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D9.86 - Report on stakeholder engagement in radiation protection: transversal issues and specifics of different exposure situations

Lead Authors: Nadja Zeleznik (EIMV), Catrinel Turcanu, Bieke Abelshausen, Tanja Perko, Gaston Meskens, Robbe Geysmans, Michiel Van Oudheusden (SCK•CEN), Christiane Pözl-Viol (BfS), Marie-Claire Cantone, Ivan Veronese (UMIL), Liudmila Liutsko (ISGlobal), Benjamin Zorko (IJS)

Reviewer(s): Catrinel Turcanu, SCK•CEN

and

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Abstract

The report presents the outcomes of the transversal analysis of stakeholder engagement prescriptions and expectations, as reflected in international and national legal provisions, and international recommendations and guidelines in three fields of exposure: medical exposures, emergency and post emergency situations and indoor radon.

In the medical field, an increase in stakeholder involvement is noticed, as supported by recent documents and guidelines. This entails an inclusive approach of professionals and organisations in radiation protection towards working together to improve the care for, and safety of, patients. The involvement of patients relies in practice on the informed consent.

For emergency preparedness and response, in most countries studied stakeholder involvement is focused on formal institutions responsible for emergency management. Participation of the public is limited to communication, for instance provision of information on how to react in case of an emergency. Consultation with the affected public is also foreseen for post emergency management in some countries, but details on how their feedback would be included are not specified. International standards quite uniformly propose to increase stakeholder engagement also in the preparedness phase, as this can improve plans, enable concerned stakeholders to prepare themselves to a post-emergency situation, and reinforce the potential for co-operation, communication and co-ordination in actual crisis or during recovery.

For radon exposures, there are large differences in how the role and level of stakeholder engagement are interpreted in different countries. Two main forms of stakeholder engagement can be generally highlighted: awareness raising on the issue of radon (a perceived prerequisite to taking action); and co-developing and implementing new regulations. While the former entails mostly information-provision (and involves a broad plethora of stakeholders, including also wider publics such as homeowners and employees), the latter reflects a higher level of participation, as this comprises discussion and decision-making (involving mostly institutional actors).

Overall, document and interview analysis reveal that recommendations and guidelines for stakeholder engagement are much more detailed than existing legal frameworks, in explicating stakeholder engagement and the underlying rationales. It is therefore not always clear how stakeholder engagement can and should be interpreted. The level of involvement of professional and/or institutional stakeholders is generally higher than that of affected publics. This distinction is most apparent in the radon and medical fields, where the former stakeholders are those included in 'higher' forms of engagement, such as joint problem-solving and decision-making. Engagement of wider publics is largely regarded as a means to raise public awareness, communicate and/or trigger specific radiological protection actions.

Despite the particularities of the three exposure contexts considered, common challenges for stakeholder engagement are considered to be the financial and time constraints, and – in some cases – the lack of a clearer legal framework. Finally, a common theme across the three fields is the integration of radiation protection in broader frameworks, therefore the need to engage with new stakeholders.

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1. Introduction

The ENGAGE project, funded under the H2020 CONCERT, aims at *ENhancinG stAkeholder participation in the GovernancE of radiological risks* [1]. It is a two-year project that started on November 20th, 2017, and which seeks to identify and address key challenges and opportunities for stakeholder engagement in relation to medical use of ionising radiation, post-accident exposures and exposure to indoor radon. In all these situations, stakeholder engagement is a key issue for improving the governance of radiological risks and the radiation protection of the exposed individuals.

The ENGAGE project aims are:

- a. to assess why, when and how stakeholders engage in radiation protection;
- b. to develop novel approaches to analysing stakeholder interaction and engagement, and provide guidance to meet the challenges and opportunities identified in response to (a);
- c. to investigate the processes for enhancing radiation protection culture and their role in facilitating stakeholder engagement, and develop guidelines for building radiation protection culture; and
- d. to build a joint knowledge base for stakeholder engagement in radiation protection.

The ENGAGE project is organized in four main work packages (WPs) coordinated by the management WP, which interact to achieve the objectives as presented on the Figure 1.

