

Programme F. HUMAN HEALTH

Rationale: A general improvement in public health care in Member States has, as a result of improved economic conditions, been followed by the development of medical services for the prevention of malnutrition, detection of health effects of pollution, and diagnosis and management of cancer, nutritional, infective and genetic disorders. Many of these significant health needs are effectively addressed using nuclear techniques, for which the Agency has unique competence among United Nations organizations. Prevention and early diagnosis are the current focus of WHO and UNICEF. The Agency complements and collaborates in these activities wherever nuclear technologies are applicable, and expands them to include the treatment of cancer and some benign tumours. In addition, the Agency plays an important role in all human health issues involving the diagnostic and therapeutic administration of radiation for medical purposes, as well as in the assessment of health effects resulting from accidental irradiation.

Nuclear and radiation techniques are often the sole means of diagnosis and treatment, and, due to their effectiveness, are also widely used in a large number of other health problems as a complement to non-nuclear techniques. Worldwide, more than two million people work in the field of medical radiation. Nuclear medicine procedures with open radioactive sources are used in vitro and in vivo for the diagnosis and management of diseases. As a new development, the Agency will also strengthen its collaboration with WHO/UNAIDS to make use of molecular techniques to monitor HIV/AIDS and related problems and to contribute to tests during trials for a new HIV/AIDS vaccine. Radiotherapy, one of the earliest applications of radiation, remains a major modality available for cancer treatment. Fostering and maintaining a quality assurance culture, leading to accurate dosimetry, dose delivery and patient protection, are of paramount importance in the success of the application of these techniques. Public health measures are supported by activities in nutritional and environmental areas.

The mandate of the Agency's human health programme arises from Article II of the Statute, which states that the Agency shall accelerate and enlarge the contribution of nuclear energy to health. Member States continue to acknowledge the appropriateness of nuclear methods to address health problems, as evidenced for example by an increasing number of technical co-operation project requests. Human health forms the largest sector of the Agency's technical co-operation programme.

Objective: To enhance the 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.

Outcomes
<ul style="list-style-type: none"> — Increased capacity of Member States to use nuclear techniques in prevention, diagnosis and treatment of diseases. — Increased application of Agency standards of practice in health programmes. — Enhanced quality of health services based on nuclear techniques.
Performance Indicators
<ul style="list-style-type: none"> — Number of Member States using nuclear techniques in human health. — Number of Member States applying Agency standards of practice in health programmes. — Number of Member States implementing quality assurance programmes in health activities based on nuclear techniques.

Specific criteria for prioritization:

- Uniqueness of the nuclear technique in addressing the problem;
- Outreach of the activity in terms of the number of beneficiaries;
- Importance of the issue being addressed in the context of the UN agenda.

Subprogramme F.1. Nuclear Medicine

Rationale: Nuclear medicine procedures using open sources of radioactivity have been widely recognized in medical science as indispensable tools for the diagnosis and management of a large number of benign and malignant disorders. Such procedures, used also in basic and clinical research, provide sensitive and functional information on a cost effective basis in comparison with other competitive technologies.

Over the years the Agency's technical co-operation and research and development activities have significantly enhanced the capabilities of many developing Member States in the field of nuclear medicine. While many of them already have appropriate infrastructure for carrying out various procedures, the majority still lack the necessary trained and qualified staff, appropriate equipment, radiopharmaceuticals and other facilities. Such countries need support to develop and adopt various nuclear medicine techniques and integrate them into their overall health care system. This objective can be met through effective transfer of mature and established technologies from the developed to the developing countries, and through provision of equipment support, expert technical advice and guidance.

Malaria is one of the greatest killers of human beings, accounting for millions of deaths every year, mostly in the developing countries of Africa and Asia. There has been an increasing demand by

Member States for the development of sterile insect techniques (SIT) for the control of malaria. A resolution (GC(45)/RES/12C) to this effect has already been passed. The Agency has a recognized expertise in some of the key components of SIT, namely mass rearing, irradiation and genetic sexing.

