Summary

imPACT Review Report

Cambodia

February 2024

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Following a request received from the Minister of Health of Cambodia in July 2022, an imPACT Review was conducted from November 2022 to June 2023 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.

Main findings

1. Cancer burden

The mortality due to non-communicable diseases in Cambodia increased from 52% in 2014 to 64% in 2018, and cancer related mortality contributed with 14% in 2018. The cancer incidence and mortality figures presented in this report are based on the International Agency for Research on Cancer (IARC) estimates using data from cancer registries in neighbouring countries, since currently there is no population or hospital-based cancer registry system established.

According to IARC's GLOBOCAN (2020) estimates, there were 18 375 new cancer case (8 418 in men and 9 957 in women). The most common among men were liver (2 080), lung (1 202), colorectum (761), leukaemia (360) and non-Hodgkin lymphoma (315). In women, the most common cancers were breast (1 877), cervix (1 135), liver (1 062), colorectum (829) and lung (695). The estimated number of deaths from cancer in 2020 was 12 638 (6 481 in men and 6 157 in women). It is estimated that by 2040, cancer incidence and mortality will increase, resulting in 31 968 new cancer cases and 23 369 cancer deaths.

2. Health system overview

The health system of Cambodia has a four-tiered system of service delivery with most resources directed to primary health care (PHC) and national-level hospitals. The health care system is dominated by private sector providers. The size of the private sector poses a challenge for its regulation and the Ministry of Health (MoH) requires additional resources to monitor and enforce private practice. In the public sector, the MoH has moved towards decentralisation of responsibilities by establishing Provincial Health Departments and Operational District Offices to coordinate the non-clinical

work of health facilities in their catchment area and to provide greater access to community health care. The MoH puts emphasis on improving access to Universal Health Coverage and Cambodia's health care equity index has been improving in the recent years and in 2019 reported slightly higher (61) than global average (57).

The financial resources for the public health sector are improving, with the Government contributing 27.7% in 2020, which is 7.4% of total government expenditures. Majority of the financing comes from out-of-pocket payment (60.6% in 2020). This is a barrier to equitable access to health care, especially for specialist services such as cancer diagnosis and treatment. There are few financial protection schemes, where comprehensive cancer treatment is not included in the benefit packages. Some screening services e.g., cervical cancer, diagnostic examinations and surgery treatment are covered. The Government has initiated reforms of the financing system at the level of primary and secondary care moving towards a performance-based model to reduce catastrophic health expenditures. This process should primarily support and have impact on the ongoing efforts for prevention and control of cervical cancer.

Comprehensive cancer services are provided only in the capital city, Phnom Penh, and mainly through the public health sector. Khmer-Soviet Friendship Hospital and Calmette Hospital are the main services providers, along with Kantha Bopha Hospital, National Paediatric Hospital, Angkor Hospital for Children and Japan Heart Hospital, which provide paediatric oncology services. In the near future, the MoH intends to transform the Luang Mè Hospital in Phnom Penh into a dedicated National Cancer Centre. Technical guidance to support this process was provided as part of the imPACT Review and is included in the relevant sections of this report.

Human resources in the health sector, including oncology workforce are considered to be understaffed, and the Government has made efforts post COVID-19 pandemic to recruit a significant number of health professionals. Shortages in specialist workforce are mainly due to internal migration, from public to the private sector, since dual public-private practice is allowed. Medical professional councils have a significant role in the health system in developing skilled workforce through support in continuous medical education.

3. National cancer control planning and governance

Important governance structures and health policy documents surrounding cancer programme are in place e.g., existing non-communicable diseases (NCDs) plan; cervical cancer strategy; NCDs dedicated unit in the MoH. Cervical cancer has a particular focus in the MoH with a specific sub-technical working group and action plan developed. There is a multi-sectoral plan of action on NCDs, and high-level support is demonstrated by commitment to establish a new National Cancer Centre. These are good foundations which can be used to develop a National Cancer Control Plan (NCCP) with the purpose to consolidate existing efforts and to ensure comprehensive approach to cancer control in the country.

