



Ratna Sagar

RATNA SAGAR

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BYWORD

E-LIVE

Education, Our Mission



As per the latest ICSE syllabus 2022

Ratna Sagar

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Revised and Updated

LIVING SCIENCE BIOLOGY

D K Rao • J J Kaur

10



EDUCATION, OUR MISSION



ICSE

Living Science

Biology

Class 10

**Chapter 14 Population – Problems
and Control**



LEARNING OBJECTIVES

Population

- ❖ Population growth in India
- ❖ Factors responsible for population explosion in India
- ❖ Factors responsible for increase in human population in the world

Population growth curves

- ❖ What are population growth curves?
- ❖ Problems posed by increasing population

Population control and family planning?

- ❖ Education
- ❖ Preventive methods

Terms to remember

- ❖ **Population:** The number of people living in a particular area or country at a particular time.
- ❖ **Demography:** The statistical study of human population of a region is called demography.
- ❖ **Population density:** The number of persons per unit area at any given time.
- ❖ **Birth rate :** The number of live births per 1000 persons in a year.
- ❖ **Death rate or mortality:** The number of deaths per 1000 persons in a year.
- ❖ **Growth rate of population:** The difference between the birth rate and the death rate.
- ❖ **Census:** It is an official enumeration of population done periodically.



Population

Population growth in India

The total population of India has multiplied by about 4 times within last one hundred years (1911–2011). As per the census of 2011, as on March 2011, the population of India was 1,210,193,422 i.e. about 121.02 crores.

Factors responsible for population explosion in India

- ❖ **Advancement in agriculture:** This has helped in the availability of more food and hence, less starvation and malnutrition.
- ❖ **Advancement in medicine:** This has helped in controlling epidemic diseases leading to increasing life span. Thus, more and more people are living longer, reaching reproductive age and producing more children.
- ❖ **Religious and social customs:** Because of prevailing social customs and religious beliefs, many people do not adopt family planning measures, leading to rise in population.
- ❖ **Industrialization:** This has helped in better production, storage and distribution of food, more employment opportunities and more prosperity.
- ❖ **Illiteracy:** A large proportion of population is still illiterate, ignorant and superstitious. They are not aware of the benefits of family planning. This results in overpopulation.



- ❖ **Economic reasons:** Children are considered to be helping hands to increase the income of the family.
- ❖ **Desire of a male child:** In most societies, the male child is considered to be essential for keeping up the name of the family from one generation to another. Due to this, the parents want to have at least one son and in this process they give birth to many children.
- ❖ **Lack of recreation:** Because of poverty and poor standard of living, there are not many recreation facilities available and sex provides recreation to such people.

Factors responsible for increase in human population in the world

- ❖ **Better health care** is available for all. There are more facilities, doctors and medicines for health care.
- ❖ **Better food supplies** are available. The food shortage has been minimized due to agricultural revolution. As a result more and better quality of food is produced and available to all.
- ❖ **Fewer deaths** as compared to ancient times. This is due to discoveries of medicines and vaccines which have controlled and even wiped out many diseases. More patients get cured and live longer.



- ❖ **Large scale immunization** against epidemic diseases.
- ❖ **Better nutrition facilities** are available specially for growing children. As a result more and more children are healthy and are reaching the reproductive age.

Population growth curves

Curves obtained by plotting the number of individuals in a population against time are called **population growth curves**. The factors that influence population growth curves are mainly environmental factors. There are two types of population growth curves,

