Chapter II

CANCER AMONG WOMEN
GLOBAL SCENARIO:

Globally, cancer is a major public health burden, accounting for one in eight deaths overall – more than AIDS, tuberculosis and malaria combined. A substantial number of sufferers experience a significant reduction in their quality of life due to physical pain, mental anguish and economic hardship. Cancer is a major public health problem, with significant associated death and disability. It is the second leading cause of death in developed countries and is one of the three leading causes of death for adults in developing countries. There are over 200 different types of cancer but four cancers: lung cancer, breast cancer, prostate cancer and large bowel cancer account for more than half of all cases. Of the 12.4 million new cancer cases in 2008, the most common cancers in terms of incidence were lung (1.52 million), breast (1.29 million) and colorectal (1.15 million) (Boehringer Ingelheim GmbH, May 2009).

In developed countries, almost as many cancer cases are attributable to an unhealthy diet and inactive lifestyle as to smoking. Although a third of all cancer deaths are linked to cigarette smoking, obesity is associated with colon, breast, uterine, oesophageal and kidney cancer. The types of cancer vary around the world and there is significant variation in the risk of different cancers by geographic area. Most of this global variation is due to exposure to known or suspected risk factors related to lifestyle or environment and provides a clear challenge to prevention. Despite the decline in cancer incidence and mortality rates in many parts of the developed world, rapid growth in the global cancer burden is being fuelled by a continued rise in economically developing countries. In the USA, for example, the overall cancer incidence rate fell 7.6 percent between 1992 and 2002, and the overall cancer mortality rate fell 10 percent between 1991 and 2002. However, these declines
were offset by increases in cancer incidence and mortality in low-and middle-income countries (Boehringer Ingelheim GmbH, May 2009).

**Prevalence and incidence:** Cancer is a leading cause of death worldwide. The disease accounted for 7.9 million deaths (13 percent of all deaths worldwide) in 2007. In addition, despite advances in treatment, deaths from cancer are projected to rise, with an estimated 17 million deaths in 2030. Worldwide, the number of new cancer cases per year is expected to top 15 million, and the number of deaths could grow to as many as 12 million by 2020. At least 70 percent of these deaths will be in economically developing countries, where survival rates (20–30 percent) are often less than half those in the USA and other developed nations (more than 60 percent) (Boehringer Ingelheim GmbH, May 2009).

Cancer predominantly affects the elderly population with approximately 65 percent of cancers diagnosed in patients over 65 years. Of the 12.4 million new cancer cases in 2008, the most common cancers in terms of incidence were lung (1.52 million), breast (1.29 million) and colorectal (1.15 million). (Boehringer Ingelheim GmbH, May 2009). Cancer is exacting severe costs from societies that are wholly unprepared to address it, and this toll will become even heavier in future years. By 2020, cancer is expected to kill more than twice as many people worldwide as it did at the turn of the millennium. In low- and middle-income countries, however, the death rate will be more than five times greater than in the industrialized world. Already, more than half a million women in low-and middle-income countries die from breast or cervical cancer alone each year (Garcia et al., 2007). The poorer regions of the world also account for more than 90 percent of cervical cancer cases worldwide (WHO, 2006).
More than a third of Australians live outside major cities, with 3 percent living in remote or very remote areas. The health disadvantage of rural and remote Australians is well documented, and includes poorer survival after a diagnosis of cancer. Both more advanced cancer at diagnosis and poorer treatment appear to contribute. Documented instances of poorer cancer care in rural and remote Australia, though not necessarily all with survival implications, include less “state of the art” diagnosis, staging and treatment of prostate cancer; less breast-conserving surgery for breast cancer; and an apparently lower probability of completing treatment when referred for radiotherapy for rectal cancer. Surprisingly, there appears to be little difference in women’s use of breast and cervical screening by area of residence (Katharine E Jong, Paula J Vale, 2005).

Remoteness of residence is not the only axis of disadvantage that may contribute to poorer cancer outcome in remote areas. Indigenous Australians account for 26 percent of the population in these areas, and have poorer survival from cancer than other Australians. Lower socioeconomic status is also associated with rural and remote residence and poorer survival. Poorer treatment may explain these worse outcomes. Analysis of linked cancer registry and hospital inpatient records in Western Australia suggests that Indigenous cancer patients are less likely to have surgery for lung cancer or radical surgery for prostate cancer, but there was no significant difference in breast-conserving surgery for breast cancer. Although that study could not address the possibility that differences in stage at diagnosis explained the observed treatment differences, a Sydney study has shown, after adjustment for size and stage of cancer, that socially disadvantaged women with breast cancer are still less likely to have breast-conserving surgery (Katharine E Jong, Paula J Vale, 2005).
Cancer imposes a major disease burden worldwide, with considerable geographic variations in incidence; mortality; survival; overall disease burden; causative environmental factors; and mix of prevention, detection, treatment, and palliative programs that make up a country’s cancer control strategy (Martin L. Brown, Sue J. Goldie, 2003). The cancer registries also suggest that age-standardized incidence rates are rising even more rapidly in low-incidence regions such as Africa and Asia. Probably the socio-economic and lifestyle changes (e.g., late child-bearing and dietary changes) and associated changes in menstrual patterns are responsible for the rise in developing countries. At the same time, improved life expectancy will increase the burden of breast cancer in developing countries as more older women are likely to develop breast cancer than younger women. (S. Pakseresht, GK Ingle, 2009).

Cancer deaths: Cancer knows no borders. It is the second leading cause of death in developed countries and is among the three leading causes of death for adults in developing countries. 12.5 percent of all deaths are caused by cancer. That’s more than the percentage of deaths caused by HIV/AIDS, tuberculosis, and malaria put together. Cancer is a public health problem worldwide. It affects all people: the young and old, the rich and poor, men, women, and children. Cancer represents a tremendous burden on patients, families, and societies. It is one of the leading causes of death in the world and is still increasing, particularly in developing countries. Almost seven million people die each year of cancer, and many of these deaths can be avoided if appropriate measures are put in place to prevent, early detect, cure and care. With this goal in sight, cancer is an important issue on the WHO agenda. With the support of Member States and other partners worldwide, we are developing the WHO Cancer Control Strategy, which aims at accelerating the translation of knowledge into action in order to save millions of lives and reduce unnecessary suffering. (WHO, 2008).
Worldwide, there are over 10 million new cases of cancer and more than six million deaths from cancer annually. Two decades ago, these figures were six million and 4 million (Tomatis et al., 1990). Of the 10 million new cancer cases each year, 4.7 million are in the more developed countries and nearly 5.5 million are in the less developed countries. Although the disease has often been regarded as a problem principally of the developed world, in fact, more than half of all cancers occur in the developing countries. In developed countries cancer is the second most common cause of death, and epidemiological evidence points to the emergence of a similar trend in developing countries. Cancer is currently the cause of 12 percent of all deaths worldwide. In approximately 20 years time, the number of deaths annually due to cancer will increase from about 6 million to 10 million (Pisani P and Parkin DM, 2002). Among men, lung and stomach cancer are the most common cancers worldwide, while prostate cancer is largely seen in more developed countries. For women, the most common cancers worldwide are breast and cervical cancer, although cervical cancer is primarily seen in less developed countries (Parkin DM, 2002).

**Epidemiology:** The global cancer burden in terms of the annual incidence rates and numbers of new cases of 25 different cancers has been estimated for the year 1990 in 23 areas of the world by Parkin et al. (1999). According to these estimates the total number of new cancer cases (excluding non melanoma skin cancer) was 8.1 million, just over half of which occur in the developing countries. Of the total 8.1 million new cases, 4.3 million were men and 3.8 million were women with a male to female sex ratio of 1:0.88. Out of these 3.8 million (3,789,800 cases) cases in women, 1.88 million cases were estimated to be from developed regions and 1.91 million cases were from developing regions.
Cancer is a leading cause of death worldwide. The disease accounted for 7.9 million deaths (13 percent of all deaths worldwide) in 2007. In addition, despite advances in treatment, deaths from cancer are projected to rise, with an estimated 17 million deaths in 2030. Cancer predominantly affects the elderly population with approximately 65 percent of cancers diagnosed in patients over 65 years. Of the 12.4 million new cancer cases in 2008, the most common cancers in terms of incidence were lung (1.52 million), breast (1.29 million) and colorectal (1.15 million) (Boehringer Ingelheim GmbH, 2009). The burden of cancer is still increasing worldwide despite advances for diagnosis and treatment. Epidemiological studies have shown that many cancers may be avoidable. It is widely held that 80–90 percent of human cancers may be attributable to environmental and lifestyle factors such as tobacco, alcohol and dietary habits. Cancer prevention includes primary, secondary and prevention methods. Primary prevention refers to avoiding cancer-causing substances in the environment or dietary elements associated with increased risk; dietary supplementation with putative protective agents. Secondary prevention aims at early detection and removal of benign tumours of oral, cervical and breast cancer. It was estimated that in the year 2000, worldwide over 10 million new cases of cancer occurred (approximately 5.3 million men and 4.7 million women) and over 6 million people died from cancers. The most frequently affected organs are lung, breast, colon, rectum, stomach and liver. Epidemiology of cancer, its control and prevention measures as applicable to Indian population have been discussed here. (N. S. Murthy, 2004, Aleyamma Mathew, 2004)

As per the estimates of cancer incidence and morality there were an estimated 2.6 million new cases of cancer in Europe in 1995, representing over 1 quarter of the world burden of cancer. The overall incidence rate in men was highest in the Western European countries at 420.9 per 100,000 with only Astria having a rate under 400. Eastern European men had the second highest rate of cancer (414.2) with extremely high rates being observed in
Hungary (566.6) and in the Czech Republic (480.5). The lowest male all cancer rates by area was observed in the Northern European countries with fairly low rates seen in Sweden (356.6) and UK (377.8). In contrast to men the highest rates in women were observed in Northern Europe (315.9) and were particularly high in Denmark (396.2) and the other Nordic countries except in Finland. Lung cancer with an estimated 377,000 cases was the most common cancer in Europe in 1995, rates were particularly high in much of Eastern Europe reflecting the current and past tobacco and smoking habits of many inhabitants. Together with cancers of the colon and rectum (334,000) and female breast (321,000) the three cancers represented approximately 40 percent of new cases in Europe. In men the most common primary sites of all cancer cases were lung (22 percent), colon and rectum (12 percent) and prostate (11 percent) and in females breast (26 percent) colon and rectum (14 percent) stomach (7 percent). Lung cancer was the most common cause of death from cancer in men (29 percent) and breast cancer was the common cause of death in females (17 percent) (Bray et al.2002).

Breast cancer was the commonest cancer among women globally, accounting for 21 percent of all cancers in women. More than one million new patients suffer from breast cancer annually in the world. In developed countries, breast cancer is the most common malignancy diagnosed among women, and in developing regions, it ranks second to cervical cancer. Among American women, breast cancer represents 32 percent of all new patients of cancer and is the second leading cause of cancer deaths (15 percent) after lung cancer (S. Pakseresht, GK Ingle, 2009). The total number of new cases was estimated to be 795,600 in 1990 and ranked third overall when both sexes were considered together. The age standardized incidence rates were high in North America (86.3/100,000) and low in china (11.8/100,000). Breast cancer is the most common cancer form in women; with an estimated 1.2 million new cases worldwide each year, breast cancer constitutes about 25 percent of all cancer cases in women and is the second most common cancer
form overall. Breast cancer can also occur in men but this is very uncommon. Incidence rates of breast cancer are significantly higher in developed countries than in developing countries; the difference in incidence rates between developed and developing countries is due a combination of demographic, hereditary, environmental and lifestyle risk factors. Incidence rates are rapidly increasing in many newly industrialized countries due to rapidly changing lifestyles reflecting those patterns in developed countries where we already see high incidence rates. Risk factors that may contribute to breast cancer incidence include: low parity, late first pregnancy, early start of menstruation, late menopause, some types of oral contraceptives, post-menopausal hormone-replacement therapy (all of which contribute to higher lifetime exposure to the hormones oestrogen and more critically, progesterone), hereditary genetic mutations, ionizing radiation to the breast region in younger individuals, low physical activity, obesity after menopause and alcohol consumption.

Breast cancer is the leading cause of cancer mortality among women in most industrialized countries (Ferlay et al., 2004). Contrary to most causes of death, higher breast cancer mortality risks are often observed among women with the highest socioeconomic status (Dano et al., 2003; Dano et al., 2004; Faggiano et al., 1997; Heck et al., 1997); however, some studies find no association between socioeconomic status and breast cancer mortality (Gwenn Menvielle, Annette Leclerc, 2008). The incidence of breast cancer is low in India, but rising. Breast cancer is the commonest cancer of urban Indian women and the second commonest in the rural women. Owing to the lack of awareness of this disease and in absence of a breast cancer screening program, the majority of breast cancers are diagnosed at a relevant advanced stage. The quality of care available for breast cancer patients varies widely according to where the patient is treated. Although there are some centers of excellence providing multimodality protocol-based treatment at par with the best anywhere in the world, the vast majority of private treatment due to lack of high-quality infrastructure and sometimes skills, and above all financial
resources. The recent emphasis on health education, early diagnosis of cancer, and more public facilities for cancer treatment are expected to bring about the much needed improvement in breast cancer in India (Gaurav Agarwal, Pooja Ramakanth, 2008).