Resources are increasingly being directed to NCDs programme, demonstrated by the upcoming establishment of a related Management Information System and financial support to encourage quality NCDs service delivery at primary health care. There is an important and cost-effective opportunity for the NCDs programmes to further streamline cancer control interventions, including a need to earmark funding

for implementation. In addition, existing service delivery platforms at primary health care targeting reproductive, maternal and child health should be used to integrate cancer prevention and early detection activities. At the level of specialized care, out-of-pocket payment remains a barrier for access and efforts should be made to include comprehensive cancer treatment into the benefit package of existing insurance schemes.

4. Cancer registration and surveillance[1]

Cambodia's cancer surveillance capacities need to be enhanced, and there is no current readiness to establish a Population Based Cancer Registry (PBCR) in Phnom Penh or other cities. There are two main public hospitals that provide cancer treatment in Cambodia, Calmette and Khmer-Soviet Friendship Hospital. An important scope of cancer data is being collected at these facilities and there is potential to develop a hospital-based cancer registry system.

Priority actions to further advance the cancer surveillance system in the country include setting up a National Registry Committee and develop a national plan for development of a Hospital Based Cancer Registry (HBCR) and Population Based Cancer Registry (PBCR). In addition, health-records keeping and vital statistic system should be improved by using international disease and cause of deaths coding standards, such as ICD-10. Separate Standard Operating Procedures (SOPs) should be developed to further guide procedures of data collection, analysis and reporting, tailored to the Cambodia's context.

5. Primary prevention

The most common cancers in Cambodia (lung, liver and cervical cancer) are preventable. The National Strategic Plan for the Prevention and Control of NCDs (2022–2030) has identified key four behavioral risk factors related to cancer occurrence in the country: tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity.

As a result of improving its tobacco control surveillance systems, Cambodia has been able to adopt stronger tobacco control measures and enforce the existing legislation. For this progress, the country has been designated as one of the world's first WHO Framework Convention on Tobacco Control (FCTC) 2030 countries, receiving direct support from the WHO FCTC Secretariat, the United Nations Development Program (UNDP) and WHO Department of Prevention of Noncommunicable Diseases in accelerating the implementation of the WHO FCTC. This has led to the development of an investment case for tobacco control in Cambodia, which anticipates significant benefits ranging from saving thousands of lives to preventing economic losses from tobacco activities.

For the infections-related cancers such as cervical and liver cancer, introduction of HPV and HBV vaccines into the national immunization programmes is essential with an appropriate coverage. Cambodia's goal reflects the WHO cervical cancer elimination initiative of achieving a 90% vaccination coverage for HPV among girls. Based on the WHO Strategic Advisory Group of Experts latest recommendation, the Ministry of Health has developed an action plan to introduce HPV in the National Immunization Programme (planned in the course of 2023), with a single-dose vaccination protocol.

1 Update from the National Team: The PBCR is now being set up. The starting point is Phnom Penh city.

Liver cancer is a major public health concern in Cambodia, with high incidence rates, particularly among men. The national vaccination schedule includes all recommended doses for HBV; however, the country needs to reach the global target (95%) for the timely birth-dose administration, with coverage ranges from 64% in rural areas to 91% in Phnom Penh. The MoH has formulated National Strategic Plan for Viral Hepatitis B and C Infection Control (2020–2024), which includes preventative measures beyond the immunization programme and focuses on prevention in health care settings and enhancing national blood safety system.

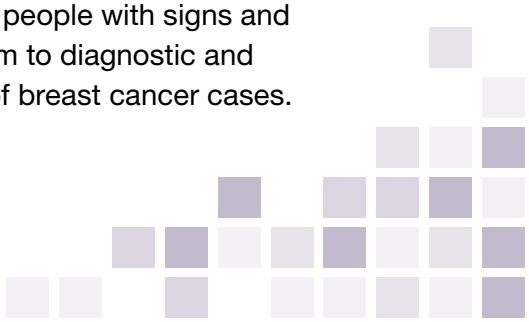
6. Early detection

Cancer early detection programmes should be situated within a holistic approach to health systems, focusing on building capacity to deliver equitable and quality assured services. Early detection strategies improve cancer outcomes by providing care at the earliest possible cancer stage, offering treatment that is more timely, effective, less costly and less complex. For early detection of cervical and breast cancers, primary health care should remain the preferred entry point for prevention and early detection interventions, but health services structures need to accommodate access to women presenting at any point in the health system.

