(ISSN: 0973-7049(P))

The Bioscan
AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES

21(3): S.I (3), 1517-1531, 2026

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# Rising Cancer Burden and Radiotherapy Infrastructure Gaps in Karnataka: "Trends, Challenges, and Policy Imperatives, 2025-26"

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DOI: https://doi.org/10.63001/tbs.2026.v21.i03.S.I(3).pp1517-1531

Keywords:

*Cancer Incidence, Cancer burden, Radiotherapy, ATMR, Karnataka*

**Received on:** **28-07-2026**
**Accepted on:** **15-08-2026**
**Published on:** **05-09-2026**

**Abstract**

Non-Communicable Diseases (NCDs) account for 63% of all deaths in India, with cancers alone contributing to 9% of these fatalities. A significant proportion of cancer cases are linked to modifiable behavioral and environmental risk factors such as tobacco and alcohol use, unhealthy diets, physical inactivity, obesity, infections, and air pollution—many of which are preventable. Nearly half of cancer-related deaths can be averted through effective prevention and control strategies. Karnataka is witnessing a steady rise in cancer incidence, positioning the disease as a growing public health challenge. Projections for the period 2024 to 2030 indicate a concerning upward trend in cancer cases, underscoring the need for robust interventions in prevention, early detection and treatment, and healthcare infrastructure. This article analyzes the burden and trends of cancer incidence in Karnataka using data from authoritative sources, including the Atomic Energy Regulatory Board (AERB), Global Cancer Observatory (GCO), and Directory of Radiotherapy Centers (DIRAC). It explores key contributing factors, assesses the current density of radiotherapy machines (RTMs), evaluates the expected treatment machine (ETM) requirements, and highlights regional disparities in access to radiotherapy infrastructure. These findings make a compelling case for sustained and targeted investment in radiotherapy infrastructure, particularly in underserved regions, to ensure equitable and timely access to cancer care across the state of Karnataka.

## Introduction

India is facing a rapidly growing cancer burden. The number of cancer incident cases in the year 2023 was 1,496,972 showing incident rate :105 per 100,000 ( significant number of cancer cases are under reported). The projected incident cases in 2030 is to be 16,66,100 (crude rate:111 per 100,000). It is estimated that one in nine people are likely to develop cancer in their lifetime. The five most common forms of cancer in India in 2022 were: Breast, lip & oral cavity, cervical uteri, lung cancer, esophagus cancer. Oral and Lung cancers are the leading sites in males while breast and cervical cancer are the leading cancer sites among females. In 2022 alone, **1.41 million new cancer cases** and **0.91 million cancer-related deaths** were reported in the country [1].

Radiation Therapy (RT) plays a pivotal role in the multidisciplinary approach to cancer treatment, serving both curative and palliative purposes. Globally, and particularly in India, RT remains integral to achieving positive patient outcomes [2]. It is estimated that among those patients who are cured of cancer, approximately 50% are treated successfully through surgery, around 40% through radiotherapy alone or in combination with surgery and/or chemotherapy, and the remaining 10%

through chemotherapy alone or in combination with other modalities such as surgery or radiotherapy. These statistics underscore the essential nature of radiotherapy in oncological care.

India has made significant strides in expanding RT infrastructure; however, gaps remain in both capacity and equitable distribution. As of recent estimates, the country hosts approximately **533 radiotherapy centers**, which collectively operate around **874 External Beam Radiotherapy (EBRT) machines**. Of these, nearly **700 are Linear Accelerators (LINACs)**, with the remainder comprising **telecobalt machines**. India also possesses several state-of-the-art RT technologies, including **5 functional Gamma Knife units, 7 CyberKnife systems, 8 Tomotherapy machines, 2 Intra-operative Radiotherapy (IORT) systems**, and **3 Proton Therapy centers**[Table 2]. In the domain of Brachytherapy, there are approximately **301 remote afterloading brachytherapy units** distributed across these facilities [3].

Despite these technological advancements, the availability of RT services across India reveals significant regional disparities, particularly between urban and rural settings. Karnataka, a southern Indian state, has a projected population of 68.68 million in 2025, up from 61.1 million in the 2011 Census, making it the ninth most populous state. It comprises 4 revenue divisions, 31 districts, 281 towns, and 7 municipal corporations. Bangalore, the largest urban center, had a population of 8.4 million in 2011, projected to reach 9.6 million by 2025. Cancer care in the state reflects broader healthcare challenges seen across India. While urban centers like Bangalore have advanced radiation therapy (RT) facilities, many rural districts in Karnataka lack basic RT services. This disparity leads to delayed treatment, higher costs, and poorer outcomes for rural patients [4]. Despite an adequate overall number of oncology services, many patients still travel to Bengaluru and other urban cities for care. This study aims to assess the actual need for RT services across Karnataka and identify districts with unmet needs where new RT units could improve access and outcomes.

