



Deliverable 6.6

The communication tools for health protection against radon and NORM exposure situations

Work Package **6**

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Executive Summary

EU Member State (MS) authorities are required to enhance public awareness and education on radon risks, as mandated by Council Directive 2013/59/Euratom. While efforts have been made to inform the public, findings from the RadoNorm European Radon Behavioural Atlas indicate that a large portion of the EU population remains unaware of radon as an indoor air pollutant. Moreover, even in countries with higher awareness, such as the Nordic region, knowledge gaps persist.

Although increasing radon awareness and knowledge is an important step in radon risk management, research suggests that knowledge alone does not necessarily lead to protective behaviours. Interestingly, residents of countries with lower radon awareness, such as Portugal and Romania, demonstrated a higher willingness to comply with radon protection advice, indicating that behavioural intentions may be influenced by additional factors.

To enhance compliance with radon testing and mitigation, effective communication strategies must go beyond information dissemination and incorporate behavioural change factors. RadoNorm research highlights the potential of social media and web-based tools in engaging at-risk populations. Specifically, the use of humour, social norms, and storytelling (narratives) has been identified as effective in capturing attention, improving understanding, and encouraging radon protection action.

This deliverable presents the communication tools developed for social media and online platforms, designed to integrate these elements. Additionally, a dedicated radon awareness webpage and stakeholder-friendly content are introduced, along with an evaluation template to assess their impact. The RadoNorm communication tools were tested in Slovenia, Austria and Belgium. They are public communication tools and are made available in the RadoNorm STORE database for EU MS to use them in their communication campaigns and interventions.

The tools were developed, tested, refined, and applied specifically for radon communication, but they can be adapted and used for NORM-related communication as well.

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1. Communication context

EU Member State (MS) authorities must comply with the mandates outlined in Council Directive 2013/59/Euratom [1] which emphasises the importance of “enhancing public awareness and educating local decision-makers, employers, and employees about the risks associated with radon, including its relationship with smoking,” as stipulated in Annex XVIII (10) [2]. Building on this directive, RadoNorm’s research on the societal aspects of radon management highlights that, indeed, a key component of radon control strategies across EU MS has been to educate the public, promote awareness, and emphasise the significance of radon exposure [3]. Despite these efforts, findings from the RadoNorm Radon Behaviour Atlas [4] indicate that a significant portion of the EU population remains unaware of or has never heard of radon as an indoor air pollutant.

The table below presents rather low radon awareness levels across different EU countries.

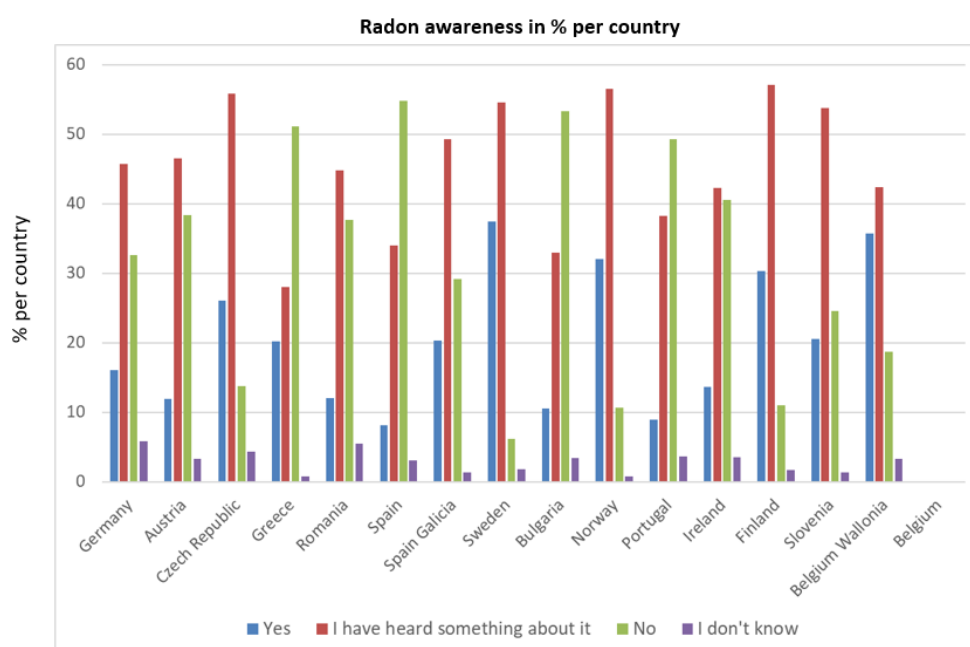


Figure 1: Radon awareness by country

The RadoNorm project distinguishes between radon awareness [5] [6] and radon knowledge [7], [8], [9], [10], [11], [12], [13]. Radon awareness is the state of being conscious of the existence of a radon health risk, while radon knowledge refers to the understanding a person has acquired about the risks associated with radon exposure through learning, experience, or campaigns. While awareness represents the initial step in the psychological process of taking behavioral action [14], findings from prior research suggest that enhancing radon knowledge may be one of the factors promoting radon testing within dwellings [7], [8], [9], [10], [11], [12], [13], [15].

