

**DEVELOPMENT AND USE OF INDICATORS AND INFORMATION
RELATING TO MATERNAL AND CHILD HEALTH CARE
IN INDIA***

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ABSTRACT

Systematic collection and analysis of various demographic and socio-economic information and reliable service data are most vital for planning, monitoring and evaluation of health and family welfare programmes, particularly the maternal and child health (MCH) care programmes. Using the data and information, indicators are developed and these are the reflections of indirect/partial measures of a real situation; but each measured sequentially over a time indicates the direction and speed of change, and serves to compare different areas or groups of people at the same point of time. Indicators are required at different levels of health services for different purposes. At the central level, national indicators are used for planning, allocating resources and monitoring the progress. At the operational level, the programme managers need indicators for reviewing the progress of their activities over a given time in relation to the targets set and in comparison to other units or sections.

The main methods of information collection in the country are through Decennial Population Census, Civil Registration System, Sample Registration System, Survey of Causes of Death, National Sample Survey, Family Welfare Services Statistics, Integrated Health Management Information and Evaluation System, and other special surveys and studies. In this presentation, the modes, the scope and the limitations of data collection through these channels have been systematically reviewed. The concepts and requisites for developing and implementing an effective MIS, including the use of indicators have been defined.

For a proper appraisal of the indicators and other information used for the development and monitoring of maternal and child health care, an understanding of

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the background in which the system operates would be important. For this purpose, the national health policy (1982), the health and family welfare services organisation and infrastructure, the maternal and child health (MCH) services, the various sources and mechanisms for information collection, and the mechanisms for development, selection and use of appropriate sets of MCH indicators have been briefly reviewed and discussed.

NATIONAL HEALTH POLICY

Policy Directions

The constitution of India envisages the establishment of a new social order based on equality, freedom, justice and dignity of the individual. It aims at the elimination of poverty, ignorance and ill health, and directs the State to regard the raising of the level of nutrition and the standard of living of its people and improvement of public health as among its primary duties.

In spite of the impressive progress achieved in the promotion of the overall health status of our people and in the development of health infrastructure and other resources during the past three-and-a-half decades, the demographic and health pictures of the country still constitute a cause for serious and urgent concern. The annual rate of population growth is alarmingly high (2.25 per cent) and it adversely affects the health and quality of life of our people. Infant mortality and maternal mortality rates are still distressingly high; almost one-half of the total deaths in the country occur among children below the age of five years; infant mortality in 1982 was around 105 per 1000 live-births. The extent and severity of malnutrition and the incidence of various communicable and other preventable diseases continue to be very high. Only 31 per cent of the rural population has access to a potable water supply and 0.5 per cent enjoys basic sanitation. Poverty and ignorance are among other major contributory factors.

Reorientation and Reorganization of Health Services

India is committed to attaining the goal of "Health for All by the Year 2000 A.D." through the primary -health care approach. This would require a thorough overhauling of the existing approaches to the education and training of medical and other health personnel and reorganization of the existing health services infrastructure. Health care has to become a part of socio-economic development; it demands the coordinated efforts of all sectors closely related to health such as drugs and pharmaceuticals, agriculture and food production, rural development, education and social welfare housing water supply and sanitation, prevention of food adulteration, maintenance of prescribed standards in the manufacture and sale of drugs and the conservation of the environment. In order to prevent and reduce diseases and disability amongst children, and to bring down the existing high infant and child mortality, it is necessary to launch an organized nationwide immunization

programme, aimed at 100 per cent coverage of targeted population groups with vaccines against preventable and communicable diseases. The highest priority would be required to be devoted to efforts at launching programmes for the improvement of infant and child health as well as maternal health, including family planning, with a special focus on the less privileged sections of society. It is to be ensured that, progressively, all deliveries are conducted by competently trained persons so that complicated cases receive timely and expert attention, with a comprehensive health programme providing antenatal, intranatal and postnatal care. Organised school health services, well integrated with general preventive and curative services, would be required to be established.

Goals for Health and Family Welfare Programmes

The goals for health and family welfare programmes to be achieved in a progressive manner as envisaged in the national health policy are given in Table 1.

HEALTH AND FAMILY WELFARE SERVICES ORGANISATION AND INFRASTRUCTURE

Health Infrastructure Development

The basis for organization of health services in India through the primary health care approach was laid by the recommendations and guidance provided by the "Health Survey and Development Committee" (Bhore Committee) in 1946. The Community Development Programme was launched in October 1952 as the first integrated all-round rural development programme. It was proposed to establish one primary health centre (PHC) for each community development block. At that time, the operational responsibilities of the PHC were to cover medical care, control of communicable diseases, maternal and child health, nutrition, health education, school health, environmental sanitation and the collection of vital statistics. Each PHC had three sub centers, being looked after by a trained midwife for providing MCH services. Subsequently, over the past three-and-half decades the health services organization and infrastructure have undergone extensive changes and expansion in stages following review by a number of expert committees.

The multipurpose workers (MPW) scheme was introduced in 1974 with the objective of making the vertical un-purpose programmes into integrated multipurpose ones. The designations and job descriptions of the paramedical staff at the PHC and sub-centers have been modified.

The health guide (HG) scheme was introduced in 1977. The HGs are chosen/selected from the community and they work part time on a voluntary basis mainly for preventive and promotive health care and also for providing curative care for minor ailments and making referrals for problem cases. About 260,000 HGs have already been trained.

GOALS FOR HEALTH AND FAMILY WELFARE PROGRAMMES

s. No	Indicator	Current level 1984	Goals	
			1990	2000
1.	Infant mortality rate	105 (1982)	87 below	60
	Perinatal mortality	557 (1980)		30-35
2.	Crude death rate	11.9 (1982)	10.4	9.0
3.	Preschool child (1-5 yrs.) mortality	24 (1976-1977)	15-20	10
4.	Maternal mortality rate	4-5 (1976)	2-3 below	2
5.	Life expectancy at birth (years)			
	- male	54.1 (1980)	57.6	64
	- female	54.7 (1980)	57.1	64
6.	Babies with birth weight below 2500 g (%)	30	18	10
7.	Crude birth rate	33.8 (1982)	27.0	21.0
8.	Effective couple protection (%)	31.9 (March 1985)	42.0	60.0
9.	Net reproduction rate (NRR)	1.48 (1981)	1.17	1.00
10.	Growth rate (annual)	2.24 (1971 - 1981)	1.66	1.20
11.	Pregnant mothers receiving antenatal care (%)	40-50	60-75	100
12.	Deliveries by trained birth attendants (%)	30-35	80	100
13.	Immunization status (percentage coverage)			
	TT (for pregnant women)	20	100	100
	TT (for school-children)	20	100	100
	DPT (children below 3 years)	25	85	85
	Polio (infants)	5	70	85
	BCG (infants)	65	80	85
	DT (new school entrants 5-6 years)	20	85	85
	Typhoid (new school entrants 5-6 years)	2	85	85

The *Dais*, i.e., traditional birth attendants (TBAs) working in the villages, have been trained since 1976 for conducting safe and aseptic deliveries, in addition to providing MCH care including motivation for family planning. So far more than 520,000 *Dais* have been trained.

India is divided into 22 States and nine union territories. It has a total of 431 administrative districts, about 6,000 community development blocks and about 576,000 villages of varying sizes. The currently estimated population is about 746 million.

As mentioned earlier, over the past three decades considerable expansion of infrastructure facilities has occurred. According to the recent decisions of the Government of India, the following types of infrastructure facilities would be further developed by the end of the Seventh Five Year Plan, i.e. by 1990 (see Table 2).

Facilities at village level - For about 1000 population in a village, there will be at least one HG, preferably female and one trained *Dai*.

Facilities at sub centre level - For each sub centre, there will be one health worker (male) and one health worker (female) - the latter actually being the auxiliary nurse midwife (ANM). They are also to provide technical guidance and support to the village level functionaries. At present there is one sub centre for 10,000 or more population. To provide effective coverage, additional sub centers are to be established to achieve a target of one per 5000 (or less in difficult terrain) population by 1990.

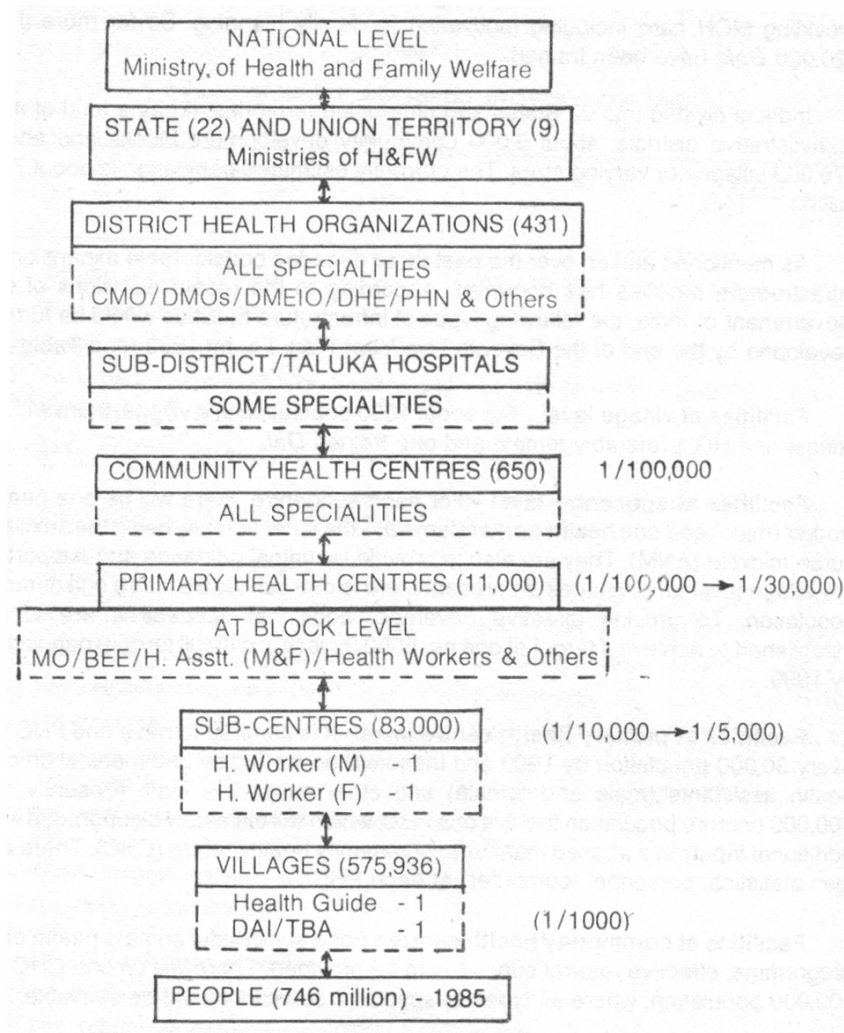
Facilities at primary health centre level - It is planned to have one PHC for every 30,000 population by 1990 and these will be staffed by one medical officer, health assistants (male and female) and other supportive staff. Presently, for 100,000 or more population there is one PHC, which will ultimately be upgraded with additional inputs in a phased manner to community health centre (CHC). There are also statistical personnel (computer) at each PHC.

Facilities at community health centre - For a successful primary health care programme, effective referral support is to be provided. There will be one CHC for 100,000 populations, where all types of specialist services would be available.

Facilities at Taluka hospitals - Some of the Taluka hospitals are being strengthened by providing a post-partum centre along with its infrastructure inputs for providing family planning and MCH services, including referral supports to peripheral centers.

Facilities at District level - District health centers are to be appropriately strengthened to cater to the need of the expanding rural health and family welfare programmes. The planning, implementation and monitoring of the programmes are

TABLE 2 HEALTH SYSTEM INFRASTRUCTURES



LEGEND

The health services organization in the country extending from the national level to a sub-centre level is diagrammatically represented in this table. Sub-centers constitute the most peripheral governmental health institutional facility. The village level health functionaries *i.e.* Health Guides and Trained Dais form the interface between the people and the governmental set up. The figures within the solid boxes represent the number of centers etc., whereas figures in parentheses outside the boxes on the right hand side represent the number of institutions in proportion to the population, which are currently available and which are aimed to be established by the year 1990. The type of the health and family welfare personnel that are available at different levels are given in the boxes marked by the dotted lines.

to be carried out at district level, in addition to satisfactorily attending to all referral cases from the periphery.

Facilities at the State level - The Ministry of Health and Family Welfare at the State level has the responsibility of planning, implementing, monitoring and evaluating the health and family welfare programmes in the State.

