

**Volume-1**

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## COURSE DESIGN - ORIGINAL

---

Prof. V.C. Kulandai Swamy  
Vice-Chancellor  
IGNOU

Prof. H.P. Dikshit  
Pro-Vice-Chancellor  
IGNOU

Prof. A.B. Bose  
Director  
School of Continuing Education  
IGNOU

Sh. P. R. Reddy  
Vice-Chancellor  
Sri Padmavathi Mahila  
VishwaVidyalyam, Tirupati

Dr. Mehtab Bamji  
National Institute of  
Nutrition  
Hyderabad

Prof. B. N. Koul  
Executive Director  
STRIDE  
New Delhi

Mrs. Mary Mammen  
CMC Hospital Vellore

Mrs. Arvind Wadhwa  
lady Irwin College  
New Dethi

Prof. Prabha Chawla  
School of Continuing Education  
IGNOU, New Delhi

Dr. Mrs. S.R. Miami  
W-163 'A', 'S' Block  
MIDC Pmpri, Bhosari, Pune

Dr. Annu J. Thomas  
School of Continuing Education  
IGNOU, New Delhi

Dr. Deeksha Kapur  
School of Continuing Education  
IGNOU, New Delhi

---

## BLOCK PREPARATION TEAM – ORIGINAL

---

Prof. K. Mahadevan  
Head, India Population Project II  
Population Studies Centre  
Sri Venkateshwara University  
Tirupati

**Block Coordinator**  
Dr. Annu J. Thomas  
School of Continuing  
Edicatopm, IGNOU, New Delhi

**Course Editor**  
Prof. P. R. Reddy  
Vice-Chancellor  
Sri Padmavathi Mahila  
VishwaVidyalyam, Tirupati

---

## COURSE REVISION

---

Prof. Deeksha Kapur  
Discipline of Nutritional  
Sciences Consultant  
School of Continuing Education  
IGNOU, New Delhi

Ms. Rajshree  
Ms. Kusum Bhatt  
School of Continuing Education  
IGNOU, New Delhi

---

## COURSE REVISION (2021 – 2022)

---

Prof. Deeksha Kapur  
Discipline of Nutritional Sciences  
School of Continuing Education  
IGNOU, New Delhi

Dr. Namrata Singh  
Asstt. Professor  
Discipline of Nutritional Sciences  
School of Continuing Education  
IGNOU, New Delhi

---

## PRINT PRODUCTION

---

Sh. Rajiv Girdhar  
Asst. Register (Pub.)  
MPDD, IGNOU

Sh. Hemant Kumar  
Section Officer (Pub.)  
MPDD, IGNOU

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October, 2022

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### ISBN:

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*Further information, about the Indira Gandhi National Open University courses may be obtained from the University's office at Maidan Garhi, New Delhi-110 068.*

*Printed and Published on behalf of the Indira Gandhi National Open University, New Delhi by Head MPDD, IGNOU, New Delhi.*

Laser Composer: Tessa Media & Computers, C-206, Shaheen Bagh, Jamia Nagar, New Delhi-25

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## **COURSE INTRODUCTION**

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In Course 1 you have been introduced to essential concepts, principles and applications related to nutrition for the community.

In this course, we move on to several aspects of interest related to public health and hygiene. The key areas dealt with include:

- Block 1      Health Indicators
- Block 2      Environmental Sanitation and Safety
- Block 3      Dietary Management of Disease
- Block 4      Food-borne Diseases, Food Infections and Intoxications
- Block 5      Common Infectious Diseases
- Block 6      Public Health and Related Issues.

After a careful study of Courses 1 and 2, you would be able to give full attention to applying the knowledge and skills you have gained when you begin Course 3 and Course 4 (Project Work).

Remember to concentrate on the practical activities in Practical Manual - Part 2. These activities will sharpen your skill in identifying health issues in your community. They would also help you to observe and analyse approaches being adopted by both Governmental and Non-governmental sectors.

The course begins with a discussion on indicators which help us to evaluate the health status of population groups. Population itself as a major determinant of health and quality of life has also been analysed in Block 1. In Block 2 we talk about the important role of environmental sanitation in the spread of diseases of public health significance. Particular emphasis has been given to related safety aspects such as personal hygiene and home safety.

The focus shifts in Block 3 to dietary management of diseases commonly encountered in the community. Those of you who are from a medical/paramedical background would find the last unit of the block useful as well especially if you are working in a hospital or clinic.

Blocks 4 and 5 give you full details about various infections and communicable diseases. Block 6 deals with primary health care and programmes related to health and income generation. Environmental protection is also discussed in terms of basic principles and applications.



**Block**

# **1**

**HEALTH INDICATORS**

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**UNIT 1**

**Population Dynamics and Epidemiology**

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**UNIT 2**

**Family Planning Programme**

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**UNIT 3**

**Asian Perspectives on Health and Quality of Life**

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## **BLOCK INTRODUCTION**

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In this first block of Course 2, the focus is on population and health indicators. It has three units: 1) Population Dynamics and Epidemiology, 2) Family Planning Programme, and (3) Asian perspectives on Health and Quality of Life. You would already be aware that population growth and family planning measures have an impact on the health and nutritional status of people.

In *Unit 1* you are introduced to various vital statistics, sources of these data and their determinants. However, more thrust is given to perspectives on fertility and mortality and their related aspects, which have direct bearing on the health and nutritional status of people.

Subsequently, *Unit 2* further discusses various measures to tackle population growth, particularly fertility and mortality through family planning and beyond family planning measures. It also discusses policies, strategies and determinants of the Family Planning Programme besides the effect of family planning on health and nutritional status.

*Unit 3* expands on the scope of this subject and discusses Asian perspectives on health and quality of life. Looking at India's position in relation to the other Asian Countries gives you a broader view of the tasks that lie ahead of us and areas where we need to concentrate in terms of population control.

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## STUDY GUIDE

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The guidelines given below will help you to know the details of the structure of the block:

- 1) The first unit focuses serially on:

Role of vital statistics in public health viz., fertility and mortality in selected Asian countries like India, China, Democratic People's Republic of Korea (DPR Korea), Thailand, Malaysia and Sri Lanka because of their geographical, cultural and developmental similarities with India. In addition, it deals with major sources of data on vital statistics — Census, Sample Registration Scheme, National Sample Surveys, Population Registers, Special Surveys, etc This section also focuses on major determinants of vital statistics and their related concepts.

- 2) The second unit begins with population policies and strategies followed in India and the genesis and development of the Family Planning Programme. Subsequently it deals with major temporary and permanent family planning methods besides two aspects of measures which go beyond family planning. Of course, major determinants of the Family Planning Programmes and its effect on health and nutrition have been given at the end.

- 3) The Asian experience is summed up in Unit 3. This would give you useful hints and ideas on how we should proceed in order to promote a better quality of life for our population.





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# UNIT 1 POPULATION DYNAMICS AND EPIDEMIOLOGY

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## Structure

- 1.1 Introduction
- 1.2 Role of Vital Statistics in Public Health
- 1.3 Vital Statistics in Asian Countries
- 1.4 Sources of Data on Vital Statistics
- 1.5 Fertility Measures and Determinants
- 1.6 Epidemiological Methods: Morbidity Mortality and their Determinants
- 1.7 Other Population Parameters
- 1.8 Let Us Sum Up
- 1.9 Glossary
- 1.10 Answers to Check Your Progress Exercises

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## 1.1 INTRODUCTION

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Research conducted in the field of population parameters such as birth weight, life expectancy at birth etc. has given us scientific evidence regarding the influence of these factors on nutritional status of the population in general. In addition, the experience in developing programmes has generated ideas about the inter-relationship between population parameters and nutritional status of people. In this unit, focussed efforts will be made to familiarise you with important vital events such as births (fertility), marriages (nuptiality), diseases (morbidity), deaths (mortality), and their levels, trends and determinants. As you go through this unit, you would realise that these vital statistics are of crucial importance in planning for public health and improving the quality of life of people.

The various fertility and mortality rates important from the point of view of public health which are discussed as part of this unit will help to acquaint you with the method of computation, importance of the vital rates as well as available statistics.

### Objectives

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

- describe the levels and trends of various population parameters in India and other Asian countries and at regional levels;
- compute major rates and ratios related to marriages, births, deaths, growth and other vital events;
- identify major determinants and patterns of vital events; and
- explain the prevalence and control of major diseases.

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## 1.2 ROLE OF VITAL STATISTICS IN PUBLIC HEALTH

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How do you think vital statistics can be of help for a community/country? There are many ways in which vital statistics can be of use. In fact, changes in vital rates help to monitor *the progress in overall socio-economic development of a community/country*. Fertility and mortality rates in a community are indicators of overall health and nutrition (i.e. quality of life) of a community and hence show the level of socio-economic development and the need to improve and accelerate the same.

*Analysis of vital statistics helps the Government (policy and programme planners) to plan for health services for reaching the general population and improving health related socio-economic conditions.* One can set objectives for achieving targets (like reducing mortality among children, reducing maternal deaths during child birth etc.) and vital rates/statistics can help in finding out whether targets are achieved or not.

Another reason for collecting vital statistics is that it helps to compare the health and nutritional status of people of two communities/countries and also the same community/country over a period of time. Thus, knowledge on various vital events during different five year plan periods and census decades will help programme managers, planners and administrators to know the impact of developmental programmes particularly their successes over time.

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## 1.3 VITAL STATISTICS IN ASIAN COUNTRIES

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Most vital statistics are expressed as vital rates. Let us define this term. When the vital statistics of fertility/morbidity/mortality are expressed as *number of people with a state of illness or number of events (e.g. births/deaths) in relation to total population at risk (group of people having certain similar characteristics like age, sex, region etc.)* is termed as vital rates. This definition of vital rates may seem a little difficult to you, when you read it for the first time. However, by carefully glancing at it again, you will surely be able to understand it.

Although India was more or less similar in developmental aspects with many Asian Countries, vital statistics varied among these countries. How did it happen? It might be due to differential progress achieved by Asian countries through differential emphasis given to one or the other priority areas of development in the recent past. For instance, certain countries and regions have given highest priority for education, health, family planning and infrastructural development. But certain other countries have given highest importance to industrialisation and/or agricultural development neglecting social development. In this context, China, Thailand, DPR Korea, Malaysia, Sri Lanka have made good progress in planning and infrastructure. Consequently, they attained rapid modernisation and improvement in quality of life of the population. On the other hand, the Government of India gave highest priority for industrialisation and agriculture, neglecting the social

development. We have just mentioned these differential models of development which have contributed to differences in several vital events. While many of the progressive Asian countries rapidly brought down their mortality and morbidity rates, India is still lagging behind, You may compare the rates of vital events of some Asian countries given in the following Table 1.1.

**Table 1.1: Vital Events in Asian Countries**

Asian Countries	CBR (2019)	IMR (2019)	CDR (2019)	Female life expectancy at birth
China	11	7	7	79
DPR of Korea	14	13	9.2	76
Malaysia	17	7	5	78
Thailand	10	8	8	81
Sri Lanka	16	6	7	80
India	18	28	7	71

CBR: Crude Birth Rate; IMR: Infant Mortality Rate; CDR: Crude Death Rate

Source: World Development Indicators, 2020.

Let us now find out how this information regarding vital rates is collected and processed.

## **1.4 SOURCES OF DATA ON VITAL STATISTICS**

The main sources of data on vital statistics are:

- 1) Census
- 2) Population Registers
- 3) Sample Registration Scheme
- 4) National Sample Surveys
- 5) Health Services Records
- 6) Special Surveys
- 7) Disease Registers

Before learning more details about each of these sources, you should remember that each of these sources have their own limitations and a country cannot solely depend on a single source. Usually information from various sources is compiled together to get vital statistics. So let us now get familiar with the main sources of data on vital statistics.

### **Census**

Let us first define the meaning of the term “Census”. Census means complete counting of all individuals/houses (individuals-population-Census; houses-housing-Census) in a country on a fixed date preferably once in 10 years. Census provides information on age, sex, religion, occupation, literacy, income etc. of the population. The first census in our country took place in 1872 and subsequently it is being conducted once in ten years. In India the latest census was held in 2011.

How do you think the population census can help in computing vital statistics/rates for a country? As you read this unit further, you will realise that the population census provides useful basic information for calculating vital rates. Similarly, housing census helps to analyse environmental conditions (such as water supply, toilet facilities, availability of space per person, etc.).

