

## Preliminary Pages

Page Nos.

Main Title Page .....	i
Contents.....	vii
List of Tables .....	viii
List of Figures .....	xi
Acknowledgements .....	xiii
Introduction.....	xv
Executive Summary .....	xvi
National Cancer Registry Programme .....	xix

---

# **NATIONAL CANCER REGISTRY PROGRAMME**

***Indian Council of Medical Research***

## **Consolidated Report of Population Based Cancer Registries 2004-2005**

***Incidence and Distribution of Cancer***

**Bangalore, India**

***December 2008***

© National Cancer Registry Programme  
(Indian Council of Medical Research)  
No. 557, 'Srinivasa Nilaya'  
7th Main, New BEL Road, Dollars Colony  
Bangalore - 560 094, INDIA.  
Email : [ncrp@ncrpindia.org](mailto:ncrp@ncrpindia.org), [ncrpblr@canceratlasindia.org](mailto:ncrpblr@canceratlasindia.org)

December 2008

Population based cancer registries provided individual core data. Quality Control checks, tabulations and statistical analysis were done at the Coordinating Unit of NCRP, Bangalore.

The publications of NCRP are intended to contribute to the dissemination of authentic information on cancer incidence by age (Five-year age groups), sex and site (ICD-10).

PRINTED IN INDIA

Published by the Coordinating Unit, National Cancer Registry Programme (ICMR), Bangalore 560094

# NATIONAL CANCER REGISTRY PROGRAMME

## Indian Council of Medical Research

**Dr V. M. Katoch**

*Secretary, Department of Health Research & Director General*

**Dr S.K. Bhattacharya**

*Additional Director General*

**Dr N.K. Ganguly**

*Former Director General (till Nov. 2007)*

### *Division of Non-Communicable Diseases*

**Dr Bela Shah**

*Head & Sr Deputy Director General*

**Dr A. Nandakumar**

*Dy Director General (Sr Gr) &  
Officer-in-Charge, NCRP*

**Dr Kishor Chaudhry**

*Dy Director General (Sr Gr)*

**Dr T. Ramnath**

*Dy Director General (Sr Gr)*

### *Steering/Monitoring Committee*

**Dr G.K. Rath, New Delhi**

**Dr Usha K. Luthra, New Delhi**

**Dr P.C. Gupta, Mumbai**

**Dr Radhakrishna, Hyderabad**

**Dr Padam Singh, Gurgaon**

**Dr R.N. Visweswara, Bangalore**

**Dr J. P. Muliylil, Vellore**

**Mr P. Gangadharan, Ernakulam**

**Dr Kusum Verma, New Delhi**

**Dr Kusum Joshi, Chandigarh**

**Dr A.C. Katak, Guwahati**

**Dr P.S.S. Sundar Rao, Bangalore (till Sept. 2007)**

**Dr B.D. Gupta, Chandigarh (till Sept. 2007)**

**Dr N.C. Misra, Lucknow (till Sept. 2007)**

*Population Based Cancer Registries at the following places (with names of respective Principal and Co-Principal Investigators/Senior Staff) that have contributed to this report*

*Ahmedabad District* : **Dr Pankaj M. Shah**

**Dr Shilin Shukla**

**Dr Parimal J. Jivarajani**

*Bangalore* : **Dr Ashok M. Shenoy (from Sept. 2008)**

**Dr K. Ramachandra Reddy**

**Dr Bapsy Padmanabhan (till Sept. 2007)**

*Barshi*

: **Dr R.A. Badwe**  
**Dr K.A. Dinshaw (till Nov. 2008)**

**Dr B.M. Nene**

*Bhopal*

: **Dr Neelkamal Kapoor**  
**Dr V.K. Bharadwaj (till March 2006)**

**Mr Atul Shrivastava**

*Chennai*

: **Dr V. Shanta**

**Dr R. Swaminathan**

*Delhi*

: **Dr Vinod Raina**  
**Dr Kusum Verma (till Sept. 2004)**

**Dr B.B. Tyagi**

*Kolkata*

: **Dr Jaydip Biswas**

**Dr M.N. Bandyopadhyay**

**Dr Karabi Datta**

*Mumbai*

: **Dr Arun P. Kurkure**

**Dr B.B. Yeole**

### *North Eastern Regional Cancer Registry*

*Monitoring Unit:* **Dr J. Mahanta, Director, Regional Medical Research Centre (N.E.) (ICMR), Dibrugarh.**

*Chairman, Projects in North East Region :* **Prof. R.C. Mahajan, Chandigarh.**

*Coordinator of Special Cell :* **Dr M.N. Bandyopadhyay, Kolkata.**

### *North East Population Based Cancer Registries with Names of Principal Investigators*

*Dibrugarh District* : **Dr M.S. Ali**

*Manipur State* : **Dr Y. Mohen Singh**

*Kamrup Urban District* : **Dr Jagannath D. Sharma**

*Mizoram State* : **Dr Eric Zomawia**

*Cachar District* : **Dr Sekhar Chakravarty**

*Sikkim State* : **Dr Yogesh Verma**

*Staff at Co-ordinating Unit of NCRP, Bangalore given overleaf.*

*Other Cancer Registries Under NCRP Network (with Names of Principal Investigators)*