Increasing knowledge related to radon is another objective of EU MS. In the European Radon Behavioral Atlas respondents who indicated that they knew or heard about radon were asked to indicate whether they agree or disagree with 11 statements related to radon exposure (Table 1). Additionally, all respondents were asked three questions relating to general knowledge about radioactivity.

Table 1: Radon knowledge test

Knowledge items	Correct answer
AW47 Exposure to radiation always leads to radioactive contamination. **	no
AW17 The human body is naturally radioactive. **	yes
AW18 With time, every radioactive substance becomes more and more radioactive. **	no
AW37 Radon causes headaches.*	no
AW38 Radon exposure is linked to lung cancer.*	no
AW39 Radon is a radioactive liquid.*	no
AW40 Radon has a strong odor.*	no
AW41 Radon is invisible.*	yes
AW42 Radon levels are usually higher in the attic than the basement.*	no
AW43 Testing is the only way to determine if a home has an elevated radon level.*	yes
AW44 Radon can enter homes through cracks in walls and floors.*	yes
AW45 Health effects of radon do not show for years.*	yes
AW46 The risks from radon exposure increase the longer you are exposed to it.*	yes
AW48si Concentrations of indoor radon are expressed in Becquerel per cubic meter.*	yes

** general knowledge (all respondents); * specific radon knowledge (only respondents familiar with radon)

The map below illustrates the percentage of correct answers per country. It reveals that Nordic countries (Norway, Sweden, and Finland) have the most knowledgeable populations regarding radon. However, even in these countries, only approximately 50% of responses were correct. In contrast, Southern European countries demonstrate lower levels of radon awareness, indicating a significant knowledge gap in these regions.