Since the technologies involved are of very high standard and their transfer involves more than one country or region, the catalytic participation of an international organization is of paramount importance. The Agency has the mandate, technical know-how and expertise to promote the above cited nuclear technologies, namely, nuclear medicine and SIT globally and in the developing countries. In particular, the role of the Agency is considered unique and indispensable in the introduction, expansion, promotion and integration of nuclear medicine techniques in the routine health care system of its developing Member States that is not duplicated by other international organizations.

Objective: To enhance the capabilities of developing Member States to employ in vivo and in vitro nuclear medicine technologies efficiently and effectively for managing their important health problems, for undertaking related basic and clinical research, and initiating a feasibility study in SIT for malaria mosquito.

Outcomes
<ul style="list-style-type: none"> — Increased use of state-of-the art in vivo and in vitro nuclear medicine procedures in the Member States through standardization and introduction of new diagnostic and therapeutic techniques. — Increased number of personnel practising nuclear medicine. — Increased level of awareness for, and practice in, quality assurance as well as heightened access to educational and information technology in the speciality among the end-users. — Increased application of the results of CRPs in Member States. — Increased involvement of laboratories in Member States in the evaluation of new rearing protocols for mosquito SIT and development of genetic sexing system.
Performance Indicators
<ul style="list-style-type: none"> — Number of new centres and new Member States adopting nuclear medicine procedures in the diagnosis and treatment of various human disorders. — Number of tests and variety of protocols utilizing radionuclides employed by professionals in the Member States in the evaluation and management of diseases spanning different categories and lifetimes through guidance provided by the Agency. — Number of trained personnel actually applying new skills acquired through CRPs in routine clinical practice in nuclear medicine.

Performance Indicators (cont'd)
<ul style="list-style-type: none"> — Number of new initiatives in the performance of quality control measures as well as volume and type of new educational and information material used in nuclear medicine. — Number of colonies of <i>An. arabiensis</i> established and mass rearing and radiation protocols developed.

Programme changes and trends: In vivo nuclear medicine, e.g. diagnostic imaging, non-imaging functional studies and radionuclide therapy, will continue to receive priority in the planning and implementation of the activities of the subprogramme as in the preceding cycle. A modified project entitled “Molecular nuclear medicine and immuno-diagnostics” will address the entire gamut of in vivo and in vitro molecular diagnostic procedures using radionuclide methods and at the same time try to maintain Agency activities in the field of radioimmunoassay. With rapid advances in the field of nuclear medicine instrumentation, it has become imperative to maintain a high level of competence in the quality assurance of imaging equipment such as gamma cameras, SPECT, coincidence and positron emission tomogram systems. The rapid growth of nuclear medicine in developing Member States has led to a concurrent need for trained personnel and quality assurance. The modified project entitled “Quality assurance in clinical nuclear medicine” aims at providing guidelines and advice on quality assurance of clinical nuclear medicine practice and targeting Agency resources for providing effective and a high standard of training to nuclear medicine personnel through the application of information and communication technology tools. With the strengthening of radiopharmacology, collaboration with the radiopharmacy function in Programme I is going to increase rapidly, leading to a better integration of the two activities. The project entitled “Development of sterile insect technique for the control of malaria transmitting mosquitoes” has been formally incorporated into the subprogramme.

Resource changes and trends: The increases in resources of \$330 000 in 2004 compared with the 2003 adjusted budget and of \$70 000 for 2005 compared with the 2004 budget are mainly foreseen to complete the construction of the mosquito rearing laboratory for research and development SIT for the control of malaria transmitting mosquitoes. In addition, two new CRPs will be initiated, one in 2004 on comparative field technical assessment of a whole spectrum of radioimmunoassay technology using evidence based methodology, and one in 2005 on development and evaluation of radionuclide imaging technique to measure and monitor tumour cells undergoing programmed cell death.

