

Human Health

Objective

To support Member States in enhancing their capability to address needs relating to nutrition and the prevention, diagnosis and treatment of health problems through the development and application of nuclear and related techniques within a quality assurance framework.

Rays of Hope

The Agency's Rays of Hope initiative aims to increase access to quality radiation medicine for cancer in countries with little to no access or inequitable access by fully integrating the support delivered to Member States.

In 2022, the Agency provided technical support to identify a first wave of priority Member States and their current needs and gaps in radiation medicine. Benin, Chad, the Democratic Republic of the Congo, Kenya, Malawi, the Niger and Senegal were selected and tailored plans were developed to support their respective needs. Each plan covers education and training needs for all relevant disciplines and equipment. As part of Rays of Hope, regional anchor centres will be identified to work as regional leaders, contributing to best practices in radiation medicine while enhancing professional development. In 2022, the Agency streamlined the application process and defined specific requirements for anchor centres, which have been made available to Member States through a dedicated section on the Agency's webpage and an information brochure. Letters of interest were received from over ten countries and are at different stages of the evaluation process.

Under Rays of Hope, the Agency and 11 professional societies signed Practical Arrangements to work together to improve access to radiotherapy services and reduce global inequities in cancer treatment. The Practical Arrangements cover various regions and focus on radiation oncology, medical physics and diagnostic imaging. With the signing of these Practical Arrangements, the Agency aims to enhance support to anchor centres by strengthening their educational and training programmes and bringing innovation and research to an advanced level.



The Director General opening the Rays of Hope Donor Roundtable, 13 June 2022.

ZODIAC

Pillar 4 of the ZODIAC initiative focuses on the implementation of cloud-based solutions to enhance data processing, data analysis and collaboration for improved detection and characterization of zoonotic pathogens through the creation of a Respiratory Disease Phenotype Observatory. By 2026, the ZODIAC Respiratory Disease Phenotype Observatory will be collecting a continuous stream of imaging data and associated clinical data from patients around the world with respiratory diseases.

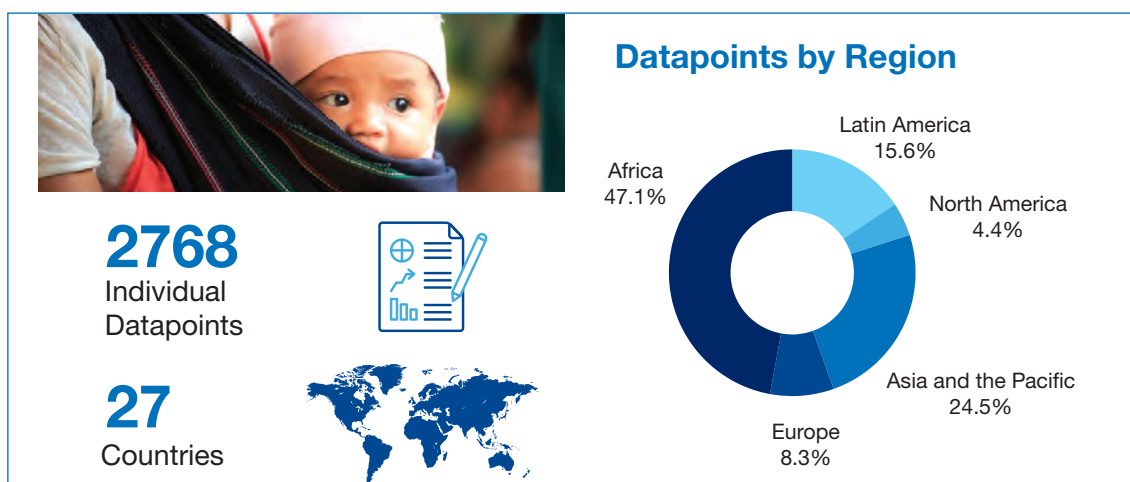
To make the Observatory a reality, in March 2022, the Agency held a an in-person stakeholders meeting with Agency experts and representatives from Amazon Web Services, the University of Vienna, the Fraunhofer Institute for Digital Medicine, Radboud University and Contextflow to define the technical aspects of the cloud-based solution that will host and manage the dataset of this repository.

