



Summary

Following a request received from the Ministry of Health (MoH) of the Lao People's Democratic Republic in January 2022, an [imPACT Review](#) was conducted from 25 to 29 July 2022 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. Disease burden: Population health in Lao PDR has improved significantly over the last three decades, however, the epidemiology of it has changed—communicable diseases and nutrition-related disorders have decreased, while noncommunicable diseases and injuries are increasing. Cancer-related disease burden has increased over the last 30 years and ranked fifth in 2019 after cardiovascular diseases, maternal and neonatal morbidity, respiratory infections (including tuberculosis) and other noncommunicable diseases (NCDs). 2 200 disability-adjusted life years (per 100 000 population) were lost in 2019 due to cancer.

The Global Cancer Observatory 2020 database estimated 9 133 new cancer cases (4 532 in men and 4 601 in women), and 6 208 cancer deaths (3 520 in men and 2 688 in women).¹ Based on these estimates, liver cancer (19.2%) and lung cancer (14.4%) had the highest share of cancer mortality in both sexes. In women, top 5 most frequent cancers² were: breast, liver, colorectum, cervical and thyroid. In men, top 5 most frequent cancers³ were: liver, lung, stomach, colorectum, oesophagus.

2. Health system overview: The Ministry of Health defines the national health policies through a multi-layer policy framework. The overarching policy documents are the Health Sector Reform Strategy (2021–2023) and the Health Sector Development Plan (2021–2025). Cancer related policies are the National Multisectoral Action Plan for the Prevention and Control of Noncommunicable Diseases (NCDs) (2014–2020)⁴ and the National Strategy for Reproductive, Maternal, Newborn, Child and Adolescent Health (2021–2025). Provincial authorities (18 provinces) have the responsibility for implementing these policies, including the organization and delivery of healthcare.

¹ Excluding nonmelanoma skin cancer

² *ibid*

³ *ibid*

⁴ A new strategy (2023–2030) is in planning



The government finances the services and goods included in the Essential Health Service Package, albeit selectively, combined with a different level of copayments and advanced payments. Regarding cancer care, radiotherapy is not included in the essential benefit package; palliative care though included has very limited coverage; systemic treatment is reimbursed only after significant advanced payment; access to diagnostic imaging and surgery requires high out-of-pocket payments. Up to 50% of current health expenditures are financed from out-of-pocket. This is one of the main factors affecting utilization of services, which in the public sector is relatively low, especially for out-of-patient care.

Health services are delivered predominantly by district, provincial and central level hospitals. In addition, village health volunteers and village health committees are engaged in implementing selected public health interventions at PHC, and referral of patients to higher level of health care. Eighteen provinces (including Vientiane Capital) differ significantly in health system performance—by mortality rates, outpatient and inpatient care utilization, health workforce density, hospital beds and health care expenditures. Cancer diagnosis and treatment is centralized in the main hospitals in Vientiane, with Mittaphab Hospital providing the most comprehensive cancer services.

3. National cancer control planning and governance: The specific health policy that pertains to cancer control is the National Multisectoral Action Plan for the Prevention and Control of Noncommunicable Diseases (NCDs) (2014–2020)⁵. This Plan is currently being updated by the Ministry of Health and a new one is expected to be endorsed in 2023. The current plan was evaluated for the effect of its implementation demonstrating relevant progress on key risk factors for cancer, such as smoking⁶ and heavy drinking⁷. However, the trend observed in obesity and physical inactivity has been increasing, both being risk factors for different types of cancers.

The Multisectoral Action Plan on NCDs included few objectives related to cancer prevention and care: i) enhance screening of cervical cancer; ii) increase access to palliative care, including for access to community-services and availability of opioids; iii) oncology workforce development. Both cervical cancer screening and palliative care interventions were included in the Essential Health Service Package (2018–2020), however, the scale of implementation has been very limited. In terms of governance, the Multisectoral Action Plan on NCDs also included a Technical Leading Committee, chaired by the Vice-Minister of Health, with representatives of all related MoH divisions, the Medical University and the National Institute of Public Health. This established committee should also be considered to streamline governance and coordination of future activities for cancer control.

The objectives of the new Multisectoral Action Plan on NCDs (2023–2030) should include the areas of primary prevention, early detection, treatment and palliative care as well as corresponding training of health professionals. To develop these objectives and targets, it is important to define milestones in a stepwise way according to the priorities in cancer diagnosis and treatment extracted from the recommendations of the imPACT Review and using other relevant reports.

⁵ A new strategy (2023–2030) is in planning.