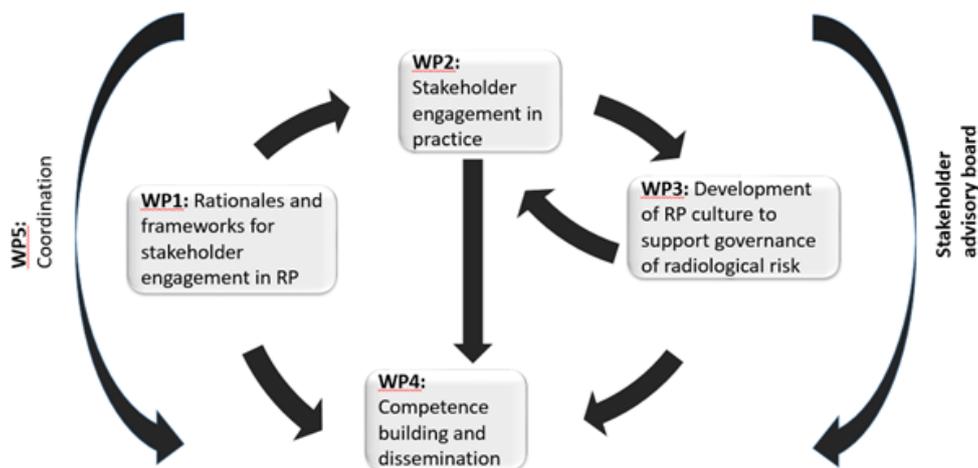


Fig. 1 Interaction between ENGAGE work packages

ENGAGE WP 1 on Rationales and frameworks for stakeholder engagement in radiation protection clarifies the rationales for stakeholder engagement in radiation protection and the related legal or contextual drivers, and therefore provides the answers to the questions like why does stakeholder engagement occur, who is involved and for what purpose. The focus of the investigation is the analysis of participation at macro-level, as highlighted in the European and international discourse. It analyses prescriptions and requirements for stakeholder engagement, and how these are transposed at national level in participating countries, or what other international institutions suggest in relation to the extent and justification for stakeholder engagement.

WP1 is divided in 4 tasks, where three tasks (1.1, 1.2 and 1.3) correspond to three radiation protection contexts as for the whole ENGAGE (respectively medicine, emergency preparedness and recovery and indoor radon), and the fourth one (1.4) is the methodological and also comparative task. The research

methods used are document analysis of all publicly available material related to legal requirements and recommendations for stakeholder engagement in three fields of radiation protection, and interviews with relevant actors in the participating countries and at the international level (EU level and international organisations such as OECD-NEA and IAEA, but also with representatives of non-institutional and non-governmental organisations). Within Task 1.4 the results from other three tasks are drawn to assess differences and commonalities between stakeholder engagement in different exposure contexts. In addition, transversal European discourse promoting inclusiveness and stakeholder engagement in science policy is analysed.

The investigation in WP 1 for different exposure situations is based on the methodological frames and tools developed in the project, such as a protocol for the analysis of literature to be carried out in Tasks 1.1, 1.2 and 1.3 and also guidelines for interviews to be performed. The analyses of the documents and results from interviews are presented in the first deliverable from WP 1 “Report on rationales and frameworks for stakeholder engagement in radiation protection in the medical field, nuclear emergency and recovery preparedness and response and indoor radon exposure” [2]. Based on collected information the second deliverable “Report on stakeholder engagement in radiation protection: transversal issues and specifics of different exposure situations” is prepared and focuses on findings from transversal analysis and specifics of different exposure situations in relation to stakeholder engagement.

This report includes an analysis of particularities and commonalities of the three fields in relation to stakeholder engagement. The analysis draws on findings from the national context, international prescriptions and recommendations, and interviews with representatives of international organisations with leading roles in radiological protection.

2. Analysis of individual fields

The analysis of individual fields drew on several documents as inputs for investigation: international legally binding documents (EC directives, conventions and similar), national legal frameworks in countries of project participants, international recommendations as well as reports reflecting the expectations of different actors, such as international organisations and associations which set the trends and standards for the different fields. In addition, interviews have been conducted with representatives of international organisations the main findings being summarized here. The detailed analysis is included in the ENGAGE Report on rationales and frameworks for stakeholder engagement in radiation protection in the medical field, nuclear emergency and recovery preparedness and response and indoor radon exposure [2]. This report focuses on main findings from the individual field (medicine, emergency preparedness and response and indoor radon) and identifies commonalities and differences in terms of stakeholder engagement.

2.1. Medical use of ionising radiation

2.1.1. Country analysis

For the medical field the analysis at national level investigated existing regulations in Germany, Slovenia, Italy and Spain, either focused on radiation protection in general or specific for the medical case, such as the act to improve patients' rights in Germany, the radiation protection in interventional procedures in Italy and the decree on justification and optimization in medical exposures in Spain.

Main questions of the analysis were based on the existence of prescriptions and requirements for stakeholder engagement, with attention to patients, public, pregnant women in view of aspects of participation, information and consent as relevant for the different stakeholders.

