Population-Based Cancer Registries at Chandigarh and SAS Nagar, Sangrur, Mansa Districts Punjab State, India

A collaborative project of
Tata Memorial Centre (TMC), Mumbai, Maharashtra State, India
Homi Bhabha National Institute (HBNI), Mumbai, India
Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India
Department of Health and Family Welfare, Government of Punjab State, India
Director of Health Services, Chandigarh, India

Cancer Burden in Chandigarh and Punjab State
Dr. G Dewan, Director of Health Services Chandigarh; Mrs. Anjali Bhawara, Principal Secretary Health and Family Welfare Punjab; Prof Jagat Ram, PGI Director; Dr. Prashant Mathur, Director NCDIR-NCRP, ICMR; Dr. Freddie Bray, Head section of cancer surveillance, IARC; Dr. Rajesh Dikshit, Director CCE-TMC; Prof JS Thakur, PGIMER and Dr. Atul Budukh, Professor, CCE-TMC along with other dignitaries released the reports of Chandigarh and Punjab PBCR concurrently during World NCD Congress held at PGIMER from 4th November 2017 to 6th November 2017. The message from the second year report is that all site cancer incidence rates are in comparison with other parts of India.
## Cancer Registry Principal Investigator, Co-Principal Investigator, and Co-investigators

### Tata Memorial Centre (TMC), Mumbai

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Dr. R A Badwe</td>
<td>Principal Investigator</td>
<td>Director</td>
</tr>
<tr>
<td>Dr. Rajesh Dikshit</td>
<td>Co – Investigator</td>
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</tr>
<tr>
<td>Dr. Pankaj Chaturvedi</td>
<td>Co – Investigator</td>
<td>Dy Director, CCE</td>
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<td>Dr. Prathamesh Pai</td>
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<tr>
<td>Dr. Atul Budukh</td>
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<td>Administrator</td>
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### Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh

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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Dr. Jagat Ram</td>
<td>Steering Committee Chairman (From 1st November 2016 to till date)</td>
<td>Director</td>
</tr>
<tr>
<td>Dr. J S Thakur</td>
<td>Principal Investigator</td>
<td>Professor</td>
</tr>
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<td>Dr. Rakesh Kapoor</td>
<td>Co- Investigator</td>
<td>Professor</td>
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<td>Dr. Pankaj Malhotra</td>
<td>Co- Investigator</td>
<td>Professor</td>
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<tr>
<td>Dr. Pankaj Arora</td>
<td>Co-Investigator</td>
<td>Assistant Professor</td>
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### Department of Health and Family Welfare, Punjab

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<tr>
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<tr>
<td>Dr. Raj Kumar</td>
<td>Co-Investigator</td>
<td>Civil Surgeon, Sangrur</td>
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<tr>
<td>Dr. Lalchand Thakral</td>
<td>Co-Investigator</td>
<td>Civil Surgeon, Mansa</td>
</tr>
<tr>
<td>Dr. Jai Singh</td>
<td>Co-Investigator</td>
<td>Civil Surgeon, SAS Nagar</td>
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### Homi Bhabha Cancer Hospital, Sangrur

<table>
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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Dr. Tapas Dora</td>
<td>Asst Professor – Radiotherapy</td>
</tr>
<tr>
<td>Dr. Sankalp Sancheti</td>
<td>Asst Professor – Pathology</td>
</tr>
<tr>
<td>Dr. Debashish Chaudhary</td>
<td>Asst Professor – Surgical Oncology</td>
</tr>
<tr>
<td>Dr. Anshul Singla</td>
<td>Asst Professor – Head and Neck Surgery</td>
</tr>
<tr>
<td>Dr. Alok Kumar Goel</td>
<td>Asst Professor – Medical Oncology</td>
</tr>
<tr>
<td>Dr. Pramod Kharade</td>
<td>Asst Professor – Preventive Oncology</td>
</tr>
<tr>
<td>Mr. Prithviraj Kadam</td>
<td>Project Manager</td>
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### Supportive staff from TMC

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Mrs. Sonali Bagal</td>
<td>Research Coordinator</td>
</tr>
<tr>
<td>Ms. Shraddha Shinde</td>
<td>Scientific Assistant</td>
</tr>
<tr>
<td>Mrs. Suchita Yadav</td>
<td>Scientific Assistant</td>
</tr>
<tr>
<td>Dr. Priyal Chakravarti</td>
<td>Sr. Project Coordinator</td>
</tr>
</tbody>
</table>

