



Impact Assessment Report

Tata Memorial Center

KMBL Project ID - KMBL202324061

A report by Crisil Limited

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Ethical Consideration

Informed consent: The interviews were done after the respondents gave their consent. Even after the interviews were completed, their permission was sought to proceed with their responses.

Confidentiality: The information provided by participants has been kept private. At no point were their data or identities disclosed. The research findings have been quoted in a way that does not expose the respondents' identities.

Comfort: The interviews were performed following the respondents' preferences. In addition, the interview time was chosen in consultation with them. At each level, respondents' convenience and comfort were considered.

Right to reject or withdraw: Respondents were guaranteed safety and allowed to refuse to answer questions or withdraw during the study.

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Understanding the Context

The global cancer burden is a profound and escalating concern, with the World Health Organization (WHO) indicating that more than two-thirds of new cancer cases and deaths arise in developing countries. A significant disparity exists between the incidence and prevalence of cancer and the availability of essential cancer care, resulting in substantial barriers to treatment access. Notably, approximately 30 countries lack access to even a single radiotherapy machine, and most cancer cases in low- and middle-income countries are diagnosed at an advanced stage¹.

Situation of Cancer Care Infrastructure in India

India is grappling with a significant cancer burden, with approximately 100 new cases diagnosed per 1 lakh people². The country's radiation therapy infrastructure is inadequate, with a severe shortage of machines, including a 62% deficit in teletherapy machines and 66% in simulators. The distribution of these facilities is skewed, with over 60% concentrated in western and southern regions, leaving rural areas with limited access to cancer treatment. Approximately 800,000 people require radiation therapy each year, highlighting the urgent need for improved access to effective cancer treatment in rural India³.

The lack of infrastructure and equipment for cancer treatment in India is a complex issue. The uneven distribution of facilities, with around 95% of specialized cancer centers concentrated in urban areas, leaves rural populations with limited access to quality care⁴. Furthermore, India's limited public health spending, which is one of the lowest in the world as a percentage of GDP, directly impacts the funding available for building public cancer centers and purchasing advanced equipment. The high cost of equipment and treatment is another significant barrier, with over 75% of cancer treatment in India being financed through out-of-pocket expenses⁵, forcing many patients to delay or discontinue treatment due to financial constraints. Despite government initiatives to improve cancer care infrastructure, there is still a pressing need for intervention. The existing gaps in access, affordability, and quality of care persist, and the growing burden of cancer in India demands sustained efforts to address these challenges.

¹ Fighting cancer in the Developing World, May 10, 2012, International Atomic Energy Agency, <https://www.iaea.org/sites/default/files/18/07/fighting-cancer-010512.pdf>

² Towards a Cancer-free India, Commitment to Treatment, Prevention & Innovation, February 13, 2025, Ministry of Health & Family Welfare, Government of India, <https://mohfw.gov.in/?q=en/pressrelease-212>

³ From Mountain to Medicine: Overcoming Radiotherapy Setup Challenges in the Sub-Himalayan Region, Vol 10 No 2 (2025), May 27, 2025, Kapil Kumar Soni , Hardik Sharma , Muninder Kumar , Priyanka Thakur , Niketa Thakur , Sucehta Das, DOI [10.31557/apjcc.2025.10.2.589-592](https://doi.org/10.31557/apjcc.2025.10.2.589-592), <https://waocp.com/journal/index.php/apjcc/article/view/1752>

⁴ Delivery of cancer care in rural India: Experiences of establishing a rural comprehensive cancer care facility, April-June, 2015, Banavali SD., 128-31. doi: 10.4103/0971-5851.158848. PMID: 26157291; PMCID: PMC4477376., <https://pmc.ncbi.nlm.nih.gov/articles/PMC4477376/>

⁵ Economics of cancer care: A community-based cross-sectional study in Kerala, India, March 9, 2020, Dinesh TA, Nair P, Abhijath V, Jha V, Aarth K., 7-12. doi: 10.4103/sajc.sajc_382_18. PMID: 31956610; PMCID: PMC6956579., <https://pmc.ncbi.nlm.nih.gov/articles/PMC6956579/#ref22>

Approach and Methodology

The evaluation employs a concurrent mixed methods design, integrating both quantitative and qualitative datasets from principal program stakeholders to construct a rigorous multi-dimensional impact evaluation.

Quantitative Insights - Measuring Program Efficacy: Quantitative evidence is acquired via a semi-structured questionnaire administered directly to program beneficiaries. This instrument measures core impact metrics and program effectiveness, leveraging structured scaling and closed-ended responses.

Qualitative Narratives - Capturing Stakeholder Perspectives: Qualitative data is collected through in-depth key informant interviews with medical professionals and other pivotal stakeholders. These interviews utilize open-ended probes to capture nuanced perspectives on program execution.

Convergent Evidence Mapping and Analysis: All findings are triaged using a formal convergence-divergence analysis to identify corroborative and contradictory evidence streams across quantitative and qualitative dimensions. Advanced triangulation increases validity and supports nuanced interpretation of complex impact pathways.

Benchmarking Against Global Standards: OECD-DAC & SDG Focus: The evaluation maps the impact of the program with the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) framework to determine the merit of an intervention on the basis of six defined evaluation criteria – **relevance, coherence, effectiveness, efficiency, impact** and **sustainability**. Additionally, outcomes are mapped to the UN SDGs for global alignment.

In addition to the above, the study also uses **SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis** to systematically assess the program’s strengths, weaknesses, opportunities, and threats, informing core evaluation and strategic recommendations.

Sampling framework

For a patient cohort of ~2000, a survey sample of 50 patients has been selected to satisfy the conventional minimum of around 30 observations required for the Central Limit Theorem to yield an approximately normal sampling distribution of the mean.

Key stakeholders	Data collection tool	Sample
Patients/Guardians	Structured survey questionnaires	50
Radiation Technicians/Oncologists	Key informant interviews	6
Hospital Administration	Key informant interviews	10
Government Officials	Key informant interviews	2
TMC officials	Key informant interviews	2

About the Program and Primary Findings

Program ID	KMBL202324061
Program duration	1 st January 2024 – 31 st October 2024
Partner organization	Tata Memorial Centre (TMC)
Location	Varanasi, Uttar Pradesh

Theory of Change (ToC)				
Need	Input	Output	Outcome	Impact
To offer quality cancer treatment at a subsidized cost with minimal side effects, to improve health outcomes and enhance patients' quality of life.	Procurement and installation of a CT Simulator machine at MPMMCC Hospital, Training for hospital staff on the operation and maintenance of the CT Simulator, Provision of subsidized cancer treatment, including radiotherapy and diagnosis.	Procurement and installation of a CT Simulator machine at MPMMCC Hospital, Training for hospital staff on the operation and maintenance of the CT Simulator, Provision of subsidized cancer treatment, including radiotherapy and diagnosis.	Timely diagnosis and treatment at subsidized rates and reduced side effects, Improved health Outcomes, Reduced financial Burden	Potential to prolong life of cancer patients, Reduced Health Inequalities, Improved quality of life, reduced stress, and increased well-being.

Primary Key Findings

Demographic profile

The assessment covered 50 respondents from different parts of the country, with a significant proportion from Uttar Pradesh; 72% were male and 28% female, and they largely chose this centre because it is the closest hospital offering radiotherapy and has better facilities than alternatives such as Banaras Hindu University (BHU), including more radiotherapy machines and the advanced CT simulator that enables faster planning and shorter waiting times for treatment. An analysis of respondents' occupational backgrounds shows that while a majority were in private jobs, there were also respondents engaged in agriculture, daily wage work, business, government jobs, and other occupations, indicating that the hospital regularly serves people from diverse economic backgrounds and different rungs of society rather than a single, uniform group.

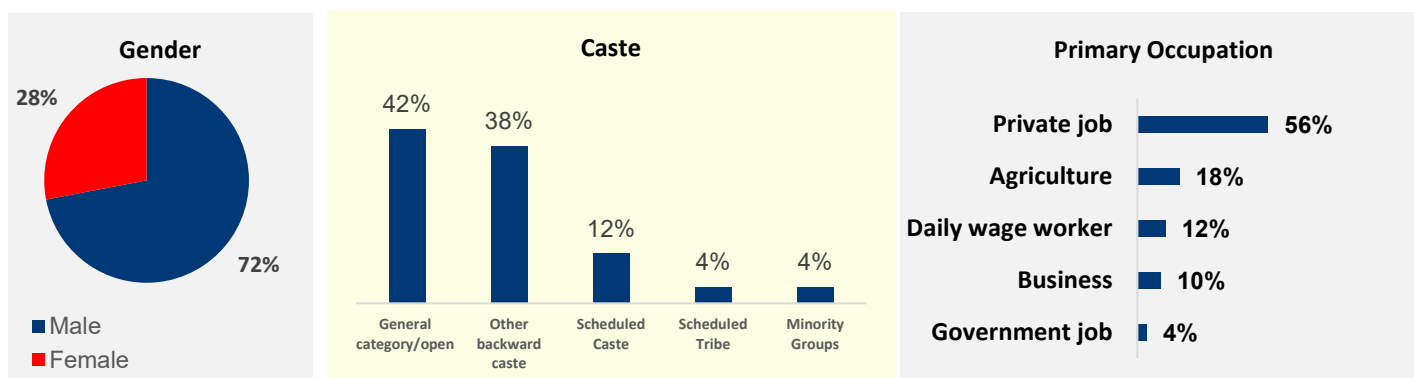


Figure 1: Demographic profile

An evaluation of monthly incomes indicates that a significant proportion of households fall within lower income brackets, with 44% earning between INR 10,001-20,000 and 40% between INR 20,001-30,000. This distribution underscores the financial constraints within which many families operate, highlighting the need for affordable and timely cancer care services.