*Population Based*

Ahmedabad Urban : **Dr Pankaj M. Shah**  
Pune, Nagpur &  
Aurangabad : **Dr B.B. Yeole**  
Kollam : **Dr K. Ramachandran**  
Thi'puram\* : **Dr Aleyamma Mathew**

*Hospital Based*

Bangalore : **Dr Ashok M. Shenoy** (from Sept. 2008)  
**Dr Bapsy Padmanabhan** (till Sept. 2007)  
Chennai : **Dr V. Shanta**  
Dibrugarh : **Dr T.R. Borbora**  
**Dr D. Hazarika** (till June 2007)  
Mumbai : **Dr K.A. Dinshaw** (till Nov. 2008)  
Thi'puram\* : **Dr K. Ramachandran** (from Nov. 2008)  
**Dr B. Rajan** (till Oct. 2008)

(\*Thiruvananthapuram)

*Staff at Co-ordinating Unit of NCRP, Bangalore (including project staff)*

*Dr. A. Nandakumar, Deputy Director General (S.G.) & Officer-in-Charge*

*Dr. T. Ramnath, Deputy Director General (S.G.)*

*Dr. N.S.Murthy, Emeritus Medical Scientist*

*Dr. Meesha Chaturvedi, Research Scientist - II (Med.)*

*F.S. Roselind, Research Scientist - III*

*Priyanka Das, Research Scientist - I*

*K.S. Vinay Urs, Research Scientist - I*

*K.L. Sudarshan, Programmer*

*Anish John, Programmer*

*Akanksha Tiwari, Programmer*

*G.C. Shivayogi, Accounts Officer*

*G. Jayaram, Administrative Officer*

*N.M. Ramesha, Personal Assistant*

*K.R. Chandrika, Sr. Technical Assist.*

*Deenu Nadayil, Statistician*

*Melbin John, Statistician*

*C. Somasekhar, Data Entry Operator*

*V. Manjusha Bai, Data Entry Operator*

*IT Consultant :*

*B.S. Girish, Akshara Technologies, Bangalore.*

*Other Staff :*

*M. Rajendra, D.N. Narayana Swamy, Chandramma*

# CONTENTS

	<i>Page Numbers</i>
<i>Acknowledgements</i>	<i>xii</i>
<i>Foreword</i>	<i>xiii</i>
<i>Introduction</i>	<i>xiv</i>
<i>Executive Summary</i>	<i>xv</i>
<i>National Cancer Registry Programme</i>	<i>xviii</i>
<b>Chapters</b>	
<b>1. Population and Cancer Incidence</b>	<b>1</b>
<b>2. Leading Sites of Cancer</b>	<b>8</b>
<b>3. Sites of Cancer Associated With the use of Tobacco</b>	<b>33</b>
<b>4. Basis of Diagnosis</b>	<b>37</b>
<b>5. Cancer Mortality</b>	<b>43</b>
<b>6. Comparison of Cancer Incidence and Patterns of all Population Based Cancer Registries</b>	<b>57</b>
<b>7. Data Quality and Indices of Reliability</b>	<b>71</b>
<b>References</b>	<b>73</b>
<b>Individual Registries Write-up</b> <i>(with Table of Sources of Registration)</i>	
<i>Bangalore</i>	<i>75</i>
<i>Barshi</i>	<i>94</i>
<i>Bhopal</i>	<i>114</i>
<i>Chennai</i>	<i>132</i>
<i>Delhi</i>	<i>151</i>
<i>Mumbai</i>	<i>170</i>
<i>Ahmedabad District (other than Ahmedabad Urban)</i>	<i>189</i>
<i>Kolkata</i>	<i>210</i>
<b>Addresses</b>	<b>229</b>
<b>Other Publications of NCRP</b>	<b>231</b>