## Materials and Methods

### Data Collection

This study utilized a comprehensive and multi-source data collection strategy to ensure robustness, accuracy, and contextual relevance. Cancer incidence and burden data were primarily obtained from well-established and authoritative sources, including the **Global Cancer Observatory (GCO)** database and the **Indian Council of Medical Research (ICMR-NCDIR) Report 2016 and Report 2021** [5]. These sources compile high-quality cancer surveillance data through a structured network of **Population-Based Cancer Registries (PBCRs)** and **Hospital-Based Cancer Registries (HBCRs)**, ensuring both population-level and institutional-level representation[6].

To contextualize the cancer burden within the regional framework of Karnataka, data

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were drawn from the **'Report of the National Cancer Registry Programme 2020'** [7]. This report, presented through the Cancer Fact Sheet, provides a detailed epidemiological profile of the region, capturing incidence rates, cancer types, demographic distributions, and longitudinal trends. In addition to cancer-specific data, socio-demographic characteristics and health infrastructure variables were also considered, given their significant influence on cancer occurrence, access to care, and treatment outcomes[8].

Information related to the infrastructure of radiotherapy services was sourced from two key databases. First, data on the annual trends of **Radiotherapy facilities (RFs)** and **Radiotherapy Machines (RTMs)** were extracted from the **Atomic Energy Regulatory Board (AERB)** annual status reports, which offer verified statistics on operational facilities and equipment availability. Second, detailed data on RTMs per institute were obtained from the **International Atomic Energy Agency's (IAEA) Directory of Radiotherapy Centres (DIRAC)** database [9]. This dataset was further cross-verified and refined in consultation with a professional network of radiation oncologists and medical physicists to correct discrepancies and confirm the operational status of listed equipment and centers. Only centers that met the defined criteria for radiation oncology services were included in the study.

Population statistics necessary for normalization and comparative analysis were derived from the **Worldometer** website and **Unique Identification Authority of India (UIDAI)** estimates for the year 2021 [10,11]. These sources provided state-level population figures, age distribution data, and growth trends, essential for estimating cancer burden per capita and resource adequacy metrics.

Collectively, the integration of these diverse and validated datasets provided a robust foundation for subsequent analysis, ensuring that conclusions drawn were both evidence-based and representative of ground realities.

## Cancer Incidence and Trends in Karnataka (2013-2030)

The state of Karnataka has experienced a consistent and significant rise in cancer incidence over the past decade, a trend that is projected to continue into the near future. Based on consolidated registry data and reliable national estimates, the recorded and projected figures from 2013 to 2030 (Table 1) highlight the growing public health challenge posed by cancer in the region[12]

In **2013**, Karnataka reported **71,657** new cancer cases. This number increased steadily each year, reaching **83,824 cases** by **2019**, reflecting a cumulative rise of approximately **17%** over six years. By **2023**, the annual incidence is projected to touch **94,780**, representing a **32% increase** from the 2013 baseline. This upward trajectory continues in the projections, with the cancer incidence expected to reach **108,125 cases by 2030**, amounting to a staggering **50.9% increase** over a 17-year period. This trend underscores the urgent need for strengthening cancer surveillance, expanding diagnostic and treatment infrastructure—especially radiotherapy capacity—and investing in preventive public health measures. The growing incidence also calls for equitable access to care, particularly in underserved and rural populations, to mitigate the rising disease burden[13]

**Scenario of Radiotherapy(RT) machines in India**

Table 2 illustrates the evolving landscape of radiotherapy (RT) equipment in India from 2000 to 2022. A notable shift occurred around 2011–2012, when linear accelerators (linacs) surpassed traditional telecobalt (TC)-based teletherapy machines in prevalence. This marked a significant transition toward more advanced RT technologies.

In 2000, linacs constituted only 12.2% of all RT machines in the country. However, their adoption steadily increased over the years, rising to 43.1% by 2010 and reaching 75.8% by 2022. Conversely, the reliance on TC machines declined consistently during this period, reflecting a broader move toward modernization in RT infrastructure.

In addition to linacs, newer technologies also gained a foothold. Tomotherapy, for example, expanded from representing just 0.7% of machines in 2010 to 3.8% in 2022. Meanwhile, the availability of highly specialized systems like Cyber Knife (CK) and Gamma Knife (GK) remained relatively stable over the past decade [14-15].

These trends underscore a nationwide shift in India's radiotherapy capabilities—favoring precision and efficiency through advanced technologies while gradually phasing out older systems. Notably, this modernization also inclues the recent introduction and slow but steady growth of proton therapy, marking a new frontier in high-precision cancer treatment.

