



## Summary

Following a request received from the Minister of Health of Mozambique on October 2023, an imPACT Review was conducted from 6 May 2024 to 11 May 2024 by the [Programme of Action for Cancer Therapy \(PACT\)](#) of the International Atomic Energy Agency (IAEA), the World Health Organization (WHO) and International Agency for Research on Cancer (IARC). The imPACT Review was organized within the framework of the [WHO-IAEA Joint Programme on Cancer Control](#). A team of international experts, nominated by the IAEA, WHO and IARC, held technical discussions with key stakeholders, and visited the principal cancer facilities in the country.

The imPACT Review builds upon ongoing efforts by the Government of Mozambique to advance cancer control including the previous imPACT Review in 2014, the development and implementation of the National Cancer Control Plan (NCCP) 2019–2029 and the request to join the IAEA's [Rays of Hope Initiative](#) in March 2023. The key objectives of the imPACT Review were to strengthen national capacities across the cancer control continuum (prevention, early detection, diagnosis, treatment and palliative care); evaluate overall progress since the imPACT Review in 2014; inform implementation of the NCCP 2019–2029; guide the development of a roadmap for decentralization of radiation medicine services and inform the needs and priorities under the Rays of Hope initiative in Mozambique.

## Main findings

### 1. Cancer burden

Mozambique faces a significant cancer burden with an estimated 26 578 new cases diagnosed in 2022 (10 219 in men and 16 359 in women) and a total of 19 020 deaths (7 391 in men and 11 629 in women). The most commonly diagnosed cancers include cervix uteri (5 456 new cases), breast (2 048 new cases) and Kaposi sarcoma (1 373 new cases) for women, and Kaposi sarcoma (2 616 new cases), prostate (1 556 new cases) and liver (872 new cases) cancers for men. The country is expected to face a considerable increase in both cancer incidence and mortality with an estimated 56 241 new cancer cases and 40 313 cancer-related deaths projected in 2045.

### 2. Health system overview

The public health system in Mozambique is structured at three levels: national, provincial (provincial health departments) and district. Service delivery is organized across four levels of care: primary (rural health centers), secondary (rural hospitals), tertiary



(provincial hospitals) and quaternary (central hospitals). There are four central hospitals located across the country: Maputo (MCH), Beira (BCH), Nampula (NCH) and Quelimane (QCH). These serve as referral centres for specialized diagnosis and treatment, including for cancer and palliative care.

Health care is partially financed from external sources with donors accounting for more than half (57%) of health expenditure in 2019. Additionally, the country has yet to establish a national health insurance scheme so patients pay out-of-pocket to access most cancer care services.

### **3. Cancer control planning and governance**

Mozambique has an NCCP 2019–2029, led by the National Cancer Control Programme within the Ministry of Health and implemented through biennial National Action Plans (NAPs). The most recent NAP, covering the period 2024–2026, prioritized the development of clinical management guidelines, the establishment and strengthening of multidisciplinary tumour boards, the expansion of population-based cancer registries and the establishment of a working group to oversee the phased implementation of HPV DNA cervical cancer screening. Steering Committees for NCCP and NAP implementation have been established; both reporting to the Minister of Health.

There is no dedicated domestic budget allocated for the NCCP implementation and the majority of interventions are funded by external donors. Priority-funded areas include cancer registration, strengthening of health information systems to optimize the cancer screening programme, training, procurement of equipment for diagnosis and treatment, and cervical cancer vaccination and screening. The Investment Case projects high economic and health gains with strategic investments, with an estimated 1 926 363 adult and 17 677 children lives saved over a 40-year period.

In order to strengthen cancer governance, Mozambique should establish, by decree, the NCCP Steering Committee with defined roles and strengthen coordination mechanisms between national and provincial levels. Equally important is the alignment of the NAP implementation with WHO global initiative targets for cervical, breast, and childhood cancers. There is also a need for Ministry of Health endorsement of the Investment Case for Cancer to guide the development of a resource mobilization plan for NCCP implementation, including allocation of a domestic budget for priority interventions.

