

Volume-2

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INTRODUCTION TO ‘HEALTH AND DEVELOPMENT’ (MDV-115), VOLUME-2

Dear Learner

This is in continuation of volume-1, Health and Development (MDV-115), in earlier volume you read three blocks of this course now you will study two blocks in this volume-2 about ‘Training and Research in Health Development as well as Socio-economic Dimensions of Health Care. These two blocks comprises 8 units of health care system, as following:

Block-4: Training and Research in Health Development

This block will introduce you to ‘Training and Research in Health Development’ and discuss about pre-service and in-service training components for health professionals, existing data sources for public health, management of information system with interface of information technology and most important ongoing health system research.

UNIT-13 Health Manpower Development: It deals with health manpower planning and development. This includes components and common principles of Health Manpower Development (HMD), institutional arrangement, issues and challenges of training for development of health manpower in India.

UNIT-14 Data Sources for Health Care : Data sources: types and agencies; Census of India, Civil Registration System, Sample Registration System, National Family Health Survey, District Level Household Survey, National Sample Survey, Central Statistical Organisation and other statistical Divisions,

UNIT-15 Health System Research: Concept and significance of Health System Research (HSR), its objectives, features and major components, global and national health system research status and most important, how to strengthen public health through HSR.

UNIT-16 Management Information System (MIS) in Health: Basic concept of Management Information System for health, important components of MIS, Structure of MIS for health in India, role of MIS in health care system, other issues and challenges related to MIS for health.

Block-5: Socio-economic Dimensions of Health Care

In this block you will study various socio-economic, cultural aspects health care which play a significant to illness and disease. It comprises four major units pertaining to the social status of women and health, education and health, poverty and health, and lastly health care of the marginalized groups.

UNIT-17 Social Status of Women and Health: This starts with Women and Health Concepts, the Status of Women’s Health, Determinants of Women’s Health, Women’s Social Empowerment and Health, Women’s Cultural Empowerment and Health Care Measures to be taken to Promote Women’s Health.

UNIT-18 Education and Health: It explains Health Education: Meaning and Significance, Principles of Health Education, its Important Content and Agencies Involved, the Role of Communication and Strategies in Health Communication.

UNIT-19 Poverty and Health: The unit deals with the relationship between Economy and Health, Poverty and Health Linkages: Past and Present, Factors of Health Challenges globally, Poverty and Health Status in India.

UNIT-20 Health Care of the Marginalised: The unit explains Marginalisation and Marginalised Groups, Marginalisation and Health Inequalities, Factors Influencing Health Status of the Marginalised, and lastly Measures to Improve Health Status of Marginal Groups.



Block

4

Training and Research in Health Development

UNIT 13

Health Manpower Development

7

UNIT 14

Data Sources for Health Care

26

UNIT 15

Health System Research

46

UNIT 16

Management Information System (MIS) in Health

65

UNIT 13 HEALTH MANPOWER DEVELOPMENT

Structure

- 13.1 Introduction
- 13.2 Concept and Common Principles of Health Manpower Development
- 13.3 Health Manpower Planning
- 13.4 Production Process and Institutional Arrangement
- 13.5 Issues and Challenges of Training and HMD Status in India
- 13.6 Suggestions for Health Manpower Development
- 13.7 Let Us Sum Up
- 13.8 Keywords
- 13.9 References and Suggested Readings
- 13.10 Check Your Progress: Possible Answers

13.1 INTRODUCTION

Health manpower is the most important building block of public health. Availability of adequate number of trained manpower with suitable skill mix and their appropriate deployment at different levels of health care set-up are essential for providing effective health care services. This unit deals with health manpower as a crucial resource in the development process. It discourses about the mechanism and linkages between manpower planning, production and management-including in-service training and capacity building for all health personnel providing effective and efficient health care services to the people with the overall goal of “health for all”.

After going through this unit students would be able to:

- a) define the concept of health manpower and human resource development,
- b) describe the common principles of health manpower development,
- c) delineate the health manpower development process,
- d) explain the training and capacity building for health manpower,
- e) discuss the critical issues and challenges to strengthen health manpower development.

13.2 CONCEPT AND COMMON PRINCIPLES OF HEALTH MANPOWER DEVELOPMENT

According to Medical Dictionary health manpower means the availability of health personnel. It includes the demand and recruitment of both professional and allied health personnel, their present and future supply and distribution, and their employment and utilization. Resources for health manpower development are important and indispensable components of effective health care delivery system. By health manpower, we mean the human resources involved in

administering health care services to the people of need health care and services (patients). If there is lack of adequate health manpower, there will not be effective delivery of health care, and it may slow or stall the process of development either through an increased burden of ill health or through a low capacity to tackle health problems.

Health is indeed a key of development, and health manpower is crucial resource in the development process. The concept of health manpower is varied and multidisciplinary in nature. Different types of health personnel are engaged to run health care delivery system i.e., doctors, two nurses, midwives, dental technician, pharmacy technician, community health workers, community extension workers, environmental health workers, health educators, social workers, a laboratory technician, etc.

13.2.1 Why Health Manpower

Manpower problems in health organizations are common. According to the government reports and records, there are several problems in health sector in the developing countries like India. Most common problems are:

- a) No proper planning of health personnel,
- b) Inadequate personnel policies to guide the management and /or employees,
- c) Inadequate and inappropriate staffing pattern and policies,
- d) No clear specification of duties and responsibilities,
- e) An absence of efficient wage and salary administration,
- f) Lack of appropriate machinery to deal with grievances,
- g) Lack of knowledge regarding legislations applicable to health institutions,
- h) Poor communication between employees and administration,
- i) Biasness of employers and employees.

All these and other issues serve as a pointer to the various aspects of staffing and manpower development such as:

- a) Planning for personnel,
- b) Laying down guidelines for the appointment and conduct of staff,
- c) Wage and salary administration,
- d) Employees welfare activities,
- e) Employers discipline/biasness and labor relations,
- f) Organization, training, performance appraisal and staff development.

Shortage of health manpower as per its population coverage results poor health care workforce at the health facilities. Limitation of health manpower teaching and training institutions is liable to inadequate health care educators' insufficient manpower training facilities for the production of human resources to address the contemporary and emerging health care requirements. Accreditation of health manpower teaching and training institutions is also a subject for effective development of health manpower.

13.2.2 Common Principles of Health Manpower Development

Information on human resources in health is significant for effective workforce planning and management to achieve the objectives of national health policy. Understanding of crucial determining factors in the provision of care and services is necessary for strategic planning and effective development of health manpower. Human Resources as indicators provide an overview of availability of trained and specialized medical, nursing and paramedical personnel in the country. These also give an idea regarding distribution and disparities at different levels of health facilities. Human Resource indicators cover the details of allopathic doctors, dental surgeons, AYUSH doctors, nursing personnel and various paramedical health man-powers in the country.

The Government in its National Health Policy anticipates “to inform, clarify, strengthen and prioritize the role of the government in shaping health systems in all its dimensions- investments in health, organization of healthcare services, prevention of diseases and promotion of good health through cross sectoral actions, access to technologies, developing human resources, encouraging medical pluralism, building knowledge base, developing better financial protection strategies, strengthening regulation and health assurance”. For implementing the national health policy and programmes, the health organizations are responsible to assess all resources required and initiate planning processes including health manpower planning which is most crucial component of health manpower development.

13.3 HEALTH MANPOWER PLANNING

Manpower planning is a technique of correcting imbalances between manpower demand and manpower supply in the health system. Manpower planning is concerned not only with balancing of demand and supply of different categories of manpower, but also utilization of manpower resources in the country. The utilization of manpower is the process of matching human and work in accordance with their level of health system development.

13.3.1 Purpose and Components of Health Manpower Planning

The purpose of manpower planning is to make available and accessible the right kind of personnel in the right number with appropriate skills at right place at right time providing the right service. The terms “manpower planning” and “human resources planning” are often used interchangeably. Both help organizations to identify future talent needs and plan ahead to make sure that those skills are available in the workforce. The main difference is that, while manpower planning is skills-based, human resources planning focus on talent management - assuming that the skills are available in the workforce.

Planning for personnel/manpower in health care delivery system is two types: a) planning for new staff and b) planning for replacement of staff/manpower.

- a) Planning for New Staff/Manpower:** This depends on:
- i) Changes that is likely to occur in the health care delivery in services and the increase in demand for health care services.
 - ii) Type and volume of expected works.

After analysing these factors, we can decide about the number of staff/manpower required, their qualifications and experiences. This entire process involves 4 steps:

- i) Analysing the activities to be performed
- ii) Analysing the quantum of works or work load Specifying job duties, responsibilities and qualifications
- iii) Writing the job description.

b) Planning for Replacement of Staff/Manpower

It is basically recruitment and selection of the staff/manpower. For their placement of personnel some principles need to be followed are: (i) principles of efficient management and (ii) principles of social and natural justice are maintained. These principles are not often followed properly by the autonomous or independent health organizations due to at compulsions, which some time organization which invites a numbers of employee's conflicts and legal problems However, for the recruitment and selection there has to be recruitment rules (RR) duly approved by the competent authority of that organization. For this, there should at least, be:

- a) Job description prepared for all the posts
- b) For all positions the qualification and experiences are specified
- c) A list of institutions, from where trained persons could be available prepared is keeping the curriculum of the course in view.
- d) Maintain an application register with details.

For the selection and recruitment process, certain tasks are to be followed.

- a) Preliminary screening
- b) Interview/written test
- c) Reference checks
- d) Orientation of employees
- e) Trainings
- f) Probation
- g) Confirmation

Promotion, training, performance appraisal and career development are ongoing processes.

13.3.2 Health Manpower Planning Process (HMPP)

The manpower planning process could be broken down into following steps.

- a) Situation analysis
- b) Estimation/forecasting
- c) Planning strategies
- d) Production
- e) Management/utilization
- a) The situation analysis deals with the existing health manpower within the health care delivery system of the organization. The most common areas

that arise when dealing with manpower planning i.e. how many employees the organization currently having, their profile by department wise, where employees are found, largest departments in the organization, employees skills, number of employees leaving returning annually and particular areas / specialisation are extremely important area for the overall success of the organization. Without an adequate amount of employees, the organisation enters into serious trouble. Not only current but also future implications need to be examined.

This analysis also looks at all opportunities and problems regarding health manpower, like, Review of the external environment including the labour market, current demand for health workers within the local community. The Productivity and working culture are also looked at in greater depth here, and looking at possible ways to improve productivity within the working environment by looking at the current situation. Lastly within the situation analysis stage the organization's financial and social marketing and intentions are also studied taking into account of cost benefit and cost effectiveness if the organization has enough health manpower to or can it afford to employ additional employees if required.

- b) Estimation/forecasting are mainly concerned with the demand of health manpower. It looks at the future requirements of the organization and how many employees would be required in different departments of the organization. It also looks at supply that is the provision of health manpower, how this is supplied adequately throughout the health organization.

The main reason of manpower planning is to help the management of employees within an organization. Manpower planning looks at the organizations current and future need of workforces. The current and future employment needs are a great concern and the examination of supply within the local area for new employees if required.

- c) Planning deals mainly with information from the forecasting process and turning it into personnel policies of the organization. These policies are used to recruit new employees with plans to train and develop them for the work they are expected to carry out. Usually health manpower policies are implemented in different departments/levels to assist each other when required.

Let's say an organization might determine that, in 10 years, there will be a greater need for employees who know how to gather, structure, and analyse big data. They then try to forecast how many persons will be in the workforce at that time will have those skills. If there's a gap, they work with public and private organizations to encourage the development of those skills. That is manpower planning. Human resources planning, on the other hand, would focus on creating a work environment attractive to support the employees. Human resources planning are focused on how on to achieve the goals identified through manpower planning.

- d) Production deals with doctors, nurses, paramedics, technician and others coming from medical colleges and health institutions. The health manpower are recruited directly for health care delivery services and they are or develop them through required trainings and skills different departments/ and training institute.

- e) Finally, management / utilization deals with the realization of organizational objectives. These objectives are accomplished through efficient use of the health manpower for effective and quality health care delivery services. It is usually measured by right person with right inputs/services at right place for right client/customer at right time for right benefits/outcomes.

Manpower planning is about when the cost of employment rises to a height of concern within the management area. These rises in cost involved both training and wages. Because of this it decides the organization would be better off if it arrange its manpower resources more effectively saving both on organization expenses and time.

13.3.3 Health Manpower Deployment (HMD)

a) Manpower as Human Resources for Health:

Human Resource for Health is defined as “the stock of all individuals engaged in the promotion, protection or improvement of population health”. This includes both public and private and different domains of health systems, such as personal curative and preventive care, non-personal public health interventions, disease prevention, health promotion, service research, health management and support services.

Trained and competent human resource is the foundation of an effective health system. In India there are various types of health manpower resources:

- Doctors (Allopathic and Ayurveda), Yoga and Naturopathy, Unani, Siddha, and Homeopathy,
- Nurses, Health Assistants (male and female), Health Workers, Auxiliary Nurse Midwife(ANM),
- Pharmacists, Lab Technicians, Radiographer
- Accredited Social Health Activists (ASHAs),
- *Anganwadi* Workers, Trained Dais, and others
- Health Inspectors, Health Educators, Physiotherapist, Occupational Therapy Assistant, Dieticians.

b) Norms of Health Manpower and Population Coverage:

For the effective and efficient health care services, certain norms of different categories of health manpower have been established for their population coverage in India.

Category of health manpower	Norms suggested
Doctor	1 per 1,000 population
Nurse	1 per 500population
Health Worker(male and female)	1 per 5,000 population in plain area and 3,000 population in tribal/hilly/hard to reach area
Health Assistant (male and female)	1 per 30,000 population in plain area and 20,000 population in tribal/hilly/hard to reach area
Pharmacist	1 per 10,000 population

Lab Technician	1 per 10,000 population
Anganwadi Worker	1 per 400–800 population
ASHA	1 per 1,000 population
Trained Dai	1 per village

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What do you mean by Health Manpower Development?

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2) Describe the important components of Health Manpower Development.

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13.4 PRODUCTION PROCESS AND INSTITUTIONAL ARRANGEMENT

Government of India has set up regulatory bodies for the institutions delivering medical education, training and research along with monitoring the standards of education, training and research activities. This is being done with a view to sustain the production of medical and para-medical manpower to meet the requirements of health care delivery system at the Primary, Secondary and Tertiary levels in the country. These activities are being conducted by various bodies and institutions at different levels i.e., national, regional, state, district and below. Each of the institutions has been performing its role and responsibilities with certain objectives for the production of health manpower in the country.

13.4.1 Regulatory Bodies of Health Manpower Production

Since Indian population belief and practice in different systems of medicine, the health manpower production has also been created accordingly. Therefore, different regulatory bodies on different systems of medicine have been established to oversee the health manpower production are as follows.

- **Medical Council of India (MCI) established in 1956:** There are 362 medical colleges in India out of which 266 medical colleges have been

recognized by MCI. The remaining 96 medical colleges have been permitted for starting MBBS course. Out of these 362 medical colleges, 168 medical colleges with annual admission capacity of 20574 students are in Government Sector and 194 medical colleges with annual admission capacity of 25055 students are in Private Sector. Total admission capacity both in Government and Private medical colleges are about 45,629 students per year. Besides, 13 new medical colleges in private sector and 13 medical colleges in Government sector including 6 new AIIMS with admission capacity of 3895 students were granted permission. The Post Graduate intake capacity of these colleges is about 22850 students annually.

- **Central Council for Indian Medicine or the Central Council for Homeopathy established in 1970 and 1973:** It includes educational institutions such as: a) National Institute of Ayurveda, Jaipur b) National Institute of Siddha, Chennai, c) National Institute of Homoeopathy, Kolkata d) National Institute of Naturopathy, Pune e) National Institute of Unani Medicine, Bangalore f) Institute of Post Graduate Teaching and Research in Ayurveda, Jamnagar g) Rashtriya Ayurveda Vidyapeeth, New Delhi h) Morarji Desai National Institute of Yoga, New Delhi i) Indian Medicine Pharmaceutical Corporation Limited, Uttaranchal (a public sector undertaking). All these institutions under the council have been producing the qualified practitioners of Ayurveda, Homeopathy, Unani, Sidha. They are collectively known as AYUSH doctors, they hold bachelors or post graduate degrees in one of the above systems of traditional medicine.
- **Dental Council of India established in 1948:** The Dental Council of India is a statutory body constituted by an Act of Parliament with the main objective of regulating the Dental Education, Dental Profession, Dental ethics in the country. For this purpose the Council periodically carries out inspection to ascertain the adequacy of courses and facilities available for the teaching of Dentistry
- **Indian Nursing Council established in 1947:** Number of Nursing Institutions recognized such as 1642 for ANM, 2670 for GNM, 1578 for B.Sc. (Nursing), 696 for P. B. Sc. (Nursing), 535 for M.Sc. (Nursing) and 256 institutions for Basic Diploma Programme. About 12, 67,020 Nurses, 6, 11,458 ANM's and 52,984 Health Visitors have been registered with various State Nursing council in 2011.
- **Pharmacy Council of India established 1948:** There are 686 institutions with 40,858 admissions for Diploma in Pharmacy and 822 institutions with 50,613 admissions for degree in pharmacy have been approved by the Pharmacy Council of India. National Institute of Paramedical Sciences is having eight Regional Institute of Paramedical Sciences as well as developing the existing RIPANS, Aizawal as the 9th RIPS and manpower development to support State Government Medical Colleges
- **National Academy of Medical Sciences established in 1961:** It was established with the objectives of promotion of knowledge of Medical Sciences in India and its practical application to problems of national welfare, recognition and encouragement of merit in all branches of Medical Sciences.

13.4.2 Centre of Excellence in Modern Medicine with Comprehensive Training Facility

A numbers of national institutions established across the country to indoctrinate higher and modern medical education with comprehensive training facilities so that the benefits of medical care and services are provided to all sections of the society in India. Some of such institutions are confined in certain region in India as follows.

