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Nuclear Medicine: Meeting Future Global Needs

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Introduction

On 12th February 2026, the UK India Nuclear Network hosted a one-day roundtable at Imperial College London, convened by Professor William Nuttall. A global group of participants gathered to exchange knowledge and gain a better collective understanding of the steps required to meet future nuclear medicine needs, especially in emerging economies.

The roundtable was the last in a series of three. Professor Nuttall envisaged that the series would explore a policy proposition sitting at the nexus of two major areas of global concern: public health and nuclear security. Within that context each event had its own focus and emphasis.

The first roundtable, held at the National Liberal Club in London in 2021, focused on the case for Professor Nuttall and Professor Michael Bluck's PREMIER reactor concept: a proliferation-resistant medical isotope reactor that could be exported to states in need of a more resilient supply of medical isotopes.[1] BASIC and The Open University co-sponsored the first roundtable.

The second roundtable, held at the Royal Society in London in 2022, considered different technical options that could meet future global isotope needs, and compared the relative merits of the PREMIER concept, the Micro-NOVA fusion reactor

[1] See Eva-Nour Repussard and Chris Spedding. The Case for a Proliferation-Resistant Medical Isotope Reactor, 2022. BASIC, 2022. https://basicint.org/wp-content/uploads/2022/03/BASIC-The-Case-for-a-Proliferation-Resistant-Medical-Isotope-Reactor-2022.pdf.

concept, and production of isotopes using accelerators.[2] BASIC co-hosted the second roundtable with the University of Bristol, Imperial College London, The Open University and Rolls-Royce. Each time BASIC published a report summarising the event and its findings. This document concludes the series.

The third roundtable was sponsored by the UK-Indian Nuclear Network (UKINN),[3] and held at Imperial College, London. Its focus was the global future for nuclear medicine and did not directly consider the question of non-proliferation. It brought together experts from international organisations, India, Africa, and the UK to gain a clear and detailed picture of both the current status of nuclear medicine in the examined regions, and future needs. It consisted of a number of geographically-focused presentations and two sessions of open discussion. The report author attended the roundtable as a participant. As with the other meetings in the series, the meeting was held under the Chatham House rule.

This report is separated into three parts. Part one provides an overview of the material shared in the presentations, and part two is a thematic discussion that brings together points made by participants during the roundtable. Part three offers a synthesis and brief conclusion, drawn from these points.

Given the roundtable's focus and the direct experience of participants, this report and its conclusions particularly reflect the African and Indian nuclear medicine experience. However, it is reasonable to assume that many of the conclusions will be applicable to other countries and parts of the world where nuclear medicine is currently underdeveloped.

1. Workshop Proceedings

India

The first presentation of the day covered the history and current status of nuclear medicine in India. India has a highly developed nuclear medicine sector, and one participant suggested that in some respects India could serve as a model for other countries with less well-developed sectors.

The presentation covered the origins of nuclear medicine in India, starting with the founding of the Tata Institute of Fundamental Research in 1945, and the APSARA research reactor, which went critical in 1956, enabling the first production of medical isotopes. The CIRUS reactor, which went critical in 1960, was described as a 'game changer', as its high neutron flux enabled large-scale production, and established India as a medical isotope supplier.

The first clinical applications of nuclear medicine in India began in the early 1960s, and cumulative patient numbers are now in the millions. India launched the world's first formal Diploma in Radiation Medicine in 1968.

Today, India produces a wide range of isotopes, using reactors and cyclotrons, has around 900 different imaging units across the country, and carries out between 0.5 and 1 million nuclear medicine scans annually. Theranostics, where radionuclides are used for both diagnostic and therapeutic purposes, has been part of routine practice in India since 2015.