As relevant national requirements were identified:

- For Germany: 1) Gesetz zur Verbesserung der Rechte von Patientinnen und Patienten, by 20th February 2013 (not official translation: "Act to improve rights for patients" [3]). 2) Gesetz zur Neuordnung des Rechts zum Schutz vor der schädlichen Wirkung ionisierender Strahlung. National legislation, Germany ("New Radiation Protection Act", Germany [4]) by 27th June 2017;
- For Italy: 1) D. Lgs. 187/2000. Legislative Decree 187/2000. Implementation of Directive 97/43 EURATOM on health protection of persons against the dangers of ionising radiation via medical exposures [5]. 2) ISISTAN 15/41, 2015 Operative indications for the optimization of radioprotection in interventional radiology procedures [6];
- For Slovenia: Ionising radiation protection and nuclear safety act (ZVISJV- 1), Off. Gaz. 76/2017 – Atomic Act [7];
- For Spain: The royal decree project on justification and optimization of the use of ionising radiations for the radiological protection of people on the occasion of medical expositions, 7/02/2018. [8].

The transposition of the revised EURATOM BSS Directive is active in Germany and Slovenia, while in Italy and Spain it is under development, although provisions are in function in the form of an early version of BSS requirements in particular for Spain. A specific definition of stakeholder and stakeholder engagement was not found in the context of medical exposure in the analysed documents, although the provision of adequate information and dialogue is mentioned for patients in general, as well as different groups in medical exposures, such as children, pregnant women, breastfeeding women; and people who might come in contact with patients and have potential exposure, such as caregivers and visitors. No focus on participation of patients as a way to evaluate and deliberate specific diagnoses or treatments (seeing the patient as an 'equal' partner in the deliberation and decision making) emerged in the analysis.

A common focus on the knowledge of and cooperation among relevant experts, 'professionals', mandatories and contracting parties was evidenced in particular in Slovenia, Italy and Spain, as a form of responsibility towards the patients (protection, safety, justification, optimization, dose limitation). Responsibility, understood as the responsibility of practitioners, involved either in prescription of ionising radiation for medical purposes or administering it during procedures, is mostly seen as providing (one-way) information to patients, 'as appropriate'. There is also, as emerged in Slovenia, a clear emphasis on the importance of 'dialogue' (two way communication), but without specification of formal methods of a more 'participatory character'. In Germany, for example, a specific authority is assigned to an ethics committee to judge accuracy of information towards the patient, as the only 'stakeholder' to be engaged.

Patients as stakeholders are still seen as a subject of concern needing protection and having the right to information as a basis for informed consent, and thus the engagement of patients is mostly 'restricted' to having the autonomy of giving informed consent (or not). No specifications of formal procedures in this sense, except for Spain, mentioning 'the signing of informed consent by himself or by his legal representative', this basic procedure being known and applied also in other countries.

With regards to stakeholder participation in deliberation and decision making in the context of specific individual cases or in the more general context of radiological protection policies, a mentioning is made of the need to involve professionals (including experts, technical staff and ethics committees), but not systematically of the need to include patients as co-decision makers.

2.1.2. International prescriptions and recommendations

The following documents were analysed with respect to medical exposures:

- ICRP Publication 103, 2007 [9];
- ICRP Publication 105, 2006 [10];
- ICRP Publication 129, 2015 [11];
- Action plan of IAEA, 2002 [12];
- Bonn Call for Action, 2012 [13],
- HERCA Report CT Manufacturers Stakeholder Involvement, from 2017 [14]
- Report of HERCA WG5 , Stakeholder Involvement in Medical Practices, 2008 [15]

Several of the aspects emerging in the analysed documents are important to be mentioned, in view of international prescriptions, within common and transversal subjects included in the cited documents.

The right of patients to expect the radiation to be used in a safe and effective modality:

- Responsibility for the medical exposure of patients lies with the physician, but the decision-making process may often include the participation of relevant stakeholders, rather than radiological protection specialists alone (ICRP 103, ICRP129, Action plan IAEA, Bonn Call for Action, HERCA)
- The significance of involvement of stakeholders is recognized, having in mind that in the management of patient dose the medical task is not limited to the reduction of dose. (ICRP 105, ICRP 129, Bonn Call for Action, HERCA)
- Direct benefits and risks are expected for the exposed patient; however, other parties may be involved in relation to this exposure. For instance, in some procedures, occupational exposure is related to patient exposure; and - in different form- also members of patient family and friends could be exposed. (ICRP 103, ICRP 105, Bonn Call for Action, HERCA)

- Different approaches are recognized in the informed consent for patients and in the levels of information relevant for family and friends, and the amount of the information provided varies on the basis of the level and the type of exposure (e.g., whether diagnostic, interventional, or therapeutic), thus it depends on the potential risks and on the procedure. (ICRP 103, ICRP 105, Action plan IAEA, Bonn Call for Action)

The continuous development of patient-centred radiation protection together with the benefit for society as a whole:

- Development of high-performance technology, in the field of imaging, is recognized as a benefit for the patients, and at the same time leading to a large increase in exposure for the society. How all the involved stakeholders (manufacturers, prescribers, imaging professionals, physicians, medical physicists, ..) give their contribution and commit themselves through action to reducing medical exposure has an important role (HERCA, ICRP 129, Action plan IAEA, Bonn Call for Action).
- Commitment of parties includes the development of standardized benchmarks for specific technologies, and an adequate and well disseminated professional education and training, and the awareness of all professional figures of the relevant aspects of radiological protection (regulation and legislation has a prominent role together with a voluntary approach e.g. of individual and professional associations) (HERCA, ICRP 105, Action plan IAEA, Bonn Call for Action).
- Coordinated work to address aspects of radiation protection in medicine can take advantage from a complete integration of radiation protection into the health care system; and from the availability of updated documents on new challenges in dose management, and guidelines for various professional stakeholders (Bonn Call for Action, ICRP 129, ICRP 105, HERCA).
- Benefit-risk dialogues in radiology and radiotherapy need to be supported; technical and communication experts in cooperation with patient associations are envisioned to improve risk communication by developing adequate messages and approaches towards patients and the public, and moreover to improve communication skills of medical professionals and radiation protection experts (Bonn Call for Action, ICRP 103, ICRP 105, HERCA).

2.1.3. Interviews with international actors

Alongside document analysis, four interviews were conducted with members of key international organizations in the field of medical exposures to ionising radiation (WHO, IAEA, HERCA and ICRP). Given the international frame in which these organizations work, respondents referred mostly to professional and institutional stakeholders, such as regulatory bodies, professional organizations of medical specialists, technicians or manufacturers, and less to the role of patients and patient organizations as stakeholders. These professional and institutional stakeholders are engaged in several ways, ranging from information provision (e.g. trainings), to more active forms of participation such as discussion and joint decision-making when standards and regulations are set. Patients are mostly seen as the object of decision making and are not given a direct position at the discussion table.

Overall, both instrumental (stakeholder engagement as a means in optimization processes) and normative (stakeholder engagement as the right thing to do) rationales for stakeholder engagement were identified in the discussions. Main challenges in engaging stakeholders were according to our respondents the search for a common language, or a common ground of understanding which needs to be established when meaningful discussion should take place. A lack of equal recognition among different stakeholders was

also mentioned, this being due to the position of different stakeholders in the process. Time constraints were also seen as a challenge in order to provide for meaningful stakeholder engagement.

2.2. Emergency preparedness and response

2.2.1. Country analysis

For Emergency Preparedness and Response (EP&R) relevant existing regulations in Belgium, Italy, Slovenia and Spain were analysed with attention to stakeholder engagement in all the phases of emergency and recovery management. The analysis included national radiation protection legislation (when relevant), as well as national documents with specific attention to EP&R, covering the preparedness phase, emergency phase, transition and recovery phase, if applicable.

Main questions of analysis were: what are the national prescriptions for stakeholder engagement and public participation in EP&R, which stakeholders are being expected to participate, how do the actors mentioned above (policy makers, regulators, civil society organisations, international organisations, etc.) define “stakeholders” and how do they understand stakeholder engagement, and what the trends are (over time) for stakeholder involvement in EP&R.

The following documents were identified as relevant legal national requirements:

- For Belgium: Royal Decree on the Nuclear and Radiological Emergency for Belgium, 2018 revision [16];
- For Italy: National plan of protective measures against radiological emergencies (March 2010) [17];
- For Slovenia: Ionising radiation protection and nuclear safety act (ZVISJV-1), Off. Gaz. 76/2017 – Atomic Act [7];
- For Spain: Nuclear Security Council Strategic Plan 2017-2022 [18]; State Civil Protection against Radiological Risk, Royal Decree 1054/2015 [19].

The requirements on EP&R from the revised EURATOM BSS Directive (2013) were transposed in the national legal frameworks in Belgium and Slovenia. In Italy and Spain, the transposition is still under development, although some provisions were in function from the earlier version of BSS requirements. The requirements transposed relate to information to the members of public likely to be affected in the event of an emergency, information to the members of the public actually affected in the event of an emergency, contaminated areas, emergency preparedness, international cooperation and implementation of strategies.

According to the analysis of documents, aside from the provision of information the population likely to be affected, stakeholder involvement focuses on the involvement of formal institutions responsible for EP&R management. The national legal settings which already transposed the BSS directive also foresee consultations with the public, e.g. on the termination of emergency, the transition and post emergency recovery phases. Some national legal settings suggest broader consultations already in the preparedness phase, but no consultation is foreseen for the urgent emergency phase. In the investigated national legal frameworks, the impact on actual decisions of such consultation processes, or the form such processes should take are not clearly described.

The aspiration, motivation and level of participation of various stakeholders varies in the countries analysed. In Italy and Slovenia it is limited to the engagement of official stakeholders (actors in the EP&R), but not the population likely to be affected or the affected population. In Spain, consultation with the general public is planned to be established and maintained mainly via electronic resources. The provision

of information for the population in case of an emergency is obligatory in all studied countries and it is mostly assumed that the public would follow the instructions and recommendations.