MATERNAL AND CHILD HEALTH SERVICES

In India children below six years and women in the reproductive age (15-44 years) comprise about 37 per cent of the total population. If all children below 15 years are taken into consideration, women and children would comprise two-thirds of the population. Maternal and child health (MCH) care services are of great significance. Realizing the close interrelationship between population control and improved health of mother and children, an integrated approach for both the programmes has been developed. The MCH programme aims at promoting the health of women in the reproductive age-group and at improving the survival and health status of pregnant women, mothers, infants, toddlers and children.

Maternal health care includes: (a) care of pregnant and nursing mothers during antenatal, natal and postnatal periods; and (b) provision of services for medical termination of pregnancy (MTP) when needed. Child health care includes: (a) care of newborn; (b) care of young children (0-5 year group); and (c) health care of school-age children.

Maternal and Neonatal Health Care

Pregnant and nursing women are a vulnerable segment of the population. Considering that 23 million births take place every year, there would be about 24 million pregnancies in a year. Although reduced considerably over the past 30 years, the maternal mortality rate is about four to five per thousand live-births, which is very high compared to that in developed and in some developing countries. Sepsis, hemorrhage, toxemia, illegal abortion and nutritional anemia are some of the important causes of maternal mortality. Realizing that induced abortions performed by unqualified persons under unhygienic conditions significantly increase maternal mortality and morbidity, abortion laws were liberalized and the Medical Termination of Pregnancy (MTP) Act was enacted in 1971. Facilities for MTP services are being increasingly provided and ultimately it has to cover up to all PHCs.

It is aimed to progressively increase registration of pregnant women for antenatal care to 100 per cent coverage, from the present level of 35 per cent. There should be at least four antenatal check-ups before delivery and high-risk cases should be referred to PHCs/community health centres. Presently, about 80 per cent of the deliveries in rural areas are being conducted at home by untrained persons. It is aimed to ensure that progressively almost all deliveries are conducted under

aseptic conditions by trained *Dais* or female MPWs. Complicated cases are to be promptly referred well in time to PHCs and other hospitals. Pregnant and nursing mothers should get prophylactic ally two to three doses of tetanus toxoid and iron and folic acid supplement for nutritional anemia. During postnatal check-ups, mothers are educated on breast-feeding, personal hygiene, proper diet and family planning.

It has been mentioned earlier that the infant mortality rate is still very high in India. It is further estimated that 50-60 per cent of infant mortality is caused by mortality during the neonatal period (0-28 days) and in particular the first week of life.

The mortality is caused or contributed to by several factors. These include poor maternal health during pregnancy, inadequate care for mothers at risk, poor infrastructural care, hardly any care of the newborn at birth and practically no facilities for newborn care from primary to tertiary level.

Low maternal weight and height, frequent pregnancies, maternal anaemia, chronic maternal diseases, pregnancy complications and non-immunisation of pregnant women have primarily resulted in the occurrence of low birth weight infants (premature and intrauterine growth retarded) and deaths due to tetanus neonatorum. Low weight at birth, particularly if associated with prematurity, is the major underlying factor resulting in neonatal or infant death.

Poor intranatal care and inappropriate care of the newborn at birth subsequently result in asphyxia, the prime birth injuries, pulmonary aspiration syndromes and bacterial infections. All these are preventable to a large extent.

For dealing with the problem of perinatal and neonatal mortality, the strategies being adopted are: (a) training of health personnel in perinatal and neonatal care; and (b) providing facilities for care of the newborn from the primary to tertiary levels.

The health guides, the trained *Dais* and female multipurpose workers will be responsible for the delivery of newborn care, adopting a high-risk approach. Proper facilities for referrals to the secondary and tertiary levels are to be developed and organized.

Care of the Young Child

For the health care of young children in the age group 0-5 years, *i.e.* preschool children, there would be two types of major intervention programmes: (a) prevention and treatment of malnutrition; and (b) reduction of mortality due to diarrhoea and respiratory infections. Malnutrition is widely prevalent in the country; the prevalence rates range between 15-30 percent for grade I, 30-50 percent for grade II and 0.8-3 per cent for grade III. Malnutrition predisposes children to infection, the morbidity rates being three times higher in malnourished children. Poor nutrition also indirectly contributes to child mortality. Its ill effects on permanent physical and mental stunting of young children are well established.

To reduce the prevalence rates of malnutrition in preschool children, the strategies would be:

- a. to train paramedical staff to detect cases of malnutrition and grade their severity;
- b. rehabilitation of grade I and II cases by supplementary feeding from home resources;
- c. provision of supplementary foods at sub centers] for cases of grade III severity;
- d. referral of cases of grade III malnutrition with accompanying diarrhea or infection to secondary level.

To reduce the mortality due to diarrhea and respiratory infections, the strategies would be:

- a. to train TBAs and multipurpose workers to recognize diarrhea and respiratory infections and administer primary care, and to judge which patients would need referral to higher levels of health services;
- b. to create facilities for secondary-level care of referred patients;
- c. to arrange for supply of drugs and supportive measures both at primary and secondary levels of care.

Health Care for School-age Children

Early detection of a potentially disabling condition can provide an opportunity for its rectification and thus preventing a situation resulting in handicaps. School-age children are prone to infections, injuries and nutritional deficiencies. The range and quantum of services provided to the 6-14-year-old age-group are inadequate. The multiplier effect of education to children is an important aspect of comprehensive health care for them. The strategies would be:

1. to train paramedical workers in the direction of visual and hearing defects and postural defects, and to administer primary care for common diseases like scabies, anemia, otorrhoea, vitamin deficiencies and malnutrition.
2. the MPWs will conduct screening examinations of school-going children at school under the supervision of a school-teacher. Children between the ages of 6-14 years who are not going to school will be examined during routine home visits;
3. complete immunizations appropriate for age.

SOURCES, MODE, SCOPE AND LIMITATION OF INFORMATION COLLECTION

Systematic collection and analysis of various demographic data and service statistics are most vital for planning, monitoring and evaluation of health and family welfare programmes and particularly the maternal and child health care programmes. In this section the main sources, the mode, the scope and the limitations of data collection through different channels will be discussed. The main sources of data collection in the country are:

- a. Decennial Population Census
- b. Civil Registration System
- c. Sample Registration System
- d. Survey of Causes of Death
- e. National Sample Survey
- f. Family welfare statistics compiled by the Evaluation and Intelligence Division of the Department of Family Welfare, Ministry of Health and Family Welfare, Government of India
- g. Integrated health information system operated by the Central Bureau of Health Intelligence, Ministry of Health and Family Welfare, Government of India
- h. Other special surveys and studies.

A. Decennial Population Census

The population census in India, which has operated since 1881, is a huge operation undertaken every 10 years. It provides detailed information on total population, including demographic and socio-economic characteristics. It also provides the basic data by which most rates may be computed, *i.e.* the denominator data, such as population number by age and sex that are needed for most of the demographic indicators and certain socio-economic indicators as well as for coverage and accessibility indicators.

In earlier census operations, no or very little information was collected on fertility. In the 1981 census, the scope was extended to collect information on all married women about age at marriage, number of male and female children surviving at present and number of male and female children ever born alive; and on currently married women about any child born alive during the past year. Although there is in general some under-enumeration and some other deficiencies,

nevertheless it provides useful information in regard to several aspects of maternal and child health, e.g. sex ratio, life expectancy for women, percentage distribution of parity, fertility indices, age structure of the population - particularly of the 0-5 age-group in rural and urban areas.

B. Civil Registration System

The Civil Registration System (CRS) in India is more than a century old. In order to improve the functioning of this system, a uniform law - "Registration of Births and Deaths Act" - was enacted in 1969 and it made the reporting and registration of births and deaths compulsory.

Registration of births and deaths is constantly generating statistical information at the local level and is being recorded by the local registrar for live-births, still-births and deaths. The "birth register" contains information on date of occurrence/registration,, place of birth, sex of the child, age and literacy of the mother, order of birth (live), religion, literacy and occupation of father, type of medical attention at birth, etc. The "death register" contains information on date of occurrence/registration, place of death; age, sex, marital status, religion and occupation of the deceased; cause of death, whether medically certified, kind of medical attention received, etc. Every registrar is required to send every month to the Chief Registrar at State Headquarters true copies of entries in the birth and death registers for the preceding month. The Chief Registrars of States in turn are required to send to the Registrar General of India monthly and annual returns. The annual returns provide the basis for the annual Vital Statistics Report of the Registrar General of India.

The CRS in India is most deficient in spite of its long history, because of incomplete coverage and under-registration. From the last available Vital Statistics Report covering up to 1979, it seems that not much improvement has occurred. Comparing the data on birth and death rates from the CRS with those from the Sample Registration System (SRS), it is observed that about 37.2 per cent of births and about 48.7 per cent of deaths were not registered during 1976 under the CRS. In some of the States the under-registration was very high, and this was particularly high in rural areas. Registration of infant deaths in the CRS is also grossly deficient. The recorded infant mortality rate in 1976 was only 49 per 1000 live-births as against 125 from SRS estimates. All India sex ratios of registered births and deaths during 1976 were 111.6 and 120.3 males respectively per 100 females. Apparently, there was higher registration for males. Furthermore, there is a long delay of about four years in bringing out yearly Vital Statistics Reports.

There are many reasons for such poor performance of the CRS. First, a number of different agencies are entrusted with registering the vital events at different levels. The different agencies are *panchayat*, police, health, revenue and others. The other causes of poor functioning of the CRS are lack of effective implementation of the 1969 Act; slackness of the executing agencies in the States; lack of knowledge of

the people, often with poor literacy, regarding the existence, location and benefits of this Act and their responsibilities thereof; about 80 per cent of the population living in rural areas with lack of communication and lack of easy accessibility to the registrar; lack of training of the registrars; and non-utilization of these data for any useful purpose of planning, monitoring and evaluation of programme performance.

Improvement of the Civil Registration System is an imperative need, as this alone can provide data at micro level required for planning and administrative purposes at relatively low cost. Various possible measures have been suggested and some steps are being taken in this direction. It would, however, take considerable time before the desired level of improvement in the system can be expected.

C. Sample Registration System (SRS)

Because of the deficiencies of the CRS and in order to obtain more reliable estimates of fertility and mortality, the Sample Registration System (SRS) was initiated by the office of the Registrar General in 1964-1965. The SRS has essentially three components:

- a. continuous enumeration of vital events pertaining to the normal resident population of the sample unit by a part-time enumerator;
- b. an independent half-yearly survey by the full-time supervisor;
- c. matching of events recorded by the enumerator and supervisor and then field verification of unmatched events.

The enumerator takes the help of the village priest, barber, village headman, midwife, etc., for obtaining information on all births and deaths in the sample unit. He contacts the informants at regular intervals and records the events on prescribed forms after contacting the households. The information collected in respect of births includes place and date of birth, whether live-birth or still-birth, whether single or multiple, sex; mother's residential status, age and religion, type of medical attention at delivery, etc. Information regarding deaths includes date and place of death, residential status, age, sex, marital status, religion and medical attention before death. At present the total number of sample units is 6022 covering a total population of over five million (with the urban sample covering 1.2 per cent of the total urban population and the rural sample covering 0.9 per cent of the total rural population).

The data collected regularly under the SRS provide estimates of various fertility and mortality indicators over the years, at state and national levels, and for rural and urban areas. These estimates include crude birth rate, Crude death rate, age-specific fertility rate, total fertility rate, gross reproduction rate, age- and sex-specific death rates, and infant mortality rates by age and sex. Such data provide the trend and pattern of fertility and mortality and also the fertility and mortality differentials

among states and between different types of urban and rural areas. Furthermore, information on the type of medical attention at birth or before death serves as an indicator of the extent of medical help, institutional and professional, available at national and state level and in urban and rural areas.

This system has been able to provide reasonably accurate estimates of births and deaths. A comparison of the SRS data with the estimates provided by some demographers using different approaches gives in general support to the reliability of the SRS estimates.

Special Surveys - A number of special surveys have also been carried out from time to time in SRS units along with regular half-yearly surveys. Two of the more relevant ones are mentioned below:

1. a fertility survey during 1972 in a sub-sample of SRS households in each unit with a view to studying the fertility differentials by socio-economic group;
2. a survey on infant and child mortality in 1979 to provide estimates of child and infant mortality, and to study the pattern and differentials of fertility and mortality by socio-economic group, and health care of infants and children.

