Introduction
Cancer is a term used for a group of diseases in which the cells in the body grow and divide in an uncontrolled manner to produce abnormal cells. These cancer cells invade adjoining parts of the body and may spread to other organs. This process of spread to distant organs is called metastasis which is a major cause of death in cancers. Cancers can affect any part of the body. Cancers are also known as malignancies and neoplasms.

The change of a normal cell into a cancer cell is the result of the interaction between genetic factors of individual and external cancer producing agents (called carcinogens) such as:
- physical agents, e.g. ultraviolet and ionizing radiation;
- chemical agents, e.g. asbestos, components of tobacco smoke, aflatoxin (a food contaminant produced by a fungus) and arsenic (a contaminant in drinking water); and
- biological agents, e.g. infections from certain viruses, bacteria or parasites.

Magnitude of the problem
Disease burden
- Cancer is one of the leading causes of death among adults in India, annually accounting for about 949,000 new cases and 634,000 deaths in 2008.1
- The most frequent sites of cancer among men in India are, head and neck including cancers of lip, oral cavity, nasopharynx, pharynx and larynx (105,000 new cases and 78,000 deaths annually), lung (47,000 new cases and 42,000 deaths), esophagus (29,000 new cases and 27,000 deaths), stomach (21,000 new cases and 21,000 deaths) and colorectal cancer (20,000 new cases and 14,000 deaths).2
- The most frequent sites of cancer among women in India are cervix uteri (134,000 new cases and 73,000 deaths annually), breast (115,000 new cases and 54,000 deaths), head and neck including cancers of lip, oral cavity, nasopharynx, pharynx and larynx (36,000 new cases and 26,000 deaths), ovary (28,000 new cases and 20,000 deaths) and esophagus (19,000 new cases and 17,000 deaths).3

Socio-economic burden
Males with cancer are likely to have a 43.9% greater likelihood of imposing catastrophic expenses on their households and a 24% greater likelihood of impoverishing their households than matched counterparts without cancer. They also use more health care services in both the public and the private sectors. Females with cancer also report higher health care use, health spending, and risks of impoverishing their households than their matched counterparts.4

Risk factors and causes
Lifestyle related factors, viral infections and exposure to carcinogens in environment are the important causes of cancer. Tobacco use, excessive alcohol use, unhealthy diet and physical inactivity are other lifestyle related factors. Among infections human papilloma virus (HPV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are most important. Environmental exposure to radiation and chemicals (pesticides, dyes) also constitute an important group of carcinogens.

Disease characteristics and management
Most cancers do not exhibit specific signs and symptoms during the early stages. When the disease is advanced one or more of the following signs/symptoms may be seen:
- Rapid and significant weight loss
- Persistent cough or hoarseness of voice
- A change in bowel habits or blood in the stool
- A swelling or growth anywhere in the body
- A swelling or lump in the breast, changes in the skin texture, discharge from the nipple or change in direction of the nipple
- Difficulty in swallowing
- Unusual bleeding from any orifice including vagina
- Non-healing patches or ulcers in any external part of the body or visible internal part, e.g. mouth

---

1http://globocan.iarc.fr
Early diagnosis
- Screening tests are applied to population groups, which do not have any symptoms so as to identify individuals with abnormalities suggestive of pre-cancer and further referral for prompt diagnosis and treatment. Population-based screening by Pap smear or visual inspection with acetic acid (VIA) for cancer cervix and examination for oral cancer in tobacco users have been shown to be effective.
- Laboratory-based diagnostic services consisting of histopathology, cytology, immunohistochemistry and tumor markers are available at most cancer centers across the country as are radiological services like X-ray, computerized tomography (CT scan), magnetic resonance imaging (MRI) and mammography. Advanced facilities for molecular testing, nuclear imaging and positron emission tomography (PET) scans are available at select centers.

Treatment
- Treatment with surgery, radiotherapy and chemotherapy is currently available at all regional cancer centers and several medical colleges and private treatment facilities across the country. Advanced radiation therapy services are available at select centers.
- High survival and cure rates are seen in childhood cancers such as leukemia and lymphoma at centers where appropriate treatment is provided. Prompt institution of treatment of cancers that can be detected early - breast cancer, cervical cancer, oral cancer and colorectal cancer – result in higher cure rates when treated according to best practices.

Due to late diagnosis of cancers, a large proportion of the cases require palliative care. Palliative care is treatment to relieve symptoms caused by cancer, rather than cure. Improved access to oral morphine is a crucial need for cancer pain, suffered by over 80% of cancer patients in terminal phase.

Public health measures for prevention and control

Strengthening health systems
- Cancer awareness and screening for cervical, breast and oral cancer should be introduced at the primary health care level in the National Rural Health Mission (NRHM).
- Diagnostic and management facilities for above three cancers should be introduced at the district level.
- Specialized treatment services for cancers should be strengthened in medical colleges and other hospitals.
- Home support for palliative and rehabilitative services should be introduced at the primary health care level.

Population level interventions
- Avoidance of risk factors should be promoted – avoidance of tobacco and alcohol, consumption of more fruits and vegetables, regular physical activity and avoidance of infections by universal safety precautions in health care settings and safe sexual practices.
- Protection from occupational carcinogens.
- Protection against HBV and HPV by vaccination.

The National Cancer Control Programme (NCCP) was launched in 1976 and was revised in 1984. This programme has now been integrated into the National Programme for Prevention and Control of Cancer, Cardio-vascular Diseases, Diabetes and Stroke since 2011. The data on cancer is collected by hospital and population based cancer registries, collated and published by the National Cancer Registry Programme (NCRP) of the Indian Council of Medical Research (ICMR).

Case study: Gutka kills a young boy
(Adapted from the Times of India, Mumbai, August 11, 2011)
Roshan Wankhede is all of 17 years and is from a village in the Amravati district. His family lives on farming; money is difficult to come by. Roshan’s parents are waiting for him to finish his education and he would have passed his higher secondary exams next year. Doctors are saying that Roshan is suffering from last-stage mouth cancer and may not live another year. Roshan started consuming tobacco because of peer pressure. “My parents didn’t know that I had this habit. I didn’t have it at home. We had it before and after school from the shops nearby,” he said. What started as small ulcers developed as a full-fledged cancer on the roof of Roshan’s mouth in a matter of months. He was taken to Tata Memorial Hospital, where the doctor told “We are going to remove his upper jaw with a surgery, which will be followed by radiotherapy. He has a slim chance of surviving more than a year as fourth-stage cancers are generally difficult to save anyway.”
Roshan had, however, given up the habit of chewing tobacco some time before he developed the cancer but it was still too late. He said his decision followed the increase in the font size of the warning ‘Tobacco causes cancer’ on gutka packets. The wait for freedom from poverty for Roshan’s parents has however got extended indefinitely.

Acknowledgement
“Developed under WHO-Govt of India collaborative programme (2010-11) by WHO Collaborative Centres at Centre for Community Medicine, AIIMS, New Delhi, Madras Diabetes Research Foundation, Chennai, Department of Pulmonary Medicine, PGIMER, Chandigarh, Tata Memorial Hospital, Mumbai, Institute of Palliative Care, Kozhikode, besides Centre for Chronic Disease Control, New Delhi and Department of Neurology at Christian Medical College, Ludhiana.”