### **4. Cancer registration and surveillance**

There are two established population-based cancer registries, in Maputo and Beira, that have contributed to the country's national estimates; Nampula City registry is in development. Both registries produce annual reports, shared with the Ministry of Health, summarizing the cancer incidence and mortality data. Data from the registries are reported according to international standards and are included in global publications, such as the Cancer Incidence in Five Continents (CI5) series.



The registries receive government funding and support from Calouste Gulbenkian Foundation and the African Cancer Registry Network (AFCRN). The completeness of data is limited by the voluntary case reporting and reliance on paper-based records. There is no legislation designating cancer as a notifiable disease, and confidentiality and data protection follow general principles rather than specific laws. The registries face significant challenges, including outdated information technology infrastructure, insufficiently trained personnel and retention issues.

Making cancer a notifiable disease, enhancing infrastructure, implementing standard operating procedures and establishing a sustainable funding model are priorities. The integration of registries and electronic upgrades are essential for improved cancer surveillance and control efforts.

## 5. Prevention

In line with the *Plano Estratégico Multissetorial de Prevenção e Controlo das Doenças Não Transmissíveis 2020–2029*, the country seeks to reduce exposure to risk factors and strengthen prevention and control of non-communicable diseases, including cancer. Infections contribute to approximately 52.5% of new cancer cases in Mozambique.<sup>1</sup> The Government is implementing interventions including the introduction of the HPV vaccine into routine immunization with support from GAVI in 2021<sup>2</sup>. The prevalence of HIV among people aged 15 and over was 12.5% in 2021, with an estimated 69% being on antiretroviral therapy (compared to UNAIDS global target of 95%<sup>3</sup>). Notably, Kaposi Sarcoma (KS), an AIDS-defining cancer, is the second most common cancer in Mozambique.

The country has not fully adopted the WHO MPOWER tobacco consumption reduction measures and prevalence of obesity has increased.

In view of the significant burden of infection-related cancers, particularly related to HIV and HPV, there is a need to strengthen integration between the National HIV Control Programme and the NCCP for improved treatment outcomes for HIV-related malignancies such as KS. Leveraging established structures at the primary health care setting will be beneficial in strengthening cervical cancer prevention. The country should revise the HPV vaccination target age group to include the 9–14 year old age range and implement the [WHO SAGE](#) recommendation for single dose HPV vaccination. Tobacco control efforts should also be strengthened through implementation of MPOWER measures, especially by increasing retail tax to over 75%.

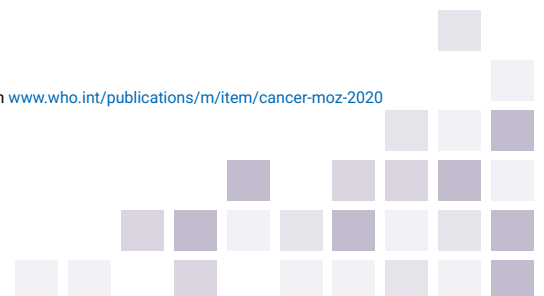
## 6. Early detection

The country established a National Programme for the Prevention and Control of Cervical and Breast Cancer (CACUM) in 2009. The screening programme is opportunistic and offered free of charge. Updated national guidelines for screening and treatment of cervical pre-cancer were launched in 2023, applying either visual inspection with 5% acetic acid (VIA), cervical cytology or HPV DNA testing. A pilot project for HPV DNA testing, limited to HIV+ women, is under implementation in five health facilities within Maputo.

<sup>1</sup> WHO Cancer Country Profile 2020: Mozambique. Int Agency Res Cancer [Internet]. 2020;(2019):1–2. Available from [www.who.int/publications/m/item/cancer-moz-2020](http://www.who.int/publications/m/item/cancer-moz-2020)

<sup>2</sup> Coverage for 9-year-old girls cohort was 70% in 2023

<sup>3</sup> [www.unaids.org/en/resources/documents/2021/2021\\_political-declaration-on-hiv-and-aids](http://www.unaids.org/en/resources/documents/2021/2021_political-declaration-on-hiv-and-aids)



Less than half of health units (741 out of 1771) with capabilities to provide VIA screening and treatment of pre-cancerous lesions are providing services. The estimated population coverage for cervical cancer screening was 28% in 2021. Challenges attributed to reduced service availability and low screening uptake include breakdown of equipment, lack of consumables, low health literacy on cervical cancer and cultural barriers.