⁶ Decrease in the prevalence of smoking from 29.8% in 2013 to 19.5% in 2020

⁷ Decrease in episodes of heavy alcoholic drinking from 67% in 2013 to 37.3% in 2020 among males



4. Planning of the national cancer center: The establishment of a national cancer center in Vientiane is a priority objective defined by the Ministry of Health, formally recognized in 2017. National cancer center is an essential component of any cancer care system. The design of it should complement the existing resources, increasing primarily the treatment capacities, where there are no available resources. The criteria for planning of national cancer center in Lao PDR should prioritize the gaps in resources and create networks with the existing providers of care. For this purpose, a network of central hospitals in Vientiane should be organized. This would be important to maximize the use of available resources and coordinate the pathway of patients requiring multidisciplinary treatment. This network may begin with a multidisciplinary tumour board involving key clinicians from different hospitals. This network should further include the provincial hospitals, which need to have a national referral pathway for the patients diagnosed.

In this context, the future national cancer centre should play a key role as a hub for cancer care within the framework of a national cancer care network of central and regional hospitals. The criteria for building a cancer center should include the need to be comprehensive, from good diagnosis to multidisciplinary treatment—surgery, radiotherapy, chemotherapy and palliative care. From this perspective, the most pressing priority in Lao PDR is to provide quality palliative care accessible to all patients who are in need. The following IAEA/WHO framework could be useful to plan the national cancer centre in greater details: www-pub.iaea.org/MTCD/Publications/PDF/P1989_web.pdf.

5. Cancer prevention: Cancer prevention is integrated into the National Multisectoral Action Plan on NCDs. As previously indicated and as part of its implementation, the country achieved behavior risk targets concerning alcohol intake, with remarkable two-fold reduction in the heavy drinking episodes among males (from 2013 to 2020) and 10% decline in prevalence of tobacco smoking among adults.

Good performance of the health system through the HPV introduction in 2020 was highly praised by Gavi, the Vaccine Alliance and development partners. Sustaining high coverage will require additional efforts. In 2021, according to WHO and UNICEF immunization coverage estimates, 87% of the target population received the first dose of HPV, while the coverage with the second dose was 42% (much below the target of 85%). The coverage with birth dose and third doses of Hep B is suboptimal—64% and 75% in 2021 as per WHO/UNICEF estimates. The country can still meet 2025 immunization targets if the main supply and demand side health system bottlenecks are identified and addressed timely.

Considering the high prevalence of liver cancer, there is a need to establish a programme to prevent cancer caused by the carcinogenic human liver fluke. Country documented programmes for reducing liver fluke infection are available through WHO⁸. This programme should be considered while planning for the new National Multisectoral Action Plan on NCDs.

6. Cancer early detection: According to GLOBOCAN, cervical cancer is one of the most prevalent cancers in the country, with 3.1% share in cancer mortality and 4.1% share of new cancer cases per year. More than 60–70% of the cases are diagnosed at advanced stages due to lack of awareness of risk factors and

⁸ www.who.int/news/item/17-07-2020-children-are-the-key-to-behaviour-change-to-reduce-infection



recognition of early signs as well as cancer related stigma. Advanced stage is also due to lack of availability and affordability of diagnostic services for communities in remote areas, where 60–70% of the country population reside.

For the context of Lao PDR, early diagnosis of common cancers is recommended over population-based screening programmes. VIA-based ‘screen, triage and treat’ approach for cervical cancer; awareness raising; breast self-examination (BSE); clinical history and clinical breast examination (CBE) in early diagnosis of breast cancer; and inspection of oral cavity by health workers for early diagnosis of oral cancer are recommended strategies for the early detection of common cancers.

Currently, cervical and breast cancer early detection is performed in an opportunistic manner and with limited coverage, mainly at central level hospitals. VIA examinations and clinical-breast examination (CBE) are performed routinely for symptomatic patients in the out-patient departments. In order to scale up the cervical cancer screening and include follow up treatment of pre-cancerous lesions, health professionals should be trained for colposcopy guided LEEP/thermal ablation and relevant equipment should be provided. In the long-term, cervical cancer screening programme should consider transition from existing VIA-based screening to HPV mRNA-based test as a primary screening test, in line with the latest WHO guidelines.

The government has added cervical cancer control in the strategic objectives of the National Strategy for Reproductive, Maternal, Newborn, Child and Adolescent Health (2021–2025). The goal is to achieve coverage of VIA-based screening to 40% of the eligible population by 2025. In addition, strengthening the capacity of healthcare staff to provide cervical cancer screening has been added as a target, with at least one healthcare worker from each hospital (central/regional) trained in VIA method by 2025.

There are no plans to establish any other cancer early detection or early diagnosis programme. The new plan (2023–2027) for the Package of Essential Noncommunicable diseases interventions (PEN) at the primary health care level includes scope of services related to awareness raising of symptoms of cancers, risk factors and importance of early detection. This represents an opportunity to scale up early diagnosis programmes for the most common cancers.