**Distribution of Radiotherapy Infrastructure in Karnataka-2023**

A critical aspect of effective cancer care lies in the equitable distribution and accessibility of radiotherapy (RT) services. In Karnataka, radiotherapy infrastructure remains concentrated in a few urban centers, with significant disparities across districts. Based on the latest available data, the state houses a total of **44 RT facilities(centers)**, equipped with **81 External Beam Radiotherapy (EBRT)** units and has 10% of India's BT units, the **highest proportion among the indicators** but distributed unevenly across 13 key districts (Table 3). BT machines are crucial for treating cervical and other common cancers and hence should be expanded along with EBRT machines.

**Bangalore**, the capital and largest urban hub, accounts for the majority of radiotherapy resources, with **19 RT facilities**, **45 EBRT units**, and **19 BT units**, making it the epicenter of cancer treatment in the state. This centralization underscores the city's dominance in healthcare infrastructure but also highlights the regional imbalance in access.

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Among the tier-two cities, **Mysore** stands out with **5 RT centers**, **7 EBRT machines**, and **2 BT units**, followed closely by **Mangalore** and **Hubli**, which host **4 RT facilities** each. Dakshin Kannada (Mangaluru) is equipped with **7 EBRT** and **3 BT machines**, while Hubli has **6 EBRT** and **2 BT units**, indicating moderate service availability for patients in these regions. (Bangaluru city includes Bangaluru Urban and Bangaluru rural)

Other districts like **Gulbarga** (2 RT centers, 3 EBRT, 1 BT) and **Mandya** (2 RT centers, 2 EBRT, no BT) have some basic infrastructure but still lack comprehensive coverage. In Shivamoga(**Shimoga)**, **Kolar**, and **Bagalkot**, services are minimal, with only 1–2 EBRT machines and sparse or no BT capabilities[16].

A few districts, such as **Bellary**, **Davanagere**, and **Kolar**, report the presence of just **1 RT center** each, with either **1 EBRT machine** or none and **no BT availability**, pointing to critical infrastructure deficits. **Manipal**, despite being a relatively smaller town, is notable for its specialized facilities, with **1 RT center**, **3 EBRT machines**, and **2 BT units**, likely due to the presence of a major academic medical institution (Table 3).

Within the Indian context Karnataka demonstrates relatively strong RT infrastructure, exceeding its population share in most metrics (Table 4). However, given its higher cancer incidence rate and visible urban-rural disparity, the state should continue expanding services in a **data-driven, need-based, and equitable manner**, focusing on underserved regions and upgrading existing RT units.

## Methodology

RT Centers were counted and considered only if they met the defined criteria for radiation therapy services. Population estimation census data of the years 2001 and 2011 were used as a base population, and population estimation for the consecutive years was done by extrapolation method. For each district of Karnataka, cancer cases were estimated by using the estimated population and crude rate from the data KIDWAI memorial institute of oncology, Bengaluru and PCC Kalaburugi,2020-2023. A limitation of the methodology is its assumption of a constant incidence rate across all districts in the future, adopted as a conservative approach. Based on the data, estimated treatment machines for the division wise districts in Karnataka is calculated. Division wise distribution of EBRT machines is being depicted in figure 1. The map illustrates the division-wise distribution of External Beam Radiotherapy (EBRT) facilities in Karnataka in the year 2023. The Bangalore Zone has the highest concentration with 49 EBRT units, followed by the Mysore Zone with 19 units, Belagavi Zone with 8 units, and Kalburugi Zone with only 4 units. The distribution highlights a strong concentration of RT facilities in the southern part of the state, with significantly fewer units in the northern zones.

The basic formula for Estimated Treatment Machines (ETM) for the state of karnataka for the year 2024/25 can be calculated using equation [10]

(ISSN: 0973-7049(P))

The Bioscan
AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES

21(3): S.I (3), 1517-1531, 2026

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ETM=(I×R×F)/ C

Where

I= Annual cancer incidence (number of new cases per year in the population)

R-Proportion of cancer patients requiring cancer treatment (50-65%) depending on guidelines and country

F-**Average number of fractions per patient** (a fraction is one treatment session; often 20–25, but this can vary

C-**Annual machine capacity in fractions** (how many fractions a single machine can deliver per year; often 7,000–10,000 depending on operation hours, staff, and equipment)

Example calculation: if a nation has:

- I=100,000 new cancer cases/year
- R=0.6 (i.e., 60% of patients need radiotherapy)
- F=20 fractions per patient
- C=9,000 fractions delivered per machine per year

Then Estimated Treatment Machines( ETM) =(100000*0.6*20)/9000

**ETM=133**

## Inference

An analysis of cancer incidence and the corresponding requirement of radiotherapy (EBRT) machines in Karnataka (Table 5) demonstrates a clear upward trend in cancer burden. In 2021, the state recorded approximately 87238 new cancer cases requiring **141** RT machines (based on 60% treatment coverage), whereas only **56** machines were available, indicating a shortfall of **83** machines. This gap widened by 2023 with the incidence rising to **90,321**, requiring **149** machines, while the availability increased only slightly from 56 to 81 machines (figure 2). Projections for 2025 further suggest a growing disparity between requirement and availability if proactive investments are not made. The estimated cancer incidence for 2025 is 93,382 demanding **158** RT machines to meet the full treatment load. These findings underscore the urgent requirement for resource planning and infrastructure expansion to ensure equitable access to radiotherapy services across Karnataka.