### **Population Registers**

In some countries, such as Sweden, Finland, Belgium, Israel, Taiwan and Korea, data about population can be obtained from continuously maintained population registers, in which the name of each person in the country is entered. Important migratory movements of individuals are also registered. The primary objective of setting up this system of population registers is to establish the identity of individuals and control them. The registers, however, are also used to obtain such demographic information as current population size, internal migration, data on vital events, etc.

### **Sample Registration Scheme**

As you know, in every community records of births, deaths and marriages are kept by either the local authorities or by religious leaders. If these records are complete and kept systematically, they can be used for estimation of fertility, mortality and marriage rates.

However, there is one limitation. In our country these records are usually not complete. This is because of ignorance, illiteracy, indifference and poor systems of management. There is no incentive also to register deaths, births and marriages. Hence, people usually do not report these vital events promptly. In spite of this, systematic analysis of these records do help to provide vital statistics of some public health significance.

### **National Sample Survey**

The main objective of the National Sample Survey has been to collect data on some important socio-economic aspects on a comprehensive basis for the whole country through its various rounds by using the technique of sample survey. The First Round of the National Sample Survey (NSS) was conducted in 1950; since then, information on different items has been collected through various rounds of the NSS. The topics covered so far include the following: fertility mortality, population growth, economically active population, family planning, employment and unemployment, consumers, expenditure patterns, housing conditions, manufacturing industries, physically handicapped persons.

### **Health Service Records**

Information can also be obtained from health service records kept by the health sector for administrative purposes (e.g. maternal mortality in hospitals, disease specific morbidity, information about birth weight, height during infancy and childhood arm circumference of children, information on immunization and prevention and control of certain endemic diseases).

Though health service records provide useful data for vital statistics, they

have their limitations unless kept properly. Their limitation is that they are kept for administrative purposes rather than monitoring purposes and that too only at places where health services are utilised.

### Special Surveys

Household surveys undertaken by the members of a community, village agents, local officials or researchers are very useful in providing information on age-specific and disease-specific mortality. These (when carried out at the national level) are more frequently used for providing information for vital statistics/rates.

### Disease Registers

Disease registers maintained by various hospitals provide data on mortality and morbidity for selected specific diseases and the treatment given.

### Check Your Progress Exercise 1

1) Define the following:

a) Vital Rates

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b) Population Census

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c) Sample Survey

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2) How do you think vital statistics can be helpful for health programme planners and policy makers?

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## 1.5 FERTILITY MEASURES AND DETERMINANTS

As you know lower mortality rates in a community often indicate better nutritional status. How would you interpret lower fertility rates in a community? Do they indicate a good or bad state of nutrition? In India, high fertility rates and insufficient food availability at the household level for a sizeable section of the population, results in poor nutritional status especially of women. Lowering fertility rate is important not only for population control but also for improving women's health and nutrition. Let us now learn about the various fertility rates which are computed from the point of public health significance.

### Crude Birth Rate (CBR)

The number of live births per 1000 estimated mid-year population of a community in a given calendar year. It can be calculated by using the following formula.

$$\text{Birth Rate} = \frac{\text{Number of live births in a year in a given area}}{\text{Estimated mid - year population}} \times 1000$$

The average population is ordinarily taken as the mid year population. Census counts are used for the calculation in the census year.

It is one of the major determinants of population growth in any country.

Birth rates are observed to be higher in the developing countries when compared to the developed world. For example, the birth rate in India is 20 (SRS 2018) when compared to 12 in Sweden, 11 in UK and 11 in USA. (World Development Indicator, 2020). The birth rates are however, declining gradually in the developing countries. In India, it has declined from 43 in 1960 to the present figure of 20.

The causes of high birth rate are:

- • Early puberty: Indian girls attain puberty early, i.e. between 12 and 14 years.
- • Early marriages
- • Poverty and low standard of living with its implications for child survival is associated with high birth rates and vice-versa.
- Low literacy rates especially the low female literacy level is associated with high birth rate.
- Value of children: Children are viewed as labour and economic assets leading to high fertility.
- Low prevalence of family planning and adoption: The use of family planning methods to adopt a small family norm is yet to make a substandard impact on the population explosion.

## General Fertility Rate (GFR)

This is a measure of fertility. It is defined as the number of live births per 1000 women in the reproductive age group (15-49 years) in a given year

$$\text{GFR} = \frac{\text{Number of live births in an area during the year}}{\text{Mid-year female population in the age group of 15-49 years in the same area during the same year}} \times 1000$$

GFR is considered to be a better indicator of fertility than the crude birth rate as only the women in child bearing ages are included in the denominator. However, you may note that all the women included in the denominator need not bear children.

A more precise measure of fertility is available which is known as *Age specific fertility rate* where the number of live births are computed per 1000 women in a specific age group. This gives a better picture of fertility pattern and serves as a sensitive indicator of the achievements of the family planning programme.

The General Fertility Rate in 2018 (SRS 2018) in India was 70.4. It was higher in rural India (77.4) when compared to urban areas (56.7). It may interest you to know that GFR is lowest in Kerala (48.6) highest in Bihar (99.8) followed by Uttar Pradesh (91.4), Madhya Pradesh (91.2) and Rajasthan (86.0). The figure for age specific fertility rate indicates that the peak age of fertility in women is between 25-29 years. The fertility rate remains almost equally high in the age group of 20-24 years. There are urban-rural differences in the fertility rates and fertility is high in rural India.

## Total Fertility Rates

Total Fertility Rate gives the average number of children a woman would bear through her entire reproductive life.

TFR is computed by summing up the age specific fertility rates per woman, an example is shown in Table 1.2.

**Table 1.2: Calculation of total fertility rate (TFR) for a State for a given year**

Age Group	Birth	Female Population	Age specific Fertility rate
10-14	300	165,000	10.8
15-19	11,000	179,000	61.5
20-24	20,000	192,000	104.2
25-29	22,000	222,000	99.1
30-34	20,000	213,000	93.9
35-39	10,000	212,000	47.2
40-44	2,000	210,000	9.5
45-49	500	200,000	2.5

Sum of age specific fertility rate = 419.7

TFR = 419.7 x 5 = 2098.5 Live births per 1000 female state residents in 2000 who live through reproductive years.

$$= \frac{2098.5}{1000} = 2.1 \text{ live births per woman.}$$

This fertility indicator is independent of the age and sex composition of the population. It indicates the approximate magnitude of completed family size.

The TFR of India was 2.2 in 2018. TFR was higher (2.4) in rural areas compared to the urban region (1.7) in 2018. It is again very high in Bihar (3.2) and Uttar Pradesh (2.9) when compared to other state. At the national level a declining trend of TFR has been noticed. TFR has declined from 3.2 in 2000 to 2.2 in 2018 (SRS Bulletin, 2018).

### **Net Reproduction Rate (NRR)**

NRR is the average number of live female children that would be born to a woman, with the existing fertility and mortality pattern in the age group of 15-49 years.

NRR indicates the number of live female children that are going to replace a mother within the reproductive period.

The NRR in India was estimated to be 1.1 (World Population Prospects, 2008). According to the United Nations Population Prospects, India will fall below a NRR level of 1.0 in the period 2020-2025.

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## **1.6 EPIDEMIOLOGICAL METHODS : MORBIDITY, MORTALITY AND THEIR DETERMINANTS**

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As you know, malnutrition is high in certain segments of the population e.g. children and pregnant mothers. Mortality rates in general as well as age-specific mortality rates reflect the incidence of malnutrition in a particular community. Let us learn about the various mortality rates and indices that are associated with malnutrition in a community. Any reduction in these mortality rates would require an improvement in nutrition, health care and environmental conditions.

### **Crude Death Rate (CDR)**

Crude Death Rate is defined as the deaths per 1,000 population per year in a given Community.

CDR serves as an indicator of the health status of people. Though it is not considered as a perfect measure of health status, a decline in death rate indicates improvement in health status of the population. A sharp decline in death rate due to control of certain communicable diseases by improved health services without a similar decline in birth rate in our country is leading to a high growth rate.

The present death rate in India is 6.2 (SRS 2018) when compared to) 8.6 in Sweden, 9 in UK and 8.7 in USA (World Development Indicators, 2020). Death rate has declined in India from a figure of 8.5 in 2000 to the present figure of 6.2 in 2018 (SRS, 2018).



## Infant Mortality Rate (IMR)

Infant Mortality Rate is defined as deaths under one year per 1000 live births in a given year.

$$\text{IMR} = \frac{\text{Number of deaths of infants under the age of 12 months in one year}}{\text{Total live births in the same area in the same year}} \times 1000$$

Infant Mortality Rate is considered as a sensitive index of health status and living standard of people. When you compare the mortality figures, you will observe that deaths below one year will be the highest when compared with any other age group. You will also see that the immediate causes of death among infants are different from that of adults. There are several other determinants of mortality which vary for different age groups, regions and communities. Major determinants of mortality include poverty, poor nutrition, illiteracy, poor sanitation, life style factors, pollution and adulteration, age at marriage, large family size and short spacing of births.

Diarrhoeal diseases, respiratory diseases and undernutrition are considered to be the main causes of high infant mortality. Any health programme specifically aimed at infants brings about a direct and quick reduction in infant mortality rate.

The decline in infant mortality can be achieved, as has been seen in the developed countries, by

- improvement of standard of living;
- control of communicable diseases;
- availability of better medicines like various antibiotics and their utilisation;
- availability of better health care facilities including safe deliveries and
- balanced diet and safe drinking water.

These are certain high priority interventions to control infant and child mortality. But many more are needed.

Infant mortality rate in India is 32 per 1000 live births (SRS, 2018). It is higher in rural areas (36) when compared to urban areas (23). When you compare these figures with infant mortality rate in developed countries (around 15 per 1000 live births), it is very high. But one encouraging factor in infant mortality is its trend of gradual decline, say from 53 in 2008 to 32 in 2018 (SRS Bulletin 2018). The decline is seen in both urban as well as in rural areas.

## Neonatal Mortality Rate

Infant deaths occurring within 4 weeks or 28 days of birth are called neonatal deaths.

Neonatal mortality rate is defined as neonatal deaths per 1000 live births in a given population.

$$\text{Neonatal Mortality Rate} = \frac{\text{Number of deaths under 28 days of age}}{\text{Total live births}} \times 1000$$

It may be interesting for you to know that nearly half of total infant deaths occur during the first 28 days of life. Most of these deaths are considered to be caused by injuries occurring during delivery besides unscientific procedures followed in conducting delivery. Other causes of neonatal deaths are congenital disorders, prematurity, certain blood disorders, condition of placenta and cord, diarrhoeal diseases and acute respiratory infections. The neonatal mortality rate in India was 23 in 2018 (SRS 2018) which is still quite high compared to developed countries (2.8 for UK, 3.7 for USA, World Development Induction, 2020).

### Perinatal Mortality Rate

Perinatal Mortality Rate is defined as the deaths (still births) occurring in late foetal life, i.e., 28 weeks of gestation or more and deaths under one week after birth in infants weighing over 1000g. at birth.

$$\text{Perinatal Mortality Rate} = \frac{\text{Late foetal deaths (still births) + deaths under one week in infants weighing over 1000 g at birth}}{\text{Total live + still births weighing over 1000 g at birth}}$$

Perinatal Mortality may be due to:

- i) complications in mothers during pregnancy or delivery
- ii) complications in placenta
- iii) disorders in the infant

You may however remember the following main causes:

- Low birth weight
- Injuries during birth
- Congenital malformations
- Infections after birth

Several factors have been identified to influence these main causes. They are:

- mother's age (early pregnancy, i.e., less than 19 years or late pregnancy, more than 35 years).
- space between pregnancies (less spacing).
- unsatisfactory progress of the pregnancy.
- poor nutritional status of the mother.
- low socio-economic status of the mother.
- lack of availability and non-utilisation of health services,
- improper delivery by non-qualified birth attendants.

Perinatal mortality is considered as a sensitive indicator for antenatal care (care during pregnancy), natal care (care during delivery) and post-natal care (care after birth).

Even in developed countries, the perinatal mortality is high and attempts are being made to control this mortality. In developing countries like our country

the infant mortality (mortality during the first year of life) is very high and masks the perinatal mortality rate.

The perinatal mortality rate in India is reported to be 22 when compared to figure of 5.1 in the developed country like U. K.

### **Post-Neonatal Mortality Rate**

Post-neonatal mortality rate refers to the deaths of infants during 28 days to one year of their life per 1000 live births.

$$\text{Post – Neonatal Mortality Rate} = \frac{\text{Deaths of infants during 28 days to under one year}}{\text{Total live births}} \times 1000$$

Nearly 60% of all infant deaths occur between one month to below one year of the infant's life. These deaths can be prevented. This will become clear to you if you know what are the causes of deaths during this period of life. The causes are: diarrhoeal diseases; acute respiratory infections; communicable diseases for which immunization is available like whooping cough, diphtheria, tuberculosis; malnutrition and accidents. You will now realise that deaths during this period are mainly due to the vicious cycle set up by malnutrition and infection, one leading to the other eventually leading to high mortality rates.

