

REPORT NO.  
**325**



सत्यमेव जयते

**PARLIAMENT OF INDIA**  
**RAJYA SABHA**

DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE  
ON SCIENCE AND TECHNOLOGY, ENVIRONMENT, FORESTS AND  
CLIMATE CHANGE

**THREE HUNDRED TWENTY FIFTH REPORT**

**An Expanded Role for the Department of Atomic Energy (DAE)  
in Cancer Treatment in India through an Enlarged  
Network of the Tata Memorial Centre (TMC)**

*(Presented to the Hon'ble Chairman, Rajya Sabha on the 11th November, 2019)*

*(Forwarded to Hon'ble Speaker, Lok Sabha on the 11th November, 2019)*

*(Presented to the Rajya Sabha on the 19th November, 2019)*

*(Laid on the Table of Lok Sabha on the 19th November, 2019)*



**Rajya Sabha Secretariat, New Delhi**  
**November, 2019/Kartika, 1941 (Saka)**

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Hindi version of this publication is also available

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## COMPOSITION OF THE COMMITTEE

(2019-20)

(Constituted on 13<sup>th</sup> September, 2019)

1. Shri Jairam Ramesh — *Chairman*

### **RAJYA SABHA**

2. Shri Anil Baluni
3. Shri R.S. Bharathi
4. Shrimati Vandana Chavan
5. Shri Hishey Lachungpa
6. Shri Parimal Nathwani
7. Shri Bhaskar Rao Nekkanti
8. Shri Ashwini Vaishnaw
9. Shri Ravi Prakash Verma
10. Shri Binoy Viswam

### **LOK SABHA**

11. Shri Guharam Ajgalley
12. Shri Pradan Baruah
13. Shri E.T. Mohammed Basheer
14. Shri Jashvantsinh Sumanbhai Bhabhor
15. Shri Sudarshan Bhagat
16. Shri Rameshbhai Lavjibhai Dhaduk
17. Shri Anantkumar Hegde
18. Shrimati Jyotsna Charandas Mahant
19. Dr. Swami Sakshiji Maharaj
20. Shri Asaduddin Owaisi
21. Shri S.R. Prathiban
22. Dr. Ranjan Singh Rajkumar
23. Shri Kotha Prabhakar Reddy
24. Dr. Jayanta Kumar Roy
25. Shrimati Satabdi Roy (Banerjee)
26. Shri Mahesh Sahoo
27. Shri Francisco Cosme Sardinha
28. Shri Anurag Sharma
29. Shri Ram Shiromani
30. Shri Kirti Vardhan Singh
31. Dr. Ramapati Ram Tripathi

(ii)

**SECRETARIAT**

Shrimati Sunita Sekaran, *Joint Secretary*

Shri T. N. Pandey, *Director*

Shri S. Rangarajan, *Additional Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

Shri Harish Kumar, *Assistant Committee Officer*

## INTRODUCTION

I, the Chairman of the Department-related Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change having been authorised by the Committee to present the Report on its behalf, present this Three Hundred and Twenty-fifth Report on “An Expanded Role for the Department of Atomic Energy (DAE) in Cancer Treatment in India through an Enlarged Network of the Tata Memorial Centre (TMC)”.

2. In its meeting held on the 11th October, 2019, the Committee heard the views of the representatives of the Department of Atomic Energy, Government of India; Tata Memorial Centre, Mumbai and Ministry of Health and Family Welfare, Government of India. The representatives of the State Government of Punjab also provided information on the Tata Memorial Centre’s Hub and Spoke Model being implemented by them in the State of Punjab during the discussion held in my office on the 21st October, 2019.

3 The Committee expresses its thanks to the officials of the Department of Atomic Energy, Government of India; Tata Memorial Centre, Mumbai; Ministry of Health and Family Welfare, Government of India and representatives of State Government of Punjab for placing before the Committee the required material and replying to the clarifications sought by the Committee.

4. In the meeting held on the 31st October, 2019, the Committee considered the draft Report and adopted the same.

NEW DELHI;  
31st October, 2019  

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Kartika 9, 1941 (Saka)

JAIRAM RAMESH  
*Chairman,*  
*Department-related Parliamentary Standing*  
*Committee on Science and Technology,*  
*Environment, Forests and Climate Change,*  
*Rajya Sabha.*

## ACRONYMS

ACTREC	:	Advanced Centre for Treatment, Research & Education in Cancer
AIIMS	:	All India Institute of Medical Sciences
CCU	:	Cardiac Care Unit
CHC	:	Community Health Centre
CME	:	Continuing Medical Education
CRI	:	Cancer Research Institute
CSR	:	Corporate Social Responsibility
CSSD	:	Central Sterile Services Department
DAE	:	Department of Atomic Energy
DM	:	Doctorate of Medicine
DMGs	:	Disease Management Groups
DPCO	:	Drug Pricing Control Order
ECG	:	Electro Cardio Gram
EQAS	:	External Quality Assurance Schemes
HBNI	:	Homi Bhabha National Institute
HDI	:	Human Development Index
HLA	:	Human Leukocyte Antigen
HR	:	Human Resource
IAEA	:	International Atomic Energy Agency
ICU	:	Intensive Care Unit
INCTR	:	International Network for Cancer Treatment and Research
IPHS	:	Indian Public Health Standards
MBBS	:	Bachelor of Medicine and Bachelor of Surgery
MD	:	Doctor of Medicine
MoU	:	Memorandum of Understanding
MS	:	Master of Surgery
NCD	:	Non Communicable Disease
NCG	:	National Cancer Grid



NLEM	:	National List of Essential Medicines
NPPA	:	National Pharmaceutical Pricing Authority
OPD	:	Outpatient Department
OT	:	Operation Theatre
PFT	:	Pulmonary Function Test
PHC	:	Primary Health Centre
PI	:	Principal Investigator
PIP	:	Project Implementation Plan
PRO	:	Public Relations Officer
R&D	:	Research and Development
SAARC	:	South Asian Association for Regional Cooperation
SCIs	:	State Cancer Institutes
TCCCs	:	Tertiary Care Cancer Centres
TISS	:	Tata Institute of Social Sciences
TMC	:	Tata Memorial Centre
WHO	:	World Health Organisation

# REPORT

## INTRODUCTION

1.1 A meeting of the reconstituted Department-related Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change was held on the 26th September 2019, wherein the Committee *inter alia* heard the representatives of Department of Atomic Energy on the activities and functioning of the Department. The Department of Atomic Energy made a detailed presentation on its mandate, activities and work programmes. The programmes covered R&D organizations, Public Sector Undertakings, industrial facilities, service organizations and aided institutions. One of the eleven aided institutions of Department of Atomic Energy is Tata Memorial Centre (TMC) in Mumbai, which has been a pioneer institution in the treatment of the cancer in the country. During the course of the presentation, the Committee was also informed about the TMC's, 'Hub and Spoke' model for cancer treatment that has been initiated in Punjab. Members of the Committee evinced great interest in this model and suggested adoption of similar model in different states of the country.

1.2 The Members of the Committee were seized of the growing burden of cancer in India and its characterization as a major healthcare issue. As per the International Agency for Research on Cancer GLOBOCAN project, it is expected that the burden of cancer in India will increase from an estimated incidence of 1.3 million cases in 2018 to about 1.7 million in 2035. While the age-adjusted cancer rates in urban and rural India has remained constant over decades, there is an increase in absolute numbers of new patients diagnosed with cancer. Equally alarming is the fact that cancer deaths are expected to rise from 0.88 million in 2018 to 1.3 million in 2035. The mortality: incidence ratio of 0.68 in India is higher than that in very high human development index (HDI) countries (0.38) and high HDI countries (0.57). While some of this disparity is because of over diagnosis in more developed countries, it is also due to the unequal distribution of and lack of access to health care resources across India.

1.3 Understanding the gravity of the matter, especially the number of states in our country without adequate institutional framework and linkage for the treatment of cancer, in its meeting held on the 26th September, 2019, the Committee took up the subject "An Expanded Role for the Department of Atomic Energy (DAE) in Cancer Treatment in India through an Enlarged Network of the Tata Memorial Centre (TMC)" for examination and report. For this purpose, the Committee also held detailed discussion on the subject with the representatives of Department of Atomic Energy/Tata Memorial Centre (TMC), Mumbai and Ministry of Health and Family Welfare, Government of India in its meeting held on 11th October, 2019.

