



KEEPING THE ICRP RECOMMENDATIONS FIT FOR PURPOSE AND THE NEED FOR A GLOBAL NORTH-SOUTH COLLABORATION

Nkubli BF^{1*}, Joseph DZ², Moi AS¹, Abubakar M¹, Nwobi IC¹, Nzotta CC³

¹Department of Medical Radiography, Faculty of Allied Health Sciences, University of Maiduguri, Nigeria

²Department of Medical Radiography and Radiological Sciences, Federal University of Lafia, Nigeria

³Department of Radiography and Radiological Sciences, Nnamdi Azikiwe University, Nigeria

ARTICLE INFO

ABSTRACT

Keywords: Radiological protection, patients, public, environment, collaboration

Background: In a world that has been affected by the global COVID-19 pandemic, the idea of keeping the ICRP recommendations fit for purpose is one whose time has come! However, the idea of keeping the ICRP recommendations fit for purpose cannot be achieved in isolation without a global North-South collaboration.

Materials and Methods: this paper stems from the livestream session of the first digital workshop of the International Commission on Radiological Protection (ICRP) on the future of radiation protection, 14th October, 2021 to 4th November, 2021. Where experts from across the globe shared their perspectives on how to make radiation protection fit for purpose using evidence from literature and real-world experiences.

Results: the expert panel during the live session agreed that radiation protection experts from the global North who are versatile in the science and practice of radiation protection will have to collaborate with those from the global South and end-users to ensure that the system of radiological protection designed by the ICRP to protect patients, workers, the public, and the environment meets the need of end-users and produces the desired impact. End-users of radiation protection all work in diverse settings and contexts.

Conclusion: Authors of this paper argue that there is a need for greater inclusivity through a global North-South collaboration over the next decade to develop the next fundamental recommendations that will shape radiation-related policy, practice, guidelines, and regulations around the world. The global road map for digital cooperation published by the United Nations in June 2020 at the peak of the COVID-19 pandemic could serve as a useful guide to make this a reality. This would ensure that existing divides are not further exacerbated by current physical restrictions.

Introduction

The role of the International Commission on Radiological Protection (ICRP) in providing guidance and recommendations on radiological protection over 90 years ago since its establishment is appreciated and its impact felt globally [1]. Several guidelines and recommendations have been developed over the years that have informed policy and practice and thus guided the use of ionizing radiation in medicine, the environment and non-human biota without limiting the positive aspects of such uses. The idea of keeping the ICRP recommendations fit for purpose is one whose time has come! This is because our knowledge about radiation and its uses over the years has increased tremendously even in non-conventional areas due to increase in human activities and a better understanding of the environment and various radiation sources and the growing need for evidence-based protection guidelines and recommendations [2].

The COVID-19 pandemic has greatly affected the way we do things globally, hence the need for a fit for purpose approach. The impact of the COVID-19 pandemic further highlighted the need for the radiological protection community to rethink their approach to radiation protection to ensure it is fit for purpose in a world that has been transformed by the pandemic. Anecdotal evidence shows that over the years, health professionals in radiology and radiotherapy departments in the global south have treated radiation safety and infection prevention and control as independent concepts however, the pandemic has just reminded us how interconnected both concepts are. The lessons learned during the global pandemic on how to maintain strict infection prevention and control measures without compromising patient safety is one which should be maintained and enshrined into regular practice especially in the global south where this has not been the norm.

The gap between the global north and south keeps widening by the day. This is further exacerbated by the non-pharmacological approaches established to curb the global pandemic such as social and physical distancing as well as travel restrictions and limitations on face-to-face meetings. Hence, the need for a collaborative effort to ensure that no one is left behind in line with the UN sustainable development goal agenda. Ensuring that no one is left behind in our drive to achieve an ICRP recommendation that is fit for purpose is important. This would mean finding a way to carry along under represented populations, those in conflict, fragile and vulnerable settings as well as the digitally excluded [3].