## LIST OF TABLES

*Page Nos.*

<b>Population and Cancer Incidence :</b>	
1.1	Area Covered and person years (Combined population of two years) for all PBCRs (2004-2005).....2
1.2	Total Number of Cases Registered for all PBCRs (2004-2005) .....2
1.3	Crude Rate (CR), Age Adjusted (AAR) and Truncated (TR) Incidence Rates per 100,000 population in different PBCRs (2004-2005).....2
1.4	Cumulative Incidence Rate, Cumulative Risk & Possibility of one in number of persons developing Cancer of any Site (ICD-10): C00-C96 for all PBCRs (2004-2005) .....7
<b>Ten Leading Sites of Cancer :</b>	
2.1	Bangalore (2004-2005) ..... 12
2.2	Barshi (2004-2005) ..... 14
2.3	Bhopal (2004-2005) ..... 16
2.4	Chennai (2004-2005) ..... 18
2.5	Delhi (2004-2005) ..... 20
2.6	Mumbai (2004-2005)..... 22
2.7	Ahmedabad District (Other than Ahmedabad Urban) (2004-2005) ..... 24
2.8	Kolkata (2005)..... 26
<b>Sites of Cancer Associated with the Use of Tobacco :</b>	
3.1	Number & Relative Proportion of TRCs (2004-2005)..... 33
3.2	Number & Proportion of Tobacco Related Cancers (TRCs) relative to all sites of cancer (Males & females) (2004-05) ..... 34
3.3	Number & Proportion of specific sites of cancer among all Tobacco Related Cancers (TRC) (2004-05) ..... 35
Basis of Diagnosis :	
4.1	Number & Relative Proportion of cancers based on Different Methods of Diagnosis ..... 37
4.2	Number & Relative Proportion of cancers based on different types of Microscopic Diagnosis ..... 40
Cancer Mortality :	
5.1	Number of Incident and Mortality cases and Mortality-Incidence Percent (M/I%)..... 44
5.2	Crude (CMR), Age Adjusted (AAMR) and Truncated (TMR) Mortality Rate..... 44
5.3	Number of Matched Deaths (MD), Number of DCO's and Total Deaths (TD) ..... 44
5.4	Average Annual Age Specific Cancer Mortality rates per 100,000 persons - All sites of cancer for all PBCRs..... 45
5.5	Average Annual Age Specific Incidence (I) and Mortality (M) rates per 100,000 persons - All sites of cancer for all PBCRs..... 46
<b>Data Quality and Indices of Reliability :</b>	
7	Number of Microscopic Verification (MV%), Proportion of DCO's (DCO%) and Mortality-Incidence Percent (M/I%) (2004-2005) ..... 72
<b>Individual Registries Write-up :</b>	
BLR-1	Population by Five Year Age Group and Gender - Bangalore (2004-2005) ..... 77
BLR-2	Main Sources of Registration of Incident Cases of Cancer in Bangalore(2004-2005) ..... 79
BLR-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005) : Bangalore ..... 80

BLR-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Bangalore .....	82
BLR-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Bangalore .....	84
BLR-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis (2004-2005) Bangalore .....	86
BLR-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Bangalore .....	88
BLR-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Bangalore .....	90
BLR-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Bangalore .....	92
BRS-1	Population by Five Year Age Group and Gender - Barshi (2004-2005).....	97
BRS-2	Main Sources of Registration of Incident Cases of Cancer in Barshi (2004-2005) .....	99
BRS-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Barshi .....	100
BRS-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Barshi .....	102
BRS-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Barshi .....	104
BRS-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis (2004-2005): Barshi ...	106
BRS-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Barshi .....	108
BRS-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Barshi .....	110
BRS-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Barshi .....	112
BHP-1	Population by Five Year Age Group and Gender - Bhopal (2004-2005) .....	115
BHP-2	Main Sources of Registration of Incident Cases of Cancer in Bhopal (2004-2005) .....	117
BHP-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Barshi .....	118
BHP-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Barsi .....	120
BHP-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Bhopal .....	122
BHP-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis(2004-2005): Bhopal ....	124
BHP-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Bhopal.....	126
BHP-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Bhopal.....	128
BHP-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Bhopal .....	130
CHN-1	Population by Five Year Age Group and Gender - Chennai (2004-2005) .....	134
CHN-2	Main Sources of Registration of Incident Cases of Cancer in Chennai (2004-2005) .....	136
CHN-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Chennai .....	137



CHN-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Chennai .....	139
CHN-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Chennai.....	141
CHN-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis(2004-2005): Chennai .....	143
CHN-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Chennai.....	145
CHN-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Chennai .....	147
CHN-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Chennai .....	149
DEL-1	Population by Five Year Age Group and Gender - Delhi (2004-2005) .....	153
DEL-2	Main Sources of Registration of Incident Cases of Cancer in Delhi (2004-2005) .....	155
DEL-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Delhi.....	156
DEL-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Delhi.....	158
DEL-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Delhi .....	160
DEL-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis(2004-2005): Delhi .....	162
DEL-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Delhi .....	164
DEL-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Delhi .....	166
DEL-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Delhi.....	168
MUM-1	Population by Five Year Age Group and Gender - Mumbai (2004-2005) .....	172
MUM-2	Main Sources of Registration of Incident Cases of Cancer in Mumbai (2004-2005).....	174
MUM-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Mumbai .....	175
MUM-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Mumbai.....	177
MUM-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Mumbai .....	179
MUM-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis(2004-2005): Mumbai... 181	
MUM-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Mumbai .....	183
MUM-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Mumbai .....	185
MUM-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Mumbai.....	187
AHM-1	Population by Five Year Age Group and Gender - Ahmedabad District (Other than Ahmedabad Urban) (2004-2005).....	193
AHM-2	Main Sources of Registration of Incident Cases of Cancer in Ahmedabad District (Other than Ahmedabad Urban) (2004-2005) .....	195

