

# Chapter 1

## INTRODUCTION

Madhya Pradesh was created as a state of India in 1956 with the city of Bhopal as the capital. The city is located in the centre of India on the Arera hills at an altitude of 505 metres above mean sea level. Geographically it is placed at latitude of 23.07° North and longitude 77.12° East. The city area is 284.90 Sq. km. The density of population as per 2001 Census is 4755.46/Sq. Km.

Bhopal today presents a multifaceted profile. The city is divided into old and new Bhopal. The old city with its crowded market places, ancient structures such as mosques and palaces still bear the aristocratic imprint of its former rulers. Equally impressive is the new city with its vibrant exquisitely laid out parks, shopping complexes, and broad vibrant avenues. Bhopal, which is also known as the city of lakes, is dominated by its two lakes namely Lower Lake and Upper Lake, which are its centre of attraction. The city receives its water supply partially from the Upper Lake and from the Kolar dam.

The city has a moderate climate with temperature varying from a minimum of 5°C in month of January to a maximum of 46°C in the month of May. The average annual rainfall recorded in the city is 1200 mm.

### **National Cancer Registry Programme**

The National Cancer Registry Programme (NCRP) was commenced by the Indian Council of Medical Research (ICMR) with a network of cancer registries across the country in December 1981. The main objectives of this Programme were: 1. To generate reliable data on the magnitude and patterns of cancer; 2. Undertake epidemiological studies based on results of registry data; 3. Help in designing, planning, monitoring and evaluation of cancer control activities under the National Cancer Control Programme (NCCP); 4. Develop training programmes in cancer registration and epidemiology.

With these objectives, three Population Based Cancer Registries (PBCRs) at Bangalore, Chennai and Mumbai and three Hospital Based Cancer Registries (HBCRs) at Chandigarh, Dibrugarh and Thiruvananthapuram were commenced from 1 January 1982 (NCRP, 2008). A PBCR at Bhopal (see below) was started soon after the industrial accident that resulted in leakage of methyl isocyanate gas into the atmosphere. The PBCRs have gradually expanded over the years and as of now there are 24 PBCRs and 6 HBCRs under the NCRP network and these are illustrated in Figure 1.1.

The NCRP is a long term activity of the ICMR and the office of the NCRP is located in Bangalore. It is assisted by a Steering Committee and a Monitoring Committee that meets periodically to oversee and guide its functioning. A review meeting is held annually where the Principal Investigators and staff of the registries present results and participate in the discussions. The meeting is preceded by a workshop.

Cancer registration in India is active and staff of all registries visit hospitals, pathology laboratories and all other sources of registration of cancer cases on a routine basis. Death certificates are also scrutinized from the municipal corporation units and information collected on all cases where cancer is mentioned on the death certificates.

The information that is collected on a core form that is computer ready is subsequently entered into a computer. Over the years, the registries and the office of the NCRP have used modern advances in electronic information technology to not only enter the data but also help in specific activities that involves checking of the data, verification of duplicates and matching mortality and incidence records. A PBCR data management software (PBCR-DM-SW) has now been developed by the Coordinating Unit and is now being used by most of the 24 PBCRs. Data quality and completeness of coverage is a prime requisite for good cancer registration. This is ensured to the best possible extent by the NCRP through this software.

Over the years, the staff from registries and the NCRP have benefited from both short term and long term training fellowships in established institutions in developed countries. This has helped the working of the cancer registries and also to evolve epidemiological studies. Data from the NCRP registries is regularly published in succeeding volumes of Cancer Incidence in Five Continents published by the International Agency for Research on Cancer - the cancer research arm of the World Health Organization (WHO).

### **Population Based Cancer Registry – Bhopal**

A chemical accident caused by the leakage of toxic gas from the factory of Union Carbide in Bhopal on the night of 3<sup>rd</sup> December 1984 led to massive mortality and morbidity in the city. Methyl isocyanate (MIC) was supposed to be the major content of the toxic gas. Subsequent to the mishap the mortality data was categorized according to different municipal wards. Based on this information, the Bhopal municipal area was divided into MIC affected and MIC unaffected areas. The affected area was further divided into severely, moderately and mildly affected areas (ICMR, Technical Report, 2009).

Immediately after this industrial disaster, the Indian Council of Medical Research initiated many studies to evaluate the ill effects of the toxic gas among the gas exposed population. Along with these studies, a PBCR was established at Bhopal to ascertain the magnitude of cancer problem and to evaluate the carcinogenic effects of MIC, if any, on the gas exposed population. The main objectives of the registry are:

1. Registration of all cancer cases of residents of the geographic area of the city of Bhopal and generate a data base.
2. To observe and compare the incidence rate of cancer (all sites) in MIC affected and unaffected areas of Bhopal.
3. To assess the time trend in the incidence of various types of cancer in the two areas.

The registry started working from 1<sup>st</sup> January 1986, registering all cancer cases of residents of Bhopal.