7. Cancer diagnosis:

Pathology and laboratory diagnosis: Development and planning of human resources in pathology and laboratory services requires prioritization, both in terms of staffing and formal education. National pathology residency training programme should be developed and essential training resources, such as autopsy services and immunohistochemistry should be made available. There are no continuous education programmes offered for pathologists once they are certified. Pathologists have limited subspecialty expertise, in particular, for surgical pathology and cytology diagnoses. Medical technologists are trained on the job, with no formal education programme. Development of their professional competencies is required for certification purposes and further accreditation of services provided in laboratories.



There are two central pathology laboratories in the country that have significant processing capability of pathology samples – University Health Services Hospital (UHS) and Mittaphab Hospital. A major challenge is the quality of pathology samples received from referring hospitals, with a lack of attention to tissue preservation during procurement and transport. In order to improve the referral system among hospitals, multi-disciplinary tumour boards should routinely include pathology specialists from both central and provincial (referring) hospitals.

It is recommended to focus on introducing a quality control programme for pathology laboratories, train pathologists and laboratory technicians following national standard operating procedures, which need be developed and compliant to international standards e.g., ISO 15189. Further, auditing of key pathology quality performance indicators should be in place e.g., cold ischemic time, assay quality control and confirm diagnosis accuracy through second opinion telepathology. To improve quality of diagnoses and develop subspecialty expertise, investment in whole-slide imaging equipment, and joining an international telepathology diagnostic support service should be considered (*see recommendations for available resources*).

Diagnostic imaging: Diagnostic imaging capabilities in Lao PDR comprise mainly services focused on acute cardiovascular or trauma conditions. All central hospitals in Vientiane region provide general radiology services with up to 30% of procedures dedicated to oncology imaging. No nuclear medicine services are available throughout the country. Most of the public hospitals offer essential radiological services, such as conventional X-rays (including mobile X-rays) and ultrasound imaging. Computed Tomography (CT) and Mammography are becoming increasingly available (in most central hospitals), while Magnetic Resonance Imaging (MRI) has limited availability (in only one central hospital).

Medical imaging professionals providing the services are generally available (~100 radiologists), however, specific trainings are required to provide efficient, effective, quality and safe radiological care. For example, trainings in quality management systems and radiation protection should be prioritized. In view of the plans to establish national cancer centres, these trainings are essential preconditions to improve the current state of diagnostic imaging services. As a follow up to the imPACT Review, further studies should be undertaken to ensure the safe operation of the current departments in terms of adequate number of trained professionals, radiation exposure practices and licensing of the facility. IAEA Quality Management Audits in Diagnostic Radiology (QUADRILL) should be utilized as a technical advisory service to improve safe radiology practices (*see recommendations for available resources*).

8. Cancer treatment:

Medical oncology: Development and planning of human resources in medical oncology requires prioritization, both in terms of staffing and formal education. Medical oncology services are provided only in Vientiane region via the Cancer Centre Unit in Mittaphab Hospital, Setthathirath Hospital and Children’s Hospital. There are a total of eight oncologists at the three sites – five for adult oncology and two for pediatric oncology.



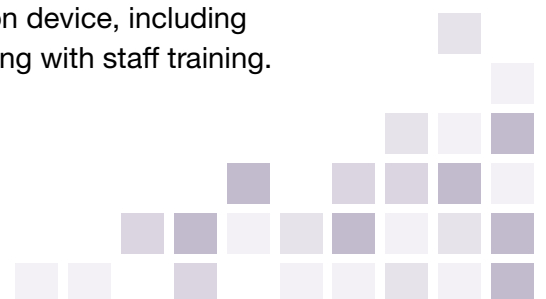
In absence of a formal residency training programme, none of these health professionals are board-certified in oncology. There is currently no training for clinical pharmacists, and additional training is merited for oncology staff, particularly in the field of palliative care.

Physicians currently follow ESMO and NCCN guidelines for treatment of cancers, management of adverse events, and follow-up. These guidelines have not been adapted to the context of Lao PDR. Treatment decisions are made without all key information, such as biomarkers due to lack of immunohistochemistry staining, and no interventional radiology to get tissue diagnoses for certain tumours. Anti-cancer drugs are purchased directly by practitioners and sourced from Thailand, leading to challenges in supplier delays, poor quality shipments, and higher prices. There is no standardized procurement or task force evaluating priority drugs and projected needs. Handling of hazardous anti-cancer drugs is an area of concern, with a lack of personal protective equipment or Compounding Aseptic Containment Isolator (CACI), and varying practices on storage and waste management. Standard Operating Procedures (SOPs) are absent and is an immediate first step towards safe management of hazardous materials (*see recommendations for available resources*).