Region Wise	Institutions
North India	All India Institute of Medical Sciences (AIIMS), New Delhi: AIIMS was established in 1956 by an Act of Parliament as an institution of national importance. It was conceived to be a centre of excellence in modern medicine with comprehensive training facility. The institute has been entrusted to develop patterns of teaching in undergraduate and postgraduate medical education in all its branches so as to demonstrate a high standard of medical education to all medical colleges and other allied institutions in India. Postgraduate Institute of Medical Education & Research (PIMER), Chandigarh: PIMER Chandigarh was established in 1956. It was declared as an Institute of “National Importance” and became an Autonomous Body in 1967. The Institute has excelled in all the three areas namely patient care, medical education and research. The main objectives of the Institute are to develop patterns of teaching of undergraduate and postgraduate medical education in all its branches so as to demonstrate a high standard of medical education. National Institute of Health and Family Welfare (NIHFW), New Delhi: The NIHFW an autonomous and apex technical institute under the Ministry of Health and Family Welfare, Government of India, is working for the promotion of Public Health in the country. The Institute addresses a wide range of issues on Public Health through its eleven Departments which are multi-disciplinary in nature. Training of in-service health personnel of various categories has been the major mandate of the Institute. NIHFW conducts various short term training courses, ranging from one to ten weeks duration.
South India	Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER): JIPMER became an Institute of National Importance in 2008 by an act of Parliament. It has been dedicated to provide high quality medical care to all sections of the society. It conducts undergraduate, postgraduate, super speciality and Ph.D. courses in various disciplines to train competent and caring medical professionals and to undertake health and medical research for the ultimate benefit of the society. Mahatma Gandhi Institute of Medical Sciences (Sevagram, Maharashtra): This is India’s first rural

	medical college established in 1969 at the Karmabhoomi of Mahatma Gandhi, in Sevagram. It conducts the entrance examination to the MBBS course along with a separate qualifying paper on Gandhian Thought. All India Institute of Physical Medicine and Rehabilitation, Mumbai: AIIPMR is an apex Institute under the Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. Graduate and Post Graduate Courses in Medical and Paramedical Courses are conducted by a team of highly qualified and dedicated Faculty. Health functionaries at the community level are also trained. All India Institute of Speech and Hearing (AIISH), Mysore: It is an autonomous institute under the Ministry of Health and Family Welfare, Government of India. AIISH is the premier organization in the country which imparts education and training, facilitates research, provides clinical services and instructs the public on matters related to communication disorders. National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore: It is a multidisciplinary frontier institution for service delivery, human resource development, basic and applied research and, policy and programme development for the nation in the areas of mental health and neurological sciences. NIMHANS has been in the forefront to develop human resources and also evolve community based strategies for priority health problems. National Tuberculosis Institute (NTI) Bangalore: NTI Bangalore is an organization under the DGHS, MOHFW established in 1959 in close collaboration with the World Health Organization (WHO) and UNICEF. This is a premier Institute in the field of Tuberculosis control in South East Asia, which caters to the human resource needs for TB control in the region. It is involved in conducting the training programmes to the TB Programme Managers positioned at different parts of the country.
Eastern India	North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences (NEIGRIHMS), Shillong: NEIGRIHMS is now a thriving tertiary care Medical and Teaching Institute under the Union Ministry of Health and Family Welfare that offers MBBS, B.Sc. Nursing and MD/ MS course in the Department of Anaesthesiology, Microbiology, Obstetrics & Gynaecology and Pathology. All India Institute of Hygiene & Public Health (AIIPH&PH), Kolkata: The AIIPH&PH, Kolkata, the oldest public health institute in the South-East Asia region, was established in 1932. It is devoted to teaching, training and research in various disciplines of public health and allied sciences.

13.4.3 Institution of Excellence for Emerging Applied Medical Education and Research

A set of health institutions established for resolving the practical emerging health issues with comprehensive education, teaching, training, research and specialized clinical facilities. Some of these institutions have been mandatory in the regions, states and even in the district levels as shown below.

Institutions	Scattered Locations in India
National Centre for Disease Control	The Institute is under administrative control of the DGHS, MOHFW, Government of India. The Institute has its headquarter in Delhi and 8 branches located at Alwar (Rajasthan), Bengaluru (Karnataka), Kozhikode (Kerala), Coonoor (TamilNadu), Jagdalpur (Chhattisgarh), Patna (Bihar), Rajahmundry (Andhra Pradesh) and Varanasi (Uttar Pradesh). The branches are also well equipped and staffed to carry out field studies, training activities and research.
State Institute of Health and Family Welfare (SIHFW):	18 states are having their SIHFWs for education training and capacity development of the state health personnel. These are located at Hyderabad Andhra Pradesh, Sola Ahmedabad Gujarat, Shimla Himachal Pradesh, Jaipur Rajasthan, Patna Bihar, Panchkula Haryana, Bangalore Karnataka, Guwahati Assam, Thycud Thiruvananthapuram Kerala, Bhubaneshwar Orissa, Mohali Punjab, Kolkata West Bengal, Raipur Chhattisgarh, Lucknow Uttar Pradesh, and Gwalior Madhya Pradesh
Health and Family Welfare Training Centre (HFWTC)	49 HFWTCs created at the state levels for the crucial role of training of health personnel in providing effective and efficient health care services to the rural community. The pre-service and in-service training for different categories of health personnel are imparted through various schemes of Government of India.
Collaborating Training Institutions (CTIs):	22 CTIs in various parts of the country are involved in RCH for reviewing and preparing comments on training component and supplementary/additional PIPs of States 35 States and UTs PIPs and submission to MOHFW. Comprehensive State Training Plans (2017-18) for each State.
NGOs	National NGOs: Red Cross Society, Christian Missionaries, Rama Krishna Mission, Bharat Seva Sangha, Sant Parmanand Blind Relief Mission, Family Planning Association of India, Voluntary Health Association of India (VHAI), etc. have been contributing to Health Care of the Community by helping the Government in the areas of Hospitals, free clinics, Maternity homes, Leprosy units, home for destitute and now in RCH, FP, HIV/AIDS etc. through training and capacity building of community based organization for Non-clinical Health Care i.e., Awareness Programs, Prevention Programs, Counseling, Life skills, etc. Mother NGOs: For the RCH care services 105 MNGOs participated in 439 districts, through approximately 800 Field NGOs working at the village/community levels in keeping with the philosophy of capacity building, 4 NGOs such as VIHAI, CINI, SEVA and GIRHFWT were identified as Regional Resource Centres (RRCs) to provide training and technical support to the MNGOs.

13.4.4 Training and Capacity Building for Health Manpower

Training and capacity building of health manpower remains as a pertinent issue in India due to lack of need based training to different categories of staff, inadequate training infrastructure and skills, lack of induction and in-service training. Besides, there are many non-training issues like lack of mechanism for follow-up after training, mismatch between training and job profile and lack of system for monitoring performance related to training which calls for adequate attention. Requirements of human resources have been increasing due to new health programs and emerging new health technologies along with the growth of health infrastructure and expanding scope of the health services. These changes in health services and strategies have led to an increasing need for developing new competencies and skills among the health personnel in addition to the increasing need of more human resources at various level. Training is one of the most effective and tested tools for performance enhancement as well as for upgrading the knowledge and skills of the personnel. Therefore, the training policy of the organization aims to address the gap between existing and the required competencies and provide opportunities to the employees to develop their capabilities.

Why Training/Capacity Building for health personnel?

The Government of India has been carrying out the training/capacity building activities for its health personnel of different categories with the active role of Ministry of Health and Family Welfare (MOHFW), National Institute of Health and Family Welfare (NIHFW), State Institutes of Health and Family Welfare (SIHFWs), District Training Officers (DTOs).

Despite the facts, training in health personnel needs priority and in-service orientation. Adequate pre-service education focused on imparting knowledge needs more competencies. To achieve these it needs to increase provision for training infrastructure and manpower, induction training for doctors and other health personnel, refresher training for professional development, appropriate training-linked plan for career progression of health professionals along with follow up of personnel undergone and learned skill in the training.

13.4.5 Training Policy for Health Manpower Development

For the development of skilled, ethical, dependable and socially sensitive health personnel committed to excellence in health care who can deliver the quality of health services comparable international standards, the organization or the government requires having a clear framework of its procedures. The goal for the training in health sector is to develop competent, committed and innovative health professional to make the health system more efficient and client centred. For accomplishment of this goal, there is need to create infrastructure, manpower and a system to acceptable standards of trainings which enable continuous professional development of all categories of health personnel to deliver quality health care services with confidence.

13.4.6 Training Strategy for Health Manpower Development

Within the given procedures it is necessary for employees to be trained regularly to improve their performance and professional career. This training need to be shifted from supply based to need based training and learning for building competencies and skills at each level, at the induction stage as well as through in-service training at suitable time intervals. The guiding principles for training health manpower includes regular job chart updating for developing need based training, task sharing by health personnel with newer technologies. Competency based training which is a structured approach to training assessment directed towards achieving specific objective outcomes. It is the mode of training where emphasis is put on the acquisition of competence in performing a skill. It is on 'performing' rather than just 'knowing'.

For the development of competent, committed and skilled health personnel, training enables better capacity of the employees for improved health outputs, better responsiveness and enhancement of the image of self and organization. This can be ensured through the following training objects.

- To develop an efficient and effective training system in the health sector in partnership with central and state governments
- To provide opportunities for health personnel to prepare themselves for changing role and responsibilities and to increase job satisfactions
- To enable all health professional to develop their knowledge, skills and attitude
- To encourage health personnel to regularly review their own training needs
- To enhance training competence of trainers to acquire high quality training skill and develop confidence
- To develop necessary inputs and an enabling environment along with state of the arts training equipment and materials
- To promote health service research and utilize its findings in modifying the training.

13.4.7 Institutional Arrangement for Training of Health Manpower

For accomplishing the set objectives of trainings the Government of India devised the organizational structure of training institutions at different levels in the country as shown below.

MOHFW (Training Division)	
Levels	Institutions
National	NIHFW
State	SIHFW
Regional	HFWTC
District	DTC
Block	NGOs

13.5 ISSUES AND CHALLENGES OF TRAINING AND HMD IN INDIA

We saw in earlier section how training policy and institutes developed for health sector now major categories of training and major issues and challenges of health status in India with changing time and place.

13.5.1 Categories of Training

- **Technical training needs** focus on the technical /functional skills or the knowledge of the employees so as to facilitate their day-to-day operational decision making. It is assumed that such training needs if not fulfilled, may adversely affect the performances of that employee.
- **Non-technical training needs** focus on the development of non-technical knowledge and skills in the areas of management, leadership, supervision, computer, accounting and procurement etc. The acquisition of soft skills like IPC/counselling and communication are essential for the delivery of services.
- **Training to be based on TNA** assumes that health personnel are given technical know-how only in pre-service education, the core competency requires non-technical and behavioural besides technical.
- **Mandatory training** means all the personnel have to undergo for core competencies.

13.5.2 Status of Health Manpower in India

Since health manpower refers to the people who are knowledgeable, skilled and trained to promote health, prevent and cure disease, and to rehabilitate the sick people, the deployment number of these health workforces is significant. There are a total 9, 88,922 doctors registered with the MCI in 2016. Considering 80 per cent availability, it is estimated that around 7.91lakh doctors may be actually available for active health care deliver services. Thus, 1 doctor serves 1,668 people. About 8 lakh doctors are working in the government sector and average population served per government allopathic doctor is 11,039. As per MCI figures that the total number of doctors in India is 9.32 lakh, while there are 6, 86,319 AYUSH practitioners.

It is estimated that up to 46% of sanctioned posts for specialists at CHCs are vacant, it is estimated that 49% of posts for surgeons, 39% for gynecologists, 52% of physician posts and 47% of sanctioned posts for pediatricians are vacant in the country as a whole., the number of functioning *Community Health Centres (CHCs) in India* was 5624. The number of doctors at the PHCs has increased from 20308 to 26329 (addition of 1,200 doctors per year) in the period 2006-2011. As they are part of the government-funded public health system in India and are the basic units of this health care delivery system. Presently there are 28,863 PHCs functioning in India.

At Sub-centre level, there are 1.79 million registered nurses/midwives and 8, 41,279 ANMs serving in the country. On average, India's nurse-to-population ratio is 1:475.14 in 2017. India is short of nearly two million nurses though a total of 156231 Sub-Centres, functioning in the country. About 870,089 ASHAs

are working in the village levels. Once the program fully implemented, there would “an ASHA in every village” in India. The training knowledge and skills including incentives is important which needs to strengthen for effective outcomes. Besides these, about 1.4 million *Anganwadi* workers are involved with the ICDS programme in India. According to the 2011 census of India, 68.84 % of Indians (around 833.1 million people) live in 640,867 different villages.

There are 19, 80,536 Registered Nurses and Registered Midwives (RN & RM) and 56,367 Lady Heath Visitors serving in the country. But India has had a shortage of 8.5 lakh anesthetists, 20.4 lakh dental staff, 1.27 lakh ophthalmologists and optometrists, 18 lakh rehabilitation specialists, 61,000 medical laboratory technicians, 19,000 radiographers, 7400 audiology and speech language specialists and 2.3 lakh medical technology workers. Paramedical is not just restricted to nursing and hospital administration, the vast field covers dozens of courses in its domain. The paramedical professional requires a science stream with Biology as mandatory subject in the senior secondary school examination as to meet the eligibility requirement of the course. The number of paramedical workers available today is almost half of the required personnel

13.5.3 Mismatch between Manpower and Health Facilities

Medical colleges are unevenly spread across the states and also present wide disparities in the quality of education. Only 193 of the 640 districts in 2011 (now 723 districts in 2019) have a medical college, while the remaining 447 districts in 2011 did not have any medical teaching facilities. The sub-centers, PHCs, and CHCs have increased in number over the years, but the current numbers are not sufficient to meet their population norm. As observed, 2,041 PHCs are functioning without any doctors, 9,649 are without lab technicians, and 5,553 are without pharmacists. A total of 10,237 PHCs have AYUSH facility. The overall shortfall in the posts of health worker (female) / ANM at sub-centers and PHCs was 5.21% of the total requirement.

13.5.4 Vacant Positions in the Public Sector

Almost all Indian states have unfilled sanctioned posts in their public health sector though the proportion varies across states. At the national level, we can estimate based on government data that 10% of primary health centres are without a doctor, 34% don't have a laboratory technician and up to 16% are running without a pharmacist on the rolls. Since this is a national level estimate, there are large regional variations.

13.5.5 Main Reasons of Shortfall

There are various reasons for shortfall in health manpower. They are:

- skewed production of health manpower,
- uneven human resource deployment and distribution,
- disconnected education and training,
- lack of job satisfaction,
- professional isolation, and
- lack of rural experience.

Given the shortage of supply of qualified health manpower as, there is hardly any strategic plan of actions accelerate implementation of evidence based and sustainable strategies and complementary approaches such as shifting sharing of tasks, fostering a team approach, including non-clinical and community health volunteers

13.5.6 Health Manpower Development Research

Health system research is the instrument for health sector development. But, there is inadequacy of established institutional mechanisms at the national level where policy makers, health service administrators and research workers could meet together to identify researchable problems, determine their priority and decide on research procedures to be applied in search of solutions. The main objective of health manpower development research is to systematically collect authentic data and reliable information on manpower planning, production, training and capacity building and utilization in order to deliver effective manpower planning deemed necessary.

However, the production of health workers has expanded greatly in recent years, but the problems of imbalances in their distribution persist. As India seeks to achieve universal health coverage by 2020, the realization of this goal remains challenged by the current lack of availability and inequitable distribution of appropriately trained, motivated and supported health workers. Experience in utilization of health manpower should provide feedback, on the basis of which production, planning and management can be appropriately adjusted. Planning, furthermore, may affect manpower training and management (utilization) if problems are identified. The health personnel, after production must not to be left without comprehensive management, monitoring and evaluation.

13.6 SUGGESTIONS FOR HEALTH MANPOWER DEVELOPMENT

- HDM should be basically related to health manpower planning, which provides the basis for the production of health personnel in various medical and paramedical school programs. The graduates should then be utilized and managed, and the outcome of the entire process should be effective health care services.
- The health manpower should never be left unmonitored. In that case, they may be ineffective and even harmful for health, and there will be paradox and complex outcomes of health manpower production.
- The private sector is the predominant provider of health services in the country, it should be acknowledged by policy makers while planning health manpower. The resources of the private sector could be harnessed to meet public health goals through partnerships and collaborations. Public financing of privately provided health care services must be examined.
- The undergraduate teaching should aim to produce clinicians who can independently manage the case load in a primary care facility. AYUSH doctors can be trained through short bridge courses to manage essential health care in primary care settings.

- Training and capacity building for the health personnel should be well designed with a focus on core competencies such as disease prevention, health promotion and rehabilitation. There should be training policies and implementation strategies at centre, state and district levels.
- Shortage in health workers might be adjusted by balancing the needs to strengthen health care delivery system by the available alternative workforce such the AYUSH doctors and the ASHAs at local level. Both of these providers can play a vital role in enhancing access to basic health-care services, especially at the community level.

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

- 1) Why training/capacity building among health personnel is required in health organizations?

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- 2) Give some suggestions for development of Health Manpower in India.

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13.7 LET US SUM UP

The availability of health personnel depends on the demand and recruitment of both professional and allied health personnel, their present and future supply and distribution, and their employment and utilization. This health manpower is a very critical resource in the development process. In health sector in India, most common problems are no proper planning of health personnel, inadequate personnel policies to guide the management and/or employees, inadequate and inappropriate staffing pattern and policies. Manpower planning is the forecasting process, which is spiraling into personnel policies of the government and other organizations as well. This process leads to recruit new employees and plans to train/develop them for providing health care services they are expected to carry out.

Health manpower production is being accomplished through the education and research of institutions like university, medical colleges and nursing schools. Sets of regulatory mechanisms like Medical Council of India and Nursing Council

of India alone with certain centres / institutions of excellence at different levels have been made responsible for quality of health manpower production in the country. As training is one of the most effective and tested tools for performance enhancement as well as for upgrading the knowledge and skills of the personnel, the training policy and strategic plan of actions of the government and other organizations enable to address the gap between existing and the required competencies and empower to provide effective, efficient and quality services.

13.8 KEYWORDS

Health Manpower Planning: It deals mainly with taking information from the forecasting process and turning it into personnel policies. These policy decisions would then device to recruit new employees with plans to train and develop them for the health work they will be expected to carry out. Human resource planning focuses on creating a work environment that would be both attractive to and support of those employees for achieving the goal and objectives identified through manpower planning.

Health Manpower Production: It deals with health personnel like doctors, nurses, paramedics, technicians and other qualification holders produced by the medical colleges and health institutions. This health manpower is recruited directly for health care delivery services and develops them through required training and skills for the deployment in different departments/levels of the health care delivery systems.

Training of Health Manpower: It is to develop competent, committed and innovative health professional to make the health system more effective, efficient and client centred. For this, there is a need to create infrastructure, manpower and a system to acceptable standards of trainings which enable continuous professional development of all categories of health personnel to deliver quality health care services with confidence.

Health Manpower Utilization: It deals with the realization of organizational objectives. These objectives are accomplished through efficient use of the health manpower for effective and quality health care delivery services. It is usually measured by right person with right inputs/services at right place for right client/customer at right time for right benefits/outcomes.

Health Manpower Shortfall: There are various reasons for shortfall in health manpower such as skewed production of health manpower, uneven human resource deployment and distribution, disconnected education and training, lack of job satisfaction, professional isolation, and lack of rural experience.

13.9 REFERENCES AND SUGGESTED READINGS

- 1) Government of India (2014-2018) *Annual Reports*, Ministry of Health & Family Welfare, Government of India, New Delhi
- 2) Government of India (Different Years) *Bulletin of Rural Health Statistics*, Ministry of Health and Family Welfare, , New Delhi
- 3) Census of India (2011) Ministry of Home Affairs, New Delhi
- 4) WHO (2013- 2016) *South East Asia Journal of Public Health*, New Delhi

13.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress 1

- 1) What do you mean by Health Manpower Development?

Ans. Health manpower means the availability of health personnel and is the most important building block of public health. Availability of adequate number of manpower with suitable skill mix and their appropriate distribution, deployment and utilization at different levels of health care set-up are essential for providing effective health care services.

- 2) Describe the important components of Health Manpower Development.

Ans. Planning of health manpower deals with taking information from the forecasting process and turning it into personnel policies. Production of health manpower deals with suitable qualification holders produced by medical colleges and allied health institutions. Utilization of trained health manpower deals with effective and efficient health services to the people.

