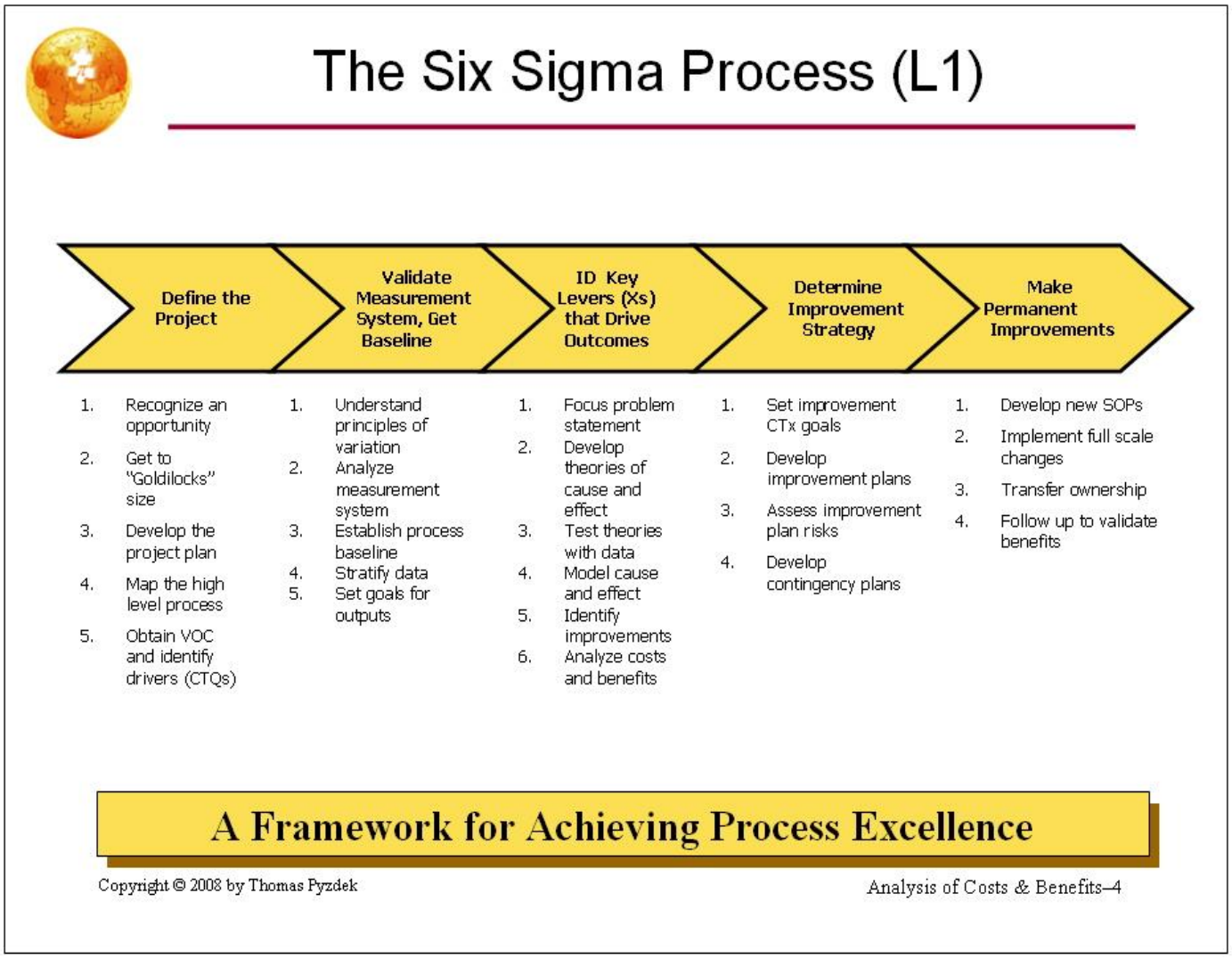
It is a way to continuously improve performance at every level of operation in every functional area of on organization using all available human and capital resources. It aims to reduce the waste and cost of poor quality. It is an umbrella methodology for continually improving the quality of all processes; it draws on knowledge of the principles and practices of the Behavioural sciences, the Analysis of quantitative and non quantitative data, Economics theories and Process analysis. TQM enjoyed widespread attention during the late 1980s and early 1990s before being overshadowed by ISO 9000, Lean manufacturing, and Six Sigma.

The main elements of TQM are three:

1 The customer, whose needs are paramount to the determination of quality,
2 The teamwork as a mean of achieving quality,
3 The scientific approach to decision-making based on data collection and analysis.

Six Sigma

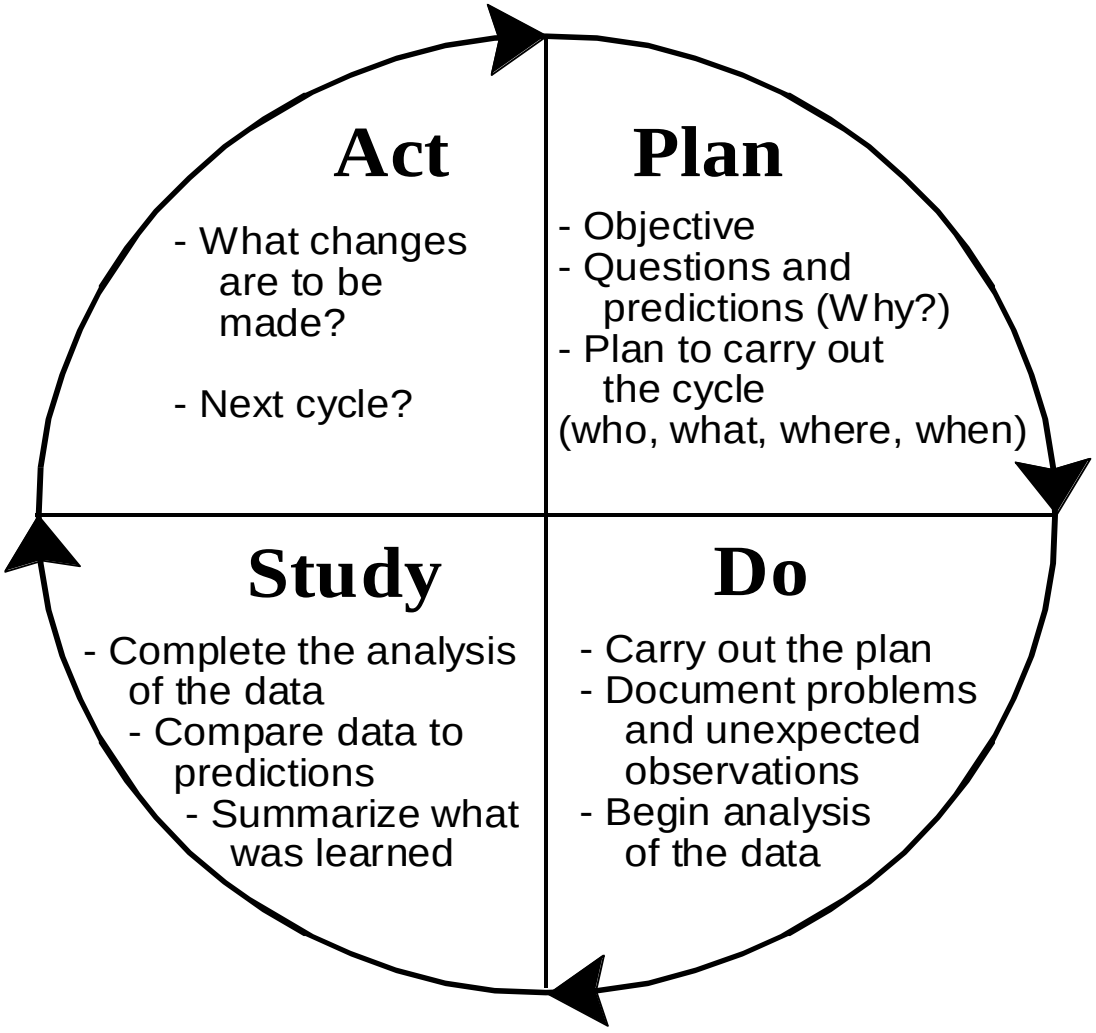
The word Sigma is a statistical term that measures how far a given process deviates from perfection. The central idea behind Six Sigma is that if you can measure how many "defects" you have in a process, you can systematically figure out how to eliminate them and get as close to "zero defects" as possible and specifically it means a failure rate of 3.4 parts per million or 99.9997% perfect. Six Sigma can therefore be also thought of as a goal, where processes not only encounter less defects, but do so consistently (low variability). Moreover, it is a multi-dimensional structured approach to: Improving Processes, lowering Defects, reducing process variability, reducing costs, increasing customer satisfaction & increased profits.