### Cancer Registry Staff

<table>
<thead>
<tr>
<th>City</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chandigarh</td>
<td>Mrs. Balkiran Kaur, Mrs. Pratibha Saxena, Ms. Pooja and Mr. Manoj Kumar</td>
</tr>
<tr>
<td>SAS Nagar</td>
<td>Mr. Randeep Singh, Mr. Narinderjit Singh, Mr. Ashok Kumar and Mr. Rajinder Singh</td>
</tr>
<tr>
<td>Sangrur</td>
<td>Ms. Divya Singh, Mr. Lakhwinder Singh, Mr. Amarjeet Singh, Mr. Charanjit Singh, Mr. Sandeep Singh, Mr. Gurwinder Singh, Mr. Manoj Kumar and Mr. Deepak Saini</td>
</tr>
<tr>
<td>Mansa</td>
<td>Mr. Sanjeev Kumar, Mrs. Gurpreet Kaur, Mrs. Kirna Kaur and Mr. Mandeep Kumar</td>
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</tbody>
</table>
## Steering Committee Member

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
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</table>
| Dr. Jagat Ram (1\textsuperscript{st} November, 2016 onwards)  
Director, PGIMER, Chandigarh                  | Chairman                                         |
| Dr. R A Badwe  
Director, TMC, Mumbai                          | Member                                           |
| Dr. Subhash C. Varma  
Professor and Head of Internal Medicine, PGIMER, Chandigarh | Member                                           |
| Dr. Arvind Rajwanshi  
Professor and Head of Cytology and Gynaecological Pathology, PGIMER, Chandigarh | Member                                           |
| Dr. Sushmita Ghoshal  
Professor and Head of Radiotherapy, PGIMER, Chandigarh | Member                                           |
| Dr. Rajesh Dikshit  
Director, CCE-TMC, Mumbai                       | Member                                           |
| Dr. J S Thakur  
Professor, Department of Community Medicine and School of Public Health, PGIMER, Chandigarh | Member                                           |
| Dr. Atul Budukh  
Professor of Epidemiology, CCE-TMC, Mumbai      | Member                                           |
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</table>
1. Background

Population-based cancer registries (PBCRs) are essential to know the true cancer burden in the population. In the year 2013, Tata Memorial Centre (TMC) in collaboration with Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh and Government of Punjab started the population-based cancer registries in urban, semi-urban and rural populations to know the cancer burden and trends over the period in these areas. These PBCRs cover 4.6 million population. The data have been collected from Chandigarh Union Territory (UT) and three districts in Punjab viz; SAS Nagar, Mansa and Sangrur.

The information presented in this report pertains to all cancer cases registered with four registries mentioned above in the year 2013 – 2016.

2. Population Covered

The Mansa and Sangrur registries are rural, SAS Nagar registry is a semi-urban registry whereas Chandigarh is predominantly urban.

Table1: Estimated average population distribution among selected districts across rural and urban areas: 2013-2016

<table>
<thead>
<tr>
<th>PBCR</th>
<th>Population covered (in million)*</th>
<th>Rural Area (%)</th>
<th>Urban Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chandigarh</td>
<td>1.1</td>
<td>2%</td>
<td>98%</td>
</tr>
<tr>
<td>SAS Nagar</td>
<td>1.0</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>Sangrur</td>
<td>1.75</td>
<td>69%</td>
<td>31%</td>
</tr>
<tr>
<td>Mansa</td>
<td>0.8</td>
<td>79%</td>
<td>21%</td>
</tr>
</tbody>
</table>

* Estimated population-based on growth rate of 2001 and 2011 census population

3. Release of the Second Year Report of the Cancer Registries

Dr. G Dewan, Director of Health Services Chandigarh; Mrs. Anjali Bhawara, Principal Secretary Health and Family Welfare Punjab; Prof Jagat Ram, PGI Director; Dr. Prashant Mathur, NCDIR-NCRP, ICMR Director; Dr. Freddie Bray, Head section of cancer surveillance, IARC; Dr. Rajesh Dikshit, Director CCE-TMC; Prof JS Thakur, PGIMER and Dr. Atul Budukh, Professor, CCE - TMC along with other dignitaries released the reports of Chandigarh and Punjab PBCR concurrently during World NCD Congress held at PGIMER on 4th November 2017 to 6th November 2017. The message from the second year report is that all site cancer incidence rates are in comparison with other parts of India.
4. Area Covered