Check Your Progress 2

- 1) Why training/capacity building among health personnel is required in health organizations?

Ans. Appropriate induction and in-service training and capacity building enhance to develop new competencies and skills among the health personnel leading to the desired changes in the health status and outcomes. Training is effective and tested tool for performance enhancement as well as upgrading the knowledge and skills of the personnel.

- 2) Give some suggestions for development of Health Manpower in India.

Ans. HDM should be basically related to health manpower planning which provides the basis for the production of training for health personnel in various medical and paramedical school programs. Experience in utilization of health manpower should provide feedback on the basis of which production, planning and management can be appropriately adjusted.

UNIT 14 DATA SOURCES FOR HEALTH CARE

Structure

- 14.1 Introduction
- 14.2 Data Sources: Concept, Types and Agencies
- 14.3 Census of India
- 14.4 Civil Registration System
- 14.5 Sample Registration System
- 14.6 National Family Health Surveys
- 14.7 District Level Household Survey
- 14.8 National Sample Survey Organization
- 14.9 Central Statistical Organization and other Statistical Divisions
- 14.10 Let Us Sum Up
- 14.11 Keywords
- 14.12 References and Selected Readings
- 14.13 Check Your Progress - Possible Answers

14.1 INTRODUCTION

Data means the basic information in terms of numbers, images, words, figures, facts or ideas; which is essential for any scientific statement, analysis and research. We collect data for diverse purposes from small individual need to large scale research and planning. Keeping the importance of data for continuous research we need many continuous periodic data sources and agencies evolved. To know these data sources is the prerequisite condition for understanding various aspects of health and development and its transition. Here, we will study about various data sources, collecting agencies and purpose. It includes both national and international data sources, with increasing pace of globalisation, information technology and socio-economic changes the sharing data sources also enhanced to compare at national and global level.

After reading this unit, you should be able to

- a) explain different data sources on population and healthcare,
- b) describe the process of data collection adopted by different agencies,
- c) assess the authenticity and reliability of different sets of data.

14.2 DATA SOURCES: CONCEPT, TYPES AND AGENCIES

Data sources defined as the sources of information gathered for specific purpose like, demographic variables, health conditions, economic status and other purpose. Broadly, there are two types of data.

- i) **Primary data:** The data which are collected by researcher himself/ herself for their specific need. This is original data, first hand information perhaps not published but more reliable.

- ii) **Secondary data-** The data which are collected by else and are made available for others sources. Usually, this information is also collected for specific purpose like census for demographic data, WHO gathers health information.

These data sources are the basic information which guides a development planner, policy makers and implementing agencies. It is policy that defines principles and rules, courses of action, regulatory measures, laws, and funding priorities concerning different aspects of development to guide decisions and achieve required outcomes. A country's policy planning for development requires essentially the information on diverse aspects of socio-economic conditions, population, health and family health care. Such information is also needed for implementation of programmes, their monitoring and laying out future policies. This information, technically known as data, is drawn from varied sources. Surveys method include both whole population surveys and sample surveys. There are two major categories of data sources as given below.

14.2.1 Agencies involved in Data Collection

There are different national and international agencies involved in the collection of data on population and health care. In the case of India, the following Ministries of Government of India are involved.

- a) Ministry of Home Affairs
- b) Ministry of Health and Family Welfare
- c) Ministry of Statistics and Programme Implementation

Moreover, national institutes like the International Institute for Population Sciences (IIPS), Population Research Centres (PRCs), and the National Institute of Health and Family Welfare (NIHFW) are engaged in the collection of critical data. International bodies like the World Bank (WB), World Health Organisation (WHO), United Nations Children's Fund (formerly, United Nations International Children's Emergency Fund, or UNICEF), also provide significant data.

The agency-wise data sources are given below.

i) Ministry of Home Affairs

The Ministry of Home Affairs, Government of India, is primarily responsible for collecting population and healthcare data through both census surveys and sample surveys. Three types of surveys that are conducted by the Ministry of Home Affairs are given below.

Names of Survey	Types of Survey
Census of India	- Complete enumeration through survey
Civil Registration System	- Complete enumeration through registration
Sample Registration System	- Sample survey

ii) Ministry of Health and Family Welfare

In India, the Ministry of Health and Family Welfare, Government of India, is responsible for conducting two large scale demographic surveys, namely, the National Family Health Survey and District Level Household Surveys.

Names of Survey	Types of Survey
National Family Health Survey	- Sample survey
District Level Household Survey	- Sample Survey

iii) Ministry of Statistics and Programme Implementation

The National Sample Survey Organization (NSSO), established in March 1970, functions under the aegis of the Ministry of Statistics and Programme Implementation. On the recommendation of the National Statistical Commission 2005, a steering committee was formed in December 2006 to coordinate the activities of NSSO for conducting surveys on various aspects.

Names of Survey	Types of Survey
Socio-economic Surveys	- Sample survey
Annual Survey of industries and	- Sample survey
Agricultural Surveys	- Sample survey

14.3 CENSUS OF INDIA

The first Census of India was published in the year 1871-72. But the census count was not synchronous and was spread over 1867-72 in different parts of the country. For the first time, in 1881, the Census was conducted across the entire country, simultaneously. Since then, it has been conducted in India at an interval of every ten years without a break. The 2001 Census was the latest one. It was 14th in the series, and the 6th after independence. The 2001 Census had the distinction of being the first one of the 21st century. The basic thrust of the Census of India is to collect information on a variety of population and housing attributes. The information is organized into the following seven series.

Table 14.1: Census Seven Series

Series	Title	Contents
Series-A	General Population Tables	Area, rural-urban break up of population, number and size, class of villages, towns and urban agglomerations, number of houses, slum area, scheduled caste and scheduled tribe population and houseless population.
Series-B	Economic Tables	Workers and non-workers, industrial classification on the basis of labour force engaged in main and marginal activities, educational level, main activities of marginal workers, non-workers, and those available for work.
Series-C	Social and Cultural Tables	Population by religious communities, age, sex, marital status, ever-married and currently married population, age at marriage, literates, educational level, attendance in educational institutions and disabled population.

Series-D	Migration Tables	Migrants by place of birth, place of last residence of the migrants, duration of migration, inter-district, intra-district, inter-state and international migrations, reasons of migration, educational level and economic activity of migrants.
Series-F	Fertility Tables	Ever married women by present age, parity and total ever born children, number of surviving children, number of births in the last year and birth order.
Series-HH	Household Tables	Number of households, its size, sex of the head of the household, houseless, institutional households, households with aged persons.
Series-H	Tables on Houses, Household Amenities and Assets	Number of census houses, type of walls, roofs, floor materials, sources of light, availability of water, bathroom, latrine, drainage and fuel used for cooking. It further gives data on availability of assets such as radio, television, telephone, bicycle, scooter, car among other things.

Data Collection: The data collection in the Census takes place in two phases: House Listing and Population Enumerations. The House Listing Operations are conducted approximately six months before actual enumeration takes place in different states and union territories. In Census of India, 2011, the House Listing operations started in April 2010. This was 15th national census survey conducted in 2 phases - house listing and population. It covered all the 28 states of the country and 7 Union territories including 640 districts, 497 cities, 5767 *tehsils* and over 6 lakh villages.

Training: A sizeable proportion of the population in the country is illiterate. It is difficult to extract information from this section, especially data on age, gender female population, and their work participation. The proper techniques of canvassing questionnaire are taught to the staff engaged in House Listing and Population Enumeration.

Post Enumeration Survey: A Post Enumeration Survey (PES) is carried out systematically to assess the degree of accuracy or error of the census count. This post enumeration check, or post enumeration survey has been an integral part of census since 1951. The post enumeration survey is conducted to get an estimate of

- Under coverage of census houses
- Under coverage of population and
- Extent of the content error with respect to certain selected data items.

Data Availability: The Census data are made available at national, state/union territories, district, sub-district / block / *thana* / town, and village levels in printed, and now, in electronic format as well. Data for a few key indicators is made available after a short span of collection, but the detailed data takes a long time to publish. Raw data is treated as confidential and is not made available under the Act.

14.4 CIVIL REGISTRATION SYSTEM

Vital statistics is an important component of population data. The recording of births and deaths, the two components of natural increase of population, helps in identifying population dynamics. The system of recording these vital events in India is known as the Civil Registration System. The data on birth, the first vital event, includes live births as well as still births and those on death. The other vital events include fetal death, in addition to all others. Besides, marriage and divorce are also considered as vital events. While registering births, some additional information such as date, sex, place of birth, order of birth, type of medical care at the time of birth, age of mother, occupation, and religion of parents are also collected. Similarly, while registering deaths, information is also obtained on date of death, age, place, sex, religion and occupation of deceased person, cause of death and whether it is medically certified and type of medical care received. Since vital events take place continuously, vital records are registered on a continuous basis.

Objective: The prime objective of the civil registration is to undertake continuous and comprehensive registration of vital events, that is, births, deaths, and marriages, with some additional particulars.

Background: The civil registration system in India started way back in the middle of the 19th century. In mid 1860s, data on deaths was collected as a result of efforts of the Sanitary Commissioner of the Government of India. The system of registration of births was initiated in 1866 when the Births, Deaths and Marriages Registration Act were enacted. The registration was, however, not made mandatory. After independence, the responsibility for carrying out the process of civil registration was assigned to the Registrar General and Census Commissioner of India. In 1969, the Parliament of India enacted the law called Registration of Births and Deaths (RBD) Act. It became effective in most states in 1970s. Since then, the registration of births and deaths across the country is done under the legal provisions of the RBD Act. While framing the Act, diversity of the country was kept in mind. It allowed State Governments to formulate rules and make appointment of various functionaries for its implementation. The implementation of the law is the responsibility of the respective State Governments.

Organization and Management: As noted above, the Registrar General of India (RGI), appointed by the Government of India, is in-charge of the civil registration system. In each state, the Chief Registrar of Births and Deaths is responsible for execution of various provisions of the Act in the respective state. Based on the registration data of the state, an annual statistical report is compiled and prepared by the Chief Registrar. On the basis of the state reports, the Office of Registrar General, India prepares national report, annually.

Data Availability: Data on the vital statistics is available at district, town, and state levels. In some states, the data is made available also at lower levels, such as *talukas*, or urban wards. State level data is published every year by the office of Registrar General of India. Any detailed cross tabulations, however, are not published. This is an indispensable source of information on births and deaths.

14.5 SAMPLE REGISTRATION SYSTEM (SRS)

The Sample Registration System (SRS) was initiated as a temporary alternative to take care of the limitations of the Civil Registration System (CRS). Despite the compulsory registration of births and deaths under CRS, the level of registrations has continued to be far from satisfactory in several States and Union Territories. With a view to generating 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 the Sample Registration System (SRS) in 1964-65 on a pilot basis, and on full scale from 1969-70. The SRS, since then, has provided data on a regular basis. It has fulfilled the need to measure short term changes in the rate of population growth and to assess the impact of the family welfare programme efforts.

Organization and Management: the SRS is being managed and implemented through the State Directorates of Census Operations, except in the states of Kerala and Maharashtra. Rural areas are covered by the Directorate of Economics and Statistics of the respective state, and the urban areas are covered by the Directorate of Census Operations. The half yearly survey is conducted by a full time supervisor placed at the state headquarter. An enumerator, usually a teacher or an *anganwadi* worker undertakes enumeration on a continuous basis. The data collected through the field survey is processed at the state headquarter. The data is then forwarded to the Office of the Registrar General, India where Vital Statistics Division systematically compiles it. Tables generated are widely disseminated.

Data Collection: The SRS is based on multi-round retrospective surveys. The dual record system is implemented and the data is collected through

- i) Continuous enumeration of births and death in the sample unit by part time enumerator
- ii) Independent six monthly retrospective survey by a full time supervisor.

A baseline survey is done before the actual registration takes place in the sample unit. The complete listing of houses and households prepared by the enumerator is updated at each half-yearly survey to obtain the current population. The enumerator records the births and deaths taking place in the sample area as well as those occurring to usual residents of the sample area who are temporarily away. Vital events occurring to visitors within the sample are also noted but are not considered for computing vital rates. For ensuring complete recording of events, the enumerator uses several means to remain informed about the vital events. The enumerator takes the help of a village *dai* / midwife, a *chowkidar*, or village priest. The enumerator is expected to maintain a list of pregnant women and make house to house visits once a month. An independent six monthly retrospective full time survey is done by a supervisor in each sample unit in January and July of each year. The supervisor visits each household in the sample unit and records the birth and death pertaining to usual residents and visitors during the fixed period of six months January to June and July to December. At this stage of survey, the supervisor has no information of the birth and death records of the enumerator for this period.

After the completion of six month survey, the two sets of records that of the enumerator and the investigator are matched event-by-event at the state or district headquarter. These records are classified as matched, partially matched or

unmatched. Unmatched and partially matched events are re-verified in the field. This is done either by a third person, or jointly by supervisor and the enumerator.

The SRS sample units are replaced after every census. The data is published form at state level with rural and urban differentials. Half yearly bulletins also containing aggregate vital statistics, it does not provide raw data but important for its reliability and trusted source for fertility and mortality statistics, of Indian States and Union Territories.

In this section, you read about the types of data sources, census of India, civil registration system and the sample registration system. Now, answer the questions given in Check Your Progress-1.

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What is the difference between census surveys and sample surveys?

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2) What are the processes of data collection adopted by the Census of India, CRS and SRS?

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14.6 NATIONAL FAMILY HEALTH SURVEYS

A noticeable change in the availability of data sources based on large scale surveys in the field of health and family welfare has taken place in India since the National Family Health Survey was initiated during early 1990s. The National Family Health Survey (NFHS) is a large scale, multi-round survey conducted on a representative sample of households, throughout India. Four rounds of the survey have been conducted since 1992 on similar lines of Demographic Health Surveys (DHS) at the international level. The first NFHS (1992-93) was a major landmark in the development of demographic and health data base in India. The second round of NFHS (1998-99), the third round (2005-06) and latest fourth round (2015-16). State and national level information, based on a survey of stratified sample of households is gathered. On an average 30 households are interviewed in each selected sampling unit. All four surveys were conducted under the aegis of Ministry of Health and Family Welfare, Government of India. The nodal agency

for conducting the surveys was the International Institute for Population Sciences (IIPS), Mumbai. For the actual conduct of these surveys, technical assistance was provided by other national and international agencies. The IIPS collaborated with a number of field organizations (FO) for survey implementation. Each FO was responsible for conducting survey activities in one or more states covered by the NFHS.

14.6.1 National Family Health Survey-1

The survey collected extensive information on population, health, and nutrition, with an emphasis on women and young children. Eighteen Population Research Centres (PRCs), located in universities and institutes of national repute, assisted IIPS in all stages of conducting NFHS-1. These PRCs are spread over 14 States, National Capital Territory of Delhi and Union Territory of Chandigarh. All the PRCs were involved at all the stages of conducting NFHS-1. One underlying consideration of the first round of NFHS-1 was to strengthen the survey and research capabilities of the PRCs.

Objectives: NFHS-1 was conducted with following aims:

- a) Collect data on health and demographic behaviour at the State and National level to evaluate the existing population and family welfare programme and policy.
- b) Provide information for health care services, nutritional status of children, along with the usual socioeconomic and demographic characteristics of a household.

Survey Design and Sampling: NFHS-1 collected the data at the individual, household, and community level. The sample design was uniform for all the States where NFHS was conducted. In all, 89,777 ever married women in the age group of 13-49 years were interviewed; 27,534 in urban areas and 62,243 in rural areas. A total of 88,562 households were interviewed covering 28,822 in urban areas and 59,740 in rural areas.

Field Work: NFHS-1 covered 24 states and the National Capital Territory of Delhi, representing 99 per cent of the population of the country. The field work was carried out in three phases from April 1992 to September 1993. Almost 30 different organizations were involved to conduct for this exercise with IIPS and PRCs collaborated many consulting organizations for doing the survey.

Survey Instruments: Three structured questionnaires namely, Household, Woman's and Village questionnaires were used to collect data for NFHS-1. These questionnaires were broadly based on the DHS model B questionnaire, used for data collection in countries with a low contraceptive prevalence rate. All questionnaires were bilingual, with questions in English and regional languages.

14.6.2 National Family Health Survey-2

NFHS-1 was successful to generate a data base of India on various indicators of health, family welfare, and demography. After the International Conference on Population and Development (ICPD) in Cairo, the Reproductive and Child Health (RCH) was adopted in India. The second National Family Health Survey (NFHS-2) was conducted in 1998-99 in 26 States of India with added features on the quality of health and family planning services, domestic violence, reproductive

health, anaemia, the nutrition of women, and the status of women. Several organizations participated in the NFHS-2. In all, 13 field organizations were involved in the collection of field data, while eight were in private research organizations, five were the population research centres.

Objective: The prime objective of NFHS-2 was more or less the same as that of NFHS-1. The NFHS-2, however, collected additional information on the quality of health and family welfare services, women's reproductive health, domestic violence and standard of living of the household. The nutritional status of women was measured for the first time in NFHS-2.

Survey Design: NFHS-2 used a standard sample design to ensure the desired quality and comparability of data. On an average, 30 households were interviewed per selected sampling unit. In all, 89,199 eligible women in the age group of 15-49 years were interviewed. Among them 61,337 were in rural areas and 27,862 in urban areas. A total of 91,196 households were interviewed; 60,761 of them belonged to rural areas and 30,435 to urban areas.

Field Work: NFHS-2 was initially planned to be carried out in 26 states. The survey, however, had to skip Tripura due to local problems. The data collection was carried out in two phases, beginning in November 1998 and, subsequently, in March 1999. It has used three sets of questionnaires for collection of data. The information in women's questionnaires was collected from the ever-married women in the age group of 15-49 years.

14.6.3 National Family Health Survey-3

It was conducted in 2005-06, and aimed to capture comparable information on trends on vital indicators related to population and health. The survey was carried out in 29 States of India by 13 research organizations and five population research centres.

Objective: NFHS-3 gathered information not only on all the items covered by NFHS-1 and NFHS-2, but, also, on several new and emerging issues such as prenatal mortality, involvement of men in the use of health and family welfare services, adolescent reproductive health, high risk sexual behaviour, family life education, safe injection, and knowledge about tuberculosis. A major new component of NFHS-3 was blood testing for HIV prevalence.

Survey Design: A uniform sample design was adopted for all states. The Census 2001 was used as the base for the sampling frame in rural and urban primary sampling units. In addition to interviewing ever-married women in the age group of 15-49 years, the never-married women in the age group of 15-49 years and, both, ever-married and never-married men in the age group of 15-54 years were covered as respondents. A total of 109,041 households were interviewed (58,805 in rural areas and 50,236 in urban areas). In the interviewed households, individual interviews were completed with 124,385 women (67,424 in rural areas and 56,961 in urban areas). Individual interviews were completed with 74,369 eligible men (36,170 in rural areas and 38,199 in urban areas).

Field Work: NFHS-3 was also carried out in two phases of November 2005 to May 2006, and April to August 2006. In the first phase, 12 states were canvassed and the remaining 17 states were covered in the second phase. NFHS-3 used three sets of questionnaires, namely Household, Women's, and Men's questionnaires.

