RAF6060 Questionnaire

Unique Factors Shaping Nuclear Medicine on the African Continent

Thank you for participating in this questionnaire.
This questionnaire will be circulated in advance so that you can fill it out before attending the meeting in Eygpt. We ask that you also consult within your country to ensure that the information given is adequate.
When arriving at the meeting, you and the other participants from your country will have the time to compare and edit your answers where needed.

This information gathering aims to interpret the data spread the information (publications, presentations) and make the world aware of the unique opportunities and constraints within the region. It will also provide stakeholders with more in-depth information on circumstances so that solutions can be found. Not solutions that worked elsewhere and are less appropriate for the region, but solutions suggested by Africa for Africa.

At the upcoming meeting, we have the unique opportunity to have more than 60, participants from 30 countries, and 3 disciplines hosted by the gracious Nuclear Medicine team in Eygpt.

Before you fill in this questionnaire, it is also mandatory that you fill in the Radiopharmacy Database of the IAEA. Kindly consolidate the information from your facility before final submission to avoid multiple entries and redundant data collection. The Radiopharmacy Database can be found on the following link:

https://nucleus.iaea.org/sites/NAPCRadiopharmacyDB/SitePages/Landing.aspx

Section A: Personal Details

Note: All personal details are optional and will remain confidential. It will be however useful if filled in completely as this information will be linked together with the rest of your answers to provide more insight.

1. Full Name (optional): _____
2. Age: ____
3. Gender:
    - ☐ Male
    - ☐ Female
    - ☐ Other: _____
    - ☐ I prefer not to say

4. Country in which you were born: _____

5. Country in which you were educated:_____

6. Country in which you currently practice your speciality:_____

7. Which profession do you identify as most?
    - ☐ Nuclear Medicine Physicist
    - ☐ Pharmacist
    - ☐ Radiopharmacist
    - ☐ Nuclear Medicine Physician
    - ☐ Radiologist
    - ☐ Nuclear Medicine Technologist
    - ☐ Scientist forming part of the Nuclear Medicine Team
    - ☐ Other (please specify):_____
    - ☐ Prefer not to say

8. What type of facility do you work at **(mark all that is applicable)**?
    - ☐ An industrial facility that produces cold radiopharmaceutical kits
    - ☐ An industrial facility that produces radionuclides (reactor/cyclotron)
    - ☐ A Nuclear Medicine Clinic supported by the Government
    - ☐ A Nuclear Medicine Clinic functioning as a private institution
    - ☐ An academic institution doing research &/or nuclear medicine-related education
    - ☐ A company that sells and imports nuclear medicine equipment
    - ☐ A government/regulatory institution that focuses on the setting of standards/guidelines and regulations that govern the practice of Nuclear Medicine in your country
    - ☐ Other (please specify): _____

9. How long have you been involved in the Nuclear Medicine Profession?

    - ☐ 5 years or less
    - ☐ 5 to 10 years
    - ☐ More than 10 years

10. What level of training have you received (as applicable to Nuclear Medicine)
    - ☐ No additional formal education above what is required of unspecialized medical healthcare personnel (eg. Bachelor in Pharmacy for Pharmacist)
    - ☐ An additional diploma for specialization
    - ☐ A master's degree for specialization purposes (eg. MMed in Nuclear Medicine)
    - ☐ A master's degree for scientific purposes (eg. an MSc in Organic Chemistry)
    - ☐ A PhD

    Over and above what is mentioned above, please briefly describe your personal training journey and everything that has assisted you in specializing in your field (internships etc). Please also indicate at which institution did you receive your graduate/post-graduate training.

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Section B: Training and retention of staff

1. In agreement between you and other professionals from your country (in the training course, or outside) how good is the overall retention of all trained healthcare professionals in Nuclear Medicine in your country?
    - ☐ Excellent, most professionals stay long-term
    - ☐ Good - retention is generally stable, with some turnover.
    - ☐ Average - retention is fair, but there are a noticeable number of trained professionals leaving the country.
    - ☐ Many trained professionals are leaving the country.
    - ☐ Poor- mostly, once trained, professionals leave the country
    - ☐ Unsure/do not know

    Do you want to provide more information on the retention of trained healthcare professionals in Nuclear Medicine in your country? The reason why most professionals stay long-term, or why most professionals leave?

