

Preliminary Pages

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
Monitoring Unit.....	xxi

**NATIONAL
CANCER REGISTRY
PROGRAMME**

Indian Council of Medical Research

NATIONAL CANCER REGISTRY PROGRAMME

Indian Council of Medical Research

North East

Population Based Cancer Registries

SECOND REPORT : 2005 - 2006

Incidence and Distribution of Cancer

Bangalore, India

September 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 : ncrpblr@canceratlasindia.org, ank@ncrpindia.org

September 2008

PRINTED IN INDIA

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

*This printed report is an abridged version of the detailed report.
The detailed report with few additional tables and figures of Chapters 1, 3-5 along
with registry wise Annexure Tabulations can be viewed*

Cover: Map depicting the eight states of the North East with shaded portions indicating the areas covered by the cancer registries.

NATIONAL CANCER REGISTRY PROGRAMME

Indian Council of Medical Research

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)

Dr R.S. Dhaliwal
Dy Director General

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 September 2007)

Dr B.D. Gupta, Chandigarh (till September 2007)

Dr N.C. Misra, Lucknow (till September 2007)

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	Imphal West District	: Dr Y. Mohen Singh
Kamrup Urban District	: Dr Jagannath D. Sharma	Aizawl District	: Dr Eric Zomawia
Silchar Town	: Dr Sekhar Chakravarty	Sikkim State	: Dr Yogesh Verma

Other Cancer Registries (With Names of Principal Investigators)

Population Based

Ahmedabad	: Dr Pankaj M. Shah
Bangalore	: Dr Ashok M. Shenoy (from Sept. 2008) Dr Bapsy Padmanabhan (till Sept. 2007) Dr K. Ramachandra Reddy
Barshi	: Dr K.A. Dinshaw
Bhopal	: Dr Neelkamal Kapoor Dr V.K. Bharadwaj (till March 2006)
Chennai	: Dr V. Shanta
Delhi	: Dr Vinod Raina
Kolkata	: Dr Jaydip Biswas
Mumbai	: Dr A.P. Kurkure

Hospital Based

Bangalore	: Dr Ashok M. Shenoy (from Sept. 2008) Dr Bapsy Padmanabhan (till Sept. 2007) Dr K. Ramachandra Reddy
Chennai	: Dr V. Shanta
Dibrugarh	: Dr T.R. Borbora Dr D. Hazarika (till June 2007)
Mumbai	: Dr K.A. Dinshaw
Thi'puram	: Dr B. Rajan <small>(*Thiruvananthapuram)</small>

Staff at Co-ordinating Unit of NCRP, Bangalore & Staff at Monitoring Unit of NE PBCR given overleaf.

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.)

K.R. Chandrika, Senior Technical Assistant

K.S. Vinay Urs, Research Scientist - I

Deenu Nadayil, Statistician

Melbin John, Statistician

V. Manjusha Bai, Data Entry Operator

G.C. Shivayogi, Accounts Officer

N.M. Ramesha, Personal Assistant

F.S. Roselind, Research Scientist - III

Priyanka Das, Research Scientist - I

Akanksha Tiwari, Programmer

Anish John, Programmer

K.L. Sudarshan, Programmer

C. Somasekhar, Data Entry Operator

IT Consultants :

M.Suresh Kumar, Intech Solutions Pvt. Ltd., Bangalore.

B.S. Girish, Akshara Technologies, Bangalore.

Other Staff :

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

Staff at Monitoring Unit of NE PBCR, Dibrugarh

Dr. J. Mahanta, Director

Dr. N.C. Hazarika, Deputy Director (S.G.)

Dr. R.K. Phukan, Scientist - C

Project Staff :

Dr. (Ms) A. Das

Dr. (Ms) J Gogoi

Dr. D. Saikia,

Ms. T. Goswami

Ms. S. Sen

Mr. H.N. Hazarika

CONTENTS

	<i>Page Numbers</i>
<i>Acknowledgements</i>	<i>xiii</i>
<i>Foreword</i>	<i>xiv</i>
<i>Introduction</i>	<i>xv</i>
<i>Executive Summary</i>	<i>xvi</i>
<i>National Cancer Registry Programme</i>	<i>xix</i>
<i>Monitoring Unit</i>	<i>xxi</i>
PART I - Chapters	
1. Population and Cancer Incidence	1-7
2. Leading Sites of Cancer	8-25
3. Sites of Cancer Associated With Use of Tobacco	26-30
4. Basis of Diagnosis	31-38
5. Cancer Mortality	39-51
6. Comparison of Cancer Incidence and Patterns with other Population Based Cancer Registries	52-65
References	66
Individual Registries Write-up (with Table of Sources of Registration)	
<i>Dibrugarh District</i> – <i>DIB</i>	<i>69-89</i>
<i>Kamrup Urban District</i> – <i>KUD</i>	<i>90-111</i>
<i>Silchar Town</i> – <i>SIT</i>	<i>112-132</i>
<i>Imphal West District</i> – <i>IMP</i>	<i>133-151</i>
<i>Mizoram State</i> – <i>MIZ</i>	<i>152-174</i>
<i>Aizawl District</i> – <i>AIZ</i>	<i>175-190</i>
<i>Mizoram State - Excl. Aizawl</i> – <i>MIO</i>	<i>191-206</i>
<i>Sikkim State</i> – <i>SKM</i>	<i>207-225</i>
Addresses	226-227
Other Publications of NCRP	228

LIST OF TABLES

Page Nos.