HIV Testing: Testing of HIV and anaemia was an additional biomarker component included in NFHS-3. HIV prevalence at the national level and for six high HIV prevalence states was estimated on the basis of blood samples collected from women in the age group of 15-49 years, and men in the age group of 15-54 years. Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, and Tamil Nadu were adopted as the high HIV prevalence states. Blood testing for HIV and anaemia testing could not be collected in Nagaland due to opposition from local community. Estimates of HIV prevalence in one low HIV prevalence state, Uttar Pradesh, was also worked out. NFHS-3 tested more than 100,000 women and men for HIV, and over 200,000 adults and young children for anaemia.

14.6.4 National Family Health Survey-4

The fourth series NFHS has conducted during 2015-16, provides information on population, health and nutrition for India and each State/Union territory. In this series first time, gathered data of district-level estimates for many important indicators. The NFHS-4 are retained and additional components are added from like, information on malaria prevention, migration in the context of HIV, abortion, violence during pregnancy, out-of-pocket expenditure for institutional deliveries, Insurance coverage for men and women, and NCDs. First time, NFHS has collected data from all 29 states and 6 territories in four types of questionnaires used four types of questionnaires a) household, b) woman, c) man and d) biomarker questionnaires; further, two additional biomarkers were added hypertension and blood glucose.

Objective: Like earlier NFHS, it has followed two major objectives. first, to provide essential data on health and family welfare needed by the Ministry of Health and Family Welfare and other agencies for policy and programme purposes, and second, to provide information on important emerging health and family welfare issues. Besides this it added many new components as per changing health need and district level information.

Survey Design: The NFHS-4 survey used three schedules- household, woman and man, and information has collected from The NFHS-4 sample comprises of 6,01,509 households, 6,99,686 women, and 1,03,525 men from 28,583 primary sampling units (rural and urban), spread across 640 districts of India. In these households information on 267,272 children below age 5 will also be collected.

Recent initiative of NFHS-5 has started in 2018-19 to make population and health programmes more effective. Thus NFHS data are known for its authenticity and reliability; it is comparable with the DHS conducted in many countries. The first round of NFHS provided reliable health and demographic data at the state level for the first time. As many as 50 reports at state and national levels were produced. The results of the survey were widely disseminated through the publication of series of NFHS research bulletins on specific themes. Data was also made available for research purposes. The survey provided extensive information on population, health, and nutrition, with an emphasis on women and young children. It fulfilled the long awaited demand for data required for planning health and demographic parameters.

In this section, you studied national family health surveys. Now, answer the questions given in Check Your Progress-2.

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) Give a brief account of National Family Health Surveys.

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14.7 DISTRICT LEVEL HOUSEHOLD SURVEYS

The Reproductive and Child Health (RCH) programme that was launched by the Government of India in 1996-97 is expected to provide quality services and achieve multiple objectives. The new approach requires decentralization of planning, monitoring and evaluation of the services. The district being the basic nucleus of planning and implementation of the RCH programme, the Government of India has been interested in generating district level data on the utilization of the services provided by government health facilities, other than data 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. These surveys, carried out under the aegis of the Ministry of Health and Family Welfare, Government of India, critically evaluate the implementation and outcome of the RCH programme at the district level. Three rounds of DLHS have been conducted so far; the first DLHS in 1998-99, the second in 2002-03, and, the third in 2007-08. These household surveys capture programme indicators for all districts in the country on a very rapid basis. The broad programme indicators are ANC, delivery care, child care practices, use of contraception, the utilization and quality of government of health services, awareness about RTI/STI and HIV/AIDS among men and women, availability of trained staff, equipment and supplies and their utilization. The scope of these surveys was widened over the three successive rounds of the survey, with the addition of new parameters.

14.7.1 District Level Household Survey-1

The unavailability of district level data on the utilization of services provided by public health centres was observed as a constraint for policy implementation at the micro level. To fill this gap, the Government of India decided to conduct Rapid Household Surveys (DLHS) in all the districts of the country in 1998-99.

Objectives: The DLHS-1 collected information on parameters, such as antenatal care (ANC) and immunization services, safe deliveries, practice of contraceptives, unmet need in terms of family planning methods, awareness about RTI/STI and HIV/AIDS, the utilization of government health services, and users' satisfaction.

Survey Design: On an average, a sample of 1,000 households from each of the district was interviewed. Twenty households from 50 PSUs (either village or urban wards in each district were covered) were selected. The survey was carried

in two phases; about half of the districts from each state and union territory in the first phase in 1998, and the remaining districts in the second phase, in 1999.

Field Work and Survey Instruments: The survey was carried out 504 districts of a total of 507 districts as they existed in 1995. For data collection, two separate questionnaires were used: the household questionnaire, and, the woman's questionnaire. The household questionnaire dealt with the socio-economic characteristics of the household members, in addition to a number of health indicators. The woman's questionnaire was used to interview all currently married women in the age group of 15-44 years.

14.7.2 District Level Household Survey-2

To get feedback on the achievements of the RCH programme it was decided to undertake the District Level Household Survey (DLHS) in 2002-2004. During this second round, all 593 districts, as per the 2001 Census, were covered.

Objectives: The main focus of the second round of the DLHS was primarily on RCH indicators. Some new parameters, such as test of cooking salt to assess the consumption of salt fortified with iodine, the collection of blood of children, adolescents, and pregnant women to assess the level of anaemia, and the measurement of the weight of children to assess their nutritional status, were incorporated.

Survey Design: In DLHS-II, the sampling framework was modified. On an average, 1,000 sampled residential households from 40 selected PSUs in each district were covered, giving a total of 620,000 households. From these surveyed households, 507,000 currently married women (aged 15-44 years) and 330,000 husbands of eligible women were interviewed.

Field Work: The fieldwork was done in two phases: covering 295 districts in Phase-I during March 2002 to December 2002, and 298 districts in Phase-II, during January 2004 to October 2004.

Survey Instruments: Five separate questionnaires were used to obtain information: Questionnaire, Woman's Questionnaire, Husband's Questionnaire, Village Questionnaire and Health Questionnaire. The questionnaires were finalized by the Ministry of Health and Family Welfare, Government of India, in consultation with the World Bank and a Technical Advisory Committee.

14.7.3 District Level Household Survey-3

To ensure access for rural communities to equitable primary health care, the Government of India launched the National Rural Health Mission in 2005-06. Under the mission, the infant mortality rate and the maternal mortality ratio are to be reduced within a specified time. As an interface between rural communities and the health system, health volunteers, called Accredited Social Health Activists (ASHA) were inducted into the mission. Further, to promote institutional deliveries, the Janani Suraksha Yojana (JSY) scheme was initiated. The DLHS-III was carried out in 2005-06 to provide information on critical interventions of the NRHM (now under National Health Mission)

Objectives: The basic objectives of the DLHS-III were the same as of the DLHS I and II. New dimensions were, however, added to assess JSY beneficiaries,

ASHA's involvement, and the status of life education among unmarried adolescent girls, and health facilities and infrastructure available.

Survey Design: Sampling design was somewhat modified in DLHS-III. The sample size ranged from 1000 households to 1,500 households in different districts. In the earlier two rounds of DLHS only currently married women age 15-44 years were interviewed. In DLHS –III, however, ever-married women in the age group of 15-49 years and never-married women in the age group of 15-24 years were interviewed.

Survey Instruments: Five separate questionnaires were used to collect information: Households Questionnaire, Ever Married Woman's Questionnaire, Unmarried Women's Questionnaire, Village Questionnaire and Facility Survey Questionnaire. The questionnaires were finalized by the Ministry of Health and Family Welfare, in consultation with other organizations.

In this section, you read about district level household surveys. Now, answer the questions given in Check Your Progress-3.

Check Your Progress 3

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) Give a brief account of District Level Household Surveys.

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14.8 NATIONAL SAMPLE SURVEY ORGANIZATION (NSSO)

The National Sample Survey organization (NSSO) was created in 1950 for collection of socio-economic data to develop a sound database through a continuous system of multiple surveys. It was reorganized as the National Sample Survey Organization (NSSO) in March 1970. On the recommendation of the National Statistical Commission, 2005, a steering committee has been formed in December 2006 to coordinate the activities of NSSO. NSSO has the following four divisions.

- i) Survey Design and Research Division
- ii) Field Operations Division
- iii) Data processing Division
- iv) Co-ordination and Publication Division

i) Survey Design and Research Division is located in Kolkata. The specific functions of this division include questionnaire design, framing sample designs, making tabulation plans, and preparing survey reports.

- ii) **Field Operations Division** has its headquarters at New Delhi, with its Agriculture Wing at Faridabad. It is responsible for conducting surveys in the area of economic and industrial statistics. Urban areas are specifically targeted by this division.
- iii) **Data Processing Division** has its headquarters at Kolkata. This division is mainly responsible for data entry, processing and tabulation of socio-economic data. It has six data processing centres located at Ahmedabad, Bangalore, Kolkata, Delhi, Giridih, and Nagpur.
- iv) **Coordination and Publication Division** is located at New Delhi. Its main responsibility is to make the survey data of the various rounds available to different stakeholders, including researchers and planners.

NSSO is primarily involved in three types of surveys- socio-economic surveys, annual survey of industries and agricultural surveys. The surveys, known as rounds in NSSO, are conducted at varying time periods, ranging from three months to one year. NSSO provides information on a variety of topics in different rounds. Themes of some of the rounds undertaken by NSSO are given in the table below.

Table-14.2: Themes Undertaken by NSSO

Human resource development	Periodic data on health indicators namely utilization of family planning methods, morbidity, health care and condition of aged, disabled persons, nutrition, National Rural Health Mission, utilization of medical service, treatment of ailments, MCH care, and consumption of tobacco, etc. On education, educational institutions in India, literacy, level of education etc.
Housing conditions	Includes data on condition of dwelling units, household amenities available, slums, migration, and construction activities.
Household consumption	Data on the pattern of household consumption of different items such as food items, clothing, footwear, etc.
Employment/Unemployment	Data on volume and structure of employment and unemployment on a regular basis and on participation of women in household work in specified activities.
Manufacturing and trade	Data on manufacturing activity, both in the organized and unorganized sector.
Agriculture	Data on size and distribution of land holdings, area under different crops, cultivation practices, indebtedness of farmer households, seasonal variation in the operational landholdings, and livestock.
Drinking water and sanitation	Data related population having safe drinking water and effective sanitation facilities.
Health and disability	Changing health condition and the status of disability

14.9 CENTRAL STATISTICAL ORGANIZATION (CSO) AND OTHER STATISTICAL DIVISIONS

14.9.1 Central Statistical Organization (CSO)

The Central Statistical Organisation (CSO) coordinates activities relating to data collection in the country and evolves and maintains statistical standards. Its activities include National Income Accounting, conduct of the Annual Survey of Industries, Economic Censuses and follow up surveys, compilation of the Index of Industrial Production, as well as the Consumer Price Indices for Urban Non-Manual Employees, Human Development Statistics, Gender Statistics, imparting training in Official Statistics, Five Year Plan work relating to Development of Statistics in the States and Union Territories, dissemination of statistical information, work relating to trade, energy, construction, and environment statistics, revision of National Industrial Classification, etc. It has a well equipped graphical unit. The CSO, located in Delhi, is headed by a Director General who is assisted by two Additional Director Generals, four Deputy Director Generals, Joint Directors, and other supporting staff.

14.9.2 Statistics Division of the Ministry of Health and Family Welfare

The Ministry of Health and Family Welfare has an inbuilt system to collect a variety of data on different aspects of health and family welfare, such as family planning acceptors, antenatal care, natal and postnatal care, and immunization among others. The ministry brings out a bulletin on rural health statistics in India. The data given in the bulletin is based on the information provided by the states and union territories in the form of Progress Reports on Rural Health Services. Specifically, it provides information on the following major schemes.

- i) **Rural Health Infrastructure:** It covers the setting up of sub-centres, primary health centres and community health centres during Five Year Plans, First Referral Units at health centres, and status of buildings for sub-centres, primary health centres and community health centres. On all these aspects, information is given separately for tribal areas, and district level data is made available.
- ii) **Health Manpower in Rural Areas:** It includes health workers, medical, paramedical and technicians in rural health care centres.
- iii) **Status of facilities available:** It gives information on detailed facilities available at sub-centres and primary health centres.
- iv) **Training:** As being provided ANM, LHV and multipurpose (male) workers under different training programmes.

These bulletins are a useful source for those who are involved in the field of research in health administration, planning and management, and, in decision making for the implementation of various rural health schemes. The ministry also publishes an annual report which provides detailed information on its own activities.

14.9.3 National Institutes and Organizations in Population and Health Research

There are some key national institutes and organizations that have been making contributions in developing useful databases on population and family healthcare.

i) **International Institute for Population Sciences (IIPS):** This is an autonomous body under the Ministry of Health and Family Welfare, Government of India. The United Nations, the Government of India, and Sir Dorabji Tata Trust jointly established the Institute in 1956. It was named the Demographic Training and Research Centre. The Centre was renamed, and called the International Institute for Population Sciences (IIPS) in March 1984. IIPS is involved in collection, organization, and dissemination of demographic information about population of India and ESCAP countries. It also undertakes scientific research on population issues that are specific to the region. The institute has been designated as the nodal agency for the organization and management of large scale demographic and health surveys by the Ministry of Health and Family Welfare. It also brings a variety of data collected through such surveys. A particular mention may be made of the three National Family Health Surveys and District Level Health Surveys.

ii) **Population Research Centres (PRCs):** In all, there is a network of 18 PRCs in the country, fully funded by the Ministry of Health and Family Welfare, Government of India. These are located in universities and institutes of 14 States, New Delhi, and in Chandigarh. Since the territorial coverage of studies by these PRCs goes beyond the boundaries of the state/UT of their location, no part of country is left uncovered on this count. The PRCs carry out studies on different aspects of population and health care, aimed largely at collection and analysis of primary data. The studies are submitted to the ministry in the form of research reports, monographs, and books. These are also published independently by the authors in relevant journals.

The Ministry of Health and Family Welfare, Government of India, assigned the task of preparing annotated bibliographies of all studies conducted at the PRCs to the Centre for Research in Rural and Industrial Development (CRRID). So far, four successive annotated bibliographies have been brought out, covering, in all, 2, 361 research studies from 1960-2007. The first bibliography, covering the 1960-86 period, had 624 annotations. The second bibliography (1987-1994) had 434 annotations. The third bibliography (1994-2001) had 651 annotations, and the fourth bibliography (2001-2007) had 652 annotations.

iii) **National Institute of Health and Family Welfare (NIHFW):** The National Institute of Health and Family Welfare, fully sponsored by the Ministry of Health and Family Welfare, were established in March 1977 by merging the National Institute of Health Administration and Education and National Institute of Family Planning. The thrust areas of the institute are health and related policies, and population optimization. In July 2003, a Demographic Data Centre was set up in the Department of Statistics and Demography. It functions as a store house of data originating from a variety of other sources such as the Census of India and the NSSO. This makes data easily accessible at one place. These data are available in book form and also online.

14.9.4 International Organizations in Population and Health Research

Besides the national agencies discussed above, the following international organizations also provide significant data on population, development, and family welfare.

- i) **The World Bank:** The World Bank regularly provides data on a variety of socio-economic parameters for various countries in the form of tables in its annual reports. Some of the topics include life expectancy, child mortality, maternal health, HIV/AIDS, malaria, and other diseases, employment, education and income. Such data serves as a base for conducting population and health studies, involving inter-country comparisons.
- ii) **The World Health Organization:** WHO is a United Nation's specialized agency for health. In India, WHO gives technical assistance and collaborates with the Ministry of Health and Family Welfare, Government of India, and other stakeholders in health related studies. WHO also provides technical assistance on several programmes such as: the National Polio Surveillance Programme, the Revised National Tuberculosis Control Programme, and the Reproductive and Child Health Programme. It also makes demographic and socio-economic statistics available on many parameters that include child mortality, access to maternal and child health care services, and access to health care services, in general.
- iii) **UNICEF:** UNICEF has been working with Government of India since 1949 on issues pertaining to children. The organization collects and gives information on data pertaining to health, nutrition, education, and other matters related to children. It also brings out reports on the state of children from time to time.

14.9.5 Non Official Statistics

Moreover, information in respect of the above stated parameters is also generated by individuals and private institutions. The data generated by scholars for their own studies and by non government agencies is known as non-official statistics. In this case, the data generated is mostly for the purpose of research. The quality of such data varies with the competence of individual organizations and scholars.

In this section, you read about the National Sample Survey Organization, Central Statistical Organization, and other statistical divisions. Now, answer the questions given in Check Your Progress-4.

Check Your Progress 4

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

- 1) What are the data sources on the theme of population and healthcare in India?

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2) What are the criteria for assessing the quality of official statistics?

14.10 LET US SUM UP

In this unit we have learnt about different sets of data sources on population and healthcare in India. Depending on the extent of coverage, the data sources have been classified as the Census Surveys and Sample Surveys. In addition, Official Statistics are also dealt with as one of the important data sources on healthcare. The major sources of data on population and health care in India are the Census of India, Civil Registration System, Sample Registration System, National Family Health Survey, District Level Household Survey, National Sample Survey Organization, Central Statistical Organization, and Statistics Division of Ministry of Health and Family Welfare, Government of India at the national level; and, WHO, the World Bank, and UNICEF at the international level. Each has its own strengths and weaknesses.

The understanding of the processes involved in data collection helps in judging the authenticity and reliability of different sets of data. National level sample surveys carry out sample surveys up to the household level, but generally, consolidate them up to the state, or, at times, up to the district level. It is evident that careful planning, elaborate training of staff, effective monitoring, and supervision are important components of ensuring the quality of data collected. The data generated and collected by different national and international agencies are made available in the published form as well on the online. Raw data, however, is not made available by the Census, SRS and CRS.

14.11 KEYWORDS

Census survey: Census survey is the complete enumeration of a population or groups in well defined part of a country at a point of time.

Sample survey: The process in which information is obtained from a sample or subset of population through the systematic use of statistical methodology.

Official statistics: Official statistics are the outcome of a process of collection and processing of data into statistical information by the government institutions.

Non-official statistics: The statistics generated by scholars for their own studies is mostly non-official unless it is adopted by the government for making it official.

CRS: Civil Registration System

SRS: Sample Registration System

14.12 REFERENCES AND SELECTED READINGS

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14.13 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress-1

- 1) What is the difference between census surveys and sample surveys?

Ans. Census survey is meant to cover every person in a group at a given point of time. Sample survey, on the other hand, is meant to cover a subset of population. The subset of population is taken as representative of the whole and data collected from it are made applicable to the universe.

- 2) What are the processes of data collection adopted by Census of India, CRS and SRS?

Ans. In Census of India data collection takes place in two stages: house listing and population enumeration. Data collection in CRS is done on a regular basis as the vital events take place on a continuous basis. In SRS, the enumerator records the births and deaths taking place in the sample area and an independent six monthly retrospective full time survey is done by a supervisor in each sample unit.

Check Your Progress 2

- 1) Give a brief account of National Family Health Surveys.