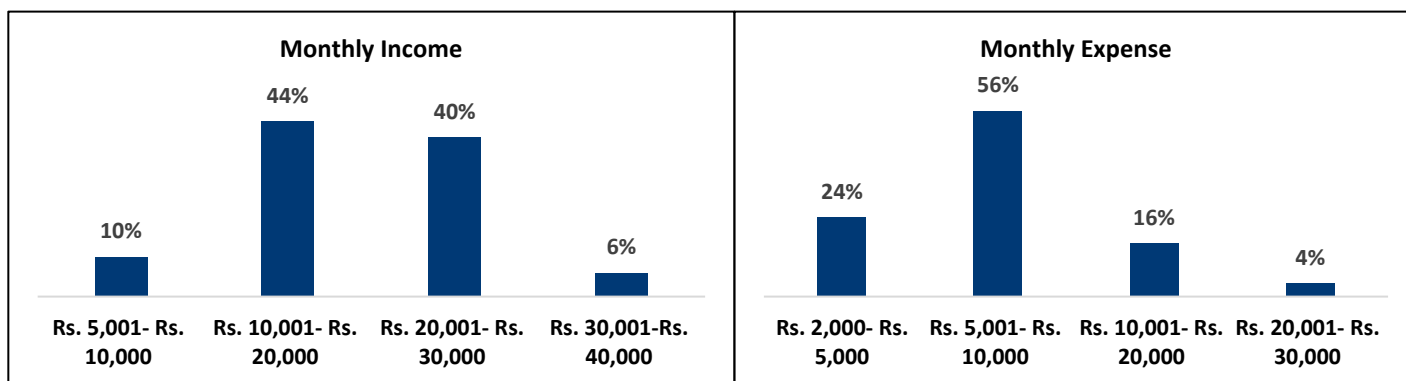


Figure 2: Monthly Income and expenses of beneficiary households

The distribution of monthly household expenses further reinforces this economic vulnerability. Excluding medical expenditure on the patient, 56% reported monthly outlays of INR 5,001-10,000, while 24% incurred expenses between INR 2,000-5,000. The close proximity between income and expenditure levels indicates limited financial flexibility for emergency health needs, making accessible treatment pathways essential for these families.

The hospital's concessional pricing is well aligned with the financial realities of these families. Around 10-15% of the patients fall under the NC category which refers to the subsidized category whereas another 10-15% from the General category patients receive free treatment under the Ayushman Fund scheme.

The programme's subsidized diagnostics and support in accessing government schemes help to mitigate such vulnerabilities, ensuring that treatment does not lead to financial distress.

Clinical Profile of the Patients

The clinical profile reflects the stage at which beneficiaries entered the program and the level of prior medical engagement, offering a clear picture of the hospital's reach and relevance of cancer care.

Most respondents were diagnosed at a stage where timely intervention could meaningfully influence treatment outcomes. A majority (56%) were diagnosed at Stage 2, indicating that the program largely catered to patients in the early-to-middle phases of cancer progression, where structured radiotherapy planning adds substantial value. A notable trend was also observed in the distribution of cancer types by gender, with **oral cancer being the most common among males and breast cancer among females.**

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- Breast cancer is the most common cancer in women in India and accounts for 27% of all cancers in women.
 - Oral cancer is the most common cancer in India amongst men (11.28% of all cancers), fifth most frequently occurring cancer amongst women (4.3% of all cancers) and the third most frequently occurring cancer in India amongst both men and women

Source: National Cancer Registry Programme

agnosis pathways also show a strong reliance on local medical systems. An overwhelming **82% of respondents mentioned that they first became aware of the patient's cancer diagnosis through local medical professionals**. Following this, their treatment pathways varied: **around 40% began their first line of care in nearby government hospitals, while 54% had no treatment initiated at all due to delays, gaps and lack of timely guidance**.

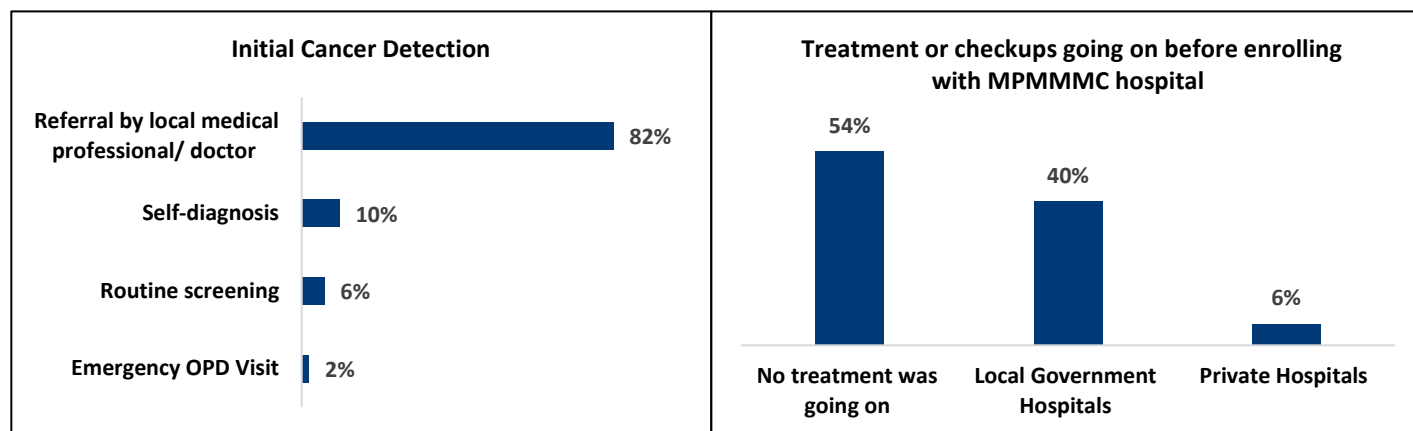


Figure 3: Initial Cancer Detection Pathways and Pre-enrollment Treatment Status

This highlights the program's role in bridging gaps in continuity of care by offering timely diagnostic and planning support.

Hospital access and registration

The hospital access and registration experience forms a critical entry point into the cancer treatment pathway, shaping patient confidence and determining how quickly they can begin receiving care. Access to cancer treatment at MPMMCC is strongly shaped by trusted referral pathways and a registration system that patients find approachable and efficient.

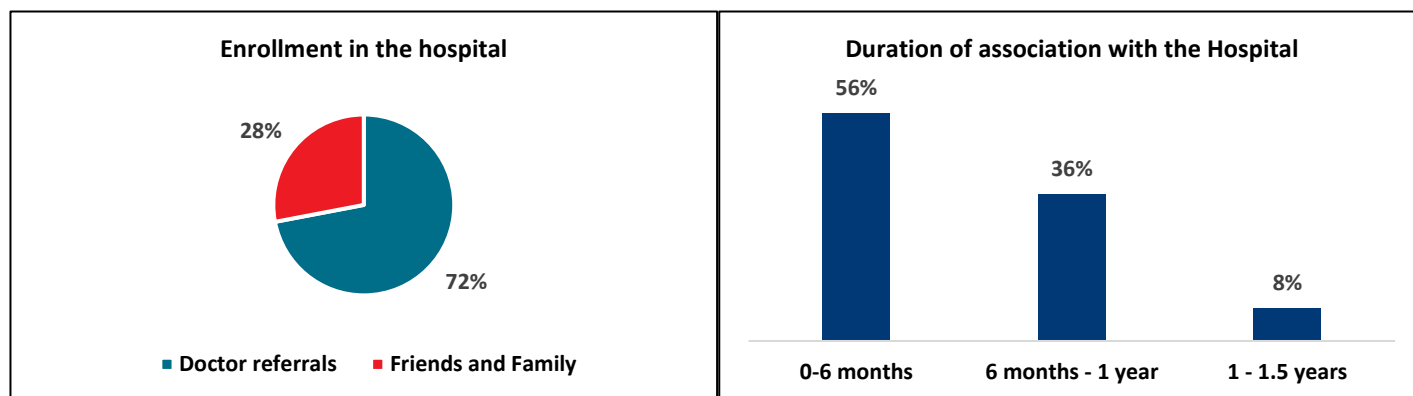


Figure 5: Enrollment in the hospital

Figure 4: Duration of association with the hospital

A substantial **72% were enrolled through doctor referrals**, confirming that formal healthcare pathways play a central role in directing patients to the hospital. Most respondents were recent entrants to the hospital, with 56% associated for 0-6 months and 36% for 6 months to 1 year. The registration process itself was largely smooth and timely. **76% of patients completed the registration process within 5-20 days**, from submitting their complete application to getting enrolled, demonstrating an efficient administrative system that allows patients to move into the diagnostic and treatment phases without delay.