Financial resources (2003 prices)

F.1.	2003	2004	2005
Reg. budg.	1 891 000	2 221 000	2 291 000

Project F.1.01: Applying in vivo diagnostic nuclear medicine procedures in the management of childhood diseases, cancer, coronary artery disease and degenerative disorders

Main outputs: The main outputs will be guidance in the use of in vivo diagnostic nuclear medicine facilities, state-of-the-art imaging equipment such as gamma cameras, SPECT (single photon emission computed tomography) and PET (positron emission tomography) systems provided through the technical co-operation programme to a targeted number of Member States; and scientific publications, monographs and TECDOCs based on the results of each of the completed CRPs.

Duration: 2002–2005

Ranking: 3

Project F.1.02: Radiopharmacology and therapeutic applications of unsealed radioactive sources in the management of thyroid cancer, liver cancer, joint diseases and coronary artery disease

Main outputs: The main outputs will be: guidance in the use of new upgraded radionuclide therapy facilities in targeted group of Member States, and in the production of new therapeutic radiopharmaceuticals; new standardized protocols for the treatment of liver cancer, intravascular radionuclide therapy for the prevention of restenosis following angioplasty and radiosynovectomy; scientific articles, monographs and TECDOCs based on the results of the completed CRPs; TECDOC containing the proceedings of the symposium on nuclear oncology; and qualified professionals in nuclear medicine with higher degrees such as a Ph.D as a result of activities carried out under the Agency's thematic CRP on liver cancer.

Duration: 2002–2007

Ranking: 6

Project F.1.03: Molecular nuclear medicine and immunodiagnostics in the diagnosis and management of infectious, neoplastic, metabolic, genetic and degenerative diseases

Main outputs: Guidance will be available in the use of new and upgraded molecular and immunodiagnostic techniques in nuclear medicine facilities for the management of malaria, tuberculosis, cancer and genetic disorders in targeted Member States. Scientific articles on the results of the completed CRPs in peer reviewed journals and TECDOCs on radiation safety in molecular biology laboratories and on strategies in molecular nuclear medicine will be produced.

Duration: 2002–2007

Ranking: 11

Project F.1.04: Quality assurance in clinical nuclear medicine

Main outputs: The project will result in: information and communication technology tools for the promotion of nuclear medicine in developing Member States; updated study programme in nuclear medicine on the Internet; finalized and updated modules of study materials for distance assisted training programme for nuclear medicine technologists; on-line teaching, reporting and consultation, as well as tele-maintenance of nuclear medicine equipment through tele-linking of nuclear medicine services in targeted Member States in Africa and Latin America. In addition, the following documents will be produced: harmonized gated SPECT protocol; a TECDOC on new methods and guidelines for the acceptance tests and routine quality control tests for dual-purpose multi-head SPECT/PET systems; and a TECDOC on conversion programmes between DICOM file standard and gamma camera/SPECT manufacturer specific file formats.

Duration: 1999–2005

Ranking: 15

Project F.1.05: Development of the sterile insect technique (SIT) for the control of malaria transmitting mosquitoes

Main outputs: The project will result in: methodologies and guidelines for the production, handling and sterilization of *An. Arabiensis*; scientific publications and reports of consultants meetings, RCMs and CRPs; improved strains (through CRP), improved radiation protocols and transformation technology; and qualified staff in targeted Member States.

Duration: 2002–2008

Ranking: 8

Project F.1.06: Applying diagnostic radiology procedures in the management of cardiovascular, oncological and neurological disorders

Main outputs: If funded, the main outputs of the project would be: guidance in the use of new and upgraded diagnostic radiology facilities in targeted group of developing countries; guidance and training in the use of state-of-the-art radiodiagnostic equipment such as image intensifiers, CT scanners and MRI scanners in a targeted number of Member States; and scientific publications based on the results of completed CRPs.

Unfunded activities/means of implementation: The whole project is unfunded.

Duration: 2004–2007

Ranking:

Subprogramme F.2. Applied Radiation Biology and Radiotherapy

Rationale: Radiation has been used as a major modality in the treatment for cure or palliation of cancer for over a century. Radiotherapy remains today, in association with surgery, an indispensable major modality in achieving the cure rate of 45% of cancer patients in the industrialized countries. Radiotherapy, alongside chemotherapy, has also retained its role in the palliation of incurable local or disseminated cancer. Radiotherapy, in current medical practice, is administered to about 60% of cancer patients.