Some changes in the approach are also noted, for instance in Belgium, where the national framework stipulates consultations with broader stakeholders and the establishment of communication strategies for alerting and informing the population in the emergency, transition and recovery phases. Other countries analysed do not have such requirements.

2.2.2. International prescriptions and recommendations

The following international documents have been investigated in relation to stakeholder engagement in emergency preparedness and response:

- Stakeholder involvement throughout the life cycle of nuclear facilities (2011), IAEA, [20];
- Handbook on Nuclear Law (2003), IAEA, [21];
- Preparedness and Response for a Nuclear or Radiological Emergency, GSR Part 7, 2015, IAEA, [22];
- Method for Developing a Communication Strategy and Plan for a Nuclear or Radiological Emergency (2015), IAEA, [23];
- Communication with the Public in a Nuclear or Radiological Emergency (2012), IAEA, [24];
- Arrangements for the termination of a nuclear or radiological emergency (2018), IAEA, [25];
- Practical proposals for further harmonisation of the reactions in European countries to any distant nuclear or radiological emergency (2013), HERCA, [26];
- Stakeholder Involvement in Decision Making: A Short Guide to Issues, Approaches and Resources (2015), OECD/NEA, [27];
- Recommendations for the Protection of People in Emergency Exposure Situation (2009), ICRP, [28];
- Recommendations for the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency (2009), ICRP, [29];
- Emergency response framework (2017), WHO, [30];
- Strategic Research Agenda, 2017, NERIS, [31];
- Report of Working Group on Emergency Preparedness and Response (2015), NTW, [32].

International standards are quite uniform in terms of their requirements concerning the provision of instructions, warnings and relevant information to the publics who are affected, or are potentially affected, by a nuclear or radiological emergency. They stipulate that arrangements have to be in place for communication with the public throughout a nuclear or radiological emergency, which can include several phases. During emergency response, such arrangements should provide for continued communication with the public, as well as the monitoring of public opinion and the reaction in the news media. In more detailed documents (guidelines), emphasis is given to communication prior to an emergency (routine communication) which is recognized to play an important role in the effectiveness of communication during an emergency (emergency communication). The importance of target audiences mapping, to identify their information needs, priorities and means (information channels), is pointed out, and recommendations for effective communication activities, information products and tools, as well as the channels through which messages would be communicated are given. It is also emphasized that early involvement in emergency preparedness improves plans, enables concerned stakeholders to prepare themselves to a post-emergency situation, and reinforces the potential for co-operation, communication and co-ordination in an actual crisis or during recovery.

For the post emergency phases the documents analysed suggest that protective actions and other response actions are formalized and included as part of consultation with the interested parties. The

consultation process should include also the decision on the termination of a nuclear or radiological emergency where different topics should be discussed such as the basis and rationale for the termination of the emergency situation, an overview of the actions taken and the restrictions imposed, the needs to adjust imposed restrictions, and any necessary modifications to people's personal behaviours and habits, among others.

Stakeholder engagement, involvement of the public and communication, are seen as having a major importance for improving the efficiency and social robustness of emergency preparedness and response and ensuring that stakeholders are involved in decisions that impact their lives. It is recommended that the incorporation of stakeholder input into decisional processes should be tuned by structures, processes, and procedures, and possibly legislation and regulation to encourage such participation. One of the civil society organisations also advises that the national authorities allocate appropriate resources to local municipalities, civil rescue teams, medical support, civil society organisations and civil initiatives to participate in planning for emergencies.

2.2.3. Interviews with international actors

Three interviews were conducted with representatives of international organizations active in the field of EP&R (Greenpeace, NERIS and HERCA), hence offering an additional source of data to identify frameworks for stakeholder engagement. In all three interviews, reference was primarily made to normative rationales for setting up stakeholder engagement (reflecting the idea that involving stakeholders who might be affected is the right thing to do); instrumental and substantive rationales were also referred to. Respondents mentioned several forms of stakeholder engagement: information provision, dialogue, consultation and involvement in research. In these different forms of engagement, the broader (affected) public is also expected to be involved. This engagement is seen in various ways: from the traditional provision of information, to empowerment of local citizens and their real involvement in matters that might negatively affect them. After the Fukushima accident, stakeholder engagement in post-accident conditions is understood also as a means to improve existing exposure management. And further, it can be seen that the engagement of a very broad public is now considered as useful also in the emergency preparedness phase.

Main challenges for stakeholder engagement identified in the interviews, are the provision of a robust and sustainable engagement process (e.g. dealing with limited resources, time and participatory fatigue), the building of trust, the effectiveness of the engagement process, communication challenges (like the trustworthiness of the source of information, language, level of complexity, level of detail, ...), and a need for a stronger legal basis for stakeholder engagement.