Ans. The NFHS is a large-scale, multi-round survey conducted throughout India on a representative sample of households. Four rounds of NFHS was conducted from 1992-93, 1998-99, 2005-06 and last 2015-16. State and National level information, based on a survey of stratified sample of households is gathered on parameters related to fertility, family planning practices, mortality (including infant and child mortality), utilization of maternal and child health care services, nutritional status of children, along with the usual socioeconomic and demographic characteristics of a household.

- 1) Give a brief account of District Level Household Surveys.

Ans. Three rounds of DLHS have been conducted so far; first DLHS in 1998-99, second in 2002-03 and the third in 2007-08. The broad programme indicators are ANC, delivery care, child care practices, use of contraception, utilization and quality of government of health services, awareness about RTI/STI and HIV/AIDS among men and women, availability of trained staff, equipment and supplies and their utilization.

Check Your Progress-4

- 1) What are the data sources on the theme of population and healthcare in India?

Ans. Data sources on the theme of population and health care in India are: Census of India, Civil Registration System, Sample Registration System, National Family Health Surveys, District Level Household Survey, National Sample Survey Organization, Central Statistical Organization and other statistical divisions, WHO, World Bank and UNICEF.

- 2) What are the criteria for assessing the quality of official statistics?

Ans. The criteria for assessing the quality of any official statistics are: relevance and completeness, timeliness, accuracy, accessibility and clarity, cost efficiency, transparency, comparability, and coherence. These are known as quality principles.

THE PEOPLE'S
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UNIT 15 HEALTH SYSTEM RESEARCH

Structure

- 15.1 Introduction
- 15.2 Health System Research: Concept and Significance
- 15.3 Health System Research: Objectives, Features and Scope
- 15.4 Global Status of Health System Research
- 15.5 History of Health System Research in Indian Context
- 15.6 Health System Research in India: Priority, Utilisation and Funding
- 15.7 Challenges and Prospects of Health System Research
- 15.8 Let Us Sum Up
- 15.9 References and Suggested Readings
- 15.10 Check Your Progress: Possible Answers

15.1 INTRODUCTION

Health system research (HSR) is the systematic study of the resources where bio-medical, socio-medical and additional significant knowledge plays a role towards overall health services and their facilities. Health system research goes beyond the frontiers of health services to update new knowledge of health, medicine, practices and innovations. In India, health system research mostly has been limited to the concern with government programmes, while the private sector and its allied sectors have a different focus and coverage. Health system research not only supports health functionaries but provides a foundation for policy makers and policy advisors to implement the evidence based research for improving health services, particularly for the poor, and other vulnerable sections of society. In this unit you will learn about the concept of HSR, its history and changes, both at the global and national levels.

After going through this unit, you will be able to:

- a) discuss the concept of health system research, particularly the World Health Organisation's six building blocks and their significance,
- b) describe the history of health system research in pre- and post-independence India,
- c) examine the structure, focus and changes in health system research,
- d) explain major challenges and emerging prospects of health system research.

15.2 HEALTH SYSTEM RESEARCH: CONCEPT AND SIGNIFICANCE

Health system research is broadly defined as the assembly of original knowledge to develop how communities and individuals should come together to achieve optimum goals of health. The World Health Organisation (WHO) defines a health system as all organisations, people and actions whose primary intent is to promote,

restore or maintain health. Further, WHO has identified six building blocks of health systems in the Framework for Action for health system. These are as following-

- a) **Service delivery** – Addressing the organisation and management of health services, which ensures access, quality, safety and continuity of care across health conditions, across health facilities and over time.
- b) **Information and evidence** – The generation and strategic use of available information, evidence based research on health and health systems to strengthen management, leadership and governance.
- c) **Medical products and technologies** – Ensuring equitable access to essential medical products and technologies of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use.
- d) **Health workforce** – Management of the dynamic labour markets, which address entry and exits from health workforce and improve the delivery and performance of current health workforce.
- e) **Health financing** – Generating adequate funds for health which ensures that people can use compulsory health services and to protect themselves from monetary calamity or disadvantage associated with having to pay for the services.
- f) **Leadership and governance** – Guaranteeing strategic policy frameworks combined with effective oversight, coalition-building, by-law, responsiveness to health-system design issues and advancement of accountability in order to defend the health interest of public.

The framework of information exchange and communication systems transformed radically from the time when the WHO health systems framework was announced in 2010.

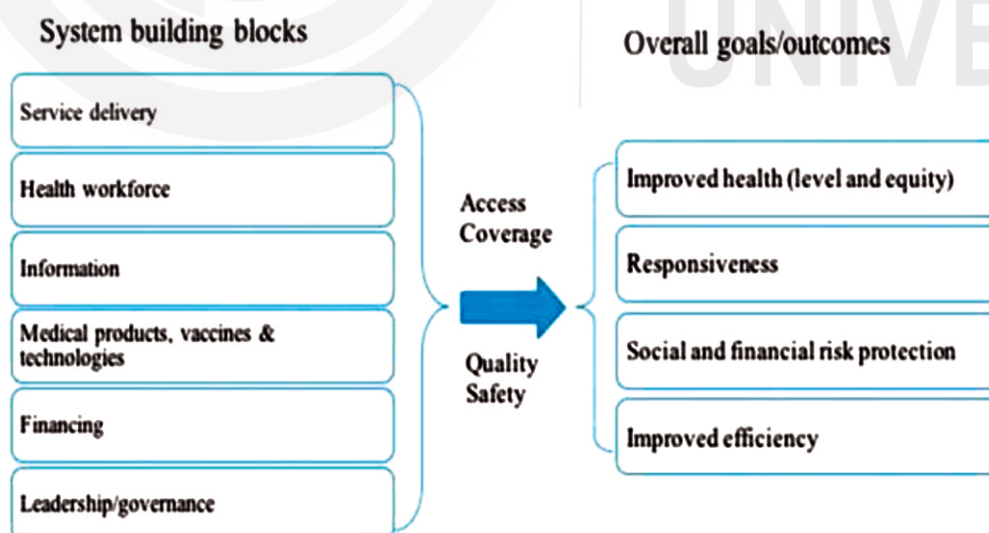


Fig. 15.1: Six Building Blocks with Goals and Outcomes Associated

Source: Six building blocks of a health system (WHO, 2007)

Correspondingly, the “patient engagement” knowledge and thinking in health care have evolved prominently. People are actively involved and participate to promote healthcare for better outcomes. While it would be impossible to integrate all multi-dimensional aspects owing to diverse conditions, a modification was

proposed for the framework, highlighting general points of influence of communication and patient engagement. Health system research must address all of these six building blocks and their allied options. The principal purpose of health system research is eventually to encourage, endorse and stimulate the coverage, worth, effectiveness and justice of health systems provided to the poor and the vulnerable sections of the society. Although many things need to be done in terms of infrastructure development, resource mobilisation, human resource for health etc. and development in health needs improvement and course correction.

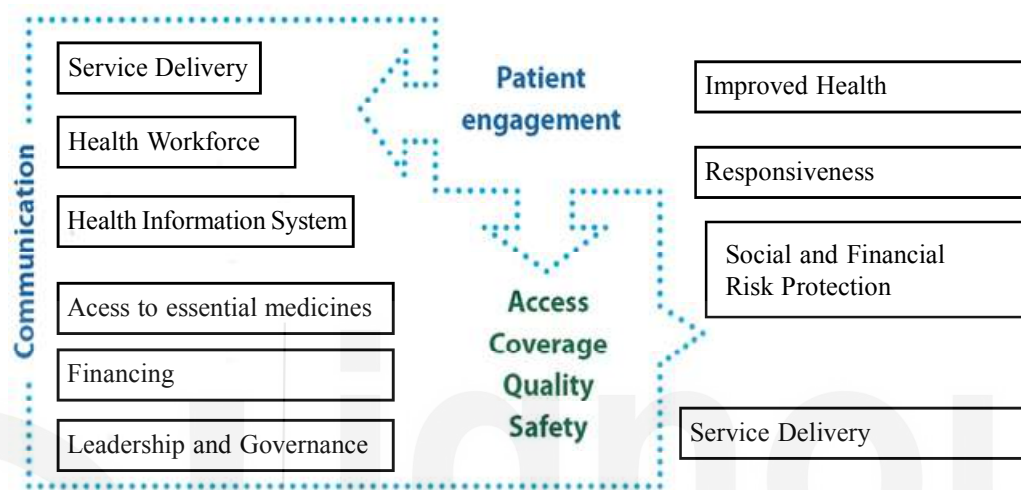


Fig. 15.2: Modified Six Building Blocks with Goals and Outcomes Associated with Six Building Blocks Overall Goals / Outcomes

Source: A new era for the WHO health system building blocks? Jeffrey V. Lazarus, Tim France, www.healthsystemsglobal.org/blog/9/A-new-era-for-the-WHO-health-system-building-blocks

Why does health system research matter?

According to the Indian Constitution's Directives Principles of State Policy, health availability is one of the obligations of the state. Health manager's plan manages and deliberates about decisions taken for organising the health system and overcome the health problems. Now the basic question arises about primary health care services and effective use of community level health workers like ASHAs or ANMs or do we need a new cadre to be inducted who can work for better services? The questions also emerge about the user charge from the community members as some people think that individuals and community should pay user charges for usage of curative services at health centres. Should health centre functionaries' performance and remuneration be linked? Health system research (HSR) has the capacity to produce dependable and rigorous evidence which helps in informed decisions.

The effects of different policies and approaches are very critical because decision makers over and again face testing questions in relation to how to implement successful health reforms. For example, if the local government authorities are authorised with the given responsibility of health, then how do we ensure the enhancement of the service for the vulnerable population? And what ought to be the function and responsibility of the policy makers at the national level? Who must ensure that the local government is made efficient and accountable for better quality public health? Wherever the central government and state government is not in a position to deliver the quality services to the community then, can private health service providers be an option for provision of primary,

secondary and tertiary health care services under strict service guidelines? It is being planned to implement a new health insurance bill or *Pradhan Mantri Jan Aarogya Yojana* (PM-JAY). The government must oversee the removal of the bottlenecks of the reforms, and how those weaknesses should be handled. For these types of questions, 'health system research' can provide answers or at least provide guidance that will improve the chances of effective decision making and implementation.

15.3 HEALTH SYSTEM RESEARCH: OBJECTIVES, FEATURES AND SCOPE

The principal objectives of any health system research is to establish the finest effective operational ways to organise, manage, achieve, finance, and ensure delivery of best available quality care; reduction of medical slips and improving the quality and standards of patient safety in the country and creation of the comprehensive demonstration of how health systems responsiveness and its adaption to health policies, how national health policies can provide outline for the health system and in turn the national policies be molded with evidence-based health systems and the wide-ranging determining factors of health.

The major purposes of health system research are:

- a) To solve health problems of the state in general and country as a whole
- b) To improve the health of people through improvement of the various interconnected components of the health system
- c) To enhance efficiency and effectiveness of health system as a fundamental measure of the overall socio-economic development
- d) Analysis of problem from technical and human angle; and translation of research results into implementable solutions

The major thrust of health policy content is, the policy preparation and decision making process. The primary focus of health system research is predominantly on the primary health care, which incorporate forward integration of preventive, promotive and curative measures for the control of diseases. The study in nutrition, malnourishment and other allied sectors for mother and child health promotion, family planning, environmental safety, problems of referral to secondary and tertiary health care, backward and forward linkages of health services etc. Focus of health system research includes learning how to work with different sectors in a wide range of development activities

15.3.1 Important Features of Health System Research

Health system research is duty-bound to pay attention and provide solutions to the urgent needs and difficulties in health care and its allied sectors. The problem ranges separately at different level of the provision of health services, for example, health managers and health policy makers will have different problems. Thus the most important feature of the health system research is to provide solutions to the health problems at different levels of programme implementation.

- I) Health system research must deliberate on the persistent complications confronted by every single level of the health workers and administrators. Health system research creates an ultimate favorable influence on health

services by means of receptiveness and responsiveness on significant problems.

II) Health system research must be action-oriented and its major aim must be envisioned in terms of developing solutions for problems. The solutions provided by health system research must and should be simple practical advice that can be implemented easily on the ground. The primary responsibility of HSR is not counting the number of individuals suffering from a certain disease or particular health condition or describing people's behaviour towards a certain disease but to solve these individuals' health problems. Health system research is duty-bound to pay attention to finding real-world solutions; for example, how to deal with people suffering from cervical cancer or how to change people's behaviour towards cervical cancer. Advocacy about any subject or event is the single most important component of health system research, although advocacy in India is very limited.

III) Health system research utilises a cohesive 'multi-disciplinary approach'. Inputs from all principal subject areas and disciplines are assimilated under one roof; for example— policy makers, decision makers, doctors, nurses, epidemiologists, public health researchers, economists, transport managers, social and behavioural researchers. Interdisciplinary approach reflects upon the intricacy of the subject that the "real world" lobs up and what real-time solution can be provided to overcome the problems.

Health system research must be participatory in nature. The important stakeholders namely (policy makers, public health specialists, health care managers, researchers, and community members) always need to be involved in all stages (conceptualisation, planning, implementation, monitoring, evaluation and dissemination) of the research. If all the relevant stakeholders are not included in every stage of planning and implementation, then in the end, the recommendations from studies may be inappropriate or not feasible from every stakeholder's perspective; or may make the research simply have less chance of being utilised for future research. For example, if public health researchers (specialists) are not consulted or not part of the team, then the methodology may not be suitable to the community or may not be dependable; likewise, if the communities are not consulted, then the recommended solutions for the community, for instance, in case of cervical cancer might not be acceptable to by the community.

IV) Research on health systems must be well-timed. HSR studies should be planned in such a way that results could be made available when needed for evidence-based key decisions. For example: In today's time, PM-JAY studies will create evidence for the government and *Niti Ayog* to take the decision that help this programme to be better implemented. The purpose of health system research is defeated when the decisions have been made without evidence of study.

VI) The research designs for health system research have to be simple and operational. In HSR, researchers work on answering the research enquiries by collecting objective evidences from qualitative and quantitative information of health user, health facilities and service providers so that reports can be generated and inferences drawn sharply for the future course of action.

- VII) Projects and study on health system research must lay emphasis on finding reasonable and operational solutions. Health system research must always consider one principal thought '*Are these policy recommendations affordable for the poor and needy population?*', if the answer is 'Yes' by the technical specialist committee, then the recommendations can be implemented on the ground.
- VIII) Results from the qualitative and quantitative study should be easy to get to and understood by the population with no trouble. The purpose of any health system research is to educate individuals and community about the result and follow-up action taken.
- IX) Health system research should be evaluated by a group of qualitative and quantitative researchers on how much it has influenced policy makers' decision making and improvement of services to the community, which leads to better health and ultimately universal health coverage. A health system research study should not come to an end after discovering new answers to questions posed by the community but health system research must include continuous calculation of decisions made on the basis of the study report submitted to the government for policy decisions.
- X) Emphasis in health system research is improvement of the existing health care services incrementally on the fronts of availability, accessibility and affordability.
- XI) Health system research must encourage development of simplest, least expensive, up to standard, most widely practical inexpensive technology.
- XII) Initiating improvement in specific management issues by means of existing facilities and employees, health system research can remove the blocks to efficient and competent services.

15.3.2 Steps in Conducting Health System Research

The current health system research follows the principles of research methodology and follows the research processes namely identification of problems, review of literature, clarifying the problem to be studied, defining the study population, data collection and instrumentation plan, collection of data, analysis and reporting of project. The following are important specific steps of HSR:

- a) Development of "health system research" (HSR) proposal on a relevant and appropriate problem which cannot be solved without intervention or may be solved more efficiently from the evidence generated from information collected through research
- b) Implementation/actual operationalisation of the study application in the targeted field area and accumulation of relevant data
- c) Analysis, interpretation of data, groundwork of report highlighting study results and their suggestions for action including recommendations for implementation of the research findings/results
- d) Dissemination of study results

15.3.3 Scope of HSR

The important issue in health system research is to comprehend and acquire knowledge and application on how to ask the right questions at the right time with the foremost intention of refining the understanding about the structure and putting into practice the whole health system research and classifying the specific problems; in particular, situations at a particular place. For example, prevalence of malaria after the rainy season in north-eastern India. Health system research is a mix of complex physical, biotic and socio-cultural, ecological factors such as geography, sociology, socio-economic development of the nation, ethnic and cultural diversity, political support to the cause, and differential demography, etc.

The main focus of health system research is on the following:

- a) Health policy planning subject to requirements, asset availability, extension and alteration of existing interventions to gain better results.
- b) Public health professionals' planning and public-defined health needs considering the present rate of morbidity, mortality and disability.
- c) Health system research is concerned about availability and utilisation of monetary resources, human resources and resource mobilisation if needed which includes taxes for health care, user charges, health insurance input, community wealth and maintenance etc.
- d) Optimum utilisation of the government health policy supported intervention programmes in terms of adequacy, coverage, acceptability, affordability, equitability and accountability of health care.

15.4 GLOBAL STATUS OF HEALTH SYSTEM RESEARCH

World level

Globally, the emergence of health research started in 1950s and later development on. In this section, we are going to talk about complete sequential progress and improvement of health system research.

I) Health Services Research (1967-1970)

World Health Organisation, in 1967, introduced Research in Epidemiology and Communication Science for the very first time in the history of health system research; the Centre for Research in Epidemiology and Communication Sciences was further reorganised and sub-divided into a Centre which caters to the strengthening of health services and transferred health services research responsibilities to the present Centre in the year 1972. Global Advisory Committee (1978) was created for Medical Research and its Sub-committee on health services research was also created for enhancing the knowledge on the functions of health system research with the goal Health for All as per the Alma Ata declaration for provision and fulfilling the services for Primary Health Care successfully. The World Health Organisation had in 1980 recognised Health Services Research as a significant primary area and laid down the foundation for HSR as a foremost research domain for health on the recommendation of Health Services Research Sub-Committee.

II) Health System Research (1980-1990)

In 1980, World Health Organisation further elaborated on health system research based on support, management and sharing of information in the practical working of the health system research, which works on growth and strengthening of national capabilities in capacity building, development of health system research programme, and evidence based research in priority areas in HSR under complete assistance from World Health Organisation.

III) From Technical Discussions to Cohered (1990-1993)

Forty-Third World Health Assembly Technical Discussion in Geneva (1990) accepted, recognised and documented health system research as a fundamental instrument of health development under the overall theme of *‘the role of health research in the strategy for health for all by the year 2000’*. On the whole, in the official deliberations, four main key themes in health research were included: a) health system research b) research capability strengthening c) nutrition research and d) science, research and health care.

IV) Global Forum and Alliance Ad-hoc Committee (1994 and onwards)

“Health System Research and Development” incorporated in itself the division on “Strengthening of Health Services (Division)” throughout the world in the middle of 1990s.

V) Ad-hoc Committee report on “Health System Development: Strategies for Future”.

WHO launched health policy and HSR in 2000 under the guidance of the Global Forum for Research with the following objective- Encourage the latest creation of synthesised knowledge with the support of evidence, make possible for development of competence generation, diffusion of knowledge and evidence based research among investigators, makers of public policy and relevant stakeholders, evidence-based dissemination and application of created knowledge to press forward the performance of health systems (WHO).

The public health system research interest group (PHSR-IG) in 2002 started a new sub area of public health system research (PHSR). The present health system will serve the evidence informed health policy making in the world, building collaboration and support across distant regions of the world. It ensures that people, groups and organisations contribute to and benefit from joining a growing global Health System Research community. World health Organisation is playing an active role in shaping much-needed momentum that will be transformative for the improvement of the health system in the world”.