Cancer is expected to increase worldwide as a result of increasing life expectancy, from the current 10 million new cases per year (of which 5.7 million are in the developing countries) to 15 million new cases in 2015, with 10 million of these in developing countries.

Developing countries with 80% of the world’s population have only one-third of the world’s radiotherapy resources. Many Agency Member States have a total absence of, or poor, radiation oncology services. Over the past decade, the Agency’s technical co-operation and research and development activities have increasingly responded to requests to initiate or improve cost effective radiotherapy services in an environment of rapidly advancing technology. Such countries need support to adopt and develop various radiotherapy techniques and integrate them into their overall national cancer control programmes. This objective is met through effective transfer of mature and established technologies to the developing countries, especially through training, including development of training material, expertise and guidance, in addition to the provision of equipment.

In industrialized countries, there is still a need to improve the cure rates of cancer achieved without causing increased patient injury. Two main trends are currently being followed. The first is increasing the dose delivered to the tumour without an increase in radiation injury. This is technology driven. The second is the modification of the radiation response by physical or chemical means to promote tumour cell kill while protecting normal tissue. Underlying both these trends is a need for better understanding of cancer cell and normal tissue growth and death, especially in response to radiation — radiobiology.

The main constituencies are radiation oncologists, consequently the improvement in radiotherapy administered will result in increased life of cancer patients worldwide and in developing countries in

particular. The Agency is the only organization supporting these types of clinical, educational and infrastructural improvements in developing Member States.

Objective: To enhance the use of effective cancer management strategies in Member States by the application of relevant techniques for the curative and palliative treatment of cancer, and improving the knowledge of radiobiology as a basis for cancer prevention and effective treatment.

Outcomes
<ul style="list-style-type: none"> — Improved application of radiation therapy demonstrated through controlled clinical trials and consensus documents. — Improvement of radiotherapy practice in centres of competence in developing Member States. — Increased body of knowledge of the radiobiological effects of high and low levels of radiation from gamma, X ray or heavy particle sources due to Agency co-ordination.
Performance Indicators
<ul style="list-style-type: none"> — Number of new centres and new Member States adopting radiotherapy for the treatment of cancer with improved equipment and clinical standards. — Number of different radiotherapy protocols applied in radiation oncology in Member States by personnel using guidance provided by the Agency. — Number of countries using new educational and information material produced or promoted by the Agency.

Programme changes and trends: The advancement of radiation therapy in developing countries remains a priority. Accompanying this rapidly advancing technology will be the need for increasingly sophisticated expertise and training resources. There will be increased emphasis, and a new activity on “Human cell and tissue response to radiation”, in the area of the biological basis of tumour and normal cell response to high and low radiation levels of all forms of radiation (X, gamma, electron and hadron). This will be directed at the improvement of therapy cure rates and minimization of morbidity under all radiation conditions. The general economic modelling and cost-benefit analysis of radiotherapy of the previous biennium will be completed and phased out. Economic modelling will be continued when new techniques develop.

Resource changes and trends: The proposed resources represent an increase of \$60 000 in 2004 compared with the 2003 adjusted budget. The 2004 figures remain unchanged for 2005. The increase is foreseen for the improvement of radiotherapy in Member States through training and education.

Financial resources (2003 prices)

F.2.	2003	2004	2005
Reg. budg.	1 063 000	1 123 000	1 123 000

Project F.2.01: Modification of radiation therapy using radiobiological knowledge

Main outputs: The main outputs will include: an ICRU report on dose-reporting for particle therapy; the result of increased number of fraction studies published as peer reviewed articles; trained personnel in the field of radiobiology through the TC programme.

Duration: 1994–2007

Ranking: 7

Project F.2.02: Human cell and tissue response to radiation

Main outputs: Publications will be made available on molecules affecting cellular death after radiation therapy .