Overview of Africa

The next presentation gave an overview of nuclear medicine across the continent of Africa.[4] Unsurprisingly, there is a significant range in provision between different countries. Of the 50 IAEA member states on the continent, 20 have no nuclear medicine service, and 30 currently provide some nuclear medicine services. Three states with no current service

[2] See Eva-Nour Repussard. Nuclear Medicine Technologies for Global Health: Proposals for Strengthening Nuclear Medicine Globally Whilst Minimising Proliferation Risks. BASIC, 2023. https://basicint.org/wp-content/uploads/2025/11/FINAL_Nuclear-Medicine-Technologies-V1.pdf.
[3] The 2026 roundtable and this report forms part of UKINN's activities under UK Research and Innovation grant EP/T016663/1
[4] Some parts of the presentation drew from: Anita Brink, Janke Kleynhans, Anna Grigoryan, et al. 'The Current Status of Nuclear Medicine in Africa'. Journal of Nuclear Medicine, 11 December 2025, jnumed.125.271248. https://doi.org/10.2967/jnumed.125.271248.

(Malawi, Lesotho, and Rwanda) are in the process of setting one up. Benin currently only provides Radioimmunoassay services, but is developing other nuclear medicine services.

Services in some countries are very limited: of the 466 nuclear physicians in Africa, only four are based in Nigeria, a country with a population of 200 million. Only five countries in the whole continent offer full postgraduate training for nuclear medicine physicians. Imaging based on Single-Photon Emission Computed Tomography (SPECT) technology is much more common than Positron Emission Tomography (PET) imaging, which only has a presence in 11 countries. The vast majority of imaging equipment (88% of SPECT or SPECT/CT machines and 95% of PET/CT machines) is concentrated in only seven countries. There are only three research reactors producing radioisotopes in the whole continent: in South Africa, Egypt, and Algeria.

As an illustration of the types of challenges facing nuclear medicine in Africa, the construction of Malawi's new radiotherapy centre had to be preceded by the construction of a cement facility next to the hospital to provide cement to build the centre.

There are a number of initiatives that can help to improve provision in Africa, including efforts to create a harmonised Radiopharmacy Master's Degree curriculum, publish guidance for states, and provide direct funding for nuclear imaging and radiotherapy equipment where it is needed. The presenter spoke of the benefits of greater nuclear medicine provision, and noted a 2021 estimate by the Lancet Oncology Commission that if comprehensive improvements in imaging, treatment, and care quality were implemented, over 9.5 million lives would be saved worldwide between 2020 and 2030.[5]

Ghana

Of the countries that were the focus of a presentation during the roundtable, Ghana is perhaps starting from the lowest base in terms of developing its nuclear medicine capacity. There are only three nuclear medicine physicians in the country, and one of them is not currently practising. Only four medical physicists in Ghana are solely practising in nuclear medicine, and there is only one practising radiopharmacist, two radiochemists, and four nuclear medicine technologists. The total population of Ghana is 35.4 million. It is significant that highly qualified people find it difficult to practise in their specialism due to challenges within the nuclear medicine sector.

The two largest teaching hospitals in the country have SPECT systems, and there was previously a PET system in a private hospital, but that has been decommissioned. Only one technetium-99m (Tc-99m) generator is imported into Ghana every month. Most patients simply cannot afford to pay for a PET scan, and health insurance typically does not cover the lower cost of a SPECT scan in a public hospital. Despite all these challenges, the presenter praised the dedication of Ghana's nuclear medicine staff and said that there are plenty of future prospects for the field in Ghana.

Nigeria

Nigeria currently has one research reactor, NIRR-1, which went critical in 1994. In 2018, the reactor was converted to run on Low-Enriched Uranium. However, it is not well-suited for the production of radioisotopes, and notably it cannot produce Tc-99m. Current provision of nuclear medicine in Nigeria is low. There are only 10 cancer treatment centres for a population of 200 million, and patients have died due to the difficulties in importing isotopes.

