
UNIT 5 HEALTH MANAGEMENT INFORMATION SYSTEM

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5.0 OBJECTIVES

After completing this unit, you will be able to:

- define the Health Information System;
- differentiate between Data and Information;
- discuss the requirements of Health Information System;
- describe the sources of Health Information; and
- explain the uses of Health Information and vital health statistics.

5.1 INTRODUCTION

You have learnt in the previous unit about the work plan. Work plan is developed on the basis of needs of community and the results of past services provided. Health Information Systems (HIS) helps in assessing the needs of the community and evaluating our work. Health information provides the link between the various department and personnel. It ensures that all sections have similar baseline data and links policy makers, managers and service providers.

In this unit we will discuss the requirements, components, uses and sources of HIS. When developing or using a Health Information System, nurses and community health worker must ensure that the rights of both client and staff are protected when information is organized.

5.2 CONCEPTS IN HEALTH MANAGEMENT INFORMATION SYSTEM

5.2.1 Meaning and Importance

A Health Information System (HIS) is defined as “a mechanism for the collection, processing, analysis and transmission of information required for organizing and operating health services, and also for research and training”.

The main objectives of HIS are to:

- provide reliable, relevant, up-to-date, adequate, timely and reasonably complete information for health managers at all levels (i.e., central, intermediate and local).
- help all the health personnel participating in health services of a country to share the technical scientific information.
- provide the data that will show the general performance of the health services from time to time.
- assist the planners in studying their immediate functioning and trends in demand and workload.

5.2.2 Difference Between Data and Information

Before proceeding further, it is necessary that we know the difference between “data” and “information”.

Data: Data is a collection of facts and observations, which carry little meaning when considered alone. The data, which is collected from operating health care systems or institutions, is not adequate for planning.

Information: The reduced, summarized and adjusted data can be termed as information. We will have to reduce, summarize, arrange and adjust the data for variations such as age, sex composition of the population so that it would be possible to compare them later on when required.

In other words we can say that Information is more than raw data or facts that describe places, things and events. Information is “data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in current or prospective decisions”.

Let us take the example of a good dish. The several ingredients e.g., raw vegetables, spices etc. are like the raw data. They are important but cannot be used on their own. When they are all put together and processed, the result is delicious dish, which can be consumed by many.

<p>Information is processed data—made ready for some one to use it meaningfully. Information is present in tables, charts, graphs etc.</p>

5.2.3 Requirements of Health Information System (HIS)

According to WHO Expert Committee the HIS should fulfil the following requirements:

- The system should be population based.
- The system should avoid the unnecessary accumulation of data in disorderly way.
- The system should be problem oriented.
- The system should employ functional and operational terms (e.g., episodes of illness, treatment regimens, laboratory tests).
- The system should express information briefly and imaginatively (e.g., tables, charts, percentages).
- The system should make provision for feedback. i.e., it should provide basis for evaluation.

5.2.4 Uses of Health Information System

After going through the requirements of health information system lets go through its uses. The uses of health information system are given below:

- i) To know about the problems and needs of the people and their health status.
- ii) For comparing the local, national and international health status.
- iii) For planning, administration and effective management of health services and programmes.
- iv) For assessing whether health services are accomplishing their objectives in terms of their effectiveness and efficiency.
- v) To assess the attitudes and degree of satisfaction of beneficiaries.
- vi) For research into particular problems of health and disease.

Check Your Progress 1

- i) Define Health Information System?

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- ii) What is the difference between information and data?

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5.3 COMPONENTS OF A HEALTH INFORMATION SYSTEM

A comprehensive health information system should have information and indicators on the followings:

- i) Demography and Vital events.
- ii) Environmental Health statistics.
- iii) Health status: mortality, morbidity, disability and quality of life.
- iv) Health Resources: facilities, beds, manpower.
- v) Utilization and non-utilization of health services: attendance, admissions, waiting lists.
- vi) Indicators of outcome of medical care.
- vii) Financial statistics (costs, expenditure related to the particular objective).

5.4 SOURCES OF HEALTH INFORMATION

Information requirements will vary according to the administrative level at which planning is to be made e.g., information requirements for public health administrator will differ from Hospital Administrator. These different contexts will require different sources, which are as follows:

Do you know that you are already collecting this information in your day to day activities.