2.3. Radon

2.3.1. Country analysis

For radon, relevant existing regulations in Belgium, Slovenia and Germany related to radiation protection in general as well as specific for radon were analysed. The focus was on the radon topic as a whole combined with a text search using keywords associated with engagement, involvement, information, collaboration.

Main questions of analysis were: Are there national prescriptions / requirements for stakeholder engagement related to radon? What is the main objective? How are stakeholders defined? What level of stakeholder engagement is required? What else is described that may count as stakeholder engagement but is not necessarily labelled as such?

Documents analysed included:

- For Belgium: Belgian national radon action plan, 2017-03-29-BDE-7-4-1-EN [32]; RADON: Plan de communication; CFA/1 mars 2012 [34];
- For Germany: Radiation Protection Act adopted on 12 May 2017 [4]; German radon action plan, publication date March 2019 [35];
- For Slovenia: Ionising radiation protection and nuclear safety act (ZVISJV-1), Off. Gaz. 76/2017 – Atomic Act [7]; Decree on national radon program regulation, Off. Gaz. 18/2018 [36];

Throughout the analysis it became clear that while the term “stakeholder” might be mentioned in one document or another, none of the analysed documents gives a specific definition to stakeholders. Relevant groups (such as radiation and health protection authorities, employers, local decision makers) that are part of the radon mitigation process are mentioned, of course, but not in a specific stakeholder engagement context.

The main aspirations are knowledge transfer (on radon exposure, radon associated health risks, radon measurements and possibilities for reducing radon activity concentration) and informing the public and relevant groups (Germany), combined with raising awareness of the radon issue (Slovenia and Belgium).

In Belgium, it can be observed that information, communication and awareness campaigns are much more elaborated in official documents and have played an important role in reducing radon health risks since several years now. This is interesting especially in the context that in Belgium the EU BSS as legal requirement has still to be transposed into national legislation.

In Slovenia and Germany, the EU BSS requirements have already been transposed into national law. In Germany, the radon action plan was launched in March 2019. In Slovenia, the national radon action plan was adopted in March 2018 and requires that the radiation protection authority leads the awareness campaign. Stakeholder engagement for the general public is not a topic per se. In the documents analysed for Germany and Slovenia it is not mentioned at all.

In Germany and Slovenia, national acts exist entailing the radon issue: Atomic Act in Slovenia (2017) and Radiation Protection Act in Germany (2017). The acts mention information and raising awareness but do not give further specific instructions. Stakeholder engagement is not mentioned in either of them. For both countries, communication on radon issues is mentioned for the first time in official documents on the national level. In Slovenia, further provision on what activities should be performed by the radiation protection authority in the areas with increased radon, are given in the Decree on national radon program (article 12).

The situation in Belgium is a somewhat different. The “Plan de communication; CFA/1” as requirement for information was set up in 2012. Stakeholder engagement as such is not described, but stakeholders who ought to be addressed and trained are covered. Radon communication campaigns are launched and evaluation is carried out. However, no document presents descriptions of motivations for stakeholder engagement.

In Belgium, the objectives of the communication plan are to increase the public awareness and to convince the stakeholders of the benefit of taking action; to inform the stakeholders; increase the knowledge; guide the stakeholders to the right information; bring about changes in the behaviour of the stakeholders. In Germany and Slovenia, the motivation for information provision is not further described, so it can be interpreted as instrumental motivation to improve knowledge, trigger actions and thereby secure the goal of reducing the radon risk. There are no indications that information, communication or, to this very little extent as it is mentioned, stakeholder engagement is seen as in itself a right thing to do from a morally or

normative point of view. Neither are there hints that there is a feeling of reaching better decisions through timely information, communication, raising awareness or stakeholder engagement.

Other observations: In Germany a higher activity level can be observed on the sub-national, the Länder level. Länder that are more concerned with the radon problem due to a higher probability of increased radon exposure have been more actively engaged in the past by spreading information, raising awareness, bringing stakeholders together to discuss radon issues and improving education and training.

2.3.2. International prescriptions and recommendations

The following documents were analysed with respect to radon:

- IAEA: Radon in Homes, Factsheet for Decision Makers [37];
- IAEA safety guide on the Protection of the Public against Exposure Indoors due to Radon and Other Natural Sources of Radiation, IAEA, 2015) [38];
- ICRP Publication 126, Radiological Protection against Radon Exposure, 2014 [39];
- RADPAR Project, RADPAR FINAL SCIENTIFIC REPORT Radon Prevention and Remediation [40];
- WHO Handbook on indoor radon, A public health perspective, 2009 [41];
- Common understanding and recommendations related to the BSS requirements on radon in workplaces, HERCA 2016 [42].

Several aspects are important to mention. Throughout the documents, dissemination of information is seen as one important step for raising awareness of the public and also of professionals.