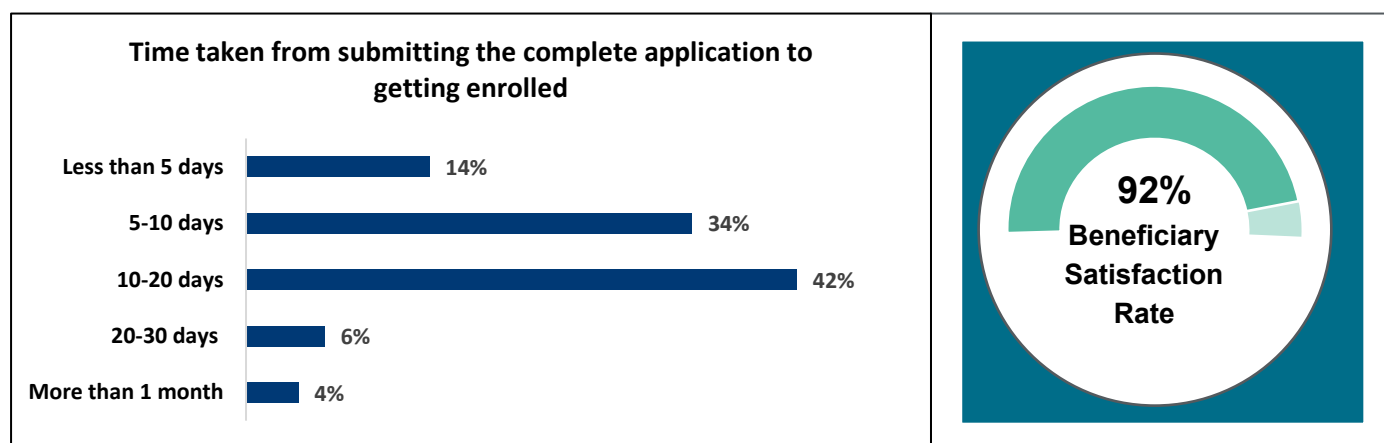


Figure 6: Time taken in enrollment and the process satisfaction rate

The registration process itself was largely smooth and timely. **76% of patients completed the registration process within 5-20 days, from submitting their complete application to getting enrolled, demonstrating an efficient administrative system that allows patients to move into the diagnostic and treatment phases without delay.** Only a very small proportion reported longer timelines, indicating that delays are isolated rather than widespread.

Affordability remains a strong feature of the hospital's access system. **An overwhelming 98% of respondents reported that the registration fee was minimal**, with a standard charge of INR 100 for normal registration. Satisfaction levels with the process were also encouraging, with **92% of patients expressing satisfaction with their registration experience – reflecting clarity, cooperation from staff, and systematic coordination.** Among the remaining 8%, the dissatisfaction stemmed mainly from operational and infrastructural challenges.

Clinical consultation and diagnosis

Accurate and sound clinical consultation and diagnosis are the foundation of effective treatment, playing a pivotal role in determining the success of a patient's care journey. A thorough and precise diagnosis enables healthcare professionals to develop a tailored treatment plan, addressing the patient's specific needs and underlying conditions. Conversely, a misdiagnosis or incomplete diagnosis can lead to ineffective or even harmful treatment, resulting in prolonged suffering, increased healthcare costs, and decreased patient satisfaction. Moreover, **a sound clinical consultation fosters trust and confidence between the patient and healthcare provider, encouraging patients to adhere to their treatment plans and complete their prescribed courses of care.** When patients feel heard, understood, and empowered, they are more likely to take an active role in their recovery, leading to better health outcomes, improved treatment completion rates, and enhanced overall well-being. By prioritizing sound clinical consultation and diagnosis, healthcare providers can set the stage for successful treatment outcomes, improved patient engagement, and a more positive healthcare experience.

Patient feedback on the consultation and diagnostic experience was uniformly positive across all assessed dimensions. All respondents reported high satisfaction with communication, explanation of medical condition, and guidance on follow-up care.

- **Consultation experience**
 - Every participant rated the overall consultation as excellent, indicating strong trust in the treating doctor and clinical team.
 - Participants highlighted that the interaction was respectful, attentive, and responsive to their questions and concerns.
- **Diagnostic process and coordination**
 - All participants confirmed that the diagnostic process, including test

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- **100%** of participants rated their consultation experience as excellent
 - **100%** of participants confirmed that the diagnostic process, including test booking, communication and coordination, was smooth and efficient
 - **100%** of the respondents confirmed that their medical condition and treatment plan were clearly explained
 - **100%** of participants noted that the radiologist demonstrated strong knowledge and provided dependable diagnostic support
 - **100%** of participants reported receiving guidance on diet and recovery underscoring a holistic approach to patient wellbeing

booking, coordination, and communication of instructions, was smooth and efficient.

- Respondents noted minimal waiting times and clear guidance at each step of the diagnostic pathway.

- **Clarity of medical explanation**

- Every respondent reported that their medical condition and treatment plan were clearly explained in a way they could understand.
- Participants felt empowered to make informed decisions, with adequate time given to clarify doubts.



- **Radiologist's expertise and support**

- All participants observed that the radiologist demonstrated strong technical knowledge and provided dependable diagnostic support.
- Respondents expressed confidence that the radiology inputs meaningfully informed their treatment decisions.

- **Holistic guidance and wellbeing**

- Every participant reported receiving guidance on diet, lifestyle, and recovery, reflecting a holistic approach to patient wellbeing.
- This emphasis on counselling and post-procedure care contributed significantly to their overall positive experience



Such experiences reflect the hospital's commitment to smooth, supportive, and patient-friendly entry processes. In addition, the patients confirmed that the staff helped them understand the overall treatment process. This comprehensive support ensures that patients remain confident and fully aware of each step of their care. The hospital also extends assistance beyond clinical procedures.

Post-treatment follow-ups

100% of the beneficiaries received follow-up support, ensuring consistent monitoring during recovery.



The follow-up mechanism demonstrates strong continuity of care, with a tailored approach that adapts to individual clinical needs. The duration of follow-ups varied accordingly, with **54% of patients receiving follow-ups for 15 days and 44% for 30 days**. This personalized outreach strategy ensures that patients receive the necessary support and guidance based on their progress.

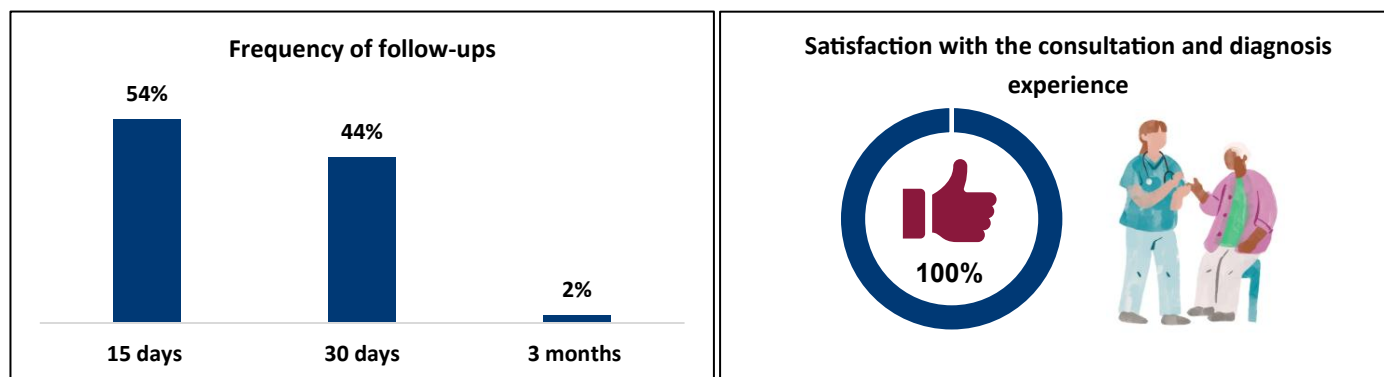


Figure 7: Frequency of follow-ups and satisfaction of beneficiaries with the support provided

“Ongoing follow-up with patients after radiotherapy sessions is vital, as it helps monitor recovery from immediate side effects like skin irritation and fatigue, while enabling early detection of delayed issues such as fibrosis or secondary cancers. These regular check-ups facilitate prompt intervention for potential recurrences.”- Doctor

Engagement levels were equally encouraging, with **100% of respondents stating that they responded to and engaged with these follow-up interactions.** This reflects both effective communication from the hospital and a high level of patient cooperation.

- During these follow-ups, patients receive reminders and support to ensure they stay on track with their treatment plans. Specifically, if patients do not complete their scheduled simulations within the stipulated timeframe, the hospital proactively sends follow-up reminders to encourage timely completion.
- In addition to reminders, the hospital also provides guidance on financial assistance to patients as needed. This include helping patients access resources to cover the costs of their treatment, connecting them with different NGOs, or providing educational materials to support their understanding of their condition and treatment plan.
- Furthermore, patients also receive support to ensure they are taking their medications correctly and following the necessary processes. This includes clear instructions on medication management, as well as monitoring and adjustments to their treatment plan as needed.