## 2. TATAMEMORIAL CENTRE

### 2.1 Historical Background

2.1.1 Tata Memorial Centre, Mumbai, a grant-in-aid Organisation under the Department of Atomic Energy is the oldest and largest cancer centre in the country. Registering close to 80,000 new patients and over 5,00,000 follow-ups annually. The Committee notes that TMC provides high quality cancer care to patients from across the country regardless of socio economic status; more than 60% of the patients are treated almost free of cost. TMC is also the centre for cancer education in the country and trains over 100 students every year in various aspects of cancer including surgical, medical and radiation oncology. Research from TMC has addressed several important questions and changed cancer practice

globally. Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) is the research wing of TMC and houses several cancer researchers working towards unravelling the biology, causes and management of cancer. TMC is a stand-alone post-graduate institute under Homi Bhabha National Institute (HBNI), which is deemed to be university under Department of Atomic Energy. The TMC has been at the vanguard of the development of trained manpower in the field of oncology for the entire nation and has contributed to training of more than 60% of workforce that deals with cancer in India. TMC has now expanded to six other hospitals located in Varanasi (two), Guwahati (Dr. B Barooah Cancer Institute), Sangrur, Visakhapatnam and Mullanpur.

2.1.2 The Tata Memorial Hospital was initially commissioned by the Sir Dorabji Tata Trust on 28 February, 1941. In 1952, the Indian Cancer Research Centre was established as a pioneer research institute for basic research - later called the Cancer Research Institute (CRI). Later, in 1957, the Ministry of Health temporarily took over the Tata Memorial Hospital. The transfer of the administrative control of the Tata Memorial Centre (Tata Memorial Hospital and Cancer Research Institute) to the Department of Atomic Energy (DAE) in 1962 was the next major milestone. This was due to the foresight and the vision of Dr. Homi Bhabha, who envisaged the major role that radiation would play in cancer treatment - from imaging to staging and actual therapy. The TMH and CRI merged as the two arms of the Tata Memorial Centre (TMC) in 1966. TMC has since shone as an example of private philanthropy augmented by Government support, with a mandate for service, education and research in cancer.

2.1.3 Responding to the query of the Committee on the significance of TMC being under the DAE, representatives of the TMC, Mumbai noted that being under the aegis of DAE has been crucial to TMC becoming a centre of excellence for cancer care. With a close link to radiation medicine facilities, DAE has contributed substantially to keeping costs of cancer care low, and serving patients from across India regardless of their socioeconomic status. With radiation therapy as well as both diagnostic and therapeutic radionuclide isotope usage being integral elements of cancer diagnosis and therapy, the representatives of TMC noted that the DAE is virtually driving a large part of cancer care in the country.

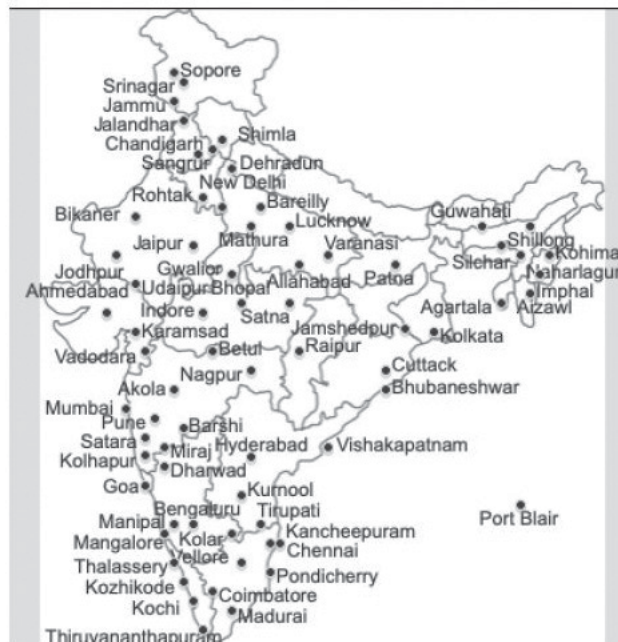
## 2.2 The National Cancer Grid

2.2.1 Responding to the query of the Committee about the course of action to be taken to address the issue of inadequacy of cancer care in several parts of the country, the representatives of TMC submitted that a dual approach is required. First, existing centres should be strengthened to provide uniform standards of cancer care across the country. Secondly, additional Government run cancer centres need to be set up to fill the gaps in access across several states and districts.

2.2.2 It was submitted before the Committee that the first approach has been successfully done by the TMC by creating the National Cancer Grid (NCG) which is a large network of cancer centres, research institutions, patient groups and professional societies, with the mandate of establishing uniform standards of patient care for prevention, diagnosis, and treatment of cancer, creating adequate trained human resources, and facilitating collaborative basic, translational and clinical research in cancer. However, there is still a need to create additional Government-run cancer centres, since only roughly one-thirds of the cancer patients are treated through the public healthcare system.

2.2.3 NCG, an initiative of the Department of Atomic Energy, Government of India, was created in 2012 with the broad vision of creating uniform standards of cancer care across India. Seven years later, it has grown to a large network of 183 cancer centres, research institutes, patient advocacy groups, charitable organisations and professional societies. Between the member organisations of the NCG, the network treats over 7,00,000 new patients with cancer annually, which is over 60% of India's entire cancer burden. NCG activities include the following:

- (i) Uniform standards of care – NCG Consensus Guidelines
- (ii) External Quality Assurance Schemes (EQAS)
- (iii) Second opinion service for patients – “Navya”
- (iv) NCG Virtual Tumor Board
- (v) Price Discovery Cell/Group negotiation for equipment, drugs and consumables
- (vi) Continuing Medical Education – NCG National Cancer Library and discovery tool “Akshara”
- (vii) Unique Educational Initiatives – “Traveling Schools of Pathology and Oncology Nursing”
- (viii) Training in Cancer Research Methods – International Collaboration on Research methods Development in Oncology – CreDO workshop
- (ix) NCG funded multi-centric collaborative research



*Figure- 1 The National Cancer Grid Map*

2.2.4 During the course of discussion, the Committee was informed that TMC has a very strong focus on cost optimisation for which several strategies have been evolved by TMC including group negotiation for drugs and medical equipment. It was informed that TMC is able to maximize the terms of negotiations for acquisition of drugs and equipment for the NCG improving the bargaining power,

and thereby bring down costs substantially for the entire network, as opposed to individual unit purchases.

- 2.2.5 The representatives of TMC also submitted before the members of the Committee that TMC has a very strong linkage with Ayushman Bharat and is partnering with them closely to revise packages on offer, and ensuring that Ayushman Bharat reimbursements are based on the best evidence available.
- 2.2.6 It was also brought to the notice of the Committee that TMC has a major thrust on cancer research and currently very large, important studies are being funded by TMC. It was submitted that all the research that is funded by the NCG is solely aimed at cost-effective implementable solutions so that it can be rolled out nationally in a very short span of time.

### 2.3 Academic, Training and Research Activities of TMC

- 2.3.1 Responding to the query of the Committee about the academic, training and research activities of TMC, it was submitted that, for more than 75 years now, TMC has contributed to development of trained manpower in the field of oncology for the entire nation and has trained more than 60% of workforce that deals with cancer in India.
- 2.3.2 It was further submitted that TMC does not train MBBS students; however they have B.Sc and M.Sc courses in oncology nursing, clinical research, radio-physics, etc. They also run technological and skill development courses. Since last year TMC has started “Kevat” a ‘first of its kind’ in India, patient navigator training course. They offer MD courses in 8 subjects namely anaesthesiology, microbiology, nuclear medicine, palliative medicine, pathology, radio-diagnosis, radiotherapy and transfusion medicine. They also offer DM in 6 subjects - critical care, gastroenterology, interventional radiology, medical oncology, onco-pathology and paediatric oncology. M.Ch in 4 subjects – gynaecological oncology, head and neck surgery, plastic surgery and surgical oncology. The details of all these programs are in the annexure (**Annexure-I**). TMC also offers Ph.Ds. in both health-sciences and life-sciences. There are 18 Principal Investigator (PI) Labs in the Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) at Kharghar, Navi Mumbai who take in up to 15 new Ph.D. students each year.
- 2.3.3 Most of the teaching activities are carried out under HBNI University and all of TMC s medical courses are MCI recognized. About 180 post graduate medical students were registered in 2018 at TMC. They have in place collaborative student-exchange programmes with at least four other reputed hospitals in Mumbai for training of their MD students.
- 2.3.4 TMC runs various HBNI Fellowships as well as TMH Fellowships. Further, TMC has received approval to start 3 new certified HBNI Fellowships in Pulmonary Oncology, Molecular Hemato-Pathology, Maxillo-Facial Onco Surgery; as well as MSc in Nuclear Medicine Information Technology. The representatives of the TMC also added that they have put in a proposal to the regulatory authorities for starting the programme of “Nurse Practitioner” to ensure more hands to take care of patients and free the students for more training especially in allied branches and research activities.
- 2.3.5 TMC also offers 6 months trainee/observership in all the fields of oncology. TMC is recognized as a Training Centre in Cancer Education and Research by several National and International Organizations including WHO, IAEA, INCTR, and Governments of various African and SAARC countries. In the year 2018, 66 overseas specialists visited TMC for a period ranging from 1 month to 1 year. In

addition, approximately 529 specialists, including dental surgeons, DM/M.Ch/DNB/Fellowship students, from all over India visited TMC as observers.