5.4.1 National Level Demographic and Epidemiological Information

Census, registration of vital events, Sample Registration System (SRS), registration notification of diseases provides national level data. Vital statistics are also summarized and presented at national level.

Census

Census is an important source of health information. It is massive undertaking to contact every person of the population in a given time and collect a variety of information. It needs considerable organization, a vast preparation and several years to analyze the results. Main drawback of census is that the full results are usually not available quickly. Census is usually done in India every 10 years. Population census provides basic data such as age and sex of population needed to compile vital statistical rates, other health, demographic and socio-economic indicators.

Registration of Vital Events

If registration of vital events like births/deaths is complete and accurate it can serve as a reliable source of Health Information. The Central Births and Deaths Registration Act was passed in 1969 and came into force from 1st April, 1970. The time limit to register birth is 14 days and death in 7 days.

Besides these now the marriages and pregnancies are also registered at the level of subcentres.

Sample Registration System (SRS)

This is a dual Record System. The births and deaths are registered at the grass roots level, and at the same time an independent survey is conducted by investigator supervisor every 6 months, to collect information. After introduction of this system from 1960, more reliable information of birth and death rates, age specific fertility and mortality rates, (infant and adult mortality etc.) have become available.

Notification of Diseases

Primarily it started with notification of infectious diseases with purpose of preventing and controlling after notification. It is a valuable source of morbidity data. The incidence of certain diseases of national and international importance, are to be notified, recorded and reported through Village Health Guides and Multipurpose Health Workers.

Limitations of Notification are that some cases escape notification due to non-recognition e.g. rubella, non-paralytic polio etc. The accuracy of diagnosis becomes difficult in rural areas due to non-availability of facilities. Notification provides valuable information about fluctuations in disease occurrence. It provides early learning about new occurrence and outbreaks of diseases. Now notification has been extended to cancer, congenital malformations, mental illness, stroke and handicapped persons.

5.4.2 Service Delivery and Utilization Information

These include hospital and health facility data, population data.

Hospital Records

It provides information only of patients who attended the hospital. Hospital statistics are considered a poor guide to estimate the disease frequency. But the hospital record can give a lot of useful information about activities and utilization of health care.

A detailed study of the hospital data will provide information on following aspects:

- a) Geographical sources of patients.
- b) Age and sex distribution of different diseases and duration of hospital stay.
- c) Period between disease and hospital admission.
- d) Association between diseases.
- e) The distribution of patients according to different social and biological characteristics.
- f) The cost of hospital care.

Disease Registers

Registers are not meant for notification of disease only but are permanent record of the diseases, cases followed-up and tabulations on frequency and survival should be entered. Morbidity registers are made for some diseases, which serve as a valuable source of information about the duration of illness, case fatality and survival such as for tuberculosis. For collecting information survey is done in the particular area.

Surveillance is defined as “the continuous scrutiny of the factors that determine the occurrence and distribution of disease and other conditions of ill-health”. In many countries where some diseases are more common, surveillance systems are set up to report on the occurrence of new cases and the efforts to control the diseases. These programmes help in collecting useful morbidity and mortality data for the particular disease.

Record Linkage

The term record linkage is the process of bringing together records originating in different times or places relating to one individual.

Medical record linkage as the name suggests implies to collection and maintenance of more important records related to health of each individual in a population. In record linkage a large volume of data can accumulate. Hence, in practice it has been applied only on a limited scale.

Other Health Services Records

Some other important records also provide useful information. Some of these are records of **out-patient departments, primary health centres and subcentres etc.**

Environmental Health Data

The information relating to the environment is generally not available. The effects of air, water and noise pollution, industrial toxicants etc. on health are not studied. Environmental data can be helpful in the identification of qualification of factors causative of disease.

5.4.3 Population Survey Information

A Health Information System should be based on population. The information provided by the above sources are not sufficient so, population surveys must be conducted to supplement the routinely collected statistics.

Health survey (surveys relating to any aspects of health-morbidity, mortality etc.) should be carried to collect information related to the health of people. The types of surveys carried out are given below:

- a) **Surveys for evaluating the health status** of a population, i.e. community diagnosis of problems of health and disease. It is information about the distribution of these problems over time and space that provides the fundamental basis for planning and developing based services.
- b) **Surveys for investigation of factors** affecting health and disease e.g., environment, occupation, income, factors associated with onset of illness etc. These surveys are helpful for studying the natural history of disease and obtaining more information about disease etiology and risk factors.
- c) **Surveys relating to administration** of health services.