Cervical cancer ranks as the second most frequent cancer among women in Cambodia and the second most frequent cancer among women between 15 and 44 years of age. Besides HPV vaccination, it is important to explore the cervical cancer screening strategy, early diagnosis and treatment of the disease. The implementation of these measures can help to reduce the burden of cervical cancer in the country and improve the overall health and well-being of Cambodian women. A cost analysis carried out by UNFPA shows that investing in the cervical cancer elimination strategies is cost-effective and can offer significant economic and societal benefits, with an estimated return of $3.20 to the economy for every dollar invested through 2050.

The newly planned National Standard Operating Procedures for Cervical Cancer Screening is commendable. Currently, the country has multiple options for primary screening methods (VIA; cytology; and HPV DNA), due to available expertise and test supplies at the public and private sector providers. In the future, Cambodia should consider shift to HPV DNA testing as primary method with introduction of self-sampling for better acceptability and access. To accomplish this transformation, the existing protocol for cervical cancer screening should be aligned with WHO's guideline for screening and treatment of cervical pre-cancer lesions.

There is a need to strengthen Cambodian health system to be able to respond to the growing burden of breast cancer, using sustainable, cost-effective and equitable breast cancer early detection and treatment services. These efforts must be integrated within a community-health framework that engages facilities at all levels and empowers women to seek and receive health care throughout the life cycle. Early detection of breast cancer should begin with breast-health awareness and the establishment of early diagnosis programme, which focuses on identifying people with signs and symptoms, suggesting possible malignancy, and linking them to diagnostic and treatment services for the timely and correct management of breast cancer cases.



7. Cancer diagnosis – pathology and laboratory services

Expansion of national cancer control programmes requires strong and reliable pathology and laboratory services. It is estimated that 70% of all medical decisions are made based on pathology and laboratory diagnoses. These services have a central importance in making a diagnosis, guiding treatment, informing prognosis, monitoring treatment outcomes and contributing to public health surveillance and disease registries.

Departments of pathology and laboratory medicine in Cambodia, including those in major hospitals, are well-equipped with basic facilities and perform essential services. The current equipment primarily focuses on essential pathology and laboratory services but given the laboratories' broad functions in diagnosis of other diseases, both expansion and modernization are required. These improvements will not only help compensate for the current human resources shortages but will also facilitate use of more specific cancer diagnosis tests. In addition, through implementing a national accreditation process, each laboratory can systematically manage human resources, infrastructure, equipment, information system and quality assurance. It is recommended to organize a domestic accreditation body centered on the medical biologists of each hospital and further use many international guidelines in this regard.

The general challenge of human resources shortages in the health sector extends to pathologists. The majority are concentrated in the capital city Phnom Penh, exacerbating the problem of workforce deficit in the provinces. A long-term plan for recruiting and training pathologists within the country is needed. There is a lack of motivation among young doctors due to insufficient support and inadequate incentives to pursue pathology professional career. Despite the limited number of professionals in the field, the establishment of an academic society for pathologists in Cambodia is recommended to advance continuous medical education and professional development support.

8. Cancer diagnosis – diagnostic imaging and nuclear medicine

Radiology imaging is essential in cancer management and Cambodia has provided its major public hospitals with essential radiology equipment. These include provision and access to X ray, mammography, computed tomography (CT) and magnetic resonance imaging (MRI) services, which are essential cancer imaging equipment. Since the imPACT Review in 2013, there has been some notable progress in the areas of workforce development and improved access to modern technology, such as the establishment of a nuclear medicine facility at Calmette Hospital. This also includes plans to establish a Positron Emission Tomography (PET)/CT; cyclotron facility; and a National Cancer Center to further improve accessibility to cancer care. Essential elements in using ionizing imaging modalities, such as the establishment of a radiation protection programme, is still under development and will need full enforcement as a priority. This is a prerequisite to the successful implementation of radiology and nuclear medicine services, which ensures safety to both radiation medicine workers and patients.

The greatest number of radiology imaging services and health professionals are concentrated in Phnom Penh, as the main referral region in the country. Diagnostic imaging human resources are available, although lacking adequate number to ensure efficient and safe services. Their competencies and clinical skills should be enhanced by targeted short-term trainings and/or overseas fellowships in oncology imaging. An important priority is to develop a plan for appointing clinical medical physicists in radiology and nuclear medicine in each hospital department. Establishing a radiology information system with digital imaging and archiving, will also allow teleradiology services that will further improve capacity of human resources.