In American women breast cancer is the most frequently diagnosed cancer and second leading cause of cancer death, second only to lung cancer. In women aged 40 to 55, breast cancer is the leading cause of all mortality. However, there has been a slight decline in breast cancer mortality overall, which can be attributed both to the success of early detection programs and to advances in treatment, particularly development in systemic therapy (Winer et al. 2001). Breast cancer is predominantly a disease of women and has a major impact on the health of women. Globally breast cancer is the most frequent cancer among women accounting for 21 percent of all cancers in women and ranking third (9.8 percent) over all when both sexes were considered together (Parkin et al. 1999). It is the most common cancer among women in all the developed areas (except for Japan, where it ranks third) as well as in Northern Africa, south America, East, south east and Western Asia and Micronesia/Polynesia. The incidence rates of breast cancer are high in North America and Northern Europe, intermediate in southern Europe and South America and low in Asia and Africa. The age standardized incidence rates of breast cancer per 100,000 women were over 100 in Montevideo, Uruguay in South America (114.9), among non Hispanic Whites in California, North America (109.6) and among Hawaiians, Hawaii in Oceania (101.3). The rate (age-standardized) of breast cancer in Finland was 72.4 per 100,000 women. The lowest incidence rate of breast cancer was seen in the Gambia in Africa (Parkin et al. 2002). Approximately 183,000 women (about 32 percent of all incident cancers in women) are diagnosed with invasive breast cancer each year in America and nearly 41,000 women die of the disease.
Cervical cancer is one of the most common cancers among women worldwide (WHO, 2009). Its mortality exemplifies health inequity, as its rates are higher in low & middle income countries (WHO, 2009), and in low socio-economic groups within countries (Kurkure and Yeole, 2006). Around 80 percent of global cervical cancer cases are in LMICs (Waggoner, 2003) (Ambika Satija, 2009). In South Africa, cervical cancer is the second most common cancer affecting women with an overall age standardized incidence rate (ASIR) of 30 per 100,000 per year. It is differentially distributed in the various population groups (12, 26, 11 and 35 per 100,000 per year for the white, colored, Asian and black populations respectively) (Bradshaw, et al, 2008). In Malawi, between 2001 and 2002, cervical cancer accounted for approximately 28 percent of all female cancers nationally (JHPIEGO, 2007). Cervical cancer occurs when normal squamous cells mutate in the cervix to carcinogenic cells, grow erratically and multiply out of control (Vuhahula, 2004). Cervical cancer is a preventable disease if detected early. It takes about ten years, on average, for the disease to progress from moderate to severe precancerous cells and finally to invasive cancer (Mary Malata Kamphinda-Banda, 2009).

Our knowledge about the prevention and treatment of cancer is increasing, yet the number of new cases grows every year. If the trend continues, 16 million people will discover they have cancer in 2020, two-thirds of them in newly-industrialized and developing countries. It is time to put current knowledge into action in order to save lives and prevent suffering. This requires concerted action between international organizations, governments, public and private institutions, and individuals. That action has already begun. We each have an important role to play (WHO, 2008).
INDIAN SCENARIO:

Cancer has emerged as an important health problem in India. More than 1.5 million people suffer from cancer at any point of the time according to the Indian Cancer Society (ICS 1993). The most common types of female cancer prevalent in India are Cervical, Breast, esophageal, Leukaemia, Ovarian, Buccal Mucosa, Malignant lymphoma, Thyroid and oral cancers. "The total number of cases was 7.62 million with almost an equal division (49 percent and 52 percent) between developed and developing countries. The most frequent cancer among females is cancer of the breast walls (19.10 percent) followed by cancer of the cervix (11.6 percent). In women, the risk of breast cancer is more in developed countries, while cancer of the cervix is the most frequent site for women in developing countries. The mortality parallels that of incidence, although high frequency of more fatal cancer (Stomach, liver, lung) together with poorer survival probabilities, place some developing areas in the risk of dying from cancer. In women, cancer of the breast is the most frequent cause of death despite relatively effective therapy" (WHO; 92-93).

Cancer has become an important Public Health Problem with over 800,000 new cases occurring every year, and is one of the ten leading causes of death in India. At any point of time, it is estimated that there are nearly 2.5 million cases in the country with nearly 400,000 deaths occurring due to cancer. Cancer incidence in India is estimated to be around 70-90 per 100,000 population. From the population based registries in India covering 28-30 million population from different parts of the country, the age adjusted incidence rates vary from 44-122 per 100,000 population in males, and 52-128 per 100,000 females. Cancer registries have also highlighted that more than 80 percent of cancer in females occur in the age group of 35-64, and 3.5 percent to 4.5 percent in childhood, thereby suggesting the impact of cancer as a major public health problem in the most productive age group. Nearly 1,500,000 people require facilities for diagnosis, treatment and follow-up at a
given time. Cancers of the female reproductive tract and breast has a high incidence amongst Indian women. Cancer registries have also highlighted that more than 70 percent of cancers in females occur in the age group of 35-64, and that these cancers exercise an adverse influence on the productive role of women in our society (K Umadevi, 2009).

Over 70 percent of patients report for diagnostic and treatment services at an advanced stage of disease, resulting in poor survival and high mortality rates. More than 50 percent were compliant to treatment protocol, less than 30 percent default during adjuvant therapy and 20 percent default after the preliminary investigation. More than 70,000 new cases of cervical uteri, 3-8 percent of ovarian, 0.5-4.8 percent of corpus uteri, 1-3 percent of vulvar and gestational trophoblastic tumors, and over 75,000 of breast cancers are reported in India every year. India's National Cancer Control Program emphasizes the importance of early detection and treatment. But there is no organized screening program and the majority of Indian women lack both awareness about the disease and access to prevention and treatment facilities. Although cancer screening programs are presently available in all the regional cancer centers and comprehensive cancer care specialty hospitals, which include Pap smears, as well as colposcopy, it is restricted to limited population coverage. In addition, nearly 75,000 Indian women die annually from cervical cancer disease (58 percent). Nearly 70 percent of India's population live in rural areas where the measure of health and living standards are low. Rural women are vulnerable to most of the risk factors for cervical cancer such as early marriage, early childbirth, multiparity, poor genital hygiene, and chronic infection with sexually transmitted disease (K Umadevi, 2009).
Close to 70 percent of all cancers in India are detected when the disease is so advanced that treatment becomes much less effective. Many of these cancers can be either prevented altogether or treated effectively if detected early, according to Geetha K. Raman of the Global Cancer Concern India (GCCCI), New Delhi a non-governmental organization involved in free screening, detection and awareness camps. There are about 2.6 million cases of cancer in India and close to nine lakh new cases are diagnosed every year. (The Hindu daily, Sunday, Oct 07, 2007).

**Breast Cancer:** Breast Cancer, which is the second most common cancer makes up for almost nine percent of all new cancer cases in India. It occurs when cells of the breast grow and multiply in an uncontrolled manner. Though the exact cause still eludes scientists, the abnormal cell division appears to be the result of some mutation in the cell's DNA. However, a number of risk factors have been identified which could help women stay alert.

*Figure – 2.1*
It is estimated that 211,240 patients suffer from invasive breast cancer in a year in the United States. These numbers represent a sharp increase over the past 30 years. Currently, in India, the incidence of breast cancer has steadily increased over the years and as many as 100,000 new patients are being detected every year. The increase reported by the cancer registries is nearly 12 percent from 1985 to 2001, representing a 57 percent rise in India's cancer burden. The trends for increase in breast cancer incidence over time for most of the population in India were found to be statistically significant. Trends in breast and cervix cancer in six population based cancer registries (Mumbai, Bangalore, Chennai, Delhi, Bhopal, and Barshi) were evaluated over the last two decades. This approach showed a decreasing trend for cancer of the cervix and increasing trends for cancers of the breast throughout the entire period of observation in most of the registries. (S. Pakseresht, GK Ingle, 2009). Presently, 75,000 new cases of breast cancer occur in Indian women every year. The breast is the second most common site of cancer in women after the cervix uteri. In the metropolitan cities of New Delhi and Mumbai, it is the most common kind of cancer in women The annual age-adjusted rate (AAR) varies between the urban and rural area. In the urban areas, the AAR is 21.9 to 28.3 per 100,000, whereas in rural areas (Barshi region), it is 8.6 per 100,000. The AAR is 43.8 per 100,000 in the Parsis of Mumbai. The Parsis community fled Persia (modern Iran) and made India its home. Intermarriage is extremely common, members of the community will not marry non-Parsi people, many are spinsters, and most families are small. All this contributes to the high AAR found among them (Rakesh Chopra, 2001).
cancer burden. The trends for increase in breast cancer incidence over time for most of the population in India were found to be statistically significant. Trends in breast and cervix cancer in six population based cancer registries (Mumbai, Bangalore, Chennai, Delhi, Bhopal, and Barshi) were evaluated over the last two decades. This approach showed a decreasing trend for cancer of the cervix and increasing trends for cancers of the breast throughout the entire period of observation in most of the registries (S. Pakseresht, GK Ingle, 2009).

**Cervical Cancer:** The cervix is the lower most part of the uterus and is made up of strong muscles. It also provides support to the uterus due to attachment of muscles from the pelvic bone. The cervix protrudes and opens through a canal into the vagina. The function of the cervix is to allow flow of menstrual blood from the uterus into the vagina, and direct the sperms into the uterus during intercourse.

**Figure – 2.2**

![Cervical Cancer](image-url)
The opening of the cervical canal is normally very narrow. However under the influence of the body hormones and the pressure from the fetal head, this opening widens to about 4 inches (10 cm) during labor, to allow the birth of a baby. If the opening is loose, as observed in some women, it can lead to miscarriages during pregnancy. The cervix is the lower part of the uterus that opens into the vagina. Cervical cancer is the second most common cause of cancer death for women worldwide (40 percent) surpassed only by breast cancer. It is a disease that is almost 100 percent curable with accurate screening and early detection. In India, it is the greatest killer in women of the menopausal zone (S.M. Kadri, 2009). India has a disproportionately high burden of cervical cancer (Shanta et al, 2000). Although its age-standardized death rate of 9.5 deaths per 100,000 population is representative of global rates, it accounts for nearly one-third of global cervical cancer deaths (WHO 2009, GLOBOCAN 2002, IARC, 2009).

India, a country of more than one billion people, lacks organized Pap smear programs, and screening has not reached the vast majority of women in need. Pap smear screening is not feasible due to lack of infrastructure, cost and necessity of follow-up visits. Meta analysis of the publications on Pap screening indicates that the sensitivity of a single Pap smear is 50 percent and not 80 percent. As a result of these difficulties, many Indian women seek care only when the cancer is advanced and not amenable to curative treatment. There are 27 regional cancer centers, and many specialty hospitals are equipped with comprehensive cancer care facilities. However, very few centers have a gynecologic oncology division served by gynecologists trained in gynecological oncology (proportionately infrastructure vs. trained gynecological oncology is lacking).
Recently, many corporate private hospitals in urban India are provided with most of the high tech facilities for diagnosis and treatment, where the complaints to treatment and follow up has much improved as most of women who have insurance coverage belong to the upper middle class. However, this constitutes less than 10 percent of the population coverage. In 1990-91 & 1998-99, the national government established a District Cancer Control Program (DCCP) and subsequently modified the District Cancer Control Program in an effort to extend prevention and early detection services to rural communities. However, the program was not focused on cervical cancer and very little impact was observed. There was no provision for follow-up or treatment of cancer patients once diagnosed in the screening program (K. Umadevi, 2009).

India, which accounts for one sixth of the world's population, also bears one fifth of the world's burden of cervical cancer. There are approximately 130,000 new cases of cervical cancer in India per year and the disease is reported to be responsible for almost 20 percent of all female deaths there. India's cervical cancer age-standardized incidence rate (30.7 per 100,000) and age-standardized mortality rate (17.4 per 100,000) are the highest in South Central Asia. Data from Mumbai suggest that there may have been a slight decline in cervical cancer incidence in recent years. However, the absolute incidence is still very high, especially in rural areas, and the number of cases grows due to high population growth (Rasha Dabash, Jyoti Vajpayee, 2005).
Table 2.1
The estimated number of incidence of female cancer cases and
Common cancer sites in 2001 in India.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common Cancer Sites</th>
<th>No. of Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total population estimated (Millions as on July 1, 2001)</td>
<td>503</td>
</tr>
<tr>
<td>2</td>
<td>Estimated number of new cancer cases – Lip, oral, Cavity (ICD-9: 140-145)</td>
<td>31,000</td>
</tr>
<tr>
<td>3</td>
<td>Pharynx and Larynx (ICD-9: 146-1149, 161)</td>
<td>14,000</td>
</tr>
<tr>
<td>4</td>
<td>Oesophagus (ICD-9: 150)</td>
<td>26,000</td>
</tr>
<tr>
<td>5</td>
<td>Stomach (ICD-9: 151)</td>
<td>16,000</td>
</tr>
<tr>
<td>6</td>
<td>Trachea, Bronchus and Lung (ICD-9: 162)</td>
<td>7,000</td>
</tr>
<tr>
<td>7</td>
<td>Breast (ICD-9: 174)</td>
<td>80,000</td>
</tr>
<tr>
<td>8</td>
<td>Cervix Uteri (ICD-9: 180)</td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>413,000</strong></td>
</tr>
</tbody>
</table>

Population and Cancer incidence: The major concern of population based cancer registries (PBCR) is to calculate cancer incidence rates, study the rates of individual cancers by comparing cancer incidence and patterns in other registries and in different subgroups of population in the respective areas. The population based cancer registration data can be used to describe the magnitude of cancer burden in the community, for etiological studies, monitoring and assessing the effectiveness of cancer control activities. Cancer incidence refers to new cases of cancer diagnosed in a given population during a specified time period. The annual average incidence and mortality rates per 100,000 population are provided. The cases registered during the three year period between 1 January 2006 to 31 December 2008 for 13 of the 20 PBCRs (Barshi, Bhopal, Chennai, Mumbai, Ahmedabad Rural District and Ahmedabad Urban PBCRs, Pune, Kollam, Dibrugarh, Kamrup Urban District, Manipur State, Mizoram State and Sikkim State). PBCRs at Aurangabad, Thiruvananthapuram and Nagpur provided data for the year 2005 also. However the data of 2008 for Nagpur PBCR was incomplete and therefore not included. For the registries at Bangalore, Delhi and Kolkata the cases are based on the two year period from 1 January 2006 to 31 December 2007 and for Cachar PBRC (earlier covering only Silchar town) and Barshi expanded registry covering Beed and Osmanabad districts the report is for the cases registered for the two years from 1 January 2007 to 31 December 2008.