Health surveys can be classified into four types:

- a) Health interview (face-to-face) survey
- b) Health examination survey
- c) Health records survey
- d) Mailed questionnaire survey.

5.4.4 Health Manpower Information

It is very important to collect the information on the health manpower. Such information is regarding the number of physicians, dentists, pharmacists and nurses etc. The records maintained by the State Medical/Dental/ Nursing councils and Directorates of Medical Education have this information.

5.4.5 Qualitative Information

Till now, the HIS concentrated on statistical data. A lot of non-quantifiable data is also necessary for health planners and decision makers like information on health policies, health legislation etc. HIS has multi-disciplinary inputs, which should be properly stored, processed and disseminated.

Check Your Progress 2

Enumerate the sources of Health Information.

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5.5 VITAL AND BASIC HEALTH STATISTICS

Vital Statistics has been defined as “the facts systematically collected and computed in numerical form derived from records of vital events”. Health Statistics cover a wide range of statistics related to health. Vital events of life are **births, deaths, marriages and sickness** that occur in a community currently recorded and analyzed or interpreted. Vital Statistics indicate the state of health of a community and provide guidelines necessary for planning and health administration.

5.5.1 Uses of Vital and Health Statistics

The important uses of Vital and Health Statistics are to:

- measure the state of health of a community.
- identify its health problems and health needs.
- compare the present health status with that of the past health status of the country.
- carry out planning and health administration.
- evaluate the progress, success or failure of health programmes.
- carry out research and studies in community health problems.

5.5.2 Sources of Vital and Health Statistics

Various sources of vital and health statistics are:

- a) Census.
- b) Registration of births, deaths and marriages.
- c) Notification of infectious diseases.
- d) Records of Hospitals and Health Centres.
- e) Health Surveys.
- f) National Sample Survey.

These have already been discussed in Section 5.4.

5.5.3 Important Vital Statistical Rates and Indices

The common vital statistical rates and indices used in community health are discussed below. They determine the health status of the country.

Crude Birth Rate: It is defined as “the number of births per 1000 population in a given year.”

Crude Death Rate: Number of Deaths per 1000 population in a given year.

Sex Ratio: Number of females per 1000 males in a population.

Population Density: Number of persons per Sq. km. of total surface area (3.3 million).

General Fertility Rate (GFR): Number of live births per 1000 married women in reproductive age group (15-49 years).

Total Fertility Rate: Average number of children that would be born to a woman if she experiences the current fertility pattern throughout her reproductive age (15-49 years) (3.5/1000).

Net Reproductive: Average number of daughters that would be born to a woman if she experiences the current fertility and mortality patterns throughout her reproductive age (15-49 years).

Infant Mortality Rate: Number of deaths of children below one year of age per 1000 live births in a year.

Neonatal Mortality rate: Number of infants dying within the first month of life (under 28 days) in a year per 1000 live births of the same year.

Post-neonatal Mortality Rate: Number of infant deaths between 28 days to one year of age per 1000 live births in a given year.

Peri-natal Mortality Rate: Number of late foetal and deaths of neonates weighing over 1000 g at birth within 1st week of delivery per 1000 live births.

Maternal Mortality Rate: Number of deaths of women while pregnant or within 42 days of termination of pregnancy from any cause related to pregnancy and child birth per 1000 live births in a given year.

Life Expectancy at Birth (Expectation of life): Average number of years a newborn child is expected to live under current mortality conditions.

There are some other important health indicators, which show the health of community. These are used to compare the health of a community with that of another community or country. These are:

- Morbidity indicators such as incidence and prevalence rates.
- Disability rates.
- Nutritional status indicators such as heights and weights of children and prevalence of low birth weight.
- Health care delivery indicators such as doctor–population ratio and nurse population ratio.

5.6 ROLE OF HEALTH WORKER IN MAINTENANCE OF RECORDS OF VITAL EVENTS

As you know that the reporting of births and deaths in villages is done by the village Chowkidar, *Dais* and other leaders of the community. You as a health worker during home visits can find out what events have taken place since your last visit. When you visit a home, you must find out, about births and deaths and keep a record of the same.