Post-neonatal mortality rate in India is around 9 per 1000 live births when compared to 0.86 in Sweden.

### **Toddler Mortality Rate (TMR)**

Children between 1 and 4 years are known as toddlers or pre-school age children.

The number of deaths in the 1 to 4 years age group children per 1000 such children is known as Toddler Mortality Rate.

The infant mortality rate has long been used as an indicator of the health status of a population. However, now it is being realised that 1-4 years mortality rate is much more sensitive. As you know pre-school age (1-4 years) is a time of combined nutritional and emotional stress. These children are much more prone to infection and malnutrition than infants as they suffer from dietary inadequacies due to poor complementary feeding and exposure to infections from the unsanitary environment. It has been estimated (according to a projection) that IMR in India as compared to developed countries was 10 times higher while the 1-4 mortality rate was 30 to 50 times higher.

The second year of life runs the highest risk of dying. Toddler mortality rate reflects the economic, educational, cultural and nutritional status of the community. So toddler mortality rate is taken as an indicator for several developmental programmes including nutrition programmes. It is now considered as the most sensitive indicator of the health status of the population.

In India, toddler mortality is 5.78 per 1000 children of the 1-4 years age group (UN IGME estimate) and it is observed that the decline in child

mortality is very slow reflecting that there is a need to strengthen the developmental and nutrition programmes in the population.

### Maternal Mortality Rate

Maternal mortality rate is defined as number of deaths of mothers while pregnant or within 42 days of termination of pregnancy excluding accidental causes in every 100000 pregnant women.

$$\text{Maternal Mortality Rate} = \frac{\text{Number of deaths from puerperal (relating to child birth) causes}}{\text{Number of pregnant women in the area}} \times 100000$$

The maternal mortality rate reflects the quality of maternal services available to the population. It also indicates the proportion of morbidity among pregnant mothers usually at the rate of 1:20 i.e., for every death of one mother in pregnancy there can be 20 such women who are ill. The major causes of maternal mortality are toxaeimias, haemorrhage and sepsis. In addition, anaemia, associated heart and lung diseases, illegal abortions, are the other causes.

The key factors governing maternal mortality are:

- i) The mother's age: The ideal child bearing age is between 20 and 30 years. Conception at ages below 20 or above 30 years of the mother poses higher risk for the mother as well as the new born.
- ii) Birth interval: Short birth intervals or lack of spacing has higher risk for both the mother and the child.
- iii) Parity: High parity, *i.e.* more number of births in the case of the mother poses risk to her life.
- iv) Undernutrition: The prenatal nutritional status of the mother and low dietary intake during pregnancy causes a severe risk to the mother. Undernutrition leads to high maternal mortality.

All these four factors are also interrelated and play a greater role than medical causes in high maternal mortality in India and other developing countries.

Maternal mortality rate in India in 2016-2018 was around 113 per 100,000 pregnant women (SRS 2020). In developed countries, the figure is around 7 in UK 17.4 in United States and 4 in Sweden. (WHO, 2019).

### Check Your Progress Exercise 2

- 1) Fill in the blanks:
  - a) IMR refers to the number of deaths below..... years of age per 1000 live births.
  - b) Neonatal mortality rate refers to the number of deaths under.....days of age per 1000 live births.
  - c) Toddler mortality rate refers to the number of deaths in .....year old children per 1000 live births.
  - d) .....is the most sensitive indicator of health status of the children of a particular community.

2) How do you think estimation of the following helps in planning for public health?

a) Maternal mortality rate:

.....  
 .....  
 .....

b) Toddler mortality rate:

.....  
 .....  
 .....

## 1.7 OTHER POPULATION PARAMETERS

The vital statistics about other factors which can influence public health are life expectancy, sex ratio, literacy rates, etc. Let us learn about them in some detail.

### Population Growth Rate

Growth rate is a measure of population change comprising addition of new borns and net migrants to the population and subtraction of deaths.

$$\text{Growth Rate} = \frac{\text{Live births} + \text{Net migrants} - \text{Deaths during the year}}{\text{Mid-year population}} \times 1000$$

Growth rate includes the natural rate of increase in population and also net migration of population. The growth rate is not uniform in the world. The rate is higher in India (0.97%) when compared to a rate of 0.58% in US (World Population Prospects, 2019).

### Natural Increase Rate

Natural Increase Rate indicates net change in the population on account of births and deaths which are the two crucial vital events determining population change.

$$\text{Natural Increase Rate} = \text{Crude Birth Rate} - \text{Crude Death Rate}$$

The Natural Increase rate in India was reported to be 10.7 in 2015-2020 (World Population Prospects, 2019).

### Sex Ratio

Sex ratio is defined as the number of females per 1000 males. Sex ratio under favourable social condition viz, higher literacy rates and good socio-economic conditions is in favour of females.

According to SRS, 2018, the sex-ratio of India stands at 899. This is a marginal improvement from the 2011 census, which had recorded 940 females for every 1000 males. According to the, SRS, 2018, the sex-ratio among major states ranged from 843 in Haryana to 957 in Kerala.

## Life Expectancy

The average number of years an individual is expected to live with the existing schedule of mortality.

### *Life Expectancy at birth*

Average number of years a new born baby can be expected to live with the existing schedule of mortality.

### *Life Expectancy at a given age*

The average number of additional years a person would live from a given time considering the existing pattern of mortality.

Life expectancy is a sensitive measure of health status, considered as an indicator of socio-economic development. Increase in the expectancy of life is due to improvement of health status of the population. Life expectancy at birth is partly dependent on infant mortality. Hence, life expectancy is lower in developing than in developed countries because of the higher infant mortality rates in the former.

Calculation of expectancy of life is based on statistical abstraction from the existing age specific death rates. Life expectancy at birth in India is gradually rising and is presently 69.66 years for both sexes 69.5 is for male and 72 for female in 2019.

## Low Birth Weight

Weight of the new born below 2500 g. at the time of birth is considered as low birth weight.

New borns with a low birth weight are considered to be at high risk and mortality rates are very high in this group. Those surviving will be highly prone to various infections and also growth retardation.

The number of children born with weight less than 2500g. in our country is in the range of 25-30 per cent.

## Check Your Progress Exercise 3

1) Fill in the blanks:

a) Birth Rate =  $\frac{\text{Estimated mid-year population}}{\text{Estimated mid-year population}} \times 1000$

b) Population Growth Rate =  $\frac{\text{Mid-year population}}{\text{Mid-year population}} \times 1000$

c) General Fertility Rate =  $\frac{\text{Mid-year female population in the age group of 15-49 years in the same area and same year}}{\text{Mid-year female population in the age group of 15-49 years in the same area and same year}} \times 1000$

So far, you have read about actual vital statistics of our country Let us now read about the Millenium Development Goals.

**HIGHLIGHT 1****Millennium Development Goals**

Do you know about the Millennium Development Goals? In September 2000, 189 nations agreed on vision for the future: a world with less poverty hunger and disease, great survival prospects for their mothers and their infants, better educated children, equal opportunities for women, and a healthier environment; a world in which developed and developing countries worked in partnership for betterment of all. This vision took the shape of eight Millennium Development Goals. All UN member States including India agreed to try to achieve these goals by the year 2015. These Eight Millennium Development Goals are as follows:

1. to eradicate extreme poverty and hunger;
2. to achieve universal primary education;
3. to promote gender equality and empower women;
4. to reduce child mortality;
5. to improve maternal health;
6. to combat HIV/AIDS, malaria, and other diseases;
7. to ensure environmental sustainability; and to develop a global partnership for development.

These goals had specific targets and indicators. Table 1.3 gives information on the progress made by India towards achievement of these health related Millennium Development Goals achieved by 2015.

**Table 1.3 : Health indicator targets to be achieved by 2015**

	Health Indicators	Present	2015 Target <sup>d</sup>
1	<b>Poverty and hunger</b>		
	Population below minimum level of dietary energy consumption (%)	22 <sup>a</sup> (2004-2006)	19
	Under-weight (<-2SD) children (%) under 5 years	40 <sup>b</sup> (2005-2006)	27
2	<b>Child mortality</b>		
	Infant mortality rate (per 1000 live births)	40 <sup>c</sup> (2013)	27
	Under-five mortality rate (per 1000 live births)	49 <sup>c</sup> (2013)	41
	One-year-old children immunized against measles (%)	74 <sup>d</sup> (2009)	>90
3	<b>Maternal health</b>		
	Maternal mortality ratio (per 100,000 live births)	167 <sup>c</sup> (2013)	109
	Births attended by skilled health staff/safe deliveries (%)	87.1 <sup>c</sup> (2013)	84

4	<b>HIV/Malaria/Tuberculosis</b>		
	HIV prevalence in 15-49 years (% population)	<b>0.27<sup>e</sup> (2011)</b>	to halt the growth of HIV/AIDS spread and also targets to reverse the spread
	Malaria Annual Parasite Incidence (Per 1000 Population)	<b>0.88<sup>f</sup> (2014)</b>	to halt the growth of malaria incidence and also targets to reverse the spread
	Tuberculosis prevalence (per 100,000 population)	<b>2.11<sup>g</sup> (2013)</b>	to halt the growth of TB incidence and also targets to reverse the spread
5	<b>Water and sanitation</b>		
	Population with access to improved water source (%)		
	Combined	<b>87.8<sup>h</sup></b>	81
	Rural	<b>86.9</b>	80
	Urban	<b>90.1</b>	94
		<b>(2012)</b>	
	Population with access to improved sanitation (%)		
	Combined	<b>46.9<sup>i</sup></b>	68
	Rural	<b>3.7</b>	72
	Urban	<b>81.4</b>	72
		<b>(2011)</b>	

**Sources:**

- a- The state of food insecurity in the world 2009. Economic crisis – impacts and lessons learned. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS Rome.
- b- National Family Health Survey (NFHS - 2005-06)
- c- Sample Registration System Bulletin 2013
- d- The Coverage Evaluation Survey, 2009
- e- HIV Estimation 2012, D/o AIDS Control
- f- Directorate of National Vector Borne Disease Control Programme
- g- Ministry of Health and Family Welfare
- h- National Sample Survey (NSS) 2012
- i- Census 2011

From table 1.3 it is very clear that India is moderately on track, while considering the targets of reducing child mortality as the sharp decline in the recent years in Infant Mortality and Under Five Mortality are likely to take us very near to the target. Also achieving the desired target for ensuring sanitation facility is lagging behind. Similarly, the Country has to strive more to reduce the maternal mortality to reach the desired level.

The MDG achieved its goal by 2015. The MDG's helped to lift more than 1 billion people out of extreme poverty, to work against hunger, to enable more girls to attend school than ever before and to protect our planet. Number of deaths of children under 5 yrs dropped. In developing countries under weight children under 5 yrs fell. New HIV infections declined and existing cases of TB declined. Target of access to safe drinking water was met. A further process was needed to agree and develop development goals from 2015-2030. In this context Sustainable Development Goals (SDG) were adopted by UN General Assembly. A brief review follows:

**Sustainable Development Goals**

On 25 September 2015, the 193 countries of the UN General Assembly adopted the 2030 Development Agenda titled "*Transforming our world: the 2030*



*Agenda for Sustainable Development*". The Official Agenda for Sustainable Development outlines 17 Sustainable Development Goals and its associated 169 targets. This included the following goals:



Goals 1-3 directly address health disparities, primarily in developing countries. These three goals address key issues like Poverty, Health, Hunger and food security. Targets for these three goals are the following:

	TARGETS	
<b>GOAL 1: No Poverty</b>	<b>1.1:</b> By 2030, eradicate extreme poverty for all people everywhere.	<b>1.2:</b> By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty.
<b>GOAL 2: Zero Hunger</b>	<b>2.1:</b> By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	<b>2.2:</b> By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
<b>GOAL 3: Good health and well being</b>	<b>3.1:</b> By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	<b>3.2:</b> By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under 5 mortality to at least as low as 25 per 1,000 live births.

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## 1.8 LET US SUM UP

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In this unit you have learnt about various vital rates (fertility as well as mortality rates) how they are computed, their importance and their use in planning effective health services.