“Follow ups aren’t just meant to ask the side effects of the treatment. This is also a means to offer crucial emotional support, alleviating patient concerns and enhancing quality of life by addressing radiation-specific challenges like breathing difficulties, hair loss, cognitive impairment, seizures etc.”- Nurse

Impact of the intervention

KMBL's intervention at MPMMCC Hospital had a positive impact on patients' health outcomes, financial protection and ability to navigate the healthcare system.

❖ Improved healthcare access and timely recovery

The intervention has substantially improved beneficiaries' access to timely and high-quality cancer care. The installation of the CT simulator ensured smoother planning and reduced delays in radiation therapy, enabling patients to progress through their treatment cycles without interruption. The CT simulator provided by KMBL facilitated treatment planning for about **1,947 patients**, significantly enhancing access to timely and high-quality cancer care.

The impact of this intervention extends beyond the local community, as patients from a wide geographic area have benefited from these enhanced services. Individuals traveled **from nearby states, including Jharkhand and Bihar, as well as cities such as Ayodhya, Mirzapur, and Gazipur**, to access the hospital's cancer care services. This highlights the criticality of the services provided, which have become a vital resource for patients across the region.

❖ Enhanced Health Outcomes and Functional Recovery

The intervention has translated into clear, measurable improvements in patient health and day-to-day functioning. Feedback from beneficiaries indicates that **98% were able to receive their radiation therapy cycles on time**, reflecting smoother scheduling and reduced delays in initiating or continuing treatment. This timely access has contributed to a marked improvement in overall health status, as patients benefited from accurately planned radiotherapy delivered as per protocol.

Patients and caregivers also reported strong gains in physical resilience and quality of life. All respondents highlighted that beneficiaries had regained physical strength compared to their pre support condition, while **96% affirmed that they were able to access better quality treatment owing to the intervention**. Importantly, **98% of respondents felt that the support had increased the beneficiary's chances of recovery**, instilling higher confidence in treatment outcomes.



100% patients had regained their physical strength compared to their condition before receiving support.

98% of respondents noted an improvement in the beneficiary's ability to carry out daily activities such as mobility, managing pain, performing basic self-care and handling simple household tasks.

These clinical improvements are mirrored in patients' functional recovery. Nearly all respondents (98%) noted a **positive change in the beneficiary's ability to carry out everyday activities** such as moving independently, managing pain, performing basic self-care, and handling simple household tasks. This enhancement in daily functioning demonstrates that the intervention is not only improving disease management but also enabling patients to regain independence and resume routine roles within their families and communities.

For cancer patients, improvements in everyday functioning are as critical as clinical outcomes because they directly determine how "livable" life is during and after treatment. The ability to move independently, manage pain, perform basic self-care, and handle simple household tasks indicates that treatment is not only controlling the disease but also preserving dignity, autonomy, and psychosocial well-being.

These capacities reduce caregiver burden, enable patients to participate in family and economic roles to the extent possible, and lower the risk of depression, social isolation, and treatment discontinuation. In an impact assessment, therefore, tracking functional independence alongside survival and symptom control provides a more holistic picture of whether the intervention is truly restoring quality of life for beneficiaries facing a long and demanding cancer journey.

❖ Strengthened Financial Protection

The intervention has played a pivotal role in easing the financial strain typically associated with cancer treatment. **A substantial 94% of respondents reported that their financial burden has reduced as a result of the support provided.** This strong majority highlights the effectiveness of the intervention in lowering out-of-pocket expenses and making essential treatment more affordable for families already coping with illness.

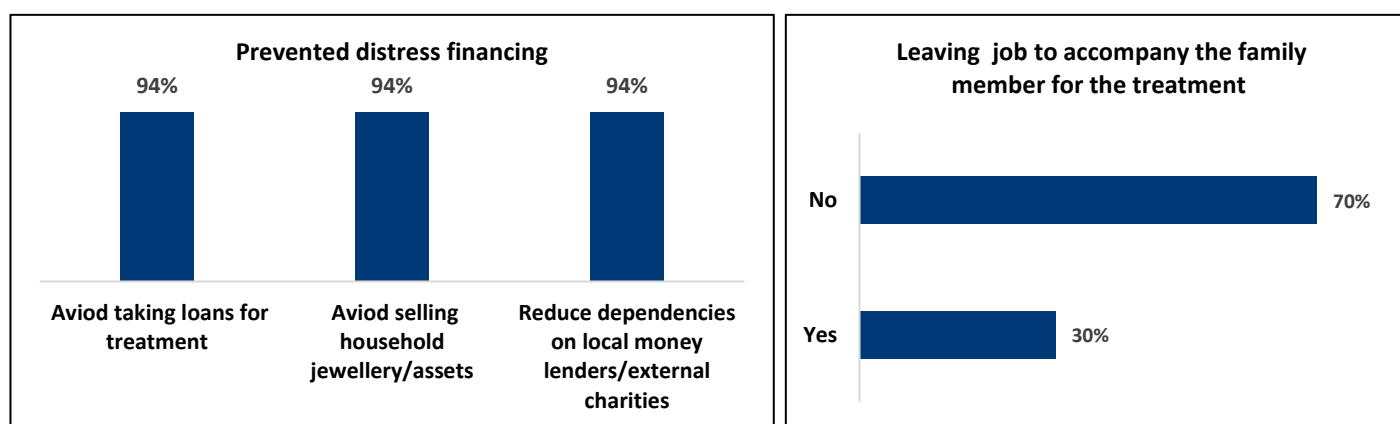


Figure 8: Reduction in the financial burden of the beneficiaries

The program also contributed to protecting household income. **70% of respondents did not have to leave their jobs to accompany the beneficiary for treatment, indicating that streamlined processes, predictable appointments and improved hospital management systems reduced the need for extended absence from work.** This stability has been essential in helping households maintain regular earnings during the treatment period. For the remaining 30% of respondents who had to discontinue their employment, the primary reason was the precarious nature of the patient's illness and treatment. Their role as the primary caregiver required considerable time and attention, compelling them to leave their jobs to attend to the patient's needs.

Additionally, the intervention significantly reduced the need for families to rely on distress financing. A remarkable **94% avoided taking loans, 94% did not have to sell household assets or jewelry, and 94% did not depend on local moneylenders or external charities to meet treatment costs.** These findings underscore the program's success in helping beneficiaries avoid high-risk borrowing and long-term financial vulnerability.

An overwhelming **98% of respondents were able to use their savings for essential household needs—such as food, rent and other daily expenditures**—due to the decrease in out-of-pocket expenses. This demonstrates that the intervention not only lowered medical spending but also enabled families to maintain stability in their day-to-day living conditions.

To understand the depth of the financial protection offered through this intervention, two comparative analyses were undertaken: (i) a within hospital comparison assessing how General and Subsidized (NC) patients benefit relative to Private-category patients, and (2) a cross-hospital comparison, evaluating the cost advantage of MPMMCC over a typical private hospital in Uttar Pradesh.

Key analytical assumptions

To ensure consistency and clarity in the financial analysis presented across both scenarios, the following analytical assumptions were applied:

1. **Full-course Radiotherapy Costs:** All treatment prices (**IMRT/IGRT and 3D-CRT**) were considered for the entire course of radiotherapy, rather than on a per-fraction basis. This approach allowed for a more accurate representation of the total financial burden faced by patients.
2. **Approximate Private Hospital Charges:** For the comparative analysis with a private hospital in Uttar Pradesh, the costs used (**INR 2,50,000 for IMRT and INR 1,50,000 for 3D-CRT**) were treated as approximate benchmark values. These figures were selected based on typical pricing trends reported for private oncology centers in Uttar Pradesh.
3. **Uniform Treatment Modality Assumption:** All patients in the comparison were assumed to undergo a standard full-course protocol of IMRT/IGRT or 3D-CRT, without variation in technique, number of sessions or ancillary imaging procedures.

4. **Exclusion of Non-Medical Costs:** The cost comparison focuses exclusively on direct medical charges. Non-medical expenses such as travel and accommodation were excluded from the tabulated scenarios to maintain analytical uniformity.

Scenario 1 – Cost Reduction Across Patient Categories Within MPMMCC

Treatment type	Private Category	General Category	NC Category (Subsidized)	Percentage Reduction (General)	Percentage Reduction (NC)
IMRT/IGRT	1,50,000	27,000	200	82%	99.87%
3D-CRT	80,000	20,000	150	75%	99.81%

(All charges mentioned above are in INR)

MPMMCC follows a differentiated pricing structure that significantly lowers the financial burden for General and NC (Subsidized) category patients. Radiotherapy charges decrease sharply from the private rate to the subsidized levels:

- For IMRT/IGRT, the cost drops from **INR 1,50,000 (Private)** to **INR 27,000 (General)** and **INR 200 (NC)**.
- For 3D-CRT, the reduction spans from **INR 80,000 (Private)** to **INR 20,000 (General)** and **INR 150 (NC)**.

These differences translate into substantial cost savings:

- General-category** patients benefit from a **75–82% reduction** in treatment charges.
- NC-category** patients experience near-complete cost elimination, with reductions of **99.8–99.9% across both modalities**. Eligibility for subsidized treatment is determined through a dedicated Medical Social Work (MSW) department, which verifies income certificates and Aadhaar information to identify economically weaker households.