1.1	Average Population at Risk.....	2
1.2	Total Number of Cases Registered.....	2
1.3	Crude Rate, Age Adjusted and Truncated Incidence Rates per 100,00 population in different PBCRs.....	2
1.4	(a) Average Population at Risk (b) Total Number of cases Registered (c) Crude (CR) Age Adjusted (AAR) and Truncated (TR) incidence rates per 100,000 population - Manipur State	3
2.1	Ten Leading Sites of Cancer - Dibrugarh District.....	9
2.2	Ten Leading Sites of Cancer - Kamrup Urban District	11
2.3	Ten Leading Sites of Cancer - Silchar Town.....	13
2.4	Ten Leading Sites of Cancer - Imphal West District	15
2.5	Ten Leading Sites of Cancer - Mizoram State	17
2.6	Ten Leading Sites of Cancer - Aizawl District.....	19
2.7	Ten Leading Sites of Cancer - Mizoram State Excl. Aizawl District.....	21
2.8	Ten Leading Sites of Cancer - Sikkim State	23
3.1	Number & Relative Proportion of TRCs.....	27
3.2	Number & Relative Proportion of specific sites of cancer related to use of tobacco to all sites of cancer.....	29
3.3	Number & Relative Proportion of specific sites of cancer related to use of tobacco relative to all Tobacco Related Cancers.....	30
4.1	Number & Relative Proportion of cancers based on different methods of diagnosis.....	33
4.2	Number & Relative Proportion of cancers based on different types of Microscopic Diagnosis	36
5.1	Number of Incident, Mortality cases and Mortality Incidence Percent (M/I%).....	40
5.2	Crude, Age Adjusted and Truncated Mortality Rate.....	40
5.3	Number of Matched Deaths, Number of DCOs and Total Deaths.....	40
5.4	Average Annual Age Specific Cancer Mortality Rates per 100,000 Persons All Sites of Cancer.....	41
DIB - 1	Population by Five Year Age Group and Gender - Dibrugarh District	74
DIB - 2	Main Sources of Registration of Incident Cases of Cancer - Dibrugarh District.....	75
DIB - 3	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Dibrugarh District	76-77
DIB - 4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Dibrugarh District.....	78-79
DIB - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Dibrugarh District	80-81
DIB - 6	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis : 2003-2004 – Dibrugarh District	82-82
DIB - 7	Number of Cancer Deaths by Five Year Age Group and Site (ICD-10) – Dibrugarh District.....	83-84
DIB - 8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE)) and Truncated (35-64 Yrs) (TR) Mortality Rate – Dibrugarh District.....	85-86
DIB - 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).....	87-88
KUD - 1	Population by Five Year Age Group and Gender – Kamrup Urban District.....	96
KUD - 2	Main Sources of Registration of Incident Cases of Cancer – Kamrup Urban District	97
KUD - 3	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Kamrup Urban District.....	98-99
KUD - 4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Kamrup Urban District	100-101

KUD - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Kamrup Urban District.....	102-103
KUD - 6	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Kamrup Urban District.....	104-105
KUD - 7	Number of cancer Deaths by Five Year Age Group and Site (ICD-10) – Kamrup Urban District.....	106-107
KUD - 8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Kamrup Urban District.....	108-109
KUD - 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).....	110-111
SIT - 1	Population by Five Year Age Group and Gender – Silchar Town	117
SIT - 2	Main Sources of Registration of Incident Cases of Cancer - Silchar Town	118
SIT - 3	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Silchar Town	119-120
SIT - 4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Silchar Town.....	121-122
SIT - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Silchar Town.....	123-124
SIT - 6	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Silchar Town	125-126
SIT - 7	Number of Cancer Deaths by Five Year Age Group and Site (ICD-10) – Silchar Town	127-128
SIT - 8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Silchar Town	129-130
SIT - 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).....	131-132
IMP - 1	Population by Five Year Age Group and Gender – Imphal West District.....	136
IMP - 2	Main Sources of Registration of Incident Cases of Cancer – Imphal West District.....	137
IMP - 3	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Imphal West District.....	138-139
IMP - 4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Imphal West District.....	140-141
IMP - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Imphal West District	142-143
IMP - 6	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Imphal West District.....	144-145
IMP - 7	Number of cancer Deaths by Five Year Age Group and Site (ICD-10) – Imphal West District	146-147
IMP - 8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Imphal West District.....	148-149
IMP - 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).....	150-151
MIZ - 1	Population by Five Year Age Group and Gender – Mizoram State (All Districts)	159
MIZ - 2	Main Sources of Registration of Incident Cases of Cancer – Mizoram State (All Districts).....	160
MIZ - 3	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Mizoram State (All Districts).....	161-162
MIZ - 4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Mizoram State (All Districts).....	163-164
MIZ - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Mizoram State (All Districts)	165-166
MIZ - 6	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Mizoram State (All Districts)	167-168