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2. Now with the focus on your profession previously specified (Radiopharmacist/Technologist/Nuclear Medicine Physician/Radiologist/Physicist/other) - what is the retention of newly trained graduates in the profession after specialization?
    - ☐ Excellent, most graduates find positions within the field of specialization in my country.
    - ☐ Average - retention is fair, but there are a noticeable number of trained professionals leaving the Nuclear Medicine Field
    - ☐ Poor- mostly, once trained, the graduates leave the field of Nuclear Medicine entirely - but still stay within the country.
    - ☐ There are no opportunities in my country for trained specialized graduates, so they leave the country and do not stay in alternative professions.
    - ☐ Unsure/do not know

Please provide some background on the answer provided above.

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3. What measures could help retain skilled Nuclear Medicine Professionals in your country **(mark your top 3)**?

- ☐ Increased salaries and benefits
- ☐ Access to professional development opportunities
- ☐ Access to more advanced technology and equipment
- ☐ Stabilization of the political environment in my country
- ☐ Stabilization of the economy
- ☐ Greater job security
- ☐ Better recognition and appreciation of the medical community
- ☐ Better opportunities for career advancement
- ☐ Stronger collaboration with international experts
- ☐ Improved funding for research and innovation
- ☐ Appointment of more staff, to reduce workload
- ☐ A more positive outlook for better opportunities for my children in the future
- ☐ Other (please specify):

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Please provide some background on the answer provided above.

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4. In your day-to-day environment, do you feel any of the following (mark all that is appropriate?)

- ☐ I often feel overwhelmed by my workload.
- ☐ I feel that I have little control over my decisions that affect my work
- ☐ I feel I need to be more appreciated and rewarded for the work I do.
- ☐ I feel isolated or unsupported by my colleagues or supervisors
- ☐ I feel that my work environment is unfair or inequitable
- ☐ I often face conflicts between my ethical values and the demands of my job
- ☐ None of the above.

5. In your opinion, when resources and funding are provided for your country for training professionals in Nuclear Medicine, to what extent do individuals use these resources and appropriately get trained? E.g. - do the right people get opportunities/do people who get opportunities complete their training etc?

- ☐ Fully utilized
- ☐ Partially utilized
- ☐ Not utilized
- ☐ Prefer not to say
- ☐ Other:

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Do you want to provide more information?

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6. Please indicate all the specialities that can receive training in your country at the moment

- ☐ Nuclear Medicine Physicians
- ☐ Radiologists with training in Nuclear Medicine
- ☐ Medical Physicists with training in Nuclear Medicine
- ☐ Radiopharmacists
- ☐ Pharmacists with Radiopharmacy as a component of pregraduate
- ☐ Nuclear Medicine Technologists
- ☐ Nuclear Medicine Scientists
- ☐ Radiochemists
- ☐ Radiobiologists
- ☐ Nurses with training in Nuclear Medicine
- ☐ Other (please specify all):

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7.. Who is mostly financing the training of people in Nuclear Medicine (eg specialization) in your country? Mark the option(s) that are most applicable.

- ☐ It depends on the specialization
- ☐ The government funds the training of Nuclear Medicine personnel
- ☐ The institutions where people are employed mostly send them for training
- ☐ There are many opportunities in our country for students to apply for funding for studies (not necessarily linked to Nuclear Medicine)
- ☐ Students fund their training themselves - they are mostly trained in the country
- ☐ Students fund their training themselves - they are mostly trained abroad in other countries
- ☐ We rely on the funding of training by external parties such as the IAEA
- ☐ Other:

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Do you want to provide more information?

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8. Please indicate in the future, which additional specialities will be able to receive training in your country

- ☐ Nuclear Medicine Physicians
- ☐ Radiologists with training in Nuclear Medicine
- ☐ Medical Physicists with training in Nuclear Medicine
- ☐ Radiopharmacists
- ☐ Pharmacists with Radiopharmacy as a component of pregraduate
- ☐ Nuclear Medicine Technologists
- ☐ Nuclear Medicine Scientists
- ☐ Radiochemists
- ☐ Radiobiologists
- ☐ Nurses with training in Nuclear Medicine
- ☐ Other (please specify all):

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9. What is your opinion about the availability of training for Nuclear Medicine professionals in your country

- ☐ Professionals of all specialities need to be trained in the country
- ☐ More focus on virtual learning, with short practical courses, should be given.
- ☐ Educational courses for all specialities should at least be available in neighbouring countries - some effort towards establishing “training hubs” throughout Africa should take place
- ☐ Enough training opportunities for all specialities are available in Africa
- ☐ It is more desirable that speciality training should take place globally - this way professionals bring the newest information and technology back to the country
- ☐ Other options:

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10. With regards to the length of additional training received in your specific speciality.