This pricing structure ensures that financially vulnerable families can access essential radiotherapy without risk of catastrophic expenditure.

Additionally, 15-20% of General-category patients receive treatment under Ayushman Bharat Scheme, making their entire radiotherapy procedure free. A dedicated Ayushman counter supports patients in activating their Ayushman cards and entering treatment details into the portal, ensuring full and seamless utilization of entitlements.

Scenario 2 – Financial Advantage Compared to a Private Hospital in Uttar Pradesh

To assess the broader financial impact, MPMCC's charges were compared with those of a typical private hospital in Uttar Pradesh, where radiotherapy costs are substantially higher. Private hospitals generally charge INR 2,50,000 for IMRT and INR 1,50,000 for 3D-CRT, creating a major financial barrier for most families.

Treatment type	Contrafactual hospital charges approx. (UP)	General Category	NC Category (Subsidized)	Percentage Reduction in Cost (General)	Percentage Reduction in Cost (NC)
IMRT/IGRT	250000	27000	200	89%	99.92%
3D-CRT	150000	20000	150	87%	99.90%

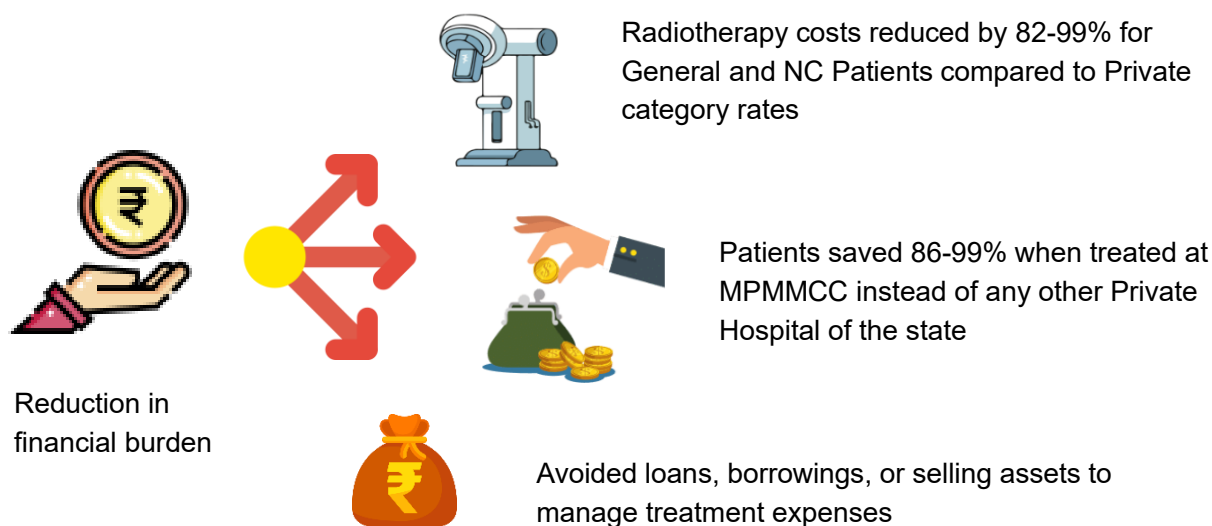
(All charges mentioned above are in INR)

Against this benchmark, MPMCC provides considerable cost savings:

- For IMRT, **General-category patients** save **INR 2,23,000 (89% reduction)**, while **NC-category patients** save **INR 2,49,800 (99.92% reduction)**.
- For 3D-CRT, **General-category patients** save **INR 1,30,000 (86.7% reduction)**, with **NC-category savings** reaching **INR 1,49,850 (99.9% reduction)**.

These findings highlight MPMCC's role in dramatically reducing the financial burden of cancer treatment, especially for the most economically vulnerable groups.

Financial Impact at a Glance:



Capacity optimization and Scalability framework

The CT Simulator machine will serve approximately **6,000 patients annually**, translating into a cumulative beneficiary reach of **60,000 patients over the machine's operational lifespan of 10 years**. Accounting for reputation-driven referral network maturation and operational optimization, total patient impact may extend to an even higher number of beneficiaries, reinforcing the intervention's scale and sustainability within regional oncology care.

Annual Patient Beneficiary Baseline and Cumulative Patient Impact Over Machine Lifespan

- The CT Simulator is currently serving approximately **15-25 patients daily**, which translates to around 6,000 annual beneficiaries.
- The machine is being utilized efficiently, with a daily capacity to serve 15-25 patients across 300 operational days (accounting for maintenance windows, planned downtime, and institutional holidays).
- This represents a meaningful expansion of oncology diagnostic capacity within the hospital's catchment, particularly for lower-income cohorts who would otherwise undertake costly inter-city referrals.

❖ Psychosocial Outcomes for Family Members

The psychosocial experience of families underscores how profoundly a cancer diagnosis destabilises the entire household, with caregiving responsibilities amplifying both emotional and financial strain.

A majority of caregivers entered the treatment journey with considerable emotional challenges. **96% of the families experienced moderate to high emotional strain** before receiving support, highlighting just how heavy the burden felt within the home. In this period, relatives navigated fear of loss, uncertainty about treatment, and rising costs, often feeling that they were carrying the crisis almost entirely on their own.

Research from different settings documents elevated psychological distress, with many caregivers reporting symptoms of anxiety, depression, and post-traumatic stress linked to the uncertainty of prognosis and fear of loss. Caregivers who feel unprepared for complex medical and practical tasks experience greater mood disturbance, including guilt and feelings of inadequacy, which further worsen their mental health.

- *Psychosocial Aspects of Caregiving: Perceptions of Cancer Patients and Family Care Givers, National Library of Medicine*

Radiotherapy emerged as a critical turning point in this otherwise overwhelming journey. As a core component of cancer care, its timely availability signalled that the patient was finally receiving definitive, high-value treatment rather than ad hoc or fragmented support. Once radiotherapy was facilitated, families

reported a marked easing of mental pressure: **98% of respondents still acknowledged physical exhaustion, but this exhaustion was now framed within a clearer, more structured care pathway that reduced their sense of chaos and helplessness.**

*These shifts are reflected powerfully in the reported psychosocial outcomes. An overwhelming **100% of caregivers reported feeling more hopeful about the patient's recovery after radiotherapy access was ensured, with a parallel 100% indicating moderate to high positive effects on sleep, stress and overall emotional state.** In narrative terms, households moved from an acute phase of fear and uncertainty to a more grounded, "we are finally doing everything possible" mindset that brought emotional steadiness back into the family environment.*

"Instead of feeling trapped in an endless, uncertain struggle, they could anchor their energy around scheduled radiotherapy sessions, predictable follow ups and clearer communication with clinicians, which collectively reduced feelings of isolation and panic."- Attendant



100% of respondents noted that they would recommend the program to other families in need, indicating both trust and perceived value.

SWOT Analysis

SWOT analysis is a strategic planning technique used to identify and evaluate the strengths, weaknesses, opportunities, and threats of an initiative. It is a framework that helps to assess the internal and external factors that can affect the impact and sustainability of a programme. It helps in identifying potential risks and developing effective strategies for making informed decisions to enhance the impact and sustainability of the program. It also supports streamlining the monitoring and evaluation process and improving accountability



STRENGTHS

- Enhanced access to timely and high-quality radiation therapy through installation of the CT Simulator.
- Improved treatment planning and reduced waiting time, improving overall care efficiency
- Substantial reduction in financial burden, preventing loans, asset sales and high-out of pocket expenditure.
- Strengthened infrastructure capacity, digital systems, billing transparency and staff responsiveness.

WEAKNESSES

- Minor operational delays due to staff learning curves with new digital systems
- Limited community engagement mechanisms for feedback.

OPPORTUNITIES

- Expand psychosocial counselling and caregiver support services to address mental health needs.
- Further enhance diagnostic and treatment capacity by integrating additional advanced technologies
- Strengthen follow-up care and health record management
- Regular training and development for hospital staff

THREATS

- Management and maintenance of equipment
- Equipment downtime or technical failures, potentially disrupting service delivery.
- Increasing patient load could strain CT Simulator capacity and hospital resources in the long term

Case Studies

Patient's Name - Pramila Kumari*

Disease identified – Breast Cancer (Stage 1)

Pramila Kumari, a resident of Bihar, was diagnosed with breast cancer at the age of 53. Her family, which consists of six members, was struggling to cope with the financial burden of her treatment.

Pramila's journey with cancer treatment was challenging. She was initially treated at a private hospital, but the costs were exorbitant, and she had to be referred to another hospital. The process of getting diagnosed and treated was tedious, and she had to visit multiple hospitals before enrolling with MPMMCC hospital.

However, her experience at MPMMCC hospital was a game-changer. The hospital's staff were knowledgeable and supportive, and the facilities were clean and hygienic. Pramila was impressed by the doctor's consultation experience. The hospital's diagnostic services and equipment were also satisfactory, and she received adequate help and support throughout her treatment.

Pramila availed radiation therapy services at the hospital, which significantly improved her health status. She attended 4 sessions of targeted radiation therapy and noticed a considerable improvement in her physical strength and ability to perform daily activities.