Clinical breast examination (CBE) is the primary method for breast cancer screening, and most diagnosed cases are at an advanced stage. The referral pathway is poorly defined with inadequate follow-up of patients with suspicious lesions. There is an established information system (The SIS-MA – Health Information System for Monitoring and Evaluation) supporting both cervical and breast cancer screening.

It is critical to fully implement the National Cancer Control Plan (2019–2029) and the interventions set out in the cervical and breast cancer screening guidelines, prioritizing integration of cervical cancer screening within primary health care and HIV treatment centres. Additionally, the country's cervical cancer screening guidelines should be aligned with the recommendations in the [Global Strategy to Eliminate Cervical Cancer](#).

## **7. Diagnosis – diagnostic imaging and nuclear medicine**

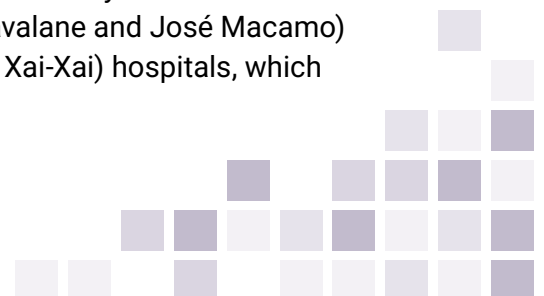
The country has recorded significant growth in diagnostic imaging capacities since the last imPACT Review with notable improvements in staffing (21 radiologists in 2024 compared to 10 in 2013), technology upgrades (Picture Archiving and Communication System [PACS] at MCH) and decentralization of services (4 newly installed CT scanners with another 13 planned across the country). There are ongoing programmes to increase evidence-based guidelines for imaging and radiation safety, including establishment of national radiation reference dose levels.

Significant gaps remain related to unavailability of critical personnel (nuclear medicine physicians, radio-pharmacists and radiation protection officers), frequent equipment breakdowns, uneven distribution of available workforce, irregular supply of consumables, long waiting times to access services and inadequate training opportunities. Nuclear medicine capacities for diagnostic and treatment purposes are yet to be introduced.

Mozambique would benefit from establishing regional imaging hubs outside Maputo by increasing the capacity of existing facilities and investing in radiology software to improve efficiency and patient care. Such investments must be accompanied by appropriate training and adherence to evidence-based guidelines to ensure standard of care across the country. Radiology workforce shortages should also be addressed by increasing general and subspecialist training while promoting task-shifting among the available workforce. It is equally critical to enact robust radiation protection and quality control measures, along with reliable national infrastructure and capacity in diagnostic imaging as prerequisites for establishment of a nuclear medicine programme.

## **8. Diagnosis – pathology and laboratory services**

There is a well-established pathology and clinical analysis laboratory infrastructure and referral network for four central hospitals, eight general (Mavalane and José Macamo) and provincial (Lichinga, Pemba, Chimoio, Tete, Inhambane, Xai-Xai) hospitals, which



facilitate processing of samples across the country. The MCH Pathology and Laboratory Medicine Departments are well established as national reference centres with training, diagnostic and research capacity. The country has had a pathology residency training programme over the past 30 years that has recently introduced breast pathology sub-specialization. The establishment of the National Pathology Programme under the Ministry of Health (MoH) has promoted the establishment of national quality programme (Fogela) and enhanced supervision of training programmes.

Key challenges identified in the provision of services include inadequate pathology workforce, service interruptions due to equipment failures and lack of consumables, absence of routine preventive maintenance for equipment and poor compliance with biosafety standards. The information and management system for pathology and laboratory services is also not integrated into the referral network with limited monitoring and supervision of services. Additionally, there is no comprehensive laboratory policy and no formal accreditation processes.

