

# HUMAN HEALTH – PUI PROJECT PROPOSALS

## 1) **Child growth during the “1000 days” window of opportunity; nuclear technique to assess the quality of growth from birth to 2 years of age**

**Rationale:** Undernutrition is one of the world’s most serious but least addressed problems. An estimated 200 million children suffer from chronic undernutrition, resulting in huge human and economic costs as undernutrition contributes to high mortality rates and negative long term effects on health, cognitive and physical development. However, undernutrition is largely preventable and recent data show that interventions during the first 1000 days, i.e., from conception to 2 years of age, is critical as physical and mental damage caused by undernutrition is largely irreversible after 2 years of age. The importance of action to reduce child undernutrition by targeting the 1000 days window of opportunity was recently emphasized in an event entitled “1000 days: change a life, change the future” co-hosted by Ms Hilary Rodham Clinton, Secretary of State of the United States and Mr Michael Martin, Minister for Foreign Affairs of Ireland (<http://www.thousanddays.org/about/>).

**Project description:** The importance of adequate growth during the “1000 days’ window of opportunity cannot be underestimated. However, the monitoring of growth during this crucial period of early life is largely based on basic measurements, primarily body weight and assessed against the WHO Child Growth Standards without any attention to the quality of growth, i.e., the partitioning of body fat and lean tissue. For example, the observations that Asian babies who are small and thin at birth have a larger proportion of body fat as compared to European newborns – “the Indian thin-fat baby”- and thus are at greater risk of developing non-communicable diseases during adult life, highlight the need to better capture the dynamic nature of growth by more detailed measures of body composition to identify infants at high risk of poor health later in life.

This project will expand the definition of healthy growth to include a measure of the quality of growth by assessing body composition from birth to 2 years of age. The project will focus on the development of normative data on body composition in this age group using stable isotope technique for assessment of total body water (TBW) to estimate lean body mass and, by difference, fat mass. The project will benefit from capacity building supported by the IAEA over a period of several years.

**Planned activities:** Pregnant mothers representing a wide geographical distribution will be enrolled into the study during the first trimester and fetal growth will be monitored by changes in mothers’ body weight. When possible, infants born to women participating in a study supported by the WHO (Department of Reproductive Health) monitoring fetal growth by three-dimensional (3D) ultrasound during pregnancy in 11 countries will be enrolled into the study. This study population will provide a unique opportunity to monitor body composition in infants and young children with known growth rates during fetal life. In addition, infants born to mothers participating in IAEA supported projects in Africa will be enrolled to ensure adequate geographical distribution. Sample size: 1000 infants. Body

composition will be assessed at regular intervals (every 3 months) by stable isotope technique, using a standardized protocol developed by the IAEA. The study duration is 5 years.

### **Outcomes/outputs**

1. Improved understanding of the quality of growth during the crucial period of life from birth to 2 years of age.
2. Establishment of normative data on body composition from birth to 2 years.
3. Training of staff on body composition by stable isotope technique.
4. Enhanced laboratory capacity.

**Estimated budget per year:** US \$160 500 per year for three years, \$161 290 for the last year

**Total estimated budget: US \$642 790**

## **2) Establishing a consultation network for radiation oncology in Africa: a Community of Care**

**(Total funding required: US \$322 581)**

### **Rationale**

The African Continent includes 54 countries, a total population of more than 1000 million and a cancer incidence of 302.800 new cancer patients per year (GLOBOCAN 2008 for all cancers except non-melanoma of the skin and Kaposi's sarcoma).

The number of existing radiotherapy facilities is relatively insufficient, radiotherapy equipment is limited and in many cases outdated and the numbers and training of radiotherapy professionals is limited.

A small number of radiotherapy centres in a few countries could be considered as centres of competence in the sense that they provide adequate patient care as well as conduct training and research activities. However, the majority of radiotherapy centres in Africa work in relative isolation with limited access to the up-to-date published literature and very limited resources to attend international meetings.

As a direct consequence of the above, patients seen in radiotherapy departments are treated following varied local policies which are not always in line with internationally accepted standards of care. This refers to indications for radiotherapy, combined modalities with surgery and chemotherapy, prescribed doses, field arrangements, dose schedules, the use of brachytherapy and others.