What was the length of training received: _____

What is your opinion on the appropriateness of the duration of training? Mark all that applies

- ☐ My time was wasted on unnecessary components eg. a research component - which I will not be performing in my day-to-day practice
- ☐ The training period needed to be longer - I needed further exposure to the practical aspects of my field, under the supervision of the training institution.
- ☐ A lot of unnecessary theoretical components were included in my training
- ☐ I appreciated the opportunity to receive a longer training duration and formal qualification, although I might not always need everything in my current practice, this is important for my personal development.
- ☐ The duration of the training was appropriate but could have been spent more focused on the role I am currently fulfilling
- ☐ I have no problems with the duration or content of training received - this has prepared me for my current role
- ☐ None of the above.
- ☐ Other:

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Do you want to provide more information?

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11. Are radiopharmacy officially recognized by the government in your country, and if so, what are the requirements to register as a specialized radiopharmacist.

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5. In your opinion, with the environment in Africa taken into consideration, which of the following personnel should be allowed to perform the production of radiopharmaceuticals? Please mark all that apply with X

	Nursing staff	Nuclear Physicists	Nuclear Medicine Technologist	Nuclear Medicine Technologists with additional training	Pharmacist	Radio-pharmacist	Radio-chemist	Other scientific staff	Other (please specify)
Overall management of the radiopharmacy									
Dispensing iodine-131 containing products									
Labelling 99mTc-cold kits with Mo-99 generators									
Radiolabelling white blood cells and other blood products									
Making cold kits in hospital radiopharmacy									
Labelling therapeutic radiopharmaceuticals (eg. 177Lu-PSMA)									
Labelling gallium-68 radiopharmaceuticals									
Cyclotron production of Fluorine-18 RPs									
Radiopharmaceuticals for research purposes									

Section C: The external environment in which Nuclear Medicine functions

1. Normally the disease priorities dictate the budget and resource allocation within a country. Indicate what is the 3 top healthcare priorities within your country.
   - ☐ Infectious disease
   - ☐ Cardiovascular disease
   - ☐ Diabetes and other metabolic disorders
   - ☐ Malnutrition
   - ☐ Maternal and child health
   - ☐ Mental health
   - ☐ Cancer
   - ☐ Dementia and disease of the ageing population
   - ☐ Other (please specify):

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   Do you want to provide more information?

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2. Which of the following economic constraints do you feel is particularly hampering the progress of Nuclear Medicine in your country?
   - ☐ Reduction of government funding towards healthcare
   - ☐ High costs of medical supplies and equipment (due to inflation and lack of domestic production)
   - ☐ Limited healthcare infrastructure
   - ☐ Unequal distribution of healthcare resources between urban and rural areas
   - ☐ Healthcare workforce shortages
   - ☐ The overall poor economic power of the country (lack of foreign exchange power)
   - ☐ Import sanctions and restrictions of trade towards my country
   - ☐ None of the above
   - ☐ Do not want to specify

☐ Other:

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Do you want to provide more information?

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3. Do you have any of the following influences on funding and resources in your country that has an influence on the growth of Nuclear Medicine?

- ☐ **Drought and famine:** economic and resource strain due to environmental challenges impacting healthcare funding
- ☐ **War and conflict:** Disruption of healthcare services and reallocation of funds due to ongoing conflict or security issues.
- ☐ **Unreliable power supply:** Frequent power outages or lack of stable electricity grid affecting healthcare operations.
- ☐ **Limited Internet and IT services:** Insufficient digital infrastructure, including internet connectivity and IT support.
- ☐ **Insufficient investment in equipment:** Lack of adequate financial resources to purchase or maintain modern Nuclear Medicine equipment.
- ☐ **Inadequate government funding:** Government investment in Nuclear Medicine is insufficient to meet the healthcare needs of the population.
- ☐ **Limited educational opportunities:** Insufficient educational programs and training facilities in the region.
- ☐ **Inequitable resource distribution:** Unequal distribution of healthcare resources between rich and poor areas, urban and rural areas.
- ☐ **Governance challenges:** issues related to governance, including misallocation of funds or ineffective use of resources and budgets.
- ☐ **Communication challenges:** language barriers exist eg. training opportunities & conferences in English whereas French is preferred
- ☐ None of the above
- ☐ Do not want to specify

- ☐ Other:

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Do you want to provide more information?