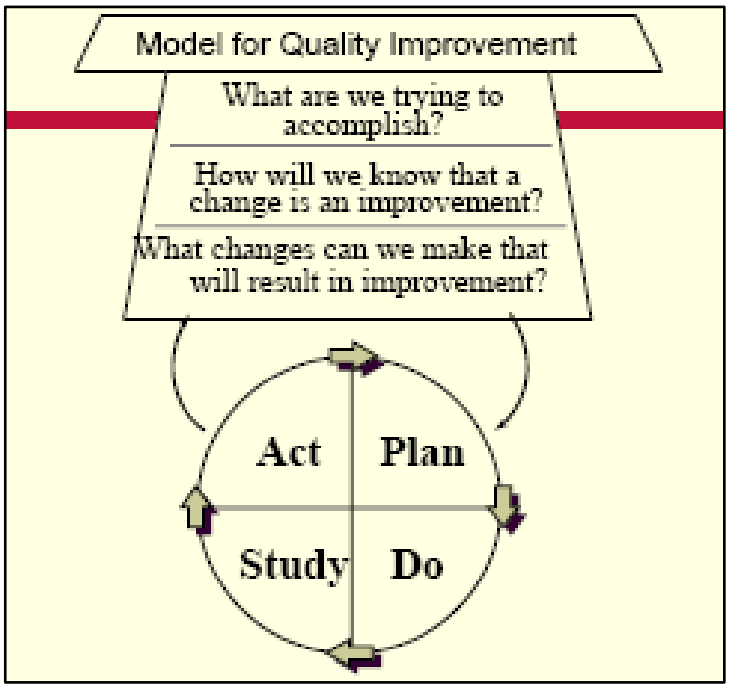


The fundamental objective of the Six Sigma methodology is the implementation of a measurement-based strategy that focuses on process improvement and variation reduction. This is accomplished through the use of two Six Sigma sub-methodologies: DMAIC and DMADV. The Six Sigma DMAIC process (defines, measure, analyze, improve, control) is an improvement system for existing processes falling below specification and looking for incremental improvement. The Six Sigma DMADV process (define, measure, analyze, design, verify) is an improvement system used to develop new processes or products at Six Sigma quality levels. It can also be employed if a current process requires more than just incremental improvement.

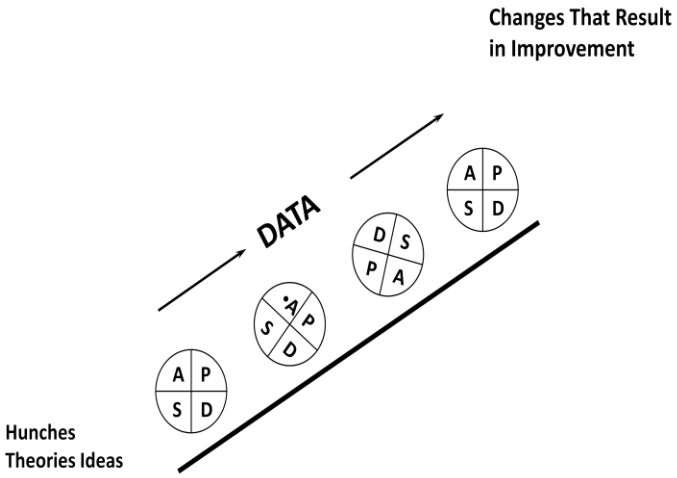
PDSA Cycle

This is a process improvement approach to evaluate change. This model allows for integration of new and existing systems. This model promotes small scale rapid cycle change over short periods of time.





Repeated Use of the Cycle



5S

5S is a system that is designed to ensure workplace safety, efficiency, cleanliness and increase quality. It is known as “Lean System of Quality Improvement mentjhods i.e. concepts that seek continuous improvement by removing waste in processes

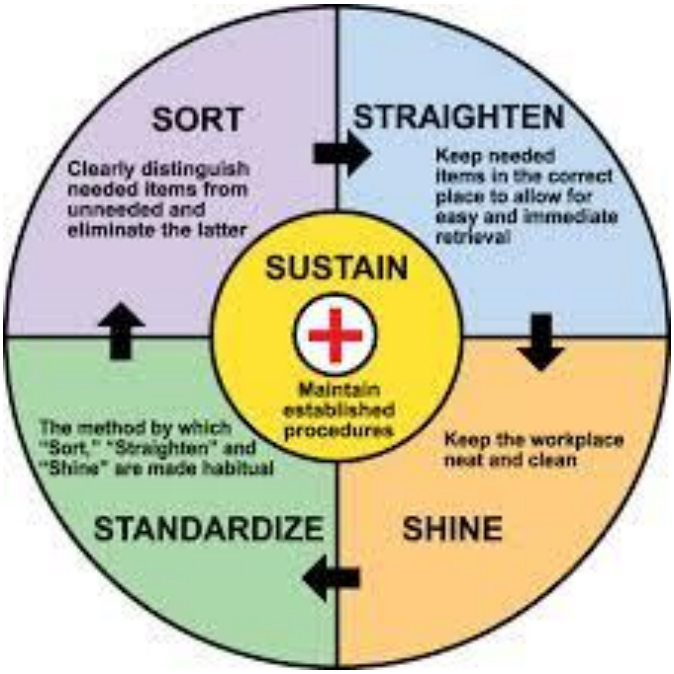
” A well organized workplace results in a safer, more efficient and more productive operation. It boosts the morale of the workers, promoting sense of pride in their work and ownership of their responsibilities.

Based on Japanese words that begin with ‘S’, the 5S Philosophy focuses on effective work place organization and standardized work procedures.

5S simplifies work environment, reduces waste and non-value activity while improving quality efficiency and safety. 5S is a philosophy and a way of organizing and managing the workspace. The key impacts of 5S is upon workplace morale and efficiency by ensuring everything has a place and everything is in its place then time is not wasted looking for things and it can be made immediately obvious when something is missing.

The real power of this methodology is in deciding what should be kept and where and how it should be stored

Steps	Japanese Words	English	Activities
1st S	**Seiri**	Sort Out	Separate out the things you use and remove the things you don't
2nd S	**Seiton**	Set in Order	Organize the things you use and place them where you need it
3rd S	**Seiso**	Shine	Scrub equipments, machine, tools, work area and floors
4th S	**Seiketsu**	Standardize	Create a system to maintain 5S daily
5th S	**Shitsuke**	Sustain	Follow the new system everyday and always look for improvement.



Creation of institutes for quality in health sector

Quality Control of India

Quality Control of India (QCI) was set up in 1997 by Government of India jointly with Indian Industry represented by the three premier industry associations i.e. Associated Chambers of Commerce and Industry of India (ASSOCHAM), Confederation of Indian Industry (CII) and Federation of Indian Chambers of Commerce and Industry (FICCI) to establish and operate the National Accreditation Structure and promote quality through National Quality Campaign. It functions through the executive boards in the specific areas i.e. Accreditation for a) Conformity Assessment Bodies, b) Healthcare Establishments, and c) Education & Vocational Training Providers. It also promotes the adoption of quality standards relating to Quality Management Systems (ISO 14001 Series), Food Safety Management Systems (ISO 22000 Series) and Product Certification and Inspection Bodies through the accreditation services provided by National Accreditation Board for Certification Bodies (NABCB). To realize the objective of improving quality competitiveness of Indian products and services, QCI provides strategic direction to the quality movement in the country by establishing conformity assessment system which is recognized at the international level.

QCI is registered as a non-profit society with its own Memorandum of Association. QCI is governed by a Council of 38 members with equal representations of government, industry and consumers. Chairman of QCI is appointed by the Prime Minister on recommendation of the industry to the government. The Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, is the nodal ministry for QCI. In addition it has an exclusive Board for promotion of Quality.

Indian Public Health Standards (IPHS):

IPHS guidelines initiated in 2005 now serve as the benchmark for infrastructure, including buildings, manpower, equipment and drugs, treatment protocols, and service guarantees for each level of healthcare. Flexible untied funds have helped many health centres reach these standards.

Indian Public Health Standards are a set of uniform standards envisaged to improve the quality of health care delivery in the country under the National Rural Health Mission (NRHM). A Task Group under the Director General of Health Services was constituted to recommend the Standards. The IPHS is based on its recommendation. These IPHS guidelines will act as the main driver for continuous improvement in quality and serve as the bench mark for assessing the functional status of health facilities.

The Indian Public Health Standards (IPHS) for Sub-centres, Primary Health Centres (PHCs), Community Health Centres (CHCs), Sub-District and District Hospitals were published in January/ February, 2007 and have been used as the reference point for public health care

infrastructure planning and up-gradation in the States and UTs. States and UTs should adopt these IPHS guidelines for strengthening the Public Health Care Institutions and put in their best efforts to achieve high quality of health care across the country. Flexibility is allowed to suit the diverse needs of the States and regions. The IPHS documents have been revised recently in 2012 keeping in view the changing protocols of the existing programmes and introduction of new programmes especially for Non-Communicable Diseases.