Several urban centers in Karnataka like Bangalore, Mysuru, Dharwad, Dakshin Kannada, Udupi exhibit a concentration of radiotherapy (RT) machines that either meet or exceed the estimated requirements, indicating a disproportionate clustering of installations in and around urban areas. In contrast, many smaller districts had zero machines, despite requiring 2–4 machines based on their incidence. Disparities persisted or worsened in underserved districts (e.g., Chikkaballapura, Chitradurga, Vijapura) with no machines but growing

(ISSN: 0973-7049(P))

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patient loads. Districts like Bellari, Belagavi have shown very static growth of RT installations. Districts where the existing number of RT machines surpasses the estimated ATMR have been represented as zero in the table to denote no additional requirement

The projected pattern for 2025-2026 reveals that radiotherapy machine installations remain unevenly distributed, lacking alignment with district-level cancer incidence rates. Without the addition of new machines, treatment delays leading to cancer mortality, and extended waiting times are likely to escalate. Urgent action is needed to install at least one machine in underserved districts (60–100% coverage) to guide state oncology planning and government procurement.

## Role of Private and public sectors in Karnataka

Cancer care in Karnataka follows a dual system comprising a dominant private sector and a smaller but essential public sector. The private sector operates approximately **77% of the state's radiotherapy (RT) centers**, mainly concentrated in urban areas such as Bengaluru, Mysuru, and Dharwad. These centers serve insured and affluent patients, offering advanced technologies including **IMRT, VMAT, and CyberKnife**, shorter waiting times, and personalized care. However, high treatment costs limit accessibility for patients without financial support or government insurance such as **Ayushman Bharat**.

In contrast, the public sector operates only about **10 RT centers**, strategically serving low-income and rural populations. These facilities provide free or subsidized treatment but often face overcrowding, outdated machines and techniques, maintenance and resource constraints, resulting in longer waiting times and service delays. Private centers emphasize tertiary care and innovation, while public centers remain central to government-led screening, prevention, and palliative-care programs, often collaborating with primary health centers for rural outreach [17–18]. A coordinated public–private approach is therefore essential to combine private innovation with public reach and ensure equitable oncology care.

## Summary and Conclusion

Karnataka accounts for approximately 8.25% of India's radiotherapy facilities and 9.27% of EBRT machines, reflecting its relatively strong RT infrastructure. However, the distribution within the state remains unequal, with districts and divisions such as Belagavi, Kalaburagi, and Shivamogga having comparatively inadequate services. The distribution of external beam radiotherapy (EBRT) and brachytherapy (BT) facilities in Karnataka demonstrates a significant urban–rural disparity, with a substantial concentration of radiotherapy resources in Bengaluru. This uneven distribution creates geographical, financial, and logistical barriers, particularly for rural, remote, and economically disadvantaged patients, causing treatment delays, interruptions, and loss to follow-up.

A major priority should therefore be the **decentralization of radiotherapy services** to underserved regions. Establishing or strengthening RT facilities in Tier-2 cities and underserved districts can reduce travel distances and improve treatment continuity. Public-private partnerships could support the development and modernization of facilities while improving access to advanced technologies. Tele-radiotherapy and centralized treatment-planning hubs connected with peripheral centers could further improve specialist support and optimize available resources. Simultaneously, investment in training and retention of radiation oncology professionals is essential for sustainable service delivery.

The projected 50.9% increase in cancer incidence in Karnataka between 2013 and 2030 further emphasizes the need for systematic expansion and modernization of radiotherapy services.

Globally accepted norms, including those from the International Atomic Energy Agency (IAEA), recommend one radiotherapy machine per 450 patients requiring treatment annually. However, the actual infrastructure requirements are influenced by various factors, including the demographic profile of the population, regional cancer incidence rates, and the treatment protocols adopted. This study underscores the necessity of localizing such standards to ensure relevance and efficacy in implementation. Human resource development must therefore be a parallel priority alongside physical infrastructure expansion [19-20].

Although the private sector provides advanced technologies, high treatment costs limit accessibility for many patients. Data-driven cancer planning can guide resource allocation using cancer incidence, population, treatment demand, machine capacity, workforce, waiting times, and accessibility. Predictive models can identify future infrastructure needs, prioritize underserved regions, promote earlier diagnosis, improve outcomes, and reduce pressure on advanced-stage cancer services [21].