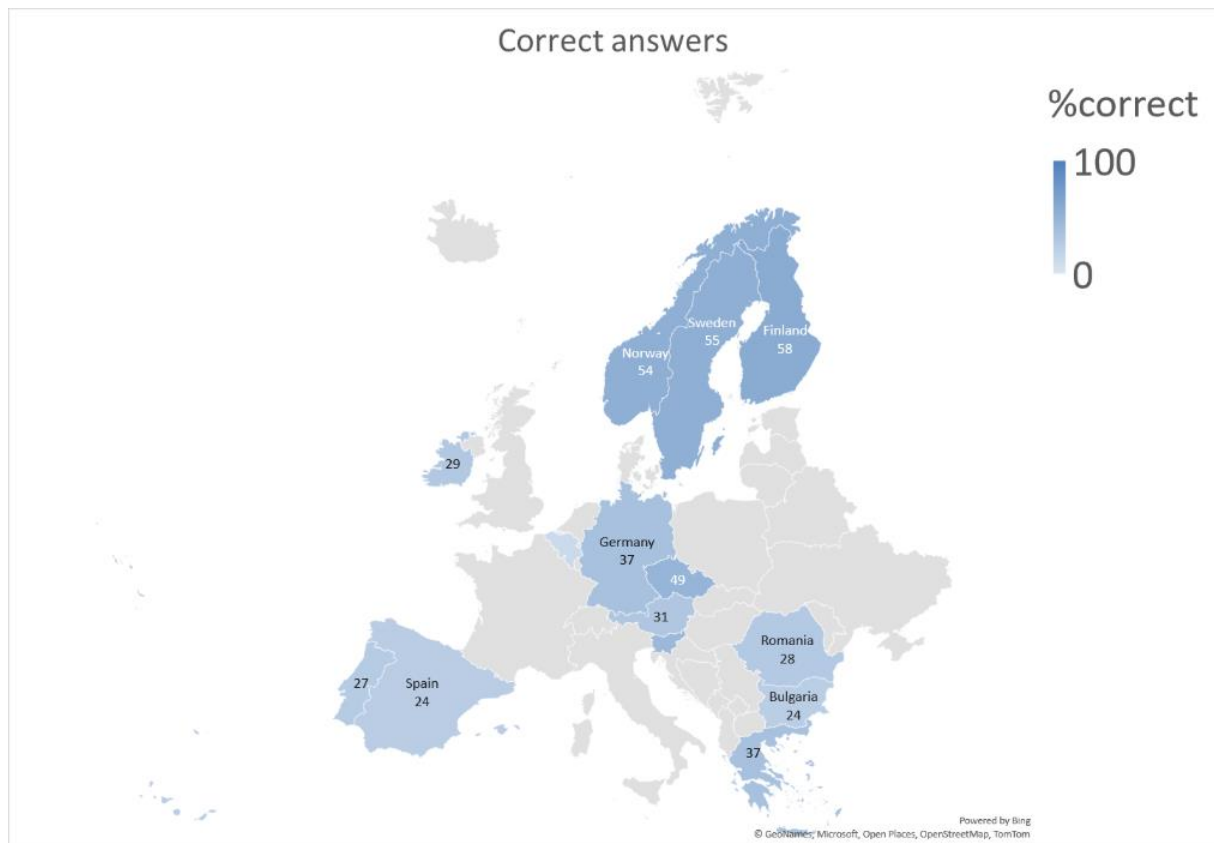


Figure 2: Radon knowledge by country

However, simply providing comprehensive information that increases awareness and knowledge does not necessarily improve risk mitigation behaviours [16]. The RadoNorm European Radon Behavioural Atlas also highlights the need to strengthen residents' intentions to protect themselves from radon exposure. Figure 3 below presents the level of agreement, by country, with the statement: "I intend to test radon concentrations in my home if advised." Interestingly, residents of countries with the lowest radon awareness, such as Portugal and Romania, expressed the highest willingness to comply with radon protection advice. This indicates that other factors beyond knowledge may play a more substantial role in shaping respondents' intentions to test and mitigate as suggested by Hevey et al. [17] and Davis et al. [15].

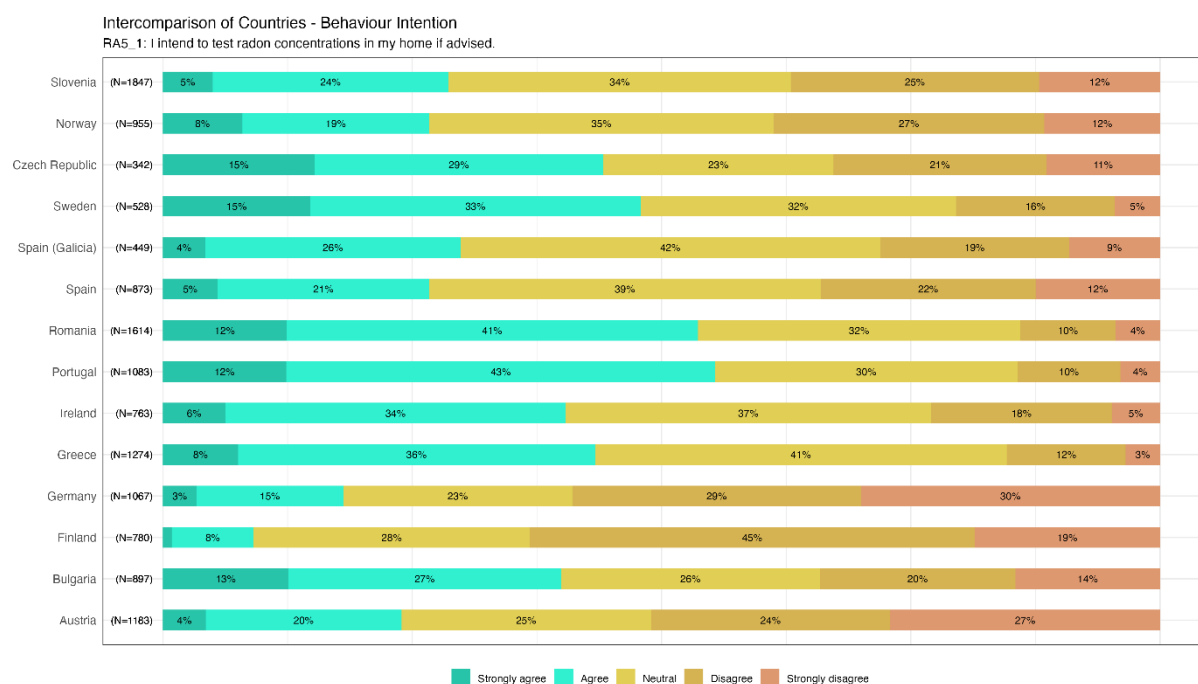


Figure 3: Compliance with radon protection advice by country

An essential step in a radon risk communication strategy aimed at increasing compliance with radon testing and mitigation is the careful selection of appropriate communication tools. These tools should be designed to appeal to relevant behavioural change factors and tailored to different target audiences [18]. Additionally, developing, testing, and continuously refining these tools is crucial to ensure they effectively address the specific needs and motivations of various groups.

The RadoNorm research [19], [3], [20], [4] and [21] suggests that social media and web pages are effective tools for reaching at-risk residents and encouraging compliance with radon protection advice. However, their effectiveness depends on the ability of the content to capture attention, enhance understanding, and motivate action.

Our theory based and evidence based RadoNorm research indicates that incorporating elements such as humour, social norms, and storytelling (narratives) can significantly enhance the impact of radon-related communication strategies.

The remainder of this deliverable presents the social media communication tools developed to incorporate these key elements. Additionally, we introduce a dedicated radon related webpage, along with stakeholder-friendly and engaging internet content, including an evaluation template to assess its effectiveness.