2.3.6 For the last 3 years now, TMC is now trying to shape students in their formative years. TMC in collaboration with Kings College London and Tata Trusts organises “Summer School in Oncology”, a training programme for 2 weeks for undergraduate and post-graduate medical students. Nearly 150 selected students from Government Medical Colleges from across the country are hosted by TMC and exposed to various aspects of oncology. After successful completion of this programme, 5 topmost participants are given chance for internship at Kings College London for 1 month. Through this programme, TMC hopes to attract the brightest minds in the field of oncology.

2.3.7 It was further submitted to the Committee by the representatives of the TMC that since last year, TMC has also started “Kevat: A Patient Navigation Program”. The aim of initiating a patient navigation program is to create a trained taskforce to facilitate patient s journey right from entry to the Hospital to follow-up and getting back to normalcy; taking care in addition of emotional, economic and various other needs in a holistic way. Tata Memorial Centre (TMC), in collaboration with Tata Institute of Social Sciences (TISS) and with support from Tata Trusts, is introducing a one year (full-time) Advanced Diploma in Patient Navigation (KEVAT), for the first time in India. The course aims to address the need for a structured patient support system for cancer care that will form a bridge between patients and access to care.

2.3.8 In addition to the courses, TMC as well as individual departments and Disease Management Groups (DMGs) conduct various activities under the aegis of Continuing Medical Education (CME) throughout the year.

#### 2.4 TMC and Present Cancer Treatment Infrastructure in India

2.4.1 On being enquired about the adequacy of infrastructure available in the country for the treatment of cancer patient by the Committee, the representatives of Tata Memorial Centre, Mumbai submitted as under:

*“The current infrastructure is grossly inadequate to handle this issue and, even by Ayushman Bharat records, which we have recently looked at over the last one year, two-thirds of the cancer care is actually provided in the private sector with the result that almost every year, six crore of India’s population goes below the poverty line because of the catastrophic healthcare related expenditure on cancer. Then, this is a figure, which shows you a heat map of 75,000 patients who visited the Tata Memorial Centre over a six-month period. So, what we did was to geo-tag their location (See Figure-2), where they are coming from, and this is quite interesting to see. The*

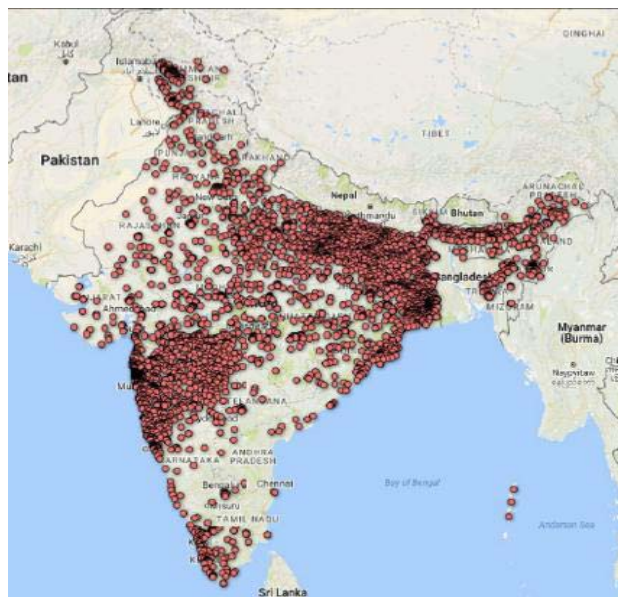


Figure- 2 Geo-tagged concentrations of patients coming to TMC

*density in and around Maharashtra is understandable because we are located in Mumbai, but what is very stark is the extremely high density that you see in the North, East and North-East India. Beyond north the time taken for a patient to travel, say from Arunachal Pradesh to Mumbai is anywhere from two to three days just in travel. This puts a lot of economic impact on the patient because usually the patient comes with a family member. The earnings of the entire family are impacted because of this. We also know that based on the overall expenditure on healthcare, almost upwards of two-third is from out-of-pocket, private expenditure, and only one-third is from Government funds, or even less when compared to the private sector. We see, on an average, 72,000 patients. This year it is going up to beyond 80,000 including new patients that we see annually, which is approximately 5,50,000 footfalls based on new as well as old patients coming into the hospital.”*

2.4.2 The representatives of Ministry of Health and Family Welfare while making a presentation on the subject before the Committee on the 11th October 2019, provided the following details of the incidence, mortality and common cancers in the country: -

Incidence of cancer	16 lakhs annually (Estimated)
Mortality of cancer	8 lakhs every year (Estimated)
Common cancer (Estimated incidence per year)	
<b>Women</b>	
Breast	1,40,000
Cervical	1,00,000
Oral cancer	45,000
<b>Men</b>	
Oral cavity	1,38,000
Pharynx	90,000
Gastro-intestinal tract (Stomach etc.)	2,00,000

2.4.3 The Committee enquired from the representatives of Ministry of Health and Family Welfare about the system in place for prevention and management of cancer. In response, the Committee was informed that the health care delivery system consists of sub-centre, Primary Health Centre (PHC), Community Health Centre (CHC) and District hospitals besides Medical Colleges and Tertiary Care Institutions. The Committee was informed that the suspicious cases are detected at the lower level either through screening or directly and referred to higher centres. Biopsy with histopathology is essential before the cancer is confirmed at District hospital and above. There are various other investigations *e.g.* biochemical, hematological, radiological and nuclear medicines investigations, which are required to see the extent of disease. There are Indian Public Health Standards (IPHS) for the sub-centre, PHC, CHC, and District hospitals for which financial assistance is provided through project implementation plan (PIP) under National Health Mission. It was brought to the notice of the Committee that the surgery, chemotherapy and palliative care is available at District Hospitals and medical colleges while

the radiotherapy facilities are limited and available at about 500 institutions in the country having about 700 radiotherapy machines.

- 2.4.4 The requirement of radiotherapy machines is about 1200 machines in the country (at the rate of one radiotherapy machine per million populations). The representatives of Health and Family Welfare also brought to the notice of the Committee that in identified districts, Cardiac Care Units (CCU) and Day Care Centres are also being set up for providing facilities for emergency Cardiac Care and Cancer Chemotherapy respectively.
- 2.4.5 On the issue of enhancing the facilities for tertiary care of cancer in the country, the Committee was given to understand that the Central Government is implementing „Strengthening of Tertiary Care Cancer facilities Scheme. Under the scheme, it is envisaged to support setting up/establish State Cancer Institutes (SCIs) and Tertiary Care Cancer Centres (TCCCs) in different parts of the country by providing financial assistance to be utilised by the institution for procurement of radio therapy equipment, diagnostic equipment, surgical equipment, enhancement of indoor civil work and patient facility for cancer and other such purposes relevant for diagnosis, treatment and care of cancer.
- 2.4.6 It was brought to the notice of the Committee by representatives of TMC that the Government of Assam has rolled out a plan to establish a multi-tiered network of 17 hospitals in collaboration with the philanthropy, Tata Trusts with the State Cancer Institute (SCI) at the apex, with a similar hub and spoke model, as followed by TMC.
- 2.4.7 On enquiring with the representatives of DAE about the annual non-plan expenditure on TMC during the past three financial years, the following information was submitted to the Committee:-

<i>(₹ in crores)</i>		
2018-19	2017-18	2016-17
796	661	594

The cumulative non-plan expenditure to achieve TMC's outcomes is ₹2051 crores in the past three financial years.

- 2.4.8 In contrast, the Ministry of Health and Family Welfare submitted to the Committee, that the expenditure carried out solely on cancer prevention and control activities under the National Programme for Prevention and control of Cancer, Diabetes, Cardio-Vascular Disease and Stroke (NPCDCS), up to District Level under National Health Mission, the Tertiary Care Cancer Scheme, and expenditure by ICMR on cancer research and awareness activities is cumulatively ₹1,119.17 crores nationally, for the past three financial years. In addition, ₹1315.28 crores was provided as grant-in-aid (capital assets) for the set-up of National Cancer Institute (NCI), Jhajjar, and funds released for Chittaranjan National Cancer Institute (CNCI), Kolkata over the past three financial years (**See Annexure-II**).

### 3. HUB AND SPOKE MODEL – A PROPOSAL

- 3.1 The Committee was informed by the representatives of Department of Atomic Energy and the Tata Memorial Centre that a distributed model of cancer care is required to offer patients high quality cancer care at their doorsteps. It was submitted by the representatives of TMC that common and less complex cancer



care facilities should be provided close to patients' homes (spokes) to create minimum disruption in their lives and that of their families. Treatment of uncommon cancers and those with complex treatment protocols require management in expert centres of excellence (hubs). However, to avoid over-burdening the hubs, the spokes need to be reasonably capable of handling less complex and common cancer types in the region. It was suggested that this strategy would be extremely helpful to minimise costs as well as inconvenience to patients and their families.

3.2 It was brought to the notice of the Committee that delivery of care would be at the spokes to the extent possible, with treatment planning even for uncommon cancers being done in the hubs and actual treatment delivered at the spokes. Punjab is one state where the hub and spoke model is in practice.