The next decade is very significant for health as well as other aspects of the human endeavours, it has been tagged a decade of difference for the world's children, a decade of action for patient safety among others. Several issues relating to climate change, one health approach, planetary health, machine learning, big data among others will continue to gain relevance over the next decade and beyond. The radiological protection community must be proactive in this regard to ensure that a fit for purpose recommendation is established for all areas of human activities that involve the peaceful use of ionizing radiation. Hence the need for collaboration as one size does not fit all.

Why a fit for purpose ICRP recommendation?

There are several reasons why a fit for purpose ICRP recommendation is needed. Empirical evidences abound in literature on the gaps that exist between the global north and south in terms of the development, deployment and implementation of ICRP recommendations in practice [4,5]

as well as other key targets of radiological protection in medicine, prominent among which is the unfinished task of the Bonn call for action in sub-Saharan Africa [6]. Variations in context and settings of the practice of radiological protection also necessitates a fit for purpose ICRP recommendation. A radiological protection intervention that has proven to be effective and efficacious in one setting may not yield the same result in another setting. Hence this may require an implementation research approach to unravel why such interventions do not yield the desired outcomes in real world settings [7].

Global demographic and epidemiological transitions in the global north and south (young populations and aging populations and the need for recurrent imaging). Increasingly, most countries in the global south are faced with the prevalence of communicable diseases such as HIV/AIDS, Tuberculosis, pneumonia, malaria among others and a swift rise in non-communicable diseases (NCDs) such as; Cardiovascular diseases, Respiratory disorders, Diabetes & cancer. Other health challenges include; Infant mortality, Maternal mortality, Injury and trauma. Based on research evidence, globally, 1 in 6 of the world population is an adolescent with a higher proportion in low- and –middle income countries, London School of Hygiene and Tropical Medicine [8]. Demographic transition is caused by the rapidly falling fertility rates and a huge improvement in child survival due to improved vaccination, access to portable Water Sanitation and Hygiene (WASH) among other factors. Epidemiological transition on the other hand is due to the decline in infectious diseases, (the gains of which were attained during the millennium development goals and pre-COVID-19 pandemic era) and the increasing importance in non-communicable conditions such as diabetes, cancer and cardiovascular diseases. The implication of all these transitions for radiation protection in medicine is that radiation protection experts are dealing with two extreme populations; an aging and a young population in both the global north and south who may be suffering from chronic conditions that may require recurrent imaging hence, the need for ICRP recommendation that is fit for purpose.

Evolutionary trends in technology such as data science, artificial intelligence, machine learning, robotics among others is transforming different aspects of human endeavour, radiological protection inclusive. Hence, the need for digital literacy and data readiness especially among countries in the global south to ensure that such technologies do not further widen the current digital divide between the global north and south [3]. One health, climate change, and planetary health are discussions that are ongoing globally and directly or indirectly these have bearing on radiological protection hence, the need for a fit for purpose ICRP recommendation. Modern technology makes new applications of radiation safer. However, inappropriate or incorrect use can lead to unnecessary or unintended radiation exposures and risks [9,10].

How can we achieve a fit for purpose ICRP recommendation?

For the ICRP to achieve a recommendation that is fit for purpose, relevant stake holders must be involved thus, leave no one behind. These stakeholders should include experts from the scientific community relevant to radiological protection to the non-technical audiences who are end users of radiological protection services. Effective communication and public engagement on radiation protection issues are essential. Radiation permeates every aspect of human endeavour hence, the need for an ICRP recommendation that is fit for purpose this must take into consideration economic and social factors consistent with indigenous knowledge and cultural norms of the communities of practice. This will enhance buy-in from end users if they are part of the process. This point has been highlighted by ICRP experts [1,2]. Radiation protection experts from the

global south have been making useful efforts in this regard in trying to engage the public on radiation protection and related issues by way of invited guest lectures and talk shows (<https://rss.com/podcasts/afrinuke/287803/>) using various media.