Table 2.2 shows the number of cases registered during the respective periods by gender in different registries. The first five maximum number of cases were registered from the PBCRs at Mumbai (33230), Delhi (26333), Chennai (15258), Bangalore (12624) and Ahmedabad Urban (9442). Cancer cases in males were more than females in Delhi, Ahmedabad Urban, Kamrup Urban District, Cachar District and Dibrugarh District (Table 2.2).
### Table – 2.2
Total number of cases registered for all PBCRs

<table>
<thead>
<tr>
<th>Registry</th>
<th>Male</th>
<th>Female</th>
<th>Total cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangalore (2006-2007)</td>
<td>5645</td>
<td>6979</td>
<td>12624</td>
</tr>
<tr>
<td>Barshi Rural (2006-2008)</td>
<td>389</td>
<td>394</td>
<td>783</td>
</tr>
<tr>
<td>Chennai (2006-2008)</td>
<td>7392</td>
<td>7866</td>
<td>15258</td>
</tr>
<tr>
<td>Delhi (2006-2007)</td>
<td>13720</td>
<td>12613</td>
<td>26333</td>
</tr>
<tr>
<td>Mumbai (2006-2008)</td>
<td>15745</td>
<td>17485</td>
<td>33230</td>
</tr>
<tr>
<td>Cachar District (2007-2008)</td>
<td>1586</td>
<td>953</td>
<td>2539</td>
</tr>
<tr>
<td>Dibrugarh District (2006-2008)</td>
<td>1483</td>
<td>1038</td>
<td>2521</td>
</tr>
<tr>
<td>Kamrup Urban District (2006-2008)</td>
<td>1952</td>
<td>1304</td>
<td>3256</td>
</tr>
<tr>
<td>Imphal West District (2006-2008)</td>
<td>605</td>
<td>752</td>
<td>1357</td>
</tr>
<tr>
<td>Mizoram State (MZ) (2006-2008)</td>
<td>1838</td>
<td>1542</td>
<td>3380</td>
</tr>
<tr>
<td>Aizawl District (2006-2008)</td>
<td>914</td>
<td>778</td>
<td>1692</td>
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*Source: NCRI, Bangalore, 2010*
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<td>Thiruvanthapuram (2005-2008)</td>
<td>126.1</td>
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*Source: NCRI, Bangalore, 2010*
Slight variation was observed in numbers between the sexes in the registries at Kollam, Kolkata, Bhopal, Mizoram State, Ahmedabad Rural District, Manipur State excluding Imphal West District and Sikkim State. Female cancer cases were more than males in Mumbai, Chennai, Bangalore, Pune, Thiruvananthapuram, Nagpur, Manipur State, Barshi, Barshi Expanded and Aurangabad.

**Crude Rate (CR):** The first five highest CR per 100,000 population among males was observed in Aizawl District (156.5) followed by Thiruvananthapuram (126.1), Kollam (119.9), Mizoram State (114.1) and Kamrup Urban District (109.1). Similarly among females the first five highest CR was observed in Aizawl District (138.7) followed by Thiruvananthapuram (22.0), Chennai (113.3), Bangalore (106.3) and Kollam (103.3). Aizawl District and Thiruvananthapuram showed the highest CR in both males and females.

**Age Adjusted Rates (AAR):** AAR per 100,000 population in males ranged from 40.8 in Barshi expanded to 249.5 in Aizawl District of Mizoram state. In females it ranged from 49.0 in Ahmedabad Rural to 210.0 in Aizawl District of Mizoram state.

**Truncated Rates (TR):** In males, the TR per 100,000 population ranged from 89.5 in Barshi expanded to 456.0 in Aizawl District. Similarly, in females, it ranged from 110.8 in Ahmedabad Rural District to 382.0 in Aizawl District of Mizoram State.

**Cumulative Rate and Risk:** Day (1987) proposed the Cumulative rate as another age standardized incidence rate. The Cumulative risk is the probability that an individual will be diagnosed with cancer during a certain age period in the absence of any competing cause of death and assuming that the current trends prevail over the time period. For practical purposes, Cumulative rate is a good approximation of Cumulative risk over the defined period of time.
Cumulative Risk (percent) in 0-64 years: Among males, except for the registry of Barshi the cumulative risk ranged from 3.7 percent in Barshi expanded to 14.5 percent in Aizawl District of Mizoram State. This cumulative risk (percent) gives an idea about a person developing cancer during the life period of 0-64 years of age, for example, in Ahmedabad District (other than Ahmedabad Urban) 4.9 percent of males in the age group of 0-64 years are likely to develop cancer in their life time. Among females, except for the registry of Ahmedabad District (other than Ahmedabad Urban) the cumulative risk ranged from 4.4 percent in Barshi Rural and Manipur state excluding Imphal West District to 12.4 percent in Aizawl District of Mizoram State. This means on an average in Chennai about 8.6 percent of females in 0-64 age group are likely to develop cancer in their life time. In Ahmedabad District (other than Ahmedabad Urban), the cumulative risk was 3.7 percent.

Cumulative Risk (percent) in 0-75 years: Among males, the cumulative risk (percent) in the 0-74 year age group ranged from 4.3 percent in Barshi expanded to 24.0 percent in Aizawl District of Mizoram State. Among females, the cumulative risk percentage in the 0-74 age group ranged from 5.0 percent in Ahmedabad District (other than Ahmedabad Urban) to 21.7 percent in Aizawl District of Mizoram State.

Leading sites of Cancer: The leading sites of cancer for females were decided based on crude incidence rates. Table 2.4 show the two leading sites of cancer for females in all registries.
Table 2.4

Two Leading Sites of Female Cancers in all Cancer Registries

| Cancer Registry                          | No. of cases | percent | CR   | AAR | TR   | No. of cases | percent | CR   | AAR | TR   |
|-----------------------------------------|--------------|---------|------|-----|------|--------------|---------|------|-----|------|------|
| Bangalore (2006-2007)                   | 1874         | 26.9    | 28.5 | 36.1| 86.4 | 1067         | 15.3    | 16.2 | 21.1| 48.1 |
| Barshi Rural (2006-2008)                | 131          | 33.2    | 17.4 | 18.6| 49.7 | 57           | 14.5    | 7.6  | 8.8 | 24.4 |
| Brashi Expanded (2007-2008)             | 681          | 34.4    | 16.3 | 18.9| 50.6 | 460          | 23.3    | 11.0 | 13.3| 36.9 |
| Bhopal (2006-2008)                      | 486          | 24.8    | 18.9 | 25.4| 61.2 | 346          | 17.6    | 13.4 | 18.9| 47.0 |
| Chennai (2006-2008)                     | 2087         | 26.5    | 30.1 | 31.5| 76.1 | 1186         | 15.1    | 17.1 | 18.5| 44.1 |
| Delhi (2006-2007)                       | 3398         | 26.9    | 22.9 | 32.3| 77.3 | 1836         | 14.6    | 12.4 | 17.9| 44.3 |
| Mumbai (2006-2008)                      | 5260         | 30.1    | 29.2 | 32.3| 70.1 | 2258         | 12.9    | 12.5 | 14.1| 33.5 |
| Cachar District (2007-2008)             | 140          | 14.7    | 8.8  | 11.1| 29.8 | 134          | 14.1    | 8.4  | 11.2| 27.6 |
| Dibrugarh District (2006-2008)          | 170          | 16.4    | 9.1  | 12.1| 32.8 | 133          | 12.8    | 7.1  | 11.4| 20.8 |
| Kamrup Urban District (2006-2008)       | 213          | 16.3    | 13.6 | 16.8| 35.0 | 160          | 12.3    | 10.2 | 14.6| 36.0 |
| Imphal West District (2006-2008)        | 89           | 11.8    | 12.0 | 12.9| 30.8 | 103          | 13.7    | 13.9 | 16.3| 38.8 |
| Manipur – Excl. Imphal West (2006-2008) | 162          | 12.6    | 5.6  | 7.0 | 18.1 | 155          | 12.1    | 5.4  | 7.4 | 18.7 |
| Mizoram State (MZ) (2006-2008)          | 163          | 10.6    | 10.7 | 15.1| 35.8 | 211          | 13.7    | 13.9 | 17.7| 45.7 |
| Aizawl District (2006-2008)             | 93           | 12.0    | 16.6 | 23.3| 57.2 | 101          | 13.0    | 18.0 | 22.5| 58.2 |
| Mizoram state - Excl. Aizawl (2006-2008) | 70           | 9.2     | 7.3  | 10.5| 23.6 | 110          | 14.4    | 11.5 | 14.8| 38.3 |
| Sikkim State (2006-2008)                | 42           | 7.7     | 4.6  | 7.2 | 17.0 | 68           | 12.4    | 7.5  | 10.9| 28.9 |
| Ahmedabad – Urban (2006-2008)           | 1255         | 29.7    | 19.1 | 21.5| 51.0 | 517          | 12.2    | 7.9  | 9.1 | 20.9 |
| Aurangabad (2005-2008)                  | 242          | 25.2    | 11.3 | 16.8| 44.9 | 196          | 20.4    | 9.2  | 13.8| 35.4 |
| Kolkata (2006-2007)                     | 1205         | 27.2    | 28.1 | 25.5| 64.4 | 660          | 14.9    | 15.4 | 14.2| 36.8 |
| Kolam (2006-2008)                       | 1138         | 26.0    | 26.9 | 23.2| 60.4 | 404          | 9.2     | 9.5  | 8.3 | 18.4 |
| Nagpur (2005-2007)                      | 827          | 30.0    | 24.4 | 27.2| 70.7 | 438          | 15.9    | 12.9 | 14.7| 36.2 |
| Pune (2006-2008)                        | 1312         | 28.9    | 19.8 | 24.5| 53.9 | 665          | 14.6    | 10.0 | 12.4| 29.2 |
| Thiruvananthapuram (2005-2008)          | 891          | 30.7    | 37.4 | 33.0| 84.0 | 235          | 8.1     | 9.9  | 8.8 | 19.9 |

Source: NCRI, Bangalore, 2010
CANCER PREVENTION AND CONTROL:

Breast and cervical cancer are the two most important cancer types and account for one-third of all cases diagnosed in women of the developing world. Cancer control from a developing country perspective (Global cancer conference). The incidence of breast cancer is rising and is the most common cancer among urban women (Chopra R, 2003). Presently 75,000 new cases occur in Indian women every year (Delhi Breast Unit, Apollo Clinic). The accumulated evidence suggests that cervical cancer is preventable and is highly suitable for primary prevention. Sexual hygiene, use of barrier contraceptives and ritual circumcision can undoubtedly reduce cervical cancer incidence. Education, cervical cancer screening of high risk groups and improvement in socio-economic status can reduce cervical cancer morbidity and mortality significantly (Shanta V, 2009).

Effective cancer control requires a comprehensive national cancer control policy and programme with adequate resource allocation, development of diagnostic and therapeutic capacity and good resource utilization in palliative care. High levels of female illiteracy, gender discrimination and other socioeconomic inequalities, as well as lack of awareness of the risk factors and poor enforcement of tobacco, alcohol and food legislation, all hinder the efforts of cancer control programmes. With reference to time trends in incidence and mortality from breast cancer, the incidence has grown rapidly during the last decades in many developing countries, and slowly in developed countries. The risk of breast cancer increases with cumulative number of ovarian cycles. The risk decreases by about 15 percent for each year of delay in age at menarche and increases by 3 percent for each year of delay in age at menopause. Artificial menopause exerts a similar or somewhat stronger protective effect than natural menopause. Pregnancy increases in the short term the risk of breast cancer, probably because of increase in the level of free estrogens during the first trimester. In
the long run, however, pregnancy has a beneficial effect, since porous women have a higher level of prolactin and a lower level of sex hormone-binding globulin than nulliparous women. These two effects result in a protective role of early age at first pregnancy and a small residual protective effect of other pregnancies (Parkin DM, Bray F, Ferlay J, et al. (2005).

World cancer declaration 2008:

Article I: Cancer patient rights are human rights. The currently evolving movement to define and adopt cancer patients' rights is critical to recognizing and protecting the value and dignity of individuals with cancer throughout the world.

Article II: The stigma associated with cancer is a significant barrier to progress in both developed and developing nations, often causing: undue emotional trauma for patients and their families bias and discrimination against employment of people with cancer and/or their meaningful participation in and contribution to society related financial hardship and loss of productivity, poor communication and insufficient public education an undue sense of fatalism that can adversely impact the commitment of governments, health agencies and private institutions in the war against cancer. The parties to this charter undertake to better understand and eradicate the stigmas associated with cancer, to assertively redefine the disease as a treatable biological pathology and not a social condition. The positive realignment of popular opinion, perception, and concern regarding cancer and the millions of lives it affects will enable the full realization of each of the following priorities.
Article III: The parties undertake a vigorous commitment to create an optimal environment for anti-cancer research innovation.

1. Knowledge of the biology of cancer and the fundamental mechanisms by which cancers emerge and progress is the origin of all advances that have increased and will further increase the rate of cure and the quality of life of millions of people worldwide. The identification of new targets for detection, diagnosis and treatment must accelerate if we are to win the war against cancer.

The parties agree to aggressively build the case for enhanced government and industry funding of basic research, to encourage, protect and incentivize those who innovate, and to increase the means by which scientists may labor in intellectual freedom to constantly advance the frontiers of current knowledge.

2. Clinical research is the sole means by which basic research becomes meaningful to the lives of human beings. Breakthroughs in molecular biology or genetics can have no impact on cancer prevention, screening, diagnosis and treatment unless they are carefully evaluated and developed in clinical trials.

Research in the clinic also can immediately inform ongoing basic research efforts. This kind of translational research, commonly conducted by institutions with both a basic and clinical research capability, rapidly tests hypotheses generated in the laboratory. Immediate feedback from the clinic obtained through translational research can meaningfully redirect basic research efforts and stimulate the generation of important new hypotheses. Despite its importance, clinical research is significantly challenged not only by a lack of funding, but often by a lack of involvement on the part of healthcare professionals and institutions - and a lack of awareness among patients of the purpose and benefits of participating in clinical studies. Inadequate legal and
regulatory harmonization between countries also means that large international clinical trials - the kind that are statistically powerful and can rapidly advance medical practice - can be extremely difficult and costly to conduct. The parties pledge to elevate awareness and commitment to clinical research among all constituencies they represent and to seize every opportunity to strengthen the international research infrastructure. The parties further pledge to advance universal recognition of informed consent - the process by which patients are fully advised of the purpose, risks, and benefits of any clinical study. In so doing, the parties seek to enable rapid, powerful and inclusive clinical trials that ethically engage and also empower people with cancer.

Article IV: Despite the considerable strides that have been taken in the fight against cancer, survival outcomes vary dramatically throughout the world - not just between countries, not just between cities, but even between institutions within the same city. Wide variations in standards of care and access to quality cancer care are a major cause of these discrepancies and the often unnecessary morbidity and mortality that result. The parties reaffirm Article 25 of the Universal Declaration of Human Rights, which states that every individual "has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care." Given the ubiquitous presence of cancer and its impact on society the parties commit to promote quality cancer care within the local economic context for all individual. The parties therefore endeavor to promote:

1. Evidence-based medical practice and clear definition of "quality care" according to all available scientific evidence.
2. Systematic development of guidelines based on the best available evidence for prevention, diagnosis, treatment and palliative care.
3. Appropriate prioritization of quality anti-cancer care at every level of healthcare provision, consistent with the total burden of disease.
4. Intensified cancer specialization and better integration of care among medical disciplines.