National Accreditation Board for Hospitals and Healthcare providers (NABH):

NABH was set up in 2005 as a constituent board of the Quality Council of India to establish and operate accreditation programme for healthcare organizations. NABH works as an autonomous body and offers accreditation to hospitals, smaller health centres, laboratories and testing centres, as well as facilities for alternate systems of medicine. NABH also conducts training of health administration officials in implementing quality management systems in their institutions and undertaking quality improvement measures in order to obtain accreditation certification. NABH has also developed standards for public health centres, namely PHCs and CHCs. (National Accreditation Board for Hospitals and Healthcare Providers. It has developed 514 Objective elements on 100 Standards spread over 10 chapter(areas)

The board is structured to cater to much desired needs of the consumers and to set benchmarks for progress of health industry. NABH is also an Institutional Member as well as a Board Member of the International Society for Quality in Health Care (lSQua).

NABH accreditation programs are available for Hospitals, small Healthcare organizations, allopathic clinics, AYUSH hospitals and clinics, Blood banks /Blood storage centres, Dental facilities, PHC/CHCs, Medical Imaging services, OST Centres, wellness centres.
Participation in NABH accreditation program is on a voluntary basis. Healthcare organization applies to participate in a program run by NABH. The award of NABH Accreditation to the healthcare organization means that the organization ensures establishment of Protocols and Policies as per National / International Standards for patient care, medication management, consent process, patient safety, clinical outcomes, medical records, infection control and staffing.

National Accreditation Board for Testing and Calibration Laboratories (NABL) :

National Accreditation Board for Testing and Calibration Laboratories (NABL) is an autonomous body under the aegis of Department of Science & Technology, Government of India. NABL has been established with the objective to provide Government, Regulators and Industry with a scheme of laboratory accreditation through third-party assessment for formally recognizing the technical competence of laboratories.

The accreditation services are provided for testing, calibration and medical laboratories in accordance with International Organization for Standardization (ISO) Standards. NABL provides laboratory accreditation services to laboratories that are performing tests / calibrations in accordance with ISO/IEC 17025:2005 and ISO 15189:2007 for medical laboratories. As on date, more than 1600 laboratories have NABL accreditation, out of which 20% are Government laboratories. NABL Accreditation is currently given in Clinical Biochemistry, Clinical Pathology, Haematology and Immunohaematology, Microbiology and Serology, Histopathology, Cytopathology, Genetics, Nuclear Medicine (in-vitro tests only)

Bureau of Indian Standards (BIS): BIS - the statutory Indian Industrial Standards body, constituted in 1987 from the Indian Standards Institution (ISO), provides ISO certification in quality management systems to health centres. It has developed guidelines for process improvements in health service organizations and for sound management systems to provide quality healthcare services to consumers in a transparent manner.

Technical assistance and capacity building institutions :

Several institutions have been designated to assist and inform healthcare programmes and policies in India. These include the National Institute of Health and Family Welfare (NIHFW) and National Health Systems Resource Centre (NHSRC). Besides these national bodies there are state level health resource centres and health and family welfare institutes. These institutions play a significant role in quality improvement through training and capacity building of officials and health personnel on relevant topics, such as management development and quality assurance strategies. NIHFW and the World Bank Institute conduct training for mid and senior level program officials in planning & implementation of strategies for improvement in quality parameters in the health system at all levels. The NHSRC has produced manuals on quality, procedures and treatment protocols. It has also conducted operations research interventions for assisting facilities obtain accreditation certification for quality management systems

Community-based actions:

Mechanisms have been devised for the monitoring and evaluation of progress and so bring about greater accountability in service provision. Periodic household and facility surveys by village health teams, public hearings on functioning of health centres, village level health and sanitation committees, and health-centre patient welfare committees are fora for citizens' participation in planning, management and monitoring of health services. A robust Management Information System (MIS) captures utilization and monitoring data from all levels of healthcare, and is available to the public on the NRHM website.

Quality Assurance Program :

Continuous assessment of the quality of services provided by facilities is fundamental to any QA programme. Assessment requires not only monitoring service utilization but also the processes undertaken in delivery of RH service package. It is assumed that both health providers and managers will pay more attention to the processes that are regularly monitored. It is known that unless monitored and supported, people often resort to the simplest or easiest ways of getting outcomes. At times these outcomes do not necessarily correspond to ultimate and intermediate goals of health systems and hence do not lead to client satisfaction.

District Quality Assurance Programme is made up of two main components:

- Quality Assessment
- Quality Improvement

The objective of the Quality Assurance mechanism at district level is to facilitate the continuous monitoring of quality of reproductive health services at subcenters, CHCs/PHCs and RCH camps and consequently improve service quality by focusing on and addressing the gaps identified during the assessment process. In order to do this, it is proposed to set up a District QA group within the public health system consisting of district programme managers who will conduct periodic assessment visits using specific tools and based on the gaps identified will help the service providers, address specific service quality elements and sub-elements.

District Level Quality Assurance Committee (DQAC)

For strengthening the Quality Assurance (QA) activities, organizational arrangements need to be set up at various levels with the roles and responsibilities defined for each level. The objective of the proposed Quality Assurance mechanism at district level is to facilitate the continuous monitoring of quality of reproductive health services at subcenters, CHCs/PHCs and RCH camps and consequently improve service quality by focusing on and addressing the gaps identified during the assessment process. In order to do this, a District QA group within the public health system consisting of district programme managers is set up, who will conduct periodic assessment visits using specific tools and based on the gaps identified will help the service providers, address specific service quality elements and sub-elementsAt district level, it includes District Level Quality Assurance Committee (DQAC), District Quality Assurance Unit (DQOAU) and District Quality Team (DQT).

Composition of DQAC:

1. District Collector/Dy. Commissioner, Chairperson.
2. Chief Medical Officer/Deputy Director/CDMO/District Health Officer/Equivalent (convener).
3. District Family Welfare Officer/RCHO/ACMO/equivalent (member secretary).
4. Deputy Superintendent/Civil Surgeon/Chief Medical Superintendent of District Hospital (s) or equivalent.
5. In-charge of CHC & PHC (one each, by rotation).
6. Nodal Officers of Programme Divisions at districts.
7. One empanelled gynaecologist (from public institutions).
8. One empanelled surgeon (from public institutions).
9. One Medical Specialist (from public institutions).
10. One anaesthetist (from public institutions).
11. One paediatrician (from public institutions).
12. One representative from the nursing cadre.
13. One representative from the legal cell.
14. One member from an accredited private sector hospital/ NGO (health care sector).
15. One representative from medical professional bodies e.g. FOGSI/IMA/IAP/IAPSM/ Association of Public Health.

However a 5 member "District Family Planning Indemnity Subcommittee" from within the DQAC would process claims received from the clients and complaints/claims lodged against the surgeons and accredited facilities, as per procedure and time frame laid down in the manual on "Family Planning Indemnity Scheme 2013".

The subcommittee would comprise of the following:

1. District Collector, (Chairperson).
2. Chief Medical Officer/District Health Officer/ CDMO/ CMHO (convener).
3. District Family Welfare Officer/RCHO/ ACMO/ equivalent (member secretary).
4. Empanelled Gynaecologist (from public institutions).
5. Empanelled Surgeon (from public institutions).

Terms of Reference:

1. **Dissemination of QA policy and guidelines:**
2. **Ensuring Standards for Quality of Care: (in health facilities)**
3. **Review, report and process compensation claims** for onward submission to the State Quality Assurance Committee (SQAC) under the National Family Planning Indemnity Scheme for cases of deaths, complications and failures following male and female sterilisation procedures.
4. **Capacity building of DQAU and DQT:**
5. **Monitoring QA efforts in the district:**
6. **Periodic Review of the progress of QA activities:**
    - RMNCH score card can be used for assessing the performance of the facilities.
7. **Supporting quality improvement process:**
    - Sanction and release of funds for implementation and improvement of quality.
8. **Coordination with the state for:**
    - Dissemination and implementation of guidelines.

- Facilitator support for the visits of SQAC/SQAU to the districts.
- Sharing minutes of DQAC meeting and monthly reports.
- Corrective actions & Preventive actions.

9. **Reporting:**
    - The committees' review report to be put on the state NRHM website.
    - Share with all district committee members and other stakeholders.
    - Share the QA reports with the concerned facility.

Process:

- The district quality assurance committee will meet at least once in a quarter.
- An attendance by at least one third of the Committee members will constitute the quorum required for a valid meeting.
- Member secretary will ensure follow-up actions with responsibilities and timelines for the same.
- The "District Family Planning Indemnity Subcommittee" would meet as often as warranted.
- At least three members would constitute the quorum of this subcommittee.

District Quality Assurance Unit (DQAU)

DQAU is the working arm under DQAC that will be responsible for undertaking various activities as per the TORs of the committee and also entrusted to them from time to time by the DQA Committee.