The WHO handbook on indoor radon (2009) emphasizes the importance of stakeholder engagement for impact, quality and sustainability with respect to several aspects, e. g. organisation of national radon programmes, and more specific required input for measurement protocols. Involving experts from other fields is seen as a key element in any radon strategy. In this document, collaboration with other health promotion programmes was already pointed out. In general, working and developing together, looking across fields of competence and learning from experiences and approaches in other fields are important aspects in this document.

IAEA documents put emphasis on broad information to be made available to interested parties, such as decision makers, medical practitioners, building professionals and the public. Here, focus is laid on informing rather than on engaging. With respect to setting reference level, it is advised to *consult* interested parties, in order to ensure that that activities resulting from reference levels are practicable and manageable. Also here, as in WHO 2009, cooperation with authorities responsible for addressing other aspects of indoor air quality and energy efficiency is emphasized. Interestingly, cooperation “*of*” the public – not “*with*” the public – is stated as necessary in order to be successful in reducing high activity concentrations of radon in dwellings. Target groups for public information programmes are described, with are seen as the most important step for raising awareness.

ICRP 126 deals with a detailed approach on how to inform or to engage stakeholders. The concept of a graded approach is emphasized in the document with respect to the responsibility of different stakeholders for taking action against radon, as well as for the control of radon exposures, involving relevant decision makers and encouraging them to promote self-help protective action. Incentive-based and mandatory provisions are mentioned as important parts of radon strategies. Similar to the other documents, increasing awareness is seen as a first important step in securing the support for a national radon strategy. All in all, the interactive and participatory aspect, as well as the graded approach reflecting the responsibilities of key stakeholders and in that sense a differentiated approach to radon mitigation actions, is most depicted in ICRP 126. Especially the section “Stakeholder interactions” reflects the general

approach of the document in the expression “Easily available information about radon, (...) should be disseminated to the general population, notably through elected representatives, civil servants in administrative divisions, home owners, landlords, employers, children at school, etc.”

2.3.3. Interviews with international actors

In order to gain further insight in existing frameworks of stakeholder engagement, three representatives of international organizations (ERA, ICRP, IAEA) and one representative of a national organization (BAG Switzerland) were interviewed. These interviews reflected how stakeholder engagement in the field of indoor radon mostly builds upon an instrumental rationale; engaging stakeholders is primarily a tool for radon measurements and mitigation strategies, and thus for tackling the issue of radon exposure. In general, respondents referred to two main forms of stakeholder engagement in the field of indoor radon; 1) awareness raising on the issue of radon (a perceived prerequisite to taking action), and 2) co-developing and implementing new regulations. While the former comprises mostly information-provision (and involves a broad plethora of stakeholders, including also wider publics such as homeowners and employees) the latter reflects a higher level of participation, as this comprises discussion and decision-making (involving mostly institutional actors).

The challenges expressed are linked with the fact that a good engagement process is dependent to a large extent on the understanding of the usefulness of the process by the relevant decision makers which is still an issue in most of the countries. How to assure the involvement of not only radiation protection and health authorities, but also other stakeholders such as the building or energy efficiency sector is an issue. Monetary incentives are particularly challenging, as they raise questions on the amount of financial benefits to be attributed, and to whom they should be attributed – and to whom not.

3. Cross field analysis

The document analysis reveals that the interaction with, and participation of relevant stakeholders, including wider publics, is increasingly recognised by the international organisations, and reflected upon, in all three fields considered: medical use of ionising radiation, emergency preparedness and response and indoor radon, particularly in EP&R.

While this is prevalent in recommendations and guidelines, it is much less apparent and elaborated in existing legal frameworks, at both the international and the national level, although opportunities for broader engagement can be found, e.g in the revised EURATOM Basic Safety Standards in relation to existing exposure situations. This can be seen as allowing for flexibility in the implementation of such requirements, “as appropriate”, in each Member State. Opposite to this, given the minimal requirements placed on stakeholder engagement in the legal frameworks, it is not always clear how stakeholder engagement can and should be interpreted. Stemming from this, there is uncertainty and potential mismatch of expectations regarding issues such as when to initiate stakeholder engagement, whom to involve at which stage and what to expect from it. The question arises therefore on who has the power to define who and what is affected.

A common theme across the three fields is the integration of radiation protection in broader frameworks. This might mean for instance integrating radon risk mitigation in National Environmental Health Action Plans or in the building and energy sectors; integrating radiation protection in general, patient-centred, healthcare in the medical sector and addressing radiological risk as part of professional medical skill and decision-making processes; or integrating nuclear emergency management in multi-hazard approaches to risk and vulnerability management. This, in turn, implies the need to engage with new stakeholders in radiological risk mitigation.