Telemedicine is a rapidly developing application of clinical medicine where medical information is transferred through interactive audiovisual media for the purpose of consulting, and sometimes remote medical procedures or examinations.

Telemedicine may be as simple as two health professionals discussing a case over the telephone, or as complex as using satellite technology and videoconferencing equipment to conduct a real-time consultation between medical specialists in two different countries. Telemedicine generally refers to the use of communications and information technologies for the delivery of clinical care.

Telemedicine is also useful as a communication tool between a general practitioner and a specialist available at a remote location. It can be used as a teaching tool, by which experienced medical staff can observe, show and instruct medical staff in another location, more effective or faster examination techniques. It improved access to healthcare for patients in remote locations.

More than a tool for interaction between patient and doctor, or teacher and student, telemedicine in this context takes advantage of teleconferencing tools to establish a real-time professional board to discuss individual patient cases; an online live meeting.

A teleconference or teleseminar is the live exchange and mass articulation of information among several persons remote from one another but linked by a telecommunications system. Terms such as audio-conferencing, telephone-conferencing and phone conferencing are also sometimes used to refer to teleconferencing.

The telecommunications system may support the teleconference by providing one or more of the following: audio, video, sharing of documents and images and/or data services by one or more means, such as telephone, computer, telegraph, teletype, radio, and television. Internet teleconferencing includes internet telephone conferencing, videoconferencing, web conferencing, and Augmented Reality conferencing.

## **Project Description**

### Phase 1: Planning phase

In the initial planning phase, a Technical Meeting will be held at IAEA headquarters inviting teleconference experts (IAEA) and a group of selected potential participating centres of the Africa region. In this meeting, a terms-of-reference document and work plan will be drafted and agreed upon.

### Phase 2: Setting up the tools.

The next step in the implementation phase will be to ensure that each of the participating centres have access to the technology necessary for teleconferencing. This may go from simply ensuring broadband internet connectivity to setting up a teleconference room with computer hardware, wide screen, microphones and cameras as required.

### Phase 3: Online live meeting.

In this phase teleconferencing will actually take place. A virtual meeting will be set up through coordination with the centres.

A clinical case (an actual case of a cancer patient referred to receive radiation therapy) will be presented by one of the centres. Diagnostic imaging studies (radiographs, CT scans, nuclear medicine scans) will be shown to all and discussed. The images of pathology or cytology specimens will be shown to all and discussed by an expert pathologist. Diagnosis, staging and prognosis of the patients will be discussed as well as a course of action for treatment. The radiotherapy treatment will be

discussed in detail including dose prescription, technique, fractionation, use of beam modifiers and association with other treatment modalities.

Each individual case discussed in the network will be properly recorded for future reference and documentation.

The project will commence by establishing the network in English speaking countries, but once the system is in place, it could be expanded to incorporate francophone countries and conducting the teleconference in French.

In each teleconference consultation, one or more experts from Europe, USA and Canada will also participate in the discussions.

The project will also have an educational value since the attendance to the online meetings by residents in training will be encouraged.

There will be a coordinator (IAEA Staff) and a small group of centres leading the project with a clear schedule of structured online meetings.

Beneficiaries of this project will be:

- 1- The patients; since treatment decisions will be made following a thorough professional discussion
- 2- Radiotherapy centres and radiation oncologists who will be able to interact with other colleagues from Africa and from other regions in the analysis and resolution of radiation oncology clinical problems

Project outcomes/outputs

1. Report of the Technical Meeting
2. Log of clinical cases discussed and solved in the network
3. Report on the methodology to establish a consultation teleconference network
4. Improved networking between the IAEA, radiotherapy centres in Africa and other regions.
5. Radiotherapy centres in Africa improving their level of clinical problem solving in their routine practice

**Estimated budget per year:** US \$107 000 per year for three years.

**Total estimated budget:** US \$321 000

### **3) Strengthening “Biological Dosimetry” in the Asia and Pacific region: Improvement of current techniques and intensification of collaboration and networking.**

**Rationale:** In the Asia and Pacific region there is a strong increment in the application of nuclear technologies, especially in the fields of electrical power/energy management, in the field of research, and in human health. In spite of strict regulations and safety measures, radiation/nuclear accidents or unplanned radiation exposures may occur. The recent accident at the Fukushima Daiichi nuclear power plant in Japan stresses the urgent need for emergency preparedness and response in the whole region. In the event of a radiation/nuclear emergency, biological dosimetry is essential for timely determination of the radiation dose to the exposed individuals (i.e. exposed workers and general public).