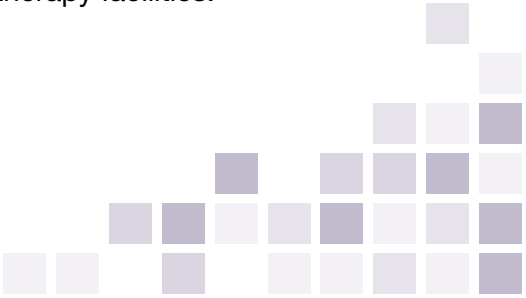
Efforts to improve radiology imaging and nuclear medicine services in Cambodia should prioritize ensuring equipment availability, developing a skilled workforce and implementing comprehensive quality management system and radiation safety practices. By addressing these critical areas, Cambodia can enhance the accessibility, accuracy and safety of radiology and nuclear medicine services, contributing to improved healthcare outcomes.

9. Cancer treatment – radiation oncology

Radiotherapy is a key component of the curative and palliative management of cancer. It has been estimated that 46% of people with cancer in Cambodia would benefit from radiotherapy. Access to radiotherapy has increased substantially in the last decade but substantial investment in equipment and human resources will be required to ensure optimal access. Three government hospitals have plans to expand their facilities so that they each have two linear accelerators and one High Dose-Rate (HDR) brachytherapy machine to ensure sustainable operation. This would triple the number of machines in the country and would substantially increase access.

Planning to increase access to radiotherapy needs to focus on human resources in addition to equipment. The University of Health Sciences (UHS) should be supported in its plans to expand its current Associate Degree in Radiation Technology to include training specific to radiation therapy. The UHS currently provides general postgraduate medical training in oncology. Doctors who have completed this should be encouraged to undertake international fellowships in radiation oncology, until the UHS can offer full radiation oncology training. International training of clinically qualified medical physicists will need to continue for at least the next few years, but in the long term, a Cambodian academic and clinical training programme should be established to train clinically qualified medical physicists.

Currently, geography is also a barrier to access. Patients must travel to Phnom Penh to receive radiotherapy. Ultimately, radiotherapy should be available in provincial centers, but in the meantime, the newly proposed National Cancer Centre at the new Luang Mè Cancer Hospital provides an opportunity to improve access through the establishment of clinical networks. Waiting times, workloads, efficiency of referrals and patient outcomes would be improved by establishing defined referral pathways to and between radiotherapy facilities.



10. Cancer treatment – medical oncology

Medical oncology services in Cambodia are primarily provided in two public hospitals, Khmer-Soviet Friendship Hospital (KSFH) and Calmette Hospital (CH). The two central hospitals have lots of needed resources for the diagnosis and treatment of adult patients with cancer. The training system is well implemented with a good curriculum under the auspices of the University of Health Science and follow up fellowship programme in designated university hospital in France. The current education system would benefit from developing oncology nursing training, which would significantly improve clinical governance, appropriate medication management, infection control in hospital settings as well as patients' education.

Despite these positive aspects, the overall capacity for diagnosis and treatment remains limited, with the cancer services concentrated in Phnom Penh. In this regard, there is a need to develop satellite outpatient cancer units in other cities to cover needs and decentralize medical oncology and haematology services. Access to licensed medication meeting the WHO essential medical list is required, and frequent medication shortages force patients to seek alternative sources in private pharmacies and lead to catastrophic expenditures and treatment abandonment. There is a need to establish oncology pharmacy in hospitals to improve the quality of chemotherapy preparation and administration. The current landscape underscores the need to improve capacity and access to cancer care, introduce national treatment guidelines and enhance support services for patients and their families.

11. Cancer treatment – surgical oncology

Surgery is a fundamental modality for curative and palliative treatment of most cancers in countries across all income settings. In low and middle-income countries, such as Cambodia, where late-stage presentation of cancer cases is very common, surgery may be one of the few available options for palliative disease control. With the Ministry of Health in Cambodia taking a keen interest in early detection and screening programmes, the country will soon be faced with large numbers of early-stage cancers, which would require surgery as their treatment modality providing control of the primary tumor.