The second survey was carried out in 3700 units of the SRS in 1979, which was declared the International Year of the Child. Some of the important findings of this study are highlighted below.

Infant Mortality - The infant mortality rate (IMR) in rural areas is more than in urban areas, where health facilities are more easily available. From the available data, it is noted that during 1970-1978 there was no decline in the infant mortality rate in rural areas (the recorded IMR in both the years was 136), whereas in urban areas it showed a significant decline from 90 to 71 per 1000 live-births. Mortality among female infants in rural areas is more than among male infants; this sex differential in infant mortality is not significant in urban areas. A possible explanation for this may be the preference for male children and the relative "neglect" of female offspring.

The neonatal mortality (deaths within the first four weeks after birth) In rural areas is almost double the postnatal mortality (deaths four weeks after birth and within the first year), which itself is higher in rural areas compared to urban areas. The difference between neonatal and postnatal mortality is not marked in urban areas. High neonatal and postnatal mortality in rural areas may be attributed to the lack of proper maternal and child health care, particularly antenatal care to the expectant mothers in the rural areas.

Child Mortality - The age-specific mortality in the age-group **0-4** years is more among females than that among males. The child mortality in rural areas is higher than that in urban areas, which may reflect the differentials in available medical and health facilities in urban and rural areas.

From the analysis/review of the data on infant mortality differentials, it is noted that both in rural and urban areas there is apparently a reduction in infant mortality with the increase in the level of education of women. The IMR is higher among working women compared to that among non-working women, both in rural and urban areas. The age at effective marriage also has an influence on infant mortality both in rural and urban areas. In the rural areas, the IMR for women married under the age of 18 years is 156 against 90 recorded for women married at 21 years or above. This clearly brings out the advantage of raising the age of marriage.

Both in rural and urban areas, the poorer section of the population has a higher IMR. With the availability of social amenities such as water supply, motor able roads, bus stand, railway station, primary school and medical facilities, which contribute to the progress of the community in the area, the infant mortality is reduced. The source of drinking water is an important variable which influences infant mortality. The IMR is lowest among populations using tap-water compared to those using well/pond/tank/river as a main source of drinking-water, either in rural or urban areas.

It is reported that among infants 58 per cent of deaths are not attended by a trained medical practitioner in rural areas, whereas the corresponding figure in urban areas is 29 per cent. The reduction in infant and child mortality is to a great extent dependent on the availability and accessibility of infrastructure facilities, especially in rural areas.

In rural areas, among the infants below one year, the major cause of death is tetanus, which account for 14 per cent of the total infant deaths. The second major cause of infant deaths is prematurity. Among one-year-old children, the major cause of death is typhoid followed by pneumonia.

D. Survey of Causes of Death

Due to the paucity of medical personnel in rural areas, medical certification of cause of death is not feasible. The office of the Registrar General (India) initiated a scheme called the Model Registration Scheme which is now known as the Survey of Causes of Death (Rural). The aim is to ascertain the causes of death in rural areas through lay reporting by utilization of the services of paramedical personnel available at primary health centers (PHCs). Since 1980, field supervision has been rationalized and the survey is being conducted in about 1200 PHCs, *i.e.* about one-fifth of the total PHCs.

Diseases peculiar to infancy accounted for 12.1 per cent of total deaths during 1981. This group comprised conditions of prematurity, respiratory infection of newborn, malnutrition, diarrhea of newborn and convulsions. The results show variations in the incidence of specific causes from state to state. Deaths due to prematurity accounted for 36.2 per cent of deaths in the group at the national level as compared to 33.5 per cent in 1980.

Maternal mortality or female deaths associated with pregnancy and child-birth are a matter of concern to demographers as well as public health authorities. Such deaths reported in the survey were 175 in 1981 compared to 209 in 1980. This cause accounted for 1 per cent of the total reported deaths. No single specific cause appears to be predominant, but bleeding during pregnancy and puerperium causes the largest proportion (23.4 per cent) of deaths in this cause group. No firm conclusions can be drawn due to the limitation of lay reporting methodology of the survey. The percentage of deaths due to abortion was found to be increasing from year to year. The same statement is true in the case of anemia and puerperal sepsis.

The medical officers in charge of PHCs have a major role in the survey to guide and supervise the work of the field workers. It has been recommended that independent field checks every month on the cause of death by the medical officer in at least two cases would provide an idea of the extent of discrepancy and would also help to improve field investigations. In 1981, medical officers had checked all over India 3577 events, which formed a fifth of the total reported deaths. These reveal a discrepancy in 4.8 per cent of cases. Furthermore, it may be mentioned that statistics presented in the report are representative of the health situation in the headquarters village of the PHCs where the survey is carried out, and do not represent the position for the entire area under the jurisdiction of the PHC. Field conditions in the remote villages may be different.

E. National Sample Survey

The National Sample Survey (NSS) collected information on births and deaths in its various rounds during the 1950s and 1960s. The estimates of the NSS have always been considered as under-estimates and the data could not be utilized for any planning or monitoring purposes.

F. Family Welfare Statistics*

These are organized and collected by the Evaluation and Intelligence Division of the Department of Family Welfare, Ministry of Health and Family Welfare, Government of India. For systematizing the arrangements for collecting information from the periphery and its compilation at district and state levels for forwarding to the central government in the form of periodic statistical reports, guidelines and manuals have been provided. Instructions on the maintenance of records at the peripheral units (such as family welfare planning centers, sub centers, contraceptive distribution centers and depots), primary health centers, the family planning bureaux at the city, district and state levels, and the compilation and submission of periodic returns by these agencies at different levels are given in these publications for uniform adoption. These records and returns are intended to indicate the results achieved by the different operational units, ultimately leading to an assessment of the total progress of the programme.

For proper functioning of this system, certain general principles have been enunciated:

- a. reporting should be based on the data and performance of the different operational units;
- b. the system should ensure a complete agreement between the statistics available at the State Family Planning Bureau and the Department of Family Planning, Central Ministry of Health and Family Welfare;
- c. the regular periodic returns should confine themselves to the collection of minimum essential data required for the purposes stated above. If any further details required, these may be collected on an *ad hoc* basis;
- d. the data at the national and state levels are built up from the information provided by the lower levels of administrative infrastructure. Therefore, it is essential to use a uniform set of reporting forms at all levels;
- e. the family planning and MCH statistics for the districts .which should form the basic administrative units, should be compiled routinely in the office of the State Family Planning Officer. The District Family Planning Bureau should maintain all lower level data, and these may be collected from them as and when necessary.

As mentioned earlier, information on various aspects of family planning and MCH is collected through the health and family welfare services infrastructure in rural and

urban areas. Information on family planning consists of the number of clients accepting different types of methods such as sterilization (male/female), intrauterine contraceptive devices, conventional contraceptive (equivalent users) and oral contraceptives (equivalent users). Information on MCH services consists of the progress made in the programmes of (a) immunization, (b) prophylaxis against nutritional anemia among women and children, (c) prophylaxis against blindness due to vitamin A deficiency, and (d) medical termination of pregnancy. The immunization programme includes tetanus toxoid immunization for expectant mothers, DPT immunization for children (0-2 years), DT immunization for other children, and immunization against poliomyelitis and typhoid.

The information collected from the sub centers, dispensaries, contraceptive distribution centers/depots, etc. is compiled every month at the level of the primary health centre with the assistance of statistical personnel (computer). This statistical report from the PHC is forwarded to the District Family Planning (Welfare) Bureau, which receives data/returns from both rural and urban centers under its jurisdiction and prepares a district report which is forwarded to the State Family Planning (Welfare) Bureau. The State Bureau, in its turn, compiles all the district reports to prepare the monthly state report which is forwarded to the centre. The state, in addition, prepares a half-yearly report and the annual report.

The Evaluation and Intelligence (E&I) Division of the Department of Family Welfare, Ministry of Health and Family Welfare, Government of India, compiles all the monthly reports received from the states and union territories and brings out monthly statements and quarterly bulletins on family welfare statistics. These reports provide information on the achievements *vis-a-vis* the relevant targets for the period in respect of the various family planning methods and different MCH activities at the all India level as well as state wise and union territory wise. The performance is also compared with that of the corresponding period of the previous year. As a measure of quality control of data collection, the E&I Division also carries out periodic sample checking by its own team of investigators. However, one of the important lacunae in the whole endeavor is the lack of field data for evaluation of impact on maternal and child health.

Over the years the E&I Division has gained considerable experience and has developed proper expertise. It publishes regularly a year book on the family welfare programme in India, which -contains, in addition to detailed service statistics, information on characteristics of vasectomy, tubectomy and IUD acceptors by number of living children, mean age at acceptance; impact of the family planning programme in terms of birth averted over the years and the achievements under special schemes in operation. This also presents data obtained from other sources on related demographic and socio-economic characteristics of the population in India to facilitate their easy availability to programme administrators, policy-makers, teachers, trainers and research workers. The related socio-economic statistics include information on national income and per capita income over the past decade; net state domestic product of different states and union territories over the past decade; employment of women in the organized sector in different states; work participation rates for main workers by age and sex (1971 and 1981); school enrolment by level and sex; progress of enrolment for elementary education in India; percentage of male and female literates to total population and changes in literacy rates by age and sex in rural and urban areas in different states; and the net availability of cereals and pulses. This may be considered as an attempt towards promoting the concept of intersects oral linkages.

Q. Management Information and Evaluation System

Over the past few years, the Central Bureau of Health Intelligence (CBHI) in the Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, has endeavoured to organise and establish an integrated management information and evaluation system (MIES) for the entire health and family welfare programme in the country. According to its approach, appropriate records (11) are to be maintained at the subcentre level for baseline information and different service activities in primary health care. Based on these records, the health workers (male and female) are to compile monthly reports under the following subheadings: (1) Communicable diseases, (2) MCH, (3) Immunisation, (4) Prophylaxis against nutritional anaemia, (5) Family planning, (6) Health education activities, (7) Vital statistics, (8) Environmental sanitation, (9) Subcentre clinics, (10)

Treatment of minor ailments, (11) Home visits, and (12) Other activities. The reports from the sub centers are to be scrutinized and compiled by the health assistants (supervisors) at the PHC. On the basis of the reports of the supervisors, the statistician (computer) at the PHC is to compile the PHC report. This report is to be scrutinized and finalized by the medical officer at the PHC, who should be able to utilize the information for local monitoring purposes during monthly meetings and on his field visits.

The monthly PHC reports are sent to the district medical/health officer, and all these reports are to be scrutinized and compiled to prepare a district monthly report which is to be sent to CBHI, New Delhi, by the 20th of the following month. The CBHI is to collect all these reports and send them to the National Information Centre, (New Delhi) for computerization of data and bringing out the output tables.

The health worker's report will include among others the following information related to MCH care and other related activities:

MCH

- a. Number of antenatal cases (ANCs) registered
- b. Number of ANCs on hand at the end of the month
- c. ANCs followed up - cases per visits
- d. Number of ANCs referred to PHC doctors
- e. Deliveries
 - i. Result of delivery - live-birth/still-birth
 - ii. Domiciliary deliveries conducted by:
 - FHW assisted by PHC staff/trained Da"/untrained *Dai* or relatives
 - Institutional deliveries at PHC/hospital, etc.
 - iii. Total deliveries
- f. Number of abortion cases attended/referred
- g. Number of cases referred for MTP
- h. Number of postnatal cases registered
- i. Number of children (0-6 years) registered - new/follow-up/on hand

Immunization

- a. ANC's - TT (first/second/booster doses)
- b. Infants and young children - DPT/DT/polio/BCG
- c. School immunization (6+years) - typhoid, TT (first and second doses)

Prophylaxis Against Nutritional Anemia

- a. Iron and folic acid beneficiaries - ANC's and PNC's/FP cases/children
- b. Vitamin A beneficiaries (children 1 -5 years - first and second doses)

Family Planning

- a. New FP acceptors in the area - vasectomy/tubectomy/IUD/MTP
- b. Number of oral pill cycles distributed
- c. Number of condom pieces and other conventional contraceptives distributed.
- d. Number of eligible couples contacted

Health Education Activities

- a. Number of group meetings
- b. Others (specify)

Vital Statistics

- a. Births - male/female/total
- b. Deaths - infant/maternal/others/total

The PHC report will contain in addition information on the incidence of and mortality due to the following principal diseases: malaria, diphtheria, diarrheal diseases including gastroenteritis, dysentery, encephalitis, enteric fever, guinea worm, viral hepatitis, poliomyelitis, animal bite, tetanus tuberculosis, whooping-cough, measles, skin diseases, leprosy, snake bite, all other diseases, other fevers with rash.