Research on quality of care and implementation is limited, leading to a lack of data regarding treatment outcomes or ability to perform monitoring and evaluation of the national cancer programme. Barriers to care include insufficient medical facilities and challenges with financial affordability (as reported above, reimbursement followed by a significant advance payment), so many patients present with advanced stage of cancer and require palliative care.

Radiation oncology: The most common treatments at the single radiotherapy centre in Lao PDR are for cervix, and bone metastasis. The radiotherapy centre at Mittaphab Hospital is a modern facility that opened in 2016. There is only one Linac machine and no further bunkers or room to install brachytherapy. There is only one CT simulator, and the planning system includes one license of planning and one license of contouring. There is no service and maintenance contract for the CT simulator and laser. There is no radiation oncology and medical physicist training. There are two radiation oncologists, who trained via an observership in Thailand in 2016. One radiation oncologist is training for three years at an observership in Thailand since December 2019. There are two medical physicists; both completed a master's in medical physics in Thailand. There was a lack of understanding in basic principles of radiotherapy among all staff groups.

It is recommended to focus on training of radiation oncologists, medical physicists, and RTTs to enhance centre utilization and to start quality assurance programmes for more advanced treatment regimens, e.g., 3D-CRT and 3D brachytherapy (*see recommendations for available resources*). A multidisciplinary team should be implemented in the centre. National guidelines should be established as quality standards for treatment as well as for reimbursement purposes, as currently radiotherapy is not included in the essential package of health services. In addition, it is recommended to develop a short- and long-term project of necessary infrastructure and manpower in view of the planning for the National Cancer Centre. Regulation of radiation safety and protection of each radiation device, including simulator and linear accelerator, should be implemented, along with staff training.



Surgical oncology: There is no surgical oncology workforce as a specialty in the country and most of the cancer cases are managed by general surgeons. The country has approximately 266 surgeons in total and around 100 surgeons in the capital city area — Vientiane. There are only few gynaecologic oncologists trained abroad and this workforce is highly inadequate for the cancer burden, in particular cervical cancer. There is a need to develop a cadre of surgical oncologists who may then become mentors and start professional degree course in surgical oncology. Currently, there is no faculty to train candidates in surgical oncology or to train general surgeons. Initially, a core group of surgeons could be trained with the support of the neighboring countries, where most surgeons are currently sent for education e.g., Thailand; Australia (*for available funding resources see priority recommendations*).

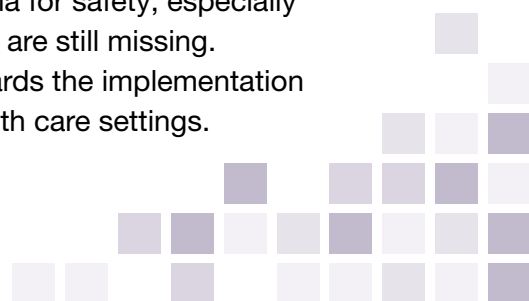
Due to lack of availability and access to other treatment modalities and pain management drugs, surgery is the main option for palliative care in Lao PDR. Approximately 70% of the cancer surgeries are done for the purposes of palliative care. On the other hand, patients have also constrained access to cancer surgery, and it is estimated that 30% of them refuse treatment because of high out-of-pocket payments. Currently all surgical departments use NCCN guidelines for treatment protocols in an individual capacity. There are no standard treatment guidelines or multidisciplinary tumour boards available for clinical decision making on treatment.

Palliative care: Most cancer cases in Lao PDR present at an advanced stage. For this reason, palliative care represents an essential service that provides a continuum of care to patients and their families. 6208 cancer patients died from cancer in 2020 (GLOBOCAN 2020) and 66% of these patients would have required pain control. Based on this figure, a conservative estimate of the number of patients that would need pain control each year in Lao PDR is 4097 patients.

National policy on palliative care needs to be developed as well as a national regulation regarding the access to oral morphine (*for available WHO resources see priority recommendations*). An important development is the inclusion of palliative care for cancer patients under the Essential Health Services Package (2018–2020). In order to support its enforcement, an implementation strategy to include palliative care across the different levels of health care is required.

The health professionals working on palliative care are very limited in number and they lack internationally recognized training. Only one medical oncologist, working at the Cancer Centre Unit in Mittaphab Hospital has completed a specific training in palliative care from Thailand. The only palliative care multidisciplinary team at the Mittaphab Hospital requires specialized training in an internationally accredited institution. This will allow the team to become highly specialized in palliative care, including as a national training resource.