Chandigarh

SAS Nagar District

Sangrur District

Mansa District
### 5. Cancer Incidence and Mortality

#### Table 2: Population covered, incidence cases registered and incidence rate by sex: (2013-2016)

<table>
<thead>
<tr>
<th></th>
<th>Chandigarh</th>
<th>SAS Nagar</th>
<th>Sangrur</th>
<th>Mansa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average population covered</td>
<td>625,093</td>
<td>601,204</td>
<td>916,056</td>
<td>426,231</td>
</tr>
<tr>
<td>Number of cases registered</td>
<td>1754</td>
<td>1594</td>
<td>1905</td>
<td>886</td>
</tr>
<tr>
<td>AAR per 100,000 *</td>
<td>96.0</td>
<td>83.1</td>
<td>54.7</td>
<td>52.0</td>
</tr>
<tr>
<td>Cumulative risk of getting the disease (0-74 age group)</td>
<td>11.6% (1 in 9)</td>
<td>9.8% (1 in 10)</td>
<td>6.4% (1 in 16)</td>
<td>5.8% (1 in 17)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average population covered</td>
<td>518,525</td>
<td>538,031</td>
<td>812,852</td>
<td>377,091</td>
</tr>
<tr>
<td>Number of cases registered</td>
<td>1749</td>
<td>1785</td>
<td>2070</td>
<td>1012</td>
</tr>
<tr>
<td>AAR per 100,000 *</td>
<td>102.4</td>
<td>98.6</td>
<td>63.6</td>
<td>62.4</td>
</tr>
<tr>
<td>Cumulative risk of getting the disease (0-74 age group)</td>
<td>12.3% (1 in 8)</td>
<td>11.3% (1 in 9)</td>
<td>7.2% (1 in 14)</td>
<td>6.9% (1 in 14)</td>
</tr>
</tbody>
</table>

*AAR: Age-adjusted rate per 100,000 population

#### Table 3: Population covered, death due to cancer and death rate by sex: (2013-2016)

<table>
<thead>
<tr>
<th></th>
<th>Chandigarh</th>
<th>SAS Nagar</th>
<th>Sangrur</th>
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<tr>
<td><strong>Male</strong></td>
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<td></td>
</tr>
<tr>
<td>Average population covered</td>
<td>625,093</td>
<td>601,204</td>
<td>916,056</td>
<td>426,231</td>
</tr>
<tr>
<td>Number of deaths registered</td>
<td>835</td>
<td>841</td>
<td>1323</td>
<td>625</td>
</tr>
<tr>
<td>AAR per 100,000 *</td>
<td>46.7</td>
<td>44.3</td>
<td>38.1</td>
<td>36.4</td>
</tr>
<tr>
<td>Cumulative risk of death due to disease (0-74 age group)</td>
<td>5.6% (1 in 18)</td>
<td>5.4% (1 in 19)</td>
<td>4.6% (1 in 22)</td>
<td>4.1% (1 in 24)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>591</td>
</tr>
<tr>
<td>AAR per 100,000 *</td>
<td>36.3</td>
<td>37.9</td>
<td>36.5</td>
<td>36.2</td>
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<tr>
<td>Cumulative risk of death due to disease (0-74 age group)</td>
<td>4.5% (1 in 22)</td>
<td>4.5% (1 in 22)</td>
<td>4.7% (1 in 21)</td>
<td>4.2% (1 in 22)</td>
</tr>
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*AAR: Age-adjusted rate per 100,000 population*
Figure 1: Cancer incidence by sex (2013-2016)

Figure 2: Cancer mortality by sex (2013-2016)
6. Leading Cancer Sites

Figure 3: Leading cancer sites in Chandigarh – Males (2013-2016)

Figure 4: Leading cancer sites in Chandigarh – Females (2013-2016)
Figure 5: Leading cancer sites in SAS Nagar – Males (2013-2016)

- Lung: 7.8 (9.0%)
- Prostate: 7.7 (9.6%)
- Oesophagus: 5.9 (6.5%)
- Bladder: 4.9 (5.8%)
- Tongue: 4.2 (5.0%)
- Liver: 4.1 (4.8%)
- Mouth: 4.0 (4.5%)
- Larynx: 4.0 (4.4%)
- Brain, nervous system: 3.3 (4.5%)
- NHL: 2.9 (3.5%)

Figure 6: Leading cancer sites in SAS Nagar – Females (2013-2016)

- Breast: 30.2 (30.3%)
- Cervix uteri: 10.4 (10.4%)
- Ovary: 7.4 (7.5%)
- Gallbladder etc.: 4.8 (4.8%)
- Corpus uteri: 4.7 (4.5%)
- Oesophagus: 4.7 (4.8%)
- NHL: 3.5 (3.5%)
- Lung: 2.2 (2.2%)
- Myeloid leukaemia: 2.1 (2.4%)
- Brain, nervous system: 2.0 (2.1%)
Figure 7: Leading cancer sites in Sangrur – Males (2013-2016)