J-shaped population growth curve

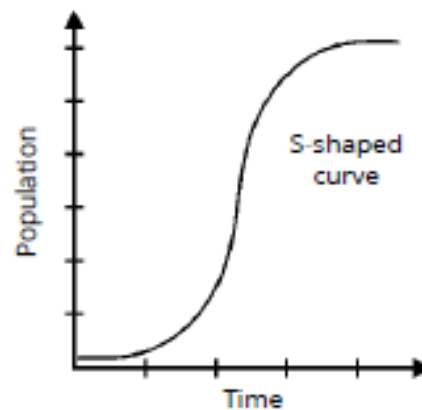
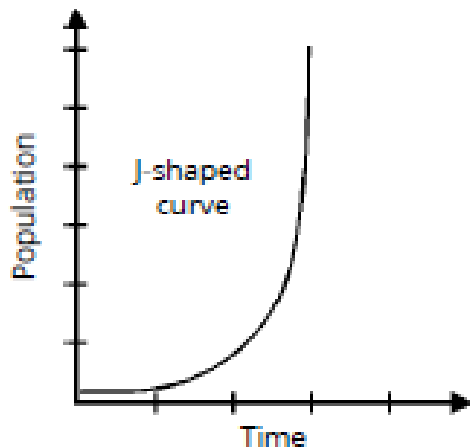
During ideal conditions, a population keeps on increasing exponentially and becomes double in size during a constant period of time. The growth is exponential and the curve is known as J-shaped curve.

S-shaped (sigmoid) population growth curve

In this population growth curve, the population first increases slowly and then more rapidly. Finally it slows down and fluctuates within a narrow range due to limitation by environmental factors. Thus, an S-shaped (sigmoid) curve is obtained showing the maximum population size an environment can sustain.



J-shaped or exponential population growth curve



S-shaped (sigmoid) population growth curve

Problems posed by increasing population

The problems posed by increasing population are of two types:

1. Problems posed to large families :

Poor health of the mother, Poor housing, Economic pressure, Malnutrition
Poor medical care, Improper education

Problems posed to the country:

Urbanization and environmental degradation, Increasing population and transportation, Increasing population and education, Increasing population, agricultural development and environmental degradation, Increasing population and deforestation, Population, industrial development and environmental pollution, Increasing population and water, Increasing population and depleting energy Source, Increasing population and depletion of mineral reserves



Population control and family planning

It is very necessary to control the overgrowing population and to educate people to accept small family norm and create awareness about population explosion and its impact on the family, society and the nation. The government has taken many measures for providing family planning guidance and support, and family welfare measures.

Education

The most effective method is to impart education to the people about various ways of fertility control. Education helps to make people aware of the advantages of a small family and the disadvantages of a large family.

Preventive methods

These methods prevent pregnancy and obstruct the fusion of the egg and the sperm. Some of the important preventive methods are discussed below.

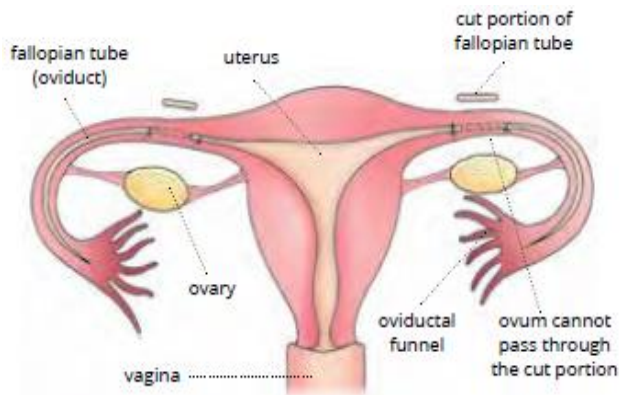
Surgical methods

1. Vasectomy (for males): This is a method of sterilization in males . In this method, each sperm duct or vas deferens is cut and tied (ligated) at both ends by a thread. The small piece between the two ligatures is then removed. By doing so the sperms cannot reach the ejaculatory duct and hence cannot be deposited in the female reproductive tract during intercourse.



This procedure is easy and quick and has no harmful effect on manliness of any kind and does not reduce libido.