You have learnt that the 1-4 year mortality rate (toddler mortality rate) is the most sensitive indicator of the health status of a population. It is very high in our country, compared to the developed countries. Various schemes are in progress to achieve goals of health.

Fertility rate, birth rate, growth rate, general fertility rates are also high in our country. In this unit you have learnt about methods of computation of each of the fertility rates and their present figure.

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## 1.9 GLOSSARY

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<b>Antenatal</b>	: Before birth
<b>Census</b>	: Complete counting of all individuals on a fixed date
<b>Congenital</b>	: Estimating from birth or before
<b>Crude</b>	: Approximate
<b>Gestation</b>	: Pregnancy
<b>Neonatal</b>	: Infant of 4 weeks old or 28 days old
<b>Puerperal</b>	: Pertaining to child birth
<b>SRS</b>	: Sample Registration System
<b>Vital</b>	: Biological events with significance e.g. births, deaths etc

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## 1.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

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### Check Your Progress Exercise 1

- 1) a) **Vital Rates:** When the vital statistics of morbidity/fertility/mortality are expressed as number of people in a state of illness or number of events (e.g. births/deaths) in relation to total population at risk, it is termed as vital rates.
  - b) **Population Census:** Complete counting of all individuals in a country on a fixed date. It is normally carried out once in ten years.
  - c) **Sample Survey:** Survey of a sample of population for finding useful information like births/deaths/marriages/divorces, etc. Vital Statistics provide useful information about the overall health/nutritional status of a population. It also tells policy makers which age group of population/area needs more health services. It also helps them in setting and evaluating objectives for achieving certain health related targets. In addition it helps them to estimate finances needed for the health programmes.
- 2) • Setting goals for improving health

- Planning health services
- Assessing impact of health services
- Comparative assessment of health status in two or more different groups of people

**Check Your Progress Exercise 2**

- 1) a) one  
b) 28  
c) 1-4  
d) Toddler mortality rate (1-4 year mortality)
- 2) a) Maternal mortality rate reflects the quality of maternal services available to the population. In other words it tells about overall health/nutritional status of married women in the reproductive age group.  
b) Toddler mortality rate is a sensitive indicator of the health status of the community because the first 1-4 years of life is the time of combined nutritional and emotional stress for a child. Children are at higher risk of dying at this age. It helps the programme planners for public health in knowing about the state of health of children and the extent of health services needed to reduce the mortality.

**Check Your Progress Exercise 3**

- 1) a) Number of live births during the year  
b) Live births + Net migrants – death during the year  
c) Number of live births in an area during the year.

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## UNIT 2 FAMILY PLANNING PROGRAMME

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### Structure

- 2.1 Introduction
- 2.2 Population Policy
- 2.3 Development of Family Planning Programme
- 2.4 Family Planning Methods
- 2.5 Beyond Family Planning Measures
- 2.6 Determinants of Family Planning Programme
- 2.7 Effect of Family Planning on Health and Nutrition
- 2.8 Let Us Sum Up
- 2.9 Glossary
- 2.10 Answers to Check Your Progress Exercises

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### 2.1 INTRODUCTION

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The need for family planning assumed importance during the middle of the 20<sup>th</sup> century because of a number of factors. Among these factors rapid decline of mortality in developed as well as in developing countries is the main factor, thanks to the scientific-cum-technological inventions and faster socio-economic development. On the other hand, fertility correspondingly did not decline, since there were no organised interventions initiated to regulate fertility as in the case of mortality. Consequently population growth reached staggering proportions much beyond the ability of developing countries to support the welfare of their populations. Under these circumstances, the United Nations took a lead through the World Health Organisation and UNFPA to evolve programmes to control the rapidly growing population in the developing countries. These efforts of the United Nations agencies were formulated in this regard after the first major World population conference held in Bucharest in 1974. The United Nations ‘Plan of Action’ gave guidance for the member countries to promote family planning for improving the quality of life of their population. Now you may be interested in finding out more about the details of the Indian family planning programme including the national population policy, programmes, various methods of family planning and beyond family planning measures, major factors influencing contraception and the effect of family planning on health and nutrition leading to better quality of life of the population. This unit discusses these major issues.

### Objectives

After studying this unit, you should be able to:

- describe perspectives on population policy;
- discuss the genesis and development of the family planning programme;
- list various methods of family planning;

- identify perspectives on beyond family planning measures;
- describe major determinants of the family planning programme; and
- discuss the effect of family planning on health, nutrition and quality of life.

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## 2.2 POPULATION POLICY

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The development of a population policy facilitates the scientific and speedy advancement of a family planning programme in any country. The importance of regulating rapid growth of population was known to humanity ever since Robert Malthus, the father of population sciences, wrote his famous essays on population as early as in 1797 focusing on the need for accepting family planning and beyond family planning measures. However, population policy per se developed only after the middle of the 20th century. Definite policy formulations for the control of rapid growth of population were adopted by the United Nations as late as 1974. Nevertheless, you may be happy to hear that a pioneering country, which adopted population policy as a part of developmental programmes, as early as in 1952, was India. But our policy developed into a comprehensive plan of action only from 1976.

Population policy outlines a series of specific measures for regulating fertility. It consists of immediate and long-term goals; several strategies like information, education and communication; interventions like mother and child health programmes; efforts for monitoring the programme and managing the administrative set up; contraceptive technology; research and development and promotion of the entire programme in terms of accessibility and acceptability. During the last four decades, several policy measures had been introduced to promote this programme through legal reforms as well. For instance, abortion was legalised in 1972 and age at marriage of girls and boys was raised to 18 and 21 years, respectively by 1978 in India. Now you may ask a question “Is it sufficient for India?” since the mean age at marriage was already 18 years for girls and 23 years for boys in India by 1981.

Of course, there is still a need to raise their age at marriage further. This has been successfully done in China, where legal minimum age at marriage has been fixed at 20 years for girls and 22 years for boys; The latest population policy is the “National Population Policy 2000” (NPP). The new NPP of Government of India deals with women education and empowerment, child health and survival, specific needs of slum, tribal and hill area population and those of disabled and migrant population, increased participation of men in planned parenthood and collaboration with NGOs.

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## 2.3 DEVELOPMENT OF FAMILY PLANNING PROGRAMME

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Although the Indian Government adopted family planning as a part of Five Year Plans right from the First Plan onwards, this programme had many ups and downs during the last four decades. During the first three Five Year Plan periods it received the least financial support. Relatively more political

commitment, supported by increased allocation of finance and seriousness in implementation of this programme was noticed subsequently upto the mid 70s. Nevertheless, even during this period financial allocation made for this programme was less than 3 per cent of the total budget of the Central Government. However, a sudden spurt in promotion of family planning programme was observed during the emergency period (1976-77), followed by an equally indifferent attitude to this programme during the period 1978-80. Subsequently from 1980 onwards, this programme received greater impetus as it advocated the two child norm. The current emphasis is on three elements: “Sons or daughters — two will do” “Second child after three years”, and “Universal Immunization”. However, this programme continues to progress very slowly in India as compared to many other developing countries in the Asian region such as China, Taiwan, South Korea, Thailand, Sri Lanka and Malaysia.

In India, the family planning programme initially came into being as a unipurpose vertical programme fully financed by the Central Government but implemented by the State Governments. After knowing the problem of implementing this programme, it was initially integrated with maternal and child health programmes and later on with total health programmes and made as a part of the multipurpose programme. It has an administrative set up at the National Level (Department of Family Planning), State level (Department of Health and Family Planning), District and PHC (Primary Health Centre) levels. For every three thousand population in hill/tribal areas and for every five thousand population in plain areas, one health sub-centre have been envisaged to promote health and planning at the peripheral level. Within each PHC, doctors, male and female supervisors, multipurpose male and female health workers, dais/community health volunteers are promoting this programme. Although we have a uniform administrative set up for this programme, it has been successfully promoted in certain states like Kerala, Tamil Nadu, Maharashtra and Punjab and poorly implemented in states like Madhaya Pradesh, Uttar Pradesh, Bihar and Rajasthan. In all the other states this programme been developed with varying success. The details of the differential promotion of the family planning programme in India can be seen from the succeeding sections.

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## **2.4 FAMILY PLANNING METHODS**

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The last few years have witnessed a contraceptive revolution, that is, man trying to control the reproductive cycles.

It is now generally recognised that there can never be an ideal contraceptive — a contraceptive that is safe, effective, acceptable, inexpensive, reversible, simple to administer, independent of coitus, long-lasting enough to obviate frequent administration and requiring little or no medical supervision. Further, a method which may be quite suitable for one group maybe unsuitable for another because of different cultural patterns, religious beliefs and socio-economic milieu. As there is no single method likely to meet the social, cultural, aesthetic and service needs of all individuals and communities, the search for an ‘ideal contraceptive’ has been given up. The

present approach in family. planning programmes is to provide a “cafeterial choice”, that is to offer all methods from which an individual can choose according to his needs and wishes and to promote family planning as a way of life. Use of family planning methods ranges from 27% to 74% in India (NFHS 5 data).

The term conventional contraceptives is used to denote those methods that require action at the time of sexual intercourse, e.g. condoms, spermicides etc. Each contraceptive method has its unique advantages and disadvantages. The success of any contraceptive method depends not only on its effectiveness in preventing pregnancy but on the rate of continuation of its proper use.

**Check Your Progress Exercise 1**

1) Why do you think a family planning programme is essential in India?

.....  
.....  
.....  
.....

2) Identify four reasons why the number of children may be high in a poor rural Family Planning family Programme

.....  
.....  
.....  
.....

The contraceptive methods may be broadly grouped into two classes — Spacing methods and Terminal methods as shown here:

**I) SPACING METHODS**

- 1) Barrier Methods
  - a) Physical methods (condom and diaphragm)
  - b) Chemical methods (spermicidal agents)
  - c) Combined methods.
- 2) Intra-Uterine Devices (IUD)
- 3) Homional methods (pills)
- 4) Post conceptional methods (Abortion)
- 5) Miscellaneous methods

**II) TERMINAL METHODS**

- 1) Male sterilization
- 2) Female sterilization

Let us now discuss each category in detail.

Spacing methods as we have already mentioned are the methods which help

to space children i.e. those which are reversible. On the other hand, terminal methods are irreversible.

## SPACING METHODS

### BARRIER METHODS

The use of condoms, diaphragm, spermicidal agents and a combination of the physical and chemical barriers fall under this group.

A variety of barrier or “occlusive” methods, suitable for both men and women are available. The aim of these methods is to prevent live sperm from meeting the ovum. Barrier methods have increased in popularity quite recently because of certain contraceptive and non-contraceptive advantages. The main contraceptive advantage is the absence of side effects of the barrier methods. The non-contraceptive advantages include some protection from sexually transmitted diseases, a reduction in the incidence of pelvic inflammatory disease and possibly some protection from the risk of cervical cancer. Barrier methods require a high degree of motivation on the part of the user. They are only effective if they are used consistently and carefully.

#### a) Physical Methods

- 1) *Condom*: Condom is the most widely known and used barrier device by males around the world and in India. It is better known by its trade name NIRODH, a Sanskrit word meaning prevention. Condom is receiving new attention today as an effective, simple “spacing” method of contraception, without side effects. In addition to preventing pregnancy, condoms protect both men and women from sexually transmitted diseases.

There are basically two kinds of condoms — latex and skin. Latex condoms are by far the most widely used. The condom is fitted on the erect penis before intercourse. The air must be expelled from the teat end to make room for the ejaculate. The condom must be held carefully when withdrawing it from the vagina to avoid spilling seminal fluid into the vagina after intercourse. A new condom should be used for each sexual act.

Condom prevents the semen from being deposited in the vagina. The effectiveness of a condom may be increased by using it in conjunction with a spermicidal jelly inserted into the vagina before intercourse. The spermicide serves as additional protection in the unlikely event that the condom should slip off or tear. A condom is now available in the UK, packed with spermicidal lubricant already in contact with the condom. This seems a real step forward in barrier technology.

The advantages of the condom are: a) they are easily available, b) safe and inexpensive, c) easy to use and do not require medical supervision, d) no side effects, e) light, compact and disposable, and f) provides protection not only against pregnancy but also against STD. The disadvantages are: a) it may slip off or tear during coitus due to incorrect use, and b) interferes with sex sensation locally about which some complain while others get used to it. The main limitation of condoms is



that many men do not use them regularly or carefully, even when the risk of unwanted pregnancy or sexually transmitted diseases is high.

Condoms are available widely and at a very low price. It has been estimated that 72 condoms per year may be needed to protect a couple. Besides commercial outlets, condoms are supplied under social marketing programme.