The support from MPMMCC hospital has had a profound impact on Pramila's life. She is now more hopeful about her recovery and is grateful for the hospital's affordable prices. Her monthly medical expenses have reduced significantly, and she is able to manage her household budget better. Pramila has already recommended the hospital to her friends and family and looks forward to continuing to receive quality care from the hospital in the future.

The program has also helped Pramila connect with government health schemes, which has been beneficial in her journey. She feels more capable of navigating the health system for her family now than before and is satisfied with the hospital's services. Pramila's story is a testament to the impact that MPMMCC hospital had on her life, and she is grateful for the support she received during her difficult times.

Patient's Name – Aniket Singh*

Disease identified – Brain Tumor (Stage 2)

Aniket Singh, a resident of Garna village in Bihar, was diagnosed with a brain tumor at the age of 52. His family, which consists of eight members, was struggling to cope with the financial burden of his treatment. Aniket's primary occupation is a private job, and his monthly income is INR 20,000 - 30,000.

Aniket's journey with cancer treatment was challenging. He was initially treated at a local government hospital, where he underwent CT simulation and radiotherapy. However, he faced difficulties in accessing quality care due to the lack of proper treatment facilities. He was referred to MPMMCC hospital by a doctor, which marked a significant turning point in his treatment journey.

At MPMMCC hospital, Aniket received excellent care and support. The hospital's staff were knowledgeable and friendly, and the facilities were clean and hygienic. Aniket was impressed by the doctor's consultation experience and the hospital's diagnostic services and equipment and received adequate help and support throughout his treatment.

Aniket availed radiation therapy services at the hospital, which significantly improved his health status. He attended 10 sessions of targeted radiation therapy and noticed a considerable improvement in his physical strength and ability to perform daily activities. The program has helped him avoid taking loans for treatment and reduced his financial burden.

The support from MPMMCC hospital has had a profound impact on Aniket's life. He is now more hopeful about his recovery and is grateful for the hospital's affordable prices. His monthly medical expenses have reduced significantly, and he is able to manage his household budget better. Aniket has already recommended the hospital to his friends and family and looks forward to continuing to receive quality care from the hospital in the future.

The program has also helped Aniket connect with government health schemes and other NGO/hospital support, which has been beneficial in his journey. He feels more capable of navigating the health system for his family now than before and is satisfied with the hospital's services.

Patient's Name – Savita Yadav*

Disease identified – Brain Tumor (Stage 2)

Savita Yadav, a resident of Gorakhpur, Uttar Pradesh, was diagnosed with head and neck cancer at the age of 40. Her family, which consists of three members, was struggling to cope with the financial burden of her treatment. Savita's husband, who is the primary earner of the family, has a monthly income of Rs. 10,000 - 20,000.

Savita's journey through cancer treatment was challenging. Initially referred by a local medical professional, she was not undergoing any treatment before coming to MPMMCC Hospital. She describes her experience as positive, noting that the hospital staff were knowledgeable, supportive, and courteous. She was impressed with the doctor's consultation, the hospital's diagnostic services, and the availability of necessary equipment. She received adequate help and support throughout her treatment.

Savita attended 20 sessions of targeted radiation therapy at the hospital, which significantly improved her health. She reports a major reduction in fatigue, sleep issues, and stress/anxiety after receiving this support. Her physical strength has increased, and she is now able to manage daily activities more easily. Savita also feels more hopeful about her recovery and is grateful for the improvements in her overall health.

The program has played a crucial role in easing the financial impact of her treatment. With the hospital's support, her medical expenses have reduced considerably, helping her manage her household budget better. She has already seen improvements in her financial condition and is thankful for the assistance provided. Additionally, the program has enabled Savita to connect with other government health schemes and NGO-supported initiatives that have further benefited her. She is satisfied with the support received from the hospital and feels confident about continuing her treatment. Her family, too, is supportive of her progress, and she looks forward to maintaining good health in the future.

Stakeholders Speak

Dr Jhansi, MPM MCC Hospital

Experience: 8 years, including 5-6 years at MPM MCC

Dr. Jhansi, a seasoned medical professional with 2.5 years of experience in healthcare administration, serves as a Doctor at Mahamana Pandit Madan Mohan Malaviya Cancer Hospital. With a strong background in cancer care, she has been instrumental in shaping the hospital's radiation oncology services. Her expertise and leadership have significantly impacted patient care and outcomes. Dr. Jhansi's commitment to delivering high-quality care has earned her recognition within the medical community.

Background and Infrastructure Upgrades: The Mahamana Pandit Madan Mohan Malaviya Cancer Hospital, a major cancer referral center for Eastern Uttar Pradesh, has recently upgraded its infrastructure with the installation of a high-end CT Simulator, treatment planning software, patient immobilization systems, and facility modifications through KMBL's CSR funding. The hospital receives 100-250 cancer patients daily, with 25-50 new cancer registrations. The CT Simulator has significantly expanded the hospital's precision-planning capability, allowing for advanced techniques such as IMRT and VMAT with greater confidence.

Service Delivery and Patient Care: The hospital ensures affordability for radiation services through a combination of government insurance schemes, concessional tariffs, and CSR-supported subsidies. Radiation therapy charges are substantially lower compared to private centers, often 50% below market rates. Around 70% of radiation therapy patients receive subsidized care, and a large segment qualifies for zero-cost treatment through Ayushman Bharat and CSR-funded pathways. The hospital promotes awareness of affordable treatment options through local PHCs and CHCs, ASHA workers, hospital counsellors, and IEC materials in regional languages.

Operational Efficiency and Impact on Patient Outcomes: The CT Simulator has enabled more accurate tumor targeting, lower exposure to healthy tissues, better patient compliance, and quicker initiation of therapy. The hospital has observed higher treatment accuracy, faster planning cycles, and shorter waiting periods for therapy initiation. The simulator has also improved patient flow, with slot-based scheduling and guided case complexity and clinical priority.

Challenges and Recommendations: Dr. Jhansi identifies several challenges, including space redesign for simulator placement, pressure on scheduling due to high patient load, and occasional technical downtime. Financial constraints, particularly for low-income patients, are also a significant challenge. Patient compliance, ensuring patients adhere to complex medication and lifestyle regimens, is an ongoing challenge. To address these, Dr. Jhansi recommends acquiring additional resources, such as advanced EHR/HIS systems, and upgrading the hospital's infrastructure.

Sustainability: Dr. Jhansi emphasizes the importance of continued CSR support to ensure sustainability in precision oncology, support high patient volume, and maintain affordability in an underserved region. If CSR support were discontinued, immediate gaps would emerge, including increased patient treatment costs, extended waiting times, and reduced affordability for poorer families. Continued CSR support is critical as it ensures sustainability in precision oncology, supports high patient volume, and helps maintain affordability in an underserved region, particularly for common cancers such as head & neck, cervical, and breast cancers that dominate the regional case load. The hospital must explore alternative funding options and partnerships to ensure long-term sustainability and continued delivery of high-quality cancer care services.

Dr. Satyajit Pradhan, Director, MPM MCC & HBCH, Varanasi Hospital

Experience: 8 years with the MPM MCC & HBCH, Varanasi Hospital

Dr. Satyajit Pradhan is the Director of the Mahamana Pandit Madan Mohan Malaviya Cancer Hospital (MPM MCC), located in Uttar Pradesh, India. With 8 years of experience in leading the hospital, Dr. Pradhan has been instrumental in shaping the institution's cancer care services. At 48 years old, he brings a wealth of knowledge and expertise in oncology, having dedicated his career to improving cancer treatment and care in the region.

Background and Overview of the Hospital: The Mahamana Pandit Madan Mohan Malaviya Cancer Hospital, under the Tata Memorial Centre (TMC), is a tertiary referral center that provides specialized oncology care to patients from across the region. The hospital plays a critical role in the state's cancer care ecosystem, offering advanced radiation therapy, specialized oncology expertise, and subsidized treatment. With a partnership with TMC, the hospital adheres to national standards and quality benchmarks, ensuring that patients receive high-quality care.

Assessment of Cancer Burden: According to Dr. Pradhan, the cancer burden in the region is significantly high and continues to grow. Uttar Pradesh reports a large number of cases of head and neck, cervical, breast, and gastrointestinal cancers. The high prevalence of tobacco consumption, late detection due to lack of awareness, and limited access to specialist oncology centers contribute to the rising incidence of cancer. Many patients present at advanced stages because primary health centers lack adequate screening facilities, and socioeconomic challenges result in delays in seeking appropriate care.

Impact of CSR Support: The CSR support provided to the hospital has had a significant impact on cancer care delivery in the region. The installation of a CT Simulator has improved access to radiation therapy, allowing for faster and more accurate treatment planning. This has led to better treatment outcomes, reduced side effects, and improved patient confidence. The hospital has also observed an increase in public trust and uptake of cancer services, with patients perceiving the hospital as a credible treatment center.

Challenges and Recommendations: Despite the progress made, Dr. Pradhan highlights several challenges that need attention. These include human resource limitations, high patient volume, and the need for additional diagnostic support. To strengthen cancer care in underserved regions, Dr. Pradhan recommends expanding cancer screening programs, increasing investment in radiation infrastructure and manpower, and strengthening district-level oncology units for early detection. He also suggests that CSR partners support the installation of advanced diagnostic and treatment equipment, fund patient navigation and counselling services, and provide technology upgrades and training programs.