Biological dosimetry implies different cytogenetic assays (including dicentric-, micronuclei-, premature chromosome condensation-assay, and fluorescent in situ hybridization) to define the frequency of chromosomal alterations, and is used to estimate the absorbed dose in the exposed individual. Biological dosimetry can be applied irrespective of the scale of the emergency/accident. In case of small-scale accidents involving one or a few individuals only a few samples need to be examined, and in case of large accidents affecting large populations many individuals need to be screened.

Information obtained with this technique may help to perform triage in radiation/nuclear mass casualty events (i.e. explosion of a nuclear power plant, terrorist attack with dirty bomb etc.). In such an event it is important that biological dosimetry institutes are capable to respond timely and adequately, and if needed also in a joint operation. For instance, by using cytogenetic assays in a triage mode, speeding up the analysis (i.e. with computer assisted microscopy), and by networking with other institutes.

**Project description:** The IAEA plays an important role in this field by establishing biological dosimetry institutes and by providing them with equipment, through its' Technical Cooperation (TC)-programme. In spite of all these activities, there is an urgent need for extra support, since many institutes, especially those in low-middle income (LMI) countries, have limited expertise or operate in isolation. In these cases, there is a risk of losing contact with the “main stream” in the field, and these institutes may not be included in any national or international incidents and radiation emergency programme. Therefore, there is an urgent need for updating existing knowledge, by producing documents, technical reports and manuals, by standardizing techniques, and by building networks and initiating joint projects. The availability of national and regional biological dosimetry programmes will be very useful not only in the case of a nuclear disaster but also for radiation workers in environments with a certain radiation risk and for the general public.

The major aim is to increase the preparedness of biological dosimetry institutes in the Asia and Pacific region to react on radiation/nuclear accidents nationally and in the region. The rationales are:

to set up suitable standards to monitor individuals exposed to radiation, to update the existing technology, introduce “state of the art” technology and to initiate national, regional and international networks on biological dosimetry that can be extremely useful in scenarios of mass casualties.

**Specific Research Objectives:**

- To implement adequate technical information and expertise in participating countries to perform biological dosimetry and human risk assessment (i.e. in scenarios of environmental, occupational, clinical and accidental exposures to radiation of different qualities at low and high dose levels).
- To update conventional biological assays and to implement state of the art technology in research centres having expertise on applying different types of cytogenetic assays for biological dosimetry immediately and/or retrospectively following (controlled and uncontrolled) exposure to radiation of different qualities.
- To technically unify/harmonize cytogenetic assays that are applicable for human biological dosimetry among different laboratories in Member States, and by initiating different networks (national and international collaborations).
- To initiate and give advice on different relevant research programs in order to enhance the current and future research programs to assess precisely the effect of ionizing radiations and human risk.
- To monitor individuals exposed to radiation environmentally, occupationally, clinically as well as accidentally.
- To complement and to add to already existing IAEA and WHO activities in this field; RANET (IAEA-Incidence and Emergency Unit, Nuclear Safety); BiodoseNet (WHO).

**Project Outcomes:**

- Increased preparedness of participating institutes to radiation/nuclear accidents.
- It is expected that the project will lead to improved knowledge and technical expertise in radiation biology and biological dosimetry in the participating institutes.
- Monitoring of exposed individuals for human risk assessment.
- Improvements in radiation safety standards for workers and the public in the Asia and Pacific region.

**Outputs:**

- This project will lead to an increase in the expertise on performing biological dosimetry in the participating institutes.
- The establishment of validated methodology for biological dosimetry for low as well as high doses of low and high LET radiation.

- Research progress on this topic (presentations, reports, publications)
- Collaborations between relevant institutes (establishing of exchange program and increase fund raising opportunities).