Mozambique would benefit from strengthening national supply chain for laboratory and pathology consumables to ensure uninterrupted provision of services. This should be complemented by a national action plan for the preventive maintenance of laboratory equipment and the strengthening of the specimen referral network to ensure access to services across the country with minimal disruptions. A national laboratory policy to guide the establishment of a quality management system and regulate the preservation of biological samples would be important.

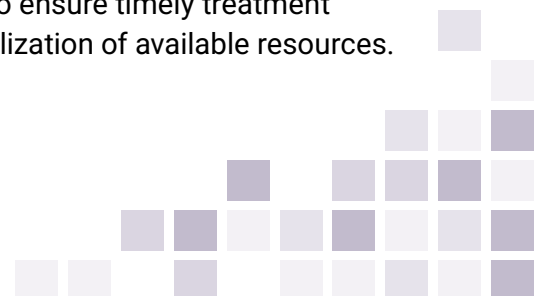
## **9. Treatment – medical oncology**

Cancer treatment in Mozambique is characterized by a high prevalence of advanced-stage cancers and associated high mortality rates. Medical oncology services are provided through day treatment centres at Maputo, Nampula and Beira Central Hospitals. MCH has a 32-bed oncology ward, five medical oncologists, three oncology nurses and five haematologists who participate in multi-disciplinary tumour boards held weekly.

The country has an Essential Medicines List (EML), which includes basic anti-cancer drugs.

A medical oncology residency programme has been established with support from Project ECHO, in collaboration with MD Anderson Cancer Centre. The country has also embarked on the process of developing national treatment guidelines.

Provision of treatment is limited by an inadequate medical oncology workforce; regular stock-outs of essential medicines, unavailability of personal protective equipment and high cost of chemotherapy drugs (primarily through out-of-pocket payments). In addressing these challenges, the country should consider the establishment of a network of cancer centres consisting of MCH as the hub and NCH, BCH and QCH as spokes or satellites to ensure standardization of and access to quality care across the country. There is also a need to expand treatment infrastructure in all the central hospitals while improving supply chain management to strengthen the availability of essential cancer drugs and supplies. Streamlining of patient care pathways to ensure timely treatment initiation would also improve outcomes and optimize the utilization of available resources.



## 10. Treatment – surgical oncology

Cancer surgery is mostly performed at the 36-bed MCH surgical oncology unit. The Unit has strengthened specializations around breast, thyroid and gastrointestinal cancers. There are active multi-disciplinary tumour boards, meeting weekly, for the most common cancer sites. The country has embarked on the process of developing a subspecialisation programme in surgical oncology with training and mentoring initiatives supported by institutions in Portugal, the United States of America and Brazil. A gynae-oncology training programme in collaboration with the International Gynaecologic Cancer Society is also in place.

There are challenges related to shortage of specialized workforce, irregular supply of surgical commodities and inadequate physical infrastructure. The majority of surgical procedures are performed by general surgeons with limited training in cancer surgery. The average waiting time for surgery is estimated at three months for gynaecological and one month for breast cancer cases. Surgical care could benefit from a quality management programme to address reported gaps in specimen collection, poor surgical margins and inadequate lymph node resections.

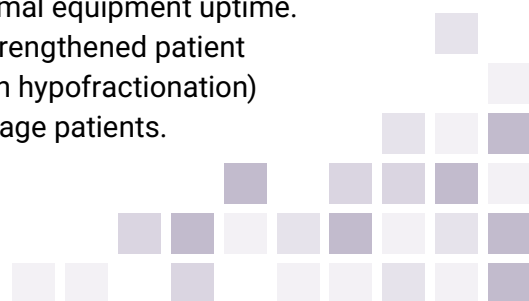
The country should expand surgical oncology infrastructure in all central hospitals to address long waiting times and improve treatment outcomes. There is also a need to strengthen ongoing training and mentoring programmes, especially on compliance with evidence-based guidelines, for professionals involved in surgical cancer care. Development of resource-stratified evidence-based management guidelines and establishment of a robust referral system is an imperative.