The proposed MIES is still in the preliminary exploratory and preparatory phase of introduction. Various indicators and output tables are yet to be developed, operational problems and constraints are to be overcome, duplication of efforts are

to be avoided, personnel are to be trained and proper managerial capabilities are to be developed at various levels.

Some Important Requisites for MIS Development

For successful development and use of a management information system (MIS), there should be a clear understanding about the concepts, the components, its scope and use and the systematic steps required for its designing, implementation and maintenance.

Data, information and indicators: Data consist of raw facts and figures, which as such are not used in decision making. On the other hand, information is the aggregate of classified and interpreted data or facts organised into knowledge or intelligence and are used in decision making. Indicators, which are developed basing on data and information, are tools used to reflect a situation or to indicate the direction and speed of change in the situation.

MIS: Management is a process to ensure effective and purposeful use of resources - man, materials and money, for achieving a predetermined objective. Management information system is meant for optimizing the output of the organization by connecting the sub-systems through the medium of information exchange. It is a technique for providing prompt feedbacks to appropriate levels for taking timely decisions with a view to increase efficiency and effectiveness for achieving the goal.

Use of MIS: The MIS could be used in a variety of ways such as to find relevance of the activities in terms of the objectives and strategies; to assess the adequacy of services; to monitor progress; to assess efficiency and effectiveness of the programmes; to assess the impact; to make decisions; to take corrective measures; to evaluate alternative approaches; and to improve programme performance by ensuring maximum utilization of the existing resources and utilization of unused resources.

Designing of MIS: For designing an effective MIS, the following systematic steps may be taken:

- 1 . Identification of the programmes and their objectives.
- 2 . Scrutinizing existing returns and reports.
3. Selection of indicators.
- 4 . Fixing of targets.
- 5 . Determination of the source of data or information and their flow.

- 6 . Decision regarding the systems of analysis and their presentation.
- 7 . Decision regarding the methodology of review and procedures for feedback.
- 8 . Orientation and training of staff.
9. Developing systems for verification of data.
10. To ensure quality control measures.

Development and implementation of MIS: Development of MIS for the health and family welfare programmes has to be gradual, by selecting a few programmes and a few critical indicators in the beginning and then subsequently expanding the scope to many more indicators.

Successful implementation of the MIS depends not only upon a good design, but also on many other factors such as (a) full commitment of the management, (b) sustained efforts, (c) acceptance and cooperation of the users, (d) sincere and hard work of intelligent staff officer, (e) proper identification of information needs, and (f) thoroughness in implementation of the system.

H. Other Special Surveys and Studies

In an earlier section, special studies carried out in the simple units of the SRS have been mentioned. Baseline and follow-up surveys are being carried out in area (development) project districts in different states by various organizations. Evaluation studies on different aspects of family planning and MCH programmes, training of traditional birth attendants, village health guides scheme, etc., have been carried out by our Institute. The training needs of different categories of health and family welfare personnel in the field of "communication" and "management" have been systematically studied by us in collaboration with other institutions. Many other studies have been carried out by some other governmental and non-governmental agencies. Relevant findings/information can be/have been used for planning, implementation, evaluation, reorientation and reorganization of health and family welfare programmes.

INDICATORS FOR MATERNAL AND CHILD HEALTH PROGRAMME

Monitoring of implementation and evaluation of impact take place at two levels: (i) at the policy level, and (ii) at managerial and technical level. At the policy level, there is a need to know whether maternal and child health status is improving and whether any revision in the policy, strategy and plan of action is required. At the managerial and technical level, it would be important to know whether programmes are being properly formulated, and whether corresponding services and activities are being properly designed. There is also a need to know whether health and related social and economic services are being properly organized. Therefore, there

would be the need for two types of indicators: (i) those measuring the health status and the related quality of life, and (ii) those measuring the provision of health care and other related services. The latter aspects may be concerned, on one hand, with the level of availability and the extent of utilization of different categories of programme personnel, materials, equipment, etc., and, on the other, with the achievement of coverage, targets, etc., and the quality of services being rendered. In both cases, the indicators should be highly selective so that their use becomes manageable and meaningful.

Indicators are merely reflections of a real thing or situation. They are indirect or partial measures of a complex situation but each measured sequentially over a time indicates the direction and speed of change and serves to compare different areas or groups of people at the same point of time. It may be pointed out that indicators are not synonymous with targets but can serve as measures of the extent to which those targets are being reached.

As countries develop socially and economically, the indicators of survival become less relevant, and other indicators of the quality of life become more important. In other words, social as well as health indicators will have to be used. On one hand, there will be indicators of growth and development, of nutritional status and specific morbidity rates, particularly in children. On the other hand, indicators related to social factors and conditions will include indicators of educational and cultural levels, status of women, of housing and environmental conditions, etc. A number of other relevant social indicators also need to be developed, *e.g.* those assessing the degree of community self-determination, social and economic productivity and narrowing of differentials in the distribution of health resources.

Whatever indicators are selected, they have to be closely related to the means available for data collection and processing; this may include lay reporting and should be gathered as an intrinsic part of health care delivery. The routine health services data are an essential source of information on disease-specific morbidity and mortality and on certain measurements of children as well as on various activities carried out by the health services. These are cheap and easy to collect but are often incomplete and inaccurate for various reasons. Furthermore, the record system of health services is often kept for administrative purposes rather than for monitoring, which means that data on denominators are not available and population at risk or population to be covered by a particular service is not mentioned.

In order to monitor progress towards health, not only the baseline levels are to be established but also the changes from these levels over a time must be measured. The need to measure change rather than the absolute level puts a greater demand upon accuracy of data sources. Another problem is the need for indicators to be applied not only as the national average but also in disaggregates fashion to certain geographical areas, social groups or age-groups, etc.

Considering the information requirements and the practical problems involved in determining and using indicators, selectivity must be observed. More will be gained by selecting a small number of relevant indicators for which the country can obtain information within the resources than by aiming at comprehensiveness. One has to choose indicators which are most relevant to the health and socio-economic situation and which are feasible to collect and analyze. Finally, selection of indicators should be guided by the uses to which these are to be put.

Keeping in view the information provided and observations made in the foregoing sections and paragraphs, a set of possible indicators relating to various aspects of maternal and child health care is suggested below. The selection, development and use of various components at different levels will be determined by various considerations already discussed. These could be used for macro- and micro-planning and monitoring of implementation at different levels, and for evaluation of the programmes. In these regards, further practical guidance is provided in the subsequent sections dealing with the mechanisms for developing indicators, and the organizational and functional issues and the criteria for selection of indicators.

A. Indicators of Health Status

Child Health Status

1. Birth weight - (a) Percentage born below 2500 g
(b) Mean body weight
2. Anthropometric measurements (age 0-5 years)
 - (a) Serial weighing
Percentage in different grades of malnourished
 - (b) Mid-arm circumference
3. (a) Infant mortality by sex
(b) Proportion of infant deaths by:
 - (i) Early neonatal (within first week) period
 - (ii) Neonatal (within four weeks) period
 - (iii) Post-natal period
4. Child mortality by sex
5. Proportionate mortality under five years of age
6. Morbidity - prevalence, incidence, and case fatality

7. Prevalence of disability and its main causes:

- (a) Congenital defects
- (c) Acquired disability

Maternal Health Status

1. Sex ratio at age 0, 0-5 and 15-44 years
2. Life expectancy at birth for women
3. Maternal mortality
4. Percentage distribution of women by birth order
5. Proportion of improvident maternity
6. Fertility indices
7. Crude birth rate and net reproduction rate
8. Pregnancy-specific diseases/complications prevalence - toxemia, hydramnios, post-partum hemorrhage, eclampsia
9. Incidence of sexually transmitted diseases
10. Percentage of premature deliveries
11. Prevalence of puerperal sepsis

B. MCH Service Indicators

Prenatal Care

1. Number and percentage of total expectant mothers registered as pregnant
2. Number and percentage of expectant mothers receiving antenatal care
3. Number and percentage of mothers visited at least three times by the trained staff
4. Number and percentage of mothers registered before the twelfth week of pregnancy.
5. Number and percentage of mothers who received two doses of TT immunization

- 6 . Number and percentage of mothers who received iron and folic acid tablets for 100 days during pregnancy
- 7 . Number and percentage of mothers who received supplementary nutrition
- 8 . Number and percentage of expectant mothers identified as high risk
- 9 . Number and percentage of high-risk mothers referred to PHC and district hospitals
- 10 . Number and percentage of mothers attended for ANC at PHC
- 11 . Number and percentage of deliveries terminated as abortions and still-births

Natal and Postnatal Care

- 1 . Number and percentage of deliveries conducted in institutions
- 2 . Number and percentage of deliveries conducted at home by trained health personnel
- 3 . Number and percentage of deliveries conducted at home by trained *Dais*
- 4 . Number and percentage of deliveries conducted by untrained *Dais* and other untrained persons
- 5 . Number and percentage of mothers delivered pre-term
- 6 . Number and percentage of mothers suffering from puerperal sepsis
- 7 . Number and percentage of mothers delivered using prepacked delivery kit
- 8 . Number and percentage of mothers given postnatal check-up
- 9 . Number and percentage of mothers who adopted a FP method after delivery
- 10 . Number and percentage of mothers lactating after six months
- 11 . Number and percentage of mothers receiving supplementary nutrition during pregnancy or after delivery

Infant Care

- 1 . Number and percentage of children receiving complete immunization
- 2 . Number and percentage of children receiving measles vaccination

3. Number and percentage of children receiving one to 10 doses of vitamin A
4. Number and percentage of children receiving polio vaccination
5. Number and percentage referred to PHC/district hospitals
6. Number and percentage receiving nutrition therapy
7. Number and percentage recovered from grade III malnutrition
8. Number and percentage of health guides using oral rehydration service
9. Number and percentage of health workers/health guides having availability of ORS packets
10. Number of ORS packets distributed at each sub centre per health worker

Child Care

1. Number and percentage of children immunized by type of immunization for specific age-groups
2. Number and percentage of children with grades I, II and III malnutrition rehabilitated with supplementary feeding from home resources/at sub centre
3. Number and percentage of children with grade III malnutrition with diarrhea/infection referred for secondary care
4. Number and percentage of children provided primary care for diarrhea/respiratory infection
5. Number and percentage of children referred for secondary care for diarrhea/respiratory infection

Family Planning

1. Number and percentage of couple using contraceptives by each method (accepting during the year and percentage covered so far)
2. Number and percentage of women having two or less children using contraceptives
3. Distribution of FP acceptors by number of living children
4. Percentage of HWs trained for Copper-T insertion and for prescribing oral pills

- 5 . Percentage of HGs trained for prescribing oral pills
- 6 . Percentage of subcentres equipped with Copper-T insertion facilities

B. Educational Programme Indicators

Health and Nutrition Education

- 1 . Number of orientation training camps (OTCs) held for females only
- 2 . Geographical distribution of OTCs
- 3 . Number of Mahila Mandals registered

C. Workers Performance Indicators

Health Workers' Performance

- 1 . Percentage of total population not covered by the health worker (HW)
- 2 . Number of households visited by the HW
- 3 . Number and percentage of expectant mothers registered per subcentre

MECHANISMS FOR DEVELOPING INDICATORS

- 1 . As mentioned earlier, the indicators are required at different levels of health services for different purposes. At central level, the national indicators are used for planning, allocating resources and monitoring the progress. At the operational level, the programme managers need indicators for reviewing the progress of their activities over a given time in relation to the targets set and in comparison with other Units or sections.
- 2 . For development of national indicators, there should be a dialogue between the central administrators and the programme managers at the operational level. If practicable indicators are to be developed and these are to be used properly, the programme or operational managers must be involved, and they should feel that the indicators are actually meant for their use and not an irrelevant thrust upon them.
- 3 . A national committee or forum should be established with balanced representation by members from the centre and operational levels at the periphery. For constructive dialogue the organisation and structuring of the meetings should be as far as possible free of traditional constraints of hierarchy in position, and the issues are to be resolved on practical considerations rather than on grounds of political or theoretical desirability.

4. The forum should firstly review the priority of health services programmes, the objectives of each programme, as related to service provision, problem reduction and the information being currently collected. Then they should decide on the minimum indicators required and the minimum data needed to provide them.
5. After identification of the data items, these should be carefully defined and clarified otherwise these may lead to confusion at the periphery and production of poor quality data. Definitions and classifications should be simple and easily understood by the health personnel responsible for data collection.
6. Information requirements and indicators should be constantly reviewed by the national forum or committee, since the indicators may need change once the programme become more effective.