- 9. Radiation safety considerations:** Progress has been made by adopting the Law on Radiation Protection and Safety (2019) and by establishing the Radiation and Nuclear Safety Office (RNSO) within the Department of Science. However, regulations to specify the requirements and associated criteria for safety, especially those relevant to medical and occupational exposure control are still missing. Completing and issuing the regulations is a crucial step towards the implementation of regulatory control over the use of radiation sources in health care settings.



The 2019 Law provides for the establishment of a system for the authorisation of radiation practices, but the regulatory body has not yet implemented this core regulatory function. The regulatory body is mandated by the 2019 Law to carry out regulatory inspections to verify compliance with regulatory requirements. Some inspection activities have been initiated but on a very limited scale. The national registry of radiation sources has not been established, and there is no indication of how many radiation sources exist in the country.

Existing competences and skills of staff of the regulatory body, in particular, regarding control over complex medical facilities such as radiotherapy, are not sufficient. Individual monitoring of external exposure for occupationally exposed workers has been established only partially. A radiation protection programme for facilities and activities is not required, for example, no need for designation of a radiation protection officer. There are no requirements nor practical arrangements for the optimization of radiation protection and justification of medical exposures.

The quality control (QC) tests, as a part of quality assurance (QA) programme, to ensure that all medical radiological equipment performs accurately and predictably are not carried out. There is a lack of awareness of radiation risks among radiological medical practitioners and health professionals in general, as well as of their responsibilities for radiation protection and safety (*IAEA resources to address these shortcomings are available in the recommendations section*).

10. Security of radioactive material in medical use: The review focused on the security and regulatory aspects of the radioactive sources used in medicine in Lao PDR. In terms of regulatory infrastructure, with the support from the IAEA, Lao PDR adopted a Law on Radiation Protection and Safety in 2019, which lays down the provisions for radiation and nuclear safety, including measures to prevent and mitigate the risk and danger to humans and environment. In terms of security, there is a single 'article 25' in the Law (19), which addresses security of radioactive sources. No special legislation on security of radioactive sources is currently planned.

Important priorities of the country to address current challenges in security of radioactive material in medical use include the need to: i) establish a training programme on nuclear security in general, and on the security of radioactive material in particular for regulatory staff and operators/users and ii) to actively engage in international security fora, such as the IAEA's Working Group for Radioactive Material Security (WGRMS) to benefit from exchange of information, knowledge and best practices



■ Key priority recommendations

National cancer control planning and governance

- The National Multisectoral Action Plan on Noncommunicable Diseases (NCDs) (expected to be endorsed by early 2023) may be the most appropriate framework to include the objectives in cancer control and the corresponding milestones. This Multisectoral Action Plan should include the areas of primary prevention, early detection, treatment, palliative care as well as health information systems and oncology workforce development.
- A steering committee on cancer control should be proposed in this Multisectoral Action Plan on NCDs to lead and evaluate the implementation of the objectives of the plan. In this committee, all stakeholders should be involved both from the Ministry of Health, relevant hospitals, health care providers involved in cancer prevention and care as well as NGOs, the academia and private sector.
- The cancer objectives within the Multisectoral Action Plan on NCDs should define the model of care and the referral of patients. This model of care should guide the design of the National Cancer Centre (NCC) and should define the following major points: i) multidisciplinary care (MDT) based on tumour boards as the cornerstone of the clinical decision making; ii) network of cancer care providers with a hub and spoke model; iii) the requirements of information technology to support the MDT and the network of hospitals and the NCC; iv) a referral pathway between the reference hospitals and the NCC.
- The MoH and its Department of Human Resources should develop a training plan in support of the specialization of professionals in cancer care; aimed at all components of cancer diagnosis and treatment (imaging, pathology, cancer surgery, medical oncology, radiation oncology and palliative care). This training could be based on international training programmes or on site supervised by international experts.
- National Cancer Centre: A planning process to assess the future needs of cancer patients should be undertaken to define the organization, resources and health professionals required. This plan should be aligned to the Health Sector Development Plan. The design of the NCC should complement the existing resources, avoiding duplications and increase the capacity of treatment where there are no resources available. The following WHO-IAEA guiding document should be used as a starting point: WHO-IAEA: Setting up a cancer centre: a WHO-IAEA framework. Vienna: IAEA, 2022. www-pub.iaea.org/MTCD/Publications/PDF/P1989_web.pdf

Registration and surveillance

- Include cancer registry and surveillance as one of the strategies under the National Multisectoral Action Plan on Noncommunicable Diseases (NCDs). Officially designate the cancer centre unit at Mittaphab Hospital responsible for national level cancer registry activities. Ensure adequate and continuous budget allocation from the Ministry of Health to support its activities.