A new research reactor, which will be known as NIRR-2, is currently in the planning stage, and authorities are consulting with the IAEA. NIRR-2 is intended to be proliferation-resistant by design[6] and produce isotopes for the oil and gas industry, as well as for nuclear medicine. It will be situated close to an airport, and is intended to supply nearby countries, as there is currently no high flux research reactor in West Africa. A government-mandated committee was set up in 2018 to identify

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[5] Hricak, Hedvig, May Abdel-Wahab, Rifat Atun, et al. 'Medical Imaging and Nuclear Medicine: A Lancet Oncology Commission'. The Lancet Oncology 22, no. 4 (2021): e136–72. https://doi.org/10.1016/S1470-2045(20)30751-8.
[6] Such thinking links to ideas from the first two meetings and reports in this series which considered very high levels of proliferation resistance and nuclear security achieved on a 'by design' basis.

isotopes of interest for nuclear medicine and industry, assess current radionuclide demand and make estimates of future demand. At present, nuclear medicine plans are focused solely on Tc-99m and iodine-131. There are also ambitions to create a domestic training capacity for nuclear medicine, and participants were told of a collaborative project involving a British private fusion company (Astral Systems), universities, hospitals and the Nigerian Atomic Energy Commission. A curriculum is planned, covering radiopharmacy and nuclear physics.

South Africa

South Africa has a highly developed nuclear medicine sector, with domestic radiopharmaceutical production, numerous clinical sites and groundbreaking academic research. As well as seven cyclotrons across the country, there is a research reactor: SAFARI-1. There are 95 SPECT/CT machines and 32 PET/CTs, although the ratio of imaging equipment to population is still below World Bank benchmarks for an upper-middle income country. There are 14 nuclear medicine facilities in the state sector, but these are substantially outnumbered by the 63 facilities in the private sector.

South Africa hosts a nuclear medicine training hub, with courses on nuclear medicine, radiopharmacy, nuclear technology and medical physics. A major centre of research is the Nuclear Medicine Research Infrastructure (NuMeRI) facility, which combines pre-clinical and clinical capabilities with radioisotope production, and is a leading centre of theranostics research. An article on the theranostic treatment of prostate cancer using actinium-225, published by scholars from NuMeRI in the European Journal of Nuclear Medicine and Molecular Imaging, was given an award in 2023 for being the most cited academic paper of the previous year.[7] The Basic and Transitional Research team, also based at NuMeRi, is conducting several strands of research, including on African-specific epigenetic signatures, which can help to redress the underrepresentation of African populations in global genomic and epigenomic datasets.

The nuclear medicine sector in South Africa still faces challenges. Funding remains a constraint, with the cost of peptides being singled out as a particular issue for theranostics work. Regulation was still felt to be a barrier, and workforce shortages remain an issue, in part due to some trained staff seeking work abroad. There is also some geographic inequity within South Africa, despite the relatively high provision of imaging equipment, and some patients based in provinces where there is no provision are obliged to travel up to 200km for treatment.

2. Thematic Discussion

The Workhorse: Technetium-99m

A major focus of discussion in the workshop was the current dominance of Tc-99m as the radioisotope of choice in nuclear medicine procedures. The question raised in the meeting was whether it was likely to retain this position in the future. Tc-99m is a metastable nuclear isomer, which decays into the isotope technetium-99 through the emission of gamma radiation. It is highly suited to nuclear medicine because of its half-life of six hours, the relatively low energy of its gamma radiation, and the minimal quantities of particle radiation dose received by the patient.[8]

Tc-99m is typically distributed for nuclear medicine procedures in a generator. This consists of a source of its parent radionuclide molybdenum-99 (Mo-99), from which Tc-99m can be extracted as the Mo-99 decays. The half-life of Mo-99 is nearly 66 hours, and this longer time period means that Tc-99m can be extracted from the generator for up to two weeks, a narrow window, but in principle sufficient for global distribution and use.