### **Planned Activities:**

It is anticipated that there will be a total of 10-14 participating institutes from the Asia and Pacific region. Each participating centre will focus on standard cytogenetic assays (dicentric, micronuclei and PCC), and if feasible (equipment such as fluorescent microscope is available), fluorescence in situ hybridization (FISH) technique will be implemented.

This project will provide a precise description of technical programs that have been established and validated for biological dosimetry which can provide information for: (1) optimal growth conditions of human peripheral blood lymphocytes; (2) most suitable protocols for different conventional as well as “state of the art” cytogenetic assays which are applicable to assess the effect of ionizing radiation immediately and retrospectively.

Activities will include:

- Harmonization of cytogenetic assays that are being used for biological dosimetry. Consequently, different training courses will be organised (on all technical issues, scoring criteria, based on the “updated” IAEA Manual 405).
- Establishment (definition) of background frequency for chromosomal alterations [such as dicentric, micronuclei, premature chromosome aberration, and FISH based translocation (the latter is optional)].
- Generation of calibration curves for low and/or high LET radiation (the latter is optional), that is essential for biological dose estimation.
- Inter-comparison studies between radiation of different qualities (for both low and high LET radiation)
- Initiation of a regional/international-network, which can be engaged in scenarios of mass casualties.

**Estimated Budget:** US \$80 250 per year for all four years

**Total estimated budget: US \$321 000**

#### **4) Enhancing Quality of Practice in Nuclear Medicine Applications through innovative methods of knowledge transfer (i.e. standard and E-learning) in IAEA Member States.**

**Rationale:** Nuclear Medicine is an integral part of patient care. It covers the whole spectrum of medical diagnostic and investigational use of "unsealed" radionuclides/ radiotracers, plus their therapeutic applications. Nuclear Medicine imaging procedures often identify abnormalities very early in the progress of a disease long before many medical problems are apparent with other diagnostic tests. In medical science, these procedures have been recognized as indispensable tools for the diagnosis and treatment of a large number of benign and malignant disorders. They provide functional information on a cost-effective basis in comparison with other complementary medical technologies. The recent developments in this field, including the introduction of multimodality hybrid imaging (SPECT/CT and PET/CT) and new tracers, among others, have revolutionized the science in the diagnosis and management of several diseases. However, these technological advancements in Nuclear Medicine need to be standardized and quality measures need to be implemented in clinical practice to improve patient care and satisfaction. This process can be achieved by setting up Quality Management Systems focused on continuous improvement of standards of practice and to provide effectiveness and efficiency in Nuclear Medicine practices, more importantly in low-middle income Member States.

This entails assisting Member States by using systematic tools in capacity building activities, quality management, clinical audits and knowledge transfer activities in order to ensure that quality of practice in Nuclear Medicine is being performed. These programmes are executed more commonly through standard methods of instructional delivery, which includes regional training courses, fellowship trainings, scientific visits, technical meetings and expert missions. With the advent of new media technology and digital age, innovative platforms of knowledge transfer can also be employed in the form of E-learning including distance assisted training. This innovative and creative use of technology will be essential in knowledge transfer when time is limited and faculty/experts are in short supply. If implemented properly, together with standard methods, this will have significant impact in the context of delivering knowledge in holistic quality practice of Nuclear Medicine to low-middle income Member States in a cost effective manner.

#### **Project Description:**

The objective of this project is to enhance the capabilities of Member States in providing capacity building activities focusing on the transfer of knowledge in (1) emerging technologies in Nuclear Medicine such as hybrid modalities, new therapeutic applications and radiotracer developments and (2) Quality Management and audit processes in Nuclear Medicine through standard and innovative educational methods.

#### **Planned Activities**

The extrabudgetary funds will be used parallel to the programmes articulated in the Nuclear Medicine Section Project and Budget, focusing on the (1) Management of chronic diseases with integrated diagnostic imaging modalities emphasizing, infectious, cardiovascular diseases and cancer (2) Cost effective use of radiopharmaceuticals in therapy, neurology and paediatric diseases and (3) Quality management in professional education and clinical practice, including the Distance Assisted Training Programme for Nuclear Medicine Professionals (DAT).



