

PROJECT COMPLETION REPORT

16th Jan 2018

Title of the Project

“Hospital based Database for Cancer in Uttarakhand region”

No. UCS&T/R&D/MED. SC.-01/11-12 /2089

Dated: 21-12-2011

Date of Commencement : March 2012

Principal Investigator :

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(9) Executive Summary of the project

The proposed project envisaged developing a comprehensive hospital based computerized data base of cancer patients attending Cancer Research Institute , at Swami Rama Himalayan University , HIHT in collaboration of UCOST.

Cancer Research Institute (CRI) at SRHU developed over last one decade as comprehensive cancer care center in State of Uttarakhand , catering to cancer patients from Uttarakhand and neighboring districts of western Uttar Pradesh , Himachal Pradesh and Haryana .

Project was sanctioned in Dec 2011 and executed in March / April 2012 , sanctioned date of completion was March 2015 , which was further extended until May 2016.

Proposal was intended for long term objective to share information on cancer in Uttarakhand and in this region. And to understand measures required for cancer control which address needs of the local population. Project sanctioned grant enabled to strengthen existing data management services at CRI, SRHU.

A total of 12188 Cancer patients data entered prospectively from 2012 to 2017 have been analyzed , in addition to these 4506 cancer patients unpublished data from 1992 to 2006 archived at CRI, SRHU has been analyzed to see time trends in cancer in this region.

This data base is the largest resource of information about cancer in Uttarakhand region , and would serve the purpose of planning for cancer control for regional population.

CRI, SRHU setup computerized clinical database system in all clinical service areas and laboratories & diagnostic services and introduced specially customized cancer electronic management record system for outpatient as well as inpatients services.

Centralized computer server with peripheral links with technical personnel support was developed . Additionally medical record department was setup for archival of hard copy of medical records. Cancer data base including hard copied were stored as per organ specific areas of cancer.

A Research fellow and Data operator assisted in organizing the data collection and entry , additionally hospital setup full team of support and technical staff for patient data monitoring.

Data entry was carried out at different workstations in patient care areas by physicians and nurses and technical staff.

Additionally from a centralized place, completeness of data would be monitored and supported, staffed by data operators.

All cancer patients were issued CRI ID with a bar code .

Data archived at CRI, SRHU is accessible to UCOST for research purpose and unique hospital ID of each patient has been provided in the project report. This data

would continue to be updated with follow up details of patients enrolled , and would help by providing readily accessible information on the patients with cancer, the treatment received and its results , as well follow up. The data may be used for clinical research and for epidemiological purposes. Such data base would enable to assess quality of patient care, participate in clinical research to evaluate therapy, provide an idea of the patterns of cancer in the area & help plan health care services.

Title of the Project :

“Hospital based Database for Cancer in Uttarakhand region”

Principal Investigator :

Dr. Sunil Saini
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Co-Investigator:

**Dr. B. P. Kalra Professor & In-charge Cancer Data Base & medical records
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Dr. Jaya Chaturvedi	Gynecology
Dr. Navneet Jain	Surgical Oncology
Dr. Manpreet Tiwana	Radiation Oncology

Research Fellow : Mr. Birender Singh

Data Operator & IT Technical support : Mr. Deep Chandra Lohani

Acknowledgments : Biostatistics : Mr Subham Pandey , Mr Ankit Singh
Secretarial staff : Mrs Rajni , Mr Rahul Rawat , Mrs Rohini , Mrs Kavita

Implementing Institution and other collaborating Institutions :

**Sushila Tiwari Memorial Cancer Research Institute (CRI)
Swami Rama Himalayan University ,
Jolly Grant , Dehradun Uttarakhand**

Date of commencement

April 2012

Planned date of completion

March 2015

Actual date of completion

May 2016

Objectives as stated in the project proposal:

To record & annotate detailed clinical data of cancer in regional population.

Objectives met :

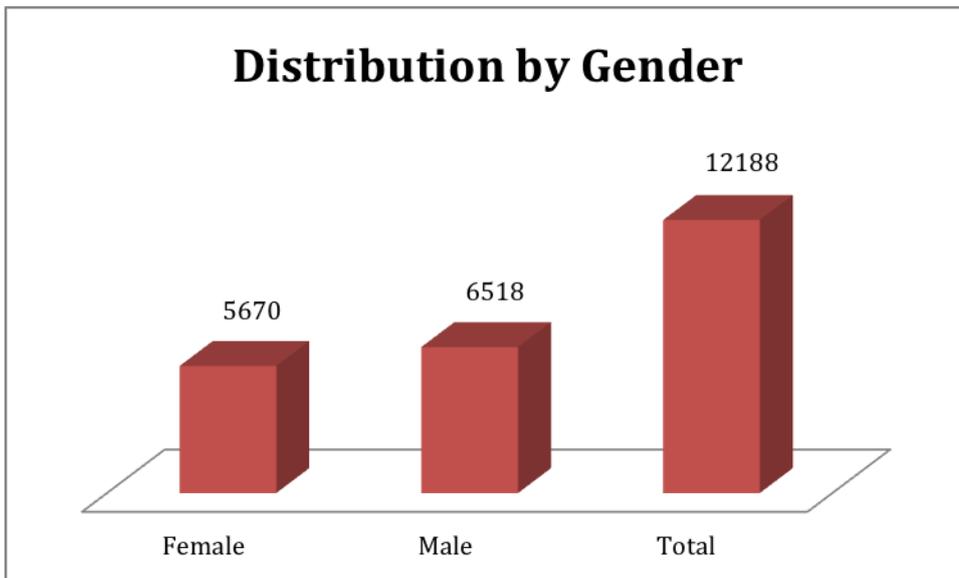
Milestones fixed as per the agreement achieved.

CRI, SRHU setup computerized clinical database system in all clinical service areas and laboratories & diagnostic services and introduced specially customized cancer electronic management record system for outpatient as well as inpatients services.