- Develop Standard Operating Procedure Guide using references from the IARC technical report [IARC_Technical_Report_No43_0.pdf](#) ([iccp-portal.org](#)) and the manual on cancer registration in Thailand, http://tcb.nci.go.th/CWEB/files/20151118_CancerRegistryManual.pdf
- Enhance the capacity of human resources by facilitating attendance at training courses inside and outside the country, particularly the IARC training programmes. In 2023, the NCI Thailand in collaboration with IARC's GICR programme and Khon Kaen University conducted a cancer registry course from 15–17 February.

Prevention

- Analyze the health system bottlenecks (e.g., workforce; financing; supplies; community acceptance etc.) affecting the low coverage of birth dose and HepB3 doses and define measures to address them in the national comprehensive multi-year plan for immunization.
- Establish a programme to prevent cancer caused by the carcinogenic human liver fluke. Country documented programmes for reducing liver fluke infection are available at WHO: www.who.int/news/item/17-07-2020-children-are-the-key-to-behaviour-change-to-reduce-infection.
- In line with the latest recommendations from WHO ([One-dose Human Papillomavirus \(HPV\) vaccine offers solid protection against cervical cancer](#) ([who.int](#))) consider introducing single dose HPV and analyze implications for the health system, including financing, workforce, and services delivery.

Early detection

- For the context of Lao PDR, early diagnosis of common cancers is recommended over population-based screening programmes. VIA-based 'screen, triage and treat' approach for cervical cancer; awareness raising; breast self-examination (BSE); clinical history and clinical breast examination (CBE) in early diagnosis of breast cancer; and inspection of oral cavity by health workers for early diagnosis of oral cancer are recommended strategies for the early detection of common cancers.

Related resources:

- [WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention](#)
- [Breast cancer](#) ([who.int](#))
- [A digital manual for the early diagnosis of oral neoplasia](#) ([iarc.fr](#))
- Strengthen existing early detection programme for cervical cancer. Health professionals should be trained for preparing smears, slides, fixing and transport of biopsy material for the 'screen, triage and treat' approach. The medical doctors and nurses should be trained for colposcopy guided LEEP/thermal ablation to conduct large scale VIA programmes at district, provincial and central level. LEEP should be performed on histologically confirmed adenocarcinoma for ablation.



- **Related resources:**

- www.who.int/publications/i/item/9789240030824

- <https://apps.who.int/iris/bitstream/handle/10665/329299/9789241550598-eng.pdf>

- Include awareness raising on risk factors, recognition of early signs and symptoms, and importance of early detection for the most prevalent cancers in the country, primarily cervical, breast and oral cancers, in the existing programme for control of NCDs at primary health care (PHC) level (NCD PEN package). Complement these efforts with culturally and language appropriate set of information, education and communication materials and tools.
- Develop a referral system for suspected or diagnosed cases of cancer on a priority basis to access further treatment at the tertiary hospitals (e.g., using colour-coding cards to prioritize). Delineate referral pathways clearly by developing national guidelines.

- **Related resources:**

- www.ncbi.nlm.nih.gov/books/NBK555330/pdf/Bookshelf_NBK555330.pdf

Diagnosis (diagnostic imaging and nuclear medicine)

- Ensure establishment of radioprotection programme and appropriate personnel to be able to lead this initiative in each of the hospitals in Lao PDR offering radiology services. This can be achieved at the hospital level by initially appointing a radiation safety officer that would support in the establishment of the radiation protection programme within the guidelines of the International Basic Safety Standards. This may be achieved in conjunction with the IAEA TC project.

- **Related resources:**

- www.iaea.org/publications/8930/radiation-protection-and-safety-of-radiation-sources-international-basic-safety-standards

- Further the education of radiologists in cancer imaging by having additional fellowship training specific for oncological imaging utilizing CT and MRI. In the absence of a specialist in CT and MRI, this approach can complement radiologists with specialty training in oncology and can serve as future trainers to junior colleagues who intend to pursue this pathway aligning with the cancer programme. This can be achieved by availing of fellowship programmes in neighboring countries such as Thailand and the Philippines, and should be supported by the national government as it prepares to enhance the national cancer control programme.
- Establish a Quality Assurance and Quality Improvement Programme in Radiology services. There is an apparent lack of documented practice in the quality management systems of the radiology department 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 which will ensure that safe practices in radiological services are carried out within the context of efficient and consistent customer service.