- Train the trainer workshop to build a core group of expert in Quality Management to further disseminate the concept of “Quality Management” to country level.
- Training workshop for clinical auditors to prepare a multidisciplinary group of professional to conduct clinical audits in Nuclear Medicine Practices in Member States
- Implementing Distance Assisted Training Programme for. Nuclear Medicine Professionals (DAT).in Member States

**Estimated Budget per year:** US \$53 500 in 2012; US \$128 400 per year in 2013 and 2014

**Total estimated budget: US \$310 300**

## **5) Assessment of medical consequences of <sup>131</sup>I and other radiohalogens intake after nuclear accidents.**

**Rationale:** Nuclear Medicine is an integral part of patient care. It covers the use of different radioisotopes for diagnosis and treatment for a wide spectrum of diseases, thus the professionals in this field are qualified to evaluate and handle the consequences of medical exposure to ionizing radiation. Due to the recent incident in Fukushima Nuclear Power Plant in Japan, a general public concern on the medical consequences of exposure and intake of <sup>131</sup>I and other radiohalogens has risen. One of the Agency’s role is to enhance the capabilities of Member States to address health issues through the use of radiation techniques and this also includes assistance on the course of action such as preparedness and monitoring in cases of nuclear accidents and radiation emergencies.

In order to be effectively implemented, emergency medical response needs to be planned and organized in accordance with the potential consequences of different radiation emergencies. The next crucial step is the identification and assessment of the medical consequences after exposure by qualified nuclear medical professionals. It is possible that during a nuclear or radiological emergency individual might receive radiation doses that lead to high individual risks of incurring organ dysfunction like hypothyroidism, radiation induced cancers as well as genetic effects. There are only few health care professionals and medical centres around the world with significant experience in the diagnosis and specialized treatment of radiation induced injuries.

Arrangements shall be made for medical personnel, both nuclear medicine professionals and general practitioners, to be aware of medical consequences of <sup>131</sup>I and other radiohalogens intake after nuclear accidents and the appropriate assessment, monitoring and treatment of the involved population.

**Project Description:** The objective of this project is to enhance the capabilities of Member States to conduct capacity building activities on the late effects of radiation following a nuclear or radiological incident including assessment, monitoring and treatment of the population involved. The project will also aim at the production of guidance documents on the effects of low-dose radiation on the human

body and at the preparation of guidelines and standard operating procedures (SOPs) to be applied in case of internal contamination due to inhalation and/or intake of volatile radioisotopes.

This project will focus on the southeast-Asian region. Partnership with local and regional medical scientific societies and bodies will be sought for their active participation into this project.

### **Beneficiaries**

This activity will be of benefit to the populations living in countries nearby nuclear power plants that will benefit from more structured diagnostics of potential detrimental effects of exposure to radiation, as regards the endocrine system in general and the thyroid in particular. Internal dosimetry as assessed by NM instrumentation will help assess radiation exposure of internal organs to inhaled radioisotopes.

More in general, outputs of the project (training; documents; guidelines; SOPs) will also be helpful for preparedness to these events that may happen in the future in any other part of the world.

### **Planned Activities**

1. Training courses to increase awareness of the medical community on the preparedness for medical response to radiation emergencies and late effects on human health.
2. Train the trainer workshops to build a core group of expert in assessment of medical consequences of <sup>131</sup>I and other radiohalogens intake after nuclear accidents.
3. Training workshops for nuclear medicine professionals in monitoring and treatment of the population involved in nuclear accidents.
4. Consultancies on preparing guidance documents and guidelines

### **Project Outcomes/Outputs**

1. Trained professional in assessment of medical consequences of <sup>131</sup>I and other radiohalogens intake after nuclear accidents.
2. Trained trainers in assessment of medical consequences of <sup>131</sup>I and other radiohalogens intake after nuclear accidents.
3. Trained nuclear medicine professionals in monitoring and treatment of the population involved in nuclear accidents.
4. Guidelines and standard operating procedures to monitor and assess late effects of radiation on the human body