Coverage of cancer surgical services in Cambodia seems reasonable for most common cancers. Surgeries are most often performed by general surgeons, who have over the years gained experience in cancer surgeries. The advantage of this approach is that patients may get cancer surgery closer to their place of residence e.g., as part of a regional hospital. This approach is however not including essential principles and practice of cancer surgery, which is specialized, multidisciplinary and high-level care provided by formally trained surgeons. Under the planning of the new National Cancer Centre at Luang Mè Hospital, there is a plan that specialist surgeons will perform cancer surgeries, which would be an important change in practice.

Surgical oncology services in most centers in Cambodia need to be further enhanced. While the larger hospitals have the necessary infrastructure to perform cancer surgery, quality of care requires improvement. There is no formal quality management and quality audit system for surgical cancer services in any of the centers. Multidisciplinary discussions are taking place; however, they are not formalized and are generally

done by surgeons on a case-to-case basis. In such multidisciplinary forums, representatives of all disciplines involved in cancer treatment gather on a regular basis and reach a consensus on what would constitute the best treatment modality. Evidence suggests that multidisciplinary approach improves treatment outcomes.

12. Paediatric oncology

According to WHO, the survival of children with cancer is estimated to be between 15% and 45% in developing countries, compared to high-income countries where five-year survival is more than 80%. Paediatric oncology in Cambodia faces significant challenges, with survival rates considerably lower than high-income countries. Recent studies highlight the urgent need for improvement, as the three-year survival rates for acute lymphoblastic leukaemia and retinoblastoma patients were 35% and 62%, respectively.

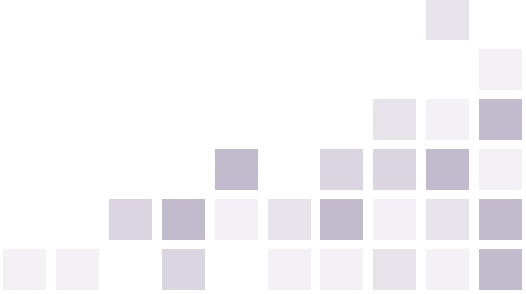
Paediatric cancer services are available in the cities of Phnom Penh and Siem Reap, mainly provided through Kantha Bopha Hospital, National Paediatric Hospital, Angkor Hospital for Children and Japan Heart Hospital. There is an important commitment to develop a national childhood cancer programme, also expressed through the establishment of the Cambodia Children Oncology Group. There is important engagement of the private/non-profit sector where additional resources are allocated. There are well-trained paediatric oncologists, paediatric surgeons and radiologists, referring patients among existing network of hospitals as needed, and working together through common multidisciplinary tumour boards.

In order to further prioritize childhood cancer and related investments, it is recommended that Cambodia joins the WHO Global Initiative for Childhood Cancer, focusing on comprehensive childhood cancer care, including early detection, treatment, palliative care and survivorship. Developing an appropriate training programme for paediatric nurses and other related specialties is required. Further activities should include patient-parent education, psychosocial and nutritional support to address the holistic needs of children. Social support programmes, like the one in Angkor Hospital for Children, can serve as models to provide comprehensive.

13. Palliative care[2]

Most of the cancer patients in Cambodia are detected at an advanced stage of disease. Therefore, enhancing the palliative care system and accompanying the palliative perspectives from the time of cancer diagnosis is crucial to provide appropriate cancer management. Although Cambodia's current palliative care situation has been improved, the accessibility of services is still limited. There is high demand for home-based palliative care due to cultural context and preferences. Current legal framework and reluctance of prescribing health workers constrain the accessibility of oral morphine, essential for home-based palliative care. For example, due to concerns of legal consequences in case of opioid mismanagement, physicians avoid prescribing adequate dosage of morphine to manage chronic pain in home settings.

2 Update from the National Team: The SOP has already been developed.



Although palliative care is not integrated into primary health care (PHC), the development of national standard operating procedures that support palliative care from PHC is in the process through the initiatives of the government and non-governmental organizations. In addition to this effort, establishing an organization or national committee for palliative care will facilitate palliative care education, improve the quality of current practice and develop related legislation and policy. Palliative care is most effectively provided from a multidisciplinary perspective, therefore, in addition to specialized professionals, workforce training for social workers, psychologists and nutritionists should be considered in further planning process.