Through the interview analysis, two transversal issues across the three different fields could be identified. First, in all fields, similar challenges for setting up initiatives for stakeholder engagement were identified, namely the financial and time constraints faced by potential stakeholders. And second, a (sometimes implicit) distinction is made between professional/institutional stakeholders, on the one hand, and the broader publics, on the other hand. This distinction was most apparent in the radon and medical fields, and implies also different levels of stakeholder engagement, as professional/institutional stakeholders are those involved in ‘higher’ forms of engagement, such as discussion and joint decision-making. While a gradual institutional shift can be noticed from public deficit to dialogue, engagement of wider publics is often seen as means to raise public awareness and communicate, or to trigger action (e.g. for radon).

4. Conclusions

This report focused on commonalities and specifics of different exposure situations (medical exposures, post-accident and recovery situations, and radon exposure) in relation to stakeholder engagement. Through an analysis of legal or contextual drivers, it aimed at answering questions such as: are there national prescriptions / requirements for stakeholder engagement related to different exposure situation? What is the main objective? How are stakeholders defined? What level of stakeholder engagement is required?

For the analysis of individual field, the findings provided in the Report on rationales and frameworks for stakeholder engagement in radiation protection in the medical field, nuclear emergency and recovery preparedness and response and indoor radon exposure [2] are summarised. The results of analysis include commonalities but also differences in relation to stakeholder engagement for the individual fields. Based on that also cross field analysis was performed.

In the medical field an evident increase in stakeholder involvement can be noticed, motivated by recent documents and guidelines. This entails an inclusive approach of professionals and organisations in radiation protection, in working to improve care and safety for patients. The involvement of patients seems not so active and uniform in the different areas. Indeed, the medical exposure of patients has unique aspects, as it is related to the expectation of direct individual health benefits to the exposed patient and moreover the dose to the patient cannot be reduced indefinitely without compromise the intended result. The level of involvement/engagement of patient and family, in the judgement of benefits for patients, is in the practice based on informed consent. There is a need to activate/improve dialogue on the benefits and risks with patients and the public; to support risk communication skills of health care and radiation protection professionals; to introduce these aspects in the education and training activities; and more in general to promote the integration of radiation protection in the health care system.

The related requirements on EP&R from the EURATOM BSS Directive (2013) were transposed in Belgium and Slovenia in the national legal framework, but in Italy and Spain, the transposition is still under development. However, some provisions are in place from the earlier version of BSS requirements. In most countries studied, stakeholder involvement is limited to formal institutions responsible for EP&R management. The public is mainly given the information on how to react in case of an emergency, with the underlying assumption that the public will prudently follow these instructions. Consultation with the affected public is foreseen for post emergency management in some countries, but the details on how their feedback would be included it is not specified.

The international standards quite uniformly propose to increase the stakeholder engagement in EP&R also in the preparedness phase, as this can improve plans, enable concerned stakeholders to prepare themselves to a post-emergency situation, and reinforce the potential for co-operation, communication and co-ordination in actual crisis or during recovery. Main challenges for stakeholder engagement include the provision of a robust and sustainable engagement process, trust building, the effectiveness of the engagement process, communication challenges, and a need for a stronger legal basis for stakeholder engagement.

For radon, the analysis revealed that, the importance of stakeholder engagement for sound and sustainable radon risk reduction actions was pointed out at least a decade ago. It became clear that on the international as well as on the national level there are large differences in the role and levels of stakeholder engagement. This might be due to the fact that the term stakeholder engagement is not described in more detail in any of the analysed documents. Examples of potentially useful information include motivations for stakeholder engagement, a general background describing the value of stakeholder engagement, depicting opportunities or pitfalls, or further information guiding stakeholder engagement activities. With

some exceptions, recipients of the documents are mostly left alone with a vague idea of what stakeholder engagement might be and how it can be implemented into practice. However, encouragingly, despite these diverse approaches, there are some good examples on how to implement stakeholder engagement into practice.

Overall, the document analysis reveals that recommendations and guidelines on stakeholder engagement are much more detailed in explicating stakeholder engagement and the underlying rationales than existing legal frameworks. Accordingly, it is not always clear how stakeholder engagement can and should be interpreted.

With few exceptions (notably post-accident recovery), the level of involvement of professional and/or institutional stakeholders is generally higher than that of affected publics. This distinction is most apparent in the radon and medical fields, professional/institutional stakeholders being those involved in 'higher' forms of engagement, such as discussion and joint decision-making. While a gradual institutional shift can be noticed from public deficit to dialogue, engagement of wider publics is mainly seen as a means to raise public awareness, communicate, and trigger specific actions (e.g. radon measurement and mitigation actions).

Despite the particularities of the three fields, the financial and time constraints, and – in some cases- the lack of a clearer legal framework are seen as common challenges for stakeholder engagement.

A common theme across the three fields is the integration of radiation protection in broader frameworks. This, in turn, implies the need to engage with new stakeholders in radiological risk governance.

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