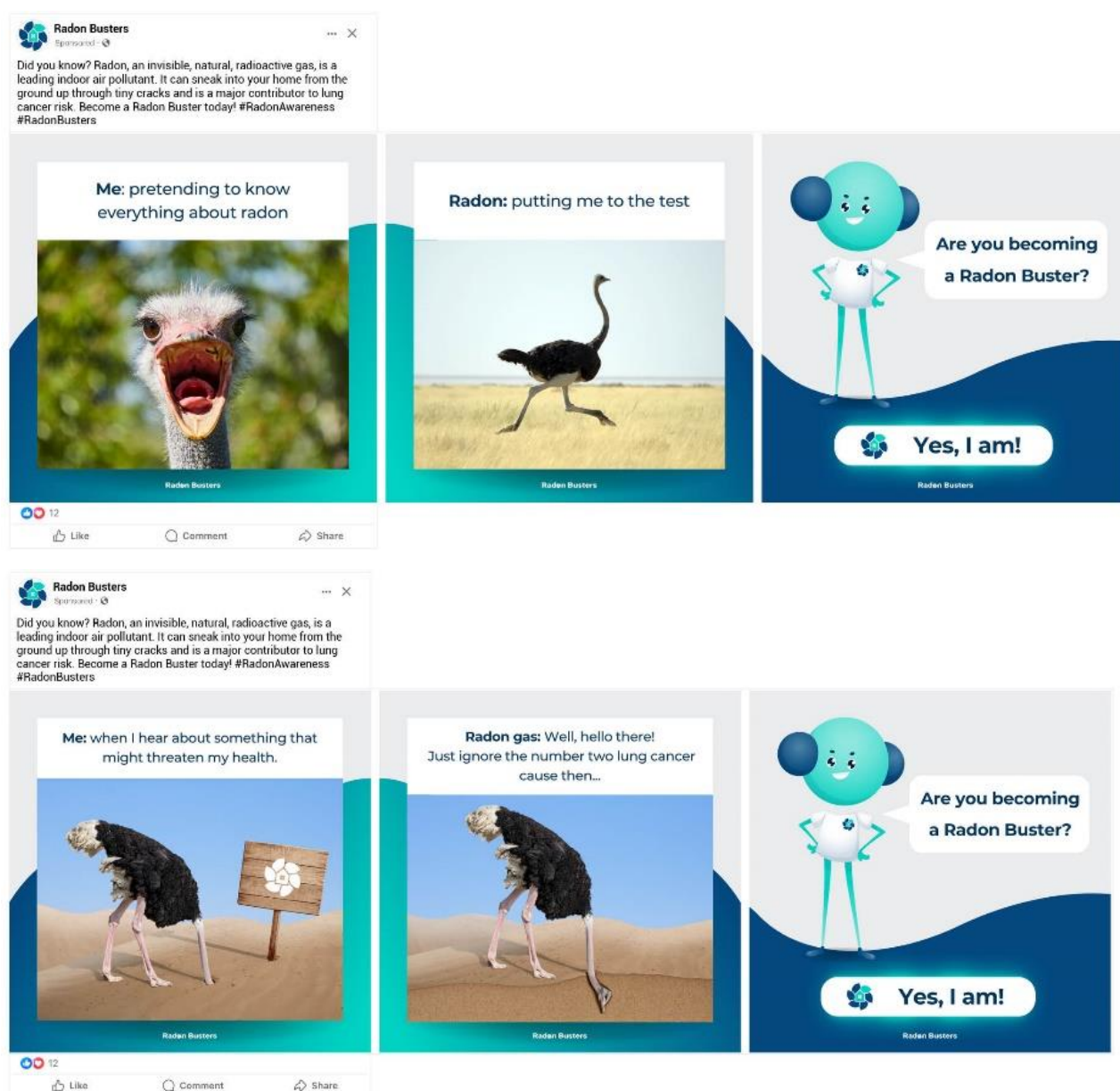
2. Communication tools addressing humour

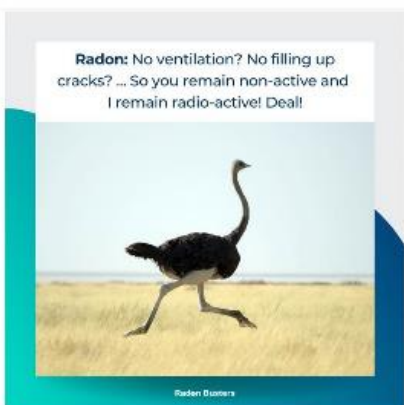
The social media post about radon testing is designed to attract attention and motivate action through humour. It consists of four carousel posts, each containing three slides, using the analogy of an ostrich to illustrate common excuses for avoiding radon testing.