The revision of the proposals for the coordinated research project (CRP) that forms the basis for the development of the Respiratory Disease Phenotype Observatory has been finalized and core institutions have been identified.

Launch of a Global Database on Breast Milk Intake

Human breast milk contains energy and nutrients that secure optimal infant growth, development and health. In order to monitor breastfeeding patterns and evaluate the effect of nutrition actions, it is vital to have reliable data. Currently, much of the available information on breastfeeding practices is in the form of self-reported data from mothers on the types of foods and liquids they feed their children and is collected mainly from small sample groups comprising around 30–100 mother-baby pairs. To accurately measure the amount of breast milk transferred from mother to infant and to assess whether an infant was exclusively breastfed, the deuterium oxide dose-to-mother (DTM) technique, a non-invasive stable isotope method, can be used.

In order to provide a unique and growing global collection of DTM data, the Agency created a database on breast milk intake by combining and harmonizing a large number of DTM studies. Aside from the obvious benefit of the larger sample size, which currently includes 3000 mother-infant pairs from 28 countries across all regions, the database generates more robust estimates of breast milk intake during infancy and helps to answer overarching research questions. It can be used, for example, to explore how socioeconomic status, the mother's body composition or the infant's gender influence breast milk intake around the world and over time. These new insights facilitate efforts to improve infant and young child feeding practices globally and help decision makers better understand potential barriers to and enablers for exclusive breastfeeding, and the importance of breast milk in the diets of infants beyond six months. The database is available for scientific purposes to both contributing researchers and those interested in accessing DTM data for secondary data analysis.



The first edition of the global database on breast milk intake, in numbers.