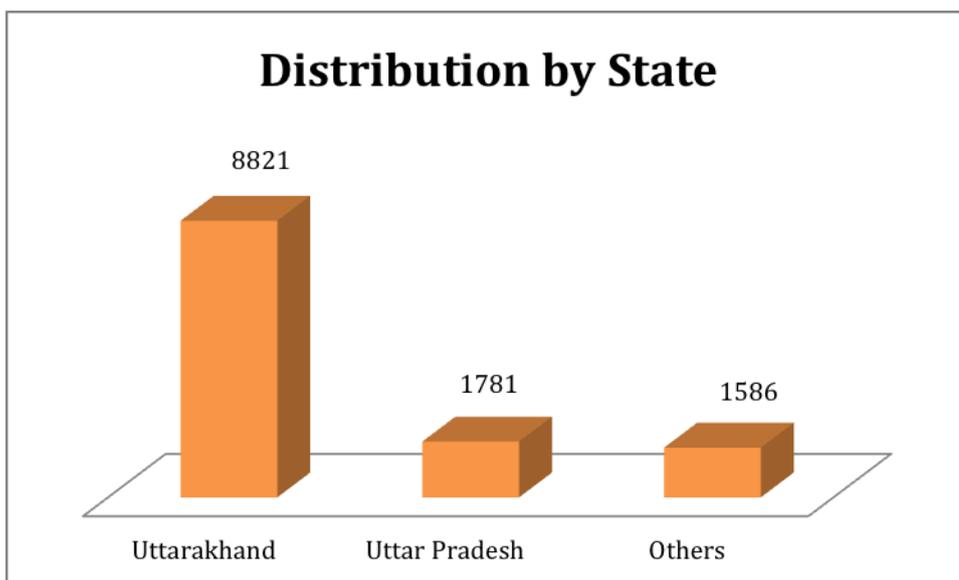
Centralized computer server with peripheral links with technical personnel support was developed . Additionally medical record department was setup for archival of hard copy of medical records. Cancer data base including hard copied were stored as per organ specific areas of cancer.

A total of 12188 Cancer patients data entered prospectively from 2012 to 2017 have been analyzed , in addition to these 4506 cancer patients unpublished data from 1992 to 2006 archived at CRI, SRHU has been analyzed to see trends in cancer in this region.

Outcome of data analysis

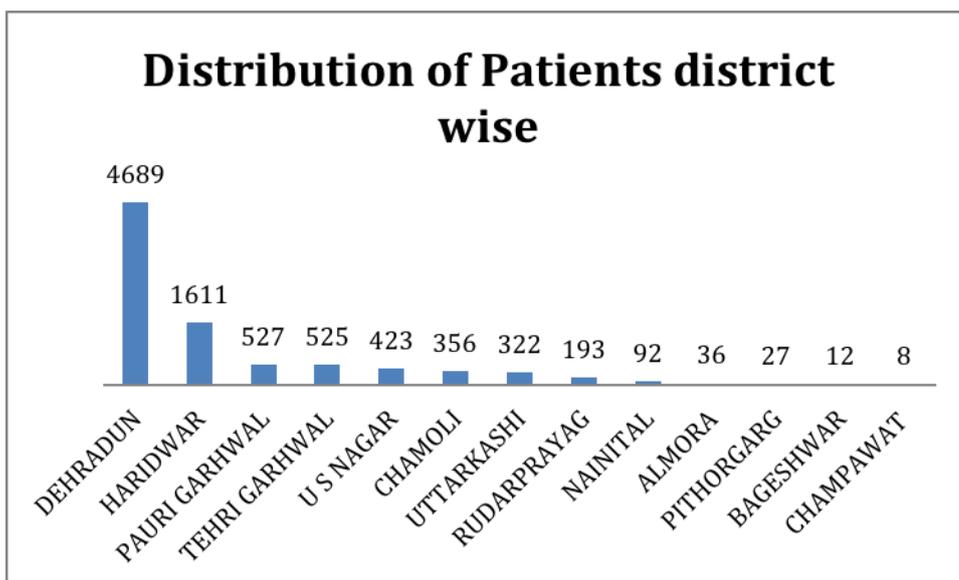


Gender	Frequency (%)
Female	5670(46.5)
Male	6518(53.4)
Total	12188(100)



State	Frequency (%)
Uttarakhand	8821(72.3)
Uttar Pradesh	1781(14.6)
Others	1586(13.01)

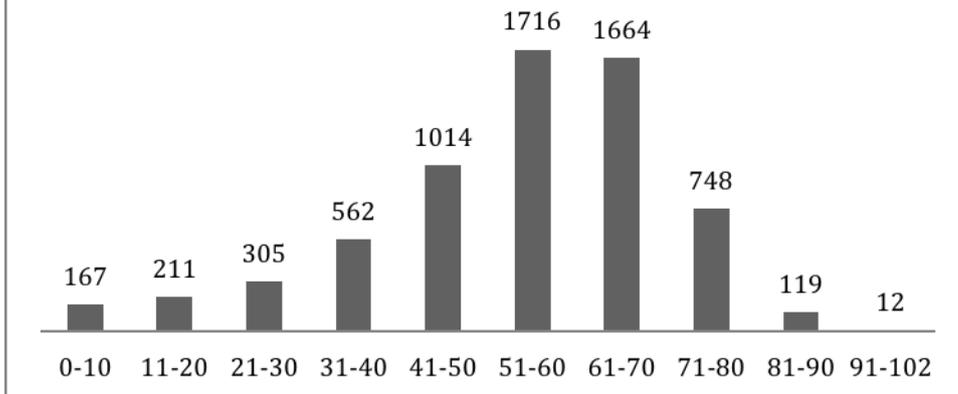
72.3% patients registered were from Uttarakhand state , remaining came from adjacent districts of Uttar Pradesh , Haryana , Himachal Pradesh



City	Frequency (%)
DEHRADUN	4689(53.1)
HARIDWAR	1611(18.2)
TEHRI GARHWAL	525(5.9)
PAURI GARHWAL	527(5.97)
U S NAGAR	423(4.7)
CHAMOLI	356(4.03)
UTTARKASHI	322(3.7)
RUDARPRAYAG	193(2.18)
NAINITAL	92(1.04)
ALMORA	36(0.40)
PITHORGARG	27(0.30)
BAGESHWAR	12(0.1)
CHAMPAWAT	8(0.09)

53% patients came from Dehradun District , 18.2% from Haridwar , largely from Garhwal region , only few came from Kumaon region.