- The first post (“**running away**”) features a confident ostrich with the text: “**Me: pretending to know everything about radon**” on the first slide. The second slide shows the ostrich running away with the text: “**Radon: putting me to the test.**”
- The second post (“**head in the sand**”) depicts an ostrich burying its head in the sand. The first slide reads: “**Me: when I hear about something that might threaten my health.**” The second slide, showing only the ostrich’s face in the sand, adds: “**Radon gas: Well, hello there! Just ignore the number two lung cancer cause then...**”
- The third post (“**ostrich with kids**”) starts with an image of a confident ostrich with its offspring, accompanied by the text: “**Me: I would do anything to protect my family.**” The second slide, featuring ostrich heads with question marks, reads: “**Radon: already checked if I’m in your house then?**”
- The final post (“**lazy ostrich**”) begins with an ostrich lying on the ground, looking lazy, with the text: “**Me: I have no time, no money, no energy to make any changes to my house.**” The second slide shows the ostrich running away with the text: “**Radon: No ventilation? No filling up cracks? ... So, you remain radioactive! Deal!**”

This humorous approach leverages relatable scenarios to engage the audience and encourage them to take radon testing seriously.

Figure 4: Using humour to communicate radon risk.





3. Communication tools addressing social norms

The **dynamic norms** post about radon testing is designed to attract attention and encourage action by highlighting changing social norms. **Social Norms** refer to the common behaviours, beliefs, or actions that people perceive as typical or expected within a group or society. They shape how individuals behave based on what they think others are doing or what is socially acceptable. **Dynamic Norms** refer to changing social norms—highlighting how behaviours and attitudes are **shifting over time**. Instead of just stating what most people currently do, dynamic norms emphasize that an **increasing number of people are adopting a certain behaviour**, making it more likely that others will follow suit.

This tool consists of four carousel posts, each with three slides. The third slide in each carousel is identical to those in the **humour** conditions. However, the caption in this version emphasizes the growing number of people taking action against radon: **“Did you know? Radon, an invisible, natural, radioactive gas, is a leading indoor air pollutant. It can sneak into your home through tiny cracks in the foundation and is a major contributor to lung cancer risk. Become a Radon Buster today! An increasing number of people in Ireland are joining the movement. #RadonAwareness #RadonBusters”**

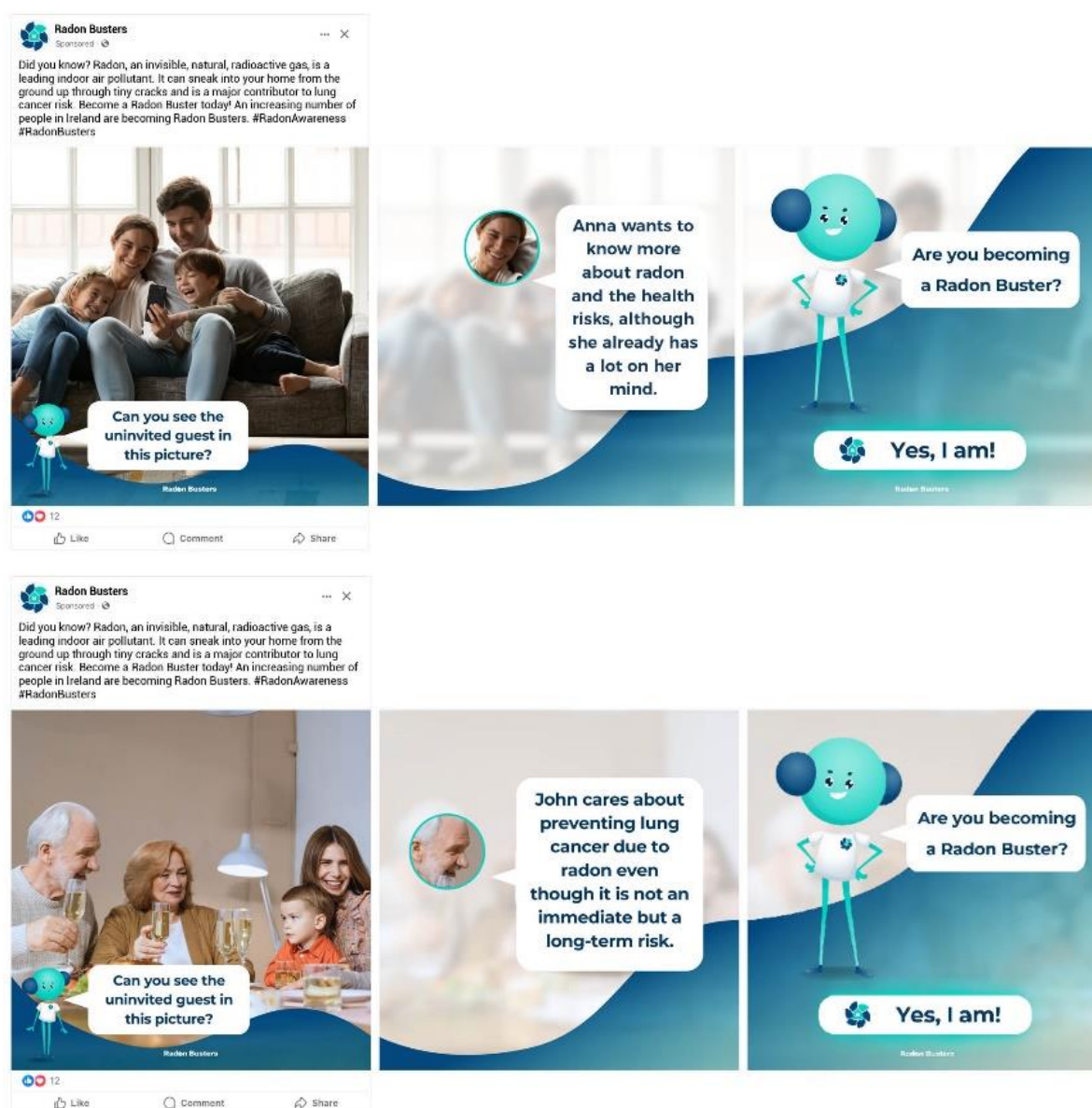
The four carousel posts feature a different family type on the first slide—one with young children, one with older children, one with grandparents, and one depicting student housing. Each slide includes a text field asking: **“Can you see the uninvited guest in this picture?”**