ORGANISATIONAL AND FUNCTIONAL ISSUES FOR SELECTION OF INDICATORS

In the selection of indicators, usually, three types of obstacles are encountered:

1. Different levels of the types of personnel who are involved in the identification of indicators, such as policy-makers or high level officials, information specialists, and middle level management and health administrators, have different perspectives on the selection and use of information and indicators because of their diverse background and functions. Sometimes, a politically appointed or motivated official may be mainly concerned with demonstrating 'positive results' within the short span of his or her appointment, and may put information into disrepute by using it incorrectly for justifying the political decision. An information specialist may be unduly biased towards comprehensiveness, disregarding selectivity and utility. On the other hand, an operational manager when asked to develop and use indicators of effectiveness or quality of care, may be unwilling and may thus react with inertia or antagonism.
2. The second major obstacle is the failure of recognition of the value of information particularly by those who are most involved with data collection, where this exercise is considered unconnected with the operational work. Often this is considered as an additional workload, and particularly because of the lack of demonstrable evidence that the information they have collected has any value to them or anyone else.
3. The third major obstacle may arise from some of the vertical programmes. Although such programmes are managed vertically at a more central level, the services are usually integrated at the point of delivery. There is competing demands by the individual vertical elements that information be

collected by the same health workers. Each programme requires, on a routine basis, a certain amount of detailed information. Although there is a common core of information necessary for all programmes, the workers may end up providing the same information to different programme managers on different forms and at different times, unless information collection and management is properly coordinated.

The goal should be full coordination of information collection and analysis, if not integration. This process inevitably meets the resistance of programme managers and this must be approached cautiously ensuring at all stages that the managers and their staff are not deprived of necessary information in the name of integration.

At the same time, it must be recognized that some vertical programmes have evolved for their objectives and an effective functioning of information system. Such experiences should not be rejected out of hand but should be built upon in strengthening the management and information requirements of all elements in the programme.

For the resolution of these problems or obstacles, the following steps may be useful:

- a. Training and sensitizing of health personnel at all levels in the function and importance of the value of information and indicators in their own work.
- b. Providing opportunities for open discussion between health personnel at different levels who are concerned with information.
- c. To ensure that the information collected by the workers at a given level has real and demonstrable relevance to their work, and these are not just used for assessing his or her performance, but are used in identifying problems in the care or management and is actually used for supporting the work.
- d. The members of the staff should be involved in the discussion, selection and implementation of indicators.
- e. An open dialogue among informed programme managers is very helpful. It is necessary to identify a core set of data common to all programmes, and to identify the minimum set of programme area data to be collected to deal with the management of each programme.

For detailed examination of the programme operations or for the collection of some additional data not available from routine system and for *ad hoc* or periodic surveys to improve information support, there should be a right climate and existence of an appropriately motivated change agent.

CRITERIA FOR SELECTION OF INDICATORS

As a general rule, the indicator should be designed to meet the specific needs of the programme at a level to which it applies. In selecting the indicators, the following criteria may be considered. The indicators should be: (a) relevant, (b) valid, (c) sensitive, (d) specific, (e) simple, (f) well-defined, (g).practicable, (h) changeable, and (i) few.

- a. An indicator must reflect an aspect of the operation of a programme which is of practical relevance to the user. To ensure this, involvement of operational managers in the development of indicators is of utmost importance.
- b. The indicator should be valid *i.e.* it should show what it is meant to show. For ensuring the validity of indicators it is very important to decide exactly what question is to be answered.
- c. To make the indicators sensitive, the significance of the magnitude of the changes that are likely to occur should be carefully considered. Where the rate of maternal mortality is still high, a change in maternal mortality rate is an excellent indicator for maternal care, but it would not provide any insight in a situation where maternal mortality is already low.
- d. In framing the indicators specificity of information should be carefully considered. In determining programme effectiveness of a particular intervention, a pure cause and effect relationship can rarely be demonstrated as the attributable change may have other explanations. However, a change in the distribution of pregnant women by age and parity is a useful indicator of the impact of family planning services and care; but other indicators may be less clear.
- e. The indicator should be simple to collect, thus avoiding mistakes, and 'simple to understand giving their messages clearly. These should be selected taking into account the technical capacity of those who are to collect and use these. A simple indicator of lower specificity and sensitivity may be preferable to a complex indicator of a high specificity and sensitivity requiring professional skill in its compilation and interpretation.
- f. An indicator must be defined in a concrete and completely understood terms and should be meaningful for operational purposes.
- g. The indicator should be practicable and the data should be available at right time which can be appropriately processed. The capacity of the system to collect data of reasonable quality must be considered. The use of birth weight as an indicator of maternal health may be valid, specific and sensitive, but if it is not possible to collect accurate and complete data on all infants, it is of no use. Under the circumstances two things are required - (a)

to improve the quality and coverage of birth weight measurement, and its recording, and (b) to develop best possible collectable proxy for birth weight.

The indicators of service activities should arise from the activities themselves. However, if these cannot be obtained through routine system, the possibility of other data sources such as *ad hoc* surveys should be considered. It may be noted that indicators for use at different levels are likely to vary in form, and those selected for use at one level may be inappropriate at other levels. The cost and time for the collection and analysis of data must be given prime consideration.

- h. The indicators must be appropriate to the system they serve. As the health situation, health care practice and the priorities of the community may change, or as the capacity of the system to collect and handling of the data improves, the indicators may lose their relevance or sensitivity and other indicators may become feasible or more suitable. There should be in-built mechanism within the health system for initiating discussions on changes when required.

The number of indicators should be kept to the minimum required, for informing the manager sufficiently to carry out his work. If there are more indicators they are likely to be less accurate and incomplete and hence will be less utilized. A few meaningful indicators will serve the programme manager and policy-makers better than a large number of less easily understood statistics.

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Lkkjk'k

स्वास्थ्य परिवार कल्याण कार्यक्रमों, विशेषरूप से मातृ-शिशु स्वास्थ्य देखरेख कार्यक्रमों की योजना बनाने प्रबोधन तथा मूल्यांकन करने के लिए अत्यन्त महत्वपूर्ण है कि जनांकिकीय तथा सामाजिक-आर्थिक पक्षों संबंधी उपलब्ध सूचनाओं तथा सर्विस आंकड़ों का संचयन एवं विश्लेषण प्रणालीपूर्ण ढंग से किया गया हो। उपलब्ध आंकड़ों तथा सूचनाओं के प्रयोग के आधार पर संकेतकों (इन्डिकेटरस) का विकास किया जाता है। ये संकेतक वास्तविक स्थिति का मान ज्ञात करने के लिए अप्रत्यक्ष/ आंशिक द्योतक होते हैं, किन्तु समयानुक्रम के अनुसार किया गया प्रत्येक मान परिवर्तन की दिशा तथा गति का सूचक होता है तथा एक ही काल बिन्दु पर विभिन्न क्षेत्रों अथवा जनसमूहों की

तुलना में सहायक होता है। स्वास्थ्य सेवाओं के विभिन्न स्तरों पर अलग-अलग उद्देश्यों के लिए इन संकेतकों की आवश्यकता होती है। केन्द्रीय स्तर पर राष्ट्रीय संकेतकों का उपयोग योजना तैयार करने, स्रोतों का निर्धारण करने तथा प्रगति का प्रबोधन करने के लिए किया जाता है। कार्यसंचालन स्तर पर, कार्यक्रम-प्रबन्धकों को संकेतकों की आवश्यकता निर्धारित लक्ष्यों के संदर्भ में (किसी निर्धारित अवधि के पश्चात) अपनी गतिविधियों की प्रगति की समीक्षा करने तथा दूसरे एककों अथवा अनुभागों के साथ अपनी प्रगति की तुलना करने के लिए होती है।

देश में सूचनाएं एकत्र करने के प्रमुख तरीके हैं, दसवर्षीय जनगणना, सिविल रजिस्ट्रेशन प्रणाली, सैम्पल रजिस्ट्रेशन प्रणाली, मृत्यु कारणों का सर्वेक्षण, राष्ट्रीय सैम्पल सर्वेक्षण, परिवार कल्याण सेवा सांख्यिकी, समन्वित स्वास्थ्य प्रबन्ध सूचना एवं मूल्यांकन प्रणाली, तथा अन्य विशेष सर्वेक्षण एवं अध्ययन। प्रस्तुत लेख में इन चैनलों के माध्यम से आंकड़ा संचयन की पद्धति, स्कोप तथा परिसीमाओं की प्रणालीपूर्ण ढंग से समीक्षा की गई है। इस लेख में प्रबन्धकीय सूचना प्रणाली की अवधारणा, इसके विकास तथा प्रभावशाली ढंग से क्रियान्वयन के लिए आवश्यक बातों तथा इसके साथ-साथ संकेतकों के प्रयोग के बारे में विभिन्न पक्षों को स्पष्ट किया गया है।

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**TRADITIONAL PRACTITIONERS OF MEDICINE IN A TRIBAL AREA:
THEIR INTEGRATION WITH THE EXISTING HEALTH CARE
SYSTEM**

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ABSTRACT

The expectations about what the primary health centres (PHCs) are supposed to achieve are indeed quite high. But their actual performance is quite dismal; and this is even more so in tribal areas. This study attempts to show how this situation can be improved by utilizing the existing network of bhagats and dais in these areas.

The primary health centre's (PHCs) are expected to perform a number of functions by way of curative and preventive care. Ideally, they are supposed to attend to curative medical relief, maternal and child health, fertility control, control of communicable diseases, environmental sanitation and health education. The expectations about what the primary health centres are supposed to achieve are quite high. But their actual performance is quite dismal; and this is even more so in the tribal areas.

The data, collected from the PHCs, show that the patient-flow is very low compared to PHCs in more developed (non-tribal) parts of the same district, viz. Nasik in Maharashtra¹. Similarly, we find that hardly 15 per cent of the registered new infants had been immunized against Diphtheria, Polio, etc. Only 20 per cent of the registered pre-school children had been similarly immunized. Only about 20 per cent of the expectant mothers out of the total registered pre-natal cases had been given tetanus toxoid².

Similarly, our household data shows that in some of the surveyed villages the wells had not been purified even once during the year. There was an increase in the incidence of Malaria. Many cases of leprosy hitherto untreated were also detected in the course of the survey³.

These stray examples and the perceptions of the tribals, recorded in the survey forms, show that preventive as well as curative measures have not made much of headway in the tribal areas. There are various reasons for these, as enumerated below:

1. Physical inaccessibility is one of the major constraints for any service to reach the tribal hamlets. The tribals also do not often go to the PHC or the sub centers.

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2. Lack of commitment on the part of the functionaries is another constraint. Postings to tribal areas are considered "punishment postings". The problem of physical inaccessibility gets multiplied when the functionaries lack commitment. Poor housing, lack of safety, lack of educational facilities for children etc. also aggravate the problem of lack of commitment.
3. Due to overwork, the doctor at PHC often does not pay any attention to preventive care, which is mostly looked after by his subordinates. Hence, prevention of diseases by environmental sanitation and nutritional education, is hardly emphasized. This in turn increases the load on curative care and thus a vicious circle is established.

THE BHAGATS

In tribal areas, the traditional practitioners of medicine are a blend of witchdoctors and herbalists. The dependence on these traditional practitioners is further strengthened by inaccessibility, which is physical as well as economic.

Eleven case studies of the Bhagats were conducted. From the analysis of the data, the following observations can be made⁴.

1. The bhagats treat diseases based on physiological causes, as well as those based on supernatural causes.
2. Payment is mostly in kind, and it ranges from one bottle of liquor to several bottles of liquor, goats, chicken, coconuts, etc.
3. The bhagats use a number of locally available medicines, which consist of herbs, roots and other flora and fauna. These medicines are often quite effective for most of the minor ailments.
4. The bhagats were often engaged in other occupations as well. The Table 1 shows that only one of them depended on the practice of medicine exclusively.

TABLE 1
MAIN OCCUPATION OF THE BHAGATS

Occupation	No. of Bhagats
Cultivators	2
Agricultural Labourers	4
Both Cultivators and Agricultural Labourers	4
No other occupation	1

5. The bhagats are not of "older" generations, as one would have expected. A majority of them were below 40 years of age (six out of eleven). Two of them were in their twenties. None of them was above sixty.