In this section, you read about the concept of health system research (HSR) and significance, HSR objectives, features and scope for public health. You read about how HSR has developed globally now attempt following questions given in Check Your Progress-1.

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What is health System Research?

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2) What is the Purpose of health System research?

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3) Explain steps in conducting health system research.

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15.5 HISTORY OF HEALTH SYSTEM RESEARCH IN INDIAN CONTEXT

The Indian health system got its first impetus from the Bhore Committee which laid down the standard for ease of access of the primary care as a basic right of citizens and which is non-dependent on individual and community social and economic status. Consequently, the Bhore committee report for primary health care was accepted as the basis of the national health care system of India. For the first time India's independent central government recognised right to healthcare and that access to structured health care services should be made easy for the people. On the other hand, the government of India continued the private provision of health care. India developed a three-tiered system of healthcare in theory, the system was designed in such a manner that it would provide health care to all including the underserved rural populations. At the lowest level, primary health centers (PHCs) were designed to make available essential health care, provision of infrastructure and human resource for disease cure and outbreak prevention. Lastly, the system promotes health education to the individual and community for preventive care.

The first National Health Policy (1983) promoted the idea of a dynamic and impactful public health services system standing on a decentralised system of primary health-care services. But in practice all the states barring a few, struggled to maintain preventive, promotive and curative care services and the administration of health services always remained a challenge because of limited health care facilities in urban areas and majority of rural areas were underserved. In the following years states became totally dependent on the central government for monetary and programme related assistance to disease control implementation programme (Peters, Rao, Fryatt, 2003).

Planning commission administrated Indian five-year planning system and decided on the national target and priority areas for the health sector (which was in total opposition with the idea of decentralisation). The central government, for financial resources and in principle, enforced top-down policy and programme making process for state health needs and health priority areas. The health schemes were sponsored by the Centre, according to state-specific disease-control programmes— Malaria, TB (tuberculosis). International players and benefactors like International Monetary Fund and the World Bank, played a decisive role in supporting restructuring of privately controlled healthcare, which included significant health investments, complete encouragement to the private entities to invest and develop. For the first time in India user charges and private investments in public hospitals to implement support and diagnostic services, were introduced.

The reduction in financial resources for communicable disease-control programmes catalysed the decrease in the services provided by the PHCs and a major paradigm shift happened in the government strategy from disease control towards focus on family planning programmes (Qadeer, 2000). There was an overwhelming increase in the overall investment in health and associated funding in water supply, hygiene and sanitation, although the existing services are not adequate. The investment in family planning ascended to 26 percent from a meager 1 percent. At the same time, total expenditure on communicable disease control programme plunged from 17 percent to only 4 percent. Many health specialists claim that it happened because a number of communicable diseases namely, smallpox and Guinea worm disease were eradicated in 70s and 90s respectively, and an estimated 7 percent of disability adjusted life years (DALY) losses nationwide can be due to vaccine-preventable diseases. New strains of diseases like HIV/AIDS have increased manifold and new strains of tuberculosis and malaria re-emerged as greater public health concern for India; in the past these diseases were thought to be under control (Gupte, Ramachandran, and Mutatkar, 2001).

Table 15.1: History of Health System in India

Phase	Pointers	Major areas in India
Between 40s and early 80s	Approach	Precedence curative care
	Providers' Role	Co-existence for public and private healthcare providers; Establishment of three-tier system
	Health achievement	Moderate

Early 80s to near the beginning 2000s	Disease trend	Domination of infectious diseasesHIV/ AIDS, re-emergence of tuberculosis (TB) and malaria strains
	Providers' Role	Privatisation of care; primary healthcare suffered major setback
Early 2000s	Policy	No clear action taken
Early 2010s	Disease trend	Prominent position for a number of communicable and lifestyle diseases

Source: (Adapted and modified from Sai Ma, Neeraj Sood (2008) A Comparison of the Health Systems in China and India Sai Ma, Neeraj Sood), Center for Asia Pacific Policy, International Program for Rand, Occational Paper, Rand Publication, Pitsberg.

15.5.1 Health System Research in 21stCentury

With the advent of opening of Indian economy at the global level, the health system in India also improved, and in the last decade, two major improvements in India's health system research were materialised. The first is the launch of the National Rural Health Mission (2005–2013) which aimed to streamline and make the centrally administrated health system stronger and universal. This was designed principally for primary care health care delivery exclusively for the underserved health services for people in rural India. The second major intervention introduced by the central government supported insurance schemes protecting individual expenditure under the clinical care for the poor initially in 2007 *Rashtriya Swasthya Bima Yojna*, while in 2015 the coverage was enhanced to fifty percent of India's population called *Pradhan Mantri Jan Aarogya Yojana*. The above reforms dreamt about meaningfully altering Indian health systems and India's advancement and attainment of universal health care (UHC). Considerably, these reforms also created an emergent interest in research for health systems and notably government of India established several research organisations for progress and advancement of health system research for future. The National Health Systems Resource Centres (NHSRC), and its state associate State Health Systems Resource Centres (SHSRC) established under NRHM to provide support to health ministry on areas of research, technical support and advocacy for future plan.

Contemporary Status

The health system is a congregation of different levels and steps like government policy making, decision process, health service providers, privately owned health care companies, and other non-government entities who provide service at local, state and pan-India level. The nation has a prolonged shortage of human resources for healthcare providers and other human resources. It has been observed that the health professionals are concentrated in the urban areas for making profit and majority of health needs of the country remain under-served. Secondly, the Indian government expenditure on health is amongst the lowest in the world and as per the gross domestic product (GDP) ratio is concerned, it is little over one percent. As a result, the Indian health system depends heavily on out-of-pocket expenditure from the patients for service care delivery. This hinders the accessibility to public health system. Hence, health care from privately owned hospitals people choose to avail the health services, which is disastrous effect on poor and vulnerable groups. In 2017, an estimated 50–60 million individuals get hard-pressed poverty each year as a consequence of curative health associated spending. (British Medical Journal July 2018).

The challenges of health care in India are enormous and government of India adopted steady approach to overcome the problem, still we are in a very infant stage. Here are few examples of India's achievement in terms of health system research.

- a) Government of India created Indian Council of Medical Research(ICMR) to act as a nodal agency for health system research in India to promote medical research in the initial stage and promote field based operational research (evidence based) to develop programme strategies for delivery of health services.
- b) Operational research (OR) taskforce was constituted in 1974 by Government of India to do operation research in the area of health system research.
- c) Under various national programmes, research and training institutions were established with the purpose of contributing towards strengthening the programme strategies through Basic and Applied Research as well as to provide in-house service training and capacity building of the institutions concerned staff. For example, Malaria, Filariasis, Tuberculosis, Leprosy, Nutrition etc.
- d) According to the recommendation of the Commission on Health Research for Development formulated in 1987, every country must make more effective use of research to guide their policies, programmes and actions to overcome health problems.
- e) Conception of the Essential National Health Research (ENHR) took shape by way of a base in each developing country to understand its own health problems, improvement in health policy and management, enhancement of the efficiency and effectiveness of limited resources, nurturing innovations and research, foundation for a stronger voice of developing countries in setting international priorities like Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs).
- f) Health complexities at country level demand skills/training and capacity building in producing more appropriate region-specific information for ascertaining answers to the overarching health problems.
- g) Officials and staff concerned need to be sensitised and equipped with skills in conducting and utilising HSR. This provides an important tool to diagnose the problems as well as to develop suitable alternate solutions and strategies for resolving the problem through investigation and experimentation, so that the policy makers have the informed evidence to take rational decisions to resolve health problems.

15.6 HEALTH SYSTEM RESEARCH IN INDIA: PRIORITY, UTILISATION AND FUNDING

HSR priority areas, resource support and its utilisation plays a significant role towards HSR development, its efficient role in health services and upcoming new challenges in health sector of any society. The important HSR priority areas in India as following:

15.6.1 Priority

- a) **Primary Health Care:** Primary health means the care a person's health needs throughout their life including prevention, health management, treatment, rehabilitation and palliative care. (WHO)
- b) **Adolescents' Health:** Adolescent health (youth health) is the variety of choices of approaches to check, to prevent, to detect and to provide treatment for young people's health and well-being. It offers four core areas for health sector action: provision of health services including collection and usage of data for planning and monitoring health sector interventions and implementing health-promotion and health-protection policies and programmes, and lastly, mobilisation of resources from other sectors.
- c) **Geriatric Care:** The steadily accumulative ageing population today is creating a burden on social and financial resources and lays enormous strain on the health system due to noticeable paradigm shift of burden of disease from non-lifestyle (Tuberculosis, Plague) to lifestyle and chronic diseases. (Diabetes and Hypertension).
- d) **Women's Health and Empowerment:** No sustainable development can take place without women's empowerment, and vice versa. Women's liberation and empowerment without all-inclusive reproductive healthcare services has no meaning. The purpose of making women's health and empowerment an important topic is to ensure inclusive development of the community.
- e) **Maternal and Child Health:** Advancement in women's health strengthens women's financial empowerment. Access to information on reproductive and sexual health care is critical for the physical health and overall integrity of women and girls. Good health potentially increases girls' probability of pursuing school and overcoming poverty as well, therefore making progress towards gender equality.
- f) **Decentralisation in the context of the Panchayati Raj system:** The 73rd Constitutional Amendment Act, 1992 authorised village Panchayats as fountainheads for health, family welfare, and education. The Panchayati Raj institutions worked on the principle of decentralised planning and programme implementation in rural India. The central theme of India's health strategy is decentralisation of healthcare systems and its affiliation with upgradation of healthcare service delivery, distribution, operation and improving health outcomes in rural areas.
- g) **Improvement of the Health Referral System and Linkages:** Forward and backward linkages of health referral system.
- h) **Vertical and Horizontal Integration at Different Levels in the Administrative Hierarchy:** Decentralisation and devolution of powers to enhance multi-level responsibility and responsiveness

HSR Institutional Development in India (Medical / Non-Medical)

The majority of organisations working in the health system research are the government funded organisations, lately private organisation have also entered the field and are providing solutions, although their numbers are very limited.

The major health system research organisations are:

- National Institute of Health and Family Welfare (NIHFW), New Delhi.
- National Institute for Public Finance and Policy, New Delhi.
- Indian Institute of Health Management Research (IIHMR), Jaipur.
- Foundation for Research in Community Health (FRCH), Mumbai
- Centre for Multidisciplinary Development Research, Dharwad
- Operation Research Group, Baroda.
- National Institute for Rural Development, Hyderabad.

15.6.2 Utilisation of Health System Research:

Any research evidence created by the study has no relevance if not utilised by the policy makers or not implemented for the good of the community. Health system research studies fill the space between the researchers, policy makers and other administrators responsible for implementation of health programmes. However, few suggestions for effective utilization are as following.

- a) Through proper co-ordination of research efforts spearheaded by NIHFW, it avoids unnecessary repetition or duplication of studies.
- b) Plug gaps in information for specific topics and geographic areas.
- c) Operate as a tool for improved administrative and policy decision-making.
- d) HSR not only analyses and interprets the routinely available data but also helps in creating supplementary information required by the means of scientific methods.

Thus, the decision-makers have to identify the locations/subjects on which conclusive decision is to be taken, the category of information requisite for sustaining these decisions, taking stock of the available information, their sources and definite questions to be answered through the original information as well as procedures to be undertaken to plan and execute research for obtaining this information.

Where to Use the Decisions of Health System Research

Now we have the informed decisions available with us, so what are the specific areas where these decisions can be implemented?

- a) Decision to implement Community Health Workers Scheme in implementation of primary health care.
- b) Decision regarding use of bio-larvicides as part of Malaria Control Programme.
- c) Decision on programme strategies as well as steep increases in federal government financial allocations for national programmes.
- d) Issues related to federal financing of health care in India based on findings of research on health spending by Central and State Governments etc.

- e) Policy decisions on blood banking in India, legislative and control mechanisms to encourage voluntary blood donations, compulsory screening of all blood samples etc.
- f) Implementation of multi-drug therapy in National Leprosy Eradication Programme.
- g) Issues related to financing of health care in India based on findings of research on health expenditure by Central and State Governments etc.

15.6.3 Funding for Health Systems Research

Research contributions in developing countries and researchers are insufficient. The research evidence suggests that such low level of research is due to very little health expenditure on health system research. The funding is so low that it does not have any impact on health system development and progress in the country. Monetary provisions come only from home grown national health systems, department of science and technology resources and international funding agencies. Though, the national budget on health is not up to the mark owing to lack of political will. We are left with very limited resources so that our only option is to prioritise our problems for research needs, which is to be identified in relation to health system, improvement goals and consensus decision with the policy makers.

The current priorities identified at different levels act as an effort for comprehensive thinking on research agendas of national and state level problems. To a large extent India needs an information and evidence supported decision making process at all stages by solidifying the “Getting research into policy and practice” (GRIPP) process. Examination of accomplishments and disappointments of the health system research needs to be used as a benchmark to develop an agenda for systematically improving the usage of evidence based knowledge in policy making.

Key ‘Getting Research into Policy and Practice’ (GRIPP) elements include:

- a) Cultivating the capability of the decision-making process by recognising the benefits and development of research evidence to strengthen health policy making and its performance;
- b) Identification and updating of health research priorities with complete list of relevant and key stakeholders and provision of suitable monetary and human resources to plan, implement and monitor the priority health agenda;
- c) Building high-quality, substantial research harvests for the identified health agenda, which in turn includes reasonable proposition, knowledge and application of policy and constraints;
- d) Appropriate communication evidence to the audience needs, usage of advocacy strategies which includes network influencers and assemblage of key stakeholders to deliver serious study proof or evidence to the decision-making body;
- e) Documentation and identification of difficulties and fundamental problems that may influence policy-making, and innovative practice to introduce evidence into decision-making processes.

15.7 CHALLENGES AND PROSPECTS OF HEALTH SYSTEM RESEARCH

Since 1970s there has been a major increase in the investment particularly after the Mexico Ministerial Summit (2004). The global forum has concluded that less than 10 percent of health spending is not sufficient towards the health problems of the developing countries, thus, the research in developing countries is not taking shape. According to the global funding agencies viewed:

- Lack of precision on opportunity and field setting to be taken for research purpose.
- Perceived lack of rigor in research methods.
- Challenges of generalisation of results from one country to another.

The Major Challenges for the Health System Research are:

- a) Defining and standardisation of the health system research field: The health system research community must be systematically updated with the subject matter and areas of empirical studies. The existing evidence should be documented, mapped, synthesised and disseminated with enhancement in study approaches, which is currently lacking in India.
- b) Development of human resource capacity: Central government, international organisations and multi-lateral donors should work jointly in increasing the capacity building initiatives of health system research professionals.
- c) Increasing funds for research: the commission on macroeconomics and health recommended that for the strengthening of the health systems the funding should be increased to 5 percent of the total health budget. Funding is needed for the country specific study, which guides the state and national policies on health, helping the nation to come up with general findings.
- d) Financial accountability, human resources for health, infrastructural changes in health, capacity building and strengthening must be developed; for example- creating a more conclusive and evidence-based health system, which works on the principles of 'research to policy method' but the foremost challenge is the move from application of vision in the background of actual lifecycle health system development and reorganisation.
- e) A nationwide comprehensive strategy for institutional research capability establishment is needed but very little is being done. The definition of "institution" must not only include universities and ministries of health supported organisation but also include defined networks (including Centre-state partnerships), renowned private research organisations, non-governmental organisations (NGOs), and community-based organisations (CBOs).
- f) Innovative applications of the scientific knowledge should be considered, which includes the suitable usage and practice of information communication technology to provide responsiveness for health development.
- g) The alliances among health systems research community to discover problem-oriented solution with a vision for strengthening national and state

health systems. These alliances will include community and public health researchers and capacity building trainers, research institutions and networks and sections of academicians who work on 'evidence based practice' for both individual patients and public health systems.

15.7.1 Prospects of HSR in India

Universal healthcare must move from disease-oriented studies to preventive and promotive care as well as its services. The major areas of future health system research in India are as following:

- More action-oriented research is required for explaining the problems, thereby corroborating the recommendations.
- Current individual localised research approach should be supplemented by multi-centric studies promotion.
- Standardisation of research procedures for common issues for comparability of research results.
- More attention in the field of human resource development necessitated.
- Health economics related studies to alternate health care financing mechanism, cost containment, economic evaluation of programme should be encouraged.
- Need to develop rapid assessment techniques using epidemiological, statistical and anthropological methods through experimentation and validation to facilitate balanced decisions.
- Mechanism for research results dissemination through proper reporting to all interested stakeholders, conferences, publication etc. need to be developed and continued.
- Focusing health system research on districts.
- Artificial intelligence is one of the emerging trends worldwide and India must take a lead in its usage.

In this section, you read about the Indian HSR and health policy, Its priority, utilization and funding to improve health system, major challenges and prospects for future. Now, answer the questions given in Check Your Progress-2.

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) Explain the focus of health system research.

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15.8 LET US SUM UP

Thus we may conclude that HSR is the most important component to combat the burden of disease and overall development of health system in any society, region and around the world. HSR does not deal only diseases but also status of demographic factors, environmental changes and overall development to prepare and plan health resources including health manpower planning. In this unit you read about how the concept of HSR emerged and occupied the central place in the health system, both globally and in the Indian context. You also learnt about the major features, objectives, funding sources and priorities of HSR. Despite these, HSR is still evolving due to paucity of funds, lack of human resources and other limitations. These components are explained at length in challenges of HSR along with future prospects.

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15.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress- 1

- 1) What is Health System Research?

Ans. Health system research (HSR) is defined as the systematic study of the means by which biomedical, socio-medical and other relevant knowledge is brought to bear on the health of communities under a given set of conditions. HSR is an important contributor to improving health system performance and generating evidence for improving health services, particularly for vulnerable sections of the society.

- 2) What is the purpose of Health System Research?

Ans. Health System Research is meant for systematic improvement in the health system. It plays the following roles in a country's health system: a) It solves the health problems of a group of people and the country as a whole b) to helps in improving the health system through inter-sectoral co-ordination c) to enhances efficiency and effectiveness of health services through knowledge about new health disorders and a measure for overall socio-economic development d) it helps in the analysis of problems from both the technical and human angles and creation of implementable solutions.

- 3) Explain the steps in conducting health system research.

Ans. There are four major steps in HSR process: a) development of HSR proposal on a pertinent problem on available data and data collected through research theme b) focus on the targetted field area and accumulate relevant data c) analysis, interpretation of data, review of available study/ report d) dissemination of study results.

Check Your Progress 2

- 4) Explain the focus of health system research.

Ans. Health system research mainly focuses on five components: a) health policy and planning in relation to need and available resources b) various workforce of public health, the gap between need and existing resources c) planning and community health needs d) financial and infrastructural components, health insurance contributions, community resources and support e) adequacy of coverage, acceptability, affordability, equitability of health intervention.

- 5) What are the major priority areas of HSR?

Ans. Priority areas for HSR in India are: primary health care, adolescents' health, geriatric care, women's health and their empowerment, maternal and child health, decentralisation like, the Panchayat Raj institutions(PRIs), improvement of the referral health system and its linkages, and vertical as well as horizontal integration at different levels in the administrative hierarchy.