District Quality Team (DQT) at District Hospital

The DQT will be functioning exclusively at district hospitals. If any facility below district level implements quality assurance under the supervision of DQAU, special incentives can be given to the team implementing QA activities in the facility.

Scope of Quality Assessment in the District Quality Assurance Programme

In this QA intervention, the Reproductive and Child Health services to be assessed are limited to those provided at the facilities such as CHC and PHCs, subcenters, RCH/sterilization camps and include subcenter outreach services

A. RCH Services.

RCH Service Areas	Elements of Quality Assessed
A. Family planning services including provision of clinical and non-clinical contraceptives **B.** ANC, safe delivery, Basic Emergency Obstetric Care (BEmOC) including essential newborn care **C.** Reproductive tract infections including sexually transmitted infection (RTI/STI) prevention and management including VCT for HIV at designated facilities. **D.** Child Immunization	1. Service environment 2. Access 3. Equipment and supplies 4. Professional standards and technical competence 5. Continuity of care 6. Client provider interaction 7. Informed decision making 8. Privacy 9. Confidentiality 10. Informed consent 11. Proper disposal of wastes

***B. Family Planning*:**

Assess quality of service provision for all modern family planning methods available at PHCs and CHCs.

Family Planning Services Components	Elements of Quality Assessed
a. Method specific counselling of men and women for FP method b. Provision of Oral Contraceptive Pills (OCPs) c. Provision of Condoms d. Cu-T 380 insertion e. Tubal Ligation: Laparoscopy/mini-lap f. Emergency contraception g. Vasectomy: Traditional/No-scalpel vasectomy h. Management of contraceptive side-effects i. Follow-up services j. Record keeping	1. Facility infrastructure 2. Equipment inventories including functionality 3. Supplies inventories 4. Staff – availability, training 5. Staffing – knowledge and skills 6. Availability of standards 7. Tracking follow-ups 8. Communication aids for IPC 9. Confidentiality 10. Privacy 11. Informed consent 12. Proper disposal of wastes

C. Safe Motherhood Services and Newborn Care

Assess all components of antenatal care, safe delivery, basic emergency obstetric care services, postpartum care and essential newborn care provided at the facility. Assess the necessary stabilization of client before transportation, and arrangements for transfer of woman to the nearest Comprehensive Emergency Obstetric Care (CEmOC) facility in the district.

Maternal and Newborn Care Services	Elements of Quality Assessed
a. Antenatal care b. Management of normal labour c. Postpartum care d. Essential newborn care e. Basic emergency obstetric care f. Referral of obstetric and newborn complications	1. Facility Infrastructure: Consultation rooms, laboratory, labour Room, ward, OT 2. Transport – availability and functionality arrangements 3. Communications: Functional telephone 4. Equipment inventories including functionality 5. Service equipment 6. Supplies inventories, including EmOC drugs 7. Staffing- training 8. Staffing – knowledge and skills 9. Availability of protocols 10. Privacy and confidentiality 11. Proper disposal of wastes

D. Management of Reproductive Tract Infections and Sexually Transmitted Infections.

Assess the RTI and STI case management services. Currently these services at the CHC/PHC are being provided on the basis of laboratory diagnosis. The CHC and PHC are expected to be staffed with trained MO, nursing staff and a laboratory technician and have reagents and supplies and equipment to conduct simple tests to detect common RTI/STI pathogens and drugs for their treatment.

RTI/STI Services (Common RTIs/STIs only)	Elements of Quality Assessed
For all common RTI/STIs a. History taking, clinical examination b. Lab investigations c. Treatment d. Partner management e. Counselling f. Follow-ups and referrals	1. Facility infrastructure including laboratory 2. Equipment 3. Supplies inventories 4. Staffing- availability 5. Staffing – knowledge and skills, training 6. Records maintenance for partner management and follow-ups 7. Availability of treatment protocols 8. Privacy 9. Confidentiality 10. Informed Consent 11. Proper disposal of wastes

E. ***Child Immunization Services***

This element, as far as possible has to be assessed on an immunization day when the immunization session is being conducted at the sub-center or at an outreach facility. However, this may not be feasible every time at the CHC/PHC level when the facility is being visited on non-immunization days. If the facility is offering immunization services on all working days and there is a child availing of the immunization service during the visit, then the steps suggested in the checklist should be followed. In case, it is not so, the QAG member should review the maintenance of cold-chain equipment, logbook, vaccines and examine the stock register and MIS records.

Child Immunization Services	Elements of Quality Assessed
a. Immunization session schedule – planned and conducted b. Functioning of cold-chain equipment c. Adherence to vaccine quality norms d. Infection prevention and safe-injection practices e. Stock situation of vaccines	1. Facility infrastructure 2. Equipment and instruments 3. Cold-chain maintenance 4. Supplies inventories 5. AD syringe use and disposal and safe injection practices 6. Staffing–knowledge and skills 7. Log-book maintenance and updating of immunization cards 8. Availability of protocols

In sum, the above classification of elements and sub-elements have been reorganized in the data collection checklists and crosscutting areas that are common to all the three RCH components, which have been categorized in general facility readiness category, followed by questions on specific RCH components at facilities and camps.Annexure :

ASSESSMENT CHECKLISTS

- **Form 1:** CHC / PHC quality assessment checklist
- **Form 1A:** CHC / PHC quality assessment results summary of major assessment findings at facility
- **Form 1B:** CHC / PHC quality assessment results -findings, interpretation and areas of improvement - action plan

- **Form 2:** Subcenter quality assessment checklist
- **Form 2A:** Subcenter quality assessment results - Summary of major assessment findings at facility

- **Form 2B:** Subcenter quality assessment results - Findings, interpretation and areas of improvement -action plan

- **Form 3:** RCH /sterilization camp quality assessment checklist
- **Form 3A:** RCH camp quality assessment results - Summary of major assessment findings at facility

- **Form 3B:** RCH camp quality assessment results- Findings, interpretation and areas of improvement -action plan form

- **Form 1C:** monthly QA summary report of CHC / PHC prepared by member secretary actions to be taken at CHC / PHC level Based on all visits made
- **Form 1D:** monthly QA summary report of CHC / PHC prepared by member secretary actions to be taken at district level - Based on all visits
- **Form 1E:** monthly QA summary report of CHC / PHC prepared by member secretary actions to be taken at state level - Based on all visits made
- **Form 2C:** monthly QA summary report of subcenters prepared by member secretary based on all visits made Actions to be taken at sub centre/ CHC / PHC level
- **Form 2D:** monthly QA summary report of subcenters prepared by member secretary based on all visits made Actions to be taken at district level
- **Form 2E:** monthly QA summary report of subcenters prepared by member secretary based on all visits made - Actions to be taken at state level
- **Form 3C:** monthly QA summary report of RCH camps prepared by member secretary Based on all visits made

- **Form 4: client satisfaction with services**

Chapter 3:

Information Technology and Public Health

Learning Objectives:

1. To know the current uses of IT in Public Health
2. To explore the untapped potential regarding use of IT in Public Health
3. To understand the barriers to scale up use of IT in Public Health

Introduction

During the past two decades, the world has seen profound changes in technology development, heralding an information age. As a result of the information and communication boom, a combination of new technologies is being used to obtain, disseminate and share information as never before. Moreover, social media has also become a powerful tool to share ideas and solutions in almost all spheres of daily life. This also offers great opportunities to bring about better health to populations at large in a different way. An important question however is: how can modern technology be deployed to improve quality of health delivery at a lower cost? What are the challenges and opportunities that lie ahead?

Mobile phones which are now virtually ubiquitous with 700 million users in India alone are being used to track distribution of bed nets by malaria programmes. In the global adult tobacco surveys, handheld devices or Personal Digital Assistant (PDAs) are used by health care workers to collect and collate survey data, and to transfer data to a central location in no time; such a facility can be used in other similar field surveys without use of the printed forms.

But technology is growing rapidly and it is often difficult to keep pace with it. Internet and social media use is growing in various countries in the South-East Asia Region. However, despite the improved access to such technologies public health and clinical health services are not dominant in their content and/or applications.

CONTEXTUAL BARRIERS AND OPPORTUNITIES IN DEVELOPING COUNTRIES

A. New Technologies in Developing Countries

By 2002, telephones had reached more than 6,000 communities in Peru, with Internet access reaching 900 (Prahalad, 2005). A high demand for cell phones is occurring in many developing countries, a demand that was lagging behind with the installation of conventional land-based communications equipment. Approximately 50% of refurbished cell phones are sold in Latin America, Africa, Russia, India, China and Pakistan (Bhuie, Ogunseitan, Saphores, & Shapiro, 2004). In Peru, the market for cell phones has been increasing since 1993, with major growth from about 200,000 in 1996 to 2.5 million cell phones by mid-2003 (ONGEI, 2003).