MIZ - 7	Number of cancer Deaths by Five Year Age Group and Site (ICD-10) – Mizoram State (All Districts).....	169-170
MIZ - 8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Mizoram State (All Districts)	171-172
MIZ - 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).....	173-174
AIZ - 1	Population by Five Year Age Group and Gender – Aizawl District	176
AIZ - 2	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Aizawl District	177-178
AIZ - 3	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Aizawl District	179-180
AIZ - 4	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Aizawl District	181-182
AIZ - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Aizawl District.....	183-184
AIZ - 6	Number of Cancer Deaths by Five Year Age Group and Site (ICD-10) – Aizawl District.....	185-186
AIZ - 7	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Aizawl District.....	187-188
AIZ - 8	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).....	189-190
MIO - 1	Population by Five Year Age Group and Gender – Mizoram State Excl. Aizawl District	192
MIO - 2	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – – Mizoram State Excl. Aizawl District.....	193-194
MIO - 3	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Mizoram State Excl. Aizawl District.....	195-196
MIO - 4	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Mizoram State Excl. Aizawl District	197-198
MIO - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Mizoram State Excl. Aizawl District	199-200
MIO - 6	Number of cancer Deaths by Five Year Age Group and Site (ICD-10) – Mizoram State Excl. Aizawl District.....	201-202
MIO - 7	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Mizoram State Excl. Aizawl District	203-204
MIO - 8	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).....	205-206
SKM - 1	Population by Five Year Age Group and Gender – Sikkim State.....	210
SKM - 2	Main Sources of Registration of Incident Cases of Cancer - Sikkim State.....	211
SKM - 3	Number of incident Cancers by Five Year Age Group and Site (ICD-10) – Sikkim State.....	212-213
SKM - 4	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error(SE)) and Truncated (35-64 yrs) (TR) Incidence Rate – Sikkim State	214-215
SKM - 5	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Method of Diagnosis – Sikkim State.....	216-217
SKM - 6	Number (#) and Proportion (%) of Cancers by site (ICD-10) and Detailed Microscopic Diagnosis – Sikkim State.....	218-219
SKM - 7	Number of Cancer Deaths by Five Year Age Group and Site (ICD-10) – Sikkim State.....	220-221
SKM - 8	Average Annual Age Specific, Crude (CR), Age Adjusted (AAR) (with Standard Error (SE) and Truncated (35-64 Yrs) (TR) Mortality Rate – Sikkim State.....	222-223
SKM - 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).....	224-225

LIST OF FIGURES

Page Nos.

1.1	Average Annual Crude, Age Adjusted and Truncated Incident Rates – All sites of Cancer (ICD-10) : C00-C96	5
1.2	Average Age Specific Cancer Incidence Rates – All Sites of Cancer	6-7
2.1	Ten Leading Sites of Cancer – Dibrugarh District	10
2.2	Ten Leading Sites of Cancer – Kamrup Urban District	12
2.3	Ten Leading Sites of Cancer – Silchar Town	14
2.4	Ten Leading Sites of Cancer – Imphal West District	16
2.5	Ten Leading Sites of Cancer – Mizoram State	18
2.6	Ten Leading Sites of Cancer – Aizawl District	20
2.7	Ten Leading Sites of Cancer – Mizoram State Excl. Aizawl	22
2.8	Ten Leading Sites of Cancer – Sikkim State.....	24
3.1	Proportion of Tobacco Related Cancers Relative to All Sites	28
3.2	Proportion of Specific Tobacco Related Sites Relative to all Tobacco Related Cancers	28
4.1	Relative Proportion of Cancers based on different methods of diagnosis	34-35
4.2	Relative Proportion of Cancers based on different types of Microscopic Diagnosis	37- 38
5.1	Average Annual Age Specific Cancer Mortality Rates	42- 43
5.2	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Dibrugarh District	44
5.3	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Kamrup Urban District.....	45
5.4	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Silchar Town	46
5.5	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Imphal West District.....	47
5.6	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Mizoram State	48
5.7	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Aizawl District	49
5.8	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Mizoram State Excl. Aizawl District.....	50
5.9	Average Annual Age Specific Incidence & Mortality Rates : All Sites of Cancer – Sikkim State.....	51
6.1	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – All Sites	54
6.2	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Tongue	55
6.3	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Mouth	55-56