5. Widespread patient access to high quality clinical trials.

Article V: The World Health Organization estimates that by the year 2020, 20 million new cases of cancer will emerge each year. 70 percent of these patients will live in countries that between them will have less than 5 percent of the resources for cancer control. Cancer will continue to become an increasingly important contributor to the global burden of disease as we enter the next millennium, despite the fact that many cancers are preventable through control of tobacco use, diet, infection and pollution. It is estimated, for instance, that infections - many potentially preventable - cause 15 percent of cancer worldwide and 22 percent of cancers in the developing world. The use of tobacco similarly causes millions of new cancers and cancer deaths each year, in both the developed and the developing world. This reality emphasizes the need for development of public policies that support the fight against cancer and urgent deployment of existing knowledge and technologies in the basic prevention of cancer to stem the rising tide of disease. The parties undertake to:

1. Actively support existing cancer prevention programs globally and build awareness and commitment to cancer prevention across all constituencies they represent.

2. Identify opportunities to accelerate public education in tobacco control, diet modification, infection control and environmental protection.

3. Organize the support of industry and governments to enhance the delivery of cancer prevention through medical technology wherever possible.
Article VI: It is an uncontested fact that early detection of cancer for any or all of the two hundred or more varieties, leads to a better outcome for the patient. Importantly, the treatment of several recognizable pre-cancerous conditions also can prevent cancer. Fear and ignorance of signs and symptoms of cancer or precancerous conditions are common, however, and by its nature cancer can be insidious and difficult to detect without a screening intervention. It is also known that early detection is particularly important for those people at high risk of cancer, due to lifestyle, environment, occupation, family predisposition or low socio-economic status. Recognition that the earliest symptoms of cancer can be confused with common illnesses further emphasizes the need for effective screening and attentive medical diagnosis. Screening methodology to identify cancer early can extend from simple observation, laboratory tests and x-ray examinations to more sophisticated examinations, all of which have proven value in the early detection of several cancers. In addition to education about cancer prevention, implementation of screening programs - within economic possibilities - should be a prime objective to reduce the cancer burden. These screening programs must be coupled with access to quality treatment in order to be effective. The parties undertake to accelerate the development and widespread application of proven and emerging screening technologies, such that all individuals who might benefit from screening will do so, irrespective of race or socio-economic status.

Article VII: Individual and constituency-based patient advocacy has directly and favorably impacted the war against cancer in instances in which it is well informed and rooted in an understanding of and commitment to quality science and evidence-based medical practice. As the primary stakeholder in the anti-cancer effort, the patient is uniquely positioned to focus the overall anti-cancer effort on eradication of disease and on the optimal use of resources to benefit people at risk of cancer and people living with and fighting the disease. The parties undertake to strengthen the position of the cancer patient as an
active partner in the fight against cancer and will actively promote the following principles:

1. All people affected or potentially affected by cancer should have equal access to information concerning the disease and treatment options including disease origin, prevention, current standards for detection, diagnosis and treatment.

2. Open and collaborative communication between people with cancer and health care professionals and scientists is essential.

3. A commitment to total patient well being includes not only clinical care but also information and psychosocial support. Health care professionals and people with cancer share the responsibility to ensure that total patient needs are met.

4. People with cancer throughout the world have the opportunity to become informed, organized and influential.

5. The professional medical community, recognizing the power and benefit of an informed and active public, will help facilitate popular commitment to both the scientific process and the practice of evidence-based medicine.

6. The medical research, industry and policy communities will regard informed patient advocates as key strategic partners in all aspects of the fight against cancer, including the advancement of standards of care and survival.

**Article VIII:** Improving patients' quality of life is a primary objective in the effort against cancer. Both the physical and emotional burdens of cancer can be significant, and often they are compounded by the side effects of treatment. Because clinical outcomes can be affected by the overall state of a patient's mental and physical well being, the preservation of quality of life - including physical, psychological and social functioning - should be a medical as well as a humanitarian priority. It also must be noted that while giant strides have been
taken to improve cure rates in the last 20 years, the majority of the world's cancer patients today do not experience a cure. When cancer is not curable, important quality of life advantages still can be achieved through optimal anticancer treatment (chemotherapy, radiotherapy) and supportive care, including pain and fatigue management, and end of life palliation. The parties will pursue the following goals to increase commitment to quality of life issues in the fight against cancer:

1. Improvement in the comprehensive care of people with cancer including supportive care and palliation through specific treatment modalities.

2. Recognition at the clinical and also at the policy level of the importance of patients' quality of life, regardless of the stage of the disease and prognosis, and optimal supportive care of cancer patients, particularly in instances in which cure is not achievable.

3. Prioritization of quality of life as a key endpoint in the development of new drugs and also in patient care.

4. Aggressive, continued development of scientific tools to measure and assess quality of life in the clinical setting.

5. Intensive education of healthcare professionals and cancer patients regarding both the need and the opportunity for effective cancer pain control at every stage of disease and treatment. Cancer-related pain profoundly impacts quality of life and is often grossly underestimated and under treated, even when it can be adequately controlled.

6. Pursuit of a better understanding and also a transformation of attitudes regarding death and dying, to ensure that the end of life is accepted as a natural experience that can and should be addressed medically, psychologically, emotionally and spiritually. Optimal medical care of the dying cancer patient must be effective, humane and compassionate.
Article IX: Recognizing the wide variability in resources and epidemiology throughout the world, the parties agree that individual countries must design national anti-cancer strategies according to local needs, and apply resources where they will have the greatest impact. Some nations might choose, for instance, to fund as a first priority strategies against those cancers that are preventable or curable, including prevention education and specific treatments. Other countries might strengthen immunization efforts as part of an overall cancer control strategy or more aggressively support the use of adjuvant chemotherapy to improve cancer survival outcomes. Each of these variable needs and opportunities has recently been defined by the World Health Organization in its effort to craft a global cancer control strategy. It is clear that regardless of economic circumstance, a critical assessment of anti-cancer needs, appropriate planning and prioritization can meaningfully curtail the impact of cancer in both developed and developing nations alike. The parties undertake to actively support the concept of national anti-cancer planning according to local need and resource. They further pledge to challenge all communities engaged in the fight against cancer to ensure such planning sufficiently prioritizes the current and looming cancer crisis - and optimally captures the significant opportunity to reduce cancer-related morbidity and mortality.

Article X: Since cancer knows no boundaries, and individual countries cannot address the challenges of cancer in isolation, a new cooperative approach to research, advocacy, prevention and treatment must be established. The parties undertake to develop unprecedented global networks and alliances to further the goals of this charter. They further pledge to ensure that the objectives of this charter are not abandoned after its signing, by:

1. Recognizing the declaration by all appropriate institutions that February 4 shall be marked as "World Cancer Day" so that each year, the Charter of Paris will be in the hearts and minds of people around the world.
2. Establishing standing committees that will produce annual reports, benchmarking progress against each of the articles of the Charter.

3. Forming a global network of advocacy groups to encourage grassroots support for charter articles within their communities.

4. Creating a global research organization made up of leading professional societies around the world. This group will be dedicated to ensuring that current knowledge is shared across borders, research gaps are identified and promising areas are explored.

5. Rallying one million people around the world to sign the Charter of Paris by the year 2001, thereby showing their willingness to mobilize on behalf of those affected by cancer (UICC, 2008).

Cancer Control and Current scenario-India: India has a National Cancer Control Programme which was established in 1975–76. This has contributed to the development of Regional Cancer Centres (RCCs), oncology wings in medical colleges and support for purchase of teletherapy machines. The District Cancer Control Programme was initiated but did not result in sustainable and productive activity (Krishna Nair, 2003). Widespread inaccessibility of preventive, early detection and treatment services for large segments of the population in India due to the geographical and financial constraints contribute to poor health outcomes. As out-of-pocket payment for the treatment of cancer could economically devastate families and individuals, the creation of appropriate financing mechanisms to cover the cost of treatment needs to be addressed (Parkin DM, Bray F, Ferlay J, et al. 2005).

Infrastructure for diagnosis: Diagnostic infrastructure in the country is limited. There are many districts in the country which do not have a pathologist and pathology/cytology services, which are crucial for diagnosing cancer. Financial and geographic constraints and lack of manpower have contributed to the urban concentration of facilities. An un-estimated number of cancers diagnosed
in the population are not treated. Untreated patients are likely to demand more resources from society (ICMR, 2002).

**Early detection:** Early detection comprises early diagnosis in symptomatic populations and screening in asymptomatic, but at risk, populations. Increasing awareness of the signs and symptoms of cancer contributes to detection of the disease in less advanced stages. Where tests for cancer of specific sites are available, and facilities are appropriate, screening of apparently healthy individuals can disclose cancer in early or precursor stages, when treatment may be most effective (Parkin DM, 2002). Even after detecting an abnormality such as a lump, the visit to a doctor for diagnosis and treatment is postponed substantially, as the initial manifestations – limps, etc. – are not associated with pain or other troublesome symptoms. Inadequate diagnostic facilities at the peripheral or community health centers close to a woman’s home act as a deterrent from seeking specialist advice. That may mean traveling and professional fees. Lack of governmental or nongovernmental support for screening, diagnosis, and treatment costs is another major deterrent in getting timely advice and managed during the period of 1960-1989 reported that the age-adjusted incidence of contralateral breast cancer in patients treated for unilateral breast cancer was 7 times the incidence of unilateral breast cancer in the general population. Among women with unilateral breast cancer, the relative risk was 4.5 comparing women with and without history of breast cancer in their mother, and 2.8 comparing women aged 21-25 years at first childbirth to those younger. Unilateral breast cancer patients not receiving any hormone treatment had a relative risk of 0.3 as compared to those receiving hormone therapy (Gaurav Agarwal, Pooja Ramakanth, 2008).

Early detection is only successful when linked to effective treatment. With early detection, there is a greater chance that curative treatment will be successful, particularly for cancers of the breast and cervix. It is therefore critical that people are taught to recognize early warning signs of
the disease, such as lumps, sores that fail to heal and abnormal bleeding and urged to seek prompt medical attention. This can be promoted among rural Indian women by public health education campaigns and through training of primary health care workers (Parkin DM, 2002). Population screening (mass application of simple tests to identify individuals with asymptomatic disease) is another approach to early detection. However, screening programmes should be undertaken only when their effectiveness has been demonstrated, when resources (personnel, equipment and so on) are sufficient to cover nearly all of the target group, when facilities exist for confirming diagnoses and for treatment and follow-up of those with abnormal results, and when prevalence of the disease is high enough to justify the effort and costs of screening (Parkin DM, 2002).

At present, in countries with high levels of resources, screening can be advocated only for cancer of the breast and cervix. Efforts should concentrate on women at greatest risk of developing invasive cancer: those aged 35 years and over for cervical cancer and those aged over 50 years for breast cancer. In developing countries, organized screening should only be considered for cervical cancer and should focus primarily on providing a limited number of screenings with maximum population coverage, because the women at greatest risk for cervical cancer are in general the last to approach the health care services. Early detection is an important factor in reducing the death rate from cancer, whether it is achieved by personal actions or through participation in early detection programmes. Awareness of different visual body signs or symptoms that could easily be observed by anyone and that are possibly related to cancer is important. It is unequivocally established that cancer survival is better for early, localised disease than for the later stage, advanced form of the disease. Thus the earlier in the process that a cancer can be diagnosed and treated then the better this is for the patient. Much effort has gone into cancer screening and the development of methods for finding cancers at an earlier stage in their development and increasing prospects for
cure. It is possible to make recommendations based on the available evidence (Parkin DM, et al. 2005).

a. Women from 25 years of age should participate in cervical screening. This should be within programmes with quality control procedures in compliance with “EU Guidelines for Quality Assurance in Cervical Screening”. Cervix cancer screening should be offered to all women over 25 years. There is limited evidence of benefit of screening in women over 60 though the likely yield of screening is low in women over age 60, since the incidence of high-grade cervical lesions declines after middle age. Screening this age group is associated with potential harm from false-positive results and subsequent invasive procedures. Stopping screening in older women is probably appropriate among women who have had 3 or more consecutive previous (recent) normal Pap smear results. Yield is also low after hysterectomy, and there is scant evidence to suggest that screening produces improved health outcomes (Parkin DM, Bray F, Ferlay J, et al. 2005).

b. Women from 50 years of age should participate in breast screening. This should be within programmes with quality control procedures in compliance with “EU guidelines for quality assurance in mammography screening”. There is considerable evidence that breast cancer screening with mammography is effective at reducing mortality from breast cancer. A well organized programme with a good compliance should lead to a reduction in breast cancer mortality of at least 20 percent in women aged over 50. The value of screening women under 50 years is uncertain. No trials having large enough statistical power to analyze these women separately have been completed. What recommendations should be made for mammographic screening of women aged 40–49 is an important question that cannot now be answered; over 40 percent of the years of life lost due to breast cancer diagnosed before the age of 80 years are attributable to cases presenting symptomatically at ages 35–49 years, frequently an age of considerable social responsibility (Parkin DM, Bray F, Ferlay J, et al. 2005).
Early detection includes down staging and screening. Down staging is the detection of cancer in an earlier and more treatable stage (e.g. moving from stage-III to II or even from stage-II to I) as the result of greater public awareness of the early warning signs of cancer and greater health professional awareness of the need for rapid referral and diagnosis for suspected cases. In contrast, screening is performed on asymptomatic individuals, with the aim to detect preclinical cancer, or precancerous lesions. In the discussion below, we will refer to the early diagnosis of cancer, rather than down staging, because early diagnosis may still result in improved in improved outcomes even if earlier detection is only achieved within a specific disease stage (e.g. Resulting in a smaller tumor burden). It is important to decide on the relevant strategy in each country by considering the stage that cancers are most often detected. If nearly all cancers are detected at an advanced stage, placing resources into early diagnosis will be preferable to concentrating upon screening. Alternatively, if a considerable proportion of cancers are detected in relatively early stage, then the appropriate strategy would be concentrate on organized screening programmes. Whatever choice is made, the risk-benefit balance must be acceptable for the community. For both approaches adequate resources are needed, with access to diagnostic and treatment facilities and quality assurance of tests used in the diagnostic processes (Arbyn M. et al, 2003).