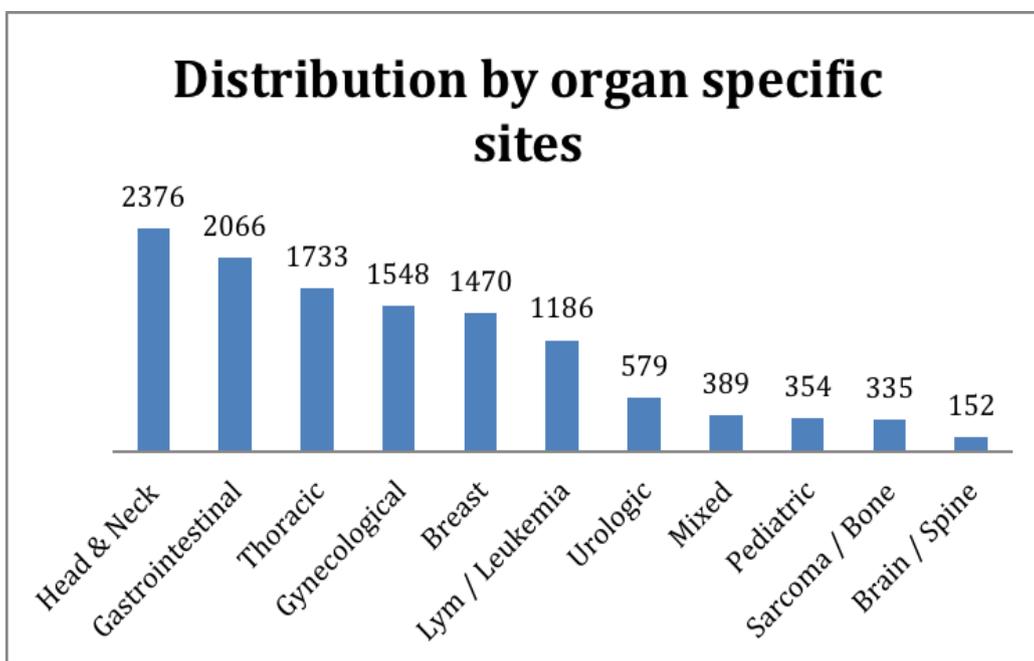
Age groups affected in Uttarakhand



Age Group	Frequency (%)
0-10	167(2.5)
11-20	211(3.2)
21-30	305(4.67)
31-40	562(8.6)
41-50	1014(15.55)
51-60	1716(26.3)
61-70	1664(25.5)
71-80	748(11.4)
81-90	119(1.8)
91-102	12(0.18)
Total	6518(100)

Common Cancer in Uttarakhand population :

Organ Site	Male (%)	Female (%)
Brain / Spine	98(1.58)	54(0.94)
Breast	35(0.53)	1435(25.20)
Gastrointestinal	1097(16.82)	969(17.02)
Gynaecological	0(0)	1544(27.12)
Head & Neck	1941(29.76)	435(7.64)
Lym/ Leukaemia	726(11.13)	460(8.08)
Mixed	273(4.18)	145(2.54)
Paediatric	236(3.61)	118(2.07)
Sarcoma/Bone	218(3.34)	117(2.05)
Thoracic	1357(20.81)	376(6.60)
Urologic	539(8.26)	40(0.70)



Mean age of patients affected by various cancer at different organ sites

Service	Mean Age \pm SD
Brain / Spine	46.25 \pm 17.08
Breast	50.18 \pm 12.92
Gastrointestinal	54.58 \pm 13.54
Gynaecological	52.28 \pm 13.28
Head & Neck	54.38 \pm 13.74
Lym/ Leukaemia	50.32 \pm 17.99
Mixed	53.05 \pm 16.23
Paediatric	9.22 \pm 6.04
Sarcoma/Bone	46.04 \pm 19.22
thoracic	59.37 \pm 11.63
Urologic	60.62 \pm 15.24

Mean age of patients coming from different districts of Uttarakhand

City	Mean age \pm SD
DEHRADUN	54.93 \pm 15.86
HARIDWAR	51.23 \pm 16.84
TEHRI GARHWAL	52.44 \pm 15.80
PAURI GARHWAL	56.86 \pm 16.74
U S NAGAR	48.16 \pm 16.08
CHAMOLI	55.12 \pm 15.78
UTTARKASHI	53.02 \pm 14.59
RUDARPRAYAG	53.90 \pm 15.80
NAINITAL	
ALMORA	52.67 \pm 15.43
PITHORGARG	55.85 \pm 16.09
BAGESHWAR	48.50 \pm 23.53
CHAMPAWAT	46.75 \pm 20.89

Common Cancers seen in patients from different districts of Uttarakhand

Almora:

Organ Site	Frequency (%)
Brain / Spine	1(2.7)
Breast	2(5.5)
Gastrointestinal	7(19.4)
Gynecological	4(11.1)
Head & Neck	5(13.8)
Lym / Leukemia	5(13.8)
Mixed	2(5.5)
Sarcoma / Bone	1(2.7)
Thoracic	8(22.2)
Urologic	1(2.7)

Bageshwar:

Organ Site	Frequency (%)
Brain / Spine	1(8.3)
Gastrointestinal	4(33.3)
Head & Neck	2(16.6)
Pediatric	1(8.3)
Thoracic	4(33.3)
Total	12 (100)

Common Cancers seen in patients from different districts of Uttarakhand

Chamoli:

Organ Site	Frequency (%)
Brain / Spine	5(1.4)
Breast	15(4.23)
Gastrointestinal	76(21.34)
Gynecological	45(12.64)
Head & Neck	45(12.64)
Lym / Leukemia	34(9.55)
Mixed	18(5.05)
Pediatric	11(3.08)
Sarcoma / Bone	9(2.52)
Thoracic	79(22.19)
Urologic	19(5.33)
Total	356(100)

Champawat:

Organ Site	Frequency (%)
Breast	1(12.5)
Gastrointestinal	3(37.5)
Head & Neck	2(25)
Lym / Leukemia	1(12.5)
Pediatric	1(12.5)
Total	8(100)

Common Cancers seen in patients from different districts of Uttarakhand

Dehradun:

Organ Site	Frequency (%)
Brain / Spine	57(1.2)
Breast	619(13.2)
Gastrointestinal	744(15.8)
Gynecological	688(14.67)
Head & Neck	871(18.57)
Lym / Leukemia	429(9.14)
Mixed	150(3.19)
Pediatric	108(2.30)
Sarcoma / Bone	131(2.79)
Thoracic	655(13.96)
Urologic	237(5.05)
Total	4689(100)

Haridwar:

Organ Site	Frequency (%)
Brain / Spine	24(1.4)
Breast	230(14.2)
Gastrointestinal	236(14.6)
Gynecological	170(10.5)
Head & Neck	351(21.77)
Lym / Leukemia	161(9.99)
Mixed	54(3.35)
Pediatric	58(3.60)
Sarcoma / Bone	31(1.92)
Thoracic	223(13.84)
Urologic	73(4.53)
Total	1611(100)

Common Cancers seen in patients from different districts of Uttarakhand

Nainital:

Organ Site	Frequency (%)
Breast	12(13.0)
Gastrointestinal	20(21.73)
Gynecological	9(9.78)
Head & Neck	21(22.82)
Lym / Leukemia	8(8.69)
Mixed	2(2.16)
Pediatric	2(2.16)
Sarcoma / Bone	3(3.26)
Thoracic	12(13.04)
Urologic	3(3.26)
Total	92(100)

Pauri Garhwal:

Organ Site	Frequency (%)
Breast	47(8.9)
Gastrointestinal	94(17.8)
Gynecological	70(13.28)
Head & Neck	100(18.9)
Lym / Leukemia	39(7.4)
Mixed	17(3.2)
Pediatric	14(2.6)
Sarcoma / Bone	17(3.2)
Thoracic	93(17.6)
Urologic	29(5.5)
Total	527(100)

Common Cancers seen in patients from different districts of Uttarakhand

UttarKashi:

Organ Site	Frequency(%)
Brain / Spine	3(0.93)
Breast	15(4.6)
Gastrointestinal	68(21.1)
Gynecological	70(21.8)
Head & Neck	45(14.01)
Lym / Leukemia	31(9.6)
Mixed	3(0.93)
Pediatric	8(2.49)
Sarcoma / Bone	15(4.6)
Thoracic	49(15.2)
Urologic	14(4.36)
Total	321(100)

U S Nagar:

Organ Site	Frequency (%)
Brain / Spine	4(0.91)
Breast	68(16.07)
Gastrointestinal	78(18.43)
Gynecological	40(9.45)
Head & Neck	97(22.93)
Lym / Leukemia	44(10.40)
Mixed	5(1.18)
Pediatric	17(4.018)
Sarcoma / Bone	7(1.65)
Thoracic	44(10.40)
Urologic	19(4.49)
Total	423(100)

Common Cancers seen in patients from different districts of Uttarakhand

Tehri Garhwal:

Organ Site	Frequency (%)
Brain / Spine	5(0.95)
Breast	46(8.7)
Gastrointestinal	95(18.09)
Gynecological	82(15.61)
Head & Neck	76(14.4)
Lym / Leukemia	47(8.95)
Mixed	22(4.19)
Pediatric	16(3.04)
Sarcoma / Bone	12(2.28)
Thoracic	104(19.80)
Urologic	20(3.80)
Total	525(100)

Rudraprayag:

Organ Site	Frequency (%)
Brain / Spine	2(1.03)
Breast	15(7.7)
Gastrointestinal	44(22.7)
Gynecological	19(9.84)
Head & Neck	25(12.95)
Lym / Leukemia	23(11.91)
Mixed	4(2.07)
Pediatric	4(2.07)
Sarcoma / Bone	4(2.072)
Thoracic	42(21.76)
Urologic	11(5.69)
Total	193(100)

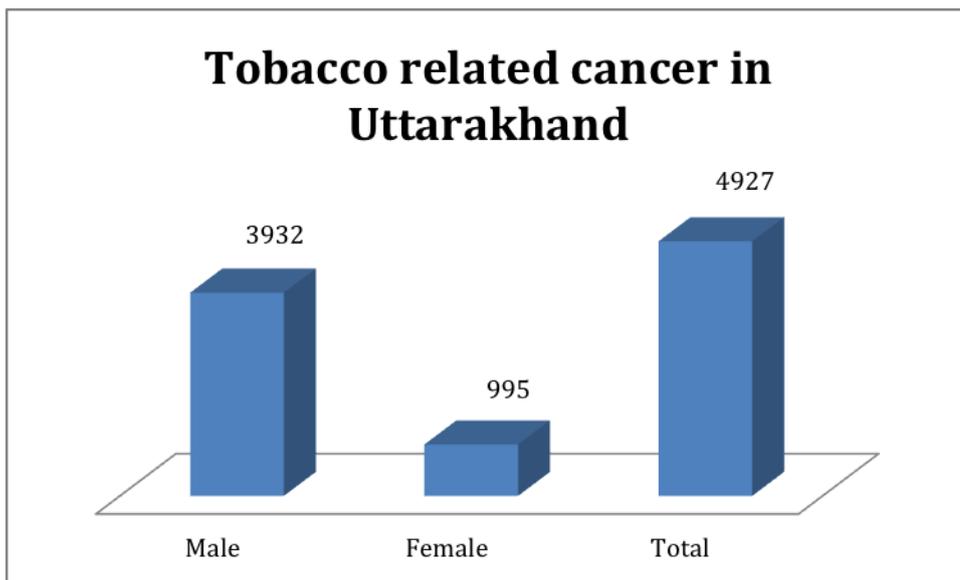
Common Cancers seen in patients from different districts of Uttarakhand

Pithoragarh:

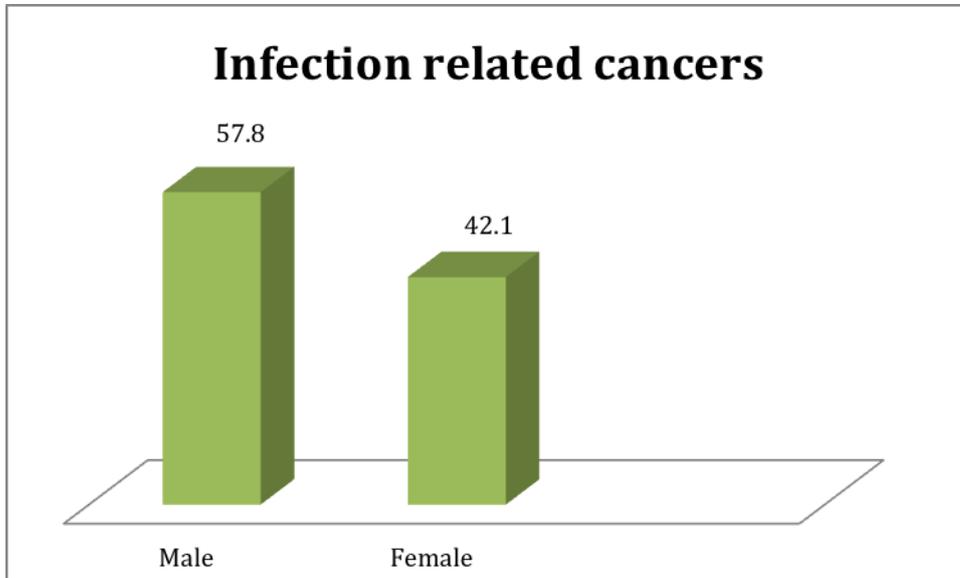
Organ Site	Frequency (%)
Breast	2(7.40)
Gastrointestinal	7(25.92)
Gynecological	6(22.22)
Head & Neck	3(11.11)
Lym / Leukemia	3(11.11)
Mixed	1(3.70)
Pediatric	2(7.40)
Thoracic	3(11.11)
Total	27(100)

Cancers having known association with use of tobacco products :

Over all 40.42 % cancers seen amongst patients coming from Uttarakhand are known to have association with use of tobacco products . 60.32 % among male with cancer and 17.54 % females with cancer had such cancers.

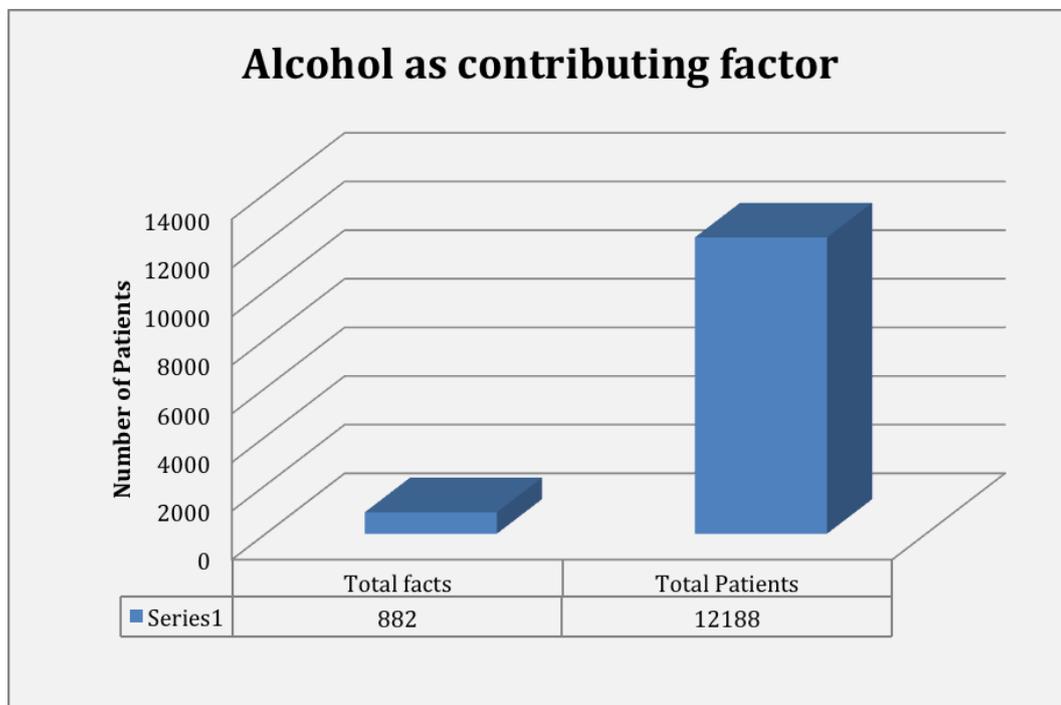


Cancers having known association with acquired infections :