- **Related resources:**

- www.iaea.org/publications/8187/comprehensive-clinical-audits-of-diagnostic-radiology-practices-a-tool-for-quality-improvement



Diagnosis (pathology and laboratory services)

- Develop a laboratory quality control programme. Pathologists and laboratory technicians need guidance and support to develop the basics of laboratory quality control. This should comprise creating standard operating procedures in pre-analytic specimen procurement, handling and transport, laboratory processes, safety, personnel, equipment management, and basic quality improvement programmes. External Quality Assurance is an excellent way to develop standards. Various resources are available e.g., EQAS and RIQAS are clinical pathology resources (EQAS is free). Other international and national accreditation programmes for anatomic pathology laboratory quality control include ISO 15189, and the Thai Medical Technology standard. The WHO has a Laboratory Quality Management course and the American Society of Clinical Pathologists sponsors training in the WHO laboratory quality management course which focuses on ISO 15189 standards.

Related resources:

- https://terrance.who.int/mediacentre/data/ebola/training-packages/LQMS/11_cd_rom_quality_standards_in_health_laboratories_thailand.pdf
- www.randox.com/riqas-external-quality-assessment
- www.qcnet.com/qc-data-management/external-quality-assurance-services-egas
- Capacity development through access to telepathology diagnostic support service, if deemed sustainable following cost-benefit analysis. For example, access to an international diagnostic support service of international experts (volunteers) in all subspecialties is available through the American Society of Clinical Pathology telepathology system (ASCP).
- Ensure availability of immunohistochemistry diagnostic service (IHC), which is as an essential diagnostic tool to determine adequate treatment, particularly for breast cancer. In preparation for introducing immunohistochemistry (IHC), a cost analysis is recommended to determine cost of different modalities (e.g., automated versus manual IHC)

Treatment (medical oncology):

- Establish a mechanism to assure adequate supply stock of quality anti-cancer drugs. A national process of quality assurance of anti-cancer drugs should be organized and procured by the government. This may involve instating a review panel to prioritize the anti-cancer drugs that must be available continuously and predict the usage of these drugs and to determine adequate reserve levels.
- Establish multidisciplinary teams of professionals (surgical oncologist, radiologist, pathologist, medical oncologist, radiation oncologist, gynaecology oncologist, social worker, psychologist, nurse, pharmacist etc.) in tertiary referral centres. Based on the case referral, include referring specialist from provincial hospitals.
- Develop resource-stratified national guidelines for the common cancer treatments, and management of adverse events. International resource-stratified guidelines from [ESMO](#) and [NCCN](#) could be adopted.



- Conduct appropriate staff training for adherence to national guidelines. Ensure mechanism for distribution and adherence to guidelines in the Cancer Centre Unit of Mittaphab Hospital, Setthathirath Hospital, Children’s Hospital, and other hospitals in Lao PDR.
- Conduct review of the national essential anti-cancer drugs list for consistent toto align with such guidelines.
- Develop Standard Operating Procedures (SOPs); for example, proper waste disposal of chemotherapy and biohazard materials management. Provide essential equipment for health professionals and environment contaminants protection, such as Compounding Aseptic Containment Isolator (CACI).

Related resources:

- Safe Handling of Hazardous Chemotherapy Drugs in Limited-Resource Settings from WHO [Paho_safehandling_eng_web\[1\].pdf](#) as reference for SOPs.
- [Module 2: The Healthcare Waste Management System \(who.int\)](#)

Treatment (radiation oncology):

- Collaborate with the IAEA for training of radiation oncologists, medical physicists, and RTTs to enhance radiotherapy centre utilization and importantly start quality assurance (QA) programme for 3D radiotherapy.
- Establish strategic planning for one brachytherapy and second external beam radiotherapy machine. Further collaborate with the IAEA for training of RO team to enhance their capacity on 3D brachytherapy.

Related resource:

www.iaea.org/publications/7694/setting-up-a-radiotherapy-programme

- Ensure establishment of radioprotection and radiation safety programme for personnel and all equipment.

Related resource:

www.iaea.org/publications/7694/setting-up-a-radiotherapy-programme

Treatment (surgical oncology):

- Develop a cadre of surgical oncologists who may then become mentors and start professional degree course in surgical oncology. Currently, there is no faculty to train candidates in surgical oncology or to train general surgeons in surgical oncology. Initially, a core group of surgeons could be trained with the support of the neighboring countries.
- Tailor resource stratified treatment guidelines (e.g., NCCN) to the country’s resources. In terms of surgical oncology, consider mastectomy to be offered as primary treatment modality as radiotherapy is not accessible or affordable to the large rural populations. Most general surgeons in the tertiary care centres are performing these surgeries. Training them to perform technically adequate mastectomy would reduce number of inadequately treated patients.



Palliative care:

- Include palliative care programme objectives under the new Multi-Sectoral Action Plan on NCDs. Develop a list of indicators to further assess the implementation of palliative care programme.