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[7] Mike Sathekge, Frank Bruchertseifer, Otto Knoesen, et al. '225Ac-PSMA-617 in Chemotherapy-Naive Patients with Advanced Prostate Cancer: A Pilot Study'. European Journal of Nuclear Medicine and Molecular Imaging 46, no. 1 (2019): 129–38. https://doi.org/10.1007/s00259-018-4167-0; 'EANM-Springer Award Winners 2023'. European Journal of Nuclear Medicine and Molecular Imaging 51, no. 4 (2024): 936–37. https://doi.org/10.1007/s00259-023-06518-4.
[8] Mettler, Fred A., and Milton J. Guiberteau. 'Radioactivity, Radionuclides, and Radiopharmaceuticals'. In Essentials of Nuclear Medicine Imaging. Elsevier, 2012. https://doi.org/10.1016/B978-1-4557-0104-9.00001-9.

While Tc-99m is used in around 80% of nuclear medical procedures worldwide, and around 85% of diagnostic scans, the global supply of Mo-99 comes from only six nuclear reactors, five of which are more than 50 years old.[9] Global shortages in 2009-2010, caused by shutdowns in this ageing reactor fleet, resulted in price increases of up to 200%.[10] These supply issues were an ongoing concern for participants, with one saying that Tc-99m had been unavailable for periods of around six months in some places. Even India, with its highly developed nuclear medicine capacity, has been affected by the shortages.

Non-Technetium Imaging Radioisotopes

Workshop participants discussed a number of alternative radiopharmaceuticals, many of which are already in active use. Nuclear medicine radionuclide choice is dependent on the imaging technology being utilised. SPECT and SPECT/CT imaging require a gamma emitter, such as Tc-99m, whereas PET and PET/CT imaging require a positron-emitting isotope, and can produce a higher-fidelity image than a SPECT machine.

Both fluorine-18 (F-18) and gallium-68 (Ga-68) are commonly used for PET scans, with the latter usually being produced in a germanium-68 generator. The 271-day half-life of Ga-68 means a generator can supply Ga-68 doses for up to six months,[11] providing considerable logistical flexibility compared to a Tc-99m generator. There was broad agreement among participants that PET imaging was better suited for theranostic uses, where imaging radionuclides can be used to identify whether a molecule that will seek out and bind to cancer cells, with the same molecule being later used to deliver targeted radiation to the cancer from a different radionuclide.

Participants stressed that while radiological and scanning characteristics could favour certain isotopes and imaging choices for particular procedures, these choices could not be assessed in isolation from other considerations such as cost, the availability of trained staff, and the ability to service and repair equipment. While one participant stressed that F-18 and Ga-68 were strictly better than Tc-99m for some uses, another asserted that SPECT scans are still sufficient for diagnostic purposes in many cases, and that we should not discount the possibility of using Tc-99m for theranostics.

One participant felt that there was broad agreement that the ideal imaging radionuclide would be a short-lived isotope such as Nitrogen-13 (N-13) or Carbon-11, produced on demand in an on-site accelerator in a hospital basement, with a half-life of 20 minutes ensuring a minimal radiation dose for the patient. However, they felt this was not a feasible solution to global nuclear medicine needs, and swift scaling up should be based on mature technologies and supply chains: SPECT scanners and Tc-99m.

Several participants stressed the importance of continued support for existing scanning infrastructure based on Tc-99m and SPECT, with African participants particularly emphasising this point. Most participants were unsure whether Tc-99m demand would grow or fall over the next 40 years, but of the remainder, more predicted a fall in demand than a rise.

Radioisotope Production Technologies

There was substantial discussion of the respective merits of various isotope production technologies. Several participants extolled the benefits of reactor production in terms of the quantities of material that can be produced and the potential for offsetting some of the costs through the sale of electricity. The current fleet of medical isotope production reactors are all research reactors that were not purpose-built for the production of medical isotopes.[12]

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[9] World Nuclear Association. 'Radioisotopes in Medicine'. 21 January 2026. https://world-nuclear.org/information-library/non-power-nuclear-applications/radioisotopes-research/radioisotopes-in-medicine. p63.
[10] The Supply of Medical Radioisotopes: An Economic Study of the Molybdenum-99 Supply Chain. Organisation for Economic Co-Operation and Development - Nuclear Energy Agency, 2010. https://www.oecd-nea.org/ndd/reports/2010/nea6967-radioisotpes-full-report.pdf.
[11] Henry F. Van Brocklin. 'PET Radiochemistry'. In Molecular Imaging, 2nd ed., edited by Brian D. Ross and Sanjiv Sam Gambhir. Elsevier, 2021. https://doi.org/10.1016/B978-0-12-816386-3.00027-2.
[12] Organisation for Economic Co-Operation and Development, 2010. Op. Cit. p. 47-49.