AHM-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	196
AHM-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	198
AHM-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	200
AHM-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis(2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	202
AHM-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	204
AHM-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	206
AHM-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Ahmedabad District (Other than Ahmedabad Urban) .....	208
KOL-1	Population by Five Year Age Group and Gender - Kolkata (2005) .....	212
KOL-2	Main Sources of Registration of Incident Cases of Cancer in Kolkata (2005) .....	214
KOL-3	Number of Incident Cancers by five Year Age Group and Site (ICD-10) (2004-2005): Kolkata .....	215
KOL-4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate per 100,000 population (2004-2005): Kolkata.....	217
KOL-5	Number and Proportion of Cancers by Site (ICD-10) and Method of Diagnosis (2004-2005): Kolkata .....	219
KOL-6	Number and Proportion of Cancers by Site (ICD-10) and Detailed Microscopic Diagnosis(2004-2005): Kolkata.... 221	
KOL-7	Number of Cancer Deaths by five Year Age Group and Site (ICD-10) (2004-2005): Kolkata .....	223
KOL-8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate per 100,000 population (2004-2005): Kolkata.....	225
KOL-9	Cumulative Rate (Cu.Rate%) & Cumulative Risk (Cu.Risk) of Individual Sites (ICD-10) Based Age Specific Rates (from 0-64 Years and from 0-74 Years ) (2004-2005): Kolkata .....	227

# LIST OF FIGURES

Page Nos.

## Population and Cancer Incidence :

1.1	Average Annual Crude, Age Adjusted and Truncated Incidence Rates All Sites of Cancer (ICD-10) : C00-C96.....	3
1.2	Average Annual Age Specific Cancer Incidence Rates - All Sites of Cancer for all PBCRs.....	4

## Ten Leading Sites of Cancer:

2.1	Bangalore (2004-2005) .....	13
2.2	Barshi (2004-2005) .....	15
2.3	Bhopal (2004-2005) .....	17
2.4	Chennai (2004-2005) .....	19
2.5	Delhi (2004-2005) .....	21
2.6	Mumbai (2004-2005).....	23
2.7	Ahmedabad District (other than Ahmedabad Urban) (2004-2005) .....	25
2.8	Kolkata (2004).....	27
2.9	All North-East PBCRs (2005-2006) .....	29

## Sites of Cancer Associated with the Use of Tobacco :

3.1	Number & Proportion of Tobacco Related Cancers (TRCs) Relative to All Sites of Cancers (Males & females) .....	36
3.2	Number & Proportion of Tobacco Related Cancers (TRCs) among all Tobacco Related Sites (Males & females) .....	36

## Basis of Diagnosis:

4.1	Relative Proportion of cancers based on different methods of diagnosis .....	38
4.2	Relative Proportion of cancers based on different types of Microscopic Diagnosis.....	41

## Cancer Mortality:

5.1	Average Annual Age Specific Cancer Mortality Rates per 100,000 persons All Sites of cancer for all PBCRs .....	47
5.2	Average Annual Age Specific Incidence & Mortality Rates per 100,000 persons All Sites of Cancer	
(a)	Bangalore (2004-2005) .....	49
(b)	Barshi (2004-2005) .....	50
(c)	Bhopal (2004-2005) .....	51
(d)	Chennai (2004-2005) .....	52
(e)	Delhi (2004-2005) .....	53
(f)	Mumbai (2004-2005) .....	54
(g)	Ahmedabad District (other than Ahmedabad Urban) (2004-2005) .....	55
(h)	Kolkata (2005).....	56

## Comparison of Cancer Incidence and Patterns of all Population Based Cancer Registries:

Comparison of Age Adjusted Incidence Rates (AARs) of all PBCRs

6.1.	All Sites (C00-C96) - Males and Females.....	59
6.2	Tongue (C01-C02) - Males.....	60
6.3	Mouth (C03-C06) - Males & Females .....	60
6.4	Tonsil (C09) - Males .....	61
6.5	Oropharynx (C10) - Males .....	62
6.6	Nasopharynx (C11) - Males.....	62

6.7	Hypopharynx (C12-C13) - Males.....	63
6.8	Pharynx (C14) - Males .....	63
6.9	Oesophagus (C15) - Males and Females .....	64
6.10	Stomach (C16) - Males and Females.....	65
6.11	Gall Bladder (C23-C24) - Females .....	66
6.12	Larynx (C32) Males.....	66
6.13	Lung (C33-C34) - Males and Females .....	67
6.14	Breast (C50) - Females.....	68
6.15	Cervix Uteri (C53) - Females.....	68
6.16	Ovary (C56) - Females.....	69
6.17	Thyroid (C73) - Females.....	69
6.18	Myeloid Leukaemia (C92-94) - Males and Females.....	70
<b>Individual Registries Write-up :</b>		
BLR-1	Population Pyramid showing Age Distribution : 2004-2005 - Bangalore.....	78
BRS-1	Population Pyramid showing Age Distribution : 2004-2005 - Barshi.....	98
BHP-1	Population Pyramid showing Age Distribution : 2004-2005 - Bhopal.....	116
CHN-1	Population Pyramid showing Age Distribution : 2004-2005 - Chennai.....	135
DEL-1	Population Pyramid showing Age Distribution : 2004-2005 - Delhi.....	154
MUM-1	Population Pyramid showing Age Distribution : 2004-2005 - Mumbai.....	173
AHM-1	Population Pyramid showing Age Distribution : 2004-2005 - Ahmedabad District (other than Ahmedabad Urban).....	194
KOL-1	Population Pyramid showing Age Distribution : 2004-2005 - Kolkata .....	213