Among the six persons who were below 40 years of age, five belonged to families which had a tradition of practice. Among those who were above forty, a majority, *i.e.* four out of five, did not belong to such families but had learnt the skill from other bhagats⁶.

THE DAIS

The dais still continue to conduct most of the deliveries and auxiliary nurse midwives (ANMs) are thus left with mostly the preventive care for mothers and infants.

The dai-training programme seems to have had some success. Four out of a total of eleven in the sample had received training. The trained dais, in our sample, have definitely shown a positive attitude towards functionaries of the primary health centre. The untrained dais continue to conduct deliveries under unhygienic conditions and with primitive instruments. This has been one of the major reasons for high infant mortality due to tetanus.

The ANMs rarely visit the villages on account of physical inaccessibility⁷. Only one of the dais in the sample complained that their practice had suffered because of the ANMs. It goes without saying that the dais should be considered as a resource to be utilized.

Each village has at least one dai and these dais work in the fields, as in the case of the bhagats, either as cultivators or as agricultural laborers. It is, therefore, advisable that the dais should be absorbed in the regular health care system as community health volunteers (CHVs).

POSSIBILITY OF INTEGRATION

The possibility of such integration is quite bright. The dais who have already undergone training have a positive attitude towards modern medicine. They could be further trained and incorporated into the structure to fulfill more functions than mere delivery work.

Among the untrained dais, there was only one who didn't want any training. Incidentally she happened to be very old (70 years) as well. If these traditional birth-attendants are thus made female community health volunteers with some more training, they would be in a position to positively contribute towards preventive health care as well as for treating minor illnesses in the community.

The same applies for bhagats as well. When asked whether they would like to receive training, six of the bhagats (out of eleven) said that they would undergo training if it was given free by the government. Only one of them was reluctant to undergo any such training. The remaining four bhagats had no clear answer to the above question.

Thus, it is possible to incorporate the bhagats as male community health workers, after imparting them the necessary training. They would prove themselves an asset to the regular health care delivery system, especially because of the social standing they presently enjoy in the community. In our household survey, we had found that the bhagats were rated first, in the order of preference, for treatment of illnesses. The average expenditure of the 311 households of the sample on bhagats worked out to Rs.47.53 per year⁸.

From the foregoing discussion one can safely conclude that the traditional medical practitioners, like bhagats and dais, are bound to co-exist with modern health care services, in the transitional period of any society. They could be incorporated into the system to make medicine more accessible to people. With training, which they are willing to undergo, they will be in a position to dispense medical care for minor ailments more effectively and can also help in promoting preventive care.

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प्राथमिक स्वास्थ्य केन्द्रों के सम्बन्ध में अपेक्षाएं वास्तव में काफी ऊंची हैं। परन्तु उनका वास्तविक प्रदर्शन काफी निराशाजनक है और जनजातीय क्षेत्रों में ऐसा अधिक है। इस अध्ययन में यह दिखाने का प्रयत्न किया गया है कि इन क्षेत्रों में उपलब्ध भगतों और दाइयों का उपयोग कर किस तरह से स्थिति को अच्छा बनाया जा सकता है।

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**ECONOMIC DETERMINANTS OF CHILD FEEDING HYGIENE:
HEALTH EDUCATION AS A WEAPON AGAINST UNHYGIENIC
FEEDING PRACTICES**

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ABSTRACT

The use of feeding bottle is more common among the respondents having higher economic level. Health education in this aspect has been of greater help in improving this practice either among the lower income group or the group with higher economic hierarchy. Almost double the number of respondents belonging to the higher economic level, sterilize the feeding bottle for 10 minutes as compared to those belonging to the lower economic group. A significant change was found because of the health education among the respondents belonging to the higher income group. The over dilution of milk is also much common among the lower income group. A comprehensive picture of the vital variables responsible for the child feeding hygiene demonstrates that the higher economic level of the family and the observation of hygienic child feeding practices are highly interrelated. Health education significantly promotes the prevalence of hygienic child feeding practices among the mothers belonging to the lower economic level.

The word 'hygiene' is derived from the Greek word Hygia - the Goddess of Health. The relevant review of literature, leads one to suspect that the poor economic level of the household may create formidable obstacles in the observation of hygienic child feeding practices. The lack of proper sterilization of the feeding bottle and over dilution of milk are the crucial factors which have recently invited the attention of child health experts. Authors of another study are of the opinion that poor women may not be able to afford an adequate supply of supplementary milk for their children¹. It has also been observed that poverty is not only a major factor affecting the preventive aspects or determining child mortality but also have an effect on the access to the curative services^{2, 10}. Accordingly, the hypothesis tested in this context is, "the higher the economic level of the family, the more hygienic are the child feeding practices". The second hypothesis adopted to determine the effectiveness of health education is, "health education significantly minimizes the prevalence of unhygienic child feeding practices among the mothers belonging to the lower economic level".

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MATERIAL AND METHODS

The study deals with a sample of 300 children, within two years of age group. Out of 300 children and their mothers, a sample of 100 children and their mothers was drawn from the children born in the Christian Medical College, Ludhiana by using the systematic random sampling method. These mothers were consistently imparted health education regarding the maintenance and promotion of child feeding practices which are scientifically recommended. The sample of remaining 200 children and their mothers was obtained from the children born in the homes which were also obtained through stratified random sampling method. Both, the primary and secondary sources of data collection were used. Information was collected by directly interviewing the mothers and examining the child health status. First of all, application of different kinds of supplementary milk to the child according to the economic level of the respondents has been worked out.

Among the respondents giving supplementary milk to the children, about 85 per cent of the children are being fed by using the bottle. This also shows that the use of the feeding bottle is more common among the respondents enjoying a higher economic level as shown in Table 1. Health education in this regard has a greater potential either in the lower economic group or in the group with the higher economic

TABLE 1
THE RESPONDENTS' ECONOMIC LEVEL AND THE TYPE OF AIDS USED FOR
GIVING MILK TO THE CHILD BY THE PLACE OF DELIVERY

Economic Level	Bottle Glass	Other	Katori	Spoon	Glass	N.R.	Total No. of cases = 100 per cent
Upto Rs.400							
Home	31.6	57.9	10.5	-	-	-	76
Hospital	45.0	25.05	20.04	5.0	5.0	-	20
Rs.401-600	38.3	53.2	4.2	2.1	2.1		47
Home	46.7	33.3	10.0	6.0	3.3	-	30
Hospital							
Rs.601-1000	37.8	55.6	2.2	2.0	-	2.2	45
Home	46.2	34.6	1.4	3.8	-	-	26
Hospital							
Rs.1001 and above Home	43.7	56.3	-	-	-	-	16
Hospital	54.5	27.3	18.2	-	-	-	11
Total percentage							
Home	35.9	56.1	6.0	1.2	1.2	0.5	184
Hospital	47.1	31.0	14.9	4.6	2.3	-	87

hierarchy. On the other hand, the use of *katori*, is more common among the respondents of the lower economic level, especially among the hospital deliveries. The findings of this study are in agreement to some extent with the findings of another study which revealed that the economic life is decidedly a function of tools and inventions and is closely interrelated with the family, family folk-ways and mores³.

Since, in this study a larger group of respondent *i.e.* about 85 per cent are using feeding bottle, it will be necessary to ascertain the method adopted for cleaning the bottle. This will not only provide a picture of the people's sanitary habits but will give the necessary information which will help reducing the morbidity and mortality among the children.

About 65 per cent of the respondents who delivered their children at home and had Rs.400 per month as income wash the feeding bottle with just cold water. A significant positive change is apparent, as we approach the higher income group. The rate of decrease in the above action has been more operative among the mothers with hospital deliveries and especially in the low income groups as given in Table 2. On the other hand, washing of the bottle with hot water is more in vogue among the higher economic groups. It is evident from the above analysis that as the

TABLE 2
THE NUMBER OF RESPONDENTS WHO USED THE FEEDING-BOTTLE, THE METHOD EMPLOYED BY THEM FOR CLEANING IT AND THEIR ECONOMIC LEVELS BY THE PLACE OF DELIVERY

Economic Level	Washed with cold water	Washed with hot water	Boiled the bottle for 5 minutes	Boiled the bottle for 10 minutes & the nipple for 5 minutes	The each total cases 100 per cent
Upto Rs.400					
Home	65.0	13.3	13.3	8.3	60
Hospital	33.3	27.8	27.8	11.1	18
Rs.401-600					
Home	47.5	25.0	20.0	7.5	40
Hospital	40.7	22.2	25.9	11.1	27
Rs.601-1000					
Home	31.8	25.0	29.5	13.6	44
Hospital	21.1	21.1	36.7	21.1	19
Rs.1001 & above					
Home	20.0	26.7	40.0	13.3	15
Hospital	10.0	20.0	40.0	30.0	10
Total No. and Percentage					
Home	75(47.2)	33(20.7)	35(22.0)	16(10.1)	159
Hospital	22(29.7)	17(22.9)	23(31.1)	12(16.2)	74

economic level of the family increases, the chances of proper sterilization of feeding bottle also progressively rises.

Almost double the number of respondents belonging to the higher economic groups, sterilize the bottle for 10 minutes as compared to those belonging to the lower-income group. These findings have been supported by another study in which it is stated that the lower class families are characterized by a greater economic insecurity than the higher income families and show a less extensive knowledge pertaining to hygienic child feeding practice⁴.

Besides one's way of cleaning or sterilizing the feeding bottle, it will be important to ascertain the number of times a feeding bottle was cleaned or sterilized.

Only 28 per cent of the respondents with income of Rs.400 cleaned the feeding bottle after every feed as shown in Table 3. Among the respondents, who have more than Rs.1001 per month as income, about 52 per cent clean the bottle after each feed. In the case of hospital and home deliveries, this percentage is strikingly higher among all the economic groups who delivered their children in hospitals. On the other hand, the practice of cleaning the bottle once or twice a day, is more in vogue in the low-income group.

TABLE 3
THE RESPONDENTS' ECONOMIC LEVEL, THE NUMBER OF RESPONDENTS USING THE FEEDING BOTTLE AND THE NUMBER OF TIMES IN A DAY THE FEEDING-BOTTLE WAS CLEANED, AS INFLUENCED BY TH

Economic Level	After each feeding	Twice a day	Once in a day	Alternate day or less often	The total No. of cases = 100 per cent
Upto Rs.400					
Home	25.0	41.7	25.0	8.3	60
Hospital	38.9	44.4	16.7	-	18
Rs.401-600					
Home	30.0	37.5	22.5	10.0	40
Hospital	44.4	37.0	14.8	3.7	27
Rs.601-1000					
Home	38.6	34.1	20.4	6.8	44
Hospital	52.6	26.3	15.8	5.3	19
Rs.1001 & above					
Home	46.7	26.7	20.0	6.7	15
Hospital	60.0	30.0	10.0		10
Total Number and Percentage					
Home	51(32.0)	59(37.1)	36(22.6)	13(8.2)	159
Hospital	35(47.3)	26(35.1)	11(14.8)	2(2.7)	74

Besides knowing about one's way of cleaning the feeding bottle, it will be important to know whether one's economic level affects the degree of the dilution of these different kinds of supplementary milk given to the children. As observed earlier, some of the people, as a result of the prevailing customs and values usually give cow's milk to the child. In the developing countries such as India, it is advisable that cow's milk should be used in its natural form, because dilution may contaminate it. Therefore, an effort will be made to distribute the respondents on the basis of their diluting the cow's milk, their economic level and the place of delivery.

About 70 per cent of the respondents, who delivered their children at home, belonging to lower income group with a monthly income of Rs.400 dilute the cow's milk. Among the respondents, whose income is between Rs.400 and Rs.600, this percentage is about 45. On the other hand, among the remaining two groups, who are higher in respect of the level of income, it is about 37 per cent, which is a significant percentage of the respondents who delivered their children at home.

The analysis in Table 4 shows that the higher the economic level of the respondents, the lower the chances of diluting the cow's milk. It means that it is not within the means of poor people to afford an adequate quantity of cow's milk for their children. Even if they give, they will add water to it. A further analysis of data has also revealed that the lower the economic level of the family, the more the dilution of supplementary milk. Even if the economic level is constant, health education plays an appreciable role in minimizing the dilution of supplementary milk.

