Human Health

Objective

To enhance capabilities in Member States to address needs related to the prevention, diagnosis and treatment of health problems through the development and application of nuclear techniques within a framework of quality assurance.

Human Health Campus

The 'Human Health Campus', an educational web site for health professionals in radiation medicine, was launched in 2010 (Fig. 1). Using expert advice and support from physicians, physicists, nutrition specialists and experts in education, the web site offers training materials designed to integrate the entire curriculum in the field of radiation medicine. It has detailed sections on nuclear medicine, radiopharmacy, radiation oncology, medical physics and nutrition, and is available at *http://humanhealth.iaea.org*.

Stable Isotope Techniques in Nutrition for Improved Health

One of the Agency's key contributions is to assist in building capacity in Member States. Capacity building efforts in 2010 included the provision of laboratory infrastructure and staff training in Africa, Asia and Latin America in the use of stable isotope techniques to assess human milk intake in breastfed infants and body composition in lactating mothers. A major achievement during this year was the designation of the first IAEA Collaborating Centre in nutrition at St John's Research Institute, in Bengaluru, India (Fig. 2). In many countries, studies are focusing on the revised WHO guidelines regarding breastfeeding by HIV positive women receiving antiretroviral therapy. This issue was addressed in Bangui, Central African Republic, where the most recent stable isotope laboratory in Africa was established in 2010. Training of medical and technical staff was provided by well established facilities in Burkina Faso and Morocco, demonstrating effective South–South collaboration in this field (Fig. 3).

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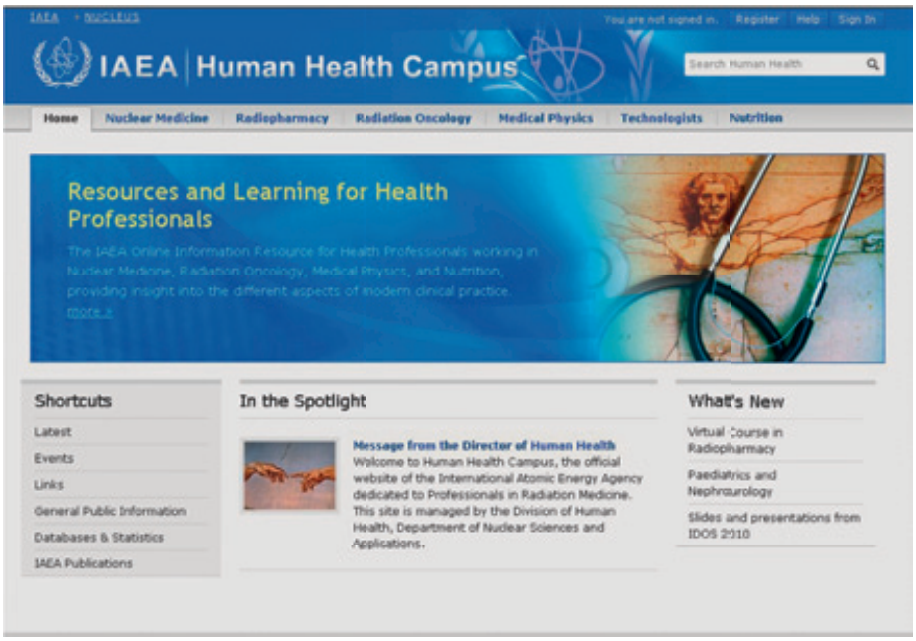

FIG. 1. The 'Human Health Campus', a new web site set up by the Agency in 2010 for the education and training of professionals in radiation medicine.

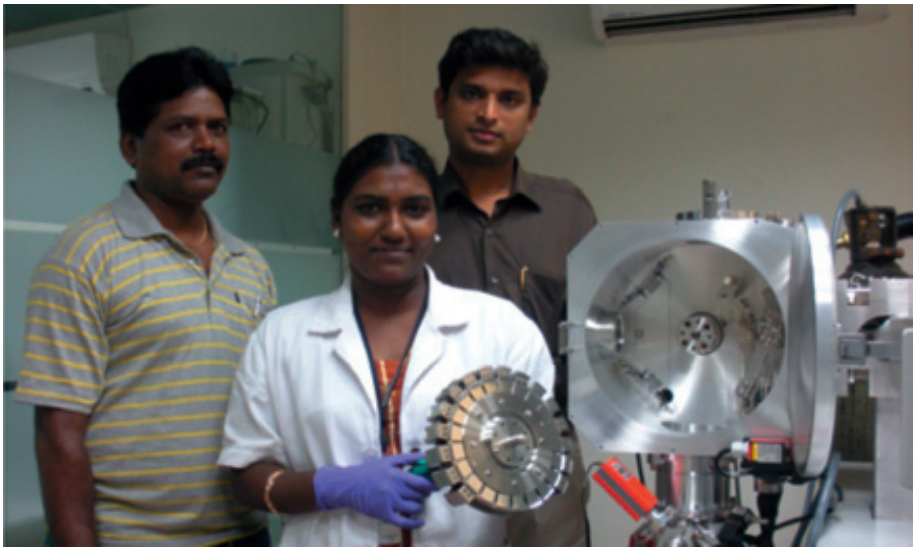

FIG. 2. Thermal ionization mass spectrometer and staff at St John's Research Institute, Bengaluru, India.