Professor Nuttall and Professor Bluck's proposed PREMIER reactor concept was briefly outlined during the discussion, and participants also mentioned the initiative to begin production of Lutetium-177 in Canada's CANDU 6 reactor,[13] with one participant suggesting that producing other isotopes in that reactor design could significantly impact global supplies and bring down costs.

Cyclotrons are the major non-reactor production technology currently in use, and are the preferred method for producing some medical isotopes, such as F-18. Cyclotron production involves bombarding a target material with protons in order to produce the required quantities of the desired isotope. While the target material would still need to be imported into most countries and transported to the cyclotron site, it will not be subject to the same logistical constraints as a generator with a relatively short half-life. For example, in F-18 production, the target used is the stable isotope oxygen-18.

While sourcing Tc-99m from existing reactors is currently much cheaper than directly producing it using a particle accelerator, a full cost-benefit analysis of reactor-derived isotopes should include an appropriate share of build and decommissioning costs for the reactor. There was a broad expectation among participants that cyclotrons would continue to be a significant contributor to isotope production, and that future technological developments could make them more economical and widespread.

One participant cited a permanent magnet cyclotron design that is under consideration by manufacturer IBA as being better suited to contexts with an unreliable electricity supply. Another pointed to a compact N-13 cyclotron produced by IONETIX[14] as being small enough to fit into a wide range of medical facilities. Participants also discussed Astral systems' multi-state fusion reactor[15] and the SHINE's proposed Chrysalis fusion isotope production facility[16] as promising developments that could herald a new era for medical isotope production.

Barriers to Scaling up Nuclear Medicine Worldwide

Geographical

When responding to the workshop presentations, participants frequently returned to the geographical impediments to increasing nuclear medicine provision in underserved regions and countries. While applauding the excellent efforts made by dedicated professionals beginning from a very low base, including in countries covered in the presentations, participants repeatedly acknowledged the inherent difficulties in treating isolated communities a long way from research and medical facilities.

The physical distance between patient and treatment centre is only one variable. It is simply harder to practice any form of medicine without the support structure of an established training and research infrastructure, and a medical community of practice. Nuclear medicine faces additional challenges relating to the acquisition and maintenance of equipment, and the need for a reliable and timely supply of medical isotopes. Airline routes and the speed of regulatory clearance can significantly affect the usable lifetime of imported isotopes, and the number of doses they can provide.

Training

The importance of training was emphasised by every presentation in the workshop. Nuclear medicine requires numerous specialist staff, and the presenters were unanimous in regarding a domestic training capacity as a necessary component

[13] Innovation, Science and Economic Development Canada. 'Canada Strengthens Global Leadership in Medical Isotope Production'. News releases. 19 August 2025. https://www.canada.ca/en/innovation-science-economic-development/news/2025/08/canada-strengthens-global-leadership-in-medical-isotope-production.html.
[14] 'ION-12SC Cyclotron Data Sheet'. IONETIX, 2021. https://ionetix.com/wp-content/uploads/2025/06/IONETIX_ION-12SCCyclotronSystem_DataSheet.pdf
[15] UK Startup's Tritium Fuel Inside Its Own Fusion Reactor. Science. 16 June 2025. https://startupindiax.com/tritium-fuel-inside-its-own-fusion-reactor/.
[16] SHINE. 'SHINE Gets Conditional $263M DOE Commitment for Chrysalis'. 9 April 2026. https://www.shinefusion.com/blog/shine-receives-conditional-commitment-for-263-million-doe-loan-to-scale-fusion-commercialization.

for a functioning nuclear medicine sector. Establishing this capacity was seen as a priority for those countries where it is not currently present. As shown in the example of Nigeria, this requires a joint effort involving central government and academic institutions, and commercial actors may also have a significant role to play.