UNIT 16 MANAGEMENT INFORMATION SYSTEM (MIS) IN HEALTH

Structure

- 16.1 Introduction
- 16.2 MIS for Health: Concept and Importance
- 16.3 Structure of MIS for health in India
- 16.4 Function of Health Management Information System (HMIS)
- 16.5 Steps in Developing a HMIS
- 16.6 Major Issues and Challenges with Current HMIS
- 16.7 Let Us Sum Up
- 16.8 Keywords
- 16.9 References and Suggested Readings
- 16.10 Check Your Progress: Possible Answers

16.1 INTRODUCTION

Management Information System (MIS) refers to the management of information through digital tools and techniques for any intervention in order to achieve the desired objectives. For instance, the planned change in health sector is only possible if requisite health data are available. MIS for health is also known as Health Management Information System (HMIS). It is a tool which helps in gathering, aggregating, analysing and then using the information generated for taking action to improve performance of health systems. It helps to improve the process of decision making and enhances the efficiency of actions required in managing any health programme or activity. Health services are provided through the network of health centres spread throughout rural and urban areas of the country. The HMIS aims at converting this data into information by taking into account issues like huge demographic composition, distant geographical location, widely varying socio-economic conditions, and the service delivery system required for effective and efficient health care delivery services.

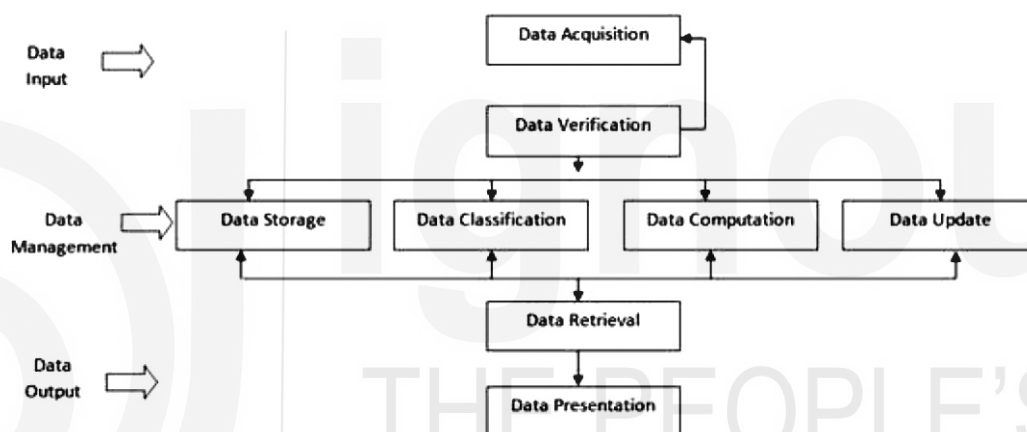
After completion of this unit, you will be able to:

- a) explain the concept of MIS for health, its organisational set-up and sub-system in India,
- b) discuss the components and their role of HMIS at different levels in the health department,
- c) explain the Web Based Health Management Information System,
- d) describe the major issues and challenges with current HMIS.

16.2 MIS FOR HEALTH: CONCEPT AND IMPORTANCE

This is a mechanism for the collection, processing, analysis and transmission of information required for organising and operating health services, and also for research and training. We will discuss four terms of HMIS and what it signifies.

Here, 'system' denotes a collection of components that work together to achieve a common objective. 'Information System' means system that provides information support to the decision-making process at each level of an organisation. 'Health information system' is defined as a system that integrates data collection, processing, reporting, and use for improving health service effectiveness and efficiency through better management at all levels of health services. Thus 'health management information system' (HMIS) refers an information system specially designed to assist the management and planning of health programmes, as opposed to delivery of care. All information systems, including HMIS are built upon the conceptualisation of three basic foundations. These are data input, data management, and data output. The data input phase includes a) data acquisition and b) data verification. The data management or processing phase includes a) data storage, b) data classification, c) data update and d) data computation. Finally, the data output phase includes a) data retrieval and b) data presentation. Altogether, these eight elements and three phases define a typical information system as represented schematically in the figure given below.



Source: Adapted from Joseph Tan (2010) HMIS- A Management Perspective, Chapter-1, Foundation concepts of Health Management Information Systems, part-1, Jones and Bartlett publications.

Importance

The importance or uses of data depends on the consciousness of the health care providers managing health services. It also depends on the prompt and easy availability of indicators needed in their daily work. This requires pruning of unnecessary information so that only the relevant, required and usable data are collected. The following are the main uses of HMIS:

- To measure the health status of the people and to quantify their health problems and medical and health care needs.
- For local, national and international comparison of health status.
- For planning, administration and effective management of health services and programmers.
- For assessing whether health services are accomplishing their objectives in terms of their effectiveness and efficiency.
- For assessing the attitudes and degree of satisfaction of the beneficiaries with the health system.

- For research into particular problems of health and diseases.
- Help in evidence based decision making process

16.3 STRUCTURE OF MIS FOR HEALTH IN INDIA

In India, the HMIS was launched in October 2008 for efficient health data entry and its dissemination at different levels. Indian organisational structure of management information system (MIS) for health is broadly classified into three levels for proper co-ordination and execution of information: a) central level b) state level and c) district level.

A) Central level

At the central level there are three major agencies dealing with the health management information system.

- a) Central Bureau of Health Intelligence (CBHI): Central Bureau of Health Intelligence is the health intelligence wing of the directorate general of health services (DGHS) under the ministry of health and family planning (MoHFW), New Delhi. The DGHS is a repository of technical knowledge concerning public health, medical education and health care, which co-ordinates with all states /UTs for implementation of health programmes. It also addresses health concerns of the people through its subordinate offices/institutes in the country.
- b) Statistics Division in the Department of Health and Family Welfare: The division is well staffed with a chief director and four joint directors. It is organised into computer unit; demography unit; performance monitoring and evaluation unit; and impact monitoring unit. Impact monitoring unit has further two sub units — field evaluation unit and concurrent evaluation unit.
- c) Sample Registration System (SRS): India conducts census operations once in every ten years. In between the estimates of vital statistics are based on a System called Sample Registration System. SRS is a large scale demographic survey conducted in India for providing reliable annual estimates of birth rate, death rate and other fertility and mortality indicators at the national and sub-national levels. The field investigation consists of continuous enumeration of births and deaths by a resident part time enumerator, generally a teacher, and followed by an independent survey every six months by an official. The data obtained through these operations are matched. The unmatched and partially matched events are verified in the field and thereafter an unduplicated count of births and deaths is obtained.

B) State Level Organisation

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

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

C) Organisation at the District Level

District medical and health officer or chief medical officer heads an average district health system. He is responsible for the Health and Family welfare in the district. Some states like, Andhra Pradesh have a different arrangement of functions in the district like two functionaries work- one responsible for hospitals (District Coordinator Hospital Services) and the other for PHC system and Family welfare (District Medical Officer). The DMO is supported by Assistant or additional DMOs for different national programs and Family welfare program now RCH. He is supported by two statistical officers one for health and the other for family welfare. These statistical officers are the key personnel in the entire HMIS chain. It depends a lot on their perseverance, support and skills to continue and sustain the HMIS.

Organisation/Person Responsible For Hmis Matrix

Location / hospital	Person responsible
Sub-center :	ANM PHC/Hospital Pharmacist, computer (a statistical assistant)
District :	District statistical officer- health, family welfare Deptt. TB (tuberculosis), Malaria, Leprosy officers
State :	Deputy/Joint director Statistics- Family welfare Deputy /Joint director- Vital statistics Surveillance Unit Sample Registration System
Central Government :	Central Bureau of Health Intelligence Statistics Division- Department of Family Welfare CGHS Statistics Division- Department of Health Sample registration system- head quartered

16.3.1 Sub-Systems under the HMIS

- Routine Service Reporting System:** Hospitals and health centres (PHC and CHC) report on a monthly basis the morbidity and mortality cases attended by them.
- Epidemiological Surveillance System:** This is used for the identification of diseases, risk factors, investigations, follow-ups, control measures and so on. Currently, the programmes like the Integrated Disease Surveillance Programme (IDSP), Polio Surveillance, HIV Surveillance and others, fall under this sub-system.
- Specific Programme Reporting:** Different divisions under the MOHFW at central and state levels compile and report their achievements on a monthly

basis. These divisions include the Revised National Tuberculosis Programme (RNTCP), National Vector Borne Disease Control Programme (NVBDCP), National Leprosy Eradication Programme (NLEP), National Programme for Control of Blindness (NPCB), and so on.

- d) **Administrative Support System:** The MIS exists for various activities within health facilities. It includes accounts and finance system, drug procurement, storage and distribution system, personnel management system and so on. A similar system also works at national level, for example, Finance Management System (FMG) under the NRHM at the MOHFW in the Government of India.
- e) **Vital Statistics System:** This includes the implementation of the Registration of Births and Deaths Act, census and Sample Registration System, and falls in the domain of the Registrar General in the Ministry of Home Affairs.
- f) **National Sample Surveys:** The national family health survey (NFHS), district level household surveys (DLHS), and annual health survey (AHS) and so on come under this category.

16.3.2 Other Aspects of HMIS

This includes different components from data collection, analysis and finalisation in report preparation. It also covers parameters of quality concern, timeline, completeness, accuracy, data quality and effective presentation. You will also learn the precautions for error in data entry and poor quality data.

Components of HMIS

- Data reporting and data entry:- monthly / quarterly / annual
- Data aggregation (consolidation) :- block level / DPMU level / state level
- Data authorisation (check and verification) :- all the above levels
- Converting data elements into indicators: - specific as per requirement
- Report preparation / Decision making process:- all levels / highest level

Parameters for quality data

- a) Completeness
- b) Timeliness
- c) Accuracy
- d) Data entry errors
- e) Systematic errors

Data completeness is assessed for the following:

- Number of facilities reported against total facilities.
- Number of data elements reported against total data elements in a reporting form.

Timeliness:

Timely processing and reporting of data facilitates timely availability of data for decision making.

Accuracy:

- Accuracy refers to the correctness of data collected in terms of actual number of services provided or health events organised.
- Inaccurate data will yield incorrect conclusions during analyses and interpretation. Small errors at facility level will cumulate into bigger mistakes since data from various providers/facilities are aggregated.

Data entry error:

Data entry errors could be due to-

- Typing errors: wrong numbers typed in computer
- Wrong box entry: data entered in wrong box e.g., 'ANC registration' data entered in 'Registration in first trimester'.
- Calculation errors: during data entry basic computation happens if formulae are incorrect then errors can happen.

Poor data accuracy could be due to following reasons: gaps in understanding of data definitions and data collection methods; data recording and data entry errors; and misreporting.

Systemic errors: Logical errors embedded in the system due to which reason these errors remain in the system, unless underlying systemic issues are corrected.

Therefore, data quality refers to what they intend to measure. It is not enough to collect and report data, data should be checked for quality to minimise errors so that they can be used for decision making process. While assessing data or reporting completeness, remember that zero and blanks need to be examined carefully. Reports are a reflection of services provision and utilisation thus an incomplete report will indicate partial service delivery/utilisation. Hence, assessment of data, its reporting and completeness play a significant role in MIS for health.

In this section you studied the concept of management information system (MIS) for health and its organisational structure, sub-systems and other important components of this system, now answer the questions given in Check Your Progress-1.

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) What do you mean by MIS for health?

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- 2) Explain the organisational structure of HMIS in India.

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16.4 FUNCTIONS OF HEALTH MANAGEMENT INFORMATION SYSTEM (HMIS)

In all levels in a health department from 'primary health centre' or a district hospital or the state till national office needs information on regular basis not only to monitor the health status of the population they serve but also to track progress towards achievement of targets under different health programmes. This information differs at each level in the hierarchy in terms of need, purpose, and use of information. Thus, a robust information system requires accurate, up-to-date and timely information to the health department every level. The important functions of HMIS at different levels are as following.

- i) The national and state level:
- ii) HMIS is primarily a tool of policy and strategy making. It is useful for assessing the progress of national health programmes. For example, by analysing full immunisation coverage in different states, the officer responsible for child health can evaluate performance of immunisation coverage in various states, so that they can allocate more resources effectively and strengthen support for the states.
- iii) The state and district level:
- iv) HMIS is a tool of programme monitoring and management. A robust HMIS can help Programme Managers to track the progress of implementation of various programmes. It enables them to distinguish better performing areas from those that require more support and resources. Thus, HMIS helps in planning and designing specific interventions that can strengthen a programme.
- v) The sub-district level:
- vi) This level includes block, primary health care, sub-centre and other facilities. HMIS always facilitates efficient and effective registering and collation of data, improvements in data quality, systems for complete reporting, timeliness and accuracy, provision of data analysis tools, interpretation and translation of data to guide action and intervention at local level. This has name-based tracking system for pregnancy and child-care that can help ANM to use their primary name-based register to plan their visit and service delivery schedules for women and children.
- vii) Two-way feedback mechanism:
- viii) Many times no feedback is provided on information collected from facilities and service providers after processing of data. Data/information/reports are always sent in the hierarchy. Feedback ensures data quality and reliability; it also builds up a sense of responsibility among service providers.

Therefore, HMIS portal under NRHM generated (now national health mission) 'feedback reports'. The feedback reports provide status of achievement against a target, and comparisons with facilities and time periods can also be made. Provision for reminders about service delivery due dates can also be made to the service providers on their mobile phones to assist them with their work. At every level, an effective HMIS should help us answer six classical epidemiological questions: who, what, when, where, why and how about the health status of the people. Service providers such as ANMs or medical officers will probably be interested in fewer data elements that they can use as indicators. Some may also find indicators confusing. However, it is empowering for the service providers to understand the utility of HMIS in programme planning and resource allocation. This higher level of understanding improves competency and ability of service providers in programme planning and management at all levels.

16.4.1 Web Based Management Information System (MIS) for Health

On 12th April 2005, MoHFW launched the NRHM to improve the health care system in the country. Various interventions under NRHM have increased the demand for data on population and health for use in both micro-level planning and programme implementation. At the same time, understanding the synergy between availability of services, cost involved in provision of public health care Service Providers' Manual services, expenditure and pattern of utilisation among various sections of population, including vulnerable sections of the society, are important aspects that influence decision making. A continuous flow of good quality information on inputs, outputs and outcome indicators, facilitates monitoring of the objectives of NRHM.

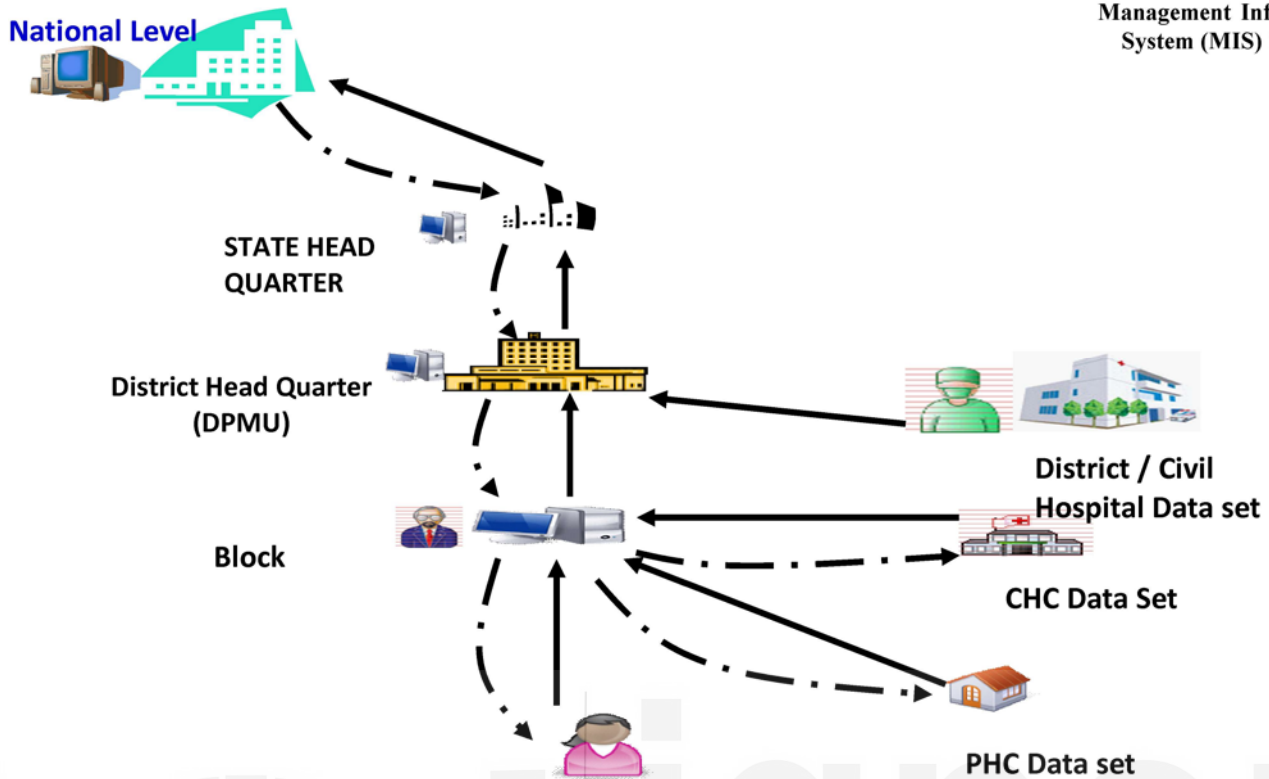
Accurate, relevant and up-to-date information is essential for the health service providers at all levels so that they can initiate action on the gaps in the system based on evidence and information. Recognising the need for an information base, one of the core strategies of the 'strengthening capacities for data collection, assessment and review for evidence based planning, monitoring and supervision'. As a step in this direction and to deal with problems cited above in the HMIS manual, the web-based management information system portal was launched by the Ministry of Health and Family Welfare on 21st October, 2008 to enable capturing of public health data from both public and private institutions in rural and urban areas across the country. The portal is envisaged as a single window for all public health data for the Ministry of Health and Family Welfare.

Domains of HMIS Portal:

It is divided into two domains; Public and Secured. The information available in the public domain is accessible to all and anyone can view and download the reports in this section. The information in the secured domain is accessible to a selected set of users of HMIS Portal. This is secured by a user ID and password provided by Government of India. The secured domain is for the Block/District/State and National Level users, to enter and view the data.

Flow of Data

The normal flow of data in most of the states follows the bottom up approach. The Sub Centre (SC/HSC) reports to PHC, the PHC to CHC and the CHC to SDH/District Hospital. District Hospital reports to District HQ which then collates the data and sends it to the State HQ.



Source: Diagram adapted from NRHM document, Introduction to Quality Issues in HMIS Data.

However, the reporting pattern varies from state to state, as some of the states' data is collected at the CHC level, where as in other states the block headquarters, collates the data and sends to district headquarters. In order to make the system flexible enough for all the states without much complexity, the concept of data aggregation unit was devised. 'Data aggregation unit' is the place where the data is collected and consolidated. It can be a district headquarters, block headquarters, sub divisional hospital, district hospital, CHC or even a PHC. Any of these places can be a data aggregation unit, if there are a certain basic requirements like, availability of computers, internet, and trained personnel.