Related resources:

[9789241565417-eng.pdf](#) ([who.int](#))

- Develop national policy for management and prescription of opioids. This will enable access to these essential medicines. WHO has developed guidelines to assist policy-makers, programme managers and public health personnel to create and facilitate appropriately balanced policies on opioids and prescribing regulations for effective and safe cancer pain management.

Related resources:

Guidelines for the pharmacological and radiotherapeutic management of cancer pain in adults and adolescents (www.who.int/publications/i/item/9789241550390)

- Formulate national guidelines on palliative care to unify approach across different levels of health care. The guidelines should define scope of services as well as roles and competencies of health professionals at different levels of health care.

Related resources:

Guidelines for the pharmacological and radiotherapeutic management of cancer pain in adults and adolescents (www.who.int/publications/i/item/9789241550390)

- Train multidisciplinary teams to enable implementation of the palliative care guidelines. Initially, train the multidisciplinary team at the Cancer Unit in Mittaphab Hospital to become highly specialized in palliative care and to serve as a training resource centre for the whole country.

Radiation safety considerations:

- The Regulatory body should complete the regulatory framework for safety by establishing regulations to complement the 2019 Law; the requirements related to regulatory control, occupational and medical exposure control are of particular importance.

[Basis: GSR Part 1 (Rev. 1), Requirement 2 and 33; GSR Part 3, Requirements 2 and 3]

- The Regulatory body should enhance its human resources by developing a training programme to build and maintain expertise in the disciplines necessary to carry out its statutory functions.

[Basis: GSR Part 1 (Rev. 1), Requirements 4, 11 and 18]

- The Regulatory body should ensure that all the facilities and activities using radiation sources have an authorization as required under the regulatory framework for safety.

[Basis: GSR Part 1 (Rev. 1), Requirement 23]

- The Regulatory body should ensure that all the facilities and activities using radiation sources are inspected. An inspection programme, based on the associated potential risk of the facilities and activities, should be developed.

[Basis: GSR Part 1 (Rev. 1), Requirements 2, 23 and 24]



- The Regulatory body should develop and implement an enforcement policy within the legal framework for responding to the authorized party's non-compliances with regulatory requirements or with authorization conditions.
[Basis: GSR Part 1, Requirements 30 and 31]
- The Regulatory body should establish adequate records relating to the safety of facilities and activities, in particular a national register of radioactive sources. A programme to locate radiation sources in the country needs to be initiated.
[Basis: GSR Part 1 (Rev. 1), Requirement 35]
- The Regulatory body should require the users of radiation sources to ensure that all occupationally exposed workers are under a programme of monitoring of occupational doses adequate to the type of exposures they receive as a consequence of their work.
[Basis: GSR Part 3, Requirement 25]
- The Regulatory body should require the authorized parties to prepare a radiation protection programme, to delineate controlled and supervised areas, to implement workplace monitoring and the corresponding safety instructions and procedures.
[Basis: GSR Part 3, Requirements 24]
- The MoH and the Regulatory body should ensure the implementation of the requirements for justification of medical exposures and optimization of protection and safety.
[Basis: GSR Part 3 Requirement 37 and 38]
- The Regulatory body should ensure that quality control (QC) tests are carried out regularly in medical facilities. There is a need to improve expertise and the availability of equipment to be able to make these measurements.
[Basis: GSR Part 3, Requirement 25 and 38]
- The Regulatory body and MoH should take measures to improve the awareness of the importance of radiation protection and safety of decision makers, health professionals and patients.
[Basis: GSR Part 1(Rev. 1), Requirement 36]

Radiation material security considerations:

- Regulatory staff and operators/users should be trained on security of radioactive material for medical applications.

Related resources:

- Security of Radioactive Material in Use and Storage and of Associated Facilities. www.iaea.org/publications/12360/security-of-radioactive-material-in-use-and-storage-and-of-associated-facilities
- Nuclear Security Recommendations on Radioactive Material and Associated Facilities. www.iaea.org/publications/8616/nuclear-security-recommendations-on-radioactive-material-and-associated-facilities
- Participate in annual IAEA's Working Group for Radioactive Material Security (WGRMS) meetings to exchange information, knowledge and best practices on security of radioactive material and related facilities.

Read more about the imPACT Review Mission to Lao PDR:

[Prioritizing Cancer Care: IAEA, IARC and WHO Support Lao PDR | IAEA](#)



■ 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.



For any questions or additional information, please contact

✉ PACT@iaea.org
and/or

✉ info@who.int

Follow us on Twitter

🐦 [@iaeapact](https://twitter.com/iaeapact)
[#CancerCare4All](https://twitter.com/CancerCare4All)

Visit us

🏠 www.iaea.org/topics/cancer
🏠 www.who.int/health-topics/cancer
🏠 www.iarc.who.int