- 2) *Diaphragm*: The diaphragm is inserted before sexual intercourse and remains in place for not less than 6 hours after sexual intercourse. A spermicidal jelly is always used along with the diaphragm. A small amount of the jelly is smeared around the edge of the diaphragm and on both sides and a teaspoonful of the same is placed inside the cup. The diaphragm holds the spermicide over the cervix. Side effects are practically nil. Failure rate for the diaphragm with spermicide vary between 6 to 12 per 100 woman.

**Advantages:** The primary advantage of the diaphragm is the almost total absence of risks and medical contraindications.

**Disadvantages:** Initially a physician or other trained person will be needed to demonstrate the technique of inserting the diaphragm into the vagina and to ensure a proper fit. After delivery it can be used only after involution of the uterus is completed. Practice of insertion, privacy for this to be carried out and facilities for washing and storing the diaphragm precludes its use in most Indian families, particularly in the rural areas. Therefore the extent of use has never been great. Variations of the diaphragm includes the cervical cap, vault cap and vimule cap. These devices are not recommended in the National Family Welfare Programme.

### **Chemical Methods**

In the 1960s before the advent of IUDs and oral contraceptives, spermicides (vaginal chemical contraceptives) were used widely. They comprise the following categories viz.

- a) Foam tablets / foam aerosols
- b) Creams, jellies and pastes — squeezed from a tube
- c) Suppositories — inserted manually
- d) Soluble films— film inserted manually.

The spermicides contain a base into which a spermicide is incorporated. The commonly used modern spermicides are “surface active agents’ which attach themselves to spermatozoa and inhibit oxygen uptake and kill sperms.

The main drawbacks of spermicides are: a) they have a high failure rate, b) they must be used almost immediately before intercourse and repeated before each sex act, c) they must be introduced into those regions of the vagina, where sperms are likely to be deposited and d) they may cause mild burning or irritation besides messiness. The spermicide should be free from potential systemic toxicity. It should not have an inflammatory or carcinogenic effect

on the vaginal skin or cervix. No spermicide which is safe to use has yet been found to be really effective in preventing pregnancy when used alone. Therefore, spermicides are not recommended by professional advisers. They are best used in conjunction with barrier methods. Recently there has been some concern about possible teratogenic effects on foetuses, following their excessive use. However, this risk is yet to be confirmed.

### **INTRAUTERINE DEVICES (IUDs)**

The control of conception by introducing a foreign body into the uterus is not new. This principle was known to the Arabs in the Middle East, who were controlling conception in camels by introducing a small round stone into each horn of the uterus. The Japanese were the first to utilise plastic material in the manufacture of IUDs, which led to the development of our modern IUDs. The rapid increase in the world population led to a reawakening of interest in intrauterine contraception. The percentage of married women using IUDs in the age group of 15-49 years is 47% in Korea, (DPR) 26.2% in China and only 1.2% in India. (2019, un-2019-contraceptive use by method). In India, during 2011 about 5.6 million IUD insertions were reported.

#### **Lippes Loop**

Lippes Loop is double-S shaped device made of polyethylene, a plastic material that is non-toxic, non-tissue reactive and extremely durable. It contains a small amount of barium sulphate to allow X ray observation. The loop has attached threads or “tail” made of fine nylon, which projects into the vagina after insertion. The tail can be easily felt and is a reassurance to the user that the loop is in its place. The tail also makes it easy to remove the loop when desired.

The Lippes loop exists in four sizes, A,B,C and D; the latter being the largest. A larger sized device usually has a greater anti-fertility effect and a lower expulsion rate but a higher removal rate because of side effects such as pain and bleeding. The larger loops (C and D) are more suitable for multiparous women. The loop is manufactured in India in two sizes 27.5 mm and 30 mm. For purposes of identification the tail of the smaller loop is black and that of the larger loop yellow. The device has now been given a slightly bulbous tip to reduce the risk of perforation. The loop may be left in the uterus as long as desired if there are no major problems. The Government of India in 1965 introduced the loop in the National Family Planning Programme.

- a) *Copper T*: Most widely used in the UK and USA. It is shaped like a numeral seven and has 200 sq.mm. surface area of copper wire around the plastic stem. The metallic copper was found to have a strong anti-fertility effect. The manufacturer recommends that it be replaced every three years. A number of copper bearing devices are now available commercially. The new variants of the T device are TCu-220C, TCu-380A or Ag and Nova T. Nova T and TCu-380Ag are distinguished by a silver case over which is wrapped the copper wire.
- b) *Multiload devices* : The Multiload (ML) device, widely used in Western Europe and in Indonesia, has two arms made of flexible plastic that bow

out and around from the top of the stem and point towards the stem's midpoint, each arm has five short fins on its outer surface. The Multiload comes in two presentations. ML CU-250 and MI CU-375. The former has a recommended life span of three years and the latter five years.

### **Advantages of Copper Devices:**

- Low expulsion rate
- Lower incidence of side-effects e.g., pain and bleeding
- Easier to fit even in nulliparous women (women without children)
- Better tolerated by nullipara
- Increased contraceptive effectiveness
- Effective as post-coital contraceptives, if inserted within 3-5 days of unprotected intercourse.

### **HORMONAL CONTRACEPTIVES**

Hormonal contraceptives when properly used are the most effective spacing methods of contraception. Oral contraceptives of the combined type are almost 100 per cent effective in preventing pregnancy. They provide the best means of ensuring spacing between one childbirth and another. More than 65 million in the world are estimated to be taking the "pill" of which about 10 million are estimated to be in India.

#### **Oral Pills**

The pill is given orally for 21 consecutive days beginning on the 5th day of the menstrual cycle (for a few preparations of 20 or 22 days are advised), followed by a break of 7 days during which period menstruation occurs. When the bleeding occurs this is considered the first day of the next cycle.

The bleeding which occurs is not like normal menstruation but is an episode of uterine bleeding from an incompletely formed endometrium caused by the withdrawal of exogenous hormones. Therefore, it is called "withdrawal bleeding" rather than menstruation. Further, the loss of blood which occurs is about half that occurring in a woman having an ovulatory cycle. If bleeding does not occur the woman is instructed to start the second cycle one week after the preceding one. Ordinarily, the woman menstruates after the second course of pill intake.

The pill should be taken every day at a fixed time, preferably before going to bed at night. The first course should be started strictly on the 5th day of the menstrual period, as any deviation in this respect may not prevent pregnancy. If the user forgets to take a pill, she should take it as soon as she remembers and then she should take the next day's pill at the usual time.

The Department of Family Welfare, in the Ministry of Health and Family Welfare, Family Planning Government of India, has made available oral pills under different brand names to the consumers free of cost and under social marketing scheme.

## **Emergency Contraceptive**

Emergency contraceptive pill has been introduced for the first time under Family Welfare Programme during 2002-03. The emergency contraceptive is the method that can be used to prevent unwanted pregnancy after an unprotected act of sexual intercourse — including sexual assault, rape or sexual coercion or contraceptive failures. Emergency contraceptive is to be taken on prescription of Medical Practitioners.

## **Post-Conceptional Methods (Abortion)**

### **Menstrual Induction**

This is based on disturbing the normal progesterone, prostaglandin balance by intrauterine application of 1-5 mg. solution (or 2.5 -5 mg. pellet) of prostaglandin F<sub>2</sub>. Within a few minutes of the prostaglandin impact, performed under sedation, the uterus responds with a sustained contraction lasting about 7 minutes followed by cyclic contractions continuing for 3-4 hours. The bleeding starts and continues for 7-8 days.

## **MISCELLANEOUS METHODS**

### **SAFE PERIOD**

In order to use this method, the couple should know when the woman's body produces an ovum. Around this time, they should avoid sexual relations if they want to avoid conception. Ovulation (release of ovum in the woman's body) occurs from 12 to 16 days before the onset of menstruation. The first day of bleeding is taken as the number one day of the menstrual cycle. So the safe days for intercourse would be before 8<sup>th</sup> day and after 21<sup>st</sup> day of any menstrual cycle. Disadvantages of the method are that the woman's menstrual cycle is not always regular. It needs a high degree of motivation and discipline. There are high failure rates.

### **TERMINAL METHODS**

Voluntary sterilization is a well-established contraceptive procedure for couples desiring no more children. Currently female sterilizations account for 85 per cent and male sterilizations for 10-15 per cent of all sterilizations in India in spite of the fact that male sterilization is simpler, safer and cheaper than female sterilization.

Sterilization offers many advantages over other contraceptive methods. It is a one-time method, it does not require sustained motivation of the user as it provides the most effective protection against pregnancy, the risk of complications is small if the procedure is performed according to accepted medical standards and it is most cost effective. It has been estimated that each procedure averts 1.5 to 2.5 births per woman.

### **Male Sterilization**

Male sterilization or vasectomy being a comparatively simple operation can be performed even in primary health centres by trained doctors under local anaesthesia. When carried out under strict aseptic technique, it should have

no risk of mortality in vasectomy. It is customary to remove a piece of vas at least 1 cm. after clamping. The ends are ligated and then folded back on themselves and sutured into position so that the cut ends face away from each other. This will reduce the risk of recanalisation (rejoining) at a later date. It is important to stress that the acceptor is not immediately sterile after the operation. Health Indicators usually until approximately 30 ejaculations have taken place. During this intermediate period another method of contraception must be used. If properly performed, vasectomies are almost 100 per cent effective.

Following vasectomy, sperm production and hormone output are not affected. The sperm produced are destroyed intraluminally by phagocytosis. This is a normal process in the male genital tract, but the rate of destruction is greatly increased after vasectomy. Vasectomy is a simpler, faster and less expensive operation than tubectomy in terms of instruments, hospitalization and doctors training-cost-wise, the ratio is about 5 vasectomies for one tubal ligation.

### **Female Sterilization**

Female sterilization can be done as an interval procedure, postpartum or at the time of abortion. Two procedures have become most common, namely laparoscopy and minilaparotomy.

#### *Laparoscopy*

This is a technique of female sterilization through abdominal approach with a specialised instrument called a “laparoscope”. The abdomen is inflated with gas (carbon dioxide, nitrous oxide or air) and the instrument is introduced into the abdominal cavity to visualise the tubes. Once the tubes are accessible the fallope rings (or clips) are applied to occlude or block the tubes. This operation should be undertaken only in those centres where specialist obstetricians/ gynaecologists are available. The short operating time, shorter stay in hospital and a small scar are some of the attractive features of this operation.

#### *Minilap Operation*

Minilaparotomy is a modification of abdominal tubectomy. It is a much simpler procedure requiring a smaller abdominal incision of only 2.5 to 3 cm. conducted under local anaesthesia. The minilap/pomeroy technique is considered a revolutionary procedure for female sterilization. It is also found to be a suitable procedure at the primary health centre level and in mass campaigns. It has the advantage over other methods with regard to safety, efficiency and ease in dealing with complications. Minilap operation is suitable for postpartum tubal sterilization.

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## **2.5 BEYOND FAMILY PLANNING MEASURES**

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The term “Beyond family planning” was popularised by Bernar Berelson and Philip M. Hauser. According to these authors, certain non-family planning measures can also regulate the growth of population. In this context they focused on the importance of raising the age at marriage of boys and girls,

medical termination of pregnancy (MTP); voluntary and involuntary separation are examples of beyond family planning measures. Now you may be wondering as to how they can regulate the population growth.

### **Raising Age at Marriage**

Females in India traditionally marry soon after puberty. Such women have a prolonged fertile reproductive period of 30-35 years for conception. This is because the mean age at puberty in India ranges from 12 to 14 years. The mean age at effective marriage of females of all ages in India in 2006 was 19.8 years resulting in a total fertility rate of 2.8. When female age at marriage is legally raised to 20 years or more, the probability of averting the future births may go up to 20-25 per cent. When it is further raised to 23 years, it may have still greater scope to prevent more births. However, our present minimum legal age of marriage of 18 years for girls is not adequate because of primary sterility existing for 1-2 years after puberty. In addition, if age at marriage is raised to 20 years or more, several advantages will be there. For example girls will have opportunity to get education, develop physical and mental maturity and a sense of planning in life besides minimising the risk of infant and maternal mortality. When age at marriage for girls is raised, maternal and child health can be assured and their longevity can become a reality. Therefore, education/counselling for raising age at marriage of girls forms a powerful beyond family planning measure to regulate population growth.