Today, community members may access the Internet in numerous ways including wireless, Internet cafes, kiosks (ATM like machines through which community can directly access government site eg: railway ticket booking inquiry, hospital information, etc), home, work and/or school accounts. Other single accounts may be shared by many users. Some users are heavy and others light; some started long ago while others started recently. Internet cafes are popular access points in many developing/underdeveloped countries.

In India, doctors have limited access to the Internet in their workplace. They access mainly from home and Internet cafes & recently through mobile phones. The use of smart phones recently has led to an **IT revolution** with number of users of internet increasing over the last couple of years, indicating the rapid pace of change. The dramatic falling costs of computers suitable for Internet use should go some way to closing the gap between rich and poor. This price drop and accessibility to computers brings a unique opportunity for health care research.

B. Socioeconomic and Technology Infrastructure Factors

There are many factors that limit the dissemination of e-health applications in developing countries. Technology distribution and access deficiencies are two factors. For example, there is a huge variation in terms of access to computer-based information technologies, usually measured in terms of **teleaccessibility**, personal computer ownership, and Internet connectivity available to people .

Other factors that contribute to the **digital divide** include insufficient telecommunications infrastructure, limited markets for information technologies (IT), high telecommunication tariffs, inappropriate or weak policies, organizational inefficiency and lack of locally

created content. Inequalities in the utilization of information technologies by the general population are also found in developed countries determined by income and level of education. In the health sector, the divide between developed and developing countries in technology access is wider than the gap observed in social and commercial sectors.

Poor telecommunications infrastructure, limited number of Internet service providers, lack of access to international bandwidth, limited wireless networks and affordable Internet access costs continue to be major impediments to the diffusion of Internet applications to the point-of-care in developing countries. Good connectivity is needed for reliable transactions. In developing countries, fast connectivity is still limited and usually only dial-up access is available.

However, the reform of telecommunications in many sectors of developing countries has been bringing considerable improvements in services. As a result of greater competition, expanding markets, and rapid trade liberalization, telecommunications prices are dropping and the infrastructure has been improving worldwide.

C. Lack of Proficiency in Using Computers, and the Internet

Several other factors have been identified as contributing to the **digital divide** in developing countries, chief among them a lack of proficiency in using computers (Chandrasekhar & Ghosh, 2001). Other factors that have contributed to the digital divide include a gap in the actual use, measured as the amount of time spent utilizing information technologies; and a gap in the impact of use, measured by financial, economic and clinical returns. In other words, equipment alone is useless unless people are able to use it effectively and are informed of the potential benefits of its use (Samuel et al., 2004).

Inadequate education in informatics skills (**Computer Illiterate**) is a constraint among medical students, doctors, nurses and many other health care professionals who have different levels of computer competence. Many of the doctors/medical students have lack of proficiency on the use of Internet. Less than half of medicos have understanding of the basic terminology and concepts of computing. How many of the teachers of medical colleges or practicing clinicians had ever consulted an electronic journal, and amongst them how many have used any electronic resource. So to conclude our very basic abilities to use **information technology facilities are limited.**

D. Absent or Costly Committed Human Resources

People are central for the success of any application of e-health products and services. Employees' skills are the most expensive and least elastic resource, and an obstacle to

technological development in developing countries. Systems professionals, technology products, services providers, and project team must have superior skill levels and experience in the particularities of the area being automated.

Managing IT personnel and projects in both developing and developed countries is a challenging undertaking. Successful IT projects depend greatly on a project head's ability to identify and select the right people to work on the project, to communicate with technical people, to hire consultants appropriately, and to organize technical teams. Selecting the most appropriate technology is important when developing an e-health project, but also important are good managing skills. It is important to recognize that the latest technology does not necessarily solve all the problems.

E. Lack of Vision of Public Health Authorities Regarding IT

There are also concerns that investing in the use of modern technology comes at a high initial cost compared to basic health needs and other competing priorities. Demonstrating the cost-effectiveness of modern technology in promoting health is therefore a priority. Creative ways of investing and cost sharing should be discussed so that the information highway has health as one of its main applications.

In developing countries, most public health organizations have a very limited use of IT applications in day-to-day practice. Some public health authorities believe that using IT is limited to creating a chart of the epidemiological weekly report or to produce statistical reports. Collecting and presenting data in a chart is not necessarily of interest to health care professionals and managers when it comes to surveillance systems.

Most of the information systems in developing countries are inadequate to the current models of health care, and many public health authorities are not aware of the potential of IT to support public health. Moreover, the public health sector is *behind business, banks* and other sectors in terms of effectively using information technologies. There can be many reasons for **resistance to change** in developing countries. These can be classified as resistance to a particular change or resistance to the changer, for example, the individual initiating the change. There are several strategies that can be used to address these factors. One strategy, the five-stage model, includes assessment, feedback and options, strategy development, implementation and reassessment.

On the other hand, **private providers** and managed care groups have been recognizing that a different type of information system and data elements are required to run their organizations and to survive in a competitive environment driven by increasing consumer demands and expectations for the delivery of personalized evidence-based services.

CAN INEXPENSIVE TECHNOLOGIES BE USED EFFECTIVELY IN PUBLIC HEALTH IN DEVELOPING COUNTRIES?

New technology offers much better ways to collect data; for example, it can be collected more easily over much shorter periods of time. Although the use of computers or Personal Digital Assistant (PDAs) are limited in developing countries because of their expense and requirement for additional equipment such relatively complex network connections, cell phones are proving a simple solution. Cell phones are ubiquitous and cheaper than most computers and PDAs. Cell phones are showing how easy it is to collect data electronically in developing countries even in remote settings.

Currently, one of the simplest solutions to collect data is to call a telephone number that links to the investigator's computer via the Internet. In one such project, subjects accessed the system, and provided data using the push buttons on the telephone. Data was automatically inserted into the subjects' data files. The Internet provided the team leaders the possibility to access to all reports made by the field workers so doctors can monitor what is going in the field on a daily or weekly basis. The team leaders could perform searches of participants, and hear the voice files that the health workers recorded. Use of such technology depends on various factors - cost and availability, the socioeconomic status and education level of the subjects, and/or the amount of money available for the research. However, the cost of new technology tends to decrease over time, and it offers much improved methods for collecting more accurate data while involving less time and inconvenience for subjects and researchers alike.

APPLICATIONS OF THE SYSTEM IN OTHER CONTEXTS (Cost & Time)

There are other applications of the system in both developing and developed countries. Alerta is a system that involves phone and the Internet for communications and disease surveillance in real-time in Peru. Health professionals, using available telephones and the Internet (whichever was available), submitted real-time, electronic reports of mandated diseases and disasters. Alerta required a substantially lower allocation of resources, lower operating costs, and resulted in a threefold increase in reporting coverage (Prahalad, 2005). Overall, the system required 40% lower costs of operations than the traditional paper system. The application was incorporated in health clinics and health centers of the Ministry of Health (Prahalad, 2005). The study also concluded that the use of voice mail for communication was 7.8 times less expensive than written communication.

Lescano et al. (2003) reported that the introduction of the application has led to early outbreak identification/response, timely case management, and increased review of clinical procedures within reporting units. The investment required by the system was

small compared to alternative approaches to building disease surveillance capabilities, particularly in terms of infrastructure and maintenance expenses. The combination of scalable technology, accurate and close monitoring of performance, controlled growth, and effective mechanisms for information sharing, feedback and data-driven decision making has turned the application into a highly innovative, cost-effective, and replicable surveillance model.

Other Applications

Blood banks – to track blood shortages

Drug banks - to prevent expiry as well as stock-outs or excess stocks.

Surveillance of VPDs / HIV-AIDS & other notifiable diseases

OTHER TELEMEDICINE APPLICATIONS

There is a great potential to improve health through the use of telecommunications and information technologies in developing countries. Installing more computers or connecting a computer to the Internet is not necessarily the answer to public health problems. One answer could be using cell phones, public phones.

TeleMedMail is a software application to facilitate store-and-forward telemedicine by secure e-mail of images from digital cameras. TeleMed Mail is written in Java and allows structured text entry, image processing, image and data compression, and data encryption. This web-based telemedicine system is currently under evaluation in South Africa and Peru and is available for free at http://www.sourceforge.net/projects/telemedmail/.

Lastly, but not least, **training in telemedicine** is a key aspect. A PPP model allows better training.

Some innovative uses of IT in public health

Alerting patients with diabetes or stroke through messages regarding their medicine intake;

Conducting information-sharing sessions through videoconferencing and teleconferencing thereby reducing the number of face-to-face interactions/meetings;

Using email for fast and non-bureaucratic means of communication;

Risk mapping through the use of geographic information system and geographic positioning system;

Social networking such as Facebook and Twitter for news gathering,

Updating of an emergency or an outbreak; and

Carrying out clinical or bedside e-consultations regarding patients in remote or rural sites as a part of telemedicine are some of the applications where modern technology can modernize health care and bring in efficiency and quality. Dissemination of technical information is another example.