Up to 40 percent of all cancer deaths can be avoided by reducing tobacco use, improving diets and physical activity, lowering alcohol consumption, eliminating workplace carcinogens and immunizing against hepatitis B virus and the human papillomavirus. A large proportion of cancer can be cured and all cancer patients deserve care. WHO provides support to strengthen health services to cure and care for cancer patients by improving primary and specialized health care. WHO makes essential medicines and technologies available for cancer treatment and palliative care. Our strategies
and policy guidelines help governments in all countries to improve population health standards and reduce national cancer burdens (WHO, 2009).

If cancer can be detected early, treatment may be curative. One means to that end is educating people regarding early signs of the disease: lumps, sores that do not heal promptly and abnormal bleeding. Medical attention should be sought when these occur. Early diagnosis of cancers that are curable if detected early (cervix and breast) can be promoted in India using public education and training of primary health care workers (Krishna Nair., 2003). A second approach to early cancer detection is through population screening: namely, the identification of people with asymptomatic disease by applying simple tests. Cancer screening should be applied only when its effectiveness has been demonstrated; programmes should be introduced only when there is adequate manpower to perform the tests, with mechanisms to achieve adequate population coverage, facilities for diagnosis, treatment and follow-up of individuals with abnormal test results, and when the extent of disease in the population justifies the effort and cost. Currently, screening can only be advocated for cancers of the cervix and breast. It is important that such programmes concentrate on those at greatest risk of invasive cancer, for cervix cancer women aged 35–60 years, for breast cancer women aged 40 years or more (but for mammography programmes those aged 50–69 years) (Cherian Varghese, 2003). Early detection of cervical and breast cancer should be encouraged through health education, promoting early diagnosis. Cost effective procedures like visual inspection with acetic acid (VIA) and physical examination of the breast will be useful tools in this regard (Sankaranarayanan, 2000).
Cancer prevention: Prevention means eliminating or minimizing exposure to the causes of cancer, and includes reducing individual susceptibility to the effects of such causes. It is this approach that offers the greatest public health potential and the most cost-effective long-term cancer control (Ferlay J, 2002). National policies and programmes can be enacted to reduce exposure to these risks and implement preventive interventions. Care needs to be taken to ensure that the public has a clear understanding of these major risks and is not overwhelmed by the minor risks that are described in their local media on a virtually daily basis (Parkin DM, 2002). There is no uniform cancer prevention strategy for the entire country. Awareness programmes have been undertaken in a few places, but there is no uniform standardized information, education and communication (IEC) strategy for cancer prevention. There is no education on risk factors, early warning signals and their management. Cancer screening is not practiced in an organized fashion in any part of India. There are sporadic attempts at opportunistic interventions and small-scale research studies for field interventions (Krishna Nair, 2003). Actions to ensure the availability of oral morphine through amendment of regulations that might inhibit the use of oral morphine for cancer pain relief, and training of health professionals in palliative care, are critical (ICMR, 2002).

It is now known that over one-third of cancers are preventable, and one-third potentially curable provided they are diagnosed early in their course. The quality of life of patients with incurable disease can be improved with palliative care (Krishna Nair, 2003). Poorer cancer care in rural and remote India, though not necessarily all with survival implications, include lack of early detection or screening facilities, less “state of the art” diagnosis, staging and treatment of Breast and cervical cancers; and an apparently lower probability of completing treatment when referred for radiotherapy or chemotherapy (Katharine E Jong, 2005). Factors that underlie Indigenous and socioeconomic disadvantage in cancer survival, and possibly treatment, may go beyond just remoteness of residence and inability to pay. They could include knowledge, attitudes and beliefs about cancer (which may influence
presentation for and acceptance or completion of recommended treatment), communication difficulties, and discrimination on the basis of race or socioeconomic status for access to travel support or more expensive care (Michael C., 2000).

Cancer is potentially the most preventable and most curable of the major life-threatening diseases facing humankind. By applying existing knowledge and promoting evidence-based actions in cancer control, we will turn this truth into reality for all people everywhere. (Dr John R. Seffrin, President, UICC, 2008). No national or regional breast cancer screening program exists in India. At present, a dedicated breast cancer screening by clinical breast examination or mammography is not available outside research studies at few institutions, or to women self-presenting to specialist hospitals to have these services provided for a fee. Mammography is available in a large number of public and private hospitals in almost all towns as a diagnostic service, which also provides a means for opportunistic screening for women willing to pay for it. Mammography is not advocate for mass screening, and it is generally felt that it may not be cost-effective in India. Under the various public health initiatives, such as 'Health for All' and the National Rural Health Mission, emphasis is put on breast awareness and breast self examination as a first step towards creating the ground work for a national wide breast cancer screening program. It is felt that breast self examination and clinical examination are perhaps the right tools for screening the huge population of India, but no credible data is available today to base these views on. Breast awareness and virtues of periodic breast self examination are being promoted for early detection of breast cancer through print, electronic media, as well as through health personnel in various settings. (Gaurav Agarwal, Pooja Ramakanth, 2008).
The chances of surviving the onset of some common cancers depend largely on how early they are detected and how well they are treated. Early detection is based on the observation that treatment is more effective when cancer is detected early. It includes awareness of early signs and symptoms of cancer (e.g. lumps, sores, bleeding), and screening. Screening is the mass testing of people who appear to be healthy. Pap test for cervical cancer is the screening method that has substantially checked the mortality rates in most developed countries and the programmes in some middle-income countries using Pap tests are working (UICC, 2008). In many developing countries, where these are not feasible, several other low technology approaches are being studied and look promising. The success of public health programmes in detecting cancer early depends on the allocation of resources, availability of qualified specialists, and access to follow-up treatment (WHO, 2008).

Survival outcomes vary dramatically throughout the world – not just between countries, not just between cities, but even between institutions within the same city. Wide variation in access to quality cancer care is a major cause of these discrepancies. (Dr Ketayun A. Dinshaw, IARC, Globocan 2002). Cancer diagnosis is the first step to cancer management. This calls for a combination of careful clinical assessment and diagnostic investigations including endoscopy, imaging, hystopathology, cytology and laboratory studies. Once a diagnosis is confirmed, it is necessary to ascertain cancer staging, where the main goals are to aid in the choice of therapy, prognostication, and to standardize the design of research treatment protocols (Parkin DM, 2002).

Cancer treatment: Treatment facilities are also mostly limited to urban areas of the country. In India the availability and affordability of cancer treatment shows wide disparities. The majority of patients with cancer present to a cancer treatment centre in late stages of the disease (80 percent are advanced) and this adds to the already high morbidity, mortality and expenditure. Treatment
results are about 20 percent less than what is observed for similar conditions in more developed countries, mostly due to late diagnosis and inappropriate treatment. Paediatric cancers are highly curable but this has not been achieved in India due to lack of access to quality care and lack of support systems. Pain relief and palliative care Oral morphine is the mainstay for cancer pain relief and is still not widely available in the country. There is a serious limitation of manpower for providing palliative care. Finances The funds for the cancer programme are mainly from the Government and needs to be augmented. Private initiatives are few and are unlikely to cater to a large population across different socioeconomic strata, as it is often not a financially viable venture (Cherian Varghese, 2003).

Due to a large variation in the health care standards between regions, the quality of treatment available for breast cancer patients varies from pathetic to world-class. In an acknowledgement of this fact, a recent effort has been made to chalk out national breast cancer management guidelines, taking into account the available data on breast cancer patients, and also keeping the logistics and economics in mind. The ICMR/WHO national breast cancer management protocols are still at a primitive stage, and far from being operationalized on a country-wide basis. The quality of breast cancer treatment is dictated by many factors, besides a patient’s own outlook, and may include where the patient lives, which institution can she reach, what can she afford to spend on her treatment, whom does she trust, etc. Few patients are treated at well-equipped centers in a protocol-based manner, with numerous compromises made in the multimodality therapy, based on factors such as the economics, tolerance, nutritional deprivation, etc. For a huge number of patients, the number of treatment facilities is low. The poor compliance to treatment and follow-up is due to the social stigma attached to the disease, and the high cost of treatment. Through there is no shortage of skills and expertise in cytology, the due of fine needle aspiration cytology is under-utilized. Pre-operative diagnosis is still based predominantly on clinical and incision or
excisional biopsy. A large proportion of Indian patients are treated with inadequate/inappropriate initial surgical procedures before they are seen and managed by specialists. In a study from major North Indian teaching hospital, almost 75 percent of the patients referred for management of operable early breast cancers (EBC) had an incision or excisional biopsy not intended for treatment of breast cancer (Gaurav Agarwal, Pooja Ramakanth, 2008).

**Palliative care:** Having a good quality of life is a highly significant aim for patients with cancer, whether or not cure is possible. Cancer pain relief and palliative care are important and integral parts of cancer care. Relatively simple and inexpensive treatment to control pain should be available throughout the country as a priority. Palliative therapy and care, including symptom control and pain relief, will be important for years to come, especially in developing countries, because of the large number of patients for whom curative therapy is not possible. Guidelines for cancer pain relief have been produced and are available from the World Health Organization (WHO, 2002). Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual. Improved quality of life is of paramount importance to patients with cancer. Pain relief and palliative care must therefore be regarded as integral and essential elements of a national cancer control programme, whatever the possibilities of cure (Parkin DM. 2002).

Care of cancer patients typically starts with recognition of an abnormality, followed by consultation at a health care facility with appropriate services for diagnosis and treatment. Treatment may involve surgery, radiation therapy, chemotherapy, hormonal therapy, or some combination of these. An initial priority, especially in developing countries, should be the development of national diagnostic and treatment guidelines to establish a minimum
standard of care, and promote the rational use of existing resources and greater equity in access to treatment services (Parkin DM, 2002).

**Quality of life of the Cancer Patients:** The term quality of life (QOL) is a global characterization usually consisting of the following factors: physical function, symptoms from disease and/or treatment, occupational and social interactions, and psychological parameters including mood with some overall assessment of well-being, such as happiness or satisfaction, Yates (1980). For the purposes of individual patient management, the physician often assesses many of these in the process of making decision about cancer care. The aggregate assessment of QOL in groups of patients is more difficult. The increasing subjectivity and difficulty in measurement as medical observers move from the physical has hindered our ability to study QOL. The changing status of the patient from the initial symptomatic disease to the incapacitation related to the treatment and/or the ongoing course of the disease often leading to death makes the measurement of QOL a moving target.

The quality of life of patients during and after disease and treatment is an important outcome of breast cancer care and an extensively studied subject. The first instruments to measure cancer patients' performance status and quality of life were physician rated; quality of life studies based on patient questionnaires did not emerge until the late 1980s and early 1990s. In the last decades a great variety of survey instruments have been developed for the assessment of health related quality of life in breast cancer; a recent literature review identified over 100 different quality of life instruments used in breast cancer; although only a few of these have become extensively validated and established over time. Due to the complexity of breast cancer care and the heterogeneity in patient populations, one single instrument may not be sufficiently comprehensive and sensitive to determine clinically meaningful changes in outcomes across all phases of care (Zabora J, BrintzenhofeSzoc K, 2001).
Social Support and cancer: The framework most applicable to the study of social support derives from the theory of social networks. A social network is generally defined by sociologists as a set of linkages among a defined group of people, the characteristics of which have some explanatory power of social behavior of the people involved (Mitchell, 1996). In an examination of social support and marital adjustment after the diagnosis of breast cancer, Lichtman, Taylor and Wood (1987) interviewed 78 breast cancer patients and each patient, and in most cases, the partner was interviewed for approximately two hours concerning: (1) the degree of support received from family, and friends, which was treated on four-point scales developed by the authors; (2) on any relationship characterized by lack of support, which was rated with an open-ended questions; (3) on ways in which relationships might have changed since their illness; and (4) on whether time significant others hand. Perceived social support appeared to be related to the patient’s adjustment. Better adjustment was associated with perception that family and friends were supportive, shared concerns with partner, open and honest communication with other significant individuals, and increased social activities, but failed to explain the type of support provided by the different relationships.

Peters-Golden (1982) studied and compared the responses of 100 breast cancer patients and 100 patients who were disease-in controls to examine the perception of emotional support. When asked about the quality of support they wanted to receive from their social network if they contacted cancer, the majority of the controls expressed that confidence in the support that they would receive. The patients, however, found that this expected network of support did not materialize. 72 percent of the patients felt that they were “misunderstood” and 52 percent said they were “avoided” or “feared”. Only half of the patients reported that the support they received was “totally adequate”, where as the other half reported that the support was “totally inconsistent” or “totally inadequate”.
India’s Cancer Policies Are Evolving: India launched its National Cancer Control Program in 1975-76 in response to the increasing incidence of various cancers affecting women and men. The program’s goals included the primary prevention of cancers through health education; secondary prevention through early detection and diagnosis; strengthening of cancer treatment facilities; and palliative care for patients with advanced cancer. In 1990-91, the national government added a District Cancer Control Program (DCCP) in an effort to extend prevention and early detection services to rural communities. With some financial support from the central government in the first five years, each DCCP project was linked to one of 19 regional cancer centers or to other institutions with facilities to treat cancer patients. However, according to Dr. Mandal, the DCCP lacked a cervical cancer focus when it was launched “which is a pity,” he says, “since [cervical cancer] is the only cancer detectable at a precancerous stage and thus completely preventable.” With little enthusiasm from the states to continue the program when government funding ended, the DCCP has been reoriented; its goals now include collecting cancer data. While the new program places greater emphasis on cervical cancer prevention, critics say it has been confined to a few regional cancer centers with either little funding or will to carry out the work.

Cancer Registration in India: The Hospital Based Cancer Registries provide an idea of the magnitude and patterns of patient care in the institution. This is especially significant as advanced disease is observed in three quarters of the patients attending first treatment, which leads to very poor survival rates. The importance of screening, early detection as well as palliative treatment has to be emphasized (Gajalakshmi V, 2000).