16.4.2 Training of Management Information System (TMIS)

It is developed as a Government to Government (G2G) web-based application which facilitates monitoring and planning of skilled and trained health care providers. TMIS is visualised as a 'single window' for all static databases related to training i.e. documents related to training such as training guidelines, training manuals, course content, training calendars, circulars and other relevant material. A dynamic database captures all real-time training, nominations, certificate generation, post training evaluation and post training deployment. The purpose of the TMIS is to have a centralised database of trained human resource to strengthen the public sector health delivery system. Hence, TMIS acts as a tool for facilitating the gap analysis of trained and untrained health workforce.

- i) Helping the policy makers in allocation of available human resources by rationalising their deployment (rational deployment of trained manpower)
- ii) Name based tracking of all the training programmes an individual has gone through
- iii) To enable user to preview, compare, modify and forward data to the next level based on authentication

- iv) Online nomination mechanism that ensures quality in nomination mechanism by putting in-built eligibility criteria based on designation etc.
- v) SMS alerts to the participants of training (scheduled) through TMIS
- vi) Online certificate generation for real-time training. Ensuring quality trained batches based on pre- and post-evaluation marks
- vii) Instant availability of facility (state / district) profile
- viii) Ensuring quality trainers by selection of trainers from the pre-defined list
- ix) Ensuring quality of delivery points based on the criteria (number of deliveries in delivery points as per the benchmark) mentioned in maternal and newborn health (MNH) toolkit of MoHFW.

The software also provides more user-friendly functions and advanced tools, such as online certificate generation for the real time trainings, 'list of trainers' based on the training type and thematic area, SMS alerts to the participants through TMIS as well as automatic statistics, report generation and visualised graphical presentation of training data.

Geographic Information System (GIS) based HMIS:

The geographic information system (GIS) based HMIS was launched on 29th March 2016 enabled services provides comprehensive data on a GIS platform on 1.6 lakh government health facilities spread across the country. It enables the effective usage of the HMIS application, enhanced analytical capabilities of States/UTs and provides geographical display of HMIS data using GIS. The application also has scope of incorporating map layers of roads and water bodies which will provide comprehensive information regarding health facilities and disease vulnerable areas of the country. At present, the application is available in login / secured domain of HMIS portal. It is planned to put it in public domain in the near future. Moreover, the mapping provides data only on public health facilities presently, which shall soon be expanded to cover private facilities also.

16.5 STEPS IN DEVELOPING HMIS

The concept of HMIS has evolved through various steps since late 1990s with the help of the World Health Organisation (WHO) for efficient and fast information system to know the status of health services, training needs, existing health professionals and other workforce. Thus, it is pertinent to know its ten important steps as given below:

i) Review the existing system:

It is based on the principle of not destroying existing systems. It is always better to build on the strengths and learn from the weaknesses of what already exists. Make an inventory of the forms, log books and other tools used to record and summarise data at different levels. Assess the quality of the data being collected using the existing forms at different levels. Identify the aspects of the system that need to be retained or modified or abolished.

ii) Define the data needs of relevant units within the health system:

It is based on the principle that different administrative levels in the health system have different roles, and therefore have different data needs. Not all

data needs should be generated through the routine system of data collection. Define the different roles/functions of each level, for each of the major programmes and identify the indicators needed by each level to perform its functions. Determine the formula and identify the variables or data elements needed in order to compute the indicators. Determine the source of the different data elements needed for both the numerator and denominator of each indicators.

iii) Determine the most appropriate and effective data flow:

It is based on the principle that not all the data collected at a certain level need to be submitted to higher levels. The most detailed data should be kept at the source, and reporting requirements to higher levels should be kept at a minimum. Determine what data will be submitted to whom. Determine how frequently data should be submitted to each level. Determine in what form data is to be submitted to each level. Make a flow chart that shows the flow of information from the peripheral to the highest level.

iv) Design the data collection and reporting tools:

It is based on the principle that the capability building of the staff, which will be tasked to fill the forms must be taken into consideration while designing it. The most effective data collection and reporting tools are simple and short. Develop the first draft of each form that is needed, using as a guide the list of indicators to be used for the programme. This step entails either the modification of existing forms, or the development of new ones. Compare the first draft of the form that has been developed with the list of indicators to ensure that all the data needs can be generated from the form. Present the first draft of the form to relevant staff members and discuss with them. Prepare a draft of the Instructions Manual on how to fill out the new forms. Pre-test the use of the new forms as well as the Instructions Manual. Assess the results of the pre-test. Modify the forms and the Instructions Manual based on the results of the pre-test.

v) Develop the procedures and mechanisms for data processing:

It is based on the principle that the way the HMIS data is processed should be consistent with the objectives for data collection and the plans for data analysis and utilisation. Assess the advantages and disadvantages of manually processing the data compared to using computers. If a computerised system is to be implemented, decide the lowest level where computers will be used to process data.

Among the important considerations in choosing this level is the presence of staff trained in system maintenance. Define the specifications for software development, in consultation with different levels of data users. Develop the software needed to process the data at each level where computers will be used, based on the required specifications. It may also be possible that the software designed to generate outputs similar to those of the HMIS have already been developed, requiring only minor modifications to customise it. In this situation, the resources needed to acquire and customize the software should be determined. A decision then needs to be made on whether to develop new software or acquire and modify an existing programme.

vi) Develop and implement a training programme for data providers and data users:

It is based on the principle that training programmes should be designed according to the needs and level of the target. Conduct a training needs assessment for data providers and data users. Develop the curriculum for each type of training, based on the results of the training needs assessment. Develop the training materials. Reproduce the training materials since there is a chance that some modifications in the format, structure and content of the training materials will be made based on the evaluation results. Formulate the evaluation design for the training programme. It is important to determine this prior to the conduct of the training activities, since most evaluation designs require the collection of a baseline or a pre-training level of knowledge among the participants. Identify the most appropriate participants for each type of training, based on their duties and responsibilities related to data generation, management and utilisation. Conduct the training of data providers and data users. Evaluate the training programme, including the training materials used. Modify the training materials and the training programme, on the basis of the results of the evaluation.

vii) Conduct a pre-test, and if necessary, redesign the system for data collection, data flow, data processing and data utilisation:

It is based on the principle that the system should be pre-tested in conditions that reflect as much as possible the actual conditions prevailing during its implementation. Prepare the guidelines for pre-testing the system. Orient the staff involved, implement the pre-testing activities, write a report on the results and formulate recommendations, based on the results of the pre-testing.

viii) Monitor and evaluate the system:

The goal of monitoring and evaluation is not to focus on what is wrong and condemn it; rather, it is to highlight the positive aspects of the system that make it work, as well as to identify what went wrong as a basis for improving the system. Develop a plan for the systematic monitoring and evaluation of the system. Identify the resources needed, prioritise the activities based on availability of resources and need and implement the monitoring and evaluation plan. Document and disseminate the results and make recommendations based on the results of monitoring and evaluation activities.

ix) Develop effective data dissemination and feedback mechanisms:

An effective way of motivating data producers is to constantly provide them with both positive and negative feedback on the status of the data they produce. Determine the most effective and efficient way of disseminating the data generated from the HMIS. Identify the human, financial and other resources needed to implement the data dissemination plan. Prioritise the different modes of data dissemination to be adopted, based on need and availability of resources. Implement the data dissemination activities. Develop and implement a system for monitoring and evaluating the data dissemination and feedback activities conducted.

x) Enhance the HMIS

The development of the HMIS is always a work in progress. It is a dynamic endeavor where managers and workers strive for constant improvement. Review the results of monitoring and evaluation activities conducted on the HMIS in recent years and identify aspects of the HMIS that need to be developed further to facilitate the functioning of the core system. Identify resources and prioritise the different options according to degree and urgency of need, and availability of resources for its proper implementation. Prepare a timetable and conduct the different activities needed to implement the desired enhancement of the HMIS. Monitor and evaluate the effect of newly implemented aspect of the HMIS.

16.6 MAJOR ISSUES AND CHALLENGES WITH CURRENT HMIS

Major issues and challenges of HMIS are most important aspects for effective implementation and overcome its limitations. After evaluation of indicators across data sources and linkages with reporting system revealed major shortfall. In this section, we will discuss various issues pertaining to data collection, definition, analysis and dissemination at national, sub-national and institutional level. Overall data that is collected is incomplete or of poor quality; there is duplication and fragmentation of data across reporting systems that have been developed by different users. Here we study two levels of issues and challenges: a) national level and sub-national level data issues; b) data compilation, analysis and intrinsic data quality concern.

National Level

At the national level there is no independent central resource and centre to provide stewardship to the health information and data management in the country. There is no unified body at a national level to provide guidance around: (i) types of data that can be collected at various levels; (ii) responsibility for collection; (iii) legal and policy framework; (iv) use of standardised definitions; (v) quality control and validation mechanism. Different ministries produce different data sets to fulfill their programme specific needs. There are four main issues relating to data at national level:

- i) **Different sources, divergent figures:** Variety of data sources in India have reported divergent population demography figures which leads to confusion in interpretation.
- ii) **Non-standardised decentralised procurement of nationalised Human Resource Information System (HRIS):** Currently, most human resources information system is neither complete nor up-to-date and is often found in disparate paper less. The Government of India established human resources for health (HRH) as an important policy initiative in its 12th five-year plan. It was agreed that the most effective method to bring together such data is in a web-based information system. The review of states' HRIS system by Shukla et al. (2014) showed that states have either a paper-based system or one with some data in electronic spreadsheets. Some systems have only 10 data elements (Haryana) and some systems have more than 200 fields (Bihar and Jharkhand). Moreover, the protocols for data quality and updating also

span a wide spectrum, from few checks to very sophisticated ones to assure quality and accuracy. This is because of lack of standard mechanism for procurement of such specialised softwares at state level. Also, as National Informatics Centre remained constrained in terms of their ability to incur any additional cost, other than for staff time and training; states were required to seek continuous external funding for its upkeep.

iii) Lack of centralised mechanism for linking data across sources: Various ministries produce different data sets, such as the MoHFW, WCD (indicators like violence against women, nutrition in children), Ministry of road transport and highways (road accidents, deaths). However, in the absence of a central data resource centre or data stewardship the system is unable to draw correlations across data sources and estimate the degree of impact of different social and environmental factors on health of people to support informed planning and improve implementation process. For instance, an article by Ackerson and Subramanian (2008) on analysis of NFHS-2 (1998-99) data indicated strong association between domestic violence on women with anaemia of children.

iv) Data dissemination and utilisation challenges: There are gaps in dissemination and use of data at a national level, in terms of timeliness of dissemination. For instance, CRS data on population reporting are available only till 2015 making it impossible to serve as basis of policy recommendation. Also, there is a delay in compilation and synthesis of data, for example, NFHS -4 for 2015-16 could bring out All-India data only in December 2017, owing to lack of processed data from several states. Again, in terms of meeting international obligation to data reporting on health indicators for, example, SAARC development goals, WHO health indicators or India stands behind. Same is the case for expenditure on health data, national health accounts.

Sub-national management level

At a sub-national level there is no state level data resource centre to coordinate and collaborate with national data resource centre for steering de-centralised data collection and collation across sources. The data that is generated at state level lacks any information on private sector where about 70 percent of population seeks treatment (NSSO, 2014).

i) Lack of private sector data: The data both at a national and sub- national level is compromised in terms of private sector data. The strength of the private sector is illustrated by the fact that it controls 80 per cent of doctors, 26 per cent of nurses, 49 per cent of beds and 78 per cent of ambulatory services (Planning Commission (2012). In treating the in-patients, private institutions dominated both the rural and urban areas respectively 58 percent and 68 percent (NSSO 2014). However, in case of both service records and administrative records private sector is not included. Therefore, there needs to be better mechanism for capturing this source of information for completeness of data. For example, the HMIS data that serves as the backbone for monitoring results of the National Health Mission comprising of the urban and rural sub-missions, needs extensive reform to accommodate the private health-care delivery system and surveys like NFHS are also restricted in terms of informing only about utilisation of mother and child care at public facilities.

Even the data on incidence of communicable and non-communicable diseases and data on cause of death is limited due to very marginal coverage of private sector. Even in the case of national health accounts (most recent report was published in 2017 presenting account for 2014-15) which gives out expenditure on health in both public and private sector, list of health care providers and related capital expenditures in the private sector, is not exhaustive due to non-availability of disaggregate data.

- ii) **Limited disaggregation of data:** Disaggregated data on coverage for specific population groups residing in remote areas, referring to vulnerable and marginalised population, especially those working in informal sectors are limited. Details around preventive, promotive, rehabilitative and palliative services are insufficient. Similarly, disaggregated health insurance data by socio-economic categories under different schemes are not available in a timely manner to evaluate impact on the vulnerable population. For example, in case of SRS information on MMR, IMR is available only for bigger states and that too combined for rural and urban. It does not provide data below state level. Like the SRS, NFHS was not providing estimates below the State level till the third round. However, NFHS-4 provides estimates at district level for most indicators.

Data compilation and analysis

- i) **Lack of training on probing skills:** A lot of success of any survey depends on probing and interviewing skill of field officers conducting surveys. While both CSO and NSSO has a training division for their field officers, but they lack in various areas. There is a marked lack in infrastructural facilities, there is no systematic calendar or arrangement for training and there is often no linkage between the kind of training received by an officer and his or her assignment. As a result, for example, while both Consumer Expenditure Survey and morbidity and health care surveys both conducted by NSSO and collect information on health expenditures, it has been shown that the way questions are put forth to households, the spending reported by both surveys lead to very different results (Garg and Karan 2009).
- ii) **Shortage of staff:** Poor data quality is due to the shortage of qualified personnel specially the nurses, ANMs, data entry operator who are responsible for data inputs. The Economist (2008) reports that only 30 per cent of nursing positions in rural hospitals are filled and a single ANM covers over five villages. Data entry at the sub-centre level is by ANMs writing into physical registers. There are bound to be errors at this level because ANMs record data in registers which are very badly designed. Thus overworked ANMs spending hours in data entry along with visiting the villages to registering and providing medicines to pregnant women. The quality of data, while fulfilling reporting obligation, becomes secondary, and often subject to errors and omissions. At the PHC level, the data entry operator (DEO) is responsible for entering data for district. Along with this, she is responsible for fulfilling several other reporting requirements too like mother and child tracking system (MCTS). Similarly, the DEO has to undertake data entry of immunisation report, vaccine and logistics, release and logbook data.

Intrinsic data quality issues

- i) **Methodical issues:** There is little standardisation in amount of information collected and definitions of indicators across states, making the data being reported of little practical use. For instance, under CRS many states report births according to the date of registration instead of the date on which the birth takes place; thus, making data incomparable across states.
- ii) **Data triangulation issues:** Before usage of data for research or policy formation data fidelity should be assured by triangulation with data from periodic surveys and community based monitoring. In SRS, quality is assured, as there is a continuous enumeration of births and deaths in selected sample units by resident part time enumerators, and an independent survey every six months by SRS supervisors. The data obtained by these two independent functionaries are matched, re-verified and thereafter an unduplicated count of births and deaths is obtained. Further, the SRS is also compared with the civil registration and vital statistics (CRVS) (Garg and Karan (2009). However, civil registration is still not complete and a better process needs to be established for states lagging behind. Various surveys like census, national sample survey (NSS) and NFHS collect valuable information on demography, expenditure and utilisation of services. However, the irregular time difference between any two surveys and the time lag with which reports are made available on the website differ across the sources. Therefore, the triangulation of statistics at disaggregated across sections of the society becomes difficult.
- iii) **Inconsistent data definitions across survey rounds:** There exist differences in concepts and definitions with respect to some important parameters in various survey rounds, across organisations, making the results incomparable. For instance, the result of NSS 71st round is not strictly comparable with the results of NSS 60th round. In the 60th round and earlier surveys on health, persons with disabilities were regarded as ailing persons. In the 70th round, pre-existing disabilities have not been recorded as ailments, unless they were under treatment for over a month during the reference period, in which case they were considered as chronic ailments. In the earlier surveys, for each person aged 60 years or more, (up to three) ailments existing on the date of survey and the nature of treatment of such ailments, were recorded in addition to information on ailments suffered during the reference period of last 15 days. In the 71st round, such information on ailments as on the date of survey was not collected.

In this section you studied the functions of HMIS, important steps and its other issues as well as existing challenges to improve the system. Now answer the questions given in Check Your Progress-2.

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

- 1) Discuss the important functions of HMIS.

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- 2) Why is shortage of staff the biggest challenge in HMIS?

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16.7 LET US SUM UP

We read about various important aspects of HMIS, how it has evolved and become an important tool for fast and effective delivery of health services in India. This computer based system plays diverse roles in existing health resources, available health infrastructure, training needs and other information. Perhaps this system has not only reduced inter-sectoral co-ordination but also regional weaknesses to improve overall health conditions. Today, India has almost eradicated polio and many communicable diseases, and it has also succeeded in reducing many demographic hurdles like maternal mortality, infant mortality, fertility rate; and has helped enhance life expectancy (see Block-1). In this unit you studied about the concept of HMIS, its relevance and organisational structure in India, its important functions and flow of data from village level to national level, and the uses of GIS technology. The unit also describes important steps of HMIS, and upcoming challenges.

16.8 KEYWORDS

PHC: Primary health care which provides health services at lower levels.

ANM: Auxiliary nurse midwife who plays an important role in health services at lowest unit.

SRS: This is an important statistics survey based on a sample called sample registration system (SRS). It is a large scale demographic survey conducted in India for providing reliable annual estimates of birth rate, death rate and other fertility and mortality indicators at the national and sub-national levels.

16.9 REFERENCES AND SUGGESTED READINGS

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- 4) HMIS Standard Report (2011) Ministry of Health and Family Welfare, Government of India, New Delhi.

16.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress-1

- 1) What do mean by MIS for health?

Ans. Management of information system (MIS) refers to the management of information through digital tools and techniques for any intervention for desired objective. It is a tool which helps in gathering, aggregating, analysing and then using the information generated for taking actions to improve performance of health systems.

- 2) Explain the organisational structure of HMIS in India.

Ans. In India, the HMIS was launched in October 2008 for efficient health data entry and its dissemination at different levels. Indian organisational structure of management information system (MIS) for health is broadly classified into three levels for proper co-ordination and execution of information: a) central level b) state level and c) district and sub-district level.

Check Your Progress-2

- 1) Discuss important functions of HMIS.

Ans. The important functions of HMIS are at three levels of health department. First, the national and state level, it is tool for assessing the progress of national health programmes. Secondly, state and district level, help programme managers to track the progress of implementation, planning and specific interventions. Thirdly, the sub-district level, facilitates efficient and effective registering and collation of data, improvements in data quality, systems for complete reporting, timeliness and accuracy, provision of data analysis tools, interpretation and translation of data to guide action and intervention at local level.

- 2) Why is the shortage of staff the biggest challenge in HMIS?

Ans. Trained staff plays a significant role in HMIS system. Lack of appropriate staff often leads to poor quality data, improper health services, faulty physical registration, overburden of work on ANMs and other existing staff and ultimately failure of health management information system. Thus overworked ANMs end up spending hours in data entry, along with their regular work of visiting the villages to register and provide medicines to pregnant women.