6.4	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Tonsil - Males	56
6.5	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Oropharynx - Males	57
6.6	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Nasopharynx - Males	57
6.7	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Hypopharynx - Males.....	58
6.8	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Pharynx - Males	58
6.9	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Oesophagus	59
6.10	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Stomach	60
6.11	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Gall Bladder - Females	61
6.12	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Larynx - Males.....	61
6.13	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Lung	62
6.14	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Breast - Females	63
6.15	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Cervix Uteri - Females.....	63
6.16	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Ovary - Females.....	64
6.17	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Thyroid - Females	64
6.18	Comparison of Age Adjusted Incidence Rates (AAR's) of North East PBCR's with the AAR's of other PBCR's (2004-2005) – Myeloid Leukaemia	65
DIB-1	Population Pyramid showing Average Age Distribution – Dibrugarh District.....	73
KUD-1	Population Pyramid showing Average Age Distribution – Kamrup Urban District	95
SIT-1	Population Pyramid showing Average Age Distribution – Silchar Town.....	116
IMP-1	Population Pyramid showing Average Age Distribution – Imphal West District	135
MIZ-1	Population Pyramid showing Average Age Distribution – Mizoram State (All Districts).....	158
AIZ-1	Population Pyramid showing Average Age Distribution – Aizawl District	175
MIO-1	Population Pyramid showing Average Age Distribution – Mizoram State Excl. Aizawl District.....	191
SKM-1	Population Pyramid showing Average Age Distribution – Sikkim State	209

ACKNOWLEDGEMENTS

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 of the North East;

Cooperating hospitals, nursing homes and other medical institutions;

All other Population Based Cancer Registries and Hospital Based Cancer Registries for providing data of North East;

Members of Steering Committee;

Members of Monitoring Committee;

Staff of Division of NCD, ICMR, New Delhi;

Staff of Coordinating Unit, NCRP, Bangalore;

Staff of Monitoring Unit of NERCR, Dibrugarh;

Special Cell of North East, Kolkata.

FOREWORD

This report of the North East Population Based Cancer Registries for the two year period (2005-2006) is the outcome of efforts made by the six registries as part of the National Cancer Registry Programme of the Indian Council for Medical Research. The six registries are located across four states (Assam, Manipur, Mizoram and Sikkim) of the North East and is the second report from that region.

The report provides information on incidence and patterns of cancer in the populations covered by these registries. The entire population of the states of Mizoram and Sikkim are covered by the respective cancer registry. Entire districts (Dibrugarh district in Assam state and Imphal West district in Manipur state) or part of the districts (Kamrup Urban District and Silchar Town in Assam state) are covered by the registries. The incidence rates and patterns of cancer in this second report are along the lines observed in the first report covering the two years 2003 and 2004.

This report highlights the manifold issues involved in systematic data collection for cancer research and its control in the North East region. It is hoped that this report will serve as a base for the researchers and health administrators to look afresh into the cancer problem occurring in the North East. The registries and their staff deserve appreciation for the efforts they have put in for collection of data from various sources towards the preparation of these reports.

I congratulate the Co-ordinating Unit of the National Cancer Registry Programme and its staff for bringing out this scientific report in relatively quick time.



Dr S.K. Bhattacharya
Additional Director General, ICMR

INTRODUCTION

The Indian Council of Medical Research (ICMR) initiated a network of cancer registries across the country under its National Cancer Registry Programme (NCRP) in December 1981 with three hospital and three population based cancer registries (PBCR). Over the years the registries, particularly the PBCRs have expanded so as to have 23 PBCRs under the NCRP network. 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 these PBCRs in four of the eight North Eastern states in 2003. The Council has now further sanctioned commencement of three more PBCRs in the three states of Tripura, Meghalaya and Nagaland. Arunachal Pradesh is covered by the North East Cancer Atlas project. Once cancer treatment facilities are established in Arunachal Pradesh, that state could also be covered through the cancer registry.

The publications of the NCRP are based on a systematic process of data collection, verification, analyzing and tabulation of data so as to meet international standards. Cancer is the only disease for which the ICMR set up a unit for such organized data collection with exclusive staff for the same. The unit at Bangalore co-ordinates and guides the activities of the NCRP registries. The Regional Medical Research Centre at Dibrugarh also facilitates the implementation of the work by these PBCRs in the North East region. Periodic reporting on facts and figures through such reports is an outcome of such an exercise.

Overall cancer incidence is higher in the North East compared to the incidence rates available from the other parts of the country. This is particularly so in Mizoram State and Kamrup Urban District. Such high incidence rates for all sites of cancer in both males and females have not been reported earlier. The marked differences in the incidence and patterns of cancer suggest the priorities for cancer control in the North East are far different from that of the rest of the country. Therefore, a general cancer awareness programme with specific primary preventive measures should be launched. For the same reason, priorities for cancer research are also different in the North East. The ICMR has commenced a number of multi-institutional research studies based on the cancer incidence data. These include studies on the role of tobacco and pesticides in the occurrence of cancer.