Karnataka's proactive steps in expanding RT infrastructure serve as a model, but sustained efforts are needed to bridge existing gaps and ensure timely, affordable, and inclusive cancer care for all populations across the state. Addressing these disparities will not only mitigate the rising cancer burden but also align with national goals for health equity and universal healthcare coverage. To address this gap, the National Cancer Control Program has issued guidelines and encouraged both new and existing medical colleges to establish or upgrade oncology departments. However, the high costs associated with setting up a radiation therapy unit often determine the feasibility of developing a comprehensive cancer center[22]. Although Karnataka boasts a strong network of medical colleges—60 out of the 542 in the country are located in the state (MCIIndia.org)—the emphasis on oncology services has remained relatively limited.

Significant urban–rural inequalities persist in Karnataka's RT infrastructure. Addressing these gaps requires coordinated investment in infrastructure, workforce, affordability, technology, and prevention.

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AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES
21(3): S.I (3), 1517-1531, 2026 www.thebioscan.com

**Table 1:Cancer Incidence(CI)and Trends in Karnataka (2013–2030)**

| year | CI | Year | CI | Year | Estimated CI |
|---|---|---|---|---|---|
| 2013 | 71657 | 2019 | 83824 | 2025 | 97004 |
| 2014 | 73619 | 2020 | 85968 | 2026 | 99228 |
| 2015 | 75595 | 2021 | 88126 | 2027 | 101452 |
| 2016 | 77608 | 2022 | 90349 | 2028 | 103677 |
| 2017 | 79626 | 2023 | 92500 | 2029 | 105901 |
| 2018 | 81729 | 2024 | 94780 | 2030 | 108125 |

-------indicates cancer incidence from 2013 to 2024

------- indicates projection in cancer incidence

**Table 2: Depicts various RT equipment trends in India in percentage (2000–2022)**

| RT machines | 2000(in %) | 2010(in %) | 2022 onwards(in %) |
|---|---|---|---|
| Telecobalt | 87.8 | 54 | 18.3 |
| Linac | 12.2 | 43.1 | 75.8 |
| Tomotherapy | nil | 0.7 | 3.8 |
| Cyberknife | nil | 1.8 | 1.2 |
| Gammaknife | nil | 0.4 | 0.8 |
| Proton | nil | nil | 0.1 |

(ISSN: 0973-7049(P))

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**Table 3 showing district wise distribution of RT centers &RT machines in Karnataka in 2023**

| District | RT facilities | EBRT | BT |
|---|---|---|---|
| Bangaluru(Banglore) | 19 | 45 | 19 |
| Belagavi(Belgaum) | 1 | 2 | 1 |
| Bellary | 1 | 1 | 0 |
| Davanagre | 1 | 1 | 0 |
| Kalburugi(Gulbarga) | 2 | 3 | 1 |
| Dharwad-Hubli | 4 | 6 | 2 |
| Kolar | 1 | 1 | 0 |
| Mandya | 2 | 2 | 0 |
| Dakshin Kannada - | 4 | 7 | 3 |
| Udupi-Manipal | 1 | 3 | 2 |
| Mysuru(Mysore) | 5 | 7 | 2 |
| Shivamoga(shimoga) | 2 | 2 | 0 |
| Bagalkot | 1 | 1 | 1 |
| Total | 44 | 81 | 31 |

**Table 4: Status of Radiotherapy Resources in Karnataka(2023)within National Context**

| Attributes | India | Karnataka | Relative proportion % |
|---|---|---|---|
| Population(million) | 1467 | 68.2 | 4.65 |
| NCI | 1,525,163 | 97,004 | 6.36 |
| RT facilities | 533 | 44 | 8.25 |
| EBRT | 874 | 81 | 9.27 |
| BT | 301 | 31 | 10 |
| CTM | 874 | 81 | 9.27 |

NCI- New Cancer Incidence
RT- Radiation Therapy
EBRT- External Beam Radiation Therapy
BT- Brachytherapy
CTM- Current Treatment Machine

(ISSN: 0973-7049(P))

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21(3): S.I (3), 1517-1531, 2026
www.thebioscan.com