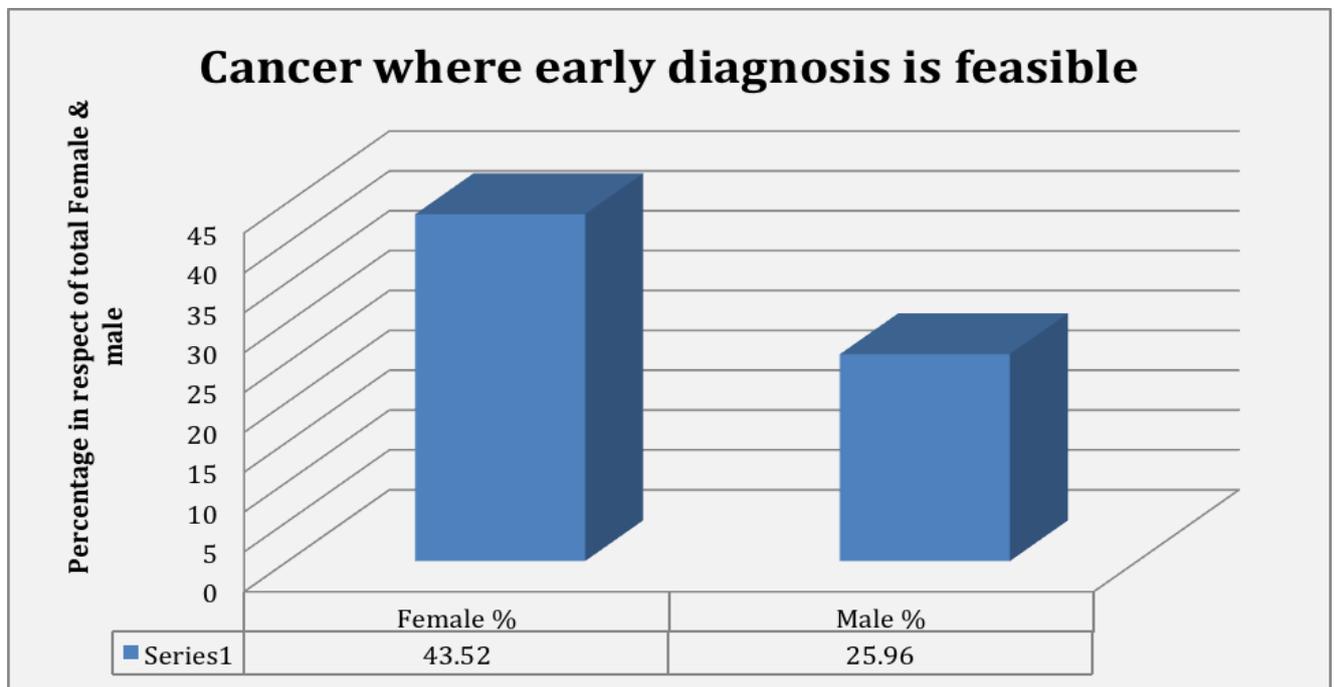
Cancer sites known to have association with consumption of alcohol beyond moderation :

Alcohol as contributing factor	
Sites	Numbers of Patients
Oesophagus	462
Stomach	357
Pancreas	63
Total	882
Total Patients	12188
Percentage	7.23662619



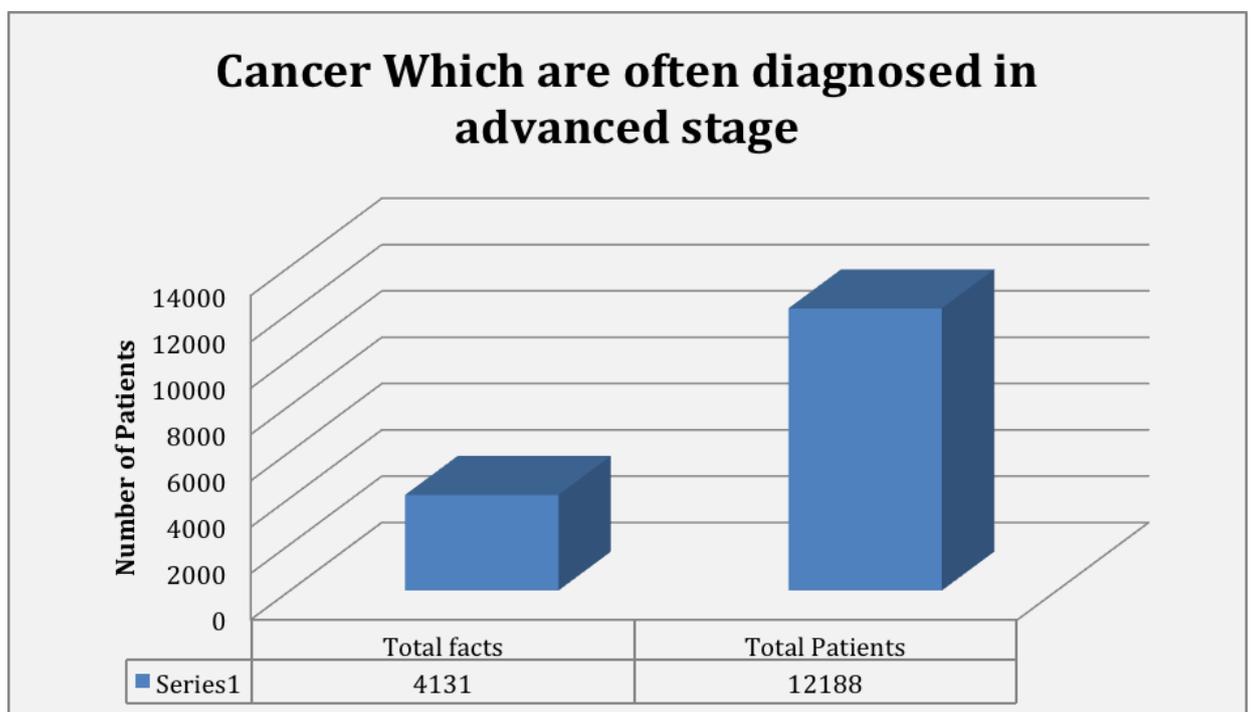
Cancer sites where early diagnosis is feasible :

Cancer where early diagnosis is feasible						
Site	Facts of Female	Total Female	Female %	Facts of Male	Total Male	Male %
Breast	1436	5670	25.32627866	35	6578	0.532076619
Oral / pharyngeal	274	5670	4.832451499	1673	6578	25.43326239
Uterine Cervix	758	5670	13.3686067	0	6578	0
Gross Percent	2468	5670	43.52	1708	6578	25.96