## 11. Treatment – radiation oncology

The country has an established radiotherapy (RT) department at MCH, staffed with four radiation oncologists, four medical physicists, nine radiotherapy technicians and four oncology nurses. However, the linear accelerator (installed in 2019) and cobalt-60 brachytherapy machine (installed in 2022) were not functional during the May 2024 country mission due to equipment breakdown and delays in obtaining appropriate licences. Based on workload data, the utilization of the LINAC machine has yet to be optimized with the highest annual case load (252 in 2022), falling below the expected output of approximately 500 new patients per year. There is a weekly multidisciplinary tumour board with RT participation. The country is yet to establish RT guidelines.

There are lengthy waiting times for radiotherapy services (estimated at four months) arising from frequent equipment breakdowns and sub-optimal utilization of resources. The MoH has developed the draft National Diagnostic Imaging and Radiotherapy Strategic Plan 2024–2040, including decentralization of radiotherapy services to Nampula and Beira Central Hospitals. The cost of radiotherapy treatment is borne by the Ministry of Health.

There is an urgent need to ensure sustainable brachytherapy services at MCH in view of the significant burden of breast, cervical and prostate cancers. The country also needs to ensure regular LINAC maintenance to ensure maximal equipment uptime. Adjustments in internal workflow, new or extended shifts, strengthened patient referral and development of national guidelines (including on hypofractionation) could also increase RT capacity to effectively treat and manage patients.





## 12. Treatment – paediatric oncology

Mozambique has a 20-bed MCH Paediatric Oncology Unit (POU). The most common cancers seen at the POU include leukaemias (35%), Wilms tumour (15%), lymphomas (11.3%), neuroblastoma (10%) and retinoblastoma (5%). There are three paediatric oncologists in the country, all based at the POU. Childhood cancer cases in other regions are attended to by medical oncologists with minimal support from the co-located paediatricians. There is an accredited two-year fellowship programme in paediatric oncology at MCH. The country has also established partnerships with St Jude Global, Barretos and SIOP Africa to prepare for participation in the WHO [Global Initiative for Childhood Cancer](#) (GICC).

The National Cancer Control Plan 2019–2029 has limited references to childhood cancer control and lacks awareness building and early detection for these diseases. Access to radiotherapy, particularly among children below five years, is limited due to skills deficits (radiation oncologists only treat head, neck and chest cancers) and lack of paediatric anaesthetic services. There are also service disruptions arising from stock-outs of essential medicines.

Mozambique would benefit from developing a national childhood cancer control strategy, aligned with the National Cancer Control Plan, and highlighting awareness building and a need for a well-defined referral pathway. There is also a need to expand diagnostic and treatment services to Beira and Nampula Hospitals, initially through mentorship provided by the POU and with investments in infrastructure development and long-term training. The country should also apply to become a GICC focus country to benefit from technical package development.

## 13. Palliative care

Mozambique's National Cancer Control Plan 2019–2029 prioritized palliative care interventions: management and coordination (designation of a focal point to interface with other MoH departments and related ministries), capacity building (approximately 500 health workers trained since 2019) and integration into primary health care settings (implementation of the [WHO-PEN protocol](#) with inclusion of palliative care).

A palliative care (PC) unit has been established at MCH with a trained multidisciplinary team. Provision of palliative care services in Nampula Central Hospital is limited to pain management. The country has no in-patient palliative care, hospices or paediatric PC services. The Mozambican Palliative Care Association (MOPCA) provides psycho-social support, advocacy and community-based PC.

There is no assured government funding for PC activities in Mozambique. Access and availability of opioids (morphine) is limited with an estimated annual consumption of 0.74 mg/capita/year. The [Global Atlas of Palliative Care \(2020\)](#) classified Mozambique as a Level 3a (isolated provision of palliative care) country with limited scope of palliative care activities and reliance on external funding.