While many scientific journals are presently facing a cost crunch in publishing hard copies, the trend is now moving towards free online or web publishing.

What we need to do? Possible Solutions:

1. Even in a **challenging social setting with limited infrastructure** it is possible to develop an effective surveillance system. It is not necessary to have the latest Palm Pilot or Tablet PC to create a sophisticated public health surveillance system (Chin, 2005). It is possible to deploy a health information system much more quickly and cost-effectively than systems that require a lot of logistics and expensive network requirements and devices.

2. The system described in this chapter is **applicable to a range of health problems** - from reporting and monitoring adverse events during clinical trials or vaccination campaigns to reporting disease outbreaks.

We can even apply the system to nonhealth settings like reporting crime or potentially tracking commercial orders and distribution.

3. Systems implementers need a clear idea of the problem. Many technologies failed because of lack of careful planning and evaluation of the necessities. **Factors to consider** include: scan assessment of barriers, technology, training, cost and sustainability. Even in 20 years this example could be still used by health professionals for different purposes. This system addresses three key ingredients of an effective surveillance system: (a) Real-time data collection, from health workers reporting an adverse event or a doctor reporting a disease outbreak, for example; (b) Rapid analyses of data to make opportune decisions and allocation of resources; and (c) Communications back to the field to coordinate response.

4. **Two-way information systems** are more than just collecting data. They provide feedback and support to health care workers in the field. Many times, only managers have information that allows them to monitor and evaluate data but these systems do not prove any aggregate value to health care workers in the field. A well-designed information system has to support and enhance the performance of all user levels in a secure environment.

5. Information systems should be carefully planned and integrated across different programs. Health workers in some developing countries spend as much as 40% of their time filling out forms, compiling and copying data from different programs (e.g., tuberculosis, malaria, HIV/AIDS, etc.). By choosing the most appropriate information technology, we can **avoid duplication** and deploy different devices - i.e., cell phones, Internet - to report from each public health program.

6. **Partnership is key** to overcome technology barriers. We can attract top-tier industry partners if we have a comprehensive public health initiative. Public private partnerships can increase developing country access to improved health technologies.

7. Installing programs and PCs in public health organizations does not mean that we are creating **an integrated system**. It is necessary to have a robust, scalable, integrated information system that connects health care professionals from the local to the national level and provide them with the most appropriate information and support they each need. To accomplish this, it may be necessary to have a different technology architecture and different approach for each demand.

8. Any new technology will fail if there is no support for **management change** by leaders or chief information officers. Many public health authorities in developing countries are not accustomed to real-time information. They have to understand that helping decision-making and response with information technologies is critical to the success of their mission. This change requires considerable teamwork, leadership with solid strategic planning, training, and capacity-building efforts that go together with the deployment of a robust information system.

9. We need to **understand the culture** and to select the most appropriate technology for a determined necessity.

FUTURE DEVELOPMENTS

Telecommunications and information technology breakthroughs hold great potential if properly harnessed. We must understand the rich array of information-based technologies that support public health goals, and which communications technologies are the most appropriate for a specific cause (intervention, prevention, etc.). We must also understand who needs to know about these new public health solutions and how to educate and train them.

Telemedicine holds the promise of improving access to health care, especially in areas where there are geographical barriers, and of reducing costs. Telehealth in developing countries is a reality and offers tremendous opportunities that need to be explored more in the future. One of the problems with telehealth is that telecommunications companies often try to force a technical "solution" in public health services without understanding the problems in the field. Some new technologies may become more important in the future, as wireless access improves (for example, Wireless Application Protocol -WAP- phones). Karras et al. reported that a Java-enabled wireless phone could be potentially used in disaster response and public health informatics. Any application that can run on a PC can potentially run on a portable phone using Java applets.

In teleconsultation, cell phones has been proven that is feasible to capture and transmit images using e-mail for care of chronic wounds. However, the main problem in telemedicine is not the lack of technology; rather, it is the organizational problem of knowing how to take advantage of the technology. For example, how communities may benefit from the right information technology application. In some countries, cell phones may be a better application than using Tablets PCs, smart cards, or satellite communications.

A Web-based electronic medical record system has shown that effective information management is also possible in a poor community with no modern infrastructure. In Peru, Fraser et al. (2004) described a webbased medical record system to support the management of multidrug resistant tuberculosis. Web-based analyses have been developed to track drug sensitivity test results, patterns of sputum smear and culture results and time to conversion from positive to negative cultures (Fraser, Jazayeri, Mitnick, Mukherjee, & Bayona, 2002). Jazayeri et al. (2003) described a prototype Electronic Medical Record system the "HIV-EMR" to support treatment of HIV and tuberculosis in remote and impoverished areas in Haiti. The EMR allows physicians to order medicines and laboratory tests, and provides alerts based on clinical status and test results.

We believed that web-based data collection may provide better access to difficult-to-reach populations and cities considering the great and cheap cost of Internet / smart phones. The unique popularity and low-cost of Internet cafes in some countries open new possibilities to developing future web-based systems to show that effective information management can be possible in poor communities with no modern infrastructure.

An example describing the use of mobile technologies for Maternal & Newborn Health (MNH) care

Factors that hinder adequate health care from reaching the women and newborns who are most at risk include distance to resources, severe shortages of trained health professionals, and lack of investment in public health. To achieve the MDGs and to maintain better MNH beyond 2015, we must critically examine **new ways of using existing resources** in regions where improvements need to be made.

With over six billion mobile phone subscriptions spread across a world population of over seven billion, mobile technologies are rapidly penetrating even the most remote corners of the world.

For women and newborns in many low- and middle income countries (LMICs), the rapid expansion of mobile technology infrastructure presents an unprecedented opportunity to increase access to health care and save lives, but how exactly can we leverage the power of mobile technology to save the lives of women and newborns?

An analysis of 'coverage gap' measures, which represents the percentage of a target population not receiving critical services, indicated that the greatest inequities in services fall into the categories of maternal and newborn care and family planning.

The high rate of maternal and newborn mortality in many low-resource settings also reflects inequities in access to medical services because of the geographic and economic imbalances that exist between rural and urban populations and the rich and poor. Poor women and their infants living in rural areas have a higher risk of poor pregnancy outcomes as a result of barriers to accessing timely and adequate care and limited preventive measures and treatments. For example, only one in three rural women in developing countries receive the recommended care during pregnancy.

Optimizing birth outcomes in these countries requires strengthening human resource and health system capacities during this acute high-risk period, and encouraging women to deliver in well-equipped and staffed institutional care settings, while addressing the need to have effective emergency responses.

HOW do we do it?

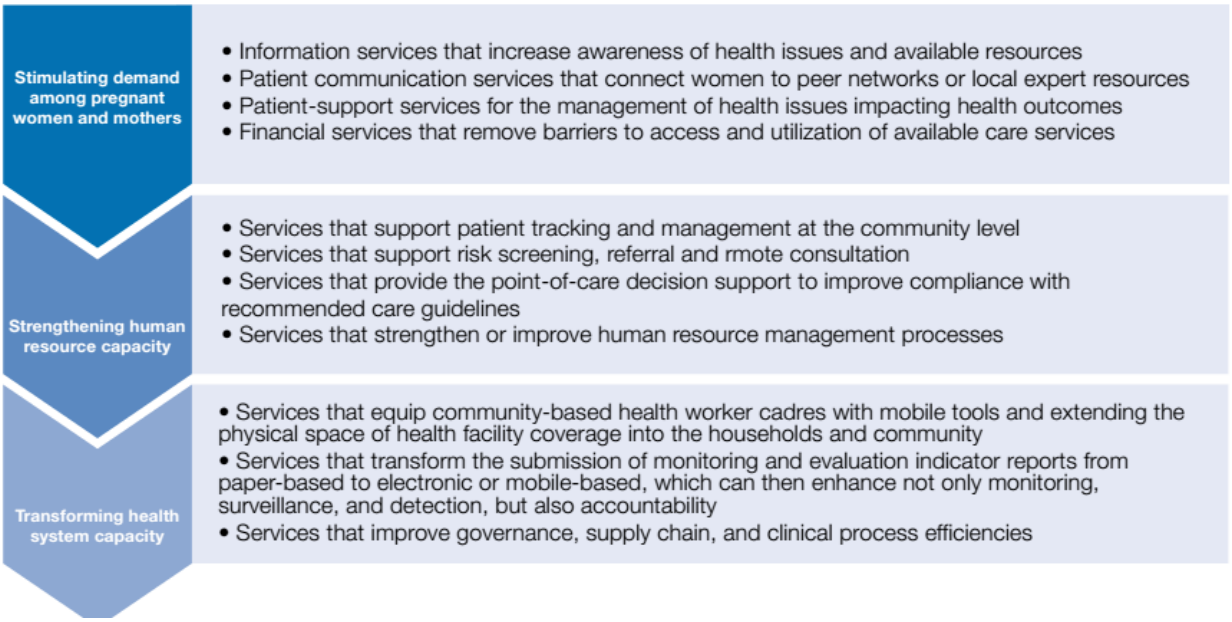
M-Health is fairly new with a rapidly developing evidence base that suggests encouraging progress. In general, M-Health interventions fall primarily into two categories:

(1) Those directed toward **improving the provision** of health services where the predominant focus is at the health system level, and

(2) Those directed toward the **recipients of health services** where client-focused services can involve sending health information or reminders to improve treatment compliance or attend appointments.