**Table 5: Estimated treatment machines for division wise districts in Karnataka [2025]**

| Division | CI -2021 | CTM in 2021 | ERTD(100%) | ERTD(60%) | ATMR in 2021 | Estimated CI 2023 | CTM in 2023 | ERTD(100%) | ERTD(60%) | ATMR in 2023 | Estimated CI 2025 | ERTD(100%) | ERTD(60%) | ATMR in 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bangalore Division | | | | | | | | | | | | | | |
| Bangaluru | 18574 | 31 | 41 | 31 | 0 | 19993 | 45 | 44 | 33 | 0 | 21523 | 47 | 36 | 0 |
| Chikkaballapura | 1661 | 0 | 4 | 3 | 3 | 1690 | 0 | 4 | 3 | 3 | 1720 | 4 | 3 | 3 |
| Chitradurga | 2217 | 0 | 2 | 2 | 2 | 2260 | 0 | 5 | 4 | 4 | 2304 | 5 | 4 | 4 |
| Davanagere | 2574 | 1 | 6 | 4 | 3 | 2615 | 1 | 6 | 4 | 3 | 2661 | 6 | 4 | 3 |
| Kolar | 2077 | 1 | 5 | 3 | 2 | 2121 | 1 | 5 | 3 | 2 | 2165 | 5 | 4 | 3 |
| Ramanagra | 1380 | 0 | 3 | 2 | 2 | 1394 | 0 | 3 | 2 | 2 | 1408 | 3 | 2 | 2 |
| Shivamogga | 2286 | 2 | 5 | 4 | 2 | 2319 | 2 | 5 | 4 | 2 | 2351 | 5 | 4 | 2 |
| Tumukuru | 3381 | 0 | 7 | 6 | 6 | 3409 | 0 | 8 | 6 | 6 | 3435 | 8 | 6 | 6 |
| Total | 34150 | 35 | 73 | 55 | 20 | 35801 | 49 | 80 | 59 | 22 | 37567 | 83 | 63 | 23 |
| Belagavi Division | | | | | | | | | | | | | | |
| Bagalkote | 2633 | 1 | 6 | 4 | 3 | 2705 | 1 | 6 | 4 | 3 | 2779 | 6 | 5 | 4 |
| Belagavi | 6595 | 1 | 15 | 11 | 10 | 6766 | 2 | 15 | 11 | 9 | 6943 | 15 | 12 | 10 |
| Dharwad | 2588 | 4 | 6 | 4 | 0 | 2663 | 6 | 6 | 4 | 0 | 2740 | 6 | 6 | 0 |
| Gadaga | 1418 | 0 | 3 | 2 | 2 | 1444 | 0 | 3 | 2 | 2 | 1471 | 3 | 2 | 2 |
| Haveri | 2155 | 0 | 5 | 3 | 3 | 2201 | 0 | 5 | 4 | 4 | 2249 | 5 | 4 | 4 |
| Uttarkannada | 1850 | 0 | 4 | 3 | 3 | 1873 | 0 | 4 | 3 | 3 | 1895 | 4 | 3 | 3 |
| Vijapura | 3180 | 0 | 7 | 5 | 5 | 3300 | 0 | 7 | 6 | 6 | 3424 | 7 | 6 | 6 |
| Total | 20419 | 6 | 46 | 32 | 26 | 20952 | 9 | 46 | 34 | 27 | 21501 | 46 | 38 | 29 |
| Mysuru Division | | | | | | | | | | | | | | |
| Chamarajanagara | 1314 | 0 | 3 | 2 | 2 | 1329 | 0 | 3 | 2 | 2 | 1346 | 3 | 2 | 2 |
| Chikkamagaluru | 1380 | 0 | 3 | 2 | 2 | 1380 | 0 | 3 | 2 | 2 | 1381 | 3 | 2 | 2 |
| Dakshina Kannada | 2786 | 5 | 6 | 5 | 0 | 2839 | 7 | 6 | 5 | 0 | 2893 | 6 | 5 | 0 |
| Hassan | 2225 | 1 | 5 | 4 | 3 | 2239 | 0 | 5 | 4 | 4 | 2253 | 5 | 4 | 4 |
| Kodagu | 686 | 0 | 2 | 1 | 1 | 689 | 0 | 2 | 1 | 1 | 692 | 2 | 1 | 1 |
| Mysuru | 4160 | 4 | 9 | 7 | 3 | 4272 | 7 | 9 | 7 | 0 | 4387 | 10 | 7 | 0 |
| Udupi | 1526 | 1 | 4 | 3 | 2 | 1543 | 3 | 3 | 3 | 0 | 1561 | 3 | 3 | 0 |
| Mandya | 2251 | 1 | 5 | 4 | 3 | 2264 | 2 | 5 | 4 | 2 | 2275 | 5 | 4 | 2 |
| Total | 16328 | 12 | 37 | 28 | 14 | 16555 | 19 | 36 | 28 | 11 | 16788 | 37 | 28 | 11 |
| Kalburugi Division | | | | | | | | | | | | | | |
| Ballari+Vijayanagara | 3863 | 0 | 9 | 6 | 6 | 4040 | 1 | 9 | 7 | 6 | 4225 | 9 | 7 | 6 |
| Bidar | 2335 | 0 | 5 | 4 | 4 | 2394 | 0 | 5 | 4 | 4 | 2455 | 5 | 4 | 4 |
| Kalbarugi | 3677 | 3 | 8 | 6 | 3 | 3801 | 3 | 8 | 6 | 3 | 3929 | 9 | 7 | 4 |
| Koppala | 1974 | 0 | 5 | 3 | 3 | 2035 | 0 | 5 | 3 | 3 | 2098 | 5 | 3 | 3 |
| Raichuru | 2739 | 0 | 6 | 4 | 4 | 2826 | 0 | 6 | 5 | 5 | 2916 | 6 | 5 | 5 |
| Yadagiri | 1754 | 0 | 4 | 3 | 3 | 1827 | 0 | 4 | 3 | 3 | 1903 | 4 | 3 | 3 |
| Total | 16342 | 3 | 37 | 26 | 23 | 16923 | 4 | 37 | 28 | 24 | 17526 | 38 | 29 | 25 |
| Sum Total | 87239 | 56 | 193 | 141 | 83 | 90231 | 81 | 199 | 149 | 84 | 93382 | 204 | 158 | 88 |