NCRPP, Bangalore

# ACKNOWLEDGEMENTS

*Dr V. M. Katoch, Secretary, Department of Health Research &*

*Director General, ICMR;*

*Dr S.K. Bhattacharya, Additional Director General, ICMR;*

*Dr Bela Shah, Head, Division of NCD, ICMR;*

*Principal Investigators and Staff of Population Based Cancer Registries;*

*Cooperating hospitals, nursing homes and other medical institutions;*

*All other Population and Hospital Based Cancer Registries;*

*Members of Steering Committee;*

*Members of Monitoring Committee;*

*Staff of Division of NCD, ICMR, New Delhi;*

*Staff of Coordinating Unit, NCRP, Bangalore.*

NCRP, Bangalore

# FOREWORD

I am happy to write this foreword for the consolidated report of National Cancer Registry Programme. This consolidated report covers data accrued over a two-year period (01 Jan 2004 to 31 Dec 2005) and is the outcome of the efforts of Population Based Cancer Registries under the National Cancer Registry Programme (NCRP) of the Council. It includes the information sent by the well-established older registries as well as that of relatively newer registries of North East, the registry covering Ahmedabad rural district and Kolkata PBCR. This is a significant step towards nationwide coverage of systematic data collection.

The PBCR reports are considered as standard work of reference for describing incidence rates and patterns of cancer in the country. It serves as an important tool for target-oriented approach for cancer control programmes. This increases the importance of this evidence-based report. The obvious differences in the incidence patterns of cancer in different parts of the country have been brought to notice by the sustained efforts of these registries.

The optimal use of ever expanding field of information technology towards data collation and correction has given visible results. The time period between the calendar year of data collection and report publication has been shortened. The basic information provided by registries can be easily obtained in the form of systematic tables using computer applications.

The information regarding magnitude and pattern of cancer can be the basis of population based epidemiological studies. I am sure that researchers, clinicians, health administrators and epidemiologists would benefit with this report.

The coordination and management of the data received along with publication of this report is the result of the mammoth effort made by staff of these registries as well as that of the Coordinating Unit of the NCRP. They deserve a special appreciation for their dedicated work which has enabled this successful completion of more than two decades of data collection.



**Dr. V. M. Katoch**  
Secretary, Department of Health Research &  
Director General, ICMR

# INTRODUCTION

The National Cancer Registry Programme (NCRP) was established under the Indian Council of Medical Research (ICMR) in 1981 with the definitive aim of assessing incidence and distribution of cancer in the country. Three Hospital Based Cancer Registries (HBCR) and three Population Based Cancer Registries (PBCR) commenced data collection on 01 Jan 1982. Over the years, the registry network has expanded so as to have twenty three (23) PBCRs under the NCRP network. This also included registries developed for examining special exposures like Bhopal PBCR. This was a significant attempt to register as many cases as possible in their respective geographic area. The WHO project on “Development of an Atlas of Cancer in India” provided some hitherto unknown information on the incidence and patterns of cancer in the North East. Based on the leads obtained, the ICMR commenced PBCRs in four of the eight North Eastern states in 2003, and from January 2009 in three additional states of the North East. The advent and optimal use of information technology in capturing and transmitting information, has eased the effort and reduced the time taken in processing while also significantly improving the quality of data.

The information collected by PBCRs serves as a database of cancer cases for several epidemiological studies. Meticulous planning, cooperation of local medical institutions, dedicated and committed personnel and adequate funding are the pre-requisites to establish registries in different areas of the country. The feasibility and futuristic planning required in establishing these newer registries is a mammoth effort undertaken by the Coordinating Unit of the NCRP located at Bangalore. The Coordinating Unit has paid a special emphasis on the quality of data along with its completeness and validity. Various quality checks are carried out on the data in keeping with the international data quality indices.

The present report is a culmination of sustained efforts made by the cancer registries and the NCRP. It covers the data accrued from a period of 01 January 2004 to 31 December 2005 by the six older and two newer PBCRs under the NCRP network. The report of the six PBCRs in the North East has been separately published. However, the overall comparison of the data is given in Chapter 6.

The ICMR has also commenced a number of multi-institutional research studies based on the cancer incidence data. The present report would serve as a reliable data resource in the conduct of these studies. The results of the study would find application and would also pave the way for planning and implementation of control measures in a scientific way.



**Dr. Bela Shah**

Head, Division of Non-Communicable Diseases, ICMR

# Two-year Report of Population Based Cancer Registries: 2004-2005

*Incidence and Distribution of Cancer*

## Executive Summary

McLennan has defined cancer registration as a process of continuing systematic collection of data on the occurrence and characteristics of reportable neoplasms (McLennan et al, 1978). Broadly there are two types of cancer registries. One is the Population Based (PBCR) and the other is a Hospital Based Cancer Registry. Registries could also be developed for a special purpose in relation to specific exposures, or, they could also be established for a specific anatomical site like Bone Tumour and Lymphoma registries. Registries could also specifically cater to a particular age group as for children or for the elderly.