National Cancer Registry Programme: Accurate information about the occurrence (incidence and mortality rates) and cause of cancer is essential in assessing the importance of the cancer problem in public health and in planning cancer control strategies. Although cancer in India has been recognized since
the Vedic times (ancient times), no nation wide accurate information on the magnitude of cancer was available till very recently (1982). It was only the Bombay Cancer Registry (a population based cancer registry established in 1963) which used to provide reliable data on cancer and international comparisons for the entire country used to be based on this registry data. Since this registry covered only the Bombay metropolitan area and hence could not be used to extrapolate nation wide estimates and also keeping in view of the paucity of reliable data in the country as a whole, the Indian Council of Medical Research (ICMR), initiated a network project, the National Cancer Registry Program (NCRP) in 1982 to generate data on the extent/incidence of cancer in India by augmenting the Bombay Cancer Registry and establishing two more population based cancer registries (PBCRs) at Kidwai Memorial Institute of Oncology, Bangalore and the Cancer Institute, Adayar, Madras (Chennai) and three hospital based cancer registries (HBCRs) at the postgraduate Institute of Medical Education and Research, Chandigarh, Assam Medical College, Dibrugarh and the Regional Cancer Center, Thiruvananthapuram.

In order to generate a large authentic database and for the better assessment of cancer patient care parameters including diagnosis, extent of disease, treatment modalities and their outcome, follow – up details for survival studies, it was soon realized that there was a need for the expansion of a few more registries and thus the ICMR decided to add three more HBCRs at Bangalore, Bombay (Mumbai) and Madras (Chennai) in 1984, where the PBCRs were in operation. Later on three more PBCRs were established ,one at the Rotary Cancer Hospital, Delhi and a special registry at the Gandhi Medical College , Bhopal in 1986 following the worst chemical disaster and a rural registry at Barshi in Maharastra State in 1987. Currently the network of NCRP consists of six PBCRs (including the rural based registry at Barshi) and five HBCRs (the hospital based cancer registry established in 1982, at the Postgraduate Institute of Medical Education and Research, Chandigarh ceased
its operations from 1990 due to administrative reasons). The coverage of cancer registration by the NCRP for urban population in the country is 16.4 percent and that of rural population is 0.06 percent. Total population coverage is only 402 percent.

The main objectives of the NCRP were:
1. To generate authentic data on the magnitude of the cancer problem
2. To conduct / undertake epidemiological investigations and advise control measures
3. To promote human resource development in cancer epidemiology.

Cancer Control Programmes in India: The National Cancer Control Programme was initiated in 1975. The objectives of the programmes are mentioned below (Rao et. al 2002).

1. Primary prevention of cancers by health education regarding hazards of tobacco consumption and necessity of genital hygiene for prevention of cervical cancer.
2. Secondary prevention by early detection and diagnosis of cancer for example, cancer of cervix, breast cancer and oro-pharyngeal cancer by screening methods and patient’s education on self examination methods.
3. Strengthening of existing cancer treatment facilities, which were inadequate.
4. Palliative care in terminal stage cancer.

Under NCCP following schemes exist, the details of scheme were explained (Rao et. al 2002, Gupta et. al 2006).

a. Oncology wings scheme: this scheme has been initiated to bridge the geographical gaps in the availability of cancer treatment facilities in the
country. Central assistance was provided for the purchase of equipment, which includes radiotherapy equipment and also other equipment of related specialty. The civil work and manpower to be provided by the state government/institutions concerned. In view of recommendation of the evaluation report of the NCCP as well as the working group for the tenth plan strategies, financial assistance under this scheme has now been raised from Rs.20.00 million (US $416,667) to Rs.30.00 million (US $ 625,000). There are several district hospitals, which are comparable to Medical College in terms of facilities and need enhanced financial assistance, which is now taken care of by this scheme.

b. Regional Cancer Centre Scheme: There are 25 Regional Cancer Centre (RCCs) recognized by the Government of India. Assistance to RCCs is provided not exceeding Rs.30.00 million (US $ 625,000) for existing RCCs and Rs.50.00 million (US $ 1,041,667) for new RCCs based on the action plan for developing the infrastructure of the institution including equipment for cancer treatment to bring them to the desired level. The grant, which was provided annually, was now been increased and is made as one time grant.

c. District Cancer Control Programme: According to the scheme cancer prevention, health education, early detection and pain relief measures were started in 1990-1991. Under this scheme a provision of Rs.2.2 million (US $45,830) is provided to the State Government concerned for each district project selected under the scheme with a provision of Rs.1.7 million (US $35,417) every year for the remaining 4 years of the project period. The project is linked to Regional Cancer Centre or an institution having good facilities for the treatment of cancer patients. The patients are provided with treatment at the Regional Cancer Centre or the nodal institution concerned. The financial assistance is now proposed to be realized to the nodal agency (RCC/well developed oncology wings in Medical College) instead, to the State Government as an earlier scheme.
d. NGO Scheme-Earlier on NGO scheme for Cancer awareness prevention was operated centrally. Now this scheme has been decentralized and entrusted to the RCC/Government Medical College as nodal agencies. Under the scheme financial assistance of Rs.8000 (US $ 167) per camp is to provide to the registered voluntary organization recommended by the nodal agency and the state Government for undertaking health education and early detection activities.

e. Modified district cancer control programme: the objective of this programme is to conduct a baseline health information and health education drive for 1.2 million women in the age group 20-65. This programme has been initiated in 4 states namely Uttar Pradesh, Bihar, Tamilnadu and West Bengal. Health education about general ailments, cancer prevention, and early detection besides “Breast Self Examination” was imported. This project will provide much needed information on the prevalence of the risk factors and will help to identified a high risk group, who can provided with services for early detection. There were some other activities carried out under the National Cancer Control Programme such as training of cytopathologists and cytotechnicians in the quality assurance in Pap smear technology, training of personnel in early detection and awareness of cancer, telemedicine and supply of hardware and software, information, education and communication activities.

There are twenty five regional cancer centres, providing the cancer treatment services and working for cancer control in their respective regions in India. Cancer has become one of the ten leading causes of death in India. As per the tenth plan emphasizes is on the generation of comprehensive data, primary and secondary prevention of cancer and strengthening of existing treatment facilities along with palliative care.
National Cancer Awareness Day: Cancer awareness day is observed on 7th November. This happens to be birthday of Madam Curie (Marie Sklodowska Curie), Nobel Prize laureate for the discovery of radium. For scientists and public, her radium was a key to basic change in our understanding of matter and energy. Her work not only influenced the development of fundamental science but also ushered in new era in medical research and treatment (NCC, 2002). A commemorative stamp on cancer and first day cover portraying Madam Curie was released on cancer awareness day in 2001. A newspaper advertisement on National Cancer Awareness Day was also released in prominent details across the country (IARC, 2002).
THE SETTING OF THE STUDY:

Profile of the Andhra Pradesh:

Geography: Andhra Pradesh lies between 12°41' and 22° longitude and 77° and 84°40' latitude. It is bounded by Madhya Pradesh and Orissa in the north, the Bay of Bengal in the east, Tamil Nadu and Karnataka in the south and Maharashtra in the west. Andhra Pradesh is the fifth largest state in India and it forms the major link between the north and the south of India. It is the biggest and most populous state in the south of India. There are three main regions in Andhra Pradesh - (1) Northern Circars or coastal Andhra comprising Srikakulam, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Ongole and Nellore districts; (2) Rayalaseema or Ceded districts comprising Kurnool, Cuddapah, Chittoor and Anantapur districts; and (3) Telangana comprising Khammam, Nalgonda, Warangal, Karimnagar, Medak, Nizamabad, Aadilabad, Mahbubnagar and Hyderabad districts. The Circars or Coastal districts are well developed and enjoy a greater degree of affluence than the other two regions; Rayalaseema is close to the coastal districts and here rainfall is less than in the coastal districts and drought conditions prevail sometimes, and the Telangana region is of the former princely state of Nizam's Hyderabad, which is close to Maharashtra's Marathwada region and some parts of Karnataka.

The state is dotted with hill ranges from the north to the south, running erratically down the middle of the country dividing it into western and eastern or coastal Andhra. These hills form integral geographical entities of Andhra life and history. In the north, there are Simhachalam and Annavaram hills, in the middle country there are the Srisailam hill ranges and in the south are the Tirumala-Tirupati hills. The state has two great rivers, Godavari and Krishna which spring from the
Western Ghats in Maharashtra and flow eastward and joins the Bay of Bengal. The Godavari enters the state of Andhra Pradesh direct from Maharashtra, but the Krishna first goes to Karnataka where it flows for a considerable distance before entering Andhra Pradesh. Besides these two big rivers, there are the Tungabhadra, the Pennar and many other small rivers and rivulets. Pennar originates in the Karnataka plateau. Like all the peninsular rivers and even those which arise in central India, like the Narmada, Sone and Chambal, all these are rain fed rivers as there is no snow below the Himalayas. Andhra Pradesh has considerable topographical variations with dense forest in the north east, flat paddy lands in the coastal plains, several noteworthy beaches along the Bay of Bengal and the stark boulder-strewn region around Hyderabad.

History: Andhra Pradesh is said to have been the home of the Pre-Dravidian dark coloured inhabitants. Andhra region witnessed the rule of Chandragupta Maurya during which it established itself as an independent kingdom. After Ashoka, the Mauryan empire declined giving opportunity to establish smaller kingdoms. In about the third century BC the Satavahanas ruled for about five centuries. The Satavahanas established a strong rule with their territories extending upto Maharashtra and Madhya Pradesh. The Satavahanas were overpowered by the Ikshvakus by the third century AD. During this period Brahmanism is said to have been revived. This reduced the influence of Buddhism which was fostered by the Satavahanas.

By the end of the third century AD the Pallavas of Kanchi put an end to the rule of the Ikshavakus. Art and Architecture advanced during their rule. By 4th century AD the Anandas established their rule which lasted till 6th century. During the 7th century the Eastern Chalukyas exercised their power for many centuries. Literature was advanced during this period with promotion of the Telegu script. The Kakatiyas who were the feudatories of
the Eastern Chalukyas became independent in about the 12th century. During the rule of Delhi Sultanate, Muslims repeatedly attempted to invade Andhra. In 1332 AD Ulugh Khan established the Reddi Kingdom of Kondavidu; the Velama kingdom. The Vijayanagar Kingdom also ruled independently. The rule of Muhammad Tughlag witnessed the rise of the independent Muslim Power at Bijapur. This was under the Bahamani Sultanate. In 1518 the Sultan Qili Qutub Shah declared himself independent and founded the Qutub Shah dynasty which existed till 1687. During this period literature, art and architect advanced. The city of Hyderabad was laid in 1591 by Muhammad Quli Qutub Shah. The Mughals put an end to the Qutub Shahi rule in 1687. After this the Asafjahis called Nizams emerged. They influenced Andhra Pradesh throughout the 18th century till Andhra Pradesh was ceded to the East India Company. Gradually the whole of Andhra Pradesh except Hyderabad was under the British till 1947. In 1956 Andhra Pradesh was declared as a state.

The state of Andhra Pradesh has an area of 275,045 sq. km. and a population of 76.21 million. There are 23 districts, 1128 blocks and 28123 villages. The State has population density of 277 per sq. km. (as against the national average of 312). The decadal growth rate of the state is 14.59 percent (against 21.54 percent for the country) and the population of the state is growing at a slower rate than the national rate.

**Health Indicators Of Andhra Pradesh:** The Total Fertility Rate of the State is 1.8. The Infant Mortality Rate is 52 and Maternal Mortality Ratio is 154 (SRS 2004 - 06) which are lower than the National average. The Sex Ratio in the State is 978 (as compared to 933 for the country).
### Table – 2.5

Demographic, Socio-economic and Health profile of A.P. as compared to India figures

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Item</th>
<th>A.P. (in million)</th>
<th>India (in million)</th>
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<tbody>
<tr>
<td>1</td>
<td>Total population (Census 2001)</td>
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<td>1028.61</td>
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<tr>
<td>2</td>
<td>Decadal Growth (Census 2001) (percent)</td>
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<td>21.54</td>
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<td>3</td>
<td>Crude Birth Rate (SRS 2008)</td>
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<td>22.8</td>
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<tr>
<td>4</td>
<td>Crude Death Rate (SRS 2008)</td>
<td>7.5</td>
<td>7.4</td>
</tr>
<tr>
<td>5</td>
<td>Total Fertility Rate (SRS 2008)</td>
<td>1.8</td>
<td>2.6</td>
</tr>
<tr>
<td>6</td>
<td>Infant Mortality Rate (SRS 2008)</td>
<td>52</td>
<td>53</td>
</tr>
<tr>
<td>7</td>
<td>Maternal Mortality Ratio (SRS 2004 - 2006)</td>
<td>154</td>
<td>254</td>
</tr>
<tr>
<td>8</td>
<td>Sex Ratio (Census 2001)</td>
<td>978</td>
<td>933</td>
</tr>
<tr>
<td>9</td>
<td>Population below Poverty line (percent)</td>
<td>15.77</td>
<td>26.10</td>
</tr>
<tr>
<td>10</td>
<td>Schedule Caste population (in million)</td>
<td>12.34</td>
<td>166.64</td>
</tr>
<tr>
<td>11</td>
<td>Schedule Tribe population (in million)</td>
<td>5.02</td>
<td>84.33</td>
</tr>
<tr>
<td>12</td>
<td>Female Literacy Rate (percent)</td>
<td>50.4</td>
<td>53.7</td>
</tr>
</tbody>
</table>

### Table – 2.6

Health Infrastructure of Andhra Pradesh

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Required</th>
<th>In position</th>
<th>shortfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-centre</td>
<td>11699</td>
<td>12522</td>
<td>-</td>
</tr>
<tr>
<td>Primary Health Centre</td>
<td>1924</td>
<td>1570</td>
<td>354</td>
</tr>
<tr>
<td>Community Health Centre</td>
<td>481</td>
<td>167</td>
<td>314</td>
</tr>
<tr>
<td>Multipurpose worker (Female)/ANM at Sub Centres &amp; PHCs</td>
<td>14092</td>
<td>12541</td>
<td>1551</td>
</tr>
<tr>
<td>Health Worker (Male) MPW(M) at Sub Centres</td>
<td>12522</td>
<td>6127</td>
<td>6395</td>
</tr>
<tr>
<td>Health Assistants (Female)/LHV at PHCs</td>
<td>1570</td>
<td>1564</td>
<td>6</td>
</tr>
<tr>
<td>Health Assistants (Male) at PHCs</td>
<td>1570</td>
<td>1920</td>
<td>-</td>
</tr>
<tr>
<td>Doctor at PHCs</td>
<td>1570</td>
<td>2214</td>
<td>-</td>
</tr>
<tr>
<td>Obstetricians &amp; Gynaecologists at CHCs</td>
<td>167</td>
<td>95</td>
<td>72</td>
</tr>
<tr>
<td>Physicians at CHCs</td>
<td>167</td>
<td>20</td>
<td>147</td>
</tr>
<tr>
<td>Paediatricians at CHCs</td>
<td>167</td>
<td>90</td>
<td>77</td>
</tr>
<tr>
<td>Total specialists at CHCs</td>
<td>668</td>
<td>235</td>
<td>433</td>
</tr>
<tr>
<td>Radiographers</td>
<td>167</td>
<td>65</td>
<td>102</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>1737</td>
<td>1614</td>
<td>123</td>
</tr>
<tr>
<td>Laboratory Technicians</td>
<td>1737</td>
<td>1363</td>
<td>374</td>
</tr>
<tr>
<td>Nurse/Midwife</td>
<td>2739</td>
<td>2373</td>
<td>366</td>
</tr>
</tbody>
</table>