You must educate the community on the importance of registration of these events. You must tell them that:

- i) Birth Registration is necessary so that you can provide services to the newborn and look after the mother and advise her about her own health and care of the newborn.
- ii) Death registration is necessary to find out the causes of deaths particularly in infants and during pregnancy and child birth so that required services are provided to mother and infants. *Dais* can be retrained and referral system can be strengthened.

You should prepare charts and graphs showing the work being done in the various fields of health service delivery in your area. These charts should be displayed in the subcentre. They will show at a glance how your work has been progressing and will help in self-evaluation of your activities.

The important maps and charts, which you should maintain are listed below:

Map of each village in the area showing (See Fig. 2.2 of Unit 2, Block 1):

- Number of houses.
- Roads.
- Location of subcentre, Panchayat Ghar, Police Station etc.
- Houses with pregnant women.
- Houses with children below 5 years.
- Houses with eligible couples.
- Location of Village Health Guide.

- Location of *Dais*.

Bar Diagram Charts can be prepared (year wise and month wise) indicating the following:

Immunization

- Total no. of children immunized.
- BCG Vaccination.
- DPT Vaccination—3 doses.
- Poliomyelitis Vaccination—3 doses.
- Measles Vaccination.
- Tetanus toxoid in pregnancy (2 doses or booster).
- Immunization to school children (T.T., D.T., Typhoid).

Family Planning

- No. of eligible couples.
- No. of cases who have undergone vasectomy.
- No. of cases who have undergone Tubectomy.
- No. of cases who have undergone IUCD insertion old/new.
- No. of cases given oral contraceptives old and new.
- No. of cases given other contraceptives old and new.

Vital Statistics

- Number of births: Male/Female.
- Number of deaths by age and sex.
- Number of pregnant women.

Maternal and Child Health

- No. of antenatal cases registered.
- No. of deliveries performed by:
 - Trained *Dai*
 - Untrained *Dai*
 - Centre Staff
 - Others.

Check Your Progress 3

List six sources of Vital Statistics.

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5.7 LET US SUM UP

Health management information system is one of the important tools of operating health services. The functions of planning, organizing, controlling and evaluating health services from time to time is carried out with the help of HIS. The primary objective of a health information system is to provide reliable, relevant, up to date, adequate, timely and reasonably complete information for health managers at all levels. It also helps sharing of technical and scientific information by all health personnel participating in the health services of a country and also to provide data that will show the general performance of the health services. It also helps the planners in studying their current functioning and trends in demand and work load.

In this unit we have discussed the requisites of health information system, its components and uses and also the sources of the health information. Further we have discussed basic health statistics, sources and uses of vital and health statistics. Important vital statistical rates and indices are given to enable you to revise how to calculate. Maintenance of records of vital statistics is also explained.

5.8 GLOSSARY

Data	:	Collection of facts and observations which carry little meaning when considered alone.
Disseminated	:	Spread, distributed.
Health Information System	:	A Mechanism for the collection, processing, analysis and transmission of information required for organizing and operating health services, and also for research and training.
Information	:	Data that has been processed into a form that is meaningful to the recipient and is real or perceived value in current or prospective decisions.

5.9 MODEL ANSWERS

Check Your Progress 1

- i) A mechanism for the collection, processing, analysis and transmission of information required for organizing and operating health services, and also for research and training.
- ii) Data is collection of facts and observations, which carry little meaning when considered alone, whereas, information is the data that has been reduced, summarized, adjusted and become meaningful.

Check Your Progress 2

The sources of HIS are:

- a) Census
- b) Registration of Health Information
- c) Sample Registration System
- d) Notification of diseases
- e) Hospital records
- f) Disease registers
- g) Record linkage
- h) Epidemiological data
- i) Other health service records
- j) Environmental health data
- k) Health manpower information
- l) Population surveys
- m) Other routine statistics related to health
- n) Qualitative information.

Check Your Progress 3

- a) Census.
- b) Registration of births, deaths and marriages.
- c) Notification of infectious diseases.
- d) Records of Hospitals and Health Centres.
- e) Health Surveys.