



Public Health

Title : health information system

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Health information system

L 11

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we mentioned that the main goals of public health is to improve the health status of the population by the promotion, protection and prevention of diseases
in order to protect, improve and know the health status of the population we need information to know what is the components of our community, what is the health problems in the community, what is the mortality causes or what are the causes of death , what are the causes of morbidity in order to know what are the main health problem that needs to be prevented and promote health of the people and protect them

also we need to know what are the health services or health programs which are rendered to the community in order to see what are the gaps in these health care services in order to improve them

so we need information to achieve these goals



Objectives

- Definition
- Importance of a Health Information System.
- Uses of Health Information.
- Sources of Health information system.
- Information Quality.
- Difficulties in Managing Data

group of information taken from different health services and then we are going to take these information, process them, analyze them in order change them to be important information so we gather information from different health institutions in order to have information about these services

Health information system (HIS)

so as we mentioned previously in PH or epidemiology it's a quantitative science dealing with numbers then we are changing these numbers into important information which are needed so we could know the health status: mortality, morbidity, death and the quality of the services in order to know the needs and gaps in these services so we could improve them

HIS “ a set of **interrelated components** working together to **gather, retrieve, process, store** and **disseminate** information **to support** the activities of health system **planning, control, coordination and decision-making**, both in management and service delivery”

Importance of a Health Information System

Produces **information needed** by patients, communities, service providers, program managers, policy-makers, providers of funds, global agencies and organizations.

The ultimate objective of health information system is not “to gain information” but “to improve action”

by taking these information and transfer them useful information in order to be helpful for decision makers to improve health programs.

Uses of Health Information

1. To measure the health status of a community.
2. To identify health problems , and medical and health care needs.
3. For comparison
4. For planning , administration and evaluation of health care services and programs.
5. For research into community health problems.
6. Assessing level and attitudes of user’s satisfaction with health system.

1 we discussed the different rates which are used to assess the fertility of the population, how many babies are born every year, what are the number of women in the community so we could give appropriate health care services for them

2 what are the causes of diseases in the community, what are the causes of death

compare health status of different population and countries also it's important to make comparison in the same country by having assessed the health status and the health problem between urban and rural area

3 also national and international comparison by comparing rates we have already discussed in different countries

4 what are the needs of the population in order to provide them with appropriate health care services also, what are the gaps, what are the resources needed, resources needed.

5 by detecting the risk factors by performing different studies and it's important to modify the risk factors in order to prevent occurrence of disease by different levels of prevention (primary, secondary) in order to screen for different health problems and prevent progression of the disease so we could change the prognosis

6 the people that use the health services are they satisfied? it is an important indicator for the quality of the services.. if they are satisfied that means that the quality is good.. also it's important to evaluate the services like antenatal services, immunization program so we could know what is the coverage rate of these programs, who are the people that aren't using these programs.. they are called "**defaulters**" cuz we have to concern about them because they are source of infection due to lack of vaccination so we will have epidemics, or women not using antenatal services cuz they are at risk of so many health problems

Information used for:

1. **Better management**, assess **coverage** and **quality** of services; **costs** and expenditures.

2. **Detect and control** emerging and endemic health problems

*what are the emerging infections like COVID, What are the source of infection
what are the main control measures to stop the pandemic*

3. **Monitor progress** towards health goals; and

*also there is the millennium developmental goals "international goals" which are 8 goals applied by the WHO it's important to achieve these goals..the first one of them is eradication of poverty and hunger, also it concerns about the health status of the child and the mother
in each country there are specific goals according to the type of the population and the health status.. in developing countries the main goal is prevention of infectious diseases or decrease in infant mortality rate, improve maternal and child health services, in developed countries they are more concerned about non communicable diseases*

4. **promote equity**.

*One of the important goals of public health is to decrease health disparities, and achieve health,
equity:all the people have equal level of health care services*

Sources of Health information system

1. **Census**

2. **Vital statistics:** Births, death, marriage, divorce.