*Source: RHS Bulletin, March 2008, M/O Health & F.W., GOI*
Table – 2.7

Health Institutions in the State of Andhra Pradesh

<table>
<thead>
<tr>
<th>Health Institution</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical College</td>
<td>32</td>
</tr>
<tr>
<td>District Hospitals</td>
<td>16</td>
</tr>
<tr>
<td>Ayurvedic Hospitals</td>
<td>9</td>
</tr>
<tr>
<td>Ayurvedic Dispensaries</td>
<td>557</td>
</tr>
<tr>
<td>Unani Hospitals</td>
<td>6</td>
</tr>
<tr>
<td>Unani Dispensaries</td>
<td>196</td>
</tr>
<tr>
<td>Homeopathic Hospitals</td>
<td>6</td>
</tr>
<tr>
<td>Homeopathic Dispensary</td>
<td>286</td>
</tr>
</tbody>
</table>

Source: RHS Bulletin, March 2008, M/O Health & F.W., GOI

Profile of Anantapur District:

The universe of the study, Anantapur district is located in the state of Andhra Pradesh. Andhra Pradesh is divided into three distinct socio-cultural regions namely, Coastal Andhra, Telangana and Rayalaseema regions. Rayalaseema region is backward and chronically drought prone region. Anantapur district is located in this region.

Historical background: Anantapur District was formed in the year 1882 having been separated from Bellary district. Later on, it was expanded with the addition of Revenue Mandals of Kadiri, Mudigubba, Nallamada, N.P.Kunta, Talupula, Nallacheruvu, O.D.Cheruvu, Tanakal, Amadagur and Gandlapenta (previous Kadiri Taluk) from Cuddapah District in the year 1910. During the year 1956, the present Revenue Mandals of Rayadurg, D.Hirehal, Kanekal, Bommanahal and Gummagatta of Bellary District were added to Anantapur District.
Boundaries and Topography: Anantapur District lies between 13'-40' and 15'-
15' Northern Latitude and 76'-50' and 78'-30' Eastern Longitude. It is bounded 
by Bellary, Kurnool District on the North, Cuddapah and Kolar District (of 
Karnataka) on South East and North respectively. The District is roughly oblong 
in shape, the longer side running north to south with a portion of Chitradurg 
District of Karnataka State intruding into it from west between Kundurpi and 
Amarapuram Mandalas. The District may be divided into three Natural 
Divisions. They are 1) Northern Mandal of Rayadurg, Kanekal, Beluguppa 
Gooty, Guntakal, Vajrakarur, Uravakonda, Vidapanakal, Yadiki, Tadipatri, 
Putlur and Yellanur containing larger areas of Black Cotton soils (2) 
Kalyandurg, Kambadur, Settur, Brahmasamudram, Ramagiri, Kanaganapalli, 
C.K.Palli, Dharmavaram, Bathalapalli, Tadimarri, Mudigubba, Anantapur, 
Kudair, Pamidi and Peddavadugur in the center which are mainly made up of 
Arid Treeless, expanse of poor Red Soils, (3) High Level Land of Penukonda, 
Roddam, Somandepalli, Hindupur, Lepakshi, Chilamathur, Madakasira, Rolla, 
Gudibanda and Agali which connects with Mysore plateau at higher elevation 
of the rest of the District. This part has average sandy red soils of normal 
productivity.

Forests: The District is not rich in the Forest Wealth. The name ‘Forest’ in 
Anantapur District does not indicate any dense tree population with thick 
foliage. The Forests in the District is thin and scanty. The Muchukota Hills 
about 35 KMs. in length run from North of Gooty Town upto extreme 
Southern Corner of Tadipatri and Yadiki Mandalas. Another line of Hills starts 
from West of Gooty Mandal and run 80 kilometers called by name 
Nagasamudram Hills. The Mallappakonda Range begins at Dharmavaram and 
runs into Karnataka State.
The Penukonda Range which starts in the South of Dharmavaram through Penukonda and Hindupur proceeds to Karnataka State. In Madakasira, the hills divide Rolla and Agali Mandals into Southern and Northern portions. There are numerous isolated Peaks and Rocky Clusters which are devoid of any vegetation.

The heights of some of these Hill Ranges are given below:

Mallappakonda four Miles to

<table>
<thead>
<tr>
<th>Location</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>North of Bukkapatnam</td>
<td>3002 feet</td>
</tr>
<tr>
<td>Penukonda</td>
<td>3091 feet</td>
</tr>
<tr>
<td>Kundurpi Durgam</td>
<td>2996 feet</td>
</tr>
<tr>
<td>Madakasira</td>
<td>2936 feet</td>
</tr>
</tbody>
</table>

Mineral Resources: Barites, High Grade Lime Stones, Iron ore and steatite are the minerals occurring in the district. There are however, no large sized minerals occurring in the district. Gold is found to occur in the district. Diamonds are also known to be available. There are two Cement Factories in Tadipatri Mandal one in the Public Sector and the other in private sector. The construction work of L&T Factory is completed and started production.

Rivers: The important river in the District is Pennar. Jayamangala, Chitravathi, Vedavathi or Hagari are the other significant rivers in the District. Apart from these, streams like Kushavathi in Chilamathur Mandal Swarnamukhi in Agali Mandal Maddileru in Nallamada, Kadiri and Mudigubba Mandals Pandameru in Kanaganipalli, Raptadu, Anantapur B.K.Samudram and Singanamala Mandals Papagni in Tanakal Mandal are important water supply sources to various large and medium irrigation tanks in the district. There is one Major Irrigation Project T.B.P.H.L.C., and three Medium Irrigation Projects. 1. Upper Pennar Project, 2. Bhairavanithippa Project, 3. Chennarayaswamy Gudi.
Rainfall and climate: The district has a dubious distinction of receiving the second lowest rainfall in the country! The normal rainfall of the district is 552.0 MMs, by which it secures least rainfall when compared to Rayalaseema and other parts of Andhra Pradesh. The Geographical position of the Peninsula render it, the driest part of the State and hence, Agriculture conditions are more often precarious, the district is deprived of both the monsoons and subjected to droughts due to bad seasons and thus is chronically drought prone. The District of Anantapur has a fairly good elevation which provides the District with tolerable climate throughout the year. There is a gradual rise in Hindupur, Parigi, Lepakshi, Chilamathur, Agali, Rolla and Madakasira Mandals in the South to join the Karnataka Plateau where the average elevation is about 2000 feet is above the mean sea level. It is about 1100 feet at Anantapur and the lowest 900 feet is at Tadipatri.

Soils and land Utilization: The soils in Anantapur District are predominantly red. Thus 76 percent are red soils, 24 percent are black soils. The total geographical area of the district is 19.13 lakh Hects. The cultivated area of the District is 10.44 Lakh Hect. Out of which 9.00 Lakh hectares are under Kharif and 1.44 Lakh hectares, is under Rabi Season during the year 2002-2003. The District occupies the lowest position in respect of Irrigation facilities with only 14.98 percent of the gross cropped area during 2002-2003. Out of the gross irrigated area of 1.56 Lakh Hects. During 2002-2003 canals accounted for 13.23 percent tanks, 1.39 percent (tube wells) 64.83 percent wells 19.22 percent and other sources 1.33 percent.

Revenue administrative divisions: The District is divided into 3 Revenue Divisions consisting of 63 Revenue Mandals (Anantapur Division 20, Dharmavaram Division 17 and Penukonda Division 26). There are 940 inhabited villages, out of a total 964 Revenue villages of the District. The number of villages in population size group of 500 to 1999 forms 36.06 percent of the total inhabited villages. The size group of 2000 to 4999 forms...
38.19 percent and the size group of 5000 to 9999 forms 12.34 percent only out of total villages, while 85 villages (9.04 percent) of total inhabited villages are having population less than 500. There are 26 villages with more than 10000 population excluding Towns. There are 10 Towns in Anantapur District as per 2001 Census. The unique feature however is that most of the revenue villages have constituent villages. Thus a revenue village often consists of a Constellation of hamlet villages. The hamlet villages thus are not the units for administrative sanctions, grants or for statistical records. Thus the district of Anantapur comprises 940 in-habitated revenue villages and 2358 hamlet villages. (Table 2.9).

Table – 2.8
Anantapur District Area Profile

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item</th>
<th>Unit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Geographical Area</td>
<td>Sq.km</td>
<td>19130</td>
</tr>
<tr>
<td>2</td>
<td>Forest Coverage</td>
<td>percent</td>
<td>10.30</td>
</tr>
<tr>
<td>3</td>
<td>Normal Rainfall</td>
<td>M.M.</td>
<td>553</td>
</tr>
<tr>
<td>4</td>
<td>Gross Cropped Area</td>
<td>Lakh in Hectors</td>
<td>10.44</td>
</tr>
<tr>
<td>5</td>
<td>Gross Irrigated Area</td>
<td>Lakh in Hectors</td>
<td>1.56</td>
</tr>
<tr>
<td>6</td>
<td>Gross Irrigated Percentage to total</td>
<td>(percent)</td>
<td>14.94</td>
</tr>
</tbody>
</table>


Table – 2.9
Anantapur District Administrative Profile

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Administrative Division</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Revenue Divisions</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Revenue Mandals</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Revenue villages (Inhabitants)</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Hamlets</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Total No. of Villages (Revenue Villages)</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>No. of Towns</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Gram Panchayats</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Mandel Parishads</td>
<td>No</td>
</tr>
</tbody>
</table>

Population: Anantapur district is second largest district in Andhra Pradesh with a total area of 19130 sq.km. However the district is sparsely populated. The density of population of the District is only 190 persons per Sq. K.M, against (277) of the State. The population of Rural and urban to the total population of the District works out to be 75 percent and 25 percent (2001 Census) as against 87.5 percent of 1991 Census. There are 958 Females per 1000 Males (2001 Census). The working force in the total population of District forms 48.83 percent as per 2001 census, out of which 26 percent are in the Agriculture Sector. The work participation rate for female is 39.4 and for male 57.8. Agriculture labour constitute main work force (37.7 percent). Agriculture labour is the mainstay for women workers (54.5). The district has low sex ratio, only 958 females per thousand males. It is further lower in the case of Scheduled Castes and Scheduled Tribe Population. The overall literacy rate in the district is only 56.13; and for rural areas it is much lower it is only 44.63 (see Table - 2.10).

Infrastructure: The details of communication, education and health services and infrastructure are shown in Tables 2.12, 2.13 and 2.14. The district is provided with 8,702 kilometers length of road facility. However, 42.65 percent only are connected with main road. 58.70 percent of villages have bus stop facility. As many as 80.46 percent village have primary schools. Only 13.58 percent of villages have medical facilities within the village.
### Table – 2.10

**Population Characteristics of Anantapur District**

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Category</th>
<th>Unit</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Density of Population</td>
<td>Per sq.km</td>
<td>190</td>
</tr>
<tr>
<td>2</td>
<td>Population</td>
<td>Lakhs</td>
<td>36.40</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>Lakhs</td>
<td>18.59</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>Lakhs</td>
<td>17.81</td>
</tr>
<tr>
<td>4</td>
<td>Rural Population</td>
<td>Lakhs</td>
<td>27.21</td>
</tr>
<tr>
<td>5</td>
<td>Urban Population</td>
<td>Lakhs</td>
<td>9.19</td>
</tr>
<tr>
<td>6</td>
<td>Urban Population as percent to</td>
<td>percent</td>
<td>25.23</td>
</tr>
<tr>
<td>7</td>
<td>Population of Scheduled Castes</td>
<td>percent</td>
<td>14.14</td>
</tr>
<tr>
<td>8</td>
<td>Population of Scheduled Tribes</td>
<td>percent</td>
<td>3.5</td>
</tr>
<tr>
<td>9</td>
<td>Population (0-6)</td>
<td>No</td>
<td>479853</td>
</tr>
<tr>
<td>10</td>
<td>Sex-ratio</td>
<td>No</td>
<td>958</td>
</tr>
<tr>
<td>11</td>
<td>Sex-ratio (0-6)</td>
<td>No</td>
<td>959</td>
</tr>
<tr>
<td>12</td>
<td>Sex-ratio S.C.</td>
<td>No</td>
<td>956</td>
</tr>
<tr>
<td>13</td>
<td>Sex-ratio S.T.</td>
<td>No</td>
<td>935</td>
</tr>
<tr>
<td>14</td>
<td>No. of Households</td>
<td>No</td>
<td>779052</td>
</tr>
<tr>
<td>15</td>
<td>Household size</td>
<td>No</td>
<td>5.0</td>
</tr>
<tr>
<td>16</td>
<td>Literacy Rate</td>
<td>No</td>
<td>56.13</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>No</td>
<td>68.4</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>No</td>
<td>43.3</td>
</tr>
<tr>
<td>17</td>
<td>Rural Literacy</td>
<td>No</td>
<td>44.63</td>
</tr>
<tr>
<td>18</td>
<td>Urban Literacy</td>
<td>No</td>
<td>60.87</td>
</tr>
</tbody>
</table>