CI -Cancer Incidence
CTM-Current Treatment Machine
ETM- Estimated Treatment Machine
ERTD(100%)- Estimated Radiotherapy Demand for 100% coverage
ERTD(60%)-Estimated RT demand for 60% coverage
ATMR-Additional Treatment Machine Requirement for 60% coverage

(ISSN: 0973-7049(P))

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AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES

21(3): S.I (3), 1517-1531, 2026

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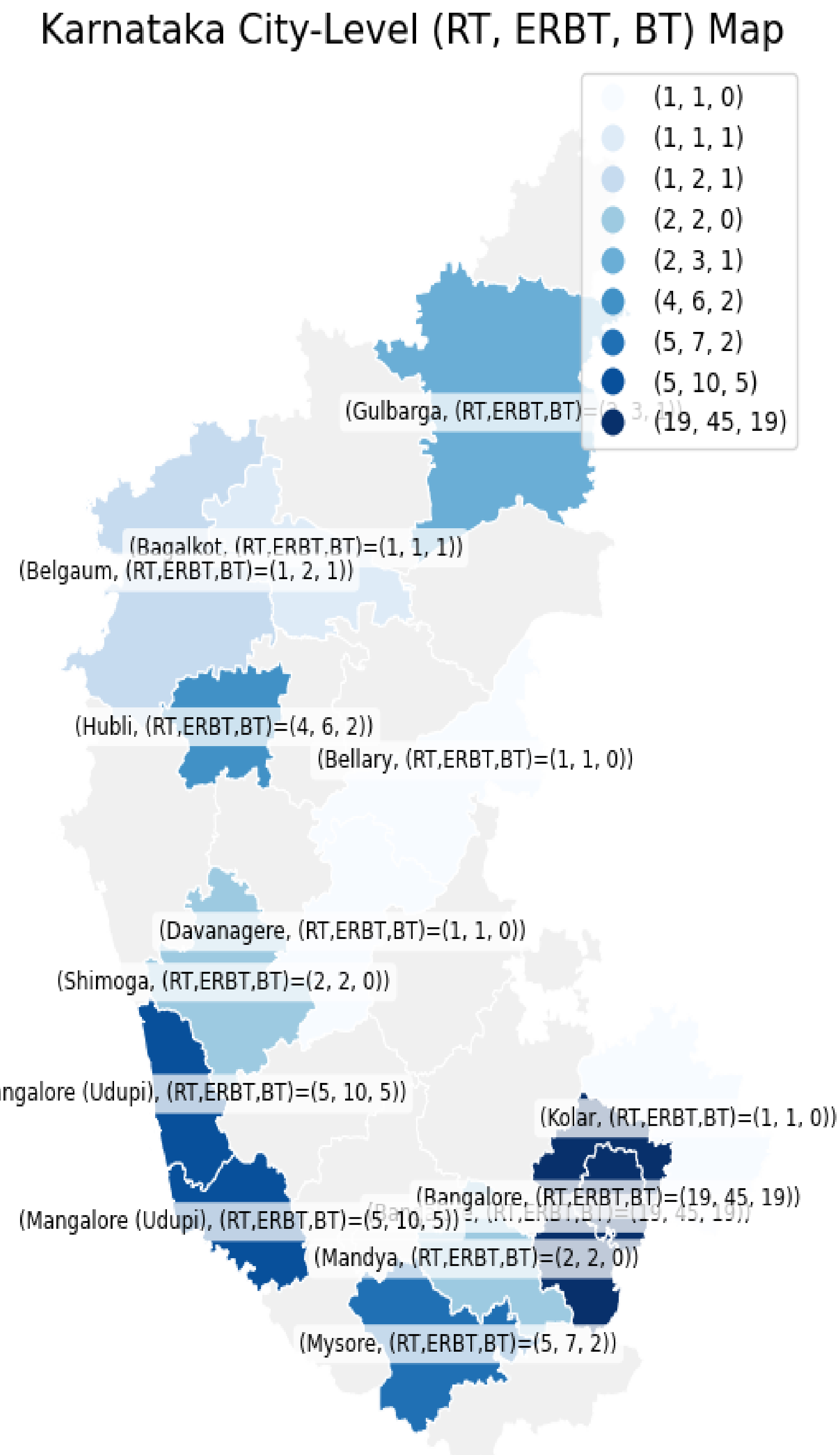