3. **Demographic:** age, sex, education, socioeconomic.

4. **Notification of Diseases**

5. **Health institutions and organizations:** hospitals, clinics, specialized register centers, WHO etc.....

6. **Epidemiological studies.**

7. **Population (household)surveys.**

8. **Research**

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Census: *الإحصاء السكاني*

Census is an important source of health information.

- It is the **complete count of a country population.**
- Taken in most countries of the world at **regular intervals, usually of 10 years.** *it is done periodically*
- It consists of collection of data i.e., **social, demographic and health related factors.**

It's the biggest source of **comprehensive data** on :

- Demography
- Economic Activity
- Literacy & Education
- Housing & Household facilities
- Urbanization
- Fertility and Mortality
- Language, Religion & Migration

STRENGTHS

- Covers the **whole population**; **small** geographic units .
and different
- **Equity** information . *same information should be taken from population*
- Data for **mortality and fertility** for different levels of geographic areas
- Important source for **planning** and implementation of various activities and programs at smallest geographic unit

LIMITATIONS

❖ Two types of error :

- coverage and content error.

Sometimes the people are not available at the time that taken coverage information, there will be inadequacy and incomplete information and sometimes the content is variable because they are different people so there will be variation in the information between people collecting the information so there will be content error

❖ Age misreporting.

Some people they don't have the exact age They giveso there will be incorrect information about their age

❖ There is no direct question on deaths.

Sometimes it's hard to ask people about death or they don't know the cause of deathfor those who are in low socioeconomic status

❖ Unable to give the demographic estimates for the period between two censuses.

Because it does only Every 10 year is not enough to see is there a difference in demography of the population pyramid

- Births,
- death,
- marriage,
- divorce

Registration of Vital Events and statistics

- It keeps a continuous check on **demographic changes**
- If registration of vital events is **complete** and **accurate**, it can serve as a **reliable source of health information**. in developed countries
but this is still a problem in developing countries
- **Preparing health indicators**, such as infant mortality rates, neonatal mortality rates, post-neonatal mortality rates, maternal mortality rates, etc. The death recording is a good indicator off
The different cause of death in different age group
- **Maternal and child health services** for planning and evaluation.
- **Fertility data in family planning.** Births, death, marriage, divorce

Notification of Diseases

- Historically notification of **infectious diseases** was the first health concern.
- The primary purpose of notification is to **effect prevention and/or control of the disease**.
by providing certain programmes, vaccination...
there is special notification centers for some diseases like aids, TB
- It is a valuable **source of morbidity** data i.e., the **incidence and distribution** of certain specified diseases which are notifiable.
- International Health Regulation included: Cholera, Plague, Yellow Fever, relapsing Fever, Polio, Influenza, Malaria, Rabies, Salmonellosis are to be notified by WHO
specially in developing countries

Strength:

- provides valuable information about **fluctuations in disease frequency**.
they register number of cases in disease
- It also provides **early warning about new occurrences or outbreaks of disease**.
- The concept of notification has been **extended to many non-communicable diseases** and conditions notably cancer, congenital malformations, mental illness, stroke and handicapped persons.
specially in developed countries

Limitations :

(a) notification covers only a small part of the total sickness in the community .

because communicable diseases constitute small portion of total health problems in the community so it covers small morbidity rate

(b) the system suffers from under-reporting .

Specially, for people who are missing cases who don't consult health care services or they die before reaching health care services so they don't get reported

(c) many cases especially atypical and subclinical cases escape notification due to non-recognition, e.g., typhoid, rubella, non- paralytic polio, etc

like people who carry the disease and transmit it to another individual without sign and symptoms they are called Chronic carrier

Health institutions and organizations

Hospital Records: large number of hospitals, health centers, private clinics..