Sustainability: Dr. Pradhan emphasizes the critical role that CSR support plays in sustaining quality and affordability in cancer care. If CSR support were discontinued, gaps would emerge in advanced radiation oncology delivery, including increased costs, longer waiting periods, and reduced reliability of treatment planning systems. To ensure long-term sustainability, Dr. Pradhan recommends aligning CSR activities with government cancer missions, establishing joint monitoring committees, and developing long-term MoUs covering maintenance, capacity-building, and technology upgrades. Continued CSR investment is essential for scaling advanced cancer care across India, filling critical infrastructure gaps, and reducing regional inequalities.

Mr. Neeraj Upadhyay, Technician, MPM MCC

Experience: 6 years with MPM MCC Hospital

Mr. Neeraj Upadhyay is a 35-year-old radiation technician with a Postgraduate degree in Radiation Technology (PG dRT). He has been working at the Mahamana Cancer Hospital in Varanasi for 6 years. With his expertise in radiation technology, Neeraj plays a crucial role in supporting cancer patients and working with the oncology team to deliver high-quality care.

Background and Clinical Process: Neeraj identifies cancer patients who may benefit from support under the KMBL-TMC Healthcare project based on clinical evaluation, disease staging, tumor complexity, and the need for advanced radiation planning. He finds the support for diagnostics, radiation therapy sessions, and medication procurement to be timely and appropriate, allowing for efficient treatment planning and reducing waiting periods. The hospital's clinical process involves a combination of simulation, contouring, and treatment planning, which Neeraj believes is streamlined and effective.

Collaboration and Training: Neeraj reports clear and efficient communication lines between radiation oncology teams, TMC officials, and KMBL officials. He interacts with patient family members frequently, educating them about treatment, side effects, and adherence. The program staff are adequately trained, and Neeraj conducts training for radiologists to handle the CT Simulator. He believes that better digital integration

of patient records, synchronized scheduling systems, and regular multi-department coordination meetings would minimize delays.

Impact of CT Simulator: The addition of the CT Simulator machine has significantly improved the management of cases, providing high-resolution images essential for precise contouring and reducing radiation exposure to surrounding healthy tissues. The machine handles approximately 15-25 cases per day, varying with case complexity and staffing. Neeraj has observed improvements in patient adherence, understanding of therapy, and reduced dropouts due to systematic follow-up and counselling mechanisms. The CT Simulator has enabled the hospital to provide advanced radiation planning at minimal cost, ensuring that financially vulnerable patients receive high-quality care.

Challenges and Recommendations: Despite the positive impact of the CT Simulator, Neeraj highlights several challenges, including treatment duration and waiting periods, limited accessibility for patients with mobility issues, and the need for additional diagnostic equipment and patient education resources. He recommends providing wheelchairs and display systems in the hospital campus, allotting wheelchairs for patients outside the hospital campus, and providing audio devices for patients and caregivers. Neeraj also suggests offering free transportation for cancer patients, establishing a pass office for cancer patients to avail transport facilities, and providing accommodation at low costs.

Sustainability: To ensure the long-term sustainability of the project, Neeraj emphasizes the need for continued support and upgrades to diagnostic infrastructure. He recommends increasing staff capacity, integrating digital systems, expanding awareness programs, and maintaining long-term maintenance commitments for equipment. Neeraj believes that addressing underserved communities requires a multi-faceted approach, including community outreach, transportation assistance, and awareness programs. By working together, the hospital and its partners can ensure that cancer care delivery continues to improve, and that vulnerable populations receive the care they need.

Alignment with OECD DAC Framework

Evaluation Dimension	Focus Areas
Relevance	TMC's Mahamana Pandit Madan Mohan Malaviya Cancer Hospital (MPMMCC) donation closes a critical diagnostic gap, enabling more accurate and timely cancer treatment. The CT simulator provides precise 3D images essential for radiation planning, directly improving quality of care for cancer patients and supporting India's NCD and healthcare infrastructure goals.
Coherence	The initiative aligns with KMBL's CSR strategy, government health priorities, and community needs, supporting India's National Health Policy 2017 and SDG 3, while ensuring a coordinated response through integration with complementary services in healthcare, education and social protection, ensuring a coordinated response for beneficiaries.
Effectiveness	The initiative's effectiveness is evident from its impact on patients and the hospital. The CT simulator has strengthened MPMMCC's diagnostic capacity, enabling more accurate diagnosis and treatment planning, and serving around 2,000 additional patients annually, many from marginalized communities.
Efficiency	The initiative used resources efficiently, with the CT simulator procured through a transparent, competitive process and installed within planned timelines and budget. Regular monitoring and the use of digital tools have streamlined implementation, enabling timely services and responsive support for patients.
Impact	The CT simulator has significantly improved patients' quality of life by enhancing cancer diagnosis and treatment outcomes and expanding access to quality care in the region. By making high-cost diagnostics available in-house, the initiative reduces inequality and structural barriers, while strengthening the hospital's services and KMBL's social responsibility credentials.
Sustainability	The program's sustainability is ensured through partnerships with reputable organizations, capacity building of hospital staff, regular monitoring and evaluation, and potential revenue generation for self-sufficiency.

Alignment with SDGs

SDG 1: No Poverty

By providing a very expensive test at low or no cost, the initiative protects low-income families from catastrophic medical spending and helps them avoid falling deeper into poverty because of a health shock.

SDG 3: Good Health and Well-being

The CT Simulator has enabled accurate individualized radiotherapy planning, leading to safer treatment delivery, fewer complications and better chances of cure for cancer patients.

SDG 8: Decent Work and Economic Growth

When patients are treated correctly, they are more likely to return to work and remain economically active; the facility also creates skilled jobs for technicians and clinical staff

SDG 9: Industry, innovation and Infrastructure

The TMC Healthcare project in collaboration with KMBL showcases the importance of investing in healthcare infrastructure and leveraging technology to improve health outcomes. The CT Simulator machine is a critical piece of equipment that enables accurate diagnoses and targeted treatments. By investing in this technology, the project contributes to the development of a robust and sustainable healthcare system that can provide quality services to all, ultimately supporting the achievement of SDG 9.

SDG 10: Reduced Inequalities

The hospital's pricing strategy is intentionally structured to be inclusive, offering free diagnosis and treatment to economically disadvantaged groups, thereby ensuring that access to quality care is not limited by financial means or social standing, and is instead available to all, regardless of income or background. By bridging the gap in healthcare access, the project promotes equal opportunities for all, regardless of socio-economic status. This focus on reducing health inequities and promoting social justice is essential for achieving SDG 10 and creating a more equitable society.

SDG 17: Partnerships for the Goals

KMBL's CSR initiatives have leveraged private capital to finance this project, demonstrating a strategic approach to addressing healthcare gaps and enhancing access to quality healthcare infrastructure in underserved areas.

Recommendations and Way forward

The KMBL-TMC Healthcare project has made significant strides in [enhancing access to affordable and high-quality cancer care](#) for patients in Varanasi, Uttar Pradesh. The project's impact is evident in [improved health outcomes, reduced financial burden, and increased patient satisfaction](#). The installation of the CT Simulator has ¹. The project's focus on subsidized diagnostics, government scheme integration, and patient-centered care has ensured that patients from diverse socio-economic backgrounds can access comprehensive cancer care.

The project's success is also reflected in the high levels of satisfaction among patients and caregivers, who appreciate the hospital's commitment to providing accessible, trustworthy, and efficient care. The project's impact on out-of-pocket expenditure and medical poverty risk has been substantial, with patients reporting reduced financial strain and increased financial resilience.

Recommendations

❖ Strengthen early diagnosis and navigation

- Establish a structured ["Cancer Navigation & Survivorship Program"](#) where trained navigators guide patients from first suspicion through diagnosis, treatment planning, financial counselling, and long term follow up, with special focus on women and low income patients who often delay care.
- Integrate [systematic screening camps](#) in surrounding blocks (breast, cervical, oral cancers) with fast-track referral pathways to the hospital's imaging and radiotherapy services so that suspected cases get scanned, staged, and treated without multiple visits or loss to follow up.

❖ Extend reach through digital oncology

- Launch a [digital health literacy initiative](#) (apps, IVR, WhatsApp based messages) providing simple explainer videos and reminders on scan preparation, side effect management, nutrition, and follow up schedules so that patients and caregivers can confidently navigate complex cancer regimens from their villages.

❖ Build caregiver support system

- Support a [structured caregiver support programme](#) at the hospital that offers group counselling, stress management sessions and peer support circles for relatives accompanying patients, with special slots during radiotherapy and chemotherapy OPD timings

Annexure

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Abbreviations

KMBL	Kotak Mahindra Bank Limited
MPMMCC	Mahamana Pandit Madan Mohan Malaviya Cancer Center
TMC	Tata Memorial Center
HBCH	Homi Bhabha Cancer Hospital
ToC	Theory of Change
WHO	World Health Organisation
MoHFW	Ministry of Health and Family Welfare
PHC	Primary HealthCare Centre
HWC	Health and Wellness Centres
HIS	Hospital Information System

About the TMC HealthCare Project

About Tata Memorial Centre (TMC)

The alarming prognosis of increase in cancer incidence underscores how ill-prepared Indian public health systems are to tackle terminal illness at a mammoth scale – in terms of detection, treatment, disease management and care⁶.