The basic thrust of a PBCR is cancer in the community. PBCRs provide information on cancer incidence and mortality in a defined population and for a particular time period. They also provide information on variation in incidence or mortality over time and with follow up, population based cancer survival rates.

To initiate, establish and sustain population based cancer registries as per international norms requires meticulous planning, cooperation of medical institutions in the area, dedicated and committed personnel and adequate funding. Generally, there are several sources of registration for a PBCR from where staff of registries, collect information on cancer cases. These include pathology reports, medical records, radiology and radiotherapy departments and death certificates. The availability of up-dated investigation / diagnostic facilities, well maintained medical records using International Classification of Diseases together with an efficient death registration system are essential for completeness as well as good quality cancer registration.

Cancer is not as yet a reportable disease in India. Therefore, methodology of data collection by the PBCRs is active, in that, registry staff make visits to various sources of registration to collect information on cancers recorded in the respective institutions. The advent of computing technology is gradually changing the method of working of cancer registries in India.

Studying the magnitude and patterns of cancer helps in determining clues to the cause of cancer and undertake studies in disease aetiology. Epidemiologic studies based on these help in knowing what is happening and what can be done about it. Cancer registries provide the needed information to undertake such investigations. The PBCRs constitute a base for carrying out scientific investigations in cancer aetiology. The population based design provides considerable strength and makes the results of both case control and cohort studies, extremely valid.



Cancer registration is a means to a purpose and not a purpose in itself. It is necessary in all settings, more so in the setting of a developing country like India.

The previous consolidated report of the PBCRs published in December 2006 covered data of the years 2001, 2002 and 2003 for the older registries at Bangalore, Barshi, Bhopal, Chennai, Delhi and Mumbai and 2004 data for the registry covering Ahmedabad district other than Ahmedabad urban. The present report covers the data of the above registries plus that of Kolkata Metropolitan Corporation. This report covers the data for the years 2004 and 2005 for the older PBCRs and 2005 data for the PBCR at Kolkata.

Chapter 1 gives an idea of the cancer incidence in the areas covered by the respective PBCRs. Cancer incidence rate is generally expressed as an age adjusted or age standardized rate (according to world standard population) per 100,000 persons for an anatomical site. In males, the incidence rate (AAR) varied from 49.2 from rural PBCR at Barshi to 219.5 in the National capital territory. Among females, the AAR varied from 43.1 in Ahmedabad district to 120.8 in Bangalore. The possibility of person developing cancer during the life time is also provided in chapter 1. Among the urban population whether male or female, for the 0 – 74 age group one in eight or 10 people have a life time risk of developing cancer.

Chapter 2 provides picture of the leading sites of cancer in different PBCRs. Cancer of the stomach continues to be the leading site of cancer among males in Bangalore as well as Chennai though the latter competes with lung as a leading site. The Metros at Delhi, Mumbai and Kolkata have recorded cancer of the lung as a leading site. Cancer of the lung is closely followed by cancer of the prostate in these places. Among females, cancer of the breast has replaced cancer of the cervix in all the registries except Barshi. Lung cancer in women in Delhi, Mumbai, Bangalore and even in Barshi as an important point to be noted.

Chapter 3 gives salient information on cancers associated with the use of tobacco. The proportion of Tobacco Related Cancers (TRCs) among males varies from 33.4% in Bangalore to 50.6 in Ahmedabad. Among females, the relative proportion varies from 10.7 in Delhi to 15.2 in both Chennai and Bangalore. The fact that cancer of the lung in women constitutes a considerable proportion of the sites among TRCs as important.

Chapter 4 deals with the basis of diagnosis of cancer. The relative proportion of different methods of diagnosis of cancer viz., microscopic, imaging, clinical etc. along with cases with DCO as the basis of diagnosis are given.

Chapter 5 gives an account of the mortality data. There are certain limitations in the collection of mortality data. These include the system of registration of death and certification of the cause of death. Though, in urban centres all deaths are generally registered, information on exact cause of death is lacking. When cancer is mentioned as a cause, the anatomical site is not mentioned and when the site is mentioned the histology or morphology is not stated. Because of this, there are difficulties in having a clear and complete picture of cancer mortality as opposed to cancer morbidity. However, traditionally Mumbai has developed a relatively better system mainly because of the earlier Coroner's act. Chennai registry and more recently

Bhopal have made extra efforts to enlist deaths due to all causes and trace back these deaths to elicit cause.

Chapter 6 provides a comparison of cancer incidence and patterns in all PBCRs including those in the North East. Higher incidence rates are found especially in Mizoram state and Kamrup Urban District. Apart from the sites of cancer associated with the use of tobacco, the AAR of cancer of the stomach in Aizawl district is several fold higher in both males and females compared to the older registries at Chennai and Bangalore. Likewise, cancer of the oesophagus also shows a similar picture for not only Mizoram state but also for PBCRs at Assam state and Sikkim. Cancer of the Gallbladder among females continues to be the higher in both Kamrup Urban District and Imphal West district than that seen in Delhi. Like cancer of the stomach, cancer of the lung in both males and females is several fold higher than that recorded in the main land cancer registries.