USEFULNESS

- **Geographic** sources of patients. From where the patient came
- **Age and sex** distribution of different diseases and **duration of hospital stay.** Because they are very important for the planning of the healthcare services
- Distribution of diagnosis .
- **Association** between different diseases. comorbidity specially among elderly people that different diseases occur together at the same time
- The **period** between disease and hospital admission. what is the incubation period and what is the natural history of the disease
- The distribution of patients according to **different social and biological** characteristics, public hospitals should be used by all the people but most of the time it is used by low and middle socio-economic people because they are unable to pay for private care
- The **cost** of hospital care. sometimes it's free for all people but some people rely on insurance

Drawbacks (disadvantage) large number, huge information but it only represents the tip of the iceberg → only severe cases

1. They constitute the “tip of the ICE-BERG.” (they provide information on only those patients who seek medical care, but not on a representative sample of the population.) some people don't go to the hospital either it's a self limiting disease or self administration of some drugs or even death before even coming to the hospital
2. Admission policy varies from hospital to hospital. There are different protocols and guidelines in different hospital is depend on the national law
3. There are no precise boundaries to the catchment area of the hospital. Each hospital covers certain area And hospitals should have the same level of health services for provision health equity
Some people go to a certain hospital in another country rather than his country because of the variation of healthcare services rendered
4. Population served by a hospital. there is differences in the population using each hospital like in rural areas people are different from urban area

Disease Registers "Registration":

Specialized Centers specialized centers for the provision of health services for special diseases

i.e. National Cancer Center , National Diabetes Center
↳ KHCC

- Disease registers allow follow-up of patients and provide a continuous account of the frequency of disease in the community.
- describe the natural course of disease, especially chronic disease in different parts of the world.

STRENGTHS

- Used for **service management** *good management For health problems*
- Yearly data on services rendered, Monthly data possible and in few cases monthly data are being compiled. *(process)*
- Basis for **disease surveillance** systems to **detect outbreaks**.
- Useful in **measuring performance of facilities and its monitoring** .
- Generates data on state specific schemes for **local planning and surveillance**

LIMITATIONS

So it's a provided for individual who have access to health care centers and some people go to the other health care centers like private ones

- Excludes those **not accessing the services** .
- **Incompleteness** and **data quality**, **Reporting** problems, irregularity and Data **duplication** & **inconsistency**
- **Private sector** often not included .

Epidemiological Surveillance

- Surveillance systems are often set-up in case where a disease **is endemic** e.g., Malaria, tuberculosis, leprosy, etc.
- To report
- To know the result of **efforts to control the diseases**.

These programs have yielded considerable **morbidity and mortality data for the specific diseases**.

Environmental Health Data

It may be:

- **Physical**: air, water , noise and radiation pollution.
- **Biological**: microorganisms
- **Chemicals**
- **Industrial** intoxicants
- Inadequate **waste disposal** and other aspects of the combination of population explosion with increased production and consumption of material goods.

Environmental data ^{that effect the health of the people.} can be helpful in the **identification and quantification of factors causative of disease**.

POPULATION SURVEY

Household survey: going to people houses and collecting data from them

- A health information system should be population-based.
- The routine statistics collected from the above sources do not provide all the information about health and disease in the community.

for example: we are going to assess the nutritional status of children so we do the house hold survey we are going to look to the children growth, height, weight and we should take large sample from the population

- The term "**health surveys**" is used for surveys relating to any aspect of health - **morbidity, mortality, nutritional status, etc.**

Strength:

❖ It can be representative to the larger population.

especially if we have appropriate sampling procedure

❖ Represents the **heterogeneity** of the population regarding : *we are going to see what are the variations in the population*

- living conditions,
- socioeconomic ,
- health status, i.e., fertility , mortality and morbidity.

Weakness

❖ Information provided by the respondent is often **inaccurate (response error)**.

They are not responding when you ask some people to give information about something some of them don't respond or give incorrect information

❖ Information requested is not provided at all (**non-response problems**).

❖ Information **incomplete**.