3.3 Representatives of the TMC and the officials of the State Government of Punjab apprised the Committee about the Memorandum of Understanding between TMC and the Government of Punjab for a hub at Mullanpur (near Chandigarh) and a spoke at Sangrur, being operated by TMC as the technical partner. The spoke in Sangrur is successfully under operation for at least two years now, whereas the hub is under construction. At present, almost 8000 patients are being treated annually in the Sangrur spoke of TMC, at highly subsidised rates with adequate financial support from the Government of Punjab.

3.4 In addition, the officials of the State Government of Punjab apprised the Committee that they are operating 6 spokes on their own, in Faridkot, Bhatinda, Patiala, Amritsar, Fazilka and Hoshiarpur. These are not covered under the MoU with TMC. Sharing the plan with the Committee, it was submitted that the comprehensive plan of TMC will address the increasing burden of cancer in India by the creation of approximately 30 hubs and between 100 and 130 spokes in various parts of the country.

3.5 The Committee was informed that one hub should cover an approximate population of about 4 crores. It is estimated that cancer burden would be about 30,000 to 40,000 new patients annually. Similarly, a spoke should cover a population of between 50 lakhs and 1 crore, (estimated cancer burden 6000 to 8000 new patients annually) depending on geographic and access issues. Therefore, about 30 hubs and 130 spokes would need to be created to bridge the gaps in access to cancer treatment.

3.6 The Committee was further given to understand that considering that the Department of Atomic Energy has already created six hubs and one spoke in various parts of the country, and that there may be some existing centres which may be directly taken over and upgraded, there will still be a shortfall of about 20 hubs and 100 spokes, which will need to be created over the next 10 years.

3.7 Therefore, the representatives of TMC proposed a detailed mapping exercise to identify region-wise cancer burden, common types of cancer and the existing facilities to manage them which would be helpful in prioritising the phasing of the proposed hubs and spokes.

3.8 The Committee was informed that the next step would be to identify centres which can be directly taken over under the proposal and upgraded; it is likely that many regions would require the setting up of new cancer centres in a phased manner and for the purpose, TMC would work closely with the respective States to identify land, expected to be provided free of cost by the concerned State Government.

3.9 The Committee was further informed that the requirements of land for setting up the proposed hubs and spokes across the country are approximately 50 acres for a hub and 10 acres for a spoke. It was also submitted that it is essential that the proposed land is (i) in close proximity to an airport, railway

station, and has good road access; and (ii) adjacent or close to a medical college hospital or district general hospital.

3.10 Apprising the Committee further about its mode, it was submitted that hubs will be comprehensive cancer facilities with state-of-the-art equipment and infrastructure, along with trained expert human resources to treat all cancers. It was informed that each hub is envisioned as a 300 bedded facility, built at an estimated cost of ₹650 crores and the annual recurring expenditure for the facility (working on the TMC model) would be ₹110 to ₹120 crores. It was brought to the notice of the Committee that spokes would be 100 bedded facilities, capable of managing most common cancers and uncommon cancers with oversight from the hub. Highly complex treatments like bone marrow transplant, complex surgical interventions and high-end radiation will not be available at the spokes.

3.11 The Committee was informed that the cost of setting up such a spoke would be approximately ₹220 crores, with a recurring annual expenditure of ₹35 to ₹40 crores. It was proposed by the representatives of TMC that the budget for the hubs be met by the Centre through a separate budgetary allocation to the DAE, and the budget for the spokes be met by respective States. However, TMC would be involved in the administrative leadership of both hubs and spokes to maintain the high quality of care required.

3.12 The Committee was further apprised by representatives of the DAE that cancer patients requires sustained treatment, wherein patients and their caregivers are required to visit cancer hospitals regularly, sometimes for months at a stretch. This requires that patients and their caregivers should have access to clean, affordable and easily available accommodation, adjacent to the hospital. In addition, transit camps may also be constructed to avoid overcrowding outside the cancer hospitals. The representatives of DAE highlighted that such measures will go a long way in mitigating the hardship faced by cancer patients and their caregivers, and therefore an additional grant for accommodation and transit camps must be allocated by the State Governments.

3.13 The representatives of Ministry of Health and Family Welfare while sharing their view about the proposed model of TMC submitted that the Hub and Spoke model stands for a network of hospitals on two levels. SCI/TCCC is envisaged for cancer treatment as Hub and Spoke for providing cancer care, giving support to district hospitals and medical colleges. SCI will serve as the nodal and apex Institution to mentor other Government Institutes (including TCCC and RCC). Similarly the TCCC should mentor cancer related activities including at the district level and below in their respective footprint area (the areas from where patients are accessing the TCCC). SCI would be hub and TCCCs as spokes, and facilities being created under National Health Mission – District NCD clinics, CHC NCD clinics, Day Care Centres – as sub-spokes. It was submitted that creating a network of these facilities is required for continuum of care, for which steps are being taken. The Committee was further informed that the maximum permissible assistance for SCI is ₹120 crores and ₹45 crores for TCCC. This is inclusive of State share of 40% (for North East and Hill States 10%). It was also placed before the Committee that upto a maximum of 30% of the sanctioned amount will be permitted for civil/electrical work (including renovation), and improvement of infrastructure. The Committee was informed that till date, 37 institutions have been approved and the proposal for two more SCIs (at Haldwani, Uttarakhand and Bilaspur, Chhattisgarh) are under consideration.

3.14 Sharing the funds allocation to be required for rolling out the Hub and Spoke Model in various parts of the country, the representatives of TMC brought to the notice of the Committee that creation of the hubs

would require an amount of ₹13000 crores over 12 years (to be adjusted for inflation) and the States would require to fund the spokes for which ₹22,000 crores over 12 years (to be adjusted for inflation) would be required. It was submitted that once fully functional, the recurring annual expenses would be to the tune of ₹3500 crores for the hubs and ₹4800 crores for the spokes, to be borne by the Centre and the States respectively.

3.15 It was also submitted that these calculations are based on assumptions that these centres will follow the TMC model of revenue generation which reduces the dependence on the Government. It was also suggested that additionally, costs will be brought down by group negotiation for construction activities, equipment, drugs, and consumables. It was requested by the representatives of TMC that consideration should also be given towards raising money from philanthropic sources including Corporate Social Responsibility (CSR).

3.16 Responding to the query of the Committee about the working model of TMC, it was submitted that Tata Memorial Centre has a system wherein 60% of patients are treated either free or at highly subsidised costs, while 40% of patients are “private” patients who pay for their care. The Committee was further informed that the revenue generated from the private patients goes a long way to meeting much of the routine expenditure incurred by the hospital, thereby decreasing the fund demand from the Government. Accordingly, it was suggested very strongly by the representatives of TMC that the model be replicated in all the hubs and spokes proposed by TMC which will enable hospitals to remain at the cutting edge to reduce some of the additional funding burden on the Government.

3.17 Sharing the details relating to the strategy to meet the requirement of skilled work force to run these hubs and spokes, it was submitted before the Committee that recruiting and retaining trained manpower for cancer management is likely to be the biggest challenge for this proposal. It was informed that the challenge lies in two aspects – first, the country does not currently have the trained medical (cancer) specialists to make these centres functional within the timeframe mentioned and secondly, the available experts are often recruited in private hospitals at much higher remuneration.

3.18 Therefore, a multipronged approach to resolve these issues would be required. It was requested that the manpower sanctions for these projects should be done at the same time as approvals for the projects itself. This is essential because the average time taken to train specialist human resource in cancer is approximately between 18 to 36 months, which is the typical period of time taken for civil constructions. Therefore, recruiting professionals early and training them well in advance of the actual need is mandatory to meet the tight timelines of commissioning of these hospitals. It was further brought to the notice of the Committee that all the hubs and spokes built or taken over under the proposal should be brought under the ambit of the Homi Bhabha National Institute. It was, therefore, requested that Homi Bhabha National Institute should urgently be made an “Institution of National Importance”, through an Act of Parliament. It was submitted that once the Homi Bhabha National Institute is declared as Institute of National Importance, TMC would be able to recruit generalists (MD General Medicine, Pediatrics, MS General Surgery) who will work under the supervision of trained and qualified medical and surgical oncologists in these hubs and spokes.

3.19 The Committee was also apprised that existing as well as the upcoming centres could provide the necessary upskilling required to work in these centres. All the hubs and many of the spokes will then be

capable of formally training professionals (medical, paramedical, scientific and technical) who will in turn, be absorbed into the upcoming centres.

3.20 The Committee was further informed that a major source of brain drain in the country is trained qualified professionals being recruited by private hospitals at salaries several times that of the Government sector. While many doctors would still prefer to work in an academic environment with opportunities for research, this discrepancy in remuneration forces them into the private sector. In order to make working at these cancer hubs and spokes attractive enough to retain talent, it was proposed that the TMC model of “Share in Hospital Income”, wherein a certain proportion of the revenue generated from private patients is pooled between the medical staff, augmenting their regular salaries with the option of either drawing a Non-Practicing Allowance or opting for the Share in Hospital Income scheme, but not both. It was further submitted that currently, approximately 12% of the overall hospital income generated at the Tata Memorial Centre is shared between the medical faculty at the Institution.