In view of the expanding activities of the NCRP, the ICMR has now created a new permanent centre – National Centre for Disease Informatics and Research in Bangalore. Through this centre it is hoped, that apart from cancer, publications on other non-communicable diseases (cardiovascular disease, diabetes and stroke) will also come out in due course. Such reports will greatly help in proceeding towards understanding disease aetiology, undertaking clinical research and instituting as well as assessing control measures in a scientific way.



Dr Bela Shah

Head, Division of Non-Communicable Diseases, ICMR

National Cancer Registry Programme North East Population Based Cancer Registries

Second Report : 2005 - 2006

Executive Summary

The first report of the six population based cancer registries (PBCRs) of the North Eastern region for the two year period from 1 Jan 2003 to 31 December 2004 was published in September 2006. Two years on, the second report for the two year period from 1 January 2005 to 31 December 2006 is now published. The location of the registries as well as the areas covered are exactly the same as that of the previous report. The state of Assam has three population based cancer registries comprising Dibrugarh district, Kamrup Urban District and Silchar town. In the state of Manipur, the area covered is of one main district, namely, Imphal West district. The PBCRs at Aizawl and Gangtok encompass the entire states of Mizoram and Sikkim respectively.

The report provides information on cancer incidence and patterns in these four North East states. The overall aim and objective is to produce incidence data that can be compared with other PBCRs under the National Cancer Registry Programme (NCRP). It attempts to give clues about the burden and patterns of cancer in these areas so as to present a base for studies in cancer aetiology and control. The report is a culmination of sustained efforts made by the PBCRs of the north east.

Cancer incidence rate is generally expressed as age adjusted, or age standardized (according to world standard population) incidence rate (AAR) per 100,000 persons. In the older established registries as well as in the newer registries in the main land this rate for all anatomical sites has been around 100 per 100,000, in the urban population based registries and relatively lower in the rural registry at Barshi. The results in this second report have again recorded incidence rates of well over 100 per 100,000 persons in six of the eight registry areas identified for describing the incidence and patterns of cancer.

Chapter 1 gives a picture of cancer incidence rates and Chapter 2 summarises the leading sites of cancer. For all anatomical sites of cancer, Mizoram state (AAR: 191.5 in males 155.0 in females) as a whole and Aizawl district (AAR : 269.0 in males and 208.4 in females) in particular (the latter being the main district of Mizoram) recorded the highest AAR. Kamrup Urban District (AAR: 180.5 in males and 131.6 in females) of Assam state follows closely in having such high incidence rates. The main anatomical site of cancer that contributed to the high incidence in males in Mizoram state was stomach cancer that accounted for almost a quarter (23.6%) of all cancers in that sex. This was followed by cancer of lung, oesophagus and hypopharynx that constituted over another quarter of all cancers. Among females in Mizoram, lung cancer was the leading site comprising nearly 15.1% of all cancers in women. This was followed by stomach cancer with 15.0% of all cancers.

In the registries in Assam, among males, cancer of the oesophagus was the leading site in Dibrugarh district and Kamrup Urban District and the fourth leading site in Silchar town. As in Mizoram, lung cancer incidence rate was high in Imphal west district of Manipur, and the leading site of cancer in males and the

second leading site in females. In Sikkim, among males stomach was the leading site. Among females lung cancer was not only the second leading site after cancer cervix, but the incidence rate of lung cancer was higher in females compared to males.

Chapter 3 deals with the number and proportion of cancers associated with use of tobacco. Kamrup Urban District accounted for the highest relative proportion of tobacco related cancer sites. Seven of the ten leading sites of cancer, were anatomical sites associated with the use of tobacco (IARC, 1987). A higher relative proportion of tobacco related cancers was also seen in the other two population based cancer registries in Assam state viz, Dibrugarh district and Silchar town.

Chapter 4 deals with the basis of diagnosis while Chapter 5 gives an outline of the Mortality Data.

A comparison of cancer incidence and patterns with other older PBCRs (NCRP, 2008b, under publication) is done in Chapter 6. The incidence rates in the newer registries in the North East were higher and in some sites considerably so, especially in Mizoram and Kamrup Urban District. Apart from the sites of cancer associated with use of tobacco, the AAR of cancer of the stomach in both males (AAR: 58.8 in males and 28.9 in females) and females in Aizawl District was many times higher than that recorded in Chennai (AAR: 11.9 in males and 5.6 in females) and Bangalore (AAR : 9.3 in males and 4.9 in females).

The incidence rate of cancer of nasopharynx was uniformly higher in seven of the eight north-east registry areas (except Dibrugarh) than that seen in the PBCRs commenced in the earlier years. Delhi PBCR has consistently reported a high incidence of cancer of the gall bladder in women. Kamrup Urban District showed almost twice the incidence rate at Delhi, while Imphal West District recorded a 30% higher incidence.