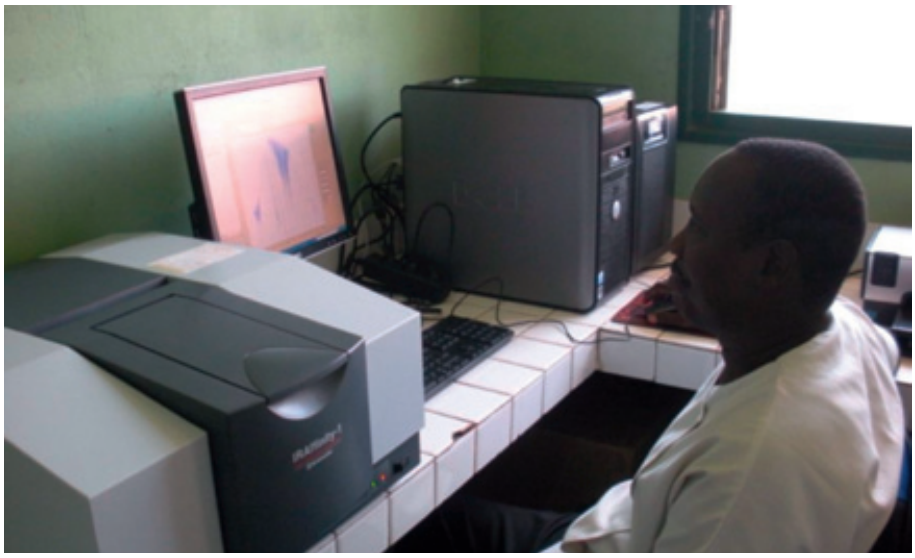

FIG. 3. Stable isotope laboratory in Bangui, Central African Republic.

The Agency's strong focus on nutrition and health during early life was highlighted by its hosting of a technical meeting on 'Biomarkers of Nutrition for Development (BOND)', organized in collaboration with the Eunice Kennedy Shriver National Institute of Child Health and Human Development of the US National Institutes of Health.

"A technical meeting on 'Trends in Nuclear Medicine', held in Vienna, noted an increase in the use of nuclear medicine procedures to diagnose cancer and heart disease."

Nuclear Medicine and Diagnostic Imaging

A technical meeting on 'Trends in Nuclear Medicine', held in Vienna, noted an increase in the use of nuclear medicine procedures to diagnose cancer and heart disease. The meeting also emphasized the need for appropriate human resource development in this area. In addition, concern was expressed regarding the availability of radioisotopes, which has been severely reduced owing to the shortage of molybdenum-99 (Mo-99) that continued to affect low and middle income countries in 2010. There was consensus that the role of hybrid imaging — positron emission tomography/computed tomography, and single photon emission computed tomography — will increase in the coming

years to improve the diagnostic accuracy of imaging techniques using radiation. Meeting participants supported the networking of available resources to help meet the future challenges of development in nuclear medicine and diagnostic imaging.

The Agency emphasized to Member States the importance of quality assurance, encouraging them to commit to quality imaging through a peer review and educational process. This message was disseminated at the annual congresses of major scientific societies such as the World Federation of Nuclear Medicine and Biology, the European Association of Nuclear Medicine, and the Society of Nuclear Medicine of India. In addition, the Agency organized train the trainers courses to augment efforts to disseminate quality management practices.

During 2010, the Agency produced publications on *Planning a Clinical PET Centre* and *Appropriate Use of FDG-PET for the Management of Cancer Patients*, as well as brochures on *Positron Emission Tomography — A Guide for Clinicians* and *Positron Emission Tomography — A Guide for Policy and Funding Agencies*.

Collecting detailed information about the practice of nuclear medicine from around the world is a challenging task. The Agency's nuclear medicine database, NUMDAB, is the only source of such data. In 2010, the Agency continued to encourage nuclear medicine centres in Member States to provide information on global developments in nuclear medicine practices

Radiation Oncology

Thirteen new Quality Assurance Team for Radiation Oncology (QUATRO) audit missions took place in 2010 in Bulgaria, El Salvador, Honduras, Indonesia, Israel, Panama, Poland, Qatar, Romania, Saudi Arabia and Thailand.