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4. Over the last 5 years, what was the status of Nuclear Medicine in your country according to your opinion?

- ☐ The provision and availability of Nuclear Medicine services in my country have declined.
- ☐ The provision of Nuclear Medicine services in my country has stayed the same - even though the need has increased.
- ☐ The provision of Nuclear Medicine services in my country has progressed some, but this just kept up with the increased demand.
- ☐ The provision of Nuclear Medicine services has improved and is steadily growing.
- ☐ The provision of Nuclear Medicine services in my country has excelled and we have implemented many new technologies.
- ☐ Do not want to specify

5. Over the next 5 years, what is your prediction of the status of Nuclear Medicine in your country?

- ☐ If nothing drastic is done, Nuclear Medicine services will decline further.
- ☐ The provision of Nuclear Medicine services will stay the same - I do not see the possibility of any future growth soon.
- ☐ The provision of Nuclear Medicine services will improve and is steadily growing.
- ☐ There is a clear path towards implementation of the newest technologies and I am very hopeful for the implementation of advanced technologies in my country over the next 5 years.
- ☐ Do not want to specify

Section D: Radiation safety, radiation protection & waste management

All participants are to fill this in. If you do not have the information with regard to your country, please attempt to get the information from other colleagues. Also, discuss with other participants from your country during the meeting in Egypt.

1. How is radiation exposure monitored for staff working with radiation? Select all that applies:
    - ☐ No monitoring is performed, and staff are not part of an active radiation and occupational safety work monitoring service
    - ☐ Staff wear film badge dosimeters
    - ☐ Staff wear electronic personal dosimeters
    - ☐ Other (please specify):

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2. How often are personal dosimetry reports reviewed by the radiation safety officer in your institution?

    - ☐ Monthly
    - ☐ Quarterly
    - ☐ Not regularly
    - ☐ I do not know - reports are never discussed with personnel.

3. How is radioactive waste managed in your facility?

    - ☐ We do not handle any radioactive materials and do not generate radioactive waste
    - ☐ Stored until decays to a safe level and then disposed of as regular waste
    - ☐ Collected by a licensed radioactive waste disposal service
    - ☐ Disposed of directly in the hospital waste system
    - ☐ No formal waste management system is in place
    - ☐ I am not aware of the waste management system being followed
    - ☐ Other:_____

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4. What procedures are in place for handling radiation spills or contamination events?

   - ☐ Staff follow a written protocol
   - ☐ There is a designated emergency response team
   - ☐ No formal procedures are in place
   - ☐ Staff are expected to handle incidents themselves
   - ☐ Other (please specify):

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5. How often are emergency drills or simulations conducted for radiation-related incidents?

   - ☐ None
   - ☐ None - but there are written instructions available
   - ☐ Annually
   - ☐ Every two years
   - ☐ Other (please specify):

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6. How is compliance with radiation safety practices verified? Mark all that applies.

   - ☐ Regular audits by the radiation safety officer
   - ☐ External inspections by regulatory bodies
   - ☐ Self-assessment by department staff
   - ☐ No formal verification process is in place
   - ☐ Other (please specify):

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7. To work safely with radioactive material, you need adequate knowledge and training. Please tick all that apply.
    - ☐ When I started my new job, I received a theoretical course
    - ☐ When I started my new job, I received practical training under the supervision of a skilled radiation worker.
    - ☐ I must attend frequent radiation training courses to refresh my knowledge
    - ☐ I followed some free online courses offered by the IAEA on radiation protection principles
    - ☐ I have never been formally trained, I taught myself by following examples around me.
    - ☐ This is not applicable as I do not work with radiation
    - ☐ Other (please specify):