However, creation of this training capacity requires sufficient domestic expertise to already be in place in order to design, coordinate and deliver training programmes. As such, training for the first generation of nuclear medicine practitioners must be delivered abroad. In order to build up regional expertise, it is preferable that this training be provided in a nearby country. South Africa is currently acting as a training hub for other African countries, but as capacity grows elsewhere in the continent, other regional training hubs should be developed.

The issue of retaining trained staff was mentioned by several participants. While the basic fact of global wage disparity provides the structural incentives for 'brain drain', it was stressed that trained staff often seek opportunities elsewhere because of a lack of suitable roles, professional development, or the possibility of using their skills in a well-funded institutional setting with the necessary equipment and materials. As such, addressing other fundamentals would have a knock-on benefit for staff retention.

Financial Barriers

There was broad agreement amongst participants that most, if not all, of the barriers to increasing access to nuclear medicine in underserved parts of the world had a financial component. Increased financial resources would increase the availability, reliability and sophistication of equipment, and ease isotope supply problems. Larger staff teams would service greater patient numbers, and competitive salaries would increase retention. Reductions in the cost of procedures would allow more patients to be treated in emerging and less developed economies, allowing nuclear medicine to more easily scale up. It is not clear whether increasing patient numbers through reduced costs could result in greater financial resources overall, resulting in a more sustainable sector in the long run.[17] One participant reflected that the group would require input from an economist to address some of these issues.

Regulatory Barriers

Participants spoke of the effort required from regulators to enable nuclear medicine. Some participants felt that regulators were not focused on making the importation process for short-lived radionuclides as speedy as possible, which has knock-on effects for the number of patients who can be treated. One participant said that regulators needed more regulatory staff who speak the language of nuclear medicine, and that regulators were currently slowing down progress.

Waste Management

After a nuclear medicine procedure, clinical isotopes are naturally excreted from the body, particularly in urine. As an example of regulation they felt was over-stringent, one participant gave the example of a country where about 20 patients undergo nuclear medicine treatments a year, which required urine from those patients to be collected in radioactive decay tanks for several weeks as an environmental and radiological safety measure. A different participant said that with a larger number of patients, waste handling protocols need to be in place to handle post-procedure excretions. Participants did not discuss management of other nuclear waste streams, but a comprehensive system of waste management measures is an essential component of working with radioactive material, and should not be neglected.

[17] Earlier in this series the idea was explored that, in collaboration with an international partner, the UK might offer a gift to the world in the form of a new highly proliferation resistant medical isotope technology, such as the PREMIER concept or an alternative.

Other Demands on Medical Resources

Nuclear medicine services often have to compete with other essential medicinal services for resources. Participants acknowledged that it is difficult to justify the expense of nuclear medicine in countries that are battling preventable infectious diseases, with some specifically mentioning HIV/AIDS in this respect.

3. Synthesis and Conclusion

An Ecosystem Perspective

It may be helpful to think about the task in scaling up nuclear medicine in terms used by several participants: developing an ecosystem. As one participant said, a sustainable and well-developed nuclear medicine capability requires numerous interconnected factors to be in balance.

A cohort of patients needs to be matched with clinicians, operational staff and equipment. Training programmes are required to bring staff into the workplace and ensure their skills are up-to-date, and job opportunities need to be available for trained staff. The supply of isotopes needs to be matched with demand, and vice versa, such that the economics and logistics of the supply chain are efficient and sustainable.

Self-sustaining systems that balance all these factors need to be in place at the local, regional, national and global levels for nuclear medicine to realise its full potential. This might appear a daunting prospect, but the examples given in the workshop of India and South Africa demonstrate that it is possible. One of the participants pointed to projected future rises in global cancer[18] cases to underline the point that a growing demand for nuclear medicine can be relied upon: the only question is whether it can be met.