**Figure 1. Mapping RT centers, EBRT & BT services available across Karnataka districts**

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AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES
21(3): S.I (3), 1517-1531, 2026
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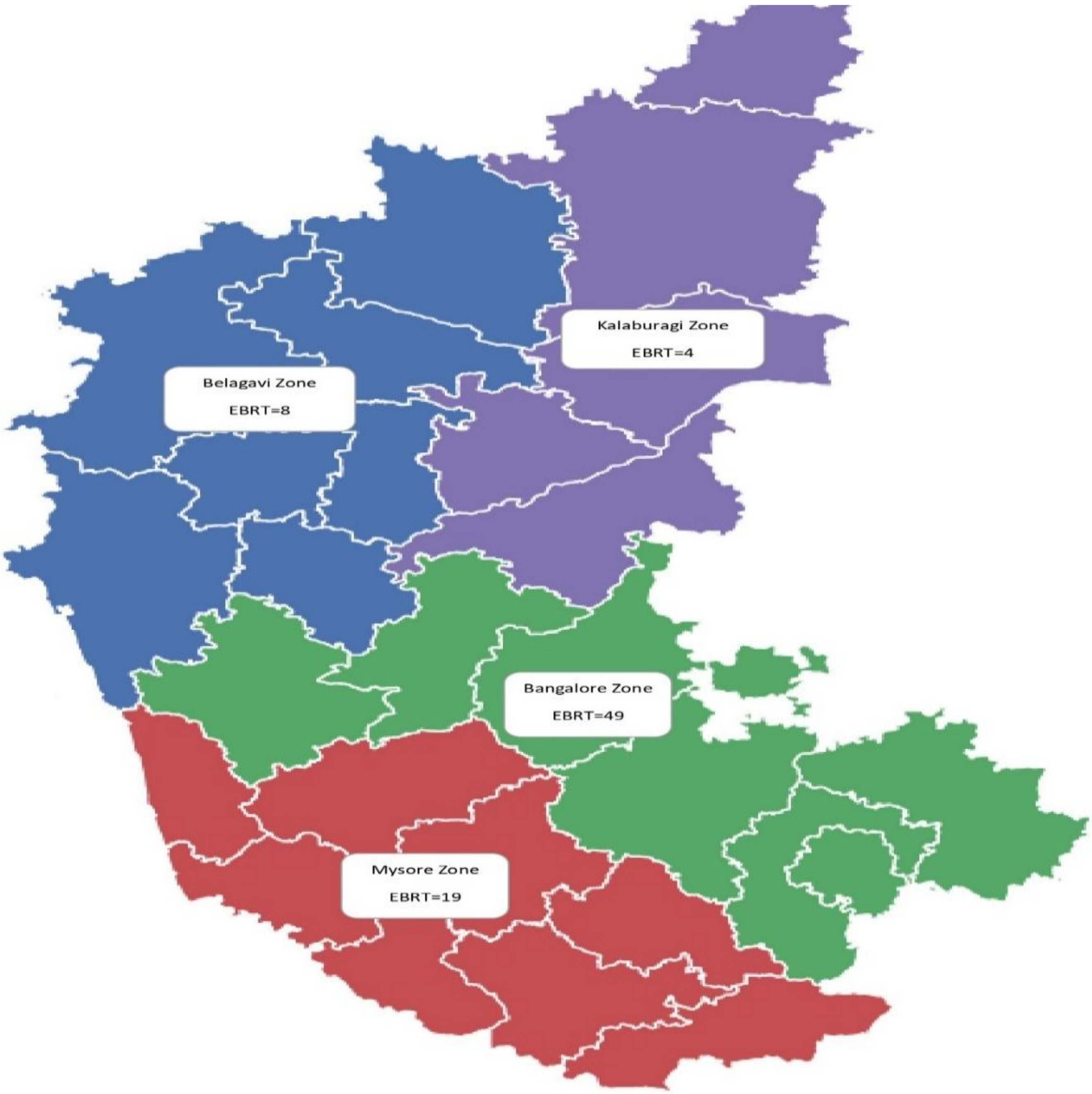


**Figure 2. Division-wise Availability of External Beam Radiotherapy Units in Karnataka in 2023**

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(ISSN: 0973-7049(P))

The Bioscan AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES 21(3): S.I (3), 1517-1531, 2026 www.thebioscan.com

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