**Estimated Budget per year:** US \$107 000 per year for four years

**Total Estimated Budget:** US \$428 000

## 6) **Quality audits in radiation oncology**

**Project Description:** Ideally, every radiotherapy centre in the world should have access to external dosimetry audit. All radiation beams used clinically should be calibrated locally and independently checked through an audit before it is used for patient treatment. The IAEA/WHO postal TLD service checks only 10% of the 5000 photon beams and none of the 10000 electron beams used by 4000 machines registered in the IAEA Directory of Radiotherapy Centres (DIRAC) in low- and middle income countries used to treat cancer patients. It is estimated that approximately 20% - 30% of clinical beams are checked through national audit services available in low and middle income countries. Thus, the reference dose in approximately half of the clinical beams and in most of the electron beams used worldwide to treat patients are not checked at all. The project will focus on the development of a systematic strategy for making available the quality audit in radiotherapy to the largest possible number radiotherapy centres in low and middle income countries through the extending of auditing activities conducted within the framework of the IAEA/WHO TLD postal dose audits to the national level and enhancing them through the national developments.

### **Planned activities**

1. Increase awareness of Member States on the need for quality audits in radiotherapy.
2. Identify the needs of Member States for quality audits and available resources at the national level.
3. Evaluate scientific level of national dosimetry audit activities and provide recommendations on the dosimetry audit programme.
4. Develop training material and support training of national external audit groups.

### **Outcomes/ outputs**

1. Report of a Technical Meeting including the assessment of Member States' quality audit needs and available resources at the national level; and an international action plan.
2. Report on the status of dosimetry audit activities at the national level including a set of recommendations for national developments.
3. Training material for dosimetry audit available and training courses conducted for staff of national external audit groups in radiation dosimetry.

**Estimated budget per year:** US \$321 000 per year in for three years

**Total estimated budget:** US \$963 000

## **7) Enhancing Education and Training in Human Health through Quality Assurance**

**Project Description:** The objective of the project is to develop more effective education and training programmes and materials in human health for Member States by applying the principles of quality assurance in higher education to education and training programmes. As a result, Member States will receive more effective and efficient hands-on experience, capacity building, and information sharing in regards to nutrition and radiation medicine.

### **Planned Activities**

1. Integrating E-learning and M-learning to increase the use of networks to facilitate information sharing and delivery of teaching materials among the Member States
2. Conducting a tracer study on fellowships and national and regional training courses as a paradigm to enhance capacity building, sound education and training, health, and quality assurance programmes
3. Enhancing the Human Health Campus website by providing sound educational principles to transform it to an active learning platform for the Member States
4. Revising all evaluation forms for education and training programmes
5. Implementing an internal quality assurance process for education and training activities
6. Managing "train the trainer" workshops on e-learning tools, curriculum development, teaching methodologies, and evaluation methods for both professional staff and lecturers teaching national and regional training courses
7. Managing Consultants' Meetings to enhance education and training activities

### **Outcomes/Outputs**

1. More effective use of networks to facilitate information sharing and delivery of teaching and learning materials among the Member States
2. Report on impacts of fellowships and national and regional training courses among the Member States
3. Human Health Campus website is transformed as a more effective distance learning forum for the Member States
4. Revised evaluation forms to bring training programmes to the next quality level
5. Establishment of an internal quality assurance framework for the Division's education and training activities
6. More effective education and training materials, courses, and delivery methods for national and regional training courses
7. Consultants' reports on strategies to further enhance education and training activities

**Estimated budget per year:** US \$160 500 per year for four years

**Total estimated budget:** US \$642 000

## **8) Supporting Comprehensive Cancer Control in the Asia and the Pacific Region**

**Rationale:** Non-communicable diseases (NCDs), the second largest of which is cancer, account for more than 87% of the disease burden in high income countries. Their prevalence is increasing rapidly in low and middle income (LMI) countries, especially in Asia and the Pacific region. It is also recognised that cancer is steadily becoming a more important cause of premature mortality than infectious disease in developing countries - cancer deaths already exceed infectious deaths in China and a number of middle income countries. Nonetheless, available resources, particularly for cancer, within LMI countries remain grossly inadequate to deal with this burgeoning problem. With a looming cancer epidemic in LMI Member States, the existing infrastructure is far from sufficient in responding to the growing demand. Effective control of cancer requires major commitments to the training of health care professionals and the provision of adequate facilities for early diagnosis and treatment, as well as public education programs and an efficient private sector producing relevant drugs and medical equipment. Further, a national cancer control programme will need to be established in which priorities are based on the pattern of cancer within a specific country. Ultimately, the effective control of cancer, that is, the reduction in the morbidity (suffering) and mortality (death) from cancer, can only be accomplished through research, which provides both a foundation on which to base control strategies, and a means to evaluate the effectiveness of such strategies.