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8. In areas where there are radioactive sources (such as in the radiopharmacy) in the institution where I work, the following measurements are taken to monitor for environmental contamination with radioactivity
    - ☐ Wipe tests of surfaces and the floor
    - ☐ Measurement of all personnel that enters and exits the area
    - ☐ Air monitoring devices
    - ☐ Electronic dosimeters worn by staff that provide real-time information with regards to radiation dose
    - ☐ We do not have active monitoring of radiation and contamination, however, we all wear dosimeters that get measured and would indicate if there are any issues
    - ☐ I do not know
    - ☐ Other (please specify):

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      _____

9. The status of shielding equipment against radiation in our institution is as follows (for each, mark what is applicable):

	Not available	Somewhat	Enough	Not applicable
Lead blocks to shield in the radiopharmacy				
Shielding for radioactive waste				
Shielding for generators				
Lead glass shielding in laminar airflow or dispensing area				
Syringe shields for SPECT radiopharmaceuticals				
Syringe shield for PET radiopharmaceuticals				
Shielding for therapeutic radiopharmaceuticals				
Syringe carriers or transport trollies for the transport of doses to patients				
Shielding of highly radioactive patients				
Mobile lead barriers				

10. Overall in your opinion, what are the attitudes and practices in your country towards radiation safety and waste management

- ☐ Above average: ample resources are allocated, people are well-informed and there are no reasons for concerns
- ☐ Good: practices are somewhat hampered by resources, but there are policies in place and most effort is being made to work safely
- ☐ Average: policies are not well enforced by regulators and most institutions do the minimum towards radiation safety and waste management
- ☐ Poor: resource constraints heavily restrict waste management and radiation safety practices in my country and I am concerned
- ☐ Other (please specify):_____

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Do you want to provide more information?

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Section E: Radiopharmacy and supply of radiopharmaceuticals

All participants are to fill this in. If you do not have the information concerning your country, please attempt to get the information from other colleagues. Also, discuss with other participants from your country during the meeting in Egypt.

1. Which of the following radionuclides are regularly used in clinical practice in your country.

   - ☐ Technetium-99m
   - ☐ Iodine-131
   - ☐ Iodine-123
   - ☐ Indium-111
   - ☐ Gallium-68
   - ☐ Gallium-67
   - ☐ Thallium-201
   - ☐ Fluorine-18
   - ☐ Lutetium-177
   - ☐ Radium-223.
   - ☐ Samarium-153
   - ☐ Yttrium-90
   - ☐ Carbon-11
   - ☐ Chromium-51
   - ☐ Strontium-82
   - ☐ Alpha emitters (specify):_____
   - ☐ Other:

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2. Which of the following generator-based systems are regularly used in clinical practice in your country (not for research purposes)

   - ☐ Molybdenum-99/technetium-99m
   - ☐ Germanium-68/gallium-68
   - ☐ Tungsten-188/rhenium-188
   - ☐ Actinium-225/bismuth-213
   - ☐ Lead-212 generators
   - ☐ No generators available

- ☐ Other (please specify):

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3. Which of the radionuclide-producing infrastructure do you currently have in your country?

   - ☐ Cyclotrons
   - ☐ Reactors
   - ☐ None, all radionuclides are imported

4. Which of the radionuclide-producing infrastructure is planned to be installed in your country in the next 5 years?

   - ☐ Cyclotrons
   - ☐ Reactors
   - ☐ None, there are no new plans

   Do you want to provide more information?

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5. In your country, according to your knowledge (but please ask around and confirm) what is the highest level of hospital radiopharmacy being practised in any Nuclear Medicine Clinic

   - ☐ **Operational Level 1A:** Dispensing pre-made diagnostic radiopharmaceuticals, no production takes place
   - ☐ **Operational Leve 1B:** Dispensing pre-made therapeutic radiopharmaceuticals, no production takes place (eg. iodine-131 therapy)
   - ☐ **Operational Level 2A:** Using technetium-99m generators and cold kits
   - ☐ **Operational Level 2B:** Radiolabelling blood products (eg. white blood cell scintigraphy)
   - ☐ **Operational Level 3A:** Making cold kits in-house

- ☐ **Operational Level 3B:** Labelling therapeutic radiopharmaceuticals in-house (eg. labelling with samarium-153 or lutetium-177)
- ☐ **Operational Level 3C:** Labelling gallium-68 radiopharmaceuticals
- ☐ **Operational Level 3C:** Cyclotron production of radiopharmaceuticals
- ☐ I could not gather the information - do not know

Do you want to provide more information?