In the former, target applications make use of mobile phone features for real-time or actionable information for data collection, surveillance, supply chain management, and point-of-care support applications. In the latter, client-focused services emphasize the promotion or reinforcement of positive health behaviors and the use of recommended health services, and mobile finance services that facilitate savings toward the cost of recommended health products and services.

With regard to the type of mobile phone features utilized, recent evaluations of M-Health programs indicate a potential to broadly support patient self management through text-message-based cues, reminders, and prompts to schedule or confirm an appointment; notifications for laboratory results or health status reports; requests for self-reported data, encouragement or motivation to sustain a positive behavior (and the reverse, to reduce a negative one); and education and information resources to improve self-efficacy.



STIMULATING DEMAND AMONG PREGNANT WOMEN AND NEW MOTHERS

Reasons that may delay a woman's decision to seek care are many and the result of a confluence of factors. These include a **lack of knowledge** about health services and complications during pregnancy and how these complications are managed, as well as **geographic, economic, and socio-cultural barriers**. In certain societies, the lower status of women is a barrier to their ability to make independent decisions regarding their own care.

Other barriers include the lack of financial resources to pay for hospital services and to purchase medications; beliefs and practices surrounding childbirth and delivery, nutrition, and education; and a lack of trust in health systems.

M-Health solutions that have been designed to influence a woman's decision to seek care can address the problem from several perspectives.

In this regard, strategies have been standalone or integrated and aim to: increase women's awareness of MNH issues and promote behavior change in their utilization of related care services; directly connect women to expert resources such as skilled birth attendants at health clinics; provide complementary patient support services for the prevention and treatment of health issues contributing to maternal and newborn mortality; and/or offer mobile financial services which either remove financial barriers to care or directly encourage women to save toward delivery and post-natal care.

Because pregnant women can also be reached through extended caretakers in their communities, M-Health interventions in this category also **target family members** of pregnant women, such as a spouse or mother, or influential community members. Targeting these individuals can facilitate the knowledge transfer of appropriate care, as well as encourage expectant mothers to seek services.

M-Health can also create **peer networks of pregnant women** or partner first-time mothers with experienced mothers for support.

In low-resource settings, a financial hurdle often confronts proper and adequate health service delivery. This is now being addressed by **transaction-based mobile financial** services, which are particularly valuable for individuals who do not have bank accounts.

STRENGTHENING HUMAN RESOURCE CAPACITY

Delays in accessing the appropriate level of care are primarily due to shortages of qualified health professionals, most often in difficult-to-reach rural and remote areas. The labor shortage is compounded by:

(1) The lack of **transportation**, particularly important in emergency situations involving complications during a pregnancy, and

(2) The lack of systems that could support the ability of community health workers to **monitor and track at-risk patients** and to refer those in need to specialized care in a timely manner.

M-Health programs strengthen human resource capacity in three main ways:

(1) point-of-care decision support solutions that facilitate the ability of frontline health workers to transmit data and receive expert feedback on urgent care cases;

(2) Direct communication with different levels of the health system, such as in the case of emergency transportation of pregnant women with complications; and

(3) Tools offering improved efficiencies in remote diagnosis, treatment, and case management of patients across the maternal and newborn continuum of care. These efforts often direct information and data from the community level to health facilities and from the district level to the ministry of health.

Such existing programs have demonstrated their feasibility; however, success in **scaling up** to the national level requires the strategic alignment of the intervention with the prioritization of MNH on national health agendas, in addition to strong public-private partnerships.

In particular for frontline health workers, M-Health can not only improve MNH care delivery but also **increase work motivation, autonomy, and supervision** in a number of ways. To improve delivery, mobile phones offer options to better collect routine patient data during home and clinic visits; screen for risk factors during pregnancy; transmit any data for remote review and interpretation by clinicians, which allows remote monitoring of high-risk pregnancies; and deliver protocol-driven care and treatment. Mobile mediated solutions can facilitate postnatal home visits in the period immediately following discharge from a facility, as well as provide critical linkages and referrals to further remote monitoring or consultation. With regard to increasing work motivation, autonomy, and supervision of health workers, M-Health solutions facilitate workloads and automate challenging aspects of the duties placed on health workers.

In rural areas where paper-based data collection and submission to district-level reporting systems requires hand delivery, traditional techniques are being streamlined by electronic opportunities of transmission, effectively resulting in both **money and time savings**. Furthermore, data collected on mobile phones can be directed **for immediate feedback** by experts to frontline health workers on follow-up actions, such as diagnosis, referrals, or treatment. Additionally, administrators have the ability to **track health indicators at the community level, monitor health worker performance, and provide learning resources to community- or facility-based health workers** to reinforce previous training or prioritize community level actions and resource allocation. Additionally, **well-equipped health facilities and on-time payment of salaries or per diems** are as important to the workforce morale as are financial incentives that reward performance.

TRANSFORMING HEALTH SYSTEM CAPACITY

Services that turn existing systems for monitoring and evaluation reporting from paper-based into electronic or mobile-based cannot only speed up monitoring, surveillance, and detection from weeks or months to real-time, but can also enhance accountability for health system strengthening. It can strengthen health system by:

1. supply chain Management
2. improve clinical diagnostic results reporting by connecting with regional laboratory
3. e-governance
4. professional knowledge networks – peer group formation of profesionals

THE LESSONS THAT HAVE EMERGED ACROSS MHEALTH INTERVENTIONS IN MNH AND THAT HIGHLIGHT WHAT HAS BEEN LEARNED BY THE GLOBAL COMMUNITY ARE DESCRIBED BELOW:

- **technology design should address user needs**

For example, when compared to **text messages, voice-based solutions** are often more effective in optimizing the reach and impact of M-Health services particularly in an environment where illiteracy levels are high. Additionally, it is important to contextualize content of the information being transmitted, while taking into consideration local cultures when designing interventions.

Literacy and inequities in women's access To Mobile phones remain Key issues in the design and implementation of M-health services

- **solutions should leverage available resources to maximize impact**

Mobile technology solutions should be consistent with local technology and health policy environments to have optimal impact on augmenting established care practices. This improves the likelihood that M-Health solutions will better contribute to health priorities and complement existing practices while minimizing the potential for disruption. In the future, it is probable that advances achieved through M-Health interventions will drive developments in public policy and health practices.

- **technology is one element of the whole solution**

In addition to the technology itself, social factors, market-based incentives, and regulatory frameworks must be considered. Incorporating these will ultimately influence successful user interaction with technology, the benefits to be derived, the rate of adoption and diffusion, and the degree of impact on health outcomes. Failure to achieve adequate attention in the planning phase may lead to mobile solutions falling short of their potential.

When designing M-Health for MNH, it is important to **avoid interventions that have too narrow a focus** and are not designed in the context of a larger health system and as part of an ehealth information system. A consequence of the detached, standalone nature of M-Health interventions is that many have been evaluated only as single deployments rather than as parts of integrated, comprehensive systems of broader ehealth deployment. The **fragmented nature** of M-Health interventions is seen as a major rate-limiting step in the advancement and scaling of the field since each "siloed" application lacks the standardization and integration to support interoperability and information sharing along the continuum of care.

M-Health should also be designed and implemented in a way that it can begin to move beyond the vertical orientation and single-solution focus adopted by many interventions to date. Focus should shift toward integration solutions within broader health system and technological contexts. Intervention examples would include the prevention of malaria to reduce mortality in pregnant women in developing countries, as well as health promotion and disease prevention in the management of chronic conditions that play a role in maternal health outcomes in higher income countries.

Although most programs are provided at minimal or no cost to the user, bringing a program to national scale on a sustained basis in low-resource settings will require innovative financing models, and governments will have a critical role to play as key stakeholders. The financing models will need to remove barriers to use, particularly affordability of mobile phones for women and the cost of services. The programs will also need to engage private partners to ensure basic operational costs are covered. Approaches to engagement that are under consideration include bundling mhealth with other "mservices," placement of product marketing in messages, direct sponsorship, and tiered user pricing, such as the mobiles for health initiative in Bangladesh. Meanwhile, governmental support can strengthen the potential of mhealth through **public health policy** and development of standards and architectures that guide the **creation of ehealth frameworks for mhealth systems** to interact with health systems seamlessly. This will align health information systems and other technology-based initiatives to maximize effectiveness.