TABLE 4
THE NUMBER OF RESPONDENTS WHO USE THE COW'S MILK, THEIR
ECONOMIC LEVEL, EXTENT OF DILUTING THE COW'S MILK AND THE
PLACE OF DELIVERY

Economic Level	Yes	No	Eeah Total No. of Cases = 100 per cent
Upto Rs.400			
Home	69 .2	38.3	13
Hospital	50 .0	50.0	6
Rs.401-600			
Home	50 .0	50.0	14
Hospital	33 .3	66.6	6
Rs.601-1000			
Home	42 .9	57.1	14
Hospital	28 .5	71.4	7
Rs.1001 and above			
Home	50 .0	50.0	4
Hospital	25 .0	75.0	4
Total No. and			
Percentage (Home)	24(53.3)	21(46. 7)	45
(Hospital)	8(34.8)	15(65. 2)	23

So far, the different aspects of child feeding hygiene in relation to the economic level of the family have been studied. Keeping in view the hypothesis No. I and II and the aggregate of the findings of Table 1 to 4 plus other relevant data which will help to classify the above child feeding practice into hygienic, less hygienic and unhygienic on the basis of relevant recommendations of various concerned scientists and organisations^{5,8,7,8,9}.

Our No. I hypothesis as explained earlier is, "the higher the economic level of the family, the more hygienic are the child feeding practices".

Analysis of data as given in Table 5 shows that as the economic level of the household rises, the unhygienic child-feeding practices weaken. It is also apparent from the Table 5 that the higher the economic level of the family more hygienic child-feeding practice will be followed. Even, if we group all the respondents into low (up to Rs.600) and high (above Rs.601) economic level and unhygienic and less hygienic feeding practices together, we still find that there are significant economic level differentials in child feeding hygiene.

The above findings support our hypothesis (t) /i.e., the higher the economic level of the family, the more hygienic are the child feeding practices. The statistical test, applied to ascertain the validity of the above hypothesis (I) reveals that the hypothesis (i) is statistically significant (p 0.05).

The above interpretation establishes that the economic level of the family plays an interesting role in the observation and promotion of child feeding hygiene. The above data highlight that with an economic advancement the hygienic level of different food practices will improve. However, in the developing countries like India

TABLE 5
THE RESPONDENTS ECONOMIC LEVEL AND THE CHILD FEEDING
HYGIENE

Economic Level	State of Child Feeding Hygiene			Each Total No. of Cases = 100 per cent
	Unhygienic	Less Hygienic	Hygienic	
Upto Rs.400	41.9	44.6	13.5	74
Rs.401 to 600	37.9	45.4	16.7	66
Rs.601 to 1000	35.6	40.7	23.7	59
Rs.1001 and above	31.8	31.8	36.4	22
Total No. and Percentage	84(38.0)	94(42.5)	43(19.4)	221

despite the number of socio-economic development schemes and input, poverty is yet one of the basic stigmas in our society. Based on our field experiences, the only feasible and practical solution to combat poor child-feeding trends is the sensitization of mothers through education towards better and healthy feeding practices among their off-springs.

Therefore, it is timely to verify that to what extent the mothers' child feeding hygiene habits in the different economic groups can be modified through health education. The hypothesis (II) needing confirmation on the above points is "health education improves the child feeding hygiene significantly among the mothers belonging to the lower economic level".

The economic level of the family was kept constant and then simultaneously efforts were made to work out the impact of health education on correcting the feeding practices among the children from hygienic point of view as shown in Table 6. The hygienic feeding practices are more common among the mothers, who delivered their children in the hospital and were repeated by exposed to health education. The health education differentials in Child feeding hygiene are operative in all the economic groups. However, the impact of health education was more visible in the higher economic group. As explained earlier, even, if one aggregate the economic groups into two categories *i.e.* higher and lower, and similarly the

TABLE 6
THE RESPONDENTS ECONOMIC LEVEL AND CHILD-FEEDING HYGIENE BY
PLACE OF DELIVERY

Economic Level	State of Unhygienic	Child Feeding Hygiene Less Hygienic	Each Total No. of cases = 100 per cent
Upto Rs.400			
Home	41.7	46.6	60
Hospital	42.9	35.7	14
Rs.401-600			
Home	42.1	44.7	38
Hospital	32.1	46.4	28
Rs.601-1000			
Home	37.5	45.0	40
Hospital	31.6	31.6	19
Rs.1001 & above			
Home	38.5	38.5	13
Hospital	22.2	22.2	9
Total Number and Percentage			
Home	40.4(61)	45.0(68)	151
Hospital	32.8(23)	37.1(26)	70

feeding practices into hygienic and poorly hygienic (less hygienic plus unhygienic), there is a very close relationship between the two varieties. The above multivariate analysis demonstrates that health education plays an important role in the acceleration of hygienic feeding practices among the higher economic groups. The above findings support our hypothesis (II). To ascertain the validity of above hypothesis, χ^2 (CHI-square) tests was applied, which showed that our hypothesis (II) is also statistically significant (p 0.05). The above data establish that health education is highly instrumental in further improving the hygienic aspects of child feeding practices in the higher economic groups, and hence health education is a must with its positive approach for all the economic groups.

ACKNOWLEDGEMENT

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Lkkjk'k

उच्च आर्थिक स्तर वाले उत्तरदाताओं में फीडिंग बाटल का प्रयोग अधिक किया जाता है। इस पहलू पर स्वास्थ्य शिक्षा द्वारा निम्न आय वर्ग अथवा उच्च आर्थिक संरचना वाले वर्गों में प्रैक्टिस को बढ़ाया जा सकता है। फीडिंग बाटल को 10 मिनट तक स्टरलाइज करने वाले निम्न आर्थिक वर्ग के उत्तरदाताओं की अपेक्षा उच्च आर्थिक स्तर वाले उत्तरदाताओं की संख्या लगभग दुगुनी थी। उच्च आय वर्ग के उत्तरदाताओं में स्वास्थ्य शिक्षा के कारण एक विशिष्ट परिवर्तन पाया गया। निम्न आय वर्ग में दूध को जरूरत से अधिक पतला बनाना भी आम है। बच्चों की फीडिंग हाइजिन के लिए जिम्मेदार मुख्य कारकों की फीडिंग हाइजेनिक आदतों का आपस में सम्बन्ध होता है। निम्न आर्थिक स्तर की माताओं को स्वास्थ्य शिक्षा से बच्चों की हाइजेनिक फीडिंग सम्बन्धी प्रोत्साहन मिलता है।

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MOTHER'S REACTION TO THE SERVICES OF INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME

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ABSTRACT

Reactions of 200 mothers to the services of Integrated Child Development Scheme were explored. All the respondents were aware of the services. Perceptions of majority of the respondents about supplementary nutrition and immunizations were in commensurate with the objective laid down for the scheme. The purpose of health check up of children and pregnant women was viewed only in relation to the illnesses. Positive attitude to the ICDS exists and mothers accept the service package.

In pursuance of National Policy on Child Development, Government of India launched the Scheme of Integrated Child Development Services (ICDS)¹ which has a comprehensive approach for all-round development of child up to six years of age. The essential components of ICDS service package *viz.* supplementary nutrition, immunization, health checkups, nutrition and health education, non-formal preschool education are delivered in the anganwadi, manned by an anganwadi worker (AWW) who is selected from within the community and serves a population of one thousand. The studies carried out so far for the scheme have indicated a considerable improvement in immunization, nutritional interventions and nutritional status of this younger age group of children²⁻⁴. This study determines mother's reaction to the services of ICDS.

METHODS AND SUBJECTS

The study essentially followed an 'interview' with limited extent of 'observation' technique. A pretested semi-structured interview schedule was used to determine mother's reaction in terms of their awareness, perception, attitude and acceptance of the services. Six villages in which ICDS scheme has been in operation for the last six years were selected by stratified random sampling technique out of a total of 30 villages of a community development block in Haryana. About 200 mothers in the reproductive age group were systematically sampled and interviewed from among the households served by six anganwadies situated in the selected villages. Care was taken to include mothers of all socio-economic groups.

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OBSERVATIONS

Socio-economic and demographic data of the respondents as shown in Table 1 represents all socio-economic groups of the community. Majority of the respondents (63.5 per cent) were in the age group of 25-35 years, and 79 per cent were illiterate.

Distribution of supplementary food in the anganwadi was considered useful by all of the respondents. In the opinion of 102 (51 per cent) of respondents, supplementary nutrition reduces 'weakness'. Majority of them (133) were for its distribution among 'weak' children as described in Table 2. All the respondents stated that food given in anganwadi is an addition to the normally consumed meals in the homes.

Although all the respondents were convinced about the efficacy of immunizations as everyone of them ascribed eradication of smallpox to the immunization against it but their knowledge of immunizable diseases was shallow as given in Table 3. Large number of respondents (94 per cent) allow immunizations and majority of them had persuaded, at one time or the other, other unwilling mothers. In the opinion of 87.5 per cent of respondents meaning of health check up of children was treatment of ailments, only 12.5 per cent were of the opinion that it should be done to supervise growth. However, 91.0 per cent of them knew that apart from treatment of minor ailments, weight of the children is being recorded regularly. None of them was against weighing of children because they considered it useful for the child.

The necessity of regular check up of pregnant women, in the opinion of 24.5 per cent respondents was to know whether delivery can be conducted safely at home or not; while rest of them were of the opinion that it should be done to know the 'well-being' of foetus and for treatment of ailments of the pregnant women as given in Table 4. Ante-natal services as perceived by the respondents were in order of precedence immunization against tetanus, distribution of folifer tablets, abdominal examinations and nutrition education. Trained birth attendant, auxiliary nurse midwife (ANM) and doctors were the persons consulted by 39.5 per cent, 40 per cent and 8.5 per cent respondents respectively in cases of any problem during pregnancy or child births, however, 5 per cent and 7 per cent respondents still rely on elderly females and untrained birth attendants respectively. Ninety-three per cent of the respondents were aware of the presence of ANM or trained dai in their villages and told that now it has become easy to approach them at times of need.

TABLE 1
SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS

<u>Age in Years</u>	Mothers per cent N=200
15 - L 25	14.0
25 - L35	63.5
35 - L40	22.5
<u>Education</u>	
Illiterate	79.0
Literate less than 5 years of schooling	11.0
years of schooling	5.0
Matriculate and above	5.0
<u>Caste</u>	
Upper caste	56.0
Backward caste	15.5
Schedule caste	28.5
<u>Family occupation</u>	
Agriculture	40.0
labourer	32.0
Artisan	8.0
Employee (Govt./Private)	20.0
<u>Type of family</u>	
Beneficiary	79.0
Non-beneficiary	21.0

TABLE 2
PERCEPTION AND ATTITUDE TO SUPPLEMENTARY NUTRITION

	Mothers N=200	
<u>Usefulness of supplementary nutrition</u>		
Useful	200	(100)
Not useful	-	(-)
<u>Reasons for usefulness</u>		
Reduces 'weakness'	102	(51.0)
Incentive for attending anganwadi	55	(27.5)
Don't know	43	(21.5)
<u>Opinions regarding beneficiaries</u>		
All	31	(15.5)
Poor	36	(18.0)
Weak	133	(66.5)

Figures in parenthesis denote percentages.

TABLE 3
KNOWLEDGE OF IMMUNISABLE DISEASES

Name of disease	Mothers N=200
Polio	114 (57.0)
Tetanus	111 (55.5)
Whooping cough	98 (49.0)
Diphtheria	- (-)
Tuberculosis	62 (31.0)
Typhoid	3 (1.5)
Measles	- (-)

Figures in parenthesis denote percentages.

TABLE 4
PERCEPTION AND ATTITUDE TO ANTE-NATAL SERVICE

Perception of purpose of ante-natal check-up*	Mothers N-200
To know the 'well-being' of fetus	180 (90.0)
To know any disease in pregnant woman	108 (54.0)
To decide place of delivery	49 (24.5)
Knowledge of various elements of ante-natal services*	
Abdominal examination	102 (51.0)
Immunization against tetanus	184 (92.0)
Distribution of folifer tablets	180 (90.0)
Nutrition education	60 (30.0)
Urine test	- (-)
Blood test	- (-)
Blood pressure measurement	- (-)

♦Multiple responses Figures in parenthesis denote percentages.

DISCUSSION

Favorable attitude to the services of ICDS exists in the community. Hundred per cent respondents were aware of the services of ICDS, which could be due to a small and compact area covered by each AWW. Moreover, AWW belongs to the same community which facilitates regular contact. In Delhi⁵, also all the respondents were aware of the existence of anganwadi and 96.7 per cent were satisfied with the services and 89.4 per cent beneficiaries considered the services useful for the health of children.