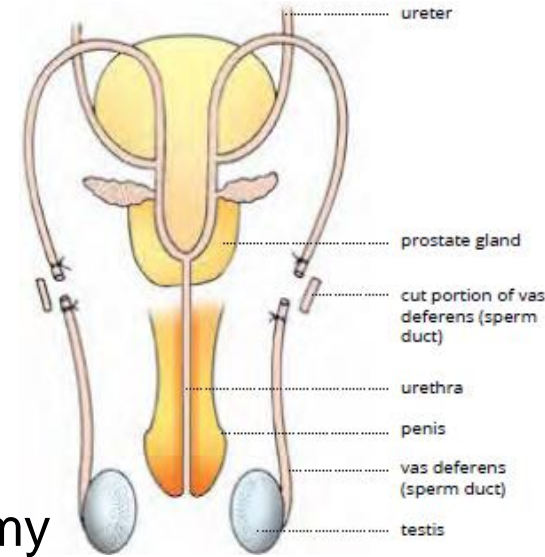
2. Tubectomy (for females): This is a method of sterilization in females . It involves cutting of the fallopian tubes or oviducts and tying the ends to prevent passage of ova down the fallopian tubes.



Tubectomy

In this method, the eggs continue to be released but do not pass through the oviducts and hence, no fertilization takes place. Further when sperms are deposited during intercourse they cannot travel to the oviduct and hence no fertilization can occur. In a new method, tubectomy is performed with the help of laparoscope.

With the help of laparoscope the abdominal organs can be viewed by a flexible optical fibre lens and a cold light source. This surgery is performed by making a small (1 cm) hole in the abdomen.



Vasectomy



Contraception methods

These methods involve prevention of fertilization and conception. Contraception results in birth control and is the basis of family planning. Contraception may be natural or mechanical.

1. Natural methods of contraception: If copulation is avoided for a few days, i.e. at +3 days of the first day of ovulation which is likely to be the time period when the ovum is available in the oviduct, fertilization can be avoided. This is called **rhythm method** of contraception. Another natural method of contraception is **coitus interruptus**. In this method, the penis is withdrawn from the vagina prior to ejaculation. All these methods require extreme self-discipline and self-control.

2. Mechanical (Barrier) methods of contraception: Mechanical barriers are used to prevent the passage of semen to the fallopian tube or to prevent implantation.

❖ **Condoms or nirodh:** It is a thin rubber tube worn over the penis before sexual intercourse. The ejaculate gets collected in this tube and is not discharged into the vagina.

❖ **Diaphragm or cervical cap:** It is a large thin rubber cap fixed on a flexible metal ring. It is fitted over the cervix of uterus in a woman's body by a doctor to prevent the passage of sperms into the cervical canal



3. Intra uterine device (IUD) or loop: It is a very effective method to avoid conception. IUD or loop is made of plastic or stainless steel. It is inserted in the uterus. Its insertion causes certain secretions which prevent the implantation of embryo in the uterine wall.

Diaphragm
or cervical cap



Intra uterine
device or
loop

4. Chemical methods of contraception

❖ **Spermicides:** In this method, strong spermicidal (sperm-killing) chemical creams, jellies, etc., are applied in the vagina before copulation, which kill the sperms and prevent fertilization.

5. Hormonal methods of contraception

❖ **Oral contraceptives or pills:** Oral contraceptives prevent ovulation in females. These pills should be taken daily. Birth control pills contain synthetic hormones resembling oestrogen and progesterone which prevent ovulation but allow monthly shedding of the uterine lining through menstrual bleeding.



Corrective methods

❖ **Medical Termination of Pregnancy (MTP):** If conception has taken place, the birth of a child can be avoided by corrective methods.

Medical Termination of Pregnancy (MTP) can be done by **induced abortion** or **aspiration** by a trained doctor. Abortion is a method by which pregnancy can be terminated by either mechanical method or by using hormones. Aspiration involves a virtual vacuuming of the uterine contents by a suction device.

MTP should be considered as a last step that can be taken. It should be taken only in case of an emergency or if there is an evidence of a genetic disease in the foetus and removal of foetus is necessary for the life of the mother. Abortion can be legally permitted only within 5 months of pregnancy by a trained doctor on the request of the would be mother. Even husband's consent is necessary for this.



SUMMARY...

- ❖ India is the second most populous country in the world only next to China. As per 2011 census population of India was 121.02 crore.
- ❖ The statistical study of human population is called demography.
- ❖ Population density means number of individuals per square kilometre at any given time.
- ❖ The difference between birth rate and death rate gives population growth rate.
- ❖ Advancement in agriculture, medicine, industrialization, religious and social custom, illiteracy, economic reasons and desire of a male child are some factors responsible for the growth of population explosion in India.
- ❖ Increasing population poses problems to the family as well as the nation.
- ❖ The enormous increase of the population can be controlled by education, preventive methods, contraception and corrective methods of population control.
- ❖ Preventive methods include, vasectomy (in males) and tubectomy (in females).



- ❖ Rhythm method and coitus interruptus are the natural methods of contraception.
- ❖ Condoms, diaphragm and intra uterine device are the mechanical contraceptives.
- ❖ Spermicides are the chemical contraceptives and oral contraceptive pills are the hormonal contraceptives.
- ❖ If conception has taken place, the birth of the foetus can be avoided by corrective methods. MTP can be done using aspiration method or induced abortion.

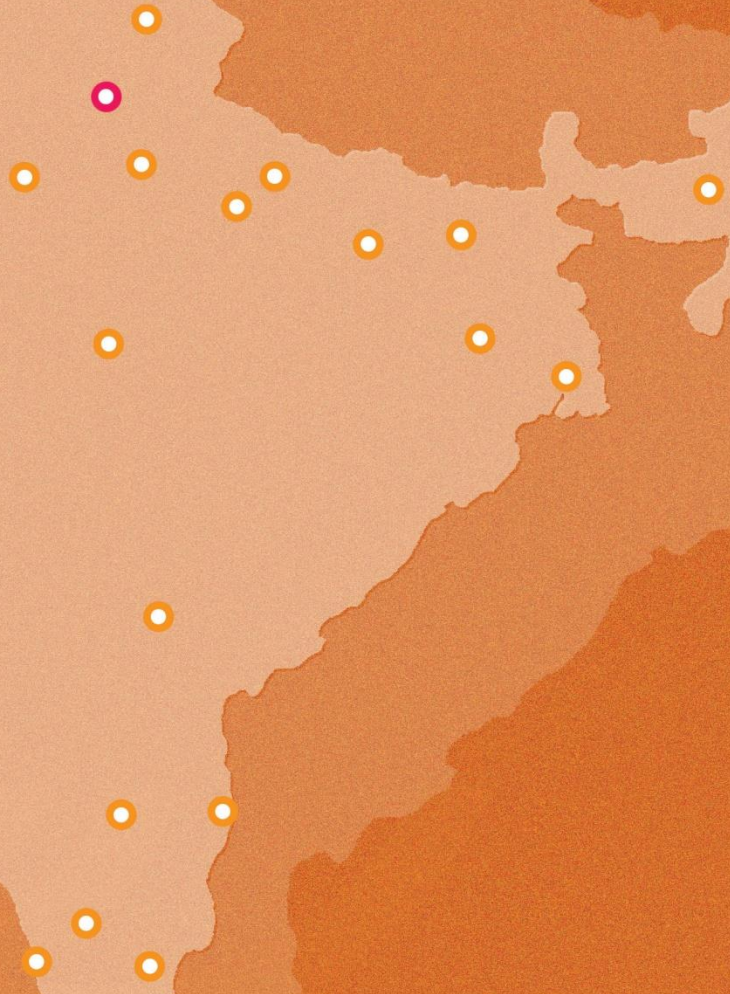
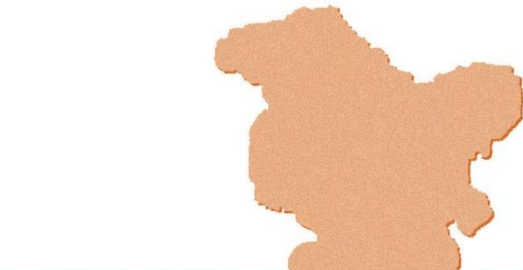


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