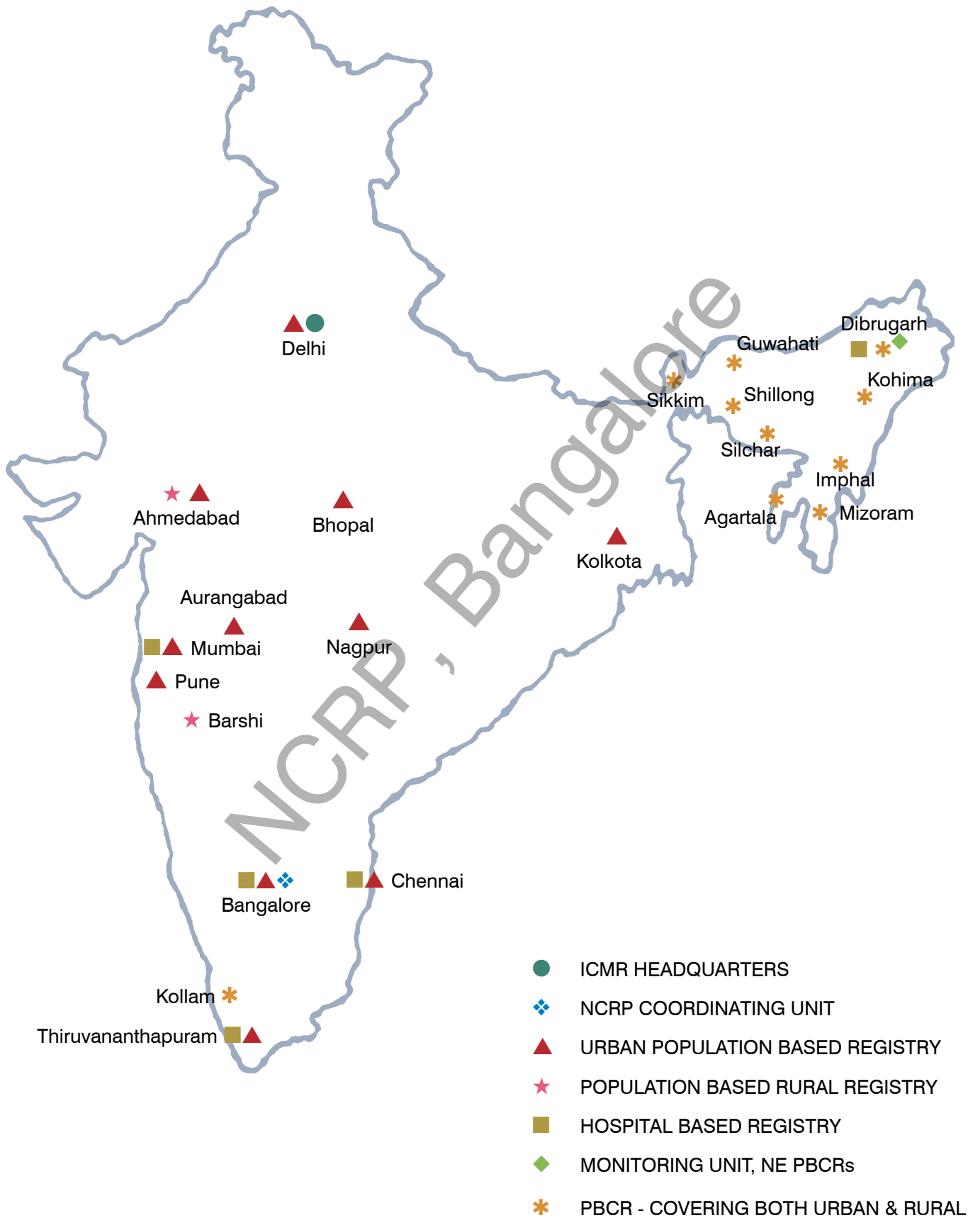
The authenticity of the data depends on its quality, and with reference to the PBCRs, this would be both in terms of completeness of coverage of cancer cases in the geographic area as well as the reliability of the data. Registries routinely undertake various exercises to ensure that the data they collate and process is of high quality. A thorough check of data is also done before tabulation and these aspects are dealt in detail in chapter 7. The Coordinating Unit has now developed an on-line check programme that can be carried out by the registries through the NCRP website ([ncrpindia.org](http://ncrpindia.org)).

The details individual registry write up and annexure tabulations are provided in Part II of the report. The annexure tabulation for numbers and rate (incidence and mortality) are provided for both the years 2004 and 2005 separately and in combination.

