



### Laboratory investigations for HIV infection:

HIV infection can be detected in the laboratory either by detection of :

- Antibodies to HIV : ELISA, rapid/simple, western blot (confirmatory test)
- Antigen detection : p24 antigen
- Direct detection of Virus : Microscopy
- Detection of viral RNA : PCR
- Isolation/culture of virus

### The indirect predictors of HIV infection and disease

CD4 cell count

Beta 2 microglobulin

These are used as monitors of immunity status of patients and for monitoring the progression of the disease.

### HIV testing strategy :

Unlinked anonymous testing

Voluntary confidential testing

Mandatory testing

**Opportunistic Infections:** Are those infections, which are non, infectious to healthy immune competent human being but on immunosuppression or immunodeficiency status leads to them become infectious. Common Opportunistic infections are:

1. Tuberculosis
2. Candidiasis
3. Cryptosporidiosis
4. Herpes Zoster
5. Toxoplasmosis

6. Bacterial pneumonia
7. Cryptococcal meningitis
8. Penumocystis Carinii Pneumonia

### Epidemiology:

The disease is 21-year-old. Till 1981 nobody knew about AIDS which has now become the second most common cause of death. Since then it becomes a pandemic around the globe. Now HIV/AIDS is truly global. It has affected million of people throughout the world.

#### As per WHO & UNAIDS:

|   |                  |              |
|---|------------------|--------------|
| Number of people with HIV/AIDS                | Total            | 34.3 million |
|   | Adults           | 33.0 million |
|   | Women            | 15.7 million |
|   | Children <15 yrs | 1.3 million  |
| Number of people infected by HIV/AIDS in 1999 | Total            | 5.4 million  |
|   | Adults           | 4.7 million  |
|   | Women            | 2.3 million  |
|   | Children <15 yrs | 620000       |
| Number of Death with HIV/AIDS in 1999         | Total            | 24.8 million |
|   | Adults           | 2.3 million  |
|   | Women            | 1.2 million  |
|   | Children <15 yrs | 500000       |

#### In India:

In India the first case was detected in 1986 in Tamil Nadu.

By the end of year 2000 it was estimated that 3.6 million Indians infected with HIV/AIDS.

More than 50% of all new infections take place among young adults below 25 years.

Every year 22837 newborn children are infected.

About 11,434 die due to HIV/AIDS.

Total 120,000 children are living with AIDS.

120,000 AIDS orphans living in country.

### CONCLUSION

The need of the hour is for dissemination of basic information in simple and intelligible terms about the causes of AIDS and the avenues of infection, the essential precautions to be taken, the facilities for treatment & all other related matters. The public must be alerted without generating hysteria about the real menace of AIDS epidemic & the measures required to combat it.

### WOMEN AND CHILD WELFARE

#### History

The health of women and children began to receive separate attention early in this century, in recognition of their greater vulnerability, particularly to socioeconomic and environmental forces, and the interdependence of the child's health and that of the mother. In 1909 the first White House Conference on Child Health recommended the formation of the Children's Bureau, which proceeded to investigate the causes of infant mortality (more than 100 per 1,000 live births). The first direct support of health services for mothers and children came with the Shepard-Towner Act of 1921, which resulted in complete birth registration and the establishment of maternal and



child health divisions in state and local health departments. Title V of the Social Security Act of 1935 extended services to handicapped children and further established the principle of public responsibility for the health of mothers and children.

In the 1960s and early 1970s a host of additional programs were initiated by Congress. These included Medicaid, Early Periodic Screening, Diagnosis and Treatment (EPSDT), Neighborhood Health Centers, Maternity and Infant Care, Family Planning, Children and Youth Projects, Head Start, Title I educational assistance, the Right to Education of the Handicapped (PL 94-142), and nutrition programs (WIC and School Lunch). While these laws expanded services at the state and local levels, the resultant programs were administered by a variety of different branches of government, diffusing responsibility and often leading to poor coordination and the undermining of maternal and child health (MCH) divisions.

MCH services were seriously weakened by the budget cuts of the Reagan years. Rather than cutting specific services, the programs were lumped into block grants that gave state governments greater freedom to apportion the reduced funds as they saw fit. This has begun the trend of providing greater local autonomy in the establishment and administration of health programs for women and children. This trend may hold promise for the creation of innovative programs that more precisely address the community's needs, making greater use of local resources.

Managed care has emerged from the multiple efforts to control health care costs, and this new structure for the delivery of medical care has had a significant impact on maternal and child health services. Medicaid recipients are rapidly being shifted into managed care plans that restrict access to all but primary care services, causing health departments to lose their base of clients for immunization, family planning, and other health care service programs. Meanwhile the managed care plans that have enrolled these high-risk populations are not held accountable in the same manner as was the health department for service delivery. Cost control efforts led to postpartum hospital stays being reduced to 1 day until Congress intervened with a rule that allowed at least a 48-hour stay at the discretion of the mother and her physician.