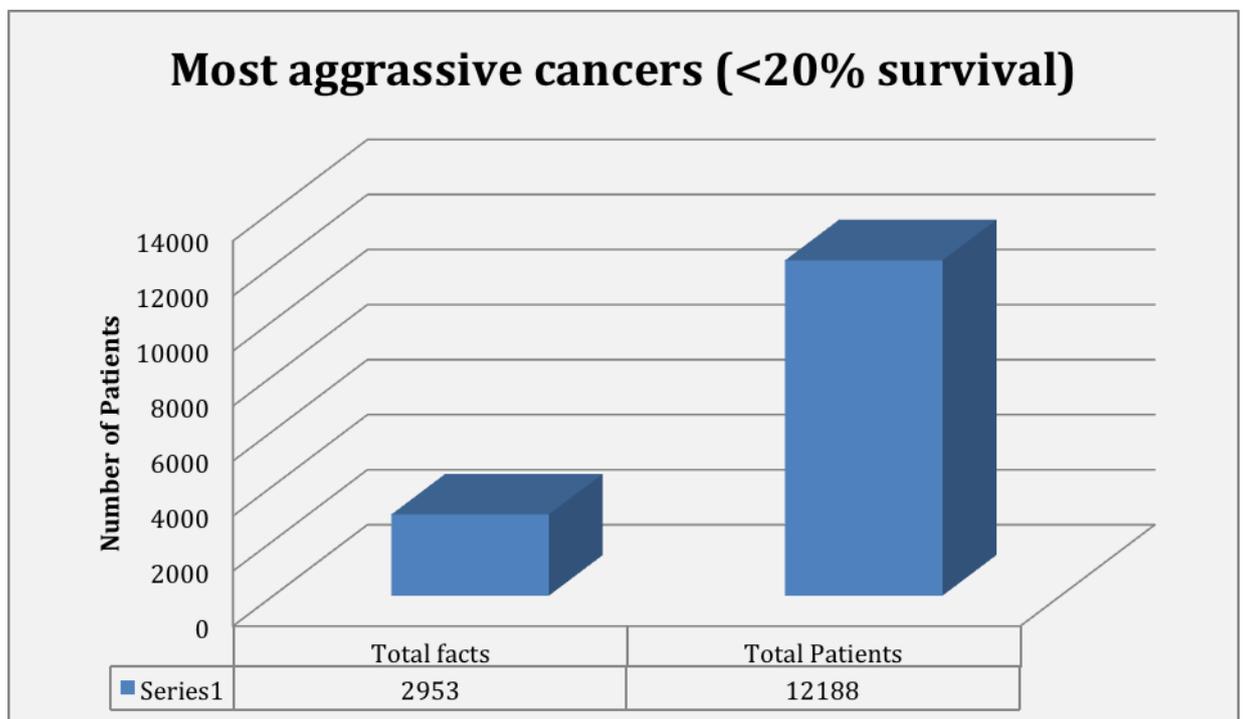
Cancer sites which are often diagnosed in advanced stage :

Cancer Which are often diagnosed in advanced stage	
Sites	Numbers of Patients
Lung	1344
Oesophagus	521
Stomach	357
Ovary	612
Pancreas	100
Liver	203
Rectum	203
Colon	193
Gall Bladder	598
Total	4131
Total Patients	12188
Percentage	33.89399409



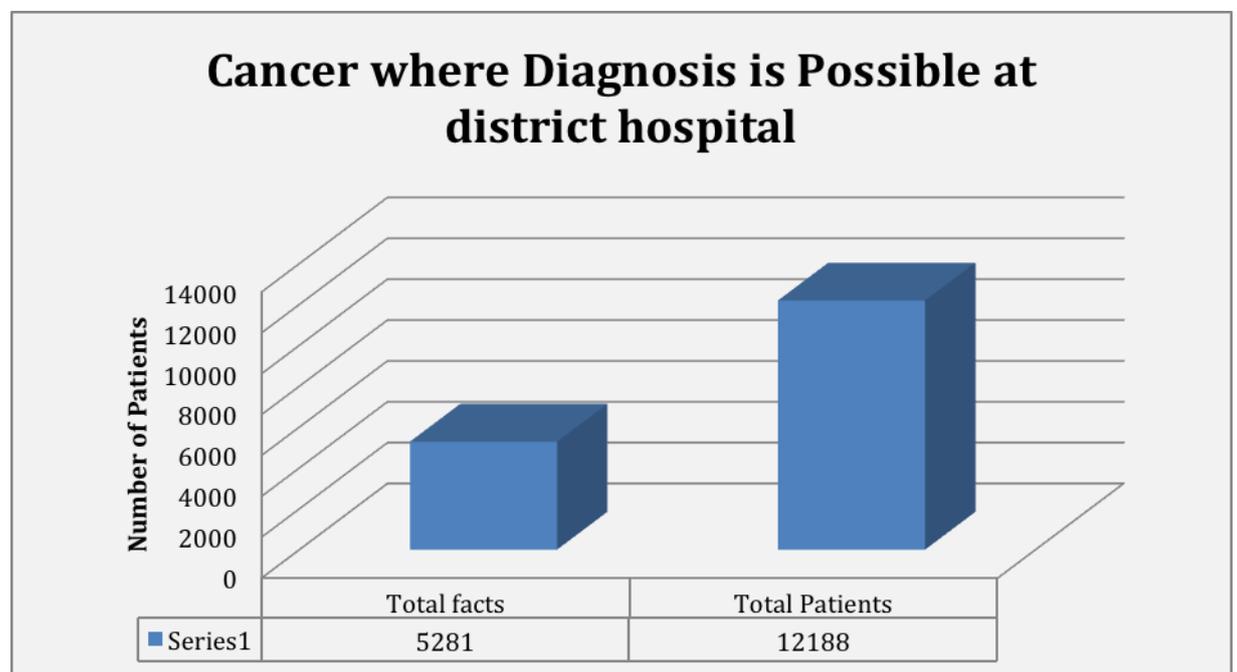
Most aggressive cancers often having poor outcome of treatment :

Most aggressive cancers (<20% survival)	
Sites	Numbers of Patients
Lung	1344
Oesophagus	521
GBM	33
Pancreas	100
Stomach	357
Gall Bladder	598
Total	2953
Total Patients	12188
Percentage	24.22874959



Common cancer which may be diagnosed at secondary level hospital / District hospitals :

Cancer where Diagnosis is Possible at district hospital	
Sites	Numbers of Patients
Breast	1471
Oral	1917
Uterine cervix	758
Lymphoma/Leukemia	1135
Total	5281 / 12188
Percentage	43.32 %



Details of Management carried out for these patients :

Pathological Tests :

Pathology tests performed : Out of total 12188 cancer patients , 8603 (70.58 %) patients underwent pathological (cytology , histopathology , IHC) confirmation at CRI, SRHU.