Release of Audit Methodology for Medical Physics Clinical Training Programmes

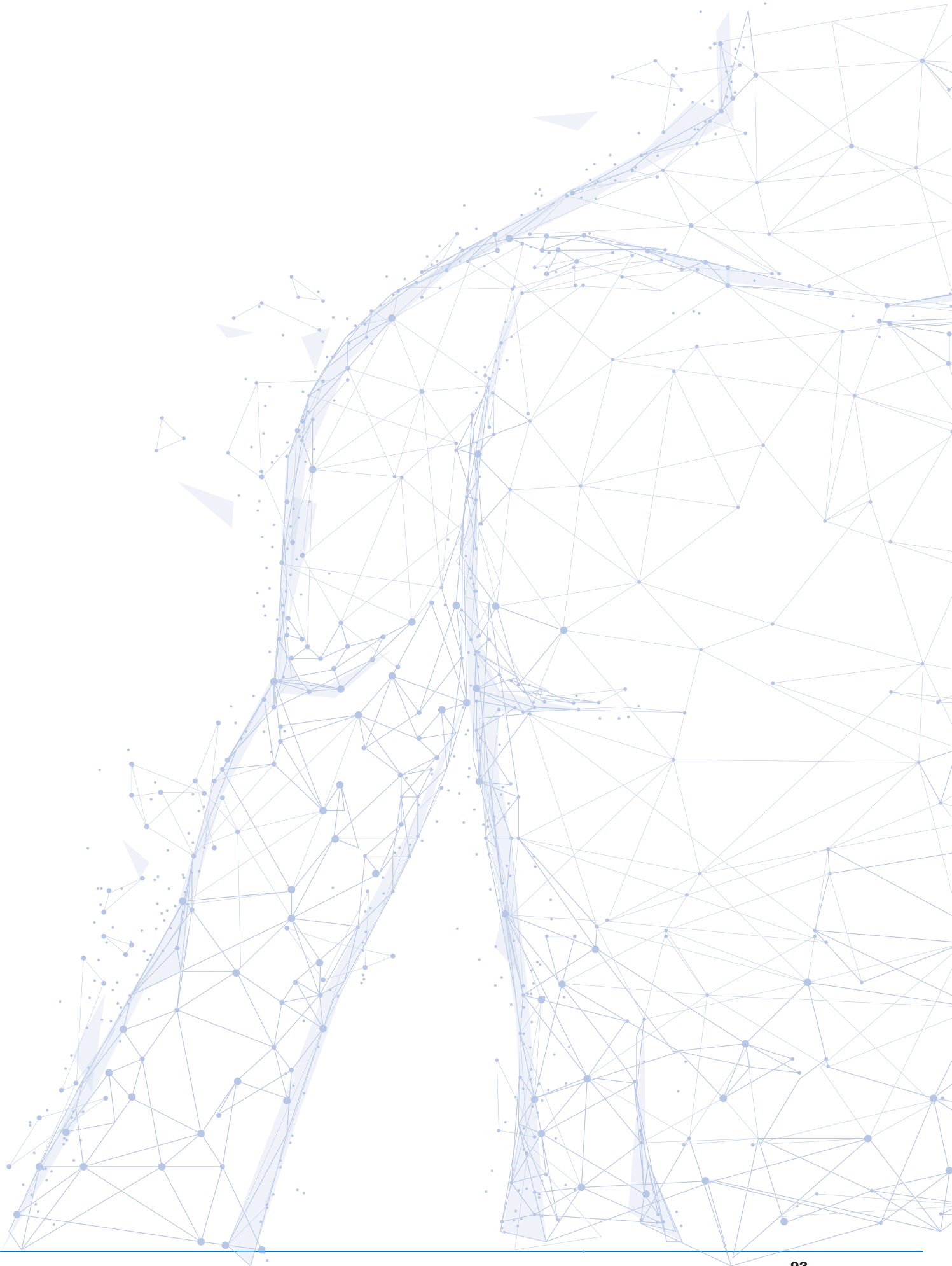
Formally structured clinical training is often overlooked when setting up educational programmes, which has a negative impact on the recognition of clinically qualified medical physicists. A structured and supervised clinical training programme is crucial to provide the competencies needed to work independently in one or more specialties of medical physics and achieve recognition as a clinically qualified professional.

In response to increasing demand from Member States wanting to establish and sustain high-quality clinical training programmes, the Agency released the *Audit Methodology for Medical Physics Clinical Training Programmes* (IAEA-TCS-74), which sets out a standardized methodology for auditing programmes in the area of medical physics. The publication is aimed at all professionals and medical residents involved in establishing, delivering or leading a clinical training programme in medical physics, and aims to clarify standards and manage expectations. Also, it highlights the major programme components that support the achievement of best practices in clinical training and can be used as a guide to establish related programmes. The audit methodology provides an independent review of a programme's compliance with relevant standards and its sustainability for quality improvement. It is structured in sequential phases, allowing for flexibility in its application and adoption in a variety of contexts and settings, and is applicable to all specialties of medical physics, including diagnostic radiology, nuclear medicine and radiation oncology, and all types of clinical training programme.

New Services at the IAEA's Dosimetry Laboratory

The Agency enhances the capabilities of Member States to implement radiation imaging and treatment modalities safely and effectively through optimized dosimetry and medical physics practices. In 2022, the Agency updated dosimetry-related codes of practice, provided guidelines, conducted training events and developed educational material to support the medical physics profession and enhance quality and safety in radiation medicine. Through its Dosimetry Laboratory, the Agency expanded its support to Member States by introducing new services such as photon calibration and external beam radiotherapy audits, including the electron beam audit service – provided using the linear accelerator (linac) facility – and calibration of high dose rate brachytherapy sources. These services are essential to help Member States ensure that when ionizing radiation is used to treat cancer patients, the process is safe, accurate and effective and achieves optimal results.