Figure 8: Leading cancer sites in Sangrur – Females (2013-2016)
Figure 9: Leading cancer sites in Mansa – Males (2013-2016)

- Oesophagus: 6.3 (12.1%)
- Liver: 2.8 (5.2%)
- Prostate: 2.3 (4.7%)
- Lung: 2.3 (4.4%)
- Mouth: 2.3 (4.4%)
- Brain, nervous system: 2.2 (4.4%)
- Tongue: 2.2 (4.4%)
- Myeloid leukaemia: 2.1 (4.3%)
- Larynx: 2.1 (4.1%)
- Lymphoid leukaemia: 1.8 (3.3%)

Figure 10: Leading cancer sites in Mansa – Females (2013-2016)

- Breast: 13.3 (21.1%)
- Cervix uteri: 10.1 (16.1%)
- Oesophagus: 7.1 (11.4%)
- Ovary: 5.0 (7.7%)
- Gallbladder etc.: 3.2 (5.0%)
- Myeloid leukaemia: 2.3 (3.7%)
- Kidney: 1.3 (1.9%)
- Liver: 1.3 (2.2%)
- Lung: 1.2 (1.8%)
- Pancreas: 0.9 (1.5%)
7. Comparison of Cancer Incidence Rate with other Indian Registries

Figure 11: Age-adjusted incidence rate of all cancer sites from Indian PBCR – Males

(Reference: 1 to 7)
Figure 12: Age-adjusted incidence rate for all cancer sites from Indian PBCR - Females

(Reference: 1 to 7)
Figure 13: Age-adjusted incidence rates of breast cancer from Indian PBCR

(Reference: 1 to 7)
Figure 14: Age-adjusted incidence rates of cervix uteri cancer from Indian PBCR

(Reference: 1 to 7)
Figure 15: Age-adjusted incidence rates of prostate cancer from Indian PBCR

(Reference: 1 to 7)
Figure 16: Age-adjusted incidence rates of oesophagus cancer from Indian PBCR

(Reference: 1 to 7)
Figure 17: Age-adjusted incidence rates of lung cancer from Indian PBCR

(Reference: 1 to 7)
8. Highlights

- The population-based cancer registry covers a 100% population of the Chandigarh Union Territory.

- SAS Nagar, Sangrur and Mansa registries cover around 3.6 million population, which constitutes 13% of the total population of Punjab state.

- **Cancer registry covers the Chandigarh area as well as 419 villages of SAS Nagar, 589 of Sangrur and 242 of Mansa districts (total 1250 villages).**

- The Chandigarh PBCR incidence rates for both males and females are higher than the national rate (Chandigarh male 96.0, India male 89.8 per 100,000 population; Chandigarh female 102.4, India female 90.0 per 100,000 population). However, it is lower than Mumbai, Delhi, Chennai and Bangalore cancer registries.

- SAS Nagar female cancer incidence rate is slightly higher than the national rate (98.6 Vs 90.0 per 100,000 population); however, the male cancer incidence rate is lower than the national rate (83.1 Vs 89.8 per 100,000).

- Sangrur and Mansa cancer registry incidence rates are lower than the urban cancer registries; however, it is in comparison with other rural registries of the country.

- 1 in 9 males is at risk of developing cancer in Chandigarh; whereas, it is 1 in 10 in SAS Nagar, 1 in 16 in Sangrur and 1 in 17 in Mansa district.

- 1 in 8 females is at risk of developing cancer in Chandigarh; whereas, it is 1 in 9 in SAS Nagar, 1 in 14 in both Sangrur and Mansa districts.

- 1 in 18 males is at risk of dying due to cancer in Chandigarh; while it is 1 in 19 in SAS Nagar, 1 in 22 in Sangrur district and 1 in 24 in the Mansa district.

- 1 in 22 females is at risk of dying due to cancer in Chandigarh, SAS Nagar and Mansa district whereas it is 1 in 21 in Sangrur district.

- Female breast cancer incidence rate of Chandigarh is 33.0 per 100,000 population which is comparatively higher but it is lower than Delhi, Chennai, Mumbai and Bangalore cancer registries.

- Female breast cancer is the most predominant cancer reported by Chandigarh, SAS Nagar, Sangrur, and Mansa population-based cancer registries.

- 1 in 25 females is at risk of getting breast cancer in Chandigarh, 1 in 29 in SAS Nagar, 1 in 53 in Sangrur and 1 in 71 in the Mansa district. This report recommends an early detection program for breast cancer to be organized in this region.

- Cervix uteri cancer is the second leading cancer site followed by breast cancer in all the cancer registries.