Other Diagnostic Tests :

Ultrasound 5473 (44.90 %)
Special Lab Tests 3764 (30.88 %)
Nuclear Medicine 519 (4.25 %)
CT Scan 5883 (48.26 %)
X-Ray 7912 (64.91 %)
Mammography 686 (5.62 %)
General. Lab Tests 8602 (70.57 %)

Endoscopic Procedures :

6445 (52.87 %) patients required multiple endoscopic examinations and procedures for diagnosis and follow up .

Endoscopic evaluation is important aspect of cancer management.

Frequency of patients visits to the the center for consultation : Each patient visits were registered . (Excluding Radiotherapy or day care chemotherapy)

(1151 + 957) patients visited only once or twice for opinion , already diagnosed , carrying details of diagnosis / medical records .

3500 patients visited 10 or more times during the treatment .

1196 patients visited 20 or more times for treatment and follow up.

433 visited more than 30 times during the course of treatment.

Radiotherapy often requires a single day to 6 weeks treatment . Patient usually visits five days in a week.

Surgical Procedures :

5533 (45.39 %) patients underwent surgical procedures for their diagnosis and treatment. Including 2101 (17.23 %) patients who underwent extra major surgical procedures.

Chemotherapy :

22924 cycles of chemotherapy were administered to patients treated at CRI, SRHU.

Year	No. of chemotherapy
2012	2577
2013	2333
2014	6373
2015	3577
2016	3644
2017	4420
Total	22924

Radiotherapy :

6260 (51.36 %) patients received radiotherapy

	2012	2013	2014	2015	2016	2017
EBRT						
Total	763	670	928	1087	1136	1212
Brachytherapy						
CVS	15	14	28	14	32	31
ICRT	45	48	65	37	54	81
Simulation	452	657	1009	1121	1201	1467
Intent						
Curative	560	451	640	780	820	979
Palliative	203	219	288	307	316	233
Gender						
Male	339	392	535	617	698	745
Female	424	278	288	470	438	467
Technique						
Conformal	295	360	654	659	816	991
IMRT	59	62	93	84	61	51
Leading cancers received radiotherapy						
Breast	87	75	106	126	162	158
Gynae	65	77	108	79	108	108
Head & Neck	207	199	266	246	258	330
Lung	63	77	120	143	154	131

For patients diagnosed with carcinoma, before or after surgery and chemotherapy, radiotherapy is considered standard options in most of cases.

In the department of radiotherapy at CRI, SRHU approximately 6260 patients have been given Radiotherapy in the form of either external beam radiotherapy or brachytherapy from the year 2012 – 2017.

Approximately 95% of patients required simulation using CT Simulator equipment. 67.5% of patients treated with External Beam Radiotherapy were treated with the intent to cure the cancer.

32.5% of patients were given palliative External Beam Radiotherapy for symptomatic relief of pain/ tumor bleed/ cord compression/ brain metastasis/ respiratory distress etc

66.8% of patients were given conformal radiotherapy (3DCRT/ IMRT) high technology and precision radiotherapy with advanced technology and equipments.

The Male: Female Ratio was 1.4

Radiotherapy is required in the treatment of all solid tumors in one form or the other.

But the leading cancers who were treated in the radiotherapy department constituted 63% of the total treated cancer. These were as following :

1. Head and Neck Cancer: 27%
2. Breast: 13%
3. Lung: 12%
4. Gynae: 11%

Cancer patients data 1992 - 2006 , patients treated in oncology service at HIHT / SRHU .

Data from 1992 to 2006

Male and Female	
Male	2590
Female	1915
Total	4505

Year wise distribution			
Years	Total patients	Male	Female
1992	17	8	9
1993	8	6	2
1994	120	60	60
1995	283	176	107
1996	257	141	116
1997	118	71	47
1998	276	160	116
1999	282	162	120
2000	466	274	192
2001	463	262	201
2002	637	373	264
2003	342	185	157
2004	355	204	151
2005	430	235	195
2006	451	273	178
Total	4505	2590	1915

Mean Age	
Male Mean Age	54.15
Female Mean Age	49.35

GI Cancers		Percentage
Male	531	20.5
Female	439	22.92
Total	970	

Lymphoma / Leukemia		Percentage
Male	175	9.13
Female	49	2.55
Total	224	

Head & Neck Cancer all sub sites		Percentage
Male	980	37.83
Female	263	13.7
Total	1243	

Oral & Laryngopharyngeal		Percentage
Male	891	34.4
Female	183	9.5
Total	1074	

Lung & Oesophagus		Percentage
Male	470	18.1
Female	114	5.95
Total	584	

Breast Cancer		Percentage
Male	20	3.71
Female	519	27.1
Total	539	

Gynecological Cancers		Percentage
All	321	16.7
Uterine Cervix	153	7.9

Misc		Percentage
Male	39	1.5
Female	24	0.92
Total	63	

GU/UR/Uro Oncology		Percentage
Male	34	1.31
Female	158	8.25
Total	192	

Unknown		Percentage
Male	79	3.05
Female	37	1.93
Total	116	

Deviation made form the original objectives if any : None

Importance of the study in context to the State :

This data base is the largest resource of information about cancer in Uttarakhand region , and would serve the purpose of planning for cancer control for regional population.

Conclusions summarizing the achievements and indications of scope for future work : Project achieved its objective , data available may be analyzed further for health care planning for the regional population.

S&T benefits accrued:

- (i) Full length research publications, if any : List attached
 - (ii) Manpower trained on the project :
 - (iii) Patents taken if any : None
 - (vi) Replication Potential : Infrastructure setup for data base would continue to record data of cancer patients coming to CRI. It is an ongoing process.
 - (vii) Linkages developed :
- CRI, SRHU is member of National Cancer Grid , a consortium of more than 100 cancer institutions in India , collaborating for bringing uniformity in cancer care and research sharing data and other information , an initiative of Government of India through Tata Memorial Hospital Mumbai.
 - CRI , SRHU is participating in National Cancer Registry Program an ICMR sponsored project. Final Report of this project data would be shared with National Cancer Registry Program as well.

Name, Sign. with Seal/PI/Co-PI