The AARs of the common sites of cancer in women, viz, cervix, breast and ovary are comparable or lower than that seen in the established PBCRs. Among the TRCs, the most common site of cancer, that was several times higher than the highest AAR documented by the older PBCRs was, cancer of the lung in women (34.7 / 100,000 in Aizawl district versus 3.5 / 100,000 in Delhi). This singular characteristic as well as the other incidence and patterns seen in the north east PBCRs reconfirm the results reported in the first report and from the study on Development of an Atlas of Cancer in India (NCRP, 2006; NCRP, 2004a,b; Nandakumar *et al*, 2005).

The authenticity of the data depends on its quality, and with reference to the population based cancer registry, 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. Some of the indicators of quality of data have been indicated in Chapters 4 and 5. Care has been taken to ensure that all possible sources of registration of cancer cases have been identified and a search made of all cancer cases diagnosed during the two-year period in each of these sources. Likewise the date of diagnosis has been strictly followed so as not to include cases diagnosed outside the two-year period. Standard checking of data has been done as per IARC norms (Parkin et al, 1994).

Cancer registration is a means to a purpose and not a purpose in itself. It is the forerunner of studies in descriptive epidemiology of cancer, which in turn generate specific scientific hypotheses. The cancer

registry is central to any rational programme on cancer control (Muir, C.S., 1985). The results of this report have provided a lead to set priorities for cancer research and identified target sites for cancer control measures.

Priorities for Cancer Control in the North East

Over all, cancer incidence is higher in the North East compared to the reports available in other parts of the country. This is particularly so in Mizoram State and Kamrup Urban District. Such higher incidence rates for all sites of cancer in both males and females have not been reported earlier. Therefore a general cancer awareness programme with specific primary prevention measures should be included.

The incidence of cancer of the stomach is extremely high in Mizoram State and on the higher side in Sikkim and Manipur. Therefore, an action plan to have early detection of stomach cancer through endoscopy is essential. It would be desirable to establish endoscopy units in all district hospitals in Mizoram State and selected district hospitals in Sikkim and Manipur States. Periodic visits by the gastroenterologist or other trained medical staff to conduct endoscopy as a screening procedure should be undertaken through periodic visits to the district hospitals. Simultaneously, education of the public about stomach cancer and the need for early detection including the benefits of undergoing endoscopy should be widely publicized. In patients who do come and undergo endoscopy, facilities should be created for prompt diagnosis and wherever necessary, adequate treatment.

A similar programme as above for oesophageal cancer in Assam is also essential.

Since lung cancer is also very common and of high incidence in both men and women in these states, campaigns on harmful effects of tobacco as also early detection programmes for lung cancer should be instituted. The value of a simple chest X-ray in early detection of, or at least picking early stage, lung cancer should be tried out as a pilot project and subsequently extended.

Besides the above, cancer of the gall bladder especially in women, also shows a higher incidence in these areas. The specific risk factors for gall bladder cancer are largely unknown. Therefore, programmes for early detection need to be taken up. The value of ultrasound as a method of early detection of gall bladder cancer should be tested out.

Cancer of the nasopharynx is also high in these North East States. Nasal and Oropharyngeal examination by trained medical personnel could help in the early detection of these cancers also.

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. The PBCRs have gradually expanded over the years and as of now there are 20 PBCRs under the NCRP network and these are illustrated in the adjoining map. Three more PBCRs at Meghalaya, Nagaland and Tripura are to commence operation soon. These 3 PBCRs will add to the six PBCRs in the North East that have started accessing data from 1 January 2003.

The NCRP is a long term activity of the ICMR and the six PBCRs of this report are now included under the NCRP. 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.