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6. In the next 5 years according to your knowledge (but please ask around and confirm), are there clear plans for your country to progress to another operational level at any of their hospital-based radiopharmacies?

   - ☐ **Operational Level 1A:** Dispensing pre-made diagnostic radiopharmaceuticals, no production takes place
   - ☐ **Operational Leve 1B:** Dispensing pre-made therapeutic radiopharmaceuticals, no production takes place (eg. iodine-131 therapy)
   - ☐ **Operational Level 2A:** Using technetium-99m generators and cold kits
   - ☐ **Operational Level 2B:** Radiolabelling blood products (eg. white blood cell scintigraphy)
   - ☐ **Operational Level 3A:** Making cold kits in-house
   - ☐ **Operational Level 3B:** Labelling therapeutic radiopharmaceuticals in-house (eg. labelling with samarium-153 or lutetium-177)
   - ☐ **Operational Level 3C:** Labelling gallium-68 radiopharmaceuticals
   - ☐ **Operational Level 3C:** Cyclotron production of radiopharmaceuticals
   - ☐ I could not gather the information - do not know
   - ☐ There are no clear plans for further progression

   Do you want to provide more information?

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7. In your country, which types of radiopharmacies provide radiopharmaceuticals to clinics? Mark all that apply:

   - ☐ Hospital-based radiopharmacies
   - ☐ Centralised radiopharmacies funded by the government
   - ☐ Centralised radiopharmacies funded by private companies
   - ☐ Radiopharmaceuticals are imported read-made, from other African countries
   - ☐ Radiopharmaceuticals are imported ready-made, from outside of Africa
   - ☐ Other (please specify):

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8. In your country, which of the following do you think would be the most effective way to provide radiopharmaceuticals to institutions?

   - ☐ Hospital-based radiopharmacies
   - ☐ Centralised radiopharmacies funded by the government
   - ☐ Centralised radiopharmacies funded by private companies
   - ☐ Radiopharmaceuticals are imported read-made, from other African countries
   - ☐ Radiopharmaceuticals are imported ready-made, from outside of Africa
   - ☐ Other (please specify):

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   Do you want to provide more information?

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The Quanum Audit

11. Have you or your facility ever undergone an audit using the IAEA's Quanum audit tool?

    - ☐ Yes, we have undergone a Quanum audit in the past 2 years
    - ☐ Yes, but it was several years ago
    - ☐ No, but we are planning to participate in a Quanum audit soon
    - ☐ No, and we are currently not planning to request one
    - ☐ I am not familiar with the Quanum auditing tool
    - ☐ I prefer not to answer
    - ☐ Other (please specify):

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12. If you have undergone a Quanum audit, how would you rate its effectiveness in improving your institution's practices?

    - ☐ Extremely effective - it led to significant improvements
    - ☐ Moderately effective - it helped, but with some limitations.
    - ☐ Slightly effective - minor improvements were made
    - ☐ Not effective - after completion of the audit no noticeable changes where made
    - ☐ Not applicable - we have not undergone a Quanum audit
    - ☐ Other

      _____
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13. Does your institution conduct self-audits using the Quanum tool or similar internal auditing methods?

    - ☐ Yes, we regularly (at least yearly) conduct self-audits using the Quanum tool
    - ☐ Yes, we conduct self-audits, but we use a different tool or method
    - ☐ We occasionally conduct self-audits using Quanum but these are not a regular/scheduled occurrence
    - ☐ We do not conduct self-audits, but we are considering it
    - ☐ We do not conduct self-audits and have no plans to do so

14. How do you feel about the potential use of electronic or e-audits as part of the Quanum auditing process?

    - ☐ I am not familiar with the e-audit Quanum system
    - ☐ Very negative - I do not believe e-audits would be helpful
    - ☐ Somewhat negative - e-audits may pose challenges or limitations
    - ☐ Neutral - I have no strong opinion on e-audits
    - ☐ Somewhat positive - e-audits could be beneficial, but I have some concerns
    - ☐ Very positive - e-audits could streamline the process and improve efficiency and access to many more institutions