Duration: 2004–2008

Ranking: 13

Project F.2.03: Adaptation of radiation therapy protocols to local conditions

Main outputs: The project will result in: new evaluated resource sparing clinical protocol data on the management of cancer in AIDS patients and on the role of teletherapy in the palliation of advanced oesophageal cancer; publications as peer review articles, consensus documents and technical documents directed at reduced resource utilization for the management of cancer, and publications on the results of CRPs (2006).

Unfunded activities/means of implementation: A CRP on resource sparing protocols for head and neck cancer; and pilot studies on resource-sparing clinical protocols.

Duration: 2001–2005

Ranking: 1

Recurrent Project F.2.04: Improvement of radiotherapy in Member States through training and education

Main outputs: This project will result in: validated distance learning package for oncologists; and trained personnel through the TC programme.

Unfunded activities/means of implementation: Preparation of updated monographs on the cancers of breast, cervix, head and neck.

Ranking: 10

Subprogramme F.3. Dosimetry and Medical Radiation Physics

Rationale: The subprogramme deals with the science and technology involved in dosimetry and medical radiation physics. The accurate measurement of

radiation dose is important in various applications such as radiation therapy, diagnostic radiology, nuclear medicine, radiation protection and radiation processing. The subprogramme supports the activities of Member States by ensuring international consistency in dosimetry standards and by monitoring the implementation and dissemination of those standards to end-users. Furthermore, it contributes to the increase in scientific and technical capacity in medical physics worldwide by fostering research and development in dosimetry techniques and playing a role in the education of medical physicists. The subprogramme also addresses the quality assurance (QA) aspects of the use of radiation in medical applications to ensure its safety and effectiveness. The Agency has signed the Mutual Recognition Arrangement (MRA) setting up the formal framework to provide Member States with radiation measurement technology in such a way that their dosimetry measurements are linked to the International System (SI). This link is provided by the calibration of radiation measurement standards for Secondary Standards Dosimetry Laboratories (SSDLs). Verification services are also provided in regular dosimetry comparisons and audits both for SSDLs and for the end-user institutions engaged in radiotherapy, diagnostic radiology, radiation protection and industrial processing. The primary beneficiaries of these activities are hospital patients undergoing radiation therapy and diagnostic radiology, radiation workers who benefit by the standardization of radiation protection measurements and the general public due to improved dosimetry practices in such areas as industrial radiation processing for sterilization of medical supplies and food.

Objective: To enhance the capability of Member States in dosimetry and medical radiation physics required for the safe and effective use of nuclear technology for the diagnosis of diseases and treatment of cancer, in radiation protection through the use of calibrated standards for accurate and traceable dose records, and in quality assurance for radiation dosimetry.

Outcomes
<ul style="list-style-type: none"> — Increased competence in dosimetry of the IAEA/WHO Network of Secondary Standards Dosimetry Laboratories due to the availability of calibrated radiation measurement standards. — Enhanced quality assurance and dosimetry in Member States through a dose verification service. — Increased capability of Member States for the safe and effective diagnosis and treatment of patients due to the transfer of radiation dosimetry technology.
Performance Indicators
<ul style="list-style-type: none"> — Number of Member States using the Agency’s calibration services for national measurement standards.

Performance Indicators (cont'd)
— Number of Member States having radiotherapy beam calibrations verified, radiation processing facilities audited and discrepancies corrected.
— Number of Member States using Agency codes of practice and quality assurance procedures and developing national dose quality audit programmes following Agency guidelines.

Programme changes and trends: Member States are seeking additional types of dosimetry calibration services and greater numbers of calibrations in order to improve their calibration and measurement capabilities, and to link their national dose auditing systems to the international dosimetry system. To deliver these services, an expansion of facilities at the Dosimetry Laboratory in Seibersdorf is expected to become a major focus. Resolution of discrepancies in dosimetry audits will be handled under the banner “Medical Physics Investigation Team (MPIT)” service, which will help Member States resolve problems that occur at any stage of the treatment process.