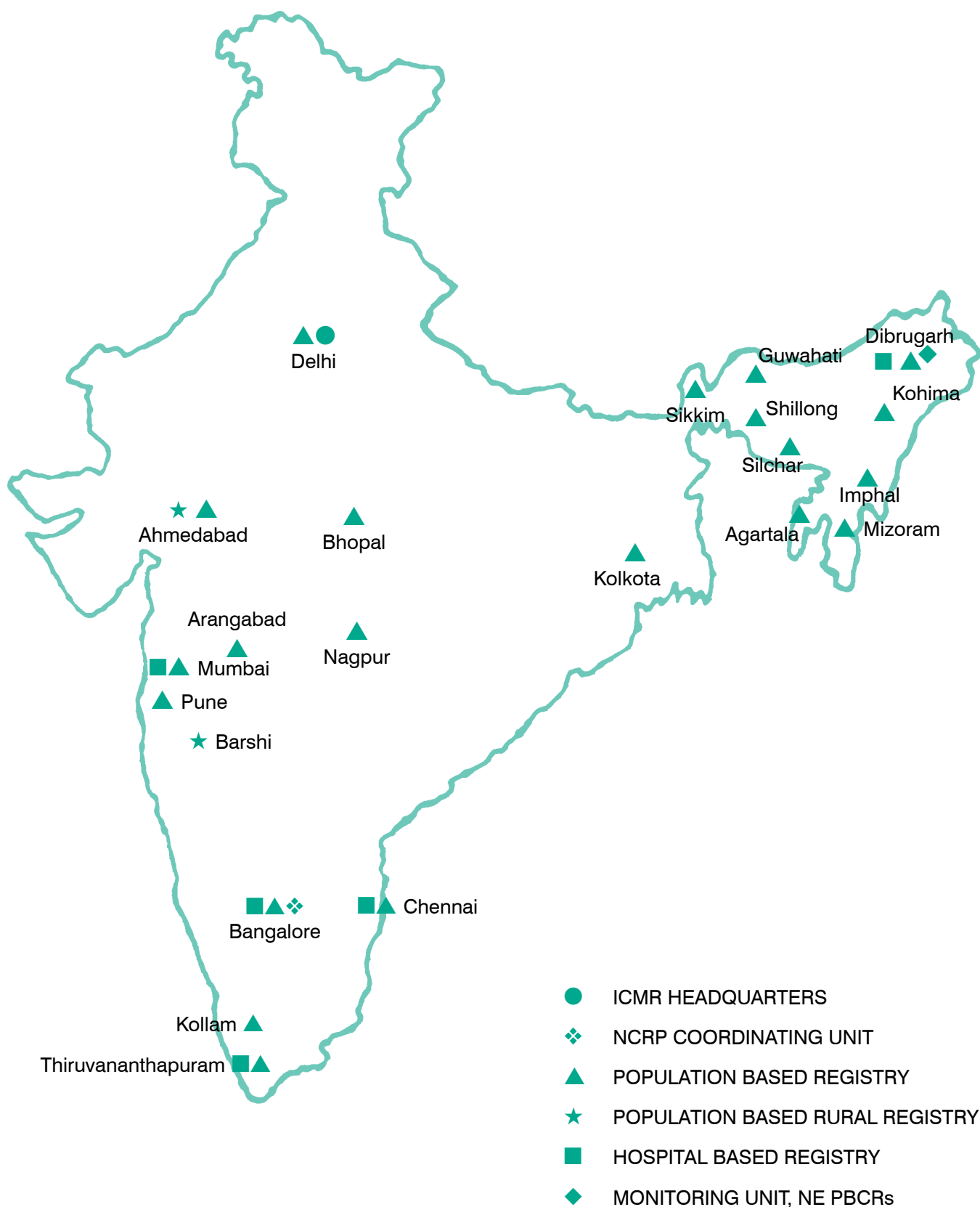
The information that is collected on a core form that is computer ready is subsequently entered on to a computer. Over the years, the registries and the office of the NCRP have used modern advances in electronic information technology to not only enter the data but also help in specific activities that involves checking of the data, verification of duplicates and matching mortality and incidence records. Electronic processing of data is now being tried out in some registries.

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.

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).

NATIONAL CANCER REGISTRY PROGRAMME

(Indian Council of Medical Research)



MONITORING UNIT

North East Regional Population Based Cancer Registry (NERPBCR), Regional Medical Research Centre For North-East (RMRC-NE), Dibrugarh, Assam

The Indian Council of Medical Research (ICMR), New Delhi initiated a network of North East Population Based Cancer Registries (NE PBCR) from January 2003 under the National Cancer Registry Programme (NCRP) in the 4 (four) North Eastern States of India. Regional Medical Research Centre (RMRC-NE) of North East, Dibrugarh is the monitoring unit for these registries.

The six Population Based Cancer Registries covered the following areas of:

1. Assam State:
 - i. Dibrugarh District
 - ii. Kamrup Urban District
 - iii. Silchar Town
2. Manipur state: Imphal West District
3. Mizoram state: Entire Mizoram state
4. Sikkim state: Entire state of Sikkim

Principal Investigator of the monitoring unit i.e. Director of RMRC-NE, Dibrugarh, coordinates all the technical and administrative functions of the registries of the NERPBCR. The Coordinating Unit of NCRP, Bangalore and other Steering Committee members of NCRP discuss the core issues for the smooth functioning of the cancer registries of north east from time to time. Monitoring unit keeps a constant touch with NCRP office at Bangalore for guidance, help and training of staff at different levels.

The investigators and staff of Monitoring Unit visits different NE PBCRs at different time and discuss various aspects of working of the registry, difficulties in abstraction, problems in coding and discussion on medical terminologies, statistical and epidemiologic methods.

Apart from this, the Monitoring Unit undertakes and coordinates epidemiologic and other research studies. They 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.

Finally data are sent to NCRP office at Bangalore for further check, verification and compilation.