All the respondents viewed distribution of supplementary nutrition to be useful, similar opinions were expressed by all the beneficiaries of supplementary nutrition in slum area of Rohtak city⁶. Contrary to the observations in studies on supplementary nutrition programme, in this study none of the respondent considered supplementation as substitution; this dissimilarity could be due to better dissemination of knowledge about supplementary nutrition by AWW's. This is also reflected from the respondent's opinion about the beneficiaries of supplementary nutrition as majority of them (66.5 per cent) were in favor of 'weak' children.

Awareness of the mothers about the efficacy of immunizations in disease prevention was of high order. In Kasa Integrated Model Maternal and Child Health Nutrition project⁷ also a year of immunization campaign by project staff led to an increase of 48 per cent in the awareness of immunizations. Convictions regarding efficacy has also led to the acceptance of immunization as 94 per cent respondents allow immunizations. However, the knowledge of immunizable diseases was shallow. This calls for dissemination of information in this specific area by all concerned.

Mother's perception of health checkups was inclined in favor of treatment of ailments. Traditionally parents had been contacting healers only in case of illness. This attitude still prevails. Attempts are needed to convince the parents that health check up of 'healthy' children is essentially in order to detect disease/deviation in early stages. Serial weight recording of children was considered useful. Home based children's road to health cards may stimulate mothers for monitoring the weight of the child. Antenatal check up is also not viewed as a activity to screen high risk cases as only 24.5 per cent respondents felt its necessity to decide about the place of safe delivery. May be home based mothers cards if used to detect high risk pregnancies, can generate mothers interest in antenatal checkups. In spite of the availability of ANM's in the village, people still rely on Dai, probably because she is culturally more acceptable.

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एकीकृत बाल विकास योजना के अर्न्तगत प्रदत्त सेवाओं के विषय में 200

माताओं की प्रतिक्रियाओं की जानकारी ली गई। सभी उत्तरदाताओं को इन सेवाओं की जानकारी थी। पूरक पोषण और इम्यूनाईजेशन के प्रति अधिसंख्य उत्तरदाताओं का दृष्टिकोण योजना में निर्धारित उद्देश्यों से मेल खाते हुए थे। बच्चों और गर्भवती महिलाओं के स्वास्थ्य की जांच के उद्देश्य को उनकी बीमारियों के सन्दर्भ में ही देखा गया। एकीकृत बाल विकास योजना के प्रति अच्छा दृष्टिकोण विद्यमान है और माताएं इस योजना के सेवा पैकेज को स्वीकार करती हैं।

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PLANNING OF AN INHALATION THERAPY UNIT - A GUIDE TO HOSPITAL PLANNERS

M. Srivastava* and R.C. Anand**

ABSTRACT

In India, though rapidly advancing medical technology is competing with Western standards, the concept of Inhalation Therapy Department and its life-saving role in an Institution is still in infancy stage.

Medical colleges and other large medical institutions will have to establish the Inhalation Therapy Unit (ITU) by 2000 A.D. Hence, hospital administrators and planners will be required to acquaint themselves with the goals of inhalation therapy, its planning, staffing pattern and selection criteria, physical facilities, equipments, organization and administration.

Throughout many countries of the world, there is rapidly increasing awareness of the life saving the therapeutic unit role afforded by a well organized Inhalation Therapy.

Most of the advanced Western countries have established a full-fledged Department of Inhalation Therapy. But in India, the concept of a separate Inhalation Therapy Unit is still in infancy stage. Very few institutions like All-India Institute of Medical Sciences have got an Inhalation Therapy Unit.

HISTORICAL DEVELOPMNT

During the early decades of the twentieth century, the principal concern of hospitals in inhalation therapy was in the maintenance of oxygen tents but little interest in the rational use of oxygen was displayed. Gradually more diversified methods for increasing the alveolar oxygen tension were developed and delivery of oxygen by nasal catheters, masks and hood came into clinical use. At this stage of development, the term oxygen therapy was coined'.

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Attention then turned towards the respiratory tract as a whole. Anesthetists were consulted when problem in pulmonary ventilation developed in patients other than those to be anaesthetized, and as a consequence, a division of oxygen therapy was often established with the Department of Anesthesiology.

Later factors, other than administration of oxygen and maintenance of a patient's airway were identified. The value of humidification of inspired gases and of the use of aerosols and bronchodilator drugs was explored. The aim was enlarged to oxygenate blood, to correct respiratory acidosis, to minimize accumulation of lung water, to diminish the respiratory effort required in many diseases and prevent or treat the multiple causes of hypoxemia. This broadened approach came to be designated as 'Inhalation Therapy'.

GOALS OF INHALATION THERAPY

The following goals of Inhalation Therapy have been spelled out².

OXYGEN

- 1 . Reverse or prevent tissue hypoxia.
- 2 . Treat arterial hypoxemia.
- 3 . Decrease work of breathing.
- 4 . Decrease myocardial work.

AEROSOL

- 1 . Restore and maintain protective mucous, secretions.
- 2 . Hydrate desiccated retained secretions.
- 3 . Promote expectoration.
- 4 . Improve effectiveness of cough.

IPPB

1. Improve distribution of ventilation.
2. Re-expand atelectatic alveoli.
3. Promote and improve cough.
4. Deliver medication.

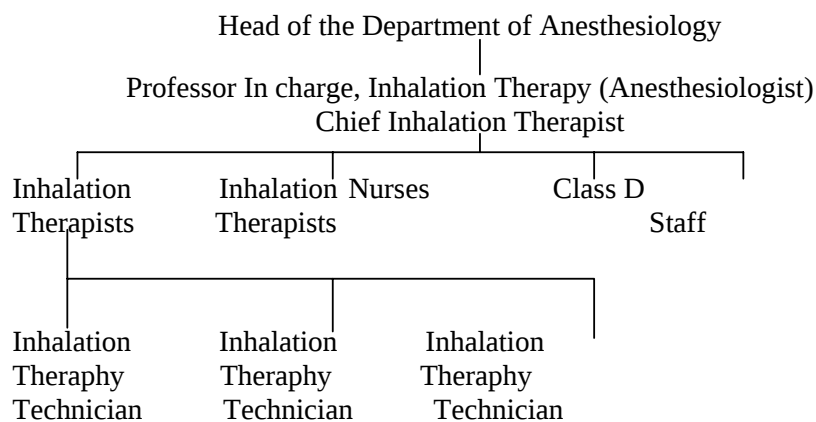
CHEST PHYSIOTHERAPY

- 1 . Improve distribution of ventilation.
- 2 . Mobilize secretions.
3. Improve efficiency of ventilation.
- 4 . Improve cardiopulmonary work capacity.

ADMINISTRATION

Normally, anesthesiologists are made in charge of the Units. But most anesthetists do not have the time to direct an Inhalation Therapy Unit¹. Both services have grown to the point that each requires full time supervision. An anesthesiologist should' be appointed full time in charge of the unit for technical supervision.

The same administrative set-up can be adopted for native hospitals also. The suggested layout of organizational chart is as under:



PLANNING OF INHALATION THERAPY UNIT (ITU)

Size of ITU will depend on the size of the hospital and type of outpatient cases being treated. In a hospital, running super-specialty clinics of chest diseases or respiratory diseases will require a full-fledged large ITU.

For planning an ITU, Inhalation Therapy Planning Committee should be appointed consisting of a Anesthesiologist, a Physician, a Surgeon, a Respiratory Therapist or a Chest Physician, Nursing Superintendent, Hospital Engineer and a representative of Hospital Administration.

This team should go into all the details including assessment of the community and hospital needs and size of the Unit.

POLICIES

Cases for oxygen therapy vary in degree of supervision and technical skill required. The necessary skill for such treatment can often best be provided by an oxygen therapy team, led by an anesthetist or respiratory physiologist working in conjunction with the physician in charge of cases³.

LOCATION

It should be centrally located since patients may be transferred from any area of the hospital.

STAFFING

Doctors, nurses and chest physical therapist are required round the clock since constant surveillance is required for recovery.

DESIGN

Every patient must be under visual observation by the nurse in charge; the unit must be based on an open plan area and not in cubicle type of accommodation.

PHYSICAL FACILITIES

Air-conditioning, high humidity, adequate wash basins, floors and walls washable with bactericidal solutions are, all of importance in effective care of the patients.

Service areas for catering, linen, laboratory, sterile store, equipment and staff duty and rest rooms, are also to be catered for in a fully functional independent ITU.

JOB CONTENT AND JOB SPECIFICATIONS

Job contents and job specifications for different categories of staff to be employed in ITU are as under:

CHIEF INHALATION THERAPIST

Job Functions

1. The Chief Inhalation Therapist plans and supervises the administration of inhalation therapy services to patients upon the physician's prescription.
2. Schedules the use of equipment.
3. Requisitions gases and equipment.
4. Participates in the layout of medical gas piping system and observes conservation and effective use of gases.
5. Keeps statistics.
6. Hires, trains, schedules and disciplines therapists.
7. Keeps informed of the latest advances in inhalation therapy and imparts training to nurses, anesthetists, medical students and medical staff on practical application of inhalation therapy.

JOB SPECIFICATIONS

Education

1. Registered by the Registry Inhalation Therapists
2. Three years experience in inhalation therapy with atleast one year's experience in the supervision of an Inhalation Therapy Department.

Personal Qualifications

Must be of good mental and moral character and be aware of his ethical responsibilities.

INHALATION THERAPIST

Function

To provide inhalation therapy in all its aspects. Job Contents

1. Upon receipt of a physician's orders, assembles and erects treatment apparatus, measures out medication and supervises the treatment.
2. Instructs nurses in the use, control and general care of the equipment.
3. At specified intervals, inspects the equipment and ensures that adequate supply of liquid or gas is on hand.
4. Therapist must be thoroughly familiar with the cleaning and servicing of the equipment.
5. The therapist should continue to expand his knowledge of inhalation therapy through journals, conferences and individual study.

JOB SPECIFICATIONS

Education

Registered by the Registry of Inhalation Therapist.

Skill and Ability

Ability to communicate well with staff and patients.

Physical and Emotional Requirements

Capacity to move compressed gas tanks and equipment weighing upto 150 pounds. Must be willing to work long periods without rest when required.

INHALATION THERAPY TECHNICIAN

Function and Job Content

To perform routine simple types of technical procedures *I.e.* assembling equipment and initiating oxygen tent, cold steam and hot steam therapy.

Returning discontinued equipment to the department for cleaning and routine repairs.

SPECIFICATIONS

Education

High school or equivalent.

Physical and Emotional Requirements

- 1 . Eighteen years of age or older.
- 2 . Male or female.
3. Able to move some heavy equipment.

EQUIPMENT MALFUNCTION PREVENTIVE

The multiple parts, interconnections and complexities of this equipment system predispose them to malfunction⁴.

Cooper examined preventable mishaps⁵. Though human error accounted for most the mishaps, equipment malfunction was involved in 14.0 per cent monitors (24.0 per cent), breathing circuits (20 per cent), airway components (18 per cent) and the anesthesia machine (12 per cent), were the principal sources of malfunction. Frequent specific incidents included breathing circuits disconnection, inadvertent gas flow - changes, gas supply problems, laryngoscope malfunction and disconnection of the intravenous administration set.

TREATMENT AND PREVENTION OF COMPLICATIONS OWING TO EQUIPMENT MALFUNCTION

Regular check and preventive maintenance of all equipments must be carried throughout the year. Items having outlived their life, should be automatically taken out of use.

CONCLUSION

A well planned, fully equipped and adequately staffed, Inhalation Therapy Unit can play a vital role in life saving patient care activity in any hospital. Hospitals in future will have to provide the facility of inhalation therapy unit, for reducing mortality and achieving higher degree of efficiency.

Lkkjk'k

यद्यपि भारत में तेजी से बढ़ती हुई मेडिकल टेक्नालाजी पश्चिमी मानकों से स्पर्धा ले रही है, इनहेलेशन थेरेपी डिपार्टमेंट और एक संस्थान में इसकी जीवन-रक्षक भूमिका की धारणा अभी भी शैशव अवस्था में है।

मेडिकल कालेजों और अन्य बड़े आयुर्विज्ञान संस्थानों में सन् 2000 ईस्वी तक इनहेलेशन थेरेपी इकाइयों की स्थापना की जानी है। इसलिए अस्पताल प्रशासकों और नियोजकों को इन्हें लेशन थेरेपी के लक्ष्यों, इसके नियोजन स्टाफिंग पद्धति और चयन आधार, वस्तुगत सुविधाओं, उपकरणों, संगठन और प्रशासन के विषय में भली भांति जानकारी रखना जरूरी है।

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