14. Radiation safety considerations[3]

The national policy and legislative framework to address radiation safety and security of radioactive sources in Cambodia should be enhanced. Within this framework, a national strategy for formal education and training in radiation protection should be developed. In addition, requirements for professional competences and qualifications on radiation protection should be established. Under the technical cooperation programme with the IAEA, the regulatory body—the Department of Nuclear Science and Technology (DNST) of the Ministry of Mines and Energy (MME)—has drafted the Technical Guidance on the Basic Safety and Security for the Use of Radiation Sources. This guidance partially includes the competencies and professional qualifications of the radiation protection officers. The regulatory body needs to further establish criteria for the designation of radiation protection officers in medical facilities that use radioactive sources.

15. Security of radioactive sources considerations

Cambodia should provide its commitment to implement the non-legally binding IAEA Code of Conduct on the Safety and Security of Radioactive Sources (CoC) and its supplementary guidance on the management of disused radioactive sources. A Draft Technical Guidance on the Basic Safety and Security for the Use of Radiation Sources is in place and addresses nuclear security. The Guidance is in an advanced stage of development, and upon approval will serve as nuclear security regulation for security of radioactive sources in use and storage, including in medical settings. The national registry of radioactive sources has been established and is being maintained through the RAIS System of the MME. Competencies of national regulatory staff need enhancement through implementation of nuclear security trainings.

3 Update from the National Team: The Ministry of Mine and Energy has addressed aforementioned considerations.

Key priority recommendations

Cancer control planning and governance

- Compose a National Cancer Control Plan. The plan will need to align with all existing cancer activities such as immunization, maternal and child health, risk factor control, hospital development, sustainable financing, data analysis inter alia.
- Evaluate and then update the ongoing National Action Plan for Cervical Cancer Prevention and Control.
- Arrange health care financing schemes to remove financial barriers to early detection, diagnosis, treatment and palliative care. Efforts should be made to include comprehensive cancer management (screening; diagnosis; treatment; palliative care) into the benefit package of the existing health insurance schemes.

Cancer registration and surveillance

- Set up a National Registry Committee and develop a national plan for development of a Hospital Based Cancer Registry (HBCR) and Population Based Cancer Registry (PBCR) system in the country. Further, develop cancer registry Standard Operating Procedures (SOPs) tailored to the Cambodia's context using references from a Standard Operating Procedure Guide (www.iarc.who.int/news-events/planning-and-developing-population-based-cancer-registration-in-low-and-middle-income-settings-as-an-e-book).
- Establish a Hospital Based Cancer Registry (NBCR) in Calmette, Khmer Soviet Friendship and Luang Mè Hospital.
- Improve health-record keeping and vital statistic system by using international disease and cause of deaths coding standards (ICD-10).

Primary prevention

- Facilitate reduction of tobacco use by increasing excise taxes and prices on tobacco products, enacting and enforcing comprehensive bans on tobacco advertising, promotion and sponsorship while eliminating exposure to second-hand tobacco smoke in all indoor workplaces, public places and public transport and implementing effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second-hand smoke.
- Based on the WHO SAGE's latest recommendation, the Ministry of Health should implement the existing action plan to introduce HPV in the National Immunization Programme (planned for 2023), with a single-dose vaccination protocol.
- Increase the coverage of Hepatitis B Vaccine (HBV) birth dose and the subsequent HBV vaccine doses to reach the global targets (95%).
- Ensure National Strategic Plan for Viral Hepatitis B and C Infection Control (2020–2024), which includes preventative measures beyond immunization i.e., reduce healthcare associated transmission; and enhancing national blood safety system is adequately resourced, and initiate planning to review existing and develop new strategic plan for Viral Hepatitis B and C Infection Control in 2024.

