# Human Health

## *Objective*

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

## Development of the First International Body Composition Reference Charts for Infants Based on Stable Isotopes

To understand infant growth and the associations between early life and later health, it is important to capture the dynamic growth of infants through the assessment of body composition. While height and weight are a core component of early childhood monitoring and global nutrition surveillance, body composition measurements of infants are not widely used due to the lack of available normative data on body composition over the first two years of life. The Agency aimed to address this need through a coordinated research project (CRP) which involved teams from Australia, Brazil, India, Pakistan, South Africa and Sri Lanka. In 2021, using the data generated by this CRP, the Agency developed body composition reference charts based on the stable isotopic technique of deuterium dilution for use in the first 24 months of life (Fig. 6). These charts will enable body composition to be evaluated against international references for children aged 0–2 years, thus ensuring accurate data for improving childhood nutrition monitoring, evaluating interventions to address infant and young child nutrition, and guiding nutrition policy.

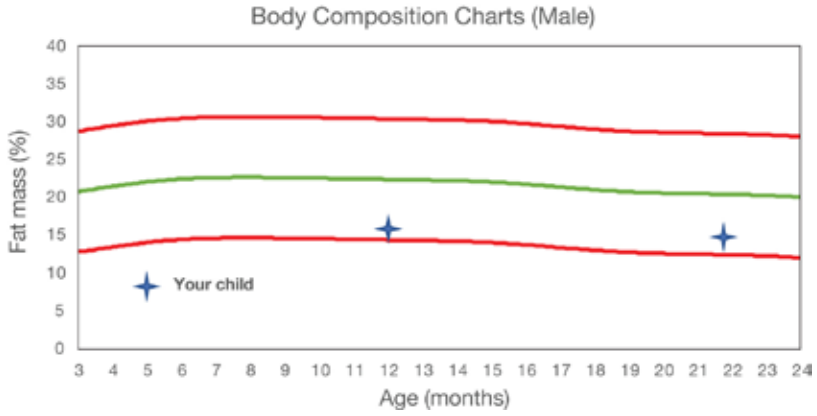


*FIG. 6. Example of the body composition international reference chart (fat mass, children 3—24 months, male) based on the nuclear nutrition technique of deuterium dilution.*

## The Lancet Oncology Commission on Medical Imaging and Nuclear Medicine

The Lancet Oncology Commission report, led and co-authored by the Agency and published in March 2021, highlights the need to improve awareness of, and patient access to, affordable and effective cancer imaging worldwide. It addresses the range of medical imaging modalities, interventional radiology and radionuclide therapies used today, and their uneven availability around the world. The report focuses on the gap between high income countries and low and middle income countries in terms of resources, health system coordination, and education and training. Also outlined is a compelling health economics case for countries, illustrating that scaling up access to nuclear medicine and imaging services would avert nearly 2.5 million cancer deaths worldwide by 2030 and yield global lifetime productivity gains of $1.41 trillion. The Commission calls for an overarching global strategy to address these needs and proposes six actions to enhance access to imaging equipment and to develop a qualified workforce to tackle the disease globally.

## Promoting Quality Assurance in Medical Physics Through Guidance and Dosimetry Services

Clinically qualified medical physicists often suffer from a lack of recognition as independent health practitioners. In line with other health professions, medical physicists must obtain certification, and the Agency has published guidelines suggesting pathways to achieve this. The role of the medical physicist includes the development of technical specifications for complex radiotherapy technologies, ensuring that the correct radiation dose is delivered to patients, and the performance of regular quality control of equipment used for diagnosis and treatment (Fig. 7). Jointly with the World Health Organization, the Agency developed technical guidance for Member States on the specifications of radiotherapy equipment packages. The Dosimetry Laboratory introduced a new service to Member States to audit the output of linear accelerator (linac) electron beams, used for the treatment of superficial cancers. Regular quality control of radiographic and mammographic equipment is important to ensure good diagnostic image quality. Radiology services are often unevenly spread geographically and can lack full time specialist attendance. A novel methodology using digital images of simple, inexpensive test objects was published to facilitate remote and automated medical physics review to maintain quality and performance.

*FIG. 7. Medical physicists performing a linac electron beam audit.*