In diagnostic radiology, the development of new dosimetry standards and calibration services requires new verification and auditing exercises. Emphasis will shift to testing the new international Code of Practice on dosimetry in diagnostic radiology and to image QA, particularly in mammography. In nuclear medicine, emphasis will shift from developing the Agency’s capabilities in radioactivity standardization to establishing a methodology to supply Member States with calibration services. A major effort will be made in the area of education of health care professionals to ensure the safe and effective use of nuclear technology in the diagnosis and treatment of disease in view of the anticipated dramatic increase in cancer incidence in developing countries.

Resource changes and trends: The resource increases of \$206 000 in 2004 compared with the 2003 adjusted budget and \$729 000 for 2005 compared with the 2004 budget are largely attributable to the upgrading/expansion of laboratory facilities to strengthen calibration services and dose measurement capabilities in order to be able to meet the needs of Member States.

Financial resources (2003 prices)

F.3.	2003	2004	2005
Reg. budg.	1 852 000	2 057 600	2 786 600

Recurrent Project F.3.01: Network of Secondary Standards Dosimetry Laboratories

Main outputs: The main outputs of the project will be: Agency certificates of calibration for radiation measurement equipment; Agency certificates of comparison and verification services; SSDL

newsletter (including its Web version); updated database on the activities of the SSDL network; results of comparisons of radiation measurement standards conducted with international metrology organizations; and trained personnel for developing Member States.

Ranking: 2

Recurrent Project F.3.02: Quality assurance and dose audits

Main outputs: The project will result in: IAEA/WHO TLD postal dose quality audit service for verification of the accuracy of dosimetry in radiotherapy; International Dose Assurance Service (IDAS) for verification of the accuracy of dosimetry for industrial irradiators; methods to resolve discrepancies in beam calibration uncovered in dosimetry audit programmes; and updated computerized database containing TLD results for the IAEA/WHO International Dose External Audits.

Unfunded activities/means of implementation: Resolution of discrepancies identified by QA programmes of the Agency through the Medical Physics Investigation Team (MPIT) and development of operational procedures for MPIT.

Ranking: 5

Recurrent Project F.3.03: Development of radiation dosimetry techniques

Main outputs: Reports will be produced on methodologies to disseminate standards of radioactivity to SSDLs, testing the new Code of Practice for X ray dosimetry in diagnostic radiology, and development of techniques at SSDLs for the dissemination of standards for absorbed dose to water. Training material for education programmes in dosimetry and medical radiation physics as well as guidance to Member States for setting up and developing laboratories that become part of the SSDL network will be made available.

Ranking: 9

Recurrent Project F.3.04: Developments in medical radiation physics quality assurance

Main outputs: Reports will be produced on the development of procedures for use in: TLD based quality audits for radiotherapy dosimetry in non-reference conditions, in vivo dosimetry, quality assurance for dosimetry calculations in radiotherapy, dosimetry audits in diagnostic radiology, quality control of the instrumentation used in nuclear medicine, and physical and biological evaluation of treatment planning calculations. Guidelines for use in quality assurance in mammography will also be an output of the project.

Ranking: 12

Subprogramme F.4. Nutrition and Effects of Contaminants on Human Health

Rationale: The application of nuclear based and related isotopic techniques such as tracer techniques, radioimmunoassay, stable isotopes and isotope dilution methods, are recognized as mature technologies. Presently these are the widely used tools for the management of problems and solutions concerning malnutrition, because of their specificity and high sensitivity and the possibility of introducing less invasive procedures when dealing with human subjects. These activities fall within the United Nations global strategy on human nutrition as formulated in regular consultations such as Human Energy Requirements and Expenditure, Protein and Amino Acid Requirements in Human Nutrition, Infant Growth Monitoring and Body Composition, Nutrition and HIV/AIDS. Under the auspices of the United Nations Subcommittee on Nutrition (SCN), the Agency has been disseminating information on the use of stable isotopes in human nutrition to WHO, FAO, UNICEF and UNU.