Early detection

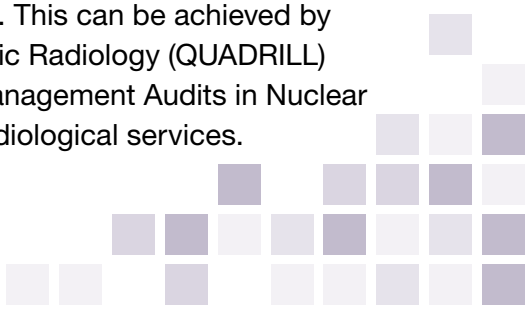
- For early detection of cervical cancer, consider shift to HPV DNA testing as a primary method, considering that testing for HPV offers superior specificity, and its strong predictive value means that women who test negative only need to be retested after a minimum interval of five years. If introducing HPV DNA testing, consider self-sampling for better acceptability and access.
- Early detection of breast cancer efforts should begin with breast-health awareness and the establishment of an early-diagnosis programme, which focuses on identifying people with signs and symptoms of breast cancer, suggesting possible malignancy and linking them to diagnostic and treatment services for the timely and correct identification and management of those with cancer.

Cancer diagnosis (pathology and laboratory services)

- Determine the necessary number of pathologists by assessing the scale of the treatment, test volume and workload in each hospital, and formulate a mid-to-long-term plan for securing pathologists, with a plan to significantly scale up capacity in the next 5 to 10 years.
- Establish and operate an academic organization for pathologists, initially focusing on promoting academic exchanges and training, with a long-term view towards expanding into academic research and fostering inter-laboratory collaboration among hospitals.
- Formulate an educational curriculum for a national training programme, with the development and implementation anchored around the Cambodian academic organization of Pathology.

Cancer diagnosis (diagnostic imaging and nuclear medicine)

- Ensure establishment of a national and hospital-based radiation protection programme and appoint appropriate personnel to be able to lead this initiative in each of the hospitals in Cambodia offering radiology and nuclear medicine services. This can be achieved at hospital level by initially appointing a radiation safety officer that would support the establishment of the radiation protection programme in line with the guidelines of the International Basic Safety Standards. This may be achieved as part of an IAEA technical cooperation project.
- Advance the education of radiologists in cancer imaging by having additional fellowship trainings specific for oncology imaging utilizing computed tomography (CT) and magnetic resonance imaging (MRI). This approach will improve the competences of radiologists and allow them to serve as future trainers to junior colleagues who intend to pursue this pathway. This can be achieved by availing fellowship programmes in neighbouring countries such as Thailand and Philippines.
- Establish Quality Assurance and Quality Improvement Programme in Radiology and Nuclear Medicine services. There is lack of documented practice in the quality management systems of the radiology and nuclear medicine departments as well as QA/QC programmes for the equipment in each hospital. This can be achieved by adopting the IAEA Quality Management Audits in Diagnostic Radiology (QUADRILL) programme for radiology services and the IAEA Quality Management Audits in Nuclear Medicine (QUANUM) which will ensure safe practices in radiological services.



- Prioritize training of nuclear medicine professionals (nuclear medicine physician, radiopharmacist, medical physicist, cyclotron operators) in anticipation of the establishment of the PET/CT and cyclotron facility at Calmette Hospital. This should also include plan to train and appoint clinical medical physicists in radiology and nuclear medicine. The medical physicists would be responsible in several areas including managing a QC programme for radiology and nuclear medicine equipment, organizing the personal radiation monitoring programme, optimizing imaging procedures, establishing diagnostic reference levels (DRLs), arranging radiation safety training for staff, patient-specific dosimetry and commissioning of new radiology equipment and premises.

Cancer treatment (medical oncology)

- Initiate the development of national evidence-based guidelines. The development of a professional National Scientific and Professional Society should be encouraged for continuous medical education and the development of national recommendations and protocols.
- Extend the Essential Medication List (EML) in line with the WHO list (www.who.int/publications/i/item/WHO-MHP-HPS-EML-2021.02) and create a reliable procurement system for good quality medication.
- Put in place oncology pharmacy (at hospital level) to improve the quality of chemotherapy preparation, administration and to undertake education and counselling of patients.
- Develop satellite outpatient cancer units in other cities to cover medical oncology services closer to the population (estimated at 4 to 5).