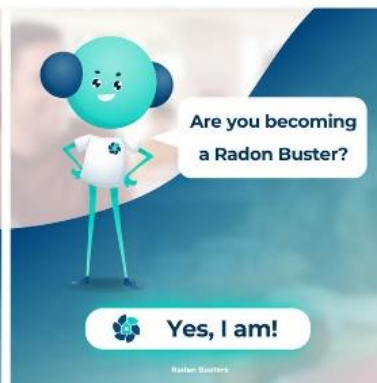
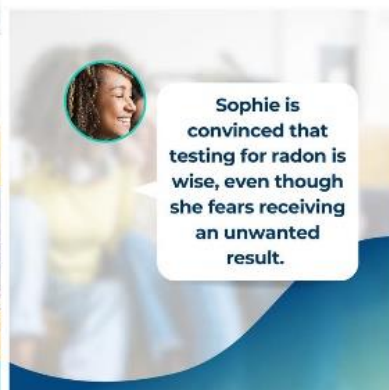
On the second slide, a family member makes a statement, emphasizing awareness and action despite potential concerns:

- **Anna** (mother of young kids) wants to learn more about radon and its health risks, even though she already has a lot on her mind.
- **John** (grandfather) is committed to preventing lung cancer caused by radon, even though the risk is long-term rather than immediate.
- **Sophie** (student) believes testing for radon is a smart decision, even though she worries about receiving an unwanted result.
- **Will** (father of older children) feels confident that he can take action if radon levels are high, even though it might require some effort.

By emphasizing the growing number of people testing for radon, this approach leverages **social influence** to encourage behaviour change.

Figure 5: Using social norms to communicate radon risk





4. Communication tools addressing narratives

To attract people and encourage them to take action on radon testing, a series of narrative posts was developed. One of these posts featured a **Facebook Carousel** with five slides, telling the story of a house affected by radon but regaining its happiness after the homeowner took action.

The text on the slides was as follows:

1. **“Once upon a time, in a not-so-happy house, radon had made itself at home.”**
2. **“But the family living there wanted their house to be happy again, so they decided to test for radon.”** (*Illustration: A person inside the house with a radon buster ready to help.*)
3. **“With determination, they reduced radon’s presence. Slowly but surely, the house began to smile again.”**
4. **“As radon levels dropped, the family thrived, and the house radiated happiness. Their journey inspired others to take action too.”**
5. **“Are you becoming a radon buster? – Yes, I am!”**

This engaging, story-driven approach aimed to simplify the message and motivate people to take the crucial step of testing their homes for radon.