- Lung, Prostate, Oesophagus and Bladder cancers are the leading cancer sites in males as per Chandigarh and SAS Nagar registries data.
• Oesophagus, Prostate and Liver cancers are the leading cancer sites in males as per Sangrur and Mansa registries data.

• Gall bladder cancer is one of the top five leading cancer sites in females in all the cancer registries (Chandigarh 5.7, SAS Nagar 4.8, Sangrur and Mansa 3.2 per 100,000 population).

• Most of the cancer cases from rural and urban areas are diagnosed at the advanced stage of the disease.

• Approximately 50% of male cancer cases are surviving in the urban population whereas only 31% of male cases are surviving in the rural population.

• 62% to 65% of female cancer cases are surviving in the urban population whereas only 42% to 43% of cases are surviving in the rural population.

• Based on the recommendation of the cancer registry report, we have started an early detection program for breast, cervix uteri and oral cancer in the Sangrur area.

• The cancer incidence rates for all cancer sites are stable in all the registries for the year 2013 to 2016. There is an improvement in the cancer registration process. The rates of all cancer sites are in comparison with the other parts of India.

• This report recommends a cancer control program to be organized in these regions with the focus on breast, cervix uteri, oesophagus, prostate, lung and oral cancer.

9. Cancer Control in Punjab

Cancer registries are the first step in cancer control. The registry data have estimated the risk of developing cancer in the range of 6 to 12% for males and for females, it is 7 to 12%. The risk is double in the urban areas as compared to rural areas.

The major cancers in Punjab are Breast, Cervix Uteri, Lung, Prostate and Oesophagus. Most of the cancers are preventable. Based on the observation from the registry, Tata Memorial Centre has started a satellite center in Sangrur and will establish a comprehensive cancer center in SAS Nagar (Mohali). The cancer center in Mohali will be in operation soon. PGIMER Chandigarh has also established a satellite center beside a regional cancer center. Govt. of Punjab has taken various other steps to strengthen the cancer care services in the state.

In addition to the above, Homi Bhabha Cancer Hospital has started an early detection program for Breast, Cervix Uteri and oral cancer in the Sangrur area. The registries will be useful in the future to monitor cancer trends and to evaluate the effects of prevention and treatment.
10. Reference


3. Chandigarh Population-Based Cancer Registry Report: (2013, 2014 and 2015-2016) – Tata Memorial Center, Mumbai and Post Graduate Institute of Medical Education and Research (PGI), Chandigarh

4. SAS Nagar Population-Based Cancer Registry Report: (2013, 2014 and 2015-2016) – Tata Memorial Center, Mumbai and Post Graduate Institute of Medical Education and Research (PGI), Chandigarh


11. Acknowledgement

We gratefully acknowledge Mr. Vijay Inder Singla – Hon Minister of PWD and Education for his support to Homi Bhabha Cancer Hospital, Sangrur and Mansa Population-Based Cancer Registry.

Our special thanks to Mrs. Vini Mahajan, Ex-Principal Secretary – Ministry of Health & Family Welfare, Government of Punjab for her valuable support.

The cancer registries gratefully acknowledge the help provided by Chandigarh administration as well as the Punjab Government.

The registries appreciate the support provided by all the departments of PGIMER, Chandigarh.

The registries acknowledge the support provided by all the departments of Acharya Tulsi Das Regional Cancer Treatment & Research Institute, Bikaner.

The registries acknowledge the help provided by all the diagnostic and treatment centers from Chandigarh, SAS Nagar, Sangrur, Mansa district and across the Punjab, Haryana, and Rajasthan state. The names of the centers are mentioned below.

We acknowledge the support provided by the administration and account unit Tata Memorial Centre in the smooth functioning of the cancer registry project.

Tata Memorial Hospital, Mumbai
Dr. C S Pramesh, Director
Dr. Banavli S, Director – Academics
Mr. Sanjeev Sood – Director Administration (Project)
Mr. Anil Sathe, CAO
Mr. Suryakant Mohapatra, JCFA
Mr. Vijendra Tiwari, DCA
Mrs. Ruchita Dhanvade, AAQ
Mr. Benny George, HRD Officer
Mr. Chandrakant Shetty, Jr AO
Mrs. Anagha Kadam, AAQ
Mrs. Varsha Patil, Stenographer

Homi Bhabha Cancer Hospital, Sangrur
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Dr. Rakesh Sharma, Surgical oncologist
Dr. Sachin Khandelwal, Surgical oncologist
Dr. Dimple Kalra, Administrator
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Dr. HKV Narayan, Dy. Director,
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