### **Medical Termination of Pregnancy**

Abortion is theoretically defined as termination of pregnancy before the foetus becomes viable (capable of living independently). This has been fixed administratively at 28 weeks, when the foetus weighs approximately 1000 gm. Abortion is sought by women for a variety of reasons including birth control. As referred to earlier, MTP was legalised in India by 1972. Through voluntary abortion, many countries successfully regulated rapid growth of population avoiding unwanted births. In fact, 75 per cent of the success of Japan's family planning programme has been attributed to induced abortion. In addition, most of Scandinavian countries in Europe regulated their population growth largely through induced abortion. However, in India it remains as a taboo and those who resort to abortion use mostly indigenous and unscientific methods which is affecting the health and longevity of women. In India every year 6.7 million abortions take place and out of which 5.7 million are illegal abortions. No doubt it varies between rural and urban areas, in different communities and states. But these abortions do not contribute much in bringing down birth rate in India because most of the women resorting to induced abortion already have high parity.

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## **2.6 DETERMINANTS OF FAMILY PLANNING PROGRAMME**

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The success of the family planning programme in a developing country is dependent upon multi-dimensional factors. When a country is developed, negative factors of family planning get reduced in number. On the other

hand, in a developing country social backwardness and many cultural barriers are detrimental to the progress of the family planning programme. The success of a family planning programme in a developing country depends upon 1) the type of management including change agents, training, motivation, efficiency and availability, 2) resources-available for contraceptives and medicines, 3) vehicles and transport facilities available on a regular and timely basis, 4) out-reach of the programme through multiple channels including Government and NGOs, 5) strategies effectively used for the promotion of the programme including IEC programmes, incentives, disincentives, etc., 6) developmental priorities given for the education of females, 7) health and nutrition programmes, 8) involvement of community and their participation in creating social support, etc These are only a few determinants of the family planning programmes but many more factors at micro-level are also equally important for the success of the family planning programme.

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## 2.7 EFFECT OF FAMILY PLANNING ON HEALTH AND NUTRITION

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Family planning programmes address important health problems. Maternal and infant death rates are extremely high in the developing world. Reported maternal mortality ratio for instance are about, 33 per 100,000 births in Mexico and 342 in Kenya, about 19 in the US and 7 in UK (2017, data.worldbank.org). The complications of pregnancy account for 10 to 30 per cent of deaths among women of reproductive age.

Deaths among children also are shockingly frequent. The death rate is as high as 31 in developing countries as compared to industrialized countries where it is 3 for infants under age one. Mortality rate of children below 5 years is only 4 in industrialized countries as compared to more than 71 in developing countries (data.worldbank.org, 2019). Children under age five make up 14 per cent of the population in developing countries but account for up to 80 per cent of the deaths each year. By contrast, in developed countries children under age five make up 8 per cent of the population but account for less than 3 per cent of deaths.

In African countries one out of every four children dies before reaching adolescence, compared with one in 40 in developed countries.

**Avoiding High-Risk Pregnancies:** Family Planning is an effective way to prevent maternal and infant mortality because family planning can help couples avoid high-risk pregnancies. Evidence from around the world shows that the risk of maternal or infant illness and death is highest in four specific types of pregnancy:

- 1) pregnancies before age 18,
- 2) pregnancies after age 35,
- 3) pregnancies after four births, and
- 4) pregnancies less than two years apart.

In other words, pregnancies can be considered high-risk if women are “too young, too old” or “if children are too many, too close”. In parts of Europe and North America as much as one-quarter of the decline in infant mortality in recent decades occurred because fewer and fewer births took place among older women with many children.

In developing countries today about 5.6 million infant deaths and 200,000 maternal deaths could be avoided if women chose to have their children within the safest years with adequate spacing between births and completed families of moderate size. This amounts to about half of the estimated 10.5 million infant deaths and 450,000 maternal deaths now occurring and represents the combined effect of fewer births and lower death rates.

### **Family Planning: Effective and Safe Prevention**

The wide choice of family planning methods now available allows health programmes to offer an appropriate method to avoid each type of high-risk pregnancy. For example, oral contraceptives, condoms, and spermicides are particularly appropriate to postpone the first pregnancy and to space births, whereas voluntary sterilization is highly effective for older couples who want no more children.

Modern family planning methods are safe. Contraceptive products are not toxic even if used incorrectly—an important consideration for community-based or non-medical distribution. For some methods, such as condoms, spermicides, and natural family planning, the only important risks are those of accidental pregnancy. Other methods may pose only rare risks, many of which can be reduced by following simple guidelines. With all methods, family planning in developing countries is much safer than child-bearing.

Moreover, some methods provide benefits beyond the control of fertility. Condoms and spermicides prevent the spread of venereal disease. Oral contraceptives reduce some menstrual problems and help to protect against pelvic inflammatory disease, cancer of the uterine lining, cancer of the ovaries, anaemia, and rheumatoid arthritis.

### **Maternal and Child Health Family Planning**

There has long been evidence from developed countries that pregnancies “too young, too old, too many, too close” endanger maternal and infant health. Now there is new evidence that meets more rigorous standards of modern epidemiology — that these adverse effects are as strong or stronger in developing countries. In all settings pregnancies among adolescents, women over 35, and women with many previous births are more likely to involve life-threatening complications such as haemorrhage and high blood pressure. Closely spaced births may contribute to malnutrition and other maternal health problems.

The infants born as a result of high-risk pregnancies are even more vulnerable. Spacing of less than two years between births is especially hazardous because it means lower birth weights and poorer nutrition, possibly including a shorter period of breast-feeding or more competition for family resources and care. From infancy to adolescence, children born into large or



closely spaced families experience more sickness, slower growth, and lower levels of academic achievement. Lower socio-economic status has similar effects, but birth patterns also are important.

Family planning programmes cannot guarantee maternal and infant health, but by protecting families against high-risk pregnancy, family planning saves lives and reduces illness.

### Check Your Progress Exercise 2

1) Fill in the blanks:

- i) India's family planning programme experienced success before..... and problems during .....periods.
- ii) Temporary family planning methods are meant for.....
- iii) The first country to adopt family planning in the world is.....
- iv) Terminal methods of family planning are..... and.....
- v) Failure of family planning is largely due to problems resulting from the... ..and..... factors.
- vi) M.T.P. stands for.....
- vii) Abortion can be done upto the end of..... week.

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## 2.8 LET US SUM UP

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Now let us recapitulate in brief on what has been discussed so far. This unit gave a resume of policy perspectives and emphasised the importance of raising female age of marriage and liberalisation of induced abortion. Subsequently, historical development of the family planning programme after independence in India under different Governments, which gave varying emphasis to this programme has been discussed. Family Planning methods—spacing and terminal are discussed. These were followed by giving an overview of major determinants of the family planning programme. At the end, in brief, certain salient implications of family planning on health and nutrition have been highlighted.

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## 2.9 GLOSSARY

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- Abortion** : Expulsion of product of conception from the uterus before it is viable i.e., before the end of the 28th week.
- Beyond Family Planning** : Measures other than family planning used to regulate population growth like age at marriage.
- Menstrual Induction** : Removal of fertilised ovum from uterus by prostaglandins.
- Population Policy** : Deals with goals, strategies, short term and long term-cum-direct and indirect developmental measures, reforms, etc. adopted by the

**Strategies**

: Refers to various effective measures used to promote interventions/programmes.

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## **2.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES**

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### **Check Your Progress Exercise 1**

Both questions require you to think carefully before you answer. The answers are hinted at in the unit but not outlined in detail.

### **Check Your Progress Exercise 2**

- i) 1976; 1976-80
- ii) Spacing of children
- iii) India
- iv) Tubectomy and vasectomy
- v) Programme and client's background
- vi) Medical Termination of Pregnancy
- v) 28

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## **UNIT 3 ASIAN PERSPECTIVES ON HEALTH AND QUALITY OF LIFE**

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### **Structure**

- 3.1 Introduction
- 3.2 Health Policy and Perspectives in Asia
- 3.3 Health Infrastructure and Inputs
- 3.4 Sanitation and Water Supply
- 3.5 Strategies and Education
- 3.6 Quality of Life in Asia
- 3.7 Let Us Sum Up
- 3.8 Glossary
- 3.9 Answers to Check Your Progress Exercises

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### **3.1 INTRODUCTION**

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Among the Asian countries, China, Thailand, Indonesia, Sri Lanka, Democratic People's Republic of Korea (DPR Korea), Malaysia and Taiwan have made significant advancements in promotion of health and improvement in quality of life of their population. No doubt, Singapore and Hongkong are equally important in this context, but they are very small countries for comparison purposes. The experiences of some of these countries will be very valuable for promoting health programmes in other sister Asian countries like India. However, availability of data is a hindrance and therefore, comparative perspectives on health from a few Asian countries have been attempted in this unit. They include China, Indonesia, Thailand, Sri Lanka, DPR Korea, Bangladesh and India. Among these, except India and Bangladesh, the other five countries have progressed considerably, in many aspects of health promotion. As you go through this unit, you will realise that India and Bangladesh are lagging behind in most of the health profiles. Therefore, contrasting comparison of health perspectives in these seven countries of Asia gives meaningful and representative information on Asia in general.

The discussion is focussed on available data on various dimensions of health among these countries, which include: GDP spent on health, medical care as percentage of total household consumption, access to safe drinking water, doctor-population ratio, access to health services, access to sanitation, coverage of immunization, care of pregnant women and children by trained personnel, low birth weight, proportion of undernourished population, infant and childhood mortality maternal mortality, longevity communication technology, percentage of adult female literacy rate and contraceptive prevalence. All these aspects together will provide the profile of health and quality of life of populations in developed and less developed Asian countries.

## Objectives

After studying this unit, you should be able to:

- list the policies and programme aspects related to health promotion in selected Asian countries;
- compare the health status, epidemiological transition and mortality levels among seven of the major Asian countries;
- discuss the nature of inputs in health promotion programmes; and
- assess the level of quality of life in terms of (a) Communication technology (b) Education of women (c) Calorie intake (d) Contraceptive prevalence rate and Life expectancy.

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## 3.2 HEALTH POLICY AND PERSPECTIVES IN ASIA

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The seven countries of Asia i.e. China, Indonesia, Thailand, DPR of Korea, Sri Lanka, Bangladesh and India, more or less began their independent existence during the early 1950s. Further they also promoted their respective National Health promotion programmes during the same decade. However, these countries follow differential health policies particularly in terms of investment made in the health sector, which may be a major determining factor in their differential success in this sector of social development. The total expenditure on health as a percentage of Gross Domestic Product (GDP) was 2.34% in Bangladesh 5.35% in China, 2.87% in Indonesia, 3.54% in India, 3.79% in Thailand and 3.76% in Sri Lanka in 2018. In China, most of the health facilities are provided free by the Government of China. In spite of free medical care, the Chinese people spent one per cent of their family income for medical care. Thus, in the National Health Policies of these Asian countries differential investment and emphasis have been given by the government as well as the people. As you may see subsequently, China made a breakthrough in improving the quality of life of the population through effective health policies, it is because China had given high priority to health promotion programmes in their overall development programmes as compared to other Asian countries.

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## 3.3 HEALTH INFRASTRUCTURE AND INPUTS

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As you know, health infrastructure consists of several parameters which have direct and indirect influence on health status of the people. These factors include aspects like health personnel viz., doctor-population ratio, nurse-population ratio, peripheral worker population ratio, bed-population ratio, distance to hospital, transport facilities, availability of specialists, super specialities, hospital facility and so on. Out of these factors, you may see certain high priority factors discussed below.

### Health Delivery Personnel

- a) **Doctors/Physicians:** In most of the Asian countries more or less similar hierarchy of staff, types of hospitals and human resource development

programmes are observed. However, facilities for human resource development in the field of health care are more available in China and India but very inadequate in the rest of the Asian countries. Therefore, these small Asian countries depute their candidates to India, England and other developed countries for training in the field of medicine. Of course, they have facility for training peripheral workers in the field of health. Despite these deficiencies noticed in human resource development in most of the small Asian countries they do not lag behind the big countries like India and China in the health delivery system.

**Table 3.1: Doctors/Physicians and Nurses and midwives per 1000 population**

Countries	Doctors/Physicians per 1000 population	Nurses and midwives per 1000 population
China	1.4	1.4
India	0.9	2.4
Indonesia	0.5	3.8
Thailand	0.9	3.2
Democratic People	3.7	4.4
Republic of Korea (DPR Korea)	(2017)	(2017)
Bangladesh	0.6	0.4
Sri Lanka	1.2	2.3

**Source:** World Development Indicators, 2019.

As you can see from the table above, Korea (DPR) has the best advantage of having 3.7 doctors per 1000 population followed by China (1.4). India have 0.9 doctors per 1,000 as against 0.6 in Bangladesh. In other words, number of doctors in Indonesia and Bangladesh are not even half of the number in Korea (DPR). It is most critical infrastructural facility for better health delivery system in any country. Therefore, inadequate number of doctors to serve the rural population is the key factor for the general poor health delivery system in most of the Asian countries. Although India is fortunate in this context, there is distortion in the distribution of doctors in our country because more than two-third of the doctors concentrate in urban areas to serve only one-fifth of the total population.