Figure 6: Using narrative to communicate radon risk





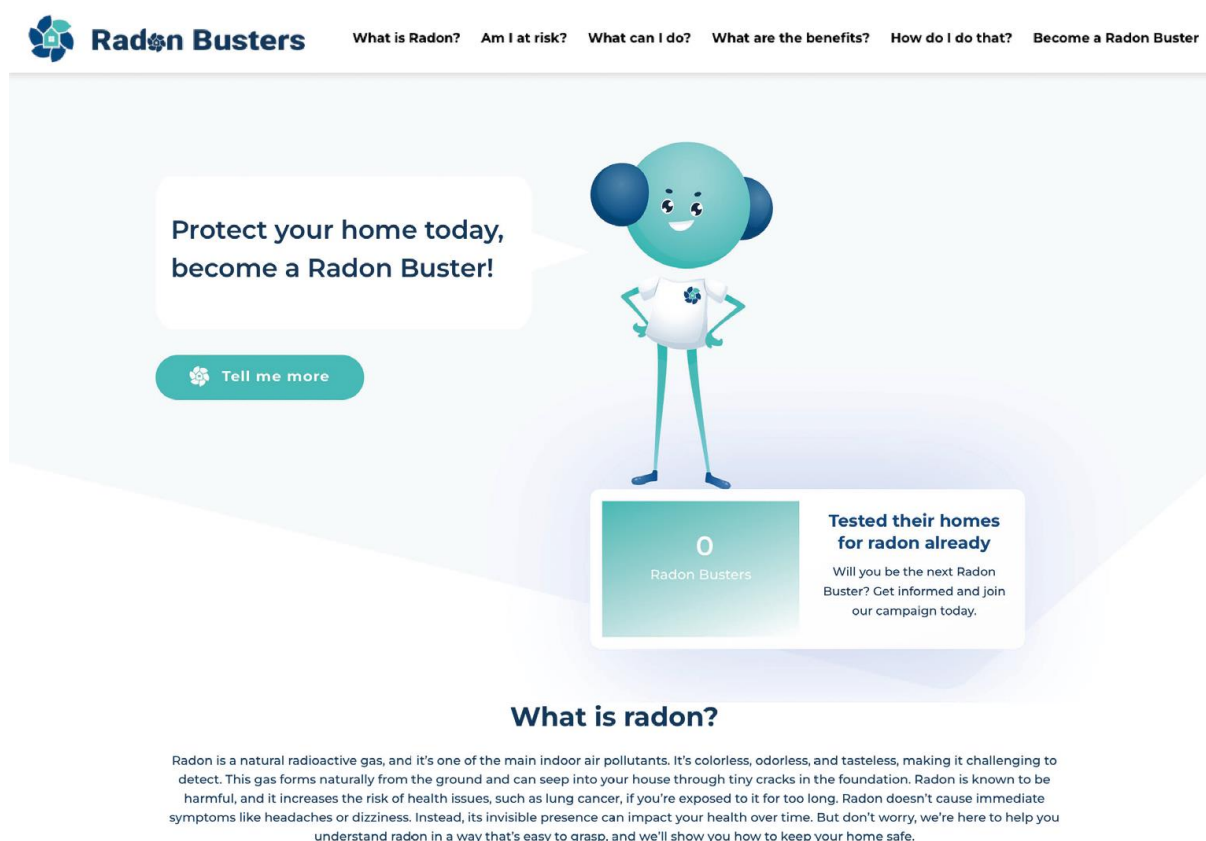
5. Website

The website is a one-page resource that organizes information about radon based on common questions people may have. It begins with an introduction to radon, followed by a section titled “**Am I at Risk?**”, which addresses concerns related to housing age, smoking, and other risk factors.

The third section, “**What Can I Do?**”, reassures users that taking action doesn’t have to be difficult, time-consuming, or ineffective. Next, the “**What Are the Benefits?**” section debunks common concerns about costs, property value, and the perceived lack of others taking action. The fifth section provides a summary of the steps individuals can take regarding radon.

The website concludes with a paragraph about the campaign, including details on the research behind it. Additionally, it offers links to local resources on three levels: finding more information, checking radon maps, and ordering a test kit. Designed as a counterbalance to highly technical websites and brochures, the content is written in a clear and accessible way for everyone.

Figure 7: Radonbuster website





Am I at risk?

Curious if radon might be paying an unwelcome visit to your home? You're not alone. Radon doesn't discriminate, and it can affect anyone, anywhere. Don't worry, we're here to help you understand the risks, and easy steps to check if radon has made itself at home. We believe in informed choices for a safer haven. As a first step, you can see if your area is at risk [here](#). Remember, radon's unbiased – testing is essential, even in 'safe' areas.

Isn't it just another risk among many others?

Not quite. While there are various risks we encounter daily, radon is unique in its invisibility and potential harm. Unlike many other risks, you can't see, smell, or taste radon, which makes it easy to overlook. However, its presence and long-term exposure can impact your health over time. Ignoring radon can be risky, but the good news is that understanding and addressing it doesn't have to be a hassle.

But I don't smoke, so that means I'm not at risk, right?

I live in a new house, so that means I'm not at risk, right?

I live in an old house, so that means I'm not at risk, right?

I have lived in my house for so long now, so why would I act now?

That sounds difficult, doesn't it?

Radon testing is easy; anyone can do it. Radon testing is as simple as setting up a kit in your home for a few months, including the heating season. It's an effortless process, and we're here to guide you every step of the way. Once you have the results, you'll be equipped to make informed decisions about your next steps.

That sounds time consuming?

Is it guaranteed that the remediation works will be effective?

What can I do?