3.21 Sharing the detailed requirement of manpower and justification for setting up of a cancer Hub (300 beds) and Spoke (100 beds) models, the following was submitted before the Committee:

**Medical:**

209 posts of medical staff for the Hub and 70 for Spoke are required which are for consultant doctors and residents. The positions proposed are for surgical, medical and radiation oncology along with anesthesiology, laboratories and resident doctors. These posts are required mainly to cater to operation theatres, ICU facility, radiology modalities and full-fledged advanced laboratory services such as molecular pathology and HLA typing, psychiatry, digestive diseases and clinical nutrition and dentistry.

**Scientific:**

53 posts of scientific category for the Hub and 22 for Spoke are required to be created in various grade considering the magnitude of the facility and expected patient load. The numbers of positions are worked out as per the proportion with the number of beds, other infrastructure, additional location and other services like occupational therapy, speech therapy and biomedical engineering, medical physics and laboratory scientific staff on account of regulatory requirements and need for advanced services.

**Technical:**

259 posts of technical category for the Hub and 86 for Spoke are projected considering the number of beds, OTs, diagnostic modalities. These posts are required under the headings of general medicine (ECG & PFT Technicians), engineering, housekeeping, CSSD, fireman, biomedical waste management, OT technician, linen and laundry, medical graphics and transfusion medicine.

**Nursing:**

377 posts for Hub and 126 for Spoke are required considering the number of beds. The nursing manpower has very close linkage to the number of inpatient beds and operation theatres. It must be highlighted here that considering the composition of beds *i.e.* ICU beds, daycare beds, stoma clinic, catheter clinic which mandate a higher number of nursing staff per bed, the strain on nursing resources is actually higher.

**Admin:**

174 posts for Hub and 58 for Spoke in various administrative positions are required. These human resources are for manning the front office desks such as OPD registration, admissions and discharge, billing, ward reception desks, appointment counters, sample receiving counters, report typing etc. and back-office activities in areas such as PRO, HR, accounts, purchase, stores etc. While some of these activities are managed with the help of contract employees, it is necessary to have a fair number of permanent staffing in these positions in view of involvement of direct patient interactions and documentation work.

**Auxiliary:**

102 posts for Hub and 41 for Spoke are essential for auxiliary category for services *viz.* housekeeping, firemen, driver, attendants, ward boys, trade helpers, and cooks etc.

3.22 The summary of the manpower requirements for both Hub and Spoke is given below:

HUB		SPOKE	
Category	No.	Category	No.
Medical	209	Medical	70
Scientific	53	Scientific	22
Technical	259	Technical	86
Nursing	377	Nursing	126
Administrative	174	Administrative	58
Auxiliary	102	Auxiliary	41
TOTAL	1174	Total	403

3.23 Responding to the query of the Committee about the manner in which all these hubs and spokes would be managed, it was submitted that for managing this huge task TMC would require a central core staff at the Tata Memorial Centre to be able to handle the additional demands on time and expertise. It was informed that this would be ideally served by a restructuring of the governance structure to include a Director General (Medical) who would be overall in-charge of the proposal and would be supported by an experienced group of about 30 professionals with varying qualifications and expertise – medical, administrative, paramedical, scientific, technical, finance, human resource and engineering. The Committee was also apprised that these individuals would be recruited through a special drive permitting lateral entry from experienced, dedicated individuals who are capable of taking on major challenges. Each of the centres' respective heads would report to the Central Core Committee so that uniformity of policy is maintained as well as being able to monitor the activities and progress at each individual centre. This would be crucial to ensure high quality of establishing as well as running these centres.

3.24 The Committee was informed by the Ministry of Health and Family Welfare through its background note that the list of medicines specified in the National List of Essential Medicines (NLEM) which are

included in the First Schedule of Drug Pricing Control Order (DPCO), 2013 also contain drugs used in the treatment of cancer. 489 NLEM medicines for which ceiling price have been notified under DPCO, 2013, includes 47 anti-cancer medicines. No person is authorized to sell any such formulation to any consumer at a price exceeding the ceiling price fixed by the National Pharmaceutical Pricing Authority (NPPA). Pricing of these medicines are controlled through Drug Pricing Control Order (DPCO) 2013 as amended from time to time.

#### **4. COMMITTEE'S OBSERVATIONS**

**4.1 The Committee appreciates the entire range of work carried out by the Tata Memorial Centre, Mumbai, from cancer treatment, training, and research to setting protocols and standards for cancer treatment all over the nation. It acknowledges that the TMC is at the vanguard of the battle against cancer in India and is making world-class treatment available to cancer patients at a very low cost.**

**4.2 The Committee also notes the success and positive impact of National Cancer Grid network, under the aegis of the DAE, since it has established uniform treatment guidelines for all cancers being treated in India at 183 centres, covering over 60% of India's entire cancer burden.**

**4.3 The Committee during the meeting held with the representatives of TMC learnt about the web-based expert opinion service being made available to the cancer patients through the NCG. The Committee noted that around 10,000 patients come to TMC only for a second opinion. They travel from various parts of the country to Mumbai, which is undoubtedly, physically as well as financially, a cumbersome task for cancer patients and their caregivers. However, with the help of the web-based service, a cancer patient need not to come to Mumbai only for a second opinion and to assure themselves that the line of treatment adopted by the doctors are in sync with the standards set by TMC. The Committee is pleased to note that close to 30,000 opinions with the help of this web-based expert opinion service have been provided by TMC so far. The Committee also applauds the fact that nearly half of the people working in the field of oncology in India have at least at some point in their career, received training at TMC.**

**4.4 The Committee, after deliberating upon the subject and scrutiny of the data made available to the Committee, is perturbed to note that the figures of the cancer patients suggest an upward trend in the number of the cancer patients in the country which is a major cause of worry for one and all. The Committee is of the considered opinion that though the Government has been taking steps to address the issue of availability of cancer infrastructure in the country, and for the prevention and management of cancer, the increasing number of patients in the Tata Memorial Centre, Mumbai, year-on-year basis, presents a stark reality check. This highlights the fact that the existing cancer care facilities available in other cancer hospitals/institutes/centres do not meet the standards of TMC.**

**4.5 The Committee also observes that existing cancer care infrastructure in the country is highly inadequate in light of the fact that a majority of the cancer patients have to travel to far-off locations, sometimes thousands of kilometres, for their treatment in the absence of availability of adequate facilities in their own region/state. Here, the Committee would like to lay emphasis on the fact that mortality to incidence ratio of 0.68 in India is higher than that in very high human development**

index (HDI) countries (0.38) and high HDI countries (0.57). This data of higher mortality rate is also reflective of our systematic failure to cater to the rising number of cancer patients in the country. The Committee also finds a co-relation between inadequate cancer care facilities and cancer deaths in the country and therefore, would like to highlight the importance and significance of having a robust cancer infrastructure in our country.

4.6 The Committee underlines that the issue of patient migration also needs to be looked through the prism of affordability, accessibility and quality of treatment of cancer in the country. Considering all these parameters, it is evident that there is an urgent requirement of cancer centres in especially underserved parts of the country, so as to ensure that the cancer patients do not have to travel longer distances, shelling out major portion of their earnings to receive cancer treatment.

4.7 Taking note of the existing burden of cancer in India, which has been showing an upward trend, as per International Agency for Research on Cancer GLOBOCAN project, it is expected that the burden of cancer in India will increase from an estimated incidence of 1.3 million cases in 2018 to about 1.7 million in 2035. The Committee finds this estimated burden of cancer in India by 2035 worrisome and feels that taking cognizance of this data, the Central and State Governments should ensure adequate infrastructure available in the country to tackle the cancer burden with the highest priority, and the TMC is best suited to take on this challenge considering their world-class standards and unmatched experience.

4.8 The Committee is especially worried to note that the incidence of cancer is very high in all North Eastern States, as it is higher than the national average for several types of cancer, showing a consistently rising trend over the past few decades. The lack of communication and access to cancer centres continues to be a problem due to the geography of the region. This problem is multiplied manifold in the case of cancer treatment, since the patient has to repeatedly visit the hospital for treatment.

## 5. COMMITTEE'S RECOMMENDATIONS

5.1 The Committee shares the vision and accepts the proposal of Tata Memorial Centre, Mumbai in rolling out its Hub and Spoke Model in various parts of the country, on an urgent basis.

5.2 The Committee acknowledges the fact that DAE through the Tata Memorial Centre has significant experience in setting up cancer centres in different parts of the country as well as the Hub and Spoke model of care delivery. The close link between radiation and radionuclide based diagnosis and treatment for cancer, and their experience with setting up and running the National Cancer Grid. This makes TMC under DAE an uniquely, ideal organization to take up the responsibility of a nationwide government funded Hub and Spoke network which will take high quality cancer care closer to the district and region of patients across the country.