As per recommendation of the 22nd Annual Review Meeting of NCRP held at Ahmedabad, 2006, a Workshop for the registry staff of the NE PBCR on “Cancer Registration – Using Data Sets for Research, Analysis and Publications” was organized by RMRC, Dibrugarh, the Monitoring unit of North East Population Based Cancer Registry (NE PBCR) in association with National Cancer Registry Programme (NCRP), Bangalore at the RMRC, Dibrugarh, Assam for 4 days from the 10th June to 13th June 2007.

The objective of the workshop was to train the northeast cancer registry staff – for Preparation of Research Proposal; analyse the data sets of cancer registries of northeast so as to publish the result as paper.

They were trained on the research methods like the designing, planning and conducting of epidemiological research. There were also sessions on methods for publication of scientific papers on cancer. The participants were taught the concepts and definition of Biostatistics and Epidemiology. There were practical demonstrations on the use of software like SPSS and EPI Info-6 on individual registry data sets. The participants were given the “Hands on” working experience of data sets. The workshop was concluded after thorough and complete coverage of all aspects of process of preparing research proposal, data analysis and publication of papers.

Brief salient findings of the North East Regional Population Based Cancer Registry:

Stomach is the leading site based on the incidence of all cancers among male in the entire North-East Cancer Registry areas. Mizoram state contributed about 40% of the total stomach cancer cases in the region. The next leading site of cancer in the region is cancer of the oesophagus of which Assam state contributed 60% of the total cases (Kamrup, Dibrugarh and Silchar). The next leading site of cancer incidence in the region is Lung and Liver of which the major contributing registries are Imphal, 35% (Manipur state) and Sikkim state (55%) respectively. The other leading sites in different registries of the northeast were- tonsil, tongue, hypopharynx, nasopharynx, larynx and mouth.

Though breast and cervix are the two major leading site of cancer incidence in the North-East Cancer Registry areas among females, in some registries the incidence of lung cancer (Imphal & Mizoram), stomach cancer (Mizoram) and oesophagus cancer (Silchar) is higher than that of breast and cervix cancer. The other leading sites of cancer among females which need a mention are thyroid in Imphal, gall bladder in Mizoram, Silchar, Kamrup and Dibrugarh and Myeloid leukemia in Sikkim, Imphal and Dibrugarh.

The incidence pattern of some of the cancer sites of the north east are comparable to other parts of world. The incidence is higher in comparison to other PBCRs of India.

The findings of these north-east cancer registries have set priorities for cancer research and identified target sites for cancer control measures such as stomach cancer in Mizoram, oesophageal cancer in Assam, lung cancer in Mizoram and Manipur, gall bladder cancer among females in Assam, nasopharyngeal cancer in Manipur and Sikkim, liver cancer in Sikkim and thyroid cancer among females in Manipur.

There also appears a need to have an extended and explicit programme of cancer control for the north east region of India, not only because of the high incidence of certain cancers, but also because of the distinct patterns of cancer seen here than that observed in the rest of the country.

Faculty:

1. Dr. P.S.S. Sundar Rao, Steering Committee Member of NCRP, Bangalore
2. Dr. A. Nandakumar, Coordinating Unit of NCRP, Bangalore
3. Dr. J. Mahanta, RMRC-NE, Monitoring Unit of NE PBCR, Dibrugarh
4. Mr. P. Gangadharan, Monitoring Committee Member of NCRP, Kochi
5. Dr. B.B. Yeole, Cancer Research Centre, Mumbai
6. Dr. T. Ramnath, Coordinating Unit of NCRP, Bangalore
7. Dr. Meesha Chaturvedi, Coordinating Unit of NCRP, Bangalore
8. Mr. A. Srivastava, Bhopal Cancer Registry, Bhopal
9. Dr. R.K. Phukan, RMRC-NE, Monitoring Unit of NE PBCR, Dibrugarh.

Participants:

2. Dr. M.S. Ali, PBCR, Dibrugarh
3. Dr. Rafiqua Akhtar, PBCR, Dibrugarh
4. Mr. Ratul Dutta, PBCR, Dibrugarh
5. Mr. S.K. Bhuyan, PBCR, Dibrugarh
6. Dr. J.D. Sharma, PBCR, Guwahati
7. Ms. Geetanjali Devi, PBCR, Guwahati
8. Dr. Raja Prosanta Banik, PBCR, Silchar
9. Dr. Yogesh Verma, PBCR, Sikkim
10. Dr. E. Zomawia, PBCR, Mizoram
11. Ms. V.L. Thlamuani, PBCR, Mizoram
12. Dr. Y. Mohen Singh, PBCR, Imphal
13. Dr. O. Vijaya Devi, PBCR, Imphal
14. Dr. Rupali Baruah, Assam Medical College, Dibrugarh
15. Dr. D. Saikia, Monitoring Unit of NE PBCR, RMRC-NE, Dibrugarh
16. Mr. Manash Protim Barman, Monitoring Unit of NE PBCR, RMRC-NE, Dibrugarh.