Empowerment starts with action. When it comes to radon, you have the tools to make a significant impact. Taking steps to address radon is simpler and more achievable than you might think. By arming yourself with knowledge and embracing specific, effective solutions, you can ensure your home is a safe haven for you and your loved ones. The first step is always testing your home. We will help you with interpreting the results and make an informed decision about what to do next. Ensuring your home's safety might involve remediation measures.



What are the benefits?

Exploring radon's impact reveals both its benefits and debunked concerns. Understanding radon's true nature empowers you to make informed decisions about your home's safety, ensuring a healthier environment for you and your loved ones. Embracing its benefits and addressing misconceptions not only safeguards your property but also protects the well-being of your family.

But that sounds expensive, doesn't it?

We understand you're worried about the costs. Safety doesn't have to come with a hefty price tag. Radon testing is an affordable investment in your health, costing approximately 50-60 euros. In case of high radon levels, mitigation costs vary between 400 and 1500 euros. Detecting and mitigating radon early can save you from potential health costs down the line.

I have a lot of issues to worry about already, I don't have the energy to test.

But what about the value of my house? Won't it decrease?

Are other people also testing? I've never heard about it.

And how do I do that?

The first step is always testing. Radon testing is a simple and inexpensive way to ensure your home's safety. For 50-60 euros, you can purchase a radon test kit by [clicking the link below](#). Placing the kit in your home for a few months allows you to accurately measure radon levels. This small investment can have a significant impact on your family's well-being.

Once you receive your radon test results, interpreting them is straightforward. If the levels are below the reference level of 200 Bq/m³, mitigation is not required. However, if the levels are above the reference level, it's time to take action. Ensuring your home's safety might involve remediation measures.

Don't worry if your radon levels are higher than the reference level – there are effective remediation options available. Improving ventilation, sealing cracks, and installing a radon mitigation system are just a few approaches. To get started, simply [click the link](#) to find a qualified contractor. They'll guide you through the process, making your home a safer place for you and your loved ones.



Are you becoming a Radon Buster ?

 YES, I AM!

About this campaign

Our mission goes beyond raising radon awareness – it's part of a larger endeavor within the RadoNorm consortium, a cutting-edge research project dedicated to decrease radon in all indoor spaces. We're not just informing; we're investigating new ways to effectively spread essential information that can lead to behavior change regarding radon. As part of this project, we're committed to understanding what works best in conveying radon's significance, its potential risks, and how to encourage proactive steps and behavior change. By being part of this campaign, you're contributing to groundbreaking research that shapes how we keep homes safer and empower communities.

Our aim is to equip you with valuable insights. If you have any questions or need clarification, feel free to contact our research team directly (sofie.apers@uantwerpen.be). Together, we're shaping a future where effective communication ensures healthier homes and informed choices.



This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 900009. Privacy policy | website by [marketinX](#)

6. Communication strategy – step by step developing



Communication Strategy:
How to meet legal requirements in practice?

Tanja Perko, SCK CEN



Legal requirements and recommendations

- The World Health Organization (WHO) recommended in 2005 that comprehensive radon programmes are developed for radon prone areas (WHO, 2009).
- This policy has also been endorsed in the revised General Safety Requirements of the International Atomic Energy Agency (IAEA, 2014)
- and the European Basic Safety Standards directive (BSS) (2013/59/EURATOM).







BSS: A (legal) requirement for communication and engagement

EU, COUNCIL DIRECTIVE 2013/59/EURATOM



"Strategy for communication to increase public awareness and inform local decision makers, employers and employees of the risks of radon, including in relation to smoking"

"Member States shall provide as appropriate for the involvement of stakeholders in decisions regarding the development and implementation of strategies for managing exposure situations"



Communication is important.

You have to plan it.

Make communication strategy.





Radon risk communication needs to be:



evidence-based (e.g., based on the qualitative and quantitative empirical data, for instance surveys, experiments),

theory-based (e.g., drawing from empirically-supported theories for instance of health behaviour, information processing, risk perception and risk communication)

and strategic (e.g., based on formats and methods that have been proven to reach its preconceived objectives)

Unfortunately, some of those principles are often overlooked in communication related to radioactivity.





Objective of this presentation

- To be able to identify objectives of the strategy.
- To be able to plan basic 5 steps in strategy making.
- To know what do we have to communicate.



Why communication strategy?

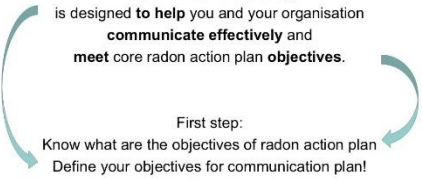
A communications strategy is designed **to help** you and your organisation **communicate effectively** and **meet** core radon action plan **objectives**.



Why communication strategy?

A communications strategy is designed **to help** you and your organisation **communicate effectively** and **meet** core radon action plan **objectives**.

First step:
Know what are the objectives of radon action plan
Define your objectives for communication plan!



 First step: Define your objectives Objectives are <u>specific results</u> that we aim to achieve within a time frame