Chapter 4:

Drug logistics Information and Management System – DLIMS

Learning Objective:

1. To know about DLIMS software
2. To know about the potential of DLIMS inventory control
3. To explore other possible benefits of in future

1. Introduction

An online web-based application named Drug logistics Information and Management System (DLIMS) has been developed by National Informative Centre (NIC) integrating various inter-related activities of the Centre Medical Stores Organization Office. This application is in operational since December 2006 at Gandhinagar. It provides some selected features for the 457 Direct Demanding Officers (DDO) spread all over the state. DLIMS has played an important role in monitoring various Govt. sponsored National Programmes such as Anti-Malaria, School Health, Epidemic, Nirmal Gujarat, Anti Rabies, Medical Camps etc. The online DLIMS application is accessed through URL http://cmso.guj.nic.in

2. Situation before the Initiative

Earlier a DOS based application was in used for entire procurement process starting from tender processing, to placing purchase orders and for stock monitoring and drug distribution. e.g. for getting indent from various indenting offices situated across the state, indent forms were received from all the indenting offices (around 457) and then data entry was done centrally and data was transferred from one machine to another machine using media as per the requirement for different activities of the office. This manual process was consuming more time and cost.

3. Strategy Adopted

(1) Keeping the objectives mentioned above in mind an online web-based application Drug logistics Information and Management System (DLIMS) has been developed by NIC, integrating various inter-related activities of the office in a phased manner analyzing actual user's requirement and feedback.

(2) The application hosted in the Central Server of NIC to get the benefit of the technical support to take care of backup, data security, data recovery and other such issues.

(3) At the time of first round of implementation of e-indenting module to reach out the users located in different district, an e-learning session was organized by NIC and demonstration cum operational training was given to these remote users.

(4) A formal training was given to the users by organizing one day training session with the hands on component in it for a batch of about forty participants each.

4. Objectives of DLIMS

1. To improve efficiency and effectiveness of drug logistics and warehousing system.

2. Using latest information and communication technology to improve various functions like procurement; indenting, placing order, bill payment etc. to serve in a better and effective manner.

3. To facilitate continuous online monitoring of all activities.

4. To integrate all inter-related activities through common database to avoid redundancy, increase accuracy and enhance transparency.

5. Distinctive Features

• Due to centralized data base, accuracy increased as all activities are inter-related and using same data base.

• As suppliers are also a part of the system it is a very good example of Government to Business (G to B) extension of e-governance and also it enhanced the transparency.

• System is hosted in central server of NIC and so data disaster, backup etc. are all taken care by NIC's technical resources.

• Management of drug procurement and supply improved due to continuous online monitoring

• As the system is online and all concerned employees and officers uses the system at their own, a different working culture has developed with enhance computer literacy and in turn lead to human resource development.

6. Technology Used

DLIMS application is developed using Microsoft .NET Technology with SQL server.

Following are the nine different modules in the system which covers all services and activities required for core functioning of this organization except quality management system.

1. eIS: e-Indenting System.

2. SPL: Special Programs Monitoring System.

3. PPS: Purchase Order Processing System.

4. SIM: Store Issuable Monitoring System.

5. SRM: Store Receipts Monitoring System.

6. SMS: Stock Monitoring System.

7. BPS: Bill Payment System.

8. MIS: Management Information System.

9. DDO: Module for Indenting Offices (Direct Demanding Offices)

Gujarat State Wide Area Network (GSWAN) infrastructure is being used to connect and access the DLIMS. Automation has been achieved in almost all activities as under through DDO:

1. Receipt of indents becomes automatic as all indenting offices are sending their indent online.

2. Monitoring of requirement vs. availability of stock is now automatic.

3. Payment orders are automatically gets generated by entering required quantity.

4. Suppliers automatically get intimation of the orders placed.

5. As suppliers enter details of delivery, it automatically gets reflected to depot.

6. Stock gets automatically updated on receipt of delivery.

7. Activities like generating notices for late supply, risk purchase orders etc. gets automatically generated.

8. Accounts wing receives intimation automatically when depot enters receipt.

9. Stock gets automatically updated on issuing drugs and medicines to indenting offices.

7. Benefits

1. Efficiency, Effectiveness & transparency has been increased,

2. Online monitoring of various functions are possible,

3. All activities indenting, procurement, receipt, dispatch, billing etc are integrated in a single database so accuracy is maintained throughout the process.

4. No duplication of data due to central data base.

5. Suppliers are a part of system, which increase the transparency of the process.

6. Due to maximum automation of various activities time and cost saved considerably.

8. Success Indicator

(a) Online Indenting

1. Before: About 457 DDO's located across the state were indenting manually & then data entry was done centrally.

2. After: Now they are indenting online leading to saving in time, resources with increase in accuracy.

(b) Integration of various functionalities

1. Before: Depending upon the requirement of various activities data was transferred on computer to another computer using media.

2. After: Various modules for different activities are integrated and there is a central data base, so it reduces the duplication of entry and time in data transfer hence saves good amount of time and cost and also accuracy of the output is increased.

9. Impact of the project

A. Impact on organization (CMSO)

- No inter branch paper correspondence.
- Data backups not needed.
- Online indenting through internet by D.D.O.'s
- E-receipt generation.
- Late supply penalties, Risk purchase order generation.
- Grant supply monitoring.

B. General Impact

- Timely procurement of quality drugs at affordable rates.

• Monitoring of status of drugs improved significantly.

• Optimum utilization of budget as DLIMS helped in proper inventory management like FIFO.

• Successful management of epidemics like leptospirosis.

• C.M.S.O. with help of DLIMS purchases drugs under Central Schemes like NRHM.

• With timely supply of quality drugs along with other measures by health department there is significant improved in all parameters like IMR, MMR, Malaria Control and institutional deliveries etc.

10. Future Planning

The process of going ahead to extend DLIMS to serve decentralized distribution through regional depots.

1. Integration of e-tendering process with DLIMS.

2. Maintaining just in time inventory.

3. E-Payments.

4. Auto generation of purchase of order

11. Quality Control using DLIMS

• DLIMS helps in quick retrieval of data of companies whose products are declared as not of a Standard / Sub Standard.

• With click of mouse by entering batch No. quantity and details of D.D.O.'s (Hospitals) who have received particular drug can be retrieved, which before DLIMS started used to take lot of time.

• With the help of DLIMS we are able to trace out list of hospitals who have received and direction like stop usage & stock recall are given immediately.

• So far 34 samples have failed and with using DLIMS we have stopped usage & recall of stock was done successfully.

Modules & Chapters

Post Graduate Certificate Course in Health System and Management

Module 4 : Basics of Human Resource Management	
1	An Introduction To Human Resources In Health
2	Human Resources Development
3	Organisation
4	Team Building
5	Motivation
6	Manager As A Leader
7	Performance Appraisal
8	Conflict Management
9	Communication, Co-Ordination And Control In Health

Module 5 : Material Management and Health Economics	
1.A	Inventory Control
1.B	Inventory Procurement
1.C	Techniques of Inventory Control
1.D	Machines & Material Management
2.A	Glossary of selected terms used in Health Economics
2.B	Concept of Health Economics
2.C	Financial Management for Health
2.D	Financing health care for all: challenges and opportunities in India
2.E	Budgeting, Accounting, Auditing, Medical Audit

Module 6 : Monitoring & Evaluation and Quality in Healthcare	
1	Monitoring & Evaluation
2	Quality in Healthcare
3	Information Technology in Public Health
4	Drug Logistics Information Management System (DLIMS)

POST GRADUATE CERTIFICATE COURSE IN HEALTH SYSTEM AND MANAGEMENT

Aim

PGCHSM is aiming to develop comprehensive knowledge and skills in the Health System and Management.

Objective

1. To equip students with an overall perspective on health system
2. To improve leadership skills in public health and create good health managers
3. To inculcate interdisciplinary approach to problem solving skills in public health

About Course

Module 1: Introduction to Public Health
Module 2: Basics of Health System and Health Care Delivery
Module 3: Basic of Management and Planning
Module 4: Organization and Human Resource Management
Module 5: Material Management in Health
Module 6: Monitoring and Evaluation in Health System & Health Economics

Student Speaks

We learned many of the newer knowledge and skills about Health System & Management.

- Dr. Snehal Vaghela

Sessions of Resource Persons who had worked in the field were very interesting. We came to know about field realities and practical solutions.

- Dr. Kanan Desai

Contact sessions were interactive and we got maximum insights and understanding about Health System & Management during these sessions.

- Dr. Jaimin Patel

Assignments were framed in completely different ways. They require more thought process and field understanding than mere book knowledge.

- Dr. Ankit Sheth