- b) Nurses and midwives:** As regards the availability of nurse-population in Asian countries, Korea (DPR) tops all other Asian countries having 4.4 nurse per 1,000 population. Surprisingly, India has a moderate nurse-population ratio (2.4 per 1,000). Interestingly Sri Lanka also has a favourable nurse-population of 2.3 per 1,000 but not a doctor-population. The service rendered in the field of health delivery systems is far from satisfactory. Should we not identify the factors for this problem and provide a remedy on a war footing?
- c) Peripheral workers:** Outreach of the programme at the peripheral level depends very much on the number and nature of peripheral functionaries employed in a country. Such services are well organised in China and brought through the barefoot doctors and so also in South Korea but not in other Asian countries. Although India has a large number of

indigenous Dais and so also Dukuns in Indonesia, they have not been trained, and effectively used in these countries. In addition, there is no systematic involvement of these people in health programmes. In addition, India produces the largest number of qualified nurses in Asia and so also doctors but a very large number of them leave India to serve in other countries. Such a peculiar situation is not there in most of the Asian countries. Therefore, should we not have a rethinking on human resource development in the field of health, manpower planning and successful utilisation of trained man-power in a need-based equitable manner in rural and urban areas as has been done successfully in China?

Utilisation of the existing health facilities by the people concerned is another problem noticed in Asian countries. It varies from country to country. However, in most of the Asian countries, except China, 50 per cent or more of the health facilities are not being used by the people. It amounts to colossal waste of investment and various inputs in the field of health. For instance, when three-fourths of the health facilities in China have been used by the people, hardly one-third of the facility is being used in India. No doubt, it tremendously varies in India. It is being used by over 80 per cent of the population in Kerala, whereas in Uttar Pradesh the same facility is not being made use of by even one-fifth of the population. In addition, excess health facilities exist in urban areas and very inadequate facilities exist in rural areas. Should we not do something in this regard?

Distortion in health inputs exists in certain Asian countries particularly in India. While China gives highest priority to the rural peripheral health delivery system, in India maximum input is provided to urban hospitals and creation of super speciality hospitals. In fact most of the patients may not need super speciality facilities. Therefore, how for is it justifiable in investing more money for a minority of population living in urban neglecting the majority of the population living in rural areas? In the two biggest countries of Asia, namely China and India, health delivery is well taken care of in some part the countries but not in others. In addition, certain regions where ethnic minorities (in China) and tribals (e.g. in India) live are not served properly by health care programmes. Such distortions are seen in other Asian countries as well.

Inputs of the health programmes also include: immunization, oral rehydration therapy (ORT), access to health services and communication technology. All these inputs substantially vary across these Asian countries. The following table will give you an overview of the inputs provided through the health delivery system in Asian countries.

**Table 3.2: Different service inputs – immunization, ORT use rate and access to health services**

Immunization (%) 2020								
Countries	1 year old children immunized against						% New borns protected against tetanus	% under five-with diarrhea receiving oral rehydration
	TB	DPT1	DPT3	Polio	Measles			

							and continued feeding ( 2009)
China	99	99	99	99	99	NA	NA
India	85	87	85	81	89	90	50.6
Indonesia	87	83	77	37	76	85	38.8
Thailand	99	99	97	97	96	98	72.5
DPR Korea	99	98	97	98	99	98	74
Bangladesh	99	99	98	96	97	98	77
Sri Lanka	99	96	96	96	96	99	51.1

NA – Not Applicable

**Source:** The State of the World's Children, UNICEF Maternal and Newborn Health. [who.int/data/gho/data/indicators](http://who.int/data/gho/data/indicators) **Internet Source:** [data.unicef.org/topic/childhealth/](http://data.unicef.org/topic/childhealth/)

A comparison of various inputs of health promotion programmes in the seven Asian countries gives a general picture of the preventive and curative service and service facilities in these respective countries. Regarding preventive care (e.g. to immunization programmes) the programme related to prevention of TB by administering BCG has become almost universal in most of these countries. Similarly, DPT, polio and measles vaccinations have spread extensively in most of the countries. India is yet to strengthen her preventive care services. In all these preventive measures India is behind most of the progressive Asian countries.

Moreover provision of tetanus toxoid to pregnant women to prevent risk to the life of mother and child and promotion of ORT to avoid dehydration deaths of children resulting out of diarrhoea are yet to become universal in many countries; in fact their coverage range is between 25-75 per cent only in several countries. Further overall accessibility to health care service in general also falls short of the real requirements in Indonesia and India. On the contrary China, Sri Lanka, DPR Korea and Thailand succeeded extensively in promoting these programmes. Thus, most of the Asia countries have achieved greater success in health care. However, India and Indonesia and such other countries in Asia have to go a long way to achieve complete coverage in health promotion programmes 'particularly prevention of communicable diseases.

### 3.4 SANITATION AND WATER SUPPLY

Sanitation and water supply are two sides of the same coin that affect the health status in rural and urban areas. Their status and availability deteriorate as a result of population pressure (density). In addition, they also reflect the level of development of a country. In fact, level of sanitation and availability of water supply are very unsatisfactory in most of the developing countries but not in the developed countries. Of course, rapid urbanisation and industrialisation adversely affected the sanitation in most of the mega cities even in the developed countries. As a result of education and modernisation, sanitation improved in the developed countries but it remained very low in developing countries because of the low social development of their population. Similarly, water supply (safe drinking water) is becoming a

scarce commodity as a result of rapid growth in population and ecological changes. When population grew rapidly and ecology was disturbed by denuding rain forests, safe drinking water became scarce. According to World Bank more than 785 million people did not have access to atleast basic water services and more than 884 million people did not have safe water to drink (2017, [cdc.gov/healthywater](http://cdc.gov/healthywater)). Two billion people still do not have basic sanitation facilities such as toilets ([who.int/news](http://who.int/news), 2019). This is true in most of the Asian countries. For instance, drying up of the Cauveri river in the southern part of India is a classical example of ecological degradation which affects the sanitation condition in Karnataka and Tamil Nadu states.

**Table 3.3: Percentage of population with access to safe water and sanitation**

Countries	% of population with access to	
	Improved drinking water	Improved Sanitation
China	94.3	69.7
India	90.5	45.9
Indonesia	92.4	59 (2012)
Thailand	100	25.9
DPR Korea	93.8	82 (2012)
Bangladesh	97.7	38.7
Sri Lanka	92.2	92 (2012)

Source: World Development Indicator 2020.

When you look at Table 3.3 and compare the scenario of availability of safe drinking water, significant differences are noticed among the seven Asian countries. Countries like Bangladesh and Thailand are on the top with respect to provision of safe drinking water to almost the entire population. The other Asian countries – China, India, Indonesia, Sri Lanka and Korea (DPR) are not so far behind in providing these basic necessities of life to their population. Now, you may be wondering as to how it is important for health promotion.

Do you know that diarrhoea and dysentery are water-borne diseases and form the major killers of infants in developing countries. In addition, cholera epidemics are also caused through water or food. Similarly, jaundice, typhoid, etc., are also spread through the medium of water and food. Now, you may be aware why safe drinking water is important for health promotion.

The level of sanitation reflects the development of a country. It is better in developed countries than in the developing nations. No doubt, it also reflects the cultural diversities of the population because beyond development, sanitation is also conditioned by the culture of the population. For instance, sanitation is of a very high order in Kerala particularly among the Kurichia tribe in the Malabar region and also among certain sects of Brahmins who are generally educated. A similar situation exists particularly in Korea (DPR) and Sri Lanka. India's performance in sanitation is very poor and is above Thailand and Bangladesh.

Sanitation promotes health status of the people. How to develop consciousness on health and sanitation should be our major concern today



because sanitation adversely affects the health condition of the population leading to several endemic diseases. Dreaded diseases like cholera and several other communicable diseases can be controlled only when sanitation is improved. Now, let us see how sanitation exists in Asian countries.

Among the Asian countries, Sri Lanka lead with universal better sanitation which is not there in all other Asian countries except Japan. Next to them, Sri Lanka has progressed considerably in the promotion of better environmental sanitation. India, Thailand and Bangladesh are at the bottom level with very poor sanitation facilities compared to most of the other Asian countries. Now you may get a realistic picture about sanitation in the context of developing countries of Asia and not to speak of the developed countries in the world. Therefore, improvement of sanitation assumes a very high priority for the promotion of health in India.

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### **3.5 STRATEGIES AND EDUCATION**

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Strategy followed for health delivery system is different in different Asian countries. In this context, the Chinese experience is unique. Two important strategies followed in China are worth emulating for the rest of the Asian countries including India. (1) They have a successful bare-foot doctor, who can reach most of the population throughout China. These bare-foot doctors are diploma holders in medicine. In fact, they are selected from all walks of life and given 3 years integrated training in medicine covering the indigenous Chinese system of medicine with the allopathic system of medicine. China has an army of bare-foot doctors to cater to the needs of the population, (2) The second novelty of the Chinese health delivery system is called the family bed system. In China patients will be screened while visiting the hospitals and most of the patients will be sent back to their families after diagnosis and they are rendered service in their respective homes by the bare-foot doctors. Such service minimises the need for more number of hospitals and in addition psychologically gives confidence to the patients which is a major prerequisite for curing the disease. These systems of service followed in China deserve replication and emulation in our country too. The strategy of using different systems of medicine is found to vary in different Asian countries. In this context, once again China is in the forefront. For instance, acupuncture is not only popular throughout China but is also being practised in several developed countries. Similarly, utilisation of indigenous herbs and bio-medicines, like Ginseng which is found to be effective for longevity are very popular in China and Korea. In fact the Chinese diet itself is very appropriate for healthy living because they consume only a cup of rice during lunch and dinner and the rest are supplemented by fish, meat and vegetables. In DPR Korea and Indonesia also peripheral indigenous workers are very popular and useful for health delivery system. They also use the indigenous system of medicine and services. In India we have ayurveda, homeopathic and unani systems of medicine along with the allopathic system. They are not suitably made use of in most states of India except in Kerala and Gujarat. In fact, several medicines of these systems are very effective for health promotion and they are cost-effective as well. Therefore should we neglect them and have prejudice against these indigenous systems of medicine? What

should be done to improve their utilisation in our country? When we improve the utilisation of these systems of medicine throughout India we may also make a breakthrough in controlling certain diseases and epidemics like in China and DPR Korea.

**Health Education:** Health Education can be defined as the art of applying social and health sciences to facilitate the development of healthy life styles and behaviour among people. Information, communication, motivation and media are essential and integral components of health education. It helps people become health conscious and develop a high value for health. It involves multi-disciplinary team work in planning educational strategies, in designing multi-media campaigns, in effective use of electronic and mass media and in folk communication activities. It is the art of working with people of various backgrounds to satisfy, their needs by their own actions and resources and by mobilising the resources of other sectors. Its main function is to create appropriate educational opportunities in varying environments for people to make their own enlightened decisions and act upon them. For this purpose, it uses home, market, and meeting place (community health education), school (school/student health education), work place (industrial health education), hospital (patient education), and employs methods and media suitable to the target groups and problems (Ramakrishna, 1992: 18).

Health promotion can be achieved largely through health education. It is a cost-effective, trouble free and appropriate service for the promotion of health. However, it is differentially promoted in several Asian countries with varying success rates.

Although health policies of most of the Asian countries provide priority for health education in the policy document, at the implementation stage priority is shifted to curative services neglecting health education. It is largely due to the defective human resources development on the part of the clients. If health education is promoted seriously, morbidity and mortality can be effectively prevented. In fact, health education and its importance is not only increasing in the context of changing patterns of morbidity but also become necessary to prevent the dreadful diseases like AIDS and cancer.

Cultural practices may be beneficial or harmful in a society. Health education should identify such beneficial practices for introducing appropriate education for healthy living. In this context, life style is the most important aspect of the culture. In fact, life style forms the major determinant of cancer, AIDS, cardiovascular diseases and diabetes today. It is well known that smoking and chewing of tobacco cause oral cancer. Sexual hygiene has been linked to cervical cancer. Likewise oral hygiene is related to mouth cancer and the intake of fibrous food checks colon cancer. All these are culturally determined.