For the first time since its commissioning at the Agency's Seibersdorf laboratories, the linac was used to provide training on: the practical aspects of its use in advanced radiotherapy techniques; the establishment of national dosimetry audits in radiotherapy; and updated guidance for Quality Assurance Team for Radiation Oncology (QUATRO) audits. In addition, the second edition of the QUATRO guidelines *Comprehensive Audits of Radiotherapy Practices: A Tool for Quality Improvement* was published to provide guidance on auditing new technologies in radiotherapy and to build on the knowledge of the audit teams by incorporating lessons learned from past audits and recommendations from QUATRO auditors.



The Agency and WHO Help Benin Develop New National Cancer Control Plan

Every year in Benin, more than 6700 people are diagnosed with cancer and more than 4600 cancer patients die from the disease, according to the Global Cancer Observatory of the International Agency for Research on Cancer (IARC). To address the increasing number of cancer cases and the relatively low survival rates, the country's authorities, supported by the Agency and WHO, are making steady progress towards developing and implementing a comprehensive National Cancer Control Plan (NCCP). The Plan is aimed at reducing cancer morbidity and mortality by equipping facilities, training staff and deploying modern technology.

A technical team organized by Benin's National Programme for the Control of Non-Communicable Diseases has been working on a draft NCCP since the beginning of 2022. Under the Agency's flagship initiative Rays of Hope, Agency, IARC and WHO experts have helped the Beninese authorities identify objectives and priorities under the Plan. The Agency is also supporting the Ministry of Health in establishing the country's first radiotherapy and nuclear medicine services, to be hosted in the new Centre Hospitalier et Universitaire de Référence d'Abomey-Calavi. This support, provided within the framework of Rays of Hope, consists of the training of health professionals in radiation medicine, and the provision of certain equipment and expert advice.

"The Ministry of Health in Benin is committed to ongoing investments in cancer control, and the NCCP is a key strategic document to support these efforts", said Lamidhi Salami, President of the National Committee for Primary Health Care.

Benin officially launched the NCCP development process at a virtual workshop in August 2022. During the event, international experts from the Agency, the IARC and WHO discussed methodologies



for designing the NCCP and presented a draft situation analysis report examining the current state of cancer care in Benin. The report served as a reference for the Beninese technical experts, helping them produce a first draft of the Plan by the end of October 2022.

In December 2022, Benin's Ministry of Health, with the support of the Agency, WHO and other international experts, organized another workshop to review progress in developing the NCCP and validate the priorities and objectives defined. The participants identified specific activities for each of the Agency's ongoing cancer-related technical cooperation projects in Benin, establishing time-bound targets for project implementation.

"The NCCP will help align the technical cooperation among the different UN agencies providing cancer control support in the country, resulting in more efficient and equitable outcomes", said Souleymane Zan, WHO Representative to Benin.

The workshop participants also agreed that during the term of the NCCP (2023–2027), the new hospital would be inaugurated; a plan developed for human resources, including recruitment, training and deployment; and national programmes established for the prevention and early detection of cervical cancer, which causes the second highest number of cancer deaths among women after breast cancer.

According to the IARC's Global Cancer Observatory, the most diagnosed cancers in Benin in 2020 were prostate, breast, cervical, colorectal, liver and stomach cancer.

Benin is one of seven countries in Africa benefiting from the Rays of Hope initiative, which helps expand access to cancer diagnosis and treatment services in low and middle income countries. Globally, more than 50 countries have expressed interest in participating in Rays of Hope and, to date, a total of €37 million has been pledged for the initiative. Since Rays of Hope was launched in February 2022, it has helped mobilize resources to build, equip and sustain cancer care infrastructure and train specialists, health workers and technicians.



Workshop launching Benin's comprehensive NCCP, attended by Agency, WHO and Beninese experts.