Another participant posited that after a certain inflection point, patient throughput, staffing, equipment and isotope supply will start to benefit from economies of scale, but it was not immediately clear at what stage that would happen. As one participant said, some of these issues discussed fall under the purview of economists, and need to be seen as part of the broader agenda of economic development.

Several participants commented on the complexities in managing the changes that would need to take place, and the need for international cooperation and coordination. As well as noting the requirement for government intervention and support, and existing efforts by the IAEA, participants suggested that lessons could potentially be drawn from the EU's Critical Medicines Act[19] or the STELLA project, which aims to provide radiotherapy equipment to parts of the world that are currently underserved.[20]

Conclusions

Participants expressed a range of views during the workshop and were not asked or expected to form a collective position on the topics discussed. Nonetheless, some conclusions can be drawn or inferred from the discussion.

1. There was broad agreement on the need for action to increase global nuclear medicine capacity, and for interventions that engender all elements of a successful ecosystem.

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[18] Luo, Qingwei, and David P. Smith. 'Global Cancer Burden: Progress, Projections, and Challenges'. The Lancet 406, no. 10512 (2025): 1536–37. https://doi.org/10.1016/S0140-6736(25)01570-3.
[19] European Parliament. 'Deal on Tackling EU Shortages of Essential Medicines'. 12 May 2026. https://www.europarl.europa.eu/news/en/press-room/20260511IPR43110/deal-on-tackling-eu-shortages-of-essential-medicines.
[20] 'Better Radiation Treatment, At Lower Cost'. STELLA, n.d. Accessed 19 May 2026. https://stellaproject.org/better-radiation-treatment-at-lower-cost/.

2. There was no consensus between participants on which imaging technologies and radioisotopes should be prioritised. Instead, participants were generally of the opinion that choices in a given setting depend upon a range of local and external factors that will need to be weighed by clinicians and national decision-makers.
3. The optimum models of global medical isotope production are contingent upon these choices, but the structure of production is also a substantial constraining influence on choices. As such, international efforts to support the development of nuclear medicine should not be prescriptive about isotope and technological choices, but instead should aim to clarify the possibility space and play an enabling role for a range of options.
4. It is possible, or even likely, that the model of isotope production and distribution best suited to a particular setting will change as capacities develop. Care should be taken to ensure that arrangements intended to build up nuclear medicine from a low base do not unintentionally constrain the long-term sustainability and maturation of a domestic nuclear medicine ecosystem.
5. Some participants anticipate a future where PET imaging either supplements or displaces SPECT technology, favouring more distributed cyclotron-based production models. There appeared to be divergent views on whether these models and technologies were desirable for a country with little or no current nuclear medicine provision, given the additional costs and complexities involved.
6. The pace of technological development in the field is substantial, and a number of potential changes could substantially alter the landscape. Innovation is happening all around the world, and should be expected to grow as more countries develop their nuclear medicine sectors.
7. The call from multiple African participants for continued support for existing scanning infrastructure based on SPECT and Tc-99m also resonated with some British participants. It is likely to be echoed in other areas of the world; even in countries with well-developed nuclear medicine sectors, such as India and the UK, Tc-99m is used in a significant proportion of nuclear medicine procedures.
8. In more developed national contexts where patient numbers are growing overall, it is likely that existing infrastructure can be supported and supplemented by new technologies without having to sacrifice existing capacity, but without sufficient growth in patient numbers it may be harder, and necessitate difficult choices.

The work of scaling up nuclear medicine globally is complex and multifaceted. Nonetheless, roundtable participants directly engaged in that work were upbeat and determined. As mentioned above, there are a number of existing initiatives that can be built upon or used as a model, particularly those run by the IAEA. While the task should not be underestimated, creating sustainable nuclear medicine ecosystems will save millions of lives.

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