Similarly the type of sexual practices, hygiene involved and the use of condoms determine the occurrence of AIDS. Value attached to chastity is well known in several Asian countries. Of course, its degree varies from community to community. Such a value system is positive cultural trait that prevents AIDS.

Another major disease like a cardiovascular problem is again caused largely by life style factors. For instance, excessive intake of fat, status syndrome associated with obesity, food habits, and sedentary life are aspects of culture which promote cardiovascular diseases. On the other hand, the value attached to vegetarian food particularly among certain communities in India and Indian origin population in Asian countries acts as a favourable cultural factor that may help to minimise cardiovascular diseases.

Similarly, diabetes and communicable diseases can also be affected by certain cultural practices either adversely or favourably. Therefore, understanding of culture in human behaviour forms a pre-requisite for the success of health education.

Promotion of personal hygiene and environmental sanitation are essential components of health education. Out of the seven Asian countries discussed here, Bangladesh and India are the most backward countries in personal hygiene and environmental sanitation. The level of hygiene and sanitation are of a higher order in Sri Lanka and Thailand. The situation is also far better in China. The major reasons for such improvement of hygiene and sanitation in other Asian countries are partially conditioned by their cultural practices and promoted through education and modernisation. Therefore, high priority must be given for hygiene and sanitation to prevent several communicable diseases in India and Bangladesh since they have been very much controlled in China, Sri Lanka and Thailand. Important morbidity conditions in this context are the diseases mentioned above and all other communicable diseases particularly water-borne diseases like diarrhoea, dysentery cholera, typhoid and jaundice and air-borne diseases like tuberculosis, polio, chickenpox, influenza, whooping cough.

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### **3.6 QUALITY OF LIFE IN ASIA**

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Attaining better quality of life is the aim of all facets of development and particularly of health promotion programmes. Of course, diverse programmes of development give different emphasis to one or the other components of development schemes. Nevertheless, the goals of all programmes work through different routes of development to the ultimate goal of improving the quality of life. In this context, certain aspects of social development, which have close linkage between them have to be examined to explore their interactions and complimentary nature to assess the overall quality of life. The indicators that have more relevance to explain quality of life particularly oriented to the health and allied aspects have been discussed here. However, not all such factors are covered here because of the non-availability of certain data. Nevertheless, most of the major indicators of quality of life have been included here. They are nutrition, health and wellbeing, mortality, longevity, social and technological aspects.

Quality of life is a relative, multi-dimensional-cum-multi-disciplinary concept which aims to achieve allround improvement in human life. As a result of such progress in quality of life, human beings may improve their life physically, mentally, socially and spiritually. It also leads people to attain better healthy life through safe ecology relatively tension free and peaceful environment to pursue sustainable future development (Table 3.4).

Table 3.4 : Selected Dimensions of Quality of Life in Asian Countries

Countries	% of population below National poverty line	Proportion of under nourished in total population (%) (2019)	Low birth weight babies (% of births) (2015)	Mortality rate (Under 5) (2019)	Infant mortality rate (2019)	Maternal mortality ratio (2012-2017)	Life expectancy at birth (2019)	Adult literacy rate females (% ages 15-24) (2018)	Contraceptive prevalence rate (%) of women ages (15-49 years) (2016-2019)	Household with television (2018)	Personal computers and the internet assess and usage (per 100 people)	*MD R (%) (2018)	
1	2	3	4	5	6	7	8	9	10	11	12	13	
											Personal computers (2010)	Internet users (2010)	
China	0.6 (2019)	3	5	7.9	6.8	27 (2013)	76.7	99.8	84.5	N.A.	N.A.	34.4	<2.5
India	21.9 (2011)	15	28 (2005-10)	34.3	28	143 (2017)	69.7	90.2	53.5	60	N.A.	7.5	9.3
Indonesia	9.4 (2019)	7	10	23.9	20.2	282 (2012)	71.7	99.7	63.6	72	N.A.	9.9	9
Thailand	6.2 (2019)	8	10.5	9	7.7	24 (2016)	77.2	98.6	73	97	N.A.	21.2	9.3
Democratic People's Republic of Korea	N.A.	42	6 (2005-10)	17.3	13.1	N.A.	72.3	100 (2008)	70.2	N.A.	N.A.	N.A.	47.6
Bangladesh	24.3 (2016)	10	27.8	30.8	25.6	215 (2017)	72.6	94.9	62.7	36	N.A.	3.7	13
Sri Lanka	4.1 (2016)	7	15.9	7.1	6.1	43 (2018)	77	99	64.6	N.A.	N.A.	12	7.6

N.A. = Not Available

Source: World Development Indicators

\* who.int/data/nutrition/nlis/country

In a population of a given country, certain group of people are below the national poverty line. They are extremely disadvantaged not only because their quality of life is poor but also because their existence is at stake. The national poverty lines reflects local perceptions of the level of consumption as income needed not to be poor. All the national poverty lines use a food bundle based on prevailing diets that attains predetermined nutritional requirements for good health and normal activity levels, plus an allowance for non food spending. In simple words their earnings will be so low that they cannot afford to have a minimum nutritionally adequate diet plus essential non food requirements. So, the National population below national poverty line is the percentage of country's population living below the national poverty line. According to this concept, let us see how these Asian countries have crossed this bottom level quality of life. About 21% of the India population live below the national poverty line. Bangladesh is second to India with 15 per cent of population living below national, poverty line, However, in Sri Lanka it is 1per cent of the population which lives below poverty line. Thailand (0%) tops the Asian countries followed by Sri Lanka (1%) china (1%) and Indonesia (5%) in raising most of their population above the poverty line. In these four countries only negligible population continue to live (see the figure in brackets) below the poverty line. Is it not a lesson for India to rapidly raise her one-fifth population above poverty line and also improve the quality of life of her population?

Another indicator manifesting the quality of life is the undernourishment. Undernourishment exists when calorie intake is below the minimum dietary energy requirement (MDER). MDER is the amount of energy needed for

light activity and the minimum acceptable weight for attained height. DPR Korea (47.6%) followed by Bangladesh (13%) are the two countries where calorie intake below MDER is the least among the Asian countries. China (97%) has the best nutritional status followed by Indonesia and Sri Lanka (93% each) then Thailand (92%), Bangladesh (90%), India (85%), Korea (OPR) has only 58% of total population that is well nourished. In fact, low birth weight of baby will also be a function of calories intake along with other factors. In this aspect, China (5.0%), India (10.5%), Thailand (10.5%) and Indonesia (10%) have the least problem of low birth weight babies which speak about better quality of life of most of their children. Therefore, the disadvantaged countries as far as infant's quality of life is concerned are Bangladesh (27.8%), and Sri Lanka (15.9%). As you know, the above three factors very much influence infant, childhood and maternal. The level of these three mortality rates also indicate the quality of population in these countries. As far as the maternal mortality ratio are concerned, Indonesia (282) is on the top with highest level of mortality followed by Bangladesh (2015) and India (143). However, Thailand (24) followed by China (27) and Sri Lanka (13) have the least maternal mortality ratio. So, Thailand, Sri Lanka and China are better privileged in this respect than India and Bangladesh. What lesson can India learn out of this? How did China, Thailand and Sri Lanka succeeded in drastically reducing their mortality patterns? The answers to this question can be seen in relation to factors such as better sanitation, availability of safe drinking water, favourable ratios of doctor, nurse and para-medical personnel, effective strategies followed in health promotion, priority given to health programmes giving emphasis to health education and prevention of diseases.

Longevity is a crucial indicator of quality of life which is once again influenced by the above mentioned factor. In this respect Sri Lanka (77) Thailand (77.2) and China (76.7) top the Asian Countries in reaching the top level of life expectancy. Once again India (69.7) is less fortunate in this regard because here life expectancy is the lowest in Asian countries. It is a pity that India having the third largest scientific man power in the world is lagging behind very much in expectation of life at birth compared to several other Asian countries.

Two other social and technological indicators of quality of life can be measured on the basis of literacy. Surprisingly, female literacy has become universal in DPR (100%) and China (99.8%). Equally fascinating is the successful achievement of female literacy in Sri Lanka (99%) and Indonesia (99.7%). Here again, India (90.2%) is the most backward nation. *It is the female illiteracy which is the key factor for poor quality of life because it has got linkages with most of the factors mentioned earlier.* Yet another equally important manifestation of quality of life is the use of effective mass media viz., TV and personal computers with internet.

However, Sri Lanka, China, Thailand and Indonesia have progressed considerably in this field. The situation in Bangladesh is still worse. They have to go a long way in roving this aspect of quality of life which is necessary for essential development of knowledge and improving the life style. Regarding percentage of households with TV, Thailand tops the Asian

countries (97%) followed by Indonesia (72%). But it is inadequate in India (60%). In India and Indonesia about 7.5 and 9.9 internet users per 100 population have been reported in comparison to Bangladesh which has only 3.7 internet users per 100 people. For developing countries, computer is a luxury at present. Quality of life of mother and children and also family as a whole is also reflected based on the adoption of small family norm and acceptance of contraception. In this respect, China and Thailand have achieved spectacular success followed by Indonesia but Bangladesh and India have to go a long way to achieve success in this programme in order to improve the quality of life of women in particular.

Epidemiological transition takes place in a country based on the level of overall development. When a country is economically and socially backward and so also manifests poor quality of life, people in such countries suffer mostly from deficiency diseases, communicable diseases and other diseases caused by poor hygiene, sanitation and soon. All these reflect the stage of pre-transition in epidemiological change. On the other hand, when a country progresses, hygiene, sanitation and nutritional status will improve. Consequently scientific attitude and behaviour takes place. However, pollution of water, soil, air and noise grow with development. As a result, they lead to occurrence of different types of diseases like cardiovascular disease, cancer, diabetes and so on. But communicable diseases in the poor countries will be reduced to the minimum. These changes in disease patterns based on level of development of a country contribute to the epidemiological transition. In fact, all these changes affect the quality of life of population both in developing and developed countries.

**Check Your Progress Exercise 1**

1) Define health policy and health education.

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2) Fill in the blanks.

- a) China follows.....and..... strategies for health promotion.
- b) In epidemiological transition communicable diseases decline and instead incidence of ..... and..... diseases increase.
- c) Quality of life aims.....
- d) Indicators of quality of life may include.....

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### 3.7 LET US SUM UP

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Now let us think again about what has been discussed so far. This unit covered the policy perspectives on health from seven major and diverse Asian countries. Subsequent discussion focussed on various infrastructure and inputs provided for the promotion of health programmes. It is followed by the question of sanitation and water supply. Another major dimension discussed here is on different categories of health personnel viz., doctors, nurses and para-medical staff. Their strategies followed for rendering health care and priority given to health education form the subsequent section. Of course, various inputs provided for prevention of diseases and promotion of health have been highlighted. As a consequence of all these developments, what happens to the quality of life of the population constitutes the last part of this unit.

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### 3.8 GLOSSARY

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**Absolute poverty level** : The income level below which a minimum nutritionally adequate diet plus essential non-food requirements is not affordable.

**Child (under-5) mortality rate** : Number of deaths of children under five years of age per 1000 live births.

**Contraceptive Prevalence rate** : Percentage of married women aged 15-48 currently using contraception.

**Health Education** : Health education can be defined as the art of applying social and health sciences to facilitate the development of healthy life styles and behaviour among people.

**Health Policy** : Health policy refers to the setting of goals in creation of infrastructure, provision of inputs, education, prevention of diseases through appropriate interventions, creation of safe environment, provision of potable water, etc.

**Life expectancy at birth:** The number of years a new born child would live if subjected to the mortality risks prevailing for the cross section of the population at the time of their birth.

**Low birth weight** : Weight less than 2500 grams at the time of birth.

**Quality of life** : Quality of life aims to achieve all round improvement in human life.

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### 3.9 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

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#### Check Your Progress Exercise 1

1) Health Policy: Health policy refers to the goals in creation of

## Health Indicators

infrastructure, adoption of policies, provision of inputs, education, prevention of diseases through appropriate interventions, creation of safe environment, provision of potable water, etc.

Health Education: Health education can be defined as the art of applying social and health sciences to facilitate the development of healthy life styles and behaviour among people.

- 2 a) Bare-foot doctor and family bed care
- b) Cardiovascular diseases, Cancer and Diabetes
- c) To achieve all round improvement in human life.
- d) Rural population below the absolute poverty level, daily per capita calorie intake, percentage of infants with low birth weight, child mortality, infant mortality, maternal mortality, life expectancy at birth, female literacy, contraceptive prevalence rate and communication technology.