5.3 Taking note of the Hub and Spoke Model submitted by Tata Memorial Centre, the Committee is of the considered opinion that this model caters to not only the existing infrastructural requirements of the cancer patients but for the future demand as well. The Committee also notes that the government expenditure on TMC for cancer treatment is proving to be of immense value as evidenced by the rising demand from cancer patients all over the country for treatment at TMC. The Committee,

therefore, finds merit in the proposal of TMC with regard to immediately embark on a mapping exercise to determine the phasing of its Hub and Spoke model, so that the first few hubs can be set up in the regions where incidences of cancer have been increasing and facilities for the cancer care is woefully inadequate. The Committee, therefore, urges upon TMC to evolve a mechanism so that the mapping exercise identifies locations where TMC would like to set up its hubs and recommend spokes for State Governments to be started and completed in a time bound manner.

5.4 The Committee strongly feels that the TMC should take all the stakeholders on board related to cancer treatment, and leverage some of the existing centres and upgrading them to TMC standards rather than building new *de novo* centres. The Committee, therefore, opines that TMC should at the outset list out all such existing centres/institutions such as AIIMS, Central/State Government Hospitals/Medical Colleges, etc. which can be converted into either a hub or spoke, so that existing facilities of these centres/institutions can be optimised and made available to the cancer patients of that region/State which will further minimise their migration to other places. This model has been successfully evidenced in setting up the hub in Varanasi anchored in the Railways Hospital. The Committee further feels that selection of the existing centres/institutions be made cautiously and judiciously so as to avoid duplication of efforts, ensuring standardised care.

5.5 The Committee is of the considered view that Hub and Spoke Model of TMC if rolled out/implemented in various parts of the country, in a phased and scientific manner, will surely go a long way in making available affordable cancer treatment to the cancer patients. The increased number of hubs and spokes will put TMC in a much more advantageous position to negotiate with the industry including pharmaceuticals and medical equipment providers, which in turn would further help in bringing down the overall cost of cancer treatment across the board.

5.6 The Committee is of the considered opinion that since creation of infrastructure and research for treatment of cancer requires huge investment of money and human resources, the Department of Atomic Energy/TMC may chalk out strategy for linkages with various industries/companies for funding under Corporate Social Responsibility (CSR) *in lieu* of knowledge sharing, technology transfer etc. The industry tie-up may further aid in kick starting 'Make in India' initiatives for pharmaceuticals and advanced medical equipment for cancer treatment.

5.7 The Committee is also of the view that keeping prices low of medicines related to cancer treatment is paramount keeping in view of the poor financial and social background of the patients. To achieve this objective, the Committee hopes that there must be a robust mechanism to check the prices of essential medicines related to treatment of cancer. These medicines must be made available at the hubs and spokes at rate contract of Government.

5.8 The Committee also notes that the proposal of TMC for its Hub and Spoke Model expects that the land for setting up these hubs and spokes would be made available to TMC free of cost by the State Government. The Committee, therefore strongly feels that a High Level Steering Committee headed by the Minister of State for Atomic Energy, the Chief Secretaries/Administrators of all the States and Union Territories as Members and Director, TMC as Member Secretary be constituted so that all the modalities related to the adoption and rolling out of the Hub and Spoke Model can be chalked out in a time bound manner in order to not only contain the patient migration but also to



ensure that state-of-the-art facilities be made available as close as possible to cancer patients. This Committee may also be empowered to evolve funding models that are tailored for the specific needs of States. The Committee also recommends additional funds for affordable accommodation and transit camps for patients and caregivers to ease their hardship.

5.9 The Committee underlines that the criteria for hubs and spokes cannot be determined based on population alone, as underserved regions could also be sparsely populated and geographically far-off from densely populated centres. Therefore, special attention should be paid to ease the hardship of cancer patients in remote areas. Particularly, Dr. B Barooah Cancer Institute at Guwahati should be upgraded and developed as a common hub for the North Eastern states with immediate focus on infrastructure development and training of human resources at all levels, until similar hubs and spokes are set up in all North Eastern states. In addition, focused research must be carried out on the higher incidence of cancer in the entire region.

5.10 The Committee hopes that after materialisation of Hubs and Spoke in various States, Memorandum of Understanding (MoU) would be signed between the Tata Memorial Centre, Mumbai and respective State Governments clearly demarcating their roles, functions, responsibilities, financial obligations (if any), areas of jurisdiction, etc.

5.11 The Committee very well understands that a project as ambitious as Hub and Spoke Model of TMC requires a tremendous amount of financial backing from the Central Government for setting up hubs as well as the State Governments for land, infrastructure and for running the spokes in their respective States. However, the Committee strongly feels that it is the responsibility of the Government to make available the state-of-the-art medical facilities to its citizens where their ailments can be cured and utmost care be taken of the patients, especially when two-thirds of the total expenditure for cancer treatment is currently being borne by patients. The Committee, therefore, desires that a separate and dedicated budget for setting up state-of-the-art cancer facilities in the form of these proposed hubs in various parts of the country be made available to the Department of Atomic Energy/Tata Memorial Centre from the Union Government without compromising on the budget for other equally important activities of the DAE.

5.12 The Committee further notes that various schemes/projects/programmes are being run by the Union as well as State Governments for which financial assistance/support is also provided. The Committee, however, is of the opinion that the current style of working in silos to address cancer treatment in India may not yield the desired results and thus there should be synergy between all such Governments/authorities/agencies. The Committee, therefore, is of the opinion that the Department of Atomic Energy/Tata Memorial Centre should work in tandem and close co-ordination with the Ministry of Health and Family Welfare, Government of India as well as State Governments so that concerted efforts are put to tackle the cancer burden.

5.13 The Committee underlines the importance of human resources of the likes of highly qualified doctors, skilled technicians, paramedics, nursing staff and administrators as the backbone of the Hub and Spoke model as proposed by TMC. Therefore, the Committee strongly agrees with the recommendation of TMC that the infrastructure and human resources must be sanctioned in tandem for the success of the Hub and Spoke model.

5.14 The Committee applauds the innovative ‘share in income’ scheme of the TMC to incentivize highly qualified doctors to give up the private sector and serve the public healthcare system. The Committee also notes the tremendous research and career growth opportunities provided by TMC to its staff. The Committee, therefore, recommends the Union Government and State Governments to adopt such innovative practices and also pursue other schemes that will meet the challenge of adequate human resources in the battle against cancer.

5.15 The Committee strongly recommends that ‘Institute of National Importance’ status be granted to ‘Homi Bhabha National Institute’ through an Act of Parliament, since it will be the knowledge, training and research hub for human resources to address cancer care in India. With the status of ‘Institute of National Importance’, the TMC would be in a position to recruit generalists (MD General Medicine, Paediatrics, MS General Surgery) who will work under the supervision of trained and qualified medical and surgical oncologists in these hubs and spokes. The Committee, therefore, urges upon the Department of Atomic Energy/Tata Memorial Centre to pursue the matter and impresses upon the Union Government, highlighting the significance and importance of Homi Bhabha National Institute being granted the status of ‘Institute of National Importance’.

## 6. CONCLUDING REMARKS

6.1 The Committee recognises that being under the aegis of DAE has been crucial to TMC becoming a centre of excellence for cancer care. DAE with a close link to radiation medicine facilities, has played a significant role in keeping costs of cancer care low, and serving patients from across India regardless of their socioeconomic status. The Committee underlines the fact that radiation therapy, as well as both diagnostic and therapeutic radionuclide isotope usage, are integral elements of cancer diagnosis and therapy, and therefore DAE is integral to all our recommendations.

6.2 Finally, the Committee is well aware that the primary mandate of the Department of Atomic Energy is to rapidly increase the generation of nuclear power generating capacity. Even so it is conscious of the fact that one of the spin-offs from the country’s nuclear programme has been the Tata Memorial Centre’s cancer treatment network. The Committee is of the considered opinion that there is urgent need to expand this network in support of national health goals. This expansion does not, in any way, clash with the objective of increasing nuclear power generating capacity. The Committee is submitting this report in the hope that the Government of India will take a comprehensive view instead of having the report examined by the Department concerned and a routine Action Taken Report submitted to Parliament. The Committee expects that such an Action Taken Report will be submitted after its recommendations are examined by the Department of Atomic Energy and the Ministry of Health and Family Welfare jointly and a holistic view taken.



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# MINUTES

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II  
SECOND MEETING

The Committee met at 11.00 A.M. on Wednesday, the 26<sup>th</sup> September, 2019 in Room No.G-074, Ground Floor, Parliament Library Building, New Delhi.