❖ **Time consuming and costly**. *Cauez we need well trained team*

❖ Represents **current (temporary) situation**.

it depends on the questions that ee are going to ask whether it's retrospective problem or current problem so ee should know what is the goal or aim when asking any question

Computerization and health care:

■ Most clinical facilities are looking towards achieving seamless integration of services based on a clinical “intranet” and deployment of full **electronic records**.

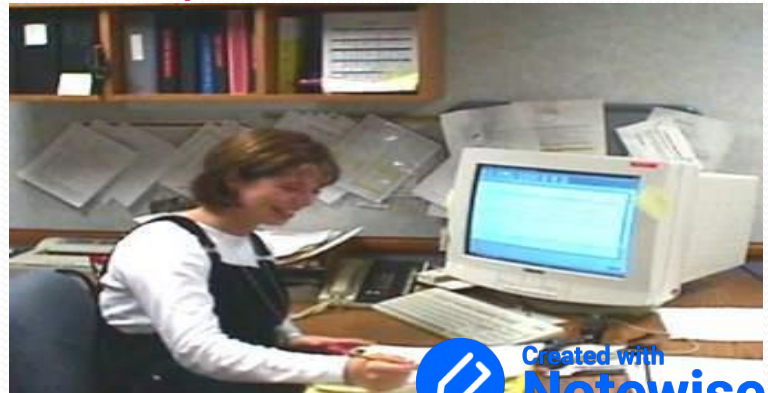
It's important to use the technology in order to report or keeping the health information and this is by introduction of the computer in different health institutions and by time it will be replacing hard copies

■ These developments open a wealth of opportunities and promise **benefits**; however, they bring with them several **important concerns and risks**, at the root of which are **security issues**.

↳ good communication between different departments and specialists regarding one patient

↳ confidentiality

also we should limit the accessibility to these information only to authorized people



■ Computerized and hard copy information differ in two fundamental ways.

■ One difference relates to perception:

■ hard copy is something we are all familiar with and feel that we understand.

■ By contrast, information that is stored in electronic form is mysterious and therefore a source of anxiety.

Some of the doctor They have some problem in using a computer Which is called computerphobia specially for old doctors, And now it's easy to use and some physicians resist to use it, but for junior doctors they are familiar with using them.

■ Professionals and the public are more concerned about the security of electronic records, especially not knowing where they are stored or who controls them.

So it is accessible to all people who are using and dealing with computer in the hospital like IT people so it's important to be very confidential and should be authorized only for people dealing with treatment of the patient

■ This may lead to failure of computerized system

Components of a HIS

▪ Inputs

- ✓ HIS resources

▪ Processes

- ✓ Indicators
- ✓ Data sources
- ✓ Data management

▪ Output

- ✓ Information products
- ✓ Dissemination and use

Components and Standards of a Health Information System



Information Quality

The most important aspect in the information to have a good information to used to assessment and planning a good health services so what is the criteria of the information that we need?

Accurate

Is there any incorrect value in the information?

Complete

Is information in agreement with detailed information?

Consistent

Is summary information in agreement with detailed information? does it agree with real situation?

Timely

Is the information current with respect to the needs?

Unique

Is each transaction and event represented only once in the information?

Difficulties in Managing Data

1. Amount of data increases exponentially.

One of the problem in managing the health information is that we have a large number of information that is collected from different individual and collected by different institutions

2. Data are collected by many individuals using various methods and devices.

3. Data come from many sources i.e., institutions.

4. Data security, quality and integrity are critical.

This data could be incorrect or incomplete and this is one of the most important problem facing health information there is always some missing information and this lead to misinterpretation of the data

5. An ever-increasing amount of data needs to be considered in making organizational decisions.

we should have good organized information, constant , unique, accurate and complete information for provision of efficient health services

Recommendations

- **Sensitization** of stakeholders involved with the HIS on its importance and components
- **Assignment** of skilled personnel to the HIS unit accompanied by better remuneration
- The **dissemination** and use of information from the system for decision-making.
- More emphasis on **electronic** than paper-based data reporting

Thank You!



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