Broadening the horizon of radiation protection beyond its current boundaries; Ionizing radiation is used in a range of public health interventions from preventive medicine to palliative medicine for purposes of screening, triaging, diagnosis and treatment of diseases and even vector control [11,12]. Beyond human health the beneficial aspects of ionizing radiation have found application in industry, agriculture, research, mining and others. Therefore, there is a need to broaden the boundaries of radiological protection to be consistent with the growing need. Another important aspect of radiological protection that needs to be broadened and strengthened is for those in fragile, conflict and humanitarian settings.

Develop a global road map for digital cooperation in radiation protection that is fit for purpose. One major area where the global COVID-19 pandemic has affected our collective existence in the past one year is the increased and increasing digital connectedness. Digital connectedness has opened up a world of opportunities for countries in the global south to freely interact virtually with their counterparts from the global north to share practice and exchange knowledge. A typical example is this Future of Radiological Protection Workshop organized by the ICRP. Events like this should be encouraged and sustained. This digital workshop could serve as an opportunity to foster the development of a global road map for digital cooperation in radiation protection as over 850 participants from around the globe are present to share their experiences and expectations of an ICRP recommendation that is fit for purpose. Being cognizant of the fact that some proportion of radiological protection community are digitally excluded like every other member of the larger global population, a global road map for digital cooperation in radiation protection could come up with possible solutions to bridge such digital divides to ensure digital inclusivity for a fit for purpose ICRP recommendation.

Bridge the knowledge-practice gap

Proven and effective tools (e.g referral guidelines and radiation safety checklist) for the safe use of radiation in medicine abound [11,13]. These tools have been reported to reduce wasteful use of radiology in children and adults to > 50 % of X-ray referrals and > 30 % radiation dose reductions [9,14]. Despite the availability of radiation safety guidelines, awareness and compliance among referring physicians and frontline radiation health workers have been poor [15]. Hence, the growing trend of unsafe use of ionizing radiation among children in conflict settings predisposing them to possible cancer risk in future. Therefore, implementation research into why these proven interventions is not yielding the desired results taking into cognizance the context and settings of local setting is required.

A multifaceted implementation strategy encompassing a combination of several strategies such as training, consultation, audit and feedback [7] with components of Information, Education and Communication (IEC) tools approach could be necessary to bridge the radiation knowledge – practice gap for a diverse audience. A participatory approach involving major stakeholders such as policy makers, potential/active service users at all levels of the research will maximize the relevance and impact of ICRP recommendations.

Encourage greater participation by providing technical support and funding where necessary. It is one thing to produce an ICRP recommendation that is fit for purpose and it is another thing to

ensure its full implementation and compliance in practice. This has been a major source of concern in the global south. Lack of technical support to ensure full implementation of guidelines and poor funding for radiological protection related events and training opportunities. Most radiological protection researches in the global south are poorly funded.

A Global North-South Collaboration for a Fit for Purpose ICRP Recommendation- A Call to Action!

For an effective collaboration radiological protection experts need to explore the strengths and weaknesses of the parties involved. Having highlighted the prospects and the consequences of radiological protection in the global north and south, we need to look at what both sides of the divide have to offer so that we could find a common ground of interest.

What is the global north bringing to the table?

The global north is far ahead in terms of technical knowledge and expertise, human capacity development training and funding opportunities as well as the enabling environment. As a matter of fact, most of the recommendations, guidelines and standards of practice emanate from the global north with some input from the global south. This is well established globally [2].

What is the global south bringing to the table?

The researchers from the global south also have their unique peculiarities in their own right. Most radiological protection experts have a firm theoretical base of radiological protection with limited opportunities to explore their full potentials due to lean resources that often compete with other basic needs. Hence, southern radiological protection experts and researchers have learned to adapt ICRP guidelines and recommendations to suit the context and the settings of where they work and conduct their research. They are also in touch with the real-world settings and better understand the radiation protection needs and challenges in such settings. They are experts in indigenous knowledge, thus thinking globally while acting locally. They have developed resilience in the practice of radiological protection in conflict and fragile settings complicated by the COVID-19 pandemic. Researchers from the global south have learned and mastered the art of a south-south collaboration in radiological protection which has resulted in workshop/conference participations and joint publication [6]. Such evidences of south-south collaborations then could engender a north-south collaboration.