15. What challenges, if any, have you encountered with the Quanum auditing process?

    - ☐ Lack of clarity or guidance on the audit process
    - ☐ Recourse constraints, such as time or staff availability
    - ☐ Difficulty in implementation of recommendations
    - ☐ Limited support or follow-up after the audit
    - ☐ We have not encountered any challenges with Quanum audits
    - ☐ Not applicable - we have not undergone a Quanum audit
    - ☐ Other (please specify):

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16. Regarding the selection of auditors that perform the Quanum inspection:

    - ☐ Auditors selected from the African region are more appropriate - they are more aware of the local challenges
    - ☐ Auditors from other regions are more appropriate as they would provide insights/solutions from outside the region - new perspectives
    - ☐ Auditors should be a mixture from within the region and outside the region to provide balance

The impact of outside investments and funding

1. Where does the funding for day-to-day costs (consumables, radionuclides, staff) come from for healthcare in your country? Mark all that contribute to a reasonable extent.

    - ☐ Government funding: regional government budget allocations for healthcare
    - ☐ Self-funded by healthcare facility through funds generated by paid services (private payment by patients or health insurance)
    - ☐ Private sector investments - funding from private companies, including pharmaceutical firms
    - ☐ Academic or research funding
    - ☐ Other:

      _____
      _____

    Do you want to provide more information?

    _____
    _____
    _____
    _____
    _____
    _____

2. Where does most of the funding for new infrastructure in Nuclear Medicine come from in your country?

    - ☐ Government funding: regional government budget allocations for healthcare
    - ☐ Self-funded by healthcare facility through funds generated by paid services (private payment by patients or health insurance)
    - ☐ Private sector investments - funding from private companies, including pharmaceutical firms
    - ☐ Academic or research funding
    - ☐ Support from national funding bodies that donate equipment
    - ☐ Support from international funding bodies that donate equipment

- ☐ Other:

  _____
  _____

Do you want to provide more information?

_____
_____
_____
_____
_____
_____

3. Where does most of the funding for the maintenance of the current Nuclear Medicine infrastructure come from in your country?

   - ☐ Government funding: regional government budget allocations for healthcare
   - ☐ Self-funded by healthcare facility through funds generated by paid services (private payment by patients or health insurance)
   - ☐ Private sector investments - funding from private companies, including pharmaceutical firms
   - ☐ Academic or research funding
   - ☐ There is not a lot of money for maintenance
   - ☐ Other:

     _____
     _____

   Do you want to provide more information?

   _____
   _____
   _____
   _____
   _____
   _____

4. What type of external funding/resources has your country received in the past 2 years concerning Nuclear Medicine services

   - ☐ Equipment
   - ☐ Financial grants
   - ☐ Training grants
   - ☐ Bigger funds for building whole facilities/part of facilities
   - ☐ I do not have all the information
   - ☐ Other: _____

   Do you want to provide more information?

   _____
   _____
   _____
   _____
   _____
   _____

5. In your opinion, when resources are provided for your institution, to what extend have these resources been utilized for the intended purpose?

   - ☐ Fully utilized
   - ☐ Partially utilized
   - ☐ Not utilized
   - ☐ Prefer not to say
   - ☐ Other:

     _____
     _____

   Do you want to provide more information?

   _____
   _____
   _____
   _____
   _____
   _____

6. Have external resources contributed to the growth in the range of the services/procedures your facility/country offers?

   - ☐ Yes significantly
   - ☐ Yes, to some extent
   - ☐ No, not at all
   - ☐ Prefer not to say
   - ☐ Other:

     _____
     _____

   Can you provide specific examples of how these resources have improved the quality or quantity of Nuclear Medicine services provided in your country?

   _____
   _____
   _____
   _____
   _____
   _____

7. Is there a maintenance plan or contract in place for any equipment received through external funding?

   - ☐ Yes, fully covered - normally as part of the funding received
   - ☐ Yes, fully covered - normally locally through the institution or government support
   - ☐ No, normally no maintenance is planned on equipment received through external funding
   - ☐ Equipment is fixed by own funds once it breaks down, this is not planned in advance.
   - ☐ Other:

     _____
     _____

8. Has there been any challenges in the maintaining and servicing of equipment in Nuclear Medicine facilities in your country?

   - ☐ Yes
   - ☐ No

Do you want to provide some examples of challenges in the maintenance and servicing of equipment in your country? Either examples of some equipment or just examples of reasons why you have specific challenges.

_____
_____
_____
_____
_____
_____
_____
_____