Toxic elements enter foodstuff due to contaminated soil, water and air. Validated techniques are required for biomonitoring for health assessment and to respond to questions arising in the nutritional toxicology area. Isotopic techniques offer solutions to resolve nutrition-pollution issues and to assess the impact of selected interactions. The environmental pollution levels of toxic substances exceed the WHO recommendations in many geographical areas. Furthermore, airborne particles, particularly in the range <10 µm, are known to be precursors of cardio-pulmonary diseases and are regarded as major risk factors for occupational health in workers. Nuclear techniques such as neutron activation analysis and proton induced X ray emission are considered unique tools for monitoring human exposure to toxic metals in the environment and in the workplace.

Objective: To enhance the sensitivity of nutrition monitoring methods in Member States through improved nuclear techniques for identifying effective food and nutrition strategies, and to biomonitor the environment to identify the sources of toxic elements and assess their impact through the use of nuclear and isotopic techniques as unique tools.

Outcomes
<ul style="list-style-type: none"> — Increased competence in selected Member States for applying isotopic and nuclear techniques to human nutrition and nutrition toxicology. — Identification of possible human exposure to toxic elements consumed through foodstuffs in selected Member States.

Performance Indicators
<ul style="list-style-type: none"> — Number of laboratories acquiring the ability of nuclear and isotopic techniques for nutritional studies. — Number of Member States demonstrating the use of nuclear based methods for national nutritional programmes. — Number of Member States establishing biomonitoring techniques to assess health impact of toxic elements in human subjects. — Number of trained personnel in the area of nutritional and health effects of contaminants as a result of capacity development efforts through CRPs or technical co-operation projects.

Programme changes and trends: There is greater emphasis in the area of nutrition on new activities that reflect close links to United Nations objectives in the areas of human nutrition and environmental health (e.g. preventive health care for the elderly, intrauterine growth restriction of the foetus, health status of adolescent girls and menopausal women, and health impact of toxic trace elements consumed through foodstuffs). In addition, a close relationship exists between these topics (e.g. nutrition-pollution interactions). A thematic CRP that enables developing countries to strengthen capacity building by providing the opportunity to participants to work towards higher educational achievements is a distinct departure from traditional CRPs. In the health related environmental area, activities focusing mainly on air pollution monitoring during the 2002-2003 cycle have been reduced. In contrast, the 2004-2005 activities address direct human exposure to contaminants (e.g. nutrition toxicology and eco-nutrition).

Two new activities started in the 2002-2003 budget cycle addressing issues of nutritional metrology (initiating analytical quality control related to organic nutrients in natural matrix materials, and development of a database of nuclear technology facilities in Member States for performing nutritional and environmental studies), will be strengthened further in 2004-2005. The former is of crucial significance to developing countries while the latter is very useful to the Agency to assess the state-of-the-practice in the application of nuclear techniques in a global context. To support these changes in direction, and the introduction of our new CRPs on the above subjects, the CRPs related to ageing, infection, use of plants as biomonitors and the health impact of mercury cycling will be phased out on successful completion.

Resource changes and trends: A decrease in resources of \$35 000 is foreseen in 2004 and 2005 compared with the 2003 adjusted budget.

Financial resources (2003 prices)

F.4.	2003	2004	2005
Reg. budg.	1 597 000	1 562 000	1 562 000

Recurrent Project F.4.01: Applied human nutrition assessment and research using nuclear and isotopic techniques

Main outputs: Documents and scientific publications will be produced on: biochemical diagnostic indicators of the onset of obesity, methods for monitoring body composition, strategies to evaluate energy metabolism, tested procedures to assess *Helicobacter pylori* infection, monitoring techniques to assess the effectiveness of nutritional interventions and evaluated parameters to assess infant growth monitoring. Data on health related recommendations will be made available for various consultation forums convened by the United Nations and other bodies.

Ranking: 4

Recurrent Project F.4.02: Facilitating studies of contaminants affecting human health by nuclear and related analytical techniques

Main outputs: The project will result in: TECDOCs summarizing the experimental results of CRPs, and scientific publications on: refined analytical approaches to study environmental pollution to assess human exposures and heavy element contamination of foods; impact of industries on contaminants in foods, assessment of nutrition pollution interactions related to essential and toxic trace elements; and identified target human tissues useful as biomonitoring pollutants in foods.

Ranking: 14