**Dr. A. Nandakumar**  
Officer-in-Charge, NCRP

# NATIONAL CANCER REGISTRY PROGRAMME

(Indian Council of Medical Research)



# National Cancer Registry Programme

Under the National Cancer Registry Programme (NCRP), the Indian Council of Medical Research commenced a network of cancer registries across the country in December 1981 with the objectives of

1. Generating reliable data on the magnitude and patterns of cancer - this would be based on morbidity and mortality information in different regions of the country according to sex, age and residence of the patient, anatomical site of cancer and proportion of histological type or microscopic confirmation for each site; pattern of different types of cancer according to relative proportions or ratios in various population sub-groups such as religion, language spoken, educational status; clinical stage of disease when patients come to hospital for treatment and where possible the nature of treatment received and outcome;
2. Undertaking epidemiologic research, such as case control or cohort studies based on observations of registry data;
3. Providing data base for developing appropriate strategies to aid in National Cancer Control Programme; this would be in the form of planning, monitoring and evaluation of activities under this programme;
4. Develop training programmes in cancer registration and epidemiology.

Data collection commenced from 1 January 1982 in the population based cancer registries at Bangalore, Chennai and Mumbai, and also in the hospital based cancer registries at Dibrugarh and Thiruvananthapuram. In order to extend the assessment of cancer patient care, hospital cancer registries were also started at Bangalore, Chennai and Mumbai in 1984. From 1986 two more urban population based cancer registries were started in Delhi and Bhopal, the latter to determine the effect of Methyl Isocyanate gas exposure on the occurrence of cancer. For the first time a population based rural cancer registry was started in 1987 in Barshi in the state of Maharashtra. To ensure uniformity in the data collected by different registries, code manuals separately for HBCRs (NCRP, 1987) and PBCRs (NCRP, 1987) were prepared. These code manuals are used for the data from 1st January 1986. Under the auspices of the World Health Organization, a project on "Development of an Atlas of Cancer in India" was commenced in 2001. As a fallout of this, a North Eastern Regional Cancer Registry (NERCR) has been commenced in six areas at Guwahati, Dibrugarh and Silchar in Assam, Aizawl in Mizoram, Imphal in Manipur and Gangtok in Sikkim with a Monitoring Unit at Regional Medical Research Centre, Dibrugarh. These registries have started collation of information on cancer cases from 1 January 2003. One more population based rural cancer registry was commenced from 1 January 2003 to cover Ahmedabad rural district. From 1 February 2005 the urban PBCR of Kolkata was included in the NCRP network to cover Kolkata Municipal Corporation. The map of India depicting the locations of the various cancer registries is shown in the adjoining page.

The NCRP is a long-term activity of the Indian Council of Medical Research. The programme is one of the many major activities of the Division of Non-Communicable Diseases and an Officer-in-charge coordinates it. The Programme is assisted by Steering and Monitoring Committees that meet periodically to oversee and guide its functioning. A review meeting is held annually, where the Principal Investigators and staff of the registries under the NCRP, present data and participate in the discussions. This meeting is preceded by a workshop, where the various aspects of working of the registry, problematic cases, use of coding, medical terminology, statistical and epidemiologic methods are taught and discussed. About 2-3 senior and junior staff from each of the registries under the NCRP, participate in the workshop.

Cancer registration in India is active. Staff of registries visit hospitals on routine basis and scrutinise the records in various departments that include pathology, radiology, radiotherapy, in-patient wards and out-patient clinics to elicit the desired information on reported cancer cases in a "common core proforma" that has been standardised for all cancer registries in India. Coding of the disease is done according to International Classification of Diseases (WHO, ICD-10). This facilitates comparison of our data with that from registries across the world. In addition, to facilitate the detailed histologic studies, coding is also done according to International Classification of Disease for Oncology (WHO, 3rd Edition 2002). The hospitals include the main cancer hospitals, other general hospitals in both the government and private sector. Besides, pathology laboratories that routinely report cancer cases are also visited. Death certificates are also scrutinised from the municipal corporation units. Every attempt is made by registries to register all cancer patients in the registration area who are resident (at least one year) in the same area, from all hospitals and from all death certificates in which cancer is mentioned.

Certain basic checks of data, especially those related to duplicate verification and matching with mortality records, are carried out by the individual registries. After this, the data is sent to the Coordinating Unit for subjecting the data to various range, consistency checks and unlikely combinations including a further round of possible duplicate listing. The list of cases with the items of patient information, that require verification are sent to the respective registries by the Coordinating Unit. Individual registries go through the records/reports of such cases and wherever necessary discuss with the concerned clinician or the pathologist. On receiving the clarifications the Coordinating Unit prepares the detailed tabulations by five-year age group, site and sex, including rates. The individual registries use these tables to prepare the registry's annual report. The Coordinating Unit collates the data and performs tabulations to prepare the consolidated report of that year.

Apart from the above, the Coordinating Unit undertakes and coordinates epidemiologic and other research studies, including those to ensure that the quality of data is of a high standard and that coverage of cancer cases in the registry area is as complete as possible.

Over the years, staff from registries under the NCRP, have benefited from both short and long term training fellowships in established institutions abroad. This has helped them and the registries to develop into departments of epidemiology and undertake several studies on their own and contribute to several research publications in indexed journals.