**MEMBERS PRESENT**

1. Shri Jairam Ramesh — *Chairman*

**RAJYA SABHA**

2. Shri Bhaskar Rao Nekkanti
3. Shri Ashwini Vaishnaw
4. Shri Ravi Prakash Verma
5. Shri Binoy Viswam

**LOK SABHA**

6. Shri Guharam Ajgalley
7. Shri Jashvantsinh Sumanbhai Bhabhor
8. Shri Sudarshan Bhagat
9. Shri Rameshbhai Lavjibhai Dhaduk
10. Dr. Swami Sakshij Maharaj
11. Shri S.R. Parthiban
12. Dr. Ranjan Singh Rajkumar
13. Shri Kotha Prabhakar Reddy
14. Dr. Jayanta Kumar Roy
15. Shrimati Satabdi Roy (Banerjee)
16. Shri Francisco Cosme Sardinha
17. Shri Anurag Sharma
18. Shri Ram Shiromani
19. Shri Kirti Vardhan Singh
20. Dr. Ramapati Ram Tripathi

**SECRETARIAT**

Shrimati Sunita Sekaran, *Joint Secretary*

Shri T.N. Pandey, *Director*

Shri S. Rangarajan, *Additional Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

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3. Thereafter, the following representatives of the Department of Atomic Energy appeared before the Committee:

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\*\*\* Relate to other matters.

- (i) Dr. K. N. Vyas, Secretary
- (ii) Dr. Ajit Kumar Mohanty, Director, Bhabha Atomic Research Centre
- (iii) Shri S.K. Sharma, Chairman & Managing Director, Nuclear Power Corporation of India Limited (NPCIL)
- (iv) Dr. U. Kamachi Mudali, Chief Executive & Chairman, Heavy Water Board
- (v) Dr. R. A. Badwe, Director, Tata Memorial Centre (TMC)
- (vi) Shri Ranajit Kumar, Head, Nuclear Control & Planning Wing (NCPW)
- (vii) Shri Sanjay Kumar, Joint Secretary (A&A)
- (viii) Shri Jayant Khobragade, Joint Secretary, (ER)
- (ix) Shri M.B. Verma, Director, Atomic Minerals Directorate for Exploration & Research (AMD)
- (x) Shri Shrikrishna Gupta, Officer on Special Duty
- (xi) Shri S.R. Pranesh, Director (Technical), Uranium Corporation of India Limited

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5. The Members then raised various queries such as a comparative cost analysis of nuclear energy vis-a-vis solar and wind energy; how India compares globally in terms of nuclear energy especially with China; safety concerns of nuclear technology and mitigation measures; Indo-U.S. nuclear agreement; delay in project completion; educational institutes in the North-East; cancer treatment on the lines of the Tata Memorial Center model and the details of the project; training human resources; disposal of nuclear waste; availability and exploration of monazite at sea-shore of Kerala; technological interventions for storage of food grains such as for godowns of Food Corporation of India (FCI), etc. The Chairman of the Committee also raised certain issues such as expansion of Tata Memorial Centre (TMC) facilities in the country and the project cost of the hub-and-spoke model of Tata Memorial Centre, public safety and health concerns of nuclear energy, desalination of water, etc.

6. The Chairman then observed that there was a requirement of one Tata Memorial Centre in every state of the country and asked about the expansion plans of the TMC. Director, Tata Memorial Centre, informed the Committee about the hub and spoke model of TMC which was very successfully established and operating in Punjab. The Committee was also informed about the financial implications of setting up of hub and spoke facilities of TMC. In view of the importance of the subject and the interest shown by all the members, the Committee decided to take up the subject 'Expansion of Hub and Spoke Model of Tata Memorial Centre in various parts of the country', for examination and report. The Chairman also asked the representatives of the Department of Atomic Energy/Tata Memorial Centre to furnish a detailed note on the subject to the Committee for its elaborate consideration.

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- 16. \* \* \*
- 17. The witness then withdrew.
- 18. A verbatim record of the proceedings was kept.
- 19. The meeting of the Committee adjourned at 1.46 P.M.



IV  
FOURTH MEETING

The Committee met at 11.00 A.M. on Friday, the 11<sup>th</sup> October, 2019 in Room No.4, Ground Floor, Parliament House Annexe Extension Building, New Delhi.

**MEMBERS PRESENT**

1. Shri Jairam Ramesh — *Chairman*

**RAJYA SABHA**

2. Shri R.S. Bharathi
3. Shrimati Vandana Chavan
4. Shri Ashwini Vaishnaw
5. Shri Ravi Prakash Verma
6. Shri Binoy Viswam

**LOK SABHA**

7. Shri Pradan Baruah
8. Shri Sudarshan Bhagat
9. Shri Anantkumar Hegde
10. Dr. Swami Sakshiji Maharaj
11. Dr. Ranjan Singh Rajkumar
12. Shri Kotha Prabhakar Reddy
13. Dr. Jayanta Kumar Roy
14. Shri Francisco Cosme Sardinha
15. Shri Anurag Sharma
16. Shri Ram Shiromani
17. Shri Kirti Vardhan Singh
18. Dr. Ramapati Ram Tripathi

**SECRETARIAT**

Shrimati Sunita Sekaran, *Joint Secretary*

Shri T.N. Pandey, *Director*

Shri S. Rangarajan, *Additional Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

**Representatives of the Department of Atomic Energy/Tata Memorial Centre, Mumbai**

- (i) Shri Sanjay Kumar, Joint Secretary
- (ii) Dr. R.A. Badwe, Director, Tata Memorial Centre (TMC)
- (iii) Shri Sanjeev Sood, Director
- (iv) Dr. C. S. Pramesh, Director

**Representatives of the Ministry of Health and Family Welfare**

- (i) Shri Manoj Jhalani, AS & MD (NHM)
- (ii) Shri Lav Aggarwal, Joint Secretary
- (iii) Shri Alok Saxena, Joint Secretary
- (iv) Dr. Sudhir Gupta, Addl. DDG
- (v) Dr. Surjeet Singh, Director (NCDC)

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2. At the outset, the Chairman welcomed the Members of the Committee and the representatives of Department of Atomic Energy/Tata Memorial Centre, Mumbai, Ministry of Health and Family Welfare, Ministry of Environment, Forest and Climate Change, Central Pollution Control Board and Professor K. Srinath Reddy. Apprising the Members about the agenda of the meeting, he informed that the Committee will have presentations by these representatives on the subjects 'Setting up of Tata Memorial Centre in various parts of the country' and 'Environment and Health'.

3. The Chairman then asked the representatives of the Department of Atomic Energy/Tata Memorial Centre, Mumbai to make a brief presentation on the Expansion of TMC facilities in various parts of the country. Thereafter, The Director, Tata Memorial Centre (TMC) informed the Committee about the cancer burden in India and the incidences of cancer in the country as compared to very high and high Human Development Index (HDI) countries. The Committee was informed that in the rural areas the incidences of cancer are about 40-50 per lakh population whereas for the urban areas it is 60-70 per lakh population.

4. Thereafter, Director, Tata Memorial Hospital made a Power Point Presentation (PPT) on the subject 'Setting up of Tata Memorial Centre in various parts of the country'. The Committee was informed of the region-wise statistics of cancer cases and that Maharashtra, Northern and North-Eastern States show higher density of cancer incidences. The Committee was informed about the existing National Cancer Grid (NCG) having 183 centers including private hospitals and charitable trusts giving standardized cancer care to over 7 lakh new patients every year. The Director then presented the cancer control plan before the Committee through systematically setting up cancer centres in hub and spoke model. The Committee was apprised that the hub and spoke model shall focus on minimizing migration of cancer patients for treatment needs by establishing a distributed model of providing cancer care through a system of standardized treatment available across all the cancer centers of the hub and spoke model. It was mentioned that the hubs shall serve as centres capable of treating all types of cancer including complex care facility, while the spokes shall serve as centres treating common and less complex cases of cancer along with delivery of treatment and care as planned by the hub for respective patients. The Committee was then informed of the various considerations such as land, location, optimization of resources, integrating and leveraging existing facilities, for setting up such a hub and spoke model across the country. The Committee was informed the Committee that a hub can be established in every state or for every 4 crore population. The hub would be a 300 bedded facility requiring a capital budget of about ₹ 650 crores while about ₹ 110-120 crores as yearly recurring expenditure. It was further informed that a spoke can be set up for every I crore population. The spoke would be a 100 bedded facility requiring a capital budget of about ₹ 220 crores while about ₹ 35-40 crores as yearly

recurring expenditure. The Committee was briefed about the manpower requirements and the strategy for training such human resources. The budgetary requirements along with a plan to establish a country wide model comprising of 26 hubs and 100 spokes in the next 12 years (by 2031) was also presented before the Committee. Towards the end of the presentation, the Committee was informed of the challenges related to funding, training human resources, governance structure and commitment of States for setting up a country wide hub and spoke model for cancer care.