In close collaboration with the European Society for Therapeutic Radiology and Oncology, a second train the trainers cycle started in August 2010. This led to a number of local courses for radiation therapists in European countries, the creation of a professional society for radiation therapy in Serbia and the initiation of a national radiation therapy training programme in Estonia.

A publication issued in 2010 entitled *Radiation Biology: A Handbook for Teachers and Students* completed the series of Agency syllabuses on the training of radiotherapy professionals, including radiation oncologists, medical radiation physicists, radiation therapists and radiation oncology nurses.

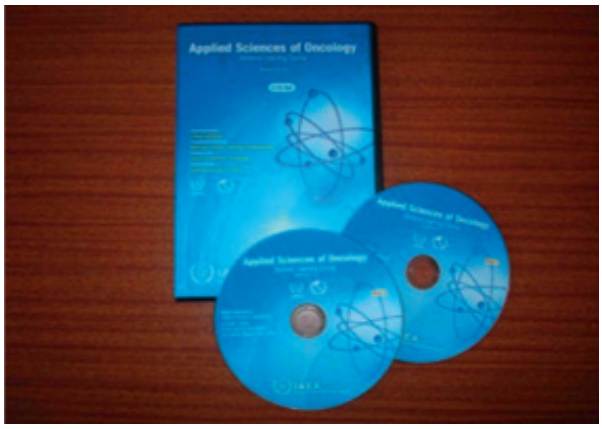

FIG. 4. The Applied Sciences of Oncology Distance Learning Course *is an educational tool produced by the Agency.*

The publication is complemented by the *Applied Sciences of Oncology Distance Learning Course*, which was updated in 2010 (available cost free from *http://www.iaea.org/newscenter/news/2010/aso.html*) (Fig. 4).

Quality Assurance and Metrology in Radiation Medicine

The Agency published a Spanish language IAEA Human Health Report on assessment criteria and recommendations for education, clinical training and certification of medical physicists. Endorsed by PAHO and targeted at the Latin American region, the book harmonizes educational and clinical training requirements and is also relevant for Member States in Asia and Africa.

During 2010, the Agency continued to offer its dosimetry services aimed at Member States that have no opportunity, other than through the Agency, to calibrate their national measurement standards and verify the calibration of their radiotherapy beams used to treat cancer patients. The number of beams checked in 2010 exceeded that planned for, mostly due to a steadily growing demand from new radiotherapy facilities. The newly installed X ray calibration facilities have been fully operational

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since November 2010. During the year, the Agency calibrated 26 national measurement standards for radiotherapy and 13 for radiation protection from 21 Member States, providing a link from their measurements to the international measurement system.

"The Agency's Programme of Action for Cancer Therapy (PACT) seeks to assist developing countries in integrating radiotherapy into the broader framework of cancer control."

The Agency organized an international symposium on 'Standards, Applications and Quality Assurance in Medical Radiation Dosimetry' in Vienna in November, in cooperation with several international and professional organizations. The objectives were to foster the exchange of information along the entire dosimetry chain and to highlight recent developments in the field.

Programme of Action for Cancer Therapy

The Agency's Programme of Action for Cancer Therapy (PACT) seeks to assist developing countries in integrating radiotherapy into the broader framework of cancer control. In 2010, efforts focused

Clinical Education in Radiation Medical Physics

In 2010, a pilot programme to test training materials was completed in Thailand, with ongoing programmes in Bangladesh, Malaysia and the Philippines. The teaching materials are supplemented by information available on the Agency web site: *http://humanhealth.iaea.org*. The programmes are coordinated with the Queensland University of Technology, Australia, which allows for practical training and mentoring to guide participants and strengthen outcomes. Additional training materials were provided for the clinical audit programmes offered by the Agency; for example, *Comprehensive Clinical Audits of Diagnostic Radiology Practices: A Tool for Quality Improvement* (IAEA Human Health Series No. 4) was published in 2010.

Clinical training workshop for medical physicists specializing in diagnostic radiology held in Manila, the Philippines.

Clinical training in nuclear medicine physics was conducted in 2010 with the Abdus Salam ICTP through a joint course on internal dosimetry held in Trieste, Italy. The Agency's gamma camera laboratory in Seibersdorf was another venue where training programmes allowed medical physicists to gain valuable clinical skills.