How can we synergise for an ICRP recommendation that is fit for purpose? By synergizing here global north and south experts in radiological protection could capitalize on their respective strengths from the both regions for a fit for purpose ICRP recommendation.

Where do we go from here? An urgent call to action!

Where do we go from here is “the big question” from “the big picture” which is an urgent call for action! All the resolutions of this future of radiological protection workshop should be taken seriously. After all we are in a decade of action.

Conclusion

The idea of a fit for purpose recommendation of the ICRP is one whose time has come and this laudable objective could only be achieved through a global north-south collaboration. The future of radiological protection workshop affords the radiological protection community such an opportunity and the time to act is now.

Conflict of interest: an initial version of the full text of this article has been hosted on the ICRP website (<https://icrp.org/page.asp?id=511>) and is republished with permission from the ICRP

Sponsorship: nil

References

1. Cousins C. The future of radiological protection. IAEA International Conference on Radiation Safety: Improving Radiation Safety in Practice Virtual Meeting, 2020; 9th - 20th November
2. Clement C , Rühm W, Harrison J , Applegate K, Cool D, Larsson C-M, Cousins C, Lochard J, Bouffler S, Cho K, Kai M, Laurier D, Liu S, Romanov S. Keeping the ICRP Recommendations Fit for Purpose. *J. Radiol. Prot.* 2021 in press <https://doi.org/10.1088/1361-6498/ac1611> [accessed on 13/09/18]
3. United Nations. Road map for digital cooperation. Report of the Secretary General. 2020
4. IAEA. Radiation protection in medicine: Setting the scene for the next decade. Proceedings of an international conference Organized by the International atomic energy agency, Hosted by the government of Germany, Co-sponsored by the World Health Organization And held in Bonn, Germany, (3–7 December 2012) 2015
5. Kawooya M, Nyabanda R, Mwangi G. Africa's progress on the Bonn call for action: Afrosafe perspective. 2018. eurosafeimaging.org [accessed on 13/09/18]
6. Nkubli BF, Joseph DZ , Yao B, Rockson P, Kenya J, Nzotta CC. Bonn call for action and the unfinished task of radiation protection of children and adolescents in low and middle-income countries: A focus on Sub-Saharan Africa. *Radiography* 2021; 27(3):962-967
7. Proctor EK et al. Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Adm Poly Ment.* 2013; 36(2)
8. Nkubli B.F, Okeji M, Nzotta CC. Demographic and epidemiological transitions in Africa: an urgent need to upscale patient care and safety in paediatric radiography. Radiography Society in Kenya Conference (RASCO) 10th -13th October, 2018
9. Malone, J., Guleria, R., Craven, C., et al. Justification of diagnostic medical exposures: some practical issues. Report of an International Atomic Energy Agency Consultation. *Br. J. Radiol.* 2012; 85, 523–538.
10. Perez MD. Justification of medical exposures: referral criteria and clinical decision support. 2nd international symposium on the system of radiological protection. Abu Dubai, 2013
11. Jawerth N. Infectious disease and how nuclear science can help In IAEA Bulletin infectious diseases 2020. www.iaea.org/bulletin [accessed 05/08/2020]
12. WHO. Guidance framework for testing the sterile insect technique as a vector control tool against Aedes-borne diseases. 2020; 93-108
13. International Atomic Energy Agency (IAEA) Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards. General Safety Requirements (GSR) Part 3. Vienna, 2014
14. Rhani MM. Smart Protection An electronic smart card could serve as a digital medical record of radiation exposure for patients who want one. *IAEA Bulletin* 2009;50(2);37
15. Ahidjo A, Garba I, Mustapha Z, Abubakar AM, Usman UA. Referring Doctors Knowledge about Radiation Doses in Patients undergoing Common Radiological Examinations. *J Med Med Sci.* 2012; 3(April):222-225.