**Source:**

### Table – 2.11

**Work Participation of Anantapur District**

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Total Workers</th>
<th>Unit</th>
<th>Persons</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proportion of Non-Main Workers</td>
<td>percent</td>
<td>51.2</td>
<td>42.2</td>
<td>60.6</td>
</tr>
<tr>
<td>4</td>
<td>Main Workers</td>
<td>percent</td>
<td>40.4</td>
<td>52.3</td>
<td>28.0</td>
</tr>
<tr>
<td>5</td>
<td>Marginal workers</td>
<td>percent</td>
<td>8.4</td>
<td>5.6</td>
<td>11.4</td>
</tr>
<tr>
<td>6</td>
<td>Proportion to total Cultivators</td>
<td>percent</td>
<td>29.8</td>
<td>32.3</td>
<td>25.9</td>
</tr>
<tr>
<td></td>
<td>Agricultural Labour</td>
<td>percent</td>
<td>37.7</td>
<td>26.8</td>
<td>54.5</td>
</tr>
<tr>
<td></td>
<td>Household Industry</td>
<td>percent</td>
<td>5.7</td>
<td>5.6</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Other Workers</td>
<td>percent</td>
<td>26.7</td>
<td>35.3</td>
<td>13.6</td>
</tr>
<tr>
<td>7</td>
<td>Work Participation Rate</td>
<td>percent</td>
<td>48.8</td>
<td>57.8</td>
<td>39.4</td>
</tr>
</tbody>
</table>

**Source:**
Table – 2.12
Infrastructure of Anantapur district

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
<th>Unit</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Govt. Hospitals</td>
<td>No</td>
<td>93</td>
</tr>
<tr>
<td>2</td>
<td>Villages electrification</td>
<td>No</td>
<td>933</td>
</tr>
<tr>
<td>4</td>
<td>Degree colleges</td>
<td>No</td>
<td>38</td>
</tr>
<tr>
<td>5</td>
<td>Jr. Colleges</td>
<td>No</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Schools (Including Primary, Upper primary and High schools)</td>
<td>No</td>
<td>4408</td>
</tr>
</tbody>
</table>

Table – 2.13
Medical and Public Health

<table>
<thead>
<tr>
<th>S. N.</th>
<th>ITEM</th>
<th>2000-</th>
<th>2001-</th>
<th>2002-</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Allopathic :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. General hospitals</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>B. Hospitals for special treatment (Specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. C.D. Hospital, Anantapur</td>
<td>01</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>ii. P.A.C. Dispensary,</td>
<td>01</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>iii. Police hospital, Anantapur</td>
<td>01</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td></td>
<td>iv. Primary health centres</td>
<td>68</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>C. Dispensaries</td>
<td>08</td>
<td>08</td>
<td>08</td>
</tr>
<tr>
<td></td>
<td>D. (i) beds</td>
<td>1394</td>
<td>1394</td>
<td>1394</td>
</tr>
<tr>
<td></td>
<td>(ii) beds (Lakh of population)</td>
<td>38.30</td>
<td>37.5</td>
<td>37.17</td>
</tr>
<tr>
<td></td>
<td>E. (i) doctors</td>
<td>186</td>
<td>203</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>(ii) doctors per Lakh of 5.11</td>
<td>5.46</td>
<td>8.53</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Ayurvedic :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Hospitals</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>B. Dispensaries</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>C. Doctors/valds</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>III</td>
<td>Unani :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Hospitals &amp; dispensaries</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>B. Doctors / tabeebs</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>IV</td>
<td>Homeopathy :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Hospitals &amp; dispensaries</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>B. Doctors</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Note: Information should relate to Government bodies including Municipalities, Zilla Parishads and Mandal Parishads.

Table – 2.14
Communication, education & medical facilities in the villages of Anantapur district

<table>
<thead>
<tr>
<th>Facility item within the village</th>
<th>Total no of Inhabitated villages</th>
<th>No. of Villages having</th>
<th>No. of villages not having the facility By distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical facility</td>
<td>3322</td>
<td>451</td>
<td>784 1115 972</td>
</tr>
<tr>
<td>Primary school</td>
<td>3322</td>
<td>2673</td>
<td>513 71 19</td>
</tr>
<tr>
<td>Upper primary</td>
<td>3322</td>
<td>511</td>
<td>1046 987 699</td>
</tr>
<tr>
<td>Main Road</td>
<td>3322</td>
<td>1417</td>
<td>933 736 230</td>
</tr>
<tr>
<td>Bus stop</td>
<td>3322</td>
<td>1950</td>
<td>808 481 73</td>
</tr>
</tbody>
</table>


The Hospital setting:

The present study was conducted at a rural Hospital, Bathalapalli run by Rural Development Trust Rural (RDT), a leading NGO. RDT was founded by late Dr. Father Vincent Ferrer and has been rendering services to the underprivileged and socially disadvantaged population of Anantapur District for the past four decades. In recognition of the father Vincent Ferrer’s contribution through RDT in the fields of livelihood, education, health, community development, women empowerment and service to the weaker sections, Sri Krishnadevaraya University has honoured Father Vincent Ferrer by conferring the award of honorary Doctorate.

The healthcare services of RDT is specially nurtured by Mrs. Anne Ferrer, whose vision has paved the way for healthcare for the poor and needy. RDT has commissioned a Secondary level Rural Hospital at Bathalapalli with a chain of rural peripheral Hospitals, rural health clinics and Community health network too. The details are as under.
### Table 2.15
*RDT Health Care Services*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Hospital</th>
<th>Location</th>
<th>Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RDT Referral Hospital</td>
<td>Bathalapalli</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>RDT Hospital</td>
<td>Kalyandurg</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>RDT Hospital</td>
<td>Kanekal</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Family Planning Centre</td>
<td>Anantapur</td>
<td>125</td>
</tr>
<tr>
<td>5</td>
<td>Care &amp; Support Centre</td>
<td>Bathalapalli</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>15 Rural Clinics</td>
<td>Mandal Head quarters</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>3 Rural Health Clinics</td>
<td>Mandal Head quarters</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: RDT Hospital Records, 2010

### Table 2.16
*RDT Health Professionals*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Category</th>
<th>No.of staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Allopathic Doctors (Hospitals)</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Nurses</td>
<td>325</td>
</tr>
<tr>
<td>3</td>
<td>Technicians (Lab, X-ray, Blood Bank, OT, CCSD, Anesthesia etc.)</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>Pharmacists</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Medical Social Workers</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Ayurvedic/Homeo Doctors (Field)</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Health Organizers (ANMs)</td>
<td>76</td>
</tr>
<tr>
<td>8</td>
<td>Community Health Workers (CHWs)</td>
<td>1350</td>
</tr>
<tr>
<td>9</td>
<td>Field based Counsellors</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Out reach workers</td>
<td>32</td>
</tr>
<tr>
<td>11</td>
<td>Hospital-based Counsellors</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: RDT Hospital Records, 2010

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The study was carried out at RDT Hospital, Bathalapalli, which is a referral Hospital to other RDT Hospitals and Community Health programme. It was commissioned in December 2000 with 50-bed capacity and now it has upgraded to 250-bedded secondary level Hospital. Bathalapalli, which is 27 kms away from the district headquarter Anantapur of State of Andhra Pradesh, is strategically located with easy access for about 500-600 villages around Dharmavaram, Kadiri, Tadipatri, Anantapur etc revenue mandals. The population of all these villages would be around 7 lakhs.

**Infrastructure of RDT Hospital:** It has necessary complement of buildings, equipments, qualified and trained Doctors, nursing, paramedical and supportive staff. In view of the facilities available for early detection, diagnosis and treatment and referral facilities, the Hospital draws patients from all over the district and also the neighboring districts of Cuddapah, Kurnool and Chittoor. The Hospital is having Operation Theatre complex (3 operating rooms), Labour room, NICU, PICU, ICU. Diagnostic departments viz., Laboratory, Radiology and Blood Bank, which are fully equipped.

**Departments functioning:** General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Infectious Diseases, Anesthesiology, Pathology, Radiology and Cancer Detection.

**Work force:** The average outpatient strength of the Hospital is 1000-1200 per day. The average inpatient strength of the Hospital is 2050 per month. The average deliveries of the Hospital are 350-400 per month and 350 general surgeries per month.
Table – 2.17
RDT Hospital, Bathalapalli and no. of beneficiaries in the year 2010

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Category</th>
<th>No. of</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total no. of out patients treated</td>
<td>272186</td>
</tr>
<tr>
<td>2</td>
<td>Total no. of in patients treated</td>
<td>16,094</td>
</tr>
<tr>
<td>3</td>
<td>Total no of patients provided free treatment</td>
<td>61,245</td>
</tr>
<tr>
<td>4</td>
<td>Total no. of deliveries conducted</td>
<td>5459</td>
</tr>
<tr>
<td>5</td>
<td>Total no. of surgeries done</td>
<td>4696</td>
</tr>
<tr>
<td>6</td>
<td>No. of patients supported for Specialist’s treatment/ special investigations outside</td>
<td>3330</td>
</tr>
<tr>
<td>7</td>
<td>No. of patients supported for treatment at tertiary level healthcare centres</td>
<td>809</td>
</tr>
</tbody>
</table>

*Source: RDT Hospital Records, 2010*

The RDT is also conducting the following programmes in its endeavour of cancer control.

**Hospital based Cancer Detection Clinic:** The RDT Hospital has started functioning of Hospital based cancer detection clinic every day from Monday to Saturday after prior registration. On an average 30 patients attend the clinic everyday for general health checkup with special emphasis on early detection of cancer. The details of the cancer patients are documented for the purpose of cancer registry. The Cancer screening programme has been started in the mid year of 2007. The sample considered for the present study in the year 2008. The success of screening led to greater mobilization. In the year 2008, a total number of 2,793 patients were referred to Cancer screening clinic for their reproductive tract infections, painful or painless swelling of the breast. Among these 2,793 referrals 102 women were diagnosed to have cancer Breast (45) and Cervix (57) respectively. These cases are only frank cancers. The cases of pre-cancer were not considered for the study.
Current status: Due to community mobilization for screening the strength has increased gradually. Now in the year 2010, totally 7294 women who attended the Cancer Detection clinic were screened. Out of these, 3248 women were taken Pap smear and sent for Pathological examination. Among these 3248 women, 252 cases were detected to be malignant (193 Cancer of the Cervix, 36 Cancer of the ovary, 6 Cancer of the vulva, 8 Carcinoma of Endometrium and 9 cancer of the Vagina). The detected cases were referred to Oncology institutes like Kidwai Institute of Oncology and Vydehi Institute of Medical Sciences, Bangalore and Indo-Americal Cancer Institute, Hyderabad for further management. Among these 252 cancer patients, RDT has sponsored free treatment for 52 patients at Vydehi Hospital, Bangalore. 20 cases were treated at RDT Hospital by providing Palliative care and 101 patients referred to Kidwai Hospital for further management. Follow up of the patients is another important work carried out by the Cancer Detection Clinic at RDT Hospital, Bathalapalli.

Community-based Mobile cancer education: RDT has Community Health Sector too and the team of trained community health personnel conducts regular camps in the villages. The team comprising of trained Gynecologist, Staff Nurses, Social Worker and Field Health personnel. The main purpose is to educate the public about cancer, its causes, prevention and to promote early detection and referral through audio-visual aids and films. The public are educated about the harmful effects of tobacco use and chewing.

Family Planning programme: RDT has an exclusive centre for conducting Family Planning surgeries at Anantapur. RDT has received four times award from the Government of Andhra Pradesh for excellency in doing maximum number of family planning surgeries in Andhra Pradesh. The main aim of RDT is to improve the reproductive health among the rural women by educating them to adopt safe family planning methods, avoid unsafe abortions and to practice personal hygiene. The field based ANMs (Health Organizers) will train the Community Health Workers to aware the women in the community
regarding sexual transmitted diseases and reproductive tract infections. These CHWs will identify the women who suffer from RTI/STI and refer them to RDT Hospitals for symptom control and treatment in right time.

Care & Support Centre: The “Hospice” Care & Support Centre a rehabilitation and continuing palliative care is a unique project for management of cancer patients. In this centre, the patients are offered free boarding and accommodation for their piece. In addition to these, they are offered psychological, spiritual rehabilitation services.

Pain and Palliative Care: RDT has started Pain clinic headed by a senior Anesthesiologist and team. The clinic is catering services to the patients who are suffering from chronic pain/diseases. The Social Workers/counselors will provide psychosocial support to the patient as well as patient’s family members.

Cancer Treatment: Breast Cancer patients are provided treatment which includes surgery followed by chemotherapy at RDT Hospital, Bathalapalli. These patients are treated by the General Surgeons, who trained at CMC & Hospital, Vellore. For Radiotherapy treatment patients will be referred to tertiary level care. For Cervical patients surgery will be done under the supervision of visiting Oncosurgeons at RDT Hospital, Bathalapalli and then refer to tertiary level care hospitals for chemotherapy/radiotherapy.

Radiotherapy Unit: Many patients are default to Radiotherapy treatment due to lack of finance, social support and transportation. Hence, RDT is planning to start Radiotherapy unit at Bathalapalli for providing comprehensive cancer treatment to the rural women who suffer from cancer disease.
REFERENCES:

Boehringer Ingelheim Gmbh, 2009, Global Burden of Cancer - fact sheet, May-09

Cherian Varghese, 2009, Cancer prevention and control in India. ICMR press


Gaurav Agarwal, Pooja Ramakant, 2008, Breast Cancer Care in India: The current scenario and the challenges for the future, Breast Care Feb-2008, 3; 21-27


Krishnan Nair M, Cherian Varghese, R. Swaminathan, Cancer: Current scenario, intervention strategies and projections for 2015

Mary Malata Kamphinda-Banda, 2009, Barriers to cervical Cancer screening programs among urban and rural women in Blantyre district, Malawi

Michael Marmot. 2006, Cancer and Health inequalities, Research Paper

Murthy NS and Aleyamma Mathew, Cancer epidemiology, prevention and control, VOL. 86, NO. 4, 25 February 2004

Pakseresht S, Ingle GK, Agarwal PN, 2009, Risk factors with Breast cancer among women in Delhi

Rao RSP, N. Suma, N. S. Nair, V. G. Kamath, Acceptability And Effectiveness of A Breast Health Awareness Programme For Rural Women In India, Vol. 59, No. 9, September 2005, Indian J Med Sci


Selvaluckshmi G, Shanta V, 2009, Cancer control in India, Cancer Institute (WIA), Chennai

Tomatis, L, 1995, Poverty and Cancer

UICC Report, 2008, World Cancer Declaration


Zabora J, 2007, The Emotional Facts of Life with Cancer A Guide To Counselling And Support For Patients, Families And Friends, Canadian Association of Psychosocial Oncology