Cancer treatment (surgical oncology)

- Increase referral of surgical cancer patients to large central hospitals for optimum use of services. Central hospitals like Khmer-Soviet Friendship Hospital have well trained surgeons and equipment to perform oncologic surgery.[4]
- Introduce evidence-based management guidelines in surgical oncology and assess adherence to guidelines.
- Collect essential data on the annual number of cancer cases, number of surgeons performing cancer surgery and number of cancer surgeries, with documentation of perioperative outcomes (complications, length of hospital stays etc.) and through the existing and/or planned hospital-based cancer registry system.
- Formally establish multidisciplinary treatment decisions (through tumour boards) at all cancer centres and ensure inclusion of all relevant specialists. The preferred composition would be surgeon, radiation oncologist, medical oncologist, radiologist, oncology head nurse, psychosocial staff and a palliative care physician.[5]

Cancer treatment (radiation oncology)

- Consider establishing a mechanism to coordinate a network of radiotherapy services, e.g., a National Cancer Agency, to minimise waiting times and to coordinate referral pathways, training and production of policies and treatment guidelines.
- Increase LINAC capacity at Luang Mè Hospital, Khmer-Soviet Friendship Hospital and Calmette Hospital: each should have two LINACS before a fourth public radiation treatment centre is established, to minimise vulnerability to machine breakdown.[6]

4 Update from the National Team: Calmette Hospital also has capacity in surgical oncology.

5 Update from the National Team: Calmette Hospital started a weekly tumour board for all new cancer cases in mid-2023.

6 Update from the National Team: Calmette Hospital plans to purchase one or two additional LINACs because there are already two extra bunkers in the hospital. However, demand for the service still needs to be validated.

- Engage an expert in the field to advise on LINAC and brachytherapy bunker design at Luang Mè Hospital. An IAEA expert mission could be requested to assist with this, potentially as part of the proposed Technical Cooperation project KAM2022004.
- Re-evaluate the internal design of the proposed radiation treatment facility at Luang Mè Hospital to optimise patient flow and workflow, with particular attention to the location of the initial LINAC and brachytherapy bunkers and the footprints for future expansion. A health architect with experience in cancer facilities should be involved

Paediatric oncology

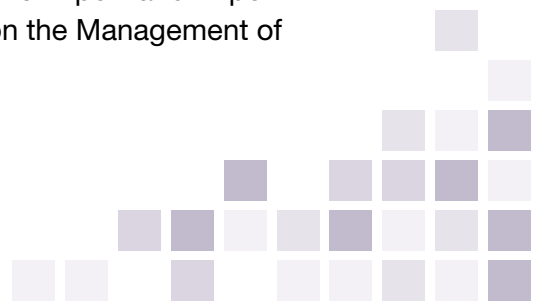
- Develop national evidence-based guidelines. The Cambodia Children Oncology Group should be supported to develop national recommendations and protocols. International Society of Paediatric Oncology has published guidelines for management of most frequent childhood cancers in developing countries that can be used. In line with developed guidelines, enhance the early detection and patient referral system building on already well-established network of paediatric hospitals managing cancer patients.
- Extend the Essential Medication List (EML) in line with the WHO EML list and set up a reliable procurement system for good quality medication at a reasonable cost. Consider joining Global Initiative for Childhood Cancer to ensure access to the Global Medicine Platform for paediatric chemotherapy.

Palliative care

- Develop a comprehensive regulation for opioid management and improve related surveillance system to avoid challenges about the illegal use of opioids and improve the pain management of those suffering from severe illnesses.
- Establish an organization or national committee to facilitate education and improve the quality of palliative care practice.
- Train the trainers who will teach the existing health professionals, pre-licensure students and other disciplines. The trainers and the palliative care organizations can create a committee to develop training in the Khmer language as a long-term goal.
- Integrate palliative care for children into relevant national strategic plans and policies.

Radiation safety considerations

- The national policy and legislative framework to address radiation safety of radioactive sources in Cambodia should be enhanced. Within this framework, a national strategy for formal education and training in radiation protection should be developed, including requirements for professional competences and qualifications on radiation protection.
- The regulatory body on radiation safety needs to establish criteria for the designation of radiation protection officers in medical facilities that use radioactive sources.
- Cambodia is encouraged to express political commitment to the non-legally binding IAEA Code of Conduct on the Safety and Security of Radioactive Sources and its supplementary Guidance on the Import and Export of Radioactive Sources and its supplementary Guidance on the Management of Disused Radioactive Sources.



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 Cambodia: Working Together for imPACT: IAEA Partners Participate in Review of Cambodia's Cancer Care Capacities | IAEA

IAEA International Atomic Energy Agency

World Health Organization

International Agency for Research on Cancer
World Health Organization

24-00545E

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