Tata Memorial Centre, Mumbai is the foremost institution in cancer care in the country. It was set up in 1941 and is an autonomous, grant-in aid institution under the Department of Atomic Energy, Government of India. The TMC umbrella includes 10 cancer institutes across India, namely,

- Tata Memorial Hospital, Parel, Mumbai
- ACTREC, Kharghar, Navi Mumbai
- Centre for Cancer Epidemiology (CCE), Kharghar, Navi Mumbai
- Homi Bhabha Cancer Hospital and Research Centre (HBCH&RC), Visakhapatnam, Andhra Pradesh
- Homi Bhabha Cancer Hospital (HBCH), Sangrur, Punjab
- Homi Bhabha Cancer Hospital and Research Centre (HBCH&RC), Mullanpur, Punjab
- Dr. Bhupaneswar Borooah Cancer Institute (BBCI), Guwahati, Assam
- Homi Bhabha Cancer Hospital (HBCH), Varanasi, Uttar Pradesh
- Mahamana Pandit Madan Mohan Malaviya Cancer Centre (MPMMCC), Varanasi, Uttar Pradesh
- Homi Bhabha Cancer Hospital & Research Centre (HBCH & RC), Muzaffarpur, Bihar

About Mahamana Pandit Madan Mohan Malaviya Cancer Centre (MPMMCC) and Homi Bhabha Cancer Hospital (HBCH), Varanasi, Uttar Pradesh

The Homi Bhabha Cancer Hospital (HBCH) in Lahartara (179 beds) and the Mahamana Pandit Madan Mohan Malaviya Cancer Centre (MPMMCC) in Sundar Bagiya, BHU Campus, Varanasi (352 beds), are two state-of-the-art cancer hospitals that are twin units of the Tata Memorial Centre (TMC), Mumbai. They together aim to provide comprehensive cancer care to the people of Eastern Uttar Pradesh, Western Bihar, and neighboring states such as Chhattisgarh, Jharkhand, and Madhya Pradesh.

⁶ National Cancer Registry Program, India



**Mahamana Pandit Madan Mohan
Malaviya Cancer Centre**



Homi Bhabha Cancer Hospital

The two hospitals work in tandem, sharing staff and administrative resources, to offer a wide range of services that cater to the diverse needs of cancer patients. With a vast catchment area spanning across several states, including Bihar, Chhattisgarh, West Bengal, Madhya Pradesh, Jharkhand, and Uttar Pradesh, where more than 50% of the patients are from Uttar Pradesh, the hospitals strive to deliver affordable and accessible cancer care to the people of Purvanchal and beyond.

Equipped with cutting-edge facilities, the hospitals provide specialized care in Radiation Oncology, Surgical Oncology, and Medical Oncology. Additionally, they boast advanced diagnostic facilities in various specialties, including Biochemistry, Haemato-pathology, Histopathology, Cytopathology, Microbiology, Radio-diagnosis, and Nuclear Medicine. The hospitals also offer services in Preventive Oncology, Palliative Medicine, and Transfusion Medicine, ensuring a holistic approach to cancer care.

The hospitals have a significant patient load, with 25-30 new cancer registrations happening daily, out of which 10-15% of patients receive subsidized treatments. The minimum number of radiotherapy sessions depends on the type of treatment, with patients undergoing curative treatment typically receiving 20-30 radiotherapy sessions, while palliative cases require far fewer, usually 1-10 sessions. For a similar test, the charges for radiotherapy range from INR 75,000-200,000 in the private sector, while the Mahamana Pandit Madan Mohan Malaviya Cancer Centre (MPMMCC) hospital keeps the charges subsidized, with some patients receiving free treatments as well.

The hospital's department reviews the financial situation of patients and waives fees accordingly, making treatment accessible to those who need it most. In fact, radiation services at the hospital cost a fraction of private-sector prices, often 60-80% lower, making treatment accessible for the poorer sections of society. The fees charged for CT Simulation and Radiation costs depend on the subsidies received by the patients.

Kotak Mahindra Bank Limited's support to Mahamana Pandit Madan Mohan Malaviya Cancer Centre (MPMMCC), Varanasi, and Homi Bhabha Cancer Hospital (HBCH), Varanasi, Uttar Pradesh

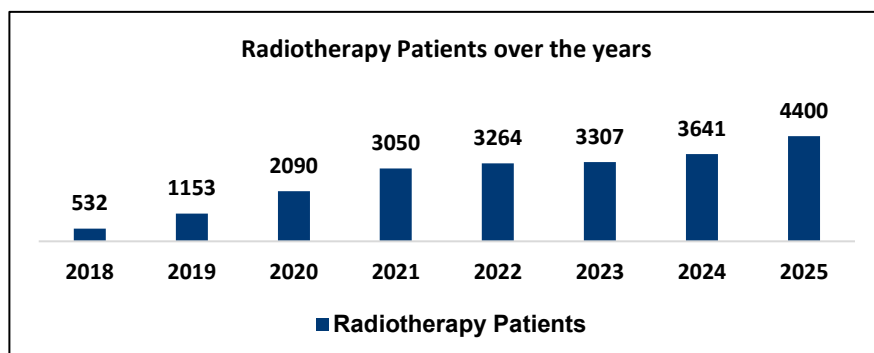
In March 2024, Kotak Mahindra Bank Limited (KMBL) signed a MoU with TMC to cover the cost of procurement and installation of a CT Simulator machine costing INR 6.40 crore for the Department of Radiation Oncology (MPMMCC & HBCH) to facilitate faster handling of patients requiring radiotherapy, thereby reducing wait time and improving treatment outcomes. The CT Simulator machine was set up with the assistance of a KMBL identified vendor, who provided training on how to use the machine and the conditions to be maintained. Additionally, the hospital's doctors also provided regular training on the machine's operation and usage.

A CT Simulator is a real-time, CT-linked, 3D Treatment Planning Equipment. It consists of a CT Scanner, and includes a multi-image display, a treatment planning device that has real-time visual optimization and a laser beam projector. CT simulator plays a very essential role in treatment planning as well as providing vital anatomical and spatial data for dose calculations and corrections. A CT simulation procedure is a process that's performed before a radiotherapy treatment to determine the size, shape, and location of a tumor. A radiotherapy team and oncologist can then plan a custom-made treatment for a patient.

Department of Radiation Oncology, MPMMCC & HBCH, Varanasi

The Department of Radiation Oncology was established in August 2018 with a legacy Theratron 780c Cobalt Teletherapy machine inherited from the former railway cancer hospital. Since then, the department has experienced remarkable growth, with a team of 11 Radiation Oncology faculty members, 12 senior residents, 11 Medical Physicists, and 28 technical officers. The department is now equipped with six advanced linear accelerators (4 Truebeam High end Linear Accelerators, 2 Halcyon Ring Gantry Accelerators) with cutting-edge technologies, a CT Simulator, and Brachytherapy facilities, enabling the delivery of sophisticated treatments such as IMRT, Rapid Arc, IGRT, large field treatment, and SBRT/SRT. Currently, the department offers a wide range of care services to patients.

- High precision 3D-CRT, IMRT, IGRT, Rapid Arc teletherapy and Electron beam therapy with FFF linear accelerator TrueBeam Version 3.0 and ECLIPSE version 18.0.
- A CT Simulator with 32-slice CT.
- Day-care and Inpatient facilities
- Brachytherapy including: intra-cavitary, intra-luminal, interstitial & mould therapy using an Elekta Flexitron Cobalt-60 brachytherapy unit. Frameless SRT/SBRT teletherapy.
- Large field irradiation



The department offers both day care and inpatient facilities. The number of patients receiving radiotherapy has increased significantly, from 532 in 2018 to 4400 in 2025. The department is currently treating over 340-350 patients daily and around 300 cases being processed for treatment.

CT Simulator Utilization and Hospital Performance

The department uses one CT Simulator to perform an average of 20-25 external beam radiotherapy planning CT scans per day and 3-4 brachytherapy planning simulations per day. In just over 5 years, the two hospitals have registered many patients:

New patients	In-patient admissions	Patients received radiotherapy	Major surgeries	Radiological Investigations	Bio-imaging procedures
94,121	66,945	12,502	16,554	245,962	34,688

Atomic Energy Regulatory Board (AERB) Registration and Radiation Safety Measures and Staff Training

The AERB License for Use of CT simulator has been in place. Only after the approval, clinical use of simulator was initiated. To ensure radiation safety, all medical staff members, including radiation technologists, radiation physicists, and doctors assigned to the CT simulator, wear TLD (Thermoluminescent Dosimeter) badges for radiation monitoring. Additionally, these staff members have undergone comprehensive training on the safe use of the CT simulator and emergency procedures, provided by the institute's Radiation Safety Officer and engineers from the CT simulator company. This training enables them to handle emergency situations effectively and safely operate the CT simulator.

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