**Project description:** The project provides a concrete platform for regional collaboration in partnership with the World Health Organization (WHO) and other key players to increase the synergies in the region in the fight against cancer. Currently, more than 70% of all cancer deaths occur in LMI countries, where resources for prevention, diagnosis and treatment of cancer are limited or non-existent, and this proportion is rising. These countries lack the national cancer control programmes and resources to effectively handle the expected increase in cancers in the next decades. The Agency has a long history of successful technical assistance and experience in providing radiation medicine know-how and technology to LMI Member States. There is an urgent need for expansion of cancer facilities and services, in particular radiation medicine. This expansion cannot however occur in isolation. It must follow WHO guidelines and be integrated within a national cancer control programme (NCCP). In addition to radiation medicine planning, NCCPs also address cancer risk factors in the country, cancer incidence and mortality, cancer prevention, need for appropriate screening programmes, public education and awareness campaigns, infrastructure and capacity for early detection, diagnosis and treatment of cancer, palliative care capacity for patients with incurable cancers, and resource mobilization and strategic planning over a 10-15 year period for such a programme to be managed and implemented at country level. Support to Member States for NCCP planning within the context of the proposed project will facilitate this effort and will also ensure that cancer-related projects submitted to the Agency for funding are designed as part of such a comprehensive programme.

**Planned Activities:**

1. Regional workshops on cancer control planning towards establishment and implementation of comprehensive national cancer control programmes
2. Conduct imPACT Missions to selected member States to identify existing gaps in cancer care services and assist the Member States to define their strategies and priorities for the effective planning and implementation of comprehensive national cancer control programmes in collaboration with WHO and other partners.
3. Conduct imPACT reviews during which representatives of national health authorities benefited from the expertise of the various IAEA/PACT partner organizations in the various components required for comprehensive cancer control programmes.

**Outputs:**

1. Enhanced capacity of Member States to improve cancer management from prevention to patient treatment and palliative care,
2. Enhanced capacity of Member States to forge alliances and areas of cooperation and collaboration between MS, IAEA, and other international health communities involved in cancer related issues, and
3. Enhanced capacity of Member States to Produce "Bankable" blueprint of fundraising proposals prepared by them.

**Estimated Budget per year:** \$160 500 per year for two years

**Total estimated budget: US \$321 000**

**9) Cervical Cancer Screening, Diagnosis and treatment in Sub-Saharan Africa**

**Project Description:** Cervical cancer is the most common cancer and the first cause of cancer mortality in the sub-Sahara Africa. In October 2009, the WHO and the Union for International Cancer Control (UICC) finalized a sub-regional pilot project "Strengthening Cervical Cancer Prevention Programmes" using VIA for screening and Cryotherapy for premalignant lesions. They trained health professionals and created awareness within the government and the population. The scale up of the results is limited now by:

1. Lack of funding for a wider screening and treatment of premalignant lesions in the six countries.
2. Lack of facilities to treat cervical cancer cases (including brachytherapy machines).

**Objectives:**

To support the government of Sub-Saharan countries in the scale-up of programmes for cervical cancer control at the national level by extending VIA screening, treatment of premalignant lesions, and treatment of cervical cancer patients.

**Outcome:**

Early diagnosis of cervical cancer cases, increase of cervical cancer survival and within 10 years cervical cancer mortality reduction.

**Estimated budget per year:** US \$535 000 per year for the first two years, 267 500 per year for the second two years.

**Total estimated budget: US \$1 605 000 for one country**

**10) High Impact Short Term Actions to Support PMDS Vietnam: Purchase a Fluoroscopic radiotherapy simulator.**

Vietnam has a population of 84 million people with ca. 111 000 new cases of cancer per year causing 82 000 cancer deaths yearly (Globocan 2008). Cancer is the second leading cause of death after cardiovascular diseases in the non-infectious diseases group; cancer is expected to become the leading cause of mortality in the near future.