There is an immediate need to scale up PC in Mozambique in view of the significant cancer burden with most patients diagnosed at advanced stages. Mozambique should develop a national Palliative Care Policy, establish a national steering committee and dedicate a sustainable budget. There is a need to strengthen PC services at hospitals, communities, homes and hospices, as part of a comprehensive care network. Addressing gaps in supply chain will also enhance availability of opioids and other essential palliative care medicines.

#### **14. Radiation safety**

The legislative framework for radiation safety in Mozambique is based on 'The Atomic Energy Law' (No. 08/2017), which provided for the establishment of the National Atomic Energy Agency (ANEA) under the Ministry of Mineral Resources and Energy as the designated regulatory body. The Law has further been enforced through a series of regulations. A draft national policy and strategy for radiation safety has been drafted by ANEA and is pending approval.

Provisions for the accreditation of radiation protection service providers by ANEA are yet to be established. There is limited human resource capacity within ANEA to cover the regulatory needs of the whole country, with reports of medical facilities, operating radiation sources without authorization. Occupational exposure dose limits have been defined yet there is no established mechanism to monitor compliance. Diagnostic reference levels have not yet been defined. A disused Co-60 therapy source and several Ra-226 disused sources were observed to be stored in a facility at MCH without adequate safety measures.

There is a need to strengthen the human resource capacity at ANEA to enable it to fulfil its regulatory obligations across the country. ANEA should urgently establish provisions for the accreditation or certification of radiation protection service providers and implement a national centralized register to monitor compliance with the established occupational exposure limits.





# ■ Key priority recommendations

## National cancer control planning and governance

- Strengthen cancer control governance through formal designation of the National Cancer Control Programme and establishment, by decree, of the NCCP Steering Committee.
- Validate and endorse the Mozambique Investment Case for Cancer (by the Minister of Health and Minister of Economy).
- Align the National Action Plan (NAP) implementation framework with the WHO Global initiative targets and indicators for cervical, breast, and childhood cancers.
- Strengthen coordination between national and provincial levels of care through a well-defined referral system.

## Cancer registration and surveillance

- Make cancer a legally notifiable disease to the national cancer registry.
- Establish interoperability between health information systems (DHIS2, SISCOVE and CanReg5) to streamline data collection and avoid duplication.
- Provide comprehensive training for all cancer registry staff on the use of the new oncology module of the DHIS2 platform.

## Prevention

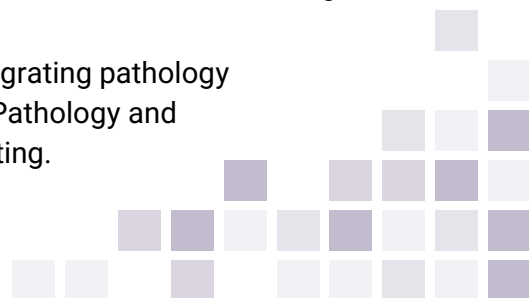
- Improve public communication and ensure high HPV vaccination coverage.
- Reinforce implementation of MPOWER measures, especially on increasing tobacco retail tax to over 75% (in line with [WHO FCTC](#)).
- Expand the HPV vaccination target cohort to include all eligible girls (9–14 years old) and apply the WHO SAGE recommendation for single dose HPV vaccine for HIV-, and at least two doses for HIV+ persons.

## Early detection

- Fully implement interventions in the cervical and breast cancer screening guidelines, prioritizing cervical cancer screening with timely access to diagnosis and treatment.
- Raise awareness and knowledge on cancer early detection, including childhood cancers, among the general population and high-risk individuals.
- Integrate cancer early detection into the HIV-AIDS programme, prioritizing cervical cancer and Kaposi's sarcoma, especially for women living with HIV.

## Diagnosis (pathology and laboratory services)

- Strengthen the national supply system for laboratory medicine and pathology consumables.
- Develop and implement a national plan for the preventive maintenance and servicing of laboratory equipment.
- Strengthen the pathology specimen referral system by integrating pathology laboratory information and management system (SISPAT-Pathology and APOLO-LAC) at MCH for timely and accurate results reporting.