5. The Members then raised various queries such as a dovetailing the various funds available under different umbrella schemes such as Ayushman Bharat, national cancer programme, cancer care; efficacy of web-based cancer consultancy for remote patients; the primary factors for the rise in cancer cases and how to curb them; standardization of cancer care across the country; establishment of early detection facility in the rural areas to identify preventable cancer cases; cancer treatment to foreign nationals and facilities around medical tourism; creating a knowledge grid by integrating cancer research happening in India and across the world; assistance provided by big pharmaceutical companies; developing some hubs as super specialty centers for treating particular kind of cancers; geo-tagging of region-wise cancer incidence statistics for better policy making; location and logistical issues of connecting hub and spokes within a State and across States; upgrading and utilizing the pre-existing infrastructure such as government hospitals, health centers as spokes, etc.

6. The Director and other representatives of Department of Atomic Energy/Tata Memorial Centre, while presenting their views, also responded to some of the queries raised by the Chairman and Members of the Committee. The Chairman also directed them to furnish written replies to other queries/points/issues raised by him and the Members of the Committee, which could not be replied during the meeting, to the Secretariat within a week.

7. The witnesses of the Department of Atomic Energy/Tata Memorial Centre, Mumbai then withdrew.

8. \* \* \*

9. \* \* \*

10. \* \* \*

11. The witness then withdrew.

12. A verbatim record of the proceedings was kept.

13. \* \* \*

14. The meeting of the Committee adjourned at 1.31 P.M.

V  
FIFTH MEETING

The Committee met at 2.00 P.M. on Thursday, the 31<sup>st</sup> December, 2019 in Committee Room No.4, Ground Floor, 'A' Block, Parliament House Annexe Extension, New Delhi.

**MEMBERS PRESENT**

1. Shri Jairam Ramesh — *Chairman*

**RAJYA SABHA**

2. Shri Bhaskar Rao Nekkanti
3. Shri Ravi Prakash Verma

**LOK SABHA**

4. Shri Pradan Baruah
5. Shri Jaswantsinh Sumanbhai Bhabhor
6. Shri Sudarshan Bhagat
7. Shri Anantkumar Hegde
8. Dr. Swami Sakshiji Maharaj
9. Shri Asaduddin Owaisi
10. Shri Kotha Prabhakar Reddy
11. Dr. Jayanta Kumar Roy
12. Shrimati Satabdi Roy (Banerjee)
13. Shri Francisco Cosme Sardinha
14. Shri Anurag Sharma
15. Dr. Ramapati Ram Tripathi

**SECRETARIAT**

Shrimati Sunita Sekaran, *Joint Secretary*

Shri T.N. Pandey, *Director*

Shri S. Rangarajan, *Additional Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

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3.	*	*	*
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6.	*	*	*

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\*\*\* Relate to other matters.

7. \* \* \*
8. Thereafter, the Committee considered the draft 325<sup>th</sup> report on “An Expanded Role for the Department of Atomic Energy (DAE) in cancer treatment in India through an enlarged network of the Tata Memorial Centre (TMC)”. The Chairman also invited suggestions from Members on the draft report. Members gave their suggestions on the draft report. The Committee, thereafter, adopted the draft 325<sup>th</sup> report and authorized the Chairman to incorporate the suggestions appropriately in the report. In view of the fact that both the Houses of Parliament are not in Session, the Committee also authorised the Chairman to present the 325<sup>th</sup> Report to Hon’ble Chairman, Rajya Sabha during the inter-session period so that the said report could be forwarded to the concerned Department for necessary action.
9. A verbatim record of the proceedings was kept.
10. The meeting of the Committee adjourned at 4:25 P.M.

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# **ANNEXURES**

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**Tata Memorial Hospital**  
**Office of the Director (Academics)**

STUDENTS ADMITTED IN THE YEAR 2019					16.10.2019
Sr. No.	Name of the Course	Tenure of Courses	Approved By	Designation	Intake (2019-20)
1.	M.CH. (Surgical Oncology)	3 Year Course Superspeciality (Post MD)	Medical Council of India	SR	24
2.	M.CH. (Gynecological Oncology)				2
3.	M.CH (Plastic & Recon. Surgery)				4
4.	M.CH. (Head & Neck Surgery)				4
5.	D.M. (Medical Oncology)				16
6.	D.M. (Critical Care Medicine)				3
7.	D.M . (Paediatric Oncology)				3
8.	D.M. (Gastroenterology)				2
9.	D.M. (Interventional Radiology)				2
10.	D.M. (Oncopathology)				3
11.	MD (Pathology)	3 Year Course Broadspeciality Course (MD)-HBNI Approved	India	JR	12
12.	MD (Anesthesiology)				20
13.	MD (Radio-diagnosis)				17
14.	MD (Radiation oncology)				16
15.	MD (Microbiology)				1
16.	MD (Immuno Hematology & Blood Transfusion)				3
17.	MD (Nuclear Medicine)				6
18.	MD (Palliative Medicine)				4.
19.	Advance Diploma in Radiotherapy Technology (ADRT)	Technologist Trainee	Government of Maharashtra	Trainee	10
20.	Advance Diploma in Medical Imaging Technology (ADMIT)	MSBTE-OTE			20
21.	Postgraduate Diploma in Fusion Imaging Technology	01 Year + 01 Year Internship	HBNI University	Trainee	10



Sr. No.	Name of the Course	Tenure of Courses	Approved By	Designation	Intake (2019-20)
22.	M.Sc Clinical Research	02 Years Course + 1 Year Internship (Bond)	HBNI University	PG students	10
23.	M.Sc Nursing	02 Years	HBNI University	PG students	10
24.	M.Sc Nuclear Medicine	02 Years	HBNI University	PG students	5
25.	Ph.D Health Sciences	05 Years	HBNI University	JRF/SRF	-
26.	HBNI Certified Fellowship (Orthopedic, Breast, Thoracic, Gastro, Uro, Oral, Plastic & Recon., Interventional, Molecular, Pulmonary, Onco Aneasthesia, Cancer Imaging, Dental & Pros, Preventive, Haemato Onco, Pediatric, Haemato Path, Infectious Diseases)	2 Years	HBNI University	Fellow	20
27.	Senior Resident/ Fellow	-	-	SR/Fellow	161

## Information received from Ministry of Health and Family Welfare dated 7th November, 2019

(₹ in crores)

Sl. No.	Expenditure Head	Actual Expenditure FY 2016-17	Actual Expenditure FY 2017-18	Actual Expenditure FY 2018-19																
1.	Expenditure on Cancer Research by the Ministry of Health and Family Welfare including grants provided to any Institutions (excluding expenditure by ICMR)	Nil	Nil	Nil																
2.	Expenditure done only on cancer prevention and control activities under the National Programme for Prevention and control of Cancer, Diabetes, Cardio-Vascular Disease and Stroke.  (I) NPCDCS upto District Level under NHM  (II) Tertiary Care Cancer Scheme	199.29  286.15	109.64  300.00	124.11  98.66																
3.	Expenditure by ICMR on Cancer Research and Awareness activities	0.36	0.45	0.51																
4.	Any other expenditure on cancer prevention, control, management or treatment done by the Ministry of Health & Family Welfare in any other head apart from the ones given above.	<p>Details of grants in aid (capital assets) released for National Cancer Institute (NCI), Jhajjar, and funds released for Chittaranjan National Cancer Institute (CNCI), Kolkata are as under :</p> <table border="1"> <thead> <tr> <th colspan="4" style="text-align: right;">(₹ in crore)</th> </tr> <tr> <th>Institute</th> <th>2016-17</th> <th>2017-18</th> <th>2018-19</th> </tr> </thead> <tbody> <tr> <td>NCI</td> <td>15.33</td> <td>712.54</td> <td>270.00*</td> </tr> <tr> <td>CNCI</td> <td>67.71</td> <td>121.26</td> <td>128.44</td> </tr> </tbody> </table> <p>* In addition, HEFA loan of Rs. 282.0 crore was also provided</p> <p>It may however be noted that substantial amount of funds under National Health Mission are provided to States for strengthening health systems (e.g. approval for ₹ 26,170 crore was provided in 2018-19) including for human resources, infrastructure, drugs and equipment, diagnostics and IEC etc. some of which</p>			(₹ in crore)				Institute	2016-17	2017-18	2018-19	NCI	15.33	712.54	270.00*	CNCI	67.71	121.26	128.44
(₹ in crore)																				
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Sl. No.	Expenditure Head	Actual Expenditure FY 2016-17	Actual Expenditure FY 2017-18	Actual Expenditure FY 2018-19
		<p>relate to cancer care. Similarly, Under the Ayushman Bharat – Health &amp; Wellness Centres (AB-HWCs), all the staff in HWCs is being trained and supported <i>inter-alia</i> for prevention, control and management of three common cancers, viz., oral, cervix and breast cancer. Annual approvals in 2019-20 for the HWCs stand at ₹ 2,618 crore. These HWCs undertake IEC and screening and refer suspected cases to higher facilities as per Standard Treatment Pathways. It is not possible to segregate the budget specifically for cancer prevention and management within above heads.</p> <p>Further, all the All India Institutes of Medical Sciences and Central Government hospitals provide free or subsidised care for cancer control and treatment from their budgets. However, details about the exact expenditure being incurred on cancer prevention, control, management or treatment from their budget is not readily available.</p>		