Though there are 10 radiotherapy facilities in Vietnam, the national health authorities aim at establishing cancer treatment centres in all major cities, at an estimated total cost of US \$140 million. The Vietnam Atomic Energy Institute (VAEI) has confirmed the national goal of having one radiotherapy machine per million inhabitants in the next decade.

To help towards Vietnam's goal of providing expanded treatment capacity in all regions of the country, the Government of India donated a new Bhabhatron II Cobalt-60 teletherapy unit to the Can Tho Oncology Hospital, through PACT. The city of Can Tho, at the heart of the Mekong Delta region, has never had radiation therapy capacity – which is critical to serve a catchment area of over three million people. Throughout much of 2008 and 2009, construction has been underway to expand the Can Tho Oncology Hospital premises to make room for the new Bhabhatron II unit, as well as other treatment and diagnosis space.

In order to ensure that the radiotherapy treatment provided at the Can Tho Oncology Hospital is of high quality and is in conformity with international standards, funding for the procurement of a

fluoroscopic radiotherapy simulator is sought. The estimated cost of a fluoroscopic radiotherapy simulator is US \$350 000.

**Estimated budget per year:** US \$374 500

**Total budget:** US\$374 500

## **11) Respond to Member States' Requests for imPACT Reviews:**

To assess cancer control capacity and gaps in a Member States and provide recommendations for immediate action as a critical first step for cancer control planning and programmes development in a country. To date, PACT has received over **85 requests from Member States** for an imPACT Review. It is a priority to conduct imPACT Reviews additional 10 countries.

In order to facilitate the implementation of PACT and the achievement of its goals, the IAEA in cooperation with WHO and other partners offers to its developing Member States, upon request, a multi-disciplinary and multi-stakeholder planning tool called **imPACT** (integrated missions of PACT ) for cancer control planning, with a view to identifying and responding to needs in critical policy and strategic level areas of:

- a. Capacity building related to comprehensive cancer control (prevention, cure and care) and supporting infrastructure for cancer advocacy, epidemiology, registration, training, education, and resource mobilization;
- b. Expansion or upgrading of radiation oncology and nuclear medicine infrastructure based on IAEA guidelines ; and
- c. Other regulatory requirements based on IAEA safety and security standards and codes of practice.

The main purpose of imPACT is to assess the national burden posed by cancer and the status of plans, strategies, programmes, policies, capacities and infrastructure related to cancer prevention, surveillance, early detection (early diagnosis and screening), diagnosis and treatment, rehabilitation and palliative care through a joint international effort. The objective of this joint needs assessment is to assist the requesting LMI Member States, the IAEA and partners, and potential donors, to identify assistance packages designed to respond to these multidisciplinary needs in an effective and efficient manner. These could be used by the Member States assisted at their discretion for resource mobilization purposes as well. All imPACT reviews also draw from expert rosters of Member States, IAEA, its PACT partners, and other leading cancer control, public health, and policy institutions to provide evaluation and recommendations on capacity building in medical oncology and other areas of cancer prevention and control as determined by specific requirements of the requesting Member State.

The initial imPACT review lasts approximately six to nine months from the initial desk study to the final joint report and recommendations for action by the government concerned. All imPACT reviews



are performed in close cooperation with the requesting government and specifically through the Ministry of Health or its equivalent and in collaboration with PACT partners, in particular the corresponding WHO Regional Offices.

The final outcome of the imPACT review is a phased planning and investment package for comprehensive cancer control based on government priorities and the following outputs:

- a. A Joint Interagency Report with relevant recommendations for a National Cancer Control Plan/Programme;
- b. A National Cancer Control Plan/Programme (NCCP) prepared by the Member State;
- c. A number of interagency multidisciplinary Specific Funding Proposals, developed by working groups comprised of local and international experts and stakeholders (based on priorities established by the government).

To date, over 35 imPACT reviews have been undertaken. Previous submission to the PUI has secured funding for imPACT reviews to 15 additional Member States to be implemented during 2011-2012. Follow-up missions and reports are designed to assess the status of implementation of recommendations and any requested support for the NCCP. The outputs are also used by PACT and partners for furthering global programme development and support for fundraising in line with the overall PACT partnership.

**Estimated budget per year:** US \$283 684 per year for two years

**Total estimated budget: US\$567 368**