## Diagnosis (diagnostic imaging and nuclear medicine)

- Establish a mechanism to oversee the identification, safe disposal and replacement of (inoperable) imaging equipment.
- Develop a national roadmap and action plan for equipment maintenance and consumables.
- Implement a Picture Archiving and Communication System (PACS) at MCH to link all imaging facilities nationally for decentralized (remote) viewing and interpretation.

## Treatment (medical oncology)

- Develop a national network for cancer care, consisting of MCH as the 'hub' and NCH, BCH and QCH as 'spokes' or satellites to support clinical consultation and ensure standard of care across the country.
- Adopt and implement the national treatment guidelines.
- Strengthen the availability of essential cancer drugs and related medicines by improving supply chain management, diversifying suppliers and enhancing forecasting.

## Treatment (radiation oncology)

- Ensure regular LINAC maintenance and servicing and increase the number of patients treated per LINAC.
- Provide urgent training for the 3D brachytherapy, both for radiation oncologists and medical physicists. Implement 2D brachytherapy-related infrastructure (applicators, X ray and film scanner).
- Optimize radiotherapy services by strengthening patient referral, increased use of hypofractionation and extending treatment operating hours.

## Treatment (surgical oncology)

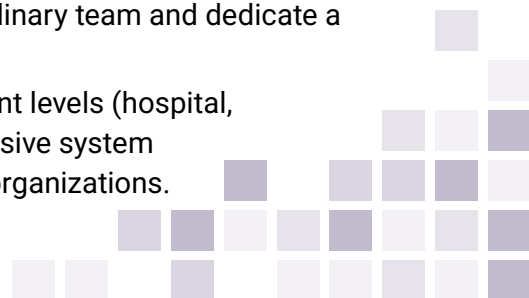
- Increase and sustain surgical oncology infrastructure (operating rooms, intensive care units, surgical instruments, anaesthesia and laparoscopic surgery resources) in all central hospitals to address the long waiting times and improve treatment outcomes.
- Ensure regular participation of surgeons in MTBs to foster multidisciplinary approach to cancer treatment planning and decision-making.
- Strengthen the patient referral pathway to ensure timely treatment initiation and optimize resource utilization in cancer hospitals.

## Treatment (paediatric oncology)

- Apply for support through the WHO Global Initiative for Childhood Cancer.
- Set up a National Childhood Cancer Steering Committee and develop a National Childhood Cancer Strategy.

## Palliative care

- Develop a MOH led PC plan/programme with a multidisciplinary team and dedicate a regular budget.
- Implement quality palliative care services/teams at different levels (hospital, community, home-based, hospice) as part of a comprehensive system of palliative care with participation of NGOs and religious organizations.



- Strengthen medicine supply chain to assure timely and safe dispensing of controlled medicines.

### Radiation safety

- Ensure that ANEA is provided with the necessary human resources to fulfil its statutory obligation for regulatory control across the country.
- Establish provisions for the accreditation or certification of radiation protection service providers.
- Implement a national centralized register of occupational doses to monitor compliance with the national exposure limits.

## ■ The WHO–IAEA–IARC joint activities on cancer control

In March 2009, WHO and IAEA signed arrangements at the Director-General level to implement a Joint Programme on Cancer Control. The main purpose of this arrangement is to coordinate activities and resources to provide evidence-based and sustainable support to comprehensive cancer control programmes, particularly in low- and middle-income countries. The impACT Review is carried out as a comprehensive assessment of national cancer control capacities and needs. It is a partnership effort between the International Atomic Energy Agency (IAEA), the International Agency for Research on Cancer (IARC) and the World Health Organization (WHO). Where relevant, other partners are involved, such as the Union for International Cancer Control (UICC) and the United Nations Office on Drugs and Crime (UNODC). The IAEA Division of Programme of Action for Cancer Therapy (PACT) is responsible for coordinating the impACT Reviews and for mobilizing the resources for their implementation.

Click here to read more about the impACT mission to Mozambique: [impACT Review mission to Mozambique | IAEA](#) and [Mozambique is Prioritizing Cancers Affecting Women and Children](#)



**For any questions or additional information, please contact**

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