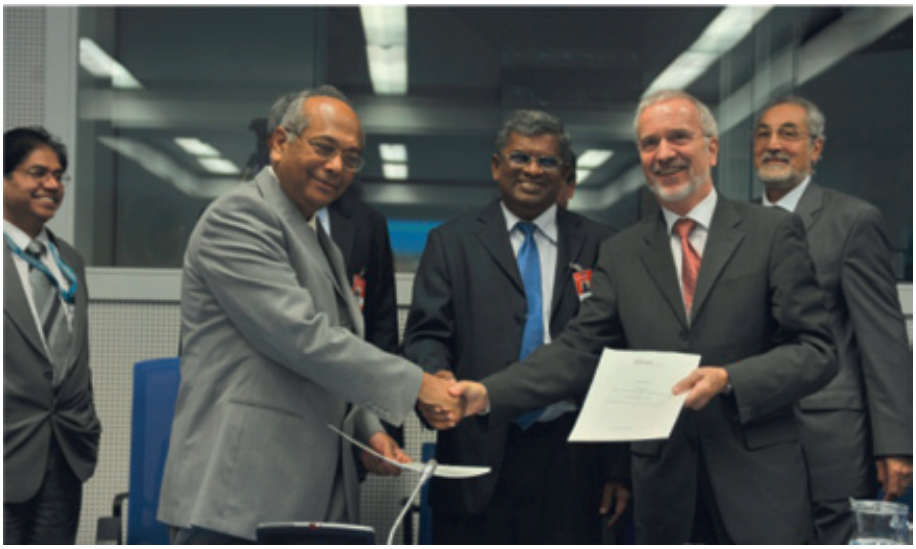

FIG 5. India donated a teletherapy unit for cancer treatment to Sri Lanka through PACT.

on building partnerships with health and cancer control organizations and maximizing the benefits of the WHO/IAEA Joint Programme on Cancer Control, established in 2009 to accelerate cancer control programme development in Member States.

Reviews and assessments of national cancer control capacity and needs are also major PACT objectives. By the end of 2010, the Agency had received requests from 86 Member States for its imPACT (integrated missions of PACT) reviews. In coordination with WHO, imPACT reviews were conducted in Burkina Faso, Côte d'Ivoire, El Salvador, Ethiopia, Guatemala, Indonesia, Kenya, Madagascar, Mauritania, Montenegro, Namibia, Niger, Senegal, Serbia, Zambia and Zimbabwe. Follow-up missions took place at PACT Model Demonstration Sites (PMDSs) in Albania, Ghana, Mongolia, Nicaragua, Sri Lanka, the United Republic of Tanzania and Vietnam. The PMDS projects continued to combine the individual strengths and resources of the ministries of health and their national counterparts in participating Member States through the WHO/IAEA Joint Programme on Cancer Control with the support of other partners and stakeholders to assist health authorities in the development of

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FIG 6. Health workers in Ghana taking part in the VUCCnet pilot project.

their national cancer control programmes. In 2010, Mongolia became the eighth Member State to set up a PMDS.

The Bhabhatron telecobalt unit, donated through PACT by the Government of India to Vietnam, was commissioned and a tripartite agreement was signed for the donation of an additional Bhabhatron unit to Sri Lanka (Fig. 5). Within the framework of a grant from the OPEC Fund for International Development, agreements for implementation of PMDS activities were signed with Albania, Nicaragua and the United Republic of Tanzania.

"… the Agency launched a project to explore the possibility of establishing a Virtual University for Cancer Control in Africa."

The shortage of qualified cancer care professionals is a major bottleneck in developing countries. At a regional consultative meeting with African Member States organized in Ghana in May 2010, the Agency launched a project to explore the possibility of establishing a Virtual University for Cancer Control in Africa (VUCCnet Africa). Following an analysis by the Agency, Ghana, Uganda, the United Republic of Tanzania and Zambia were selected as the pilot sites (Fig. 6). This initiative will facilitate the education and training of cancer care professionals in their home countries by utilizing African e-learning infrastructure and a regional training network relying on existing designated centres.

In addition to contributions from the USA, financial resources were received in 2010 through an agreement with F. Hoffmann-La Roche Ltd, a research based health care company in Switzerland.

Responding to the inequity that persists in access to radiation therapy in the developing world, the Agency launched an Advisory Group on Increasing Access to Radiotherapy Technologies (AGaRT). Intended as a forum to bring together users and suppliers of diagnostic and radiotherapy technologies and other stakeholders, the group seeks to encourage the production of safe, affordable and reliable equipment for the specific requirements of radiotherapy centres in developing countries. Over 60 participants, including business representatives from 14 radiotherapy manufacturers, attended the first meeting in Vienna in 2010.