Progress in MCH has been driven by the dual forces of research and advocacy. Multidisciplinary studies over the last 20 years have shed important light on the health problems of women and children and provided numerous examples of effective means to ameliorate those problems. Articulate and committed individuals and organizations have played a critical role in fostering public commitment to improve the lives of mothers and children. However, that support has been significantly reduced through the 1980s. As our knowledge of what to do has continued to grow, the political will to use that knowledge has shrunk.

## HEALTH INDICATORS

Various health indicators are used to assess the health status of mothers and children. The continuous monitoring of these indicators is an essential part of evaluating our progress in improving the health status of women and children.

Maternal mortality rates have reached such a low level that they are of little value now. Maternal health is better reflected in fertility rates and birth rates as well as in pregnancy-related morbidity rates. Pregnancy outcomes have become a more important measure of maternal health and quality of maternity services provided. Miscarriage, therapeutic abortion, stillbirth, and especially low-birth weight rates can be used to assess the success of the pregnancy. Prenatal care, place of delivery, attendant at delivery, type of delivery, complications, length of stay, and cost all measure the availability and quality of maternal health services.

The infant mortality rate remains an important though crude measure of MCH. Linking infant birth and death records has provided a far more precise way of assessing factors associated with pregnancy outcome, particularly when the causes of death are grouped by pregnancy-related



internet, web etc. are also developed. These are some of the important environmental issues and has the capability to influence people. Media has taken up the task of compiling a DATABASE on various biotic communities. Ministry of Environment and Forests Govt. of India has taken up the task of compiling a database, forest cover database etc. Since database is the collection of inter-related data on various subjects, also available for chronic diseases like HIV/AIDS etc. They are in computerized form. The Ministry of Environment & Forests, Govt. of India has created Environmental Information System (ENVIS). ENVIS has many centres all over the country for generating a network of database in different areas like pollution, environmental management, wildlife etc.

[www.mhhe.com/environmental](http://www.mhhe.com/environmental) science and multimedia Digital Content Manager (DCM) in the form of CD-ROM are the on line learning centre, which provides the most current and relevant information on environmental science.

With the help of computers and internet, not only we can have knowledge of the patients at a glance within no time, but also we can get information about the diseases their medicines and alternative medicines. (Alopathic, Ayurvedic and Homoeopathic). CT-scanning (Computed Tomographic Scanning, CAT (Computed Axial Tomography) are such examples of information technology in human health. It also help in computer-aided monitoring, health testing, implantation of artificial body parts and in pharmaceutical designing of new drugs. IT is expanding rapidly with increasing applications in the field of environment and human health. For awareness, songs, drama, bhajans, advertisements in TV, radio, cultural programmes should be exhibited in urban & rural sectors both.

## **HUMAN ACTIVITIES AND ENVIRONMENT**

### **HOW DO HUMANS AFFECT THE ENVIRONMENT**

Climate change, extinction of species and pollution of life supporting air and water has become a growing concern for nations all over the world. Knowing how do humans affect the environment will help us understand and address the problems better.

The Intergovernmental Panel on Climate Change (IPCC) was formed in 1988 to study the risk of climate change due to human activity. In the Kyoto Protocol of 1997, industrialized nations agreed to cut down their emissions of greenhouse gases considerably by 2012. Even the G8 committee that began as a response to the 1973 oil crisis and was primarily concerned with the economic issues of the member nations, now unfailingly have something related to the environment in their summits.

Years of thoughtless exploitation of nature by man has resulted in the effects staring right in our face now. The truth, that in the bid to improve our lives, we have put our own survival to stake, has finally hit us hard. Now as more and more studies and researches are being carried out to understand how do humans affect the environment, an increasing number of people are awakening to the fact that the well-being of the environment and survival are intricately woven into each other.



## **EFFECTS OF HUMAN ACTIVITIES ON ENVIRONMENT**

### **CLIMATE CHANGE**

Just about a year back, I came across an article in which environmentalists expressed their concern that if the Gangotri glacier (that feeds river Ganges) kept melting at its current rate, the river Ganges would soon dry up. River Ganges is the holy river of India, which has served as a lifeline for centuries for millions of people its banks. Rivers have played an important role in the survival of mankind, and many of them are fed by glaciers. Global warming refers to the increase in the temperatures of the earth due to release of greenhouse gases like carbon dioxide and methane from industries and vehicles. This phenomenon is causing the glaciers to melt at an alarming rate. Not just the Gangotri, but even the polar ice caps are melting at a faster rate they can form. The result is increase in the sea level, and it poses a danger of drowning the low lying areas. Some of the areas that may go under the sea if the sea levels kept increasing include Bangladesh, parts of Africa and even major cities like London and New York!

### **DEPLETION OF OZONE LAYER**

The stratosphere has a layer of ozone that protects us from the harmful ultraviolet (UV) rays of the sun. Exposure to these layers cause skin cancer and cataracts. However, the ozone layer filters out the dangerous UV rays from sunlight as it enters the earth's atmosphere. The chlorofluorocarbons (CFCs) that are man-made chemicals are released in the atmosphere through CFC containing aerosols, refrigeration equipment, foam and as by products of certain industrial processes. As these chemicals are released, they rise up into the atmosphere and break down the ozone molecules that form the ozone layer. There is an ozone hole in the Antarctic stratosphere that is causing great concern to environmentalists all over the world. Not only is the depleting ozone layer harmful to human beings, but the UV rays can destroy a certain type of bacteria known are Cyanobacteria that are important for a number economically important crops. Researches are even predicting that excess level of UV rays could lead to the death of the phytoplanktons, that are an important component of the food web of the oceans.



## POLLUTION

Industrialization has been the hallmark of human progress. However, with industries have come a host of toxic gases that are being released into the atmosphere even as I write this article and you read it. The industries release gallons of liquid waste into the seas and rivers. Some of the effluents percolate down to the reach the ground water and pollute it to the extent that it can't be used by human beings for drinking or cooking. Besides adding to air pollution, the innumerable vehicle running on the roads add to noise pollution that has led to increase in stress, anxiety and problems related to hearing. Pollution of water has led to the decrease in a number of large number aquatic life forms. Migratory birds are known to change their course due to pollution or change in weather. Respiratory diseases in human beings is another price that we are paying for polluting the environment.

## DEFORESTATION

Expanding population, industrialization and need of land for development of expanding cities has led man to cut down forests selfishly. Not only are the forests home to a large number of animals, trees are also an important component of the water cycle. The roots of plants hold the soil together and prevent soil erosion. The global forest cover has shrunk to half its area in the last 11,000 years. During the period between 1990 and 2000 itself, the yearly loss of natural forests 16 million hectares. Deforestation at such alarming rate has been a cause of constant worry for environmentalists the world over.

## EXTINCTION OF SPECIES

Man has been killing animals right since the time he acquired the skill of hunting. Although in those times hunting was the means for survival, human beings continued to kill animals even after he had learned to cultivate crops. The relentless hunting by human beings, sometimes for the hide of a cheetah or the tusks of the elephants, or simply to cook the tasty shark fin soup, has wiped out the existence a large number of animals in just a century. Besides hunting, human activities like environmental pollution and deforestation has led to the extinction of a large number of animals and plants due to loss of habitat. Recent studies have shown that in North America, 37 animal species have become extinct in the last 50 years due to human activities. Loss of habitat led to the extinction of the Bali subspecies of tiger in 1937. According to the 2008 annual IUCN report, there were 16,928 animal and plant species that are threatened of extinction and the list keeps increasing every year.

Despite the indiscriminate exploitation of nature by some people, there are a handful of those that are relentlessly working to reverse the detrimental effects of human activities on the environment. The World Wildlife Fund, European Environment Agency and the National Geographic are some organizations that run programs for the preservation of nature and educate and inspire people to conserve all life forms be it flora or fauna.

Now that we know how do humans affect the environment, let us not sit back leaving all the responsibility of conserving our planet on a handful of people. Each one of us can make a valuable contribution towards preserving our environment. Let us do our own bit, for, in the well-being of the environment lies the key to our survival.

**Antarctica is certainly the most pristine place on earth although it is not as unspoiled as may be imagined.** For more than a hundred years people have travelled to Antarctica and most parts have now been visited. More than just footprints have been left and more than just photographs have been taken.



Some Antarctic species have been taken to the verge of extinction for economic benefit. Others have been killed or disturbed, soils have been contaminated, sewage has been discharged into the sea and rubbish that will not decompose or break down has been left behind in even the remotest parts.

Recently attitudes have changed as we begin to realise that there are **few unvisited places left on earth** and that they are tremendously important of humanity. Antarctica's clean air, water and ice of are of importance to science for understanding how the Earth's environment is changing both naturally and as a result of human activity.

Tour operators are beginning to tap a huge and ever increasing demand to visit the Earth's last great wilderness. Both science and tourism have the potential to damage the very qualities that draw them to Antarctica.

### GLOBAL IMPACTS

Antarctica is an important laboratory for research into the global impacts of the industrialized world.

Lakes on Signy Island in the Maritime Antarctic for instance have shown possibly the **fastest local response to regional climate found anywhere on Earth**. Average lake temperatures having risen by  $0.9^{\circ}\text{C}$  in 15 years while temperatures in the surrounding seas have stayed constant.

Global change may have effects that impact directly on the Antarctic environment and its fauna and flora. Global warming for example may contribute to break-up ice-shelves causing loss of habitat for animals dependent on the ice-shelf as well as the effect of increasing sea level on low-lying regions in the rest of other world.

**Increasing Ultra Violet (UV) radiation due to the ozone hole** may cause changes to phytoplankton communities and could have effects up the food chain.

**Antarctica is a sensitive indicator of global change.** The polar ice cap holds within it a record of past atmospheres that go back tens or even hundreds of thousands of years, allowing study of the earth's natural climate cycles against which the significance of recent changes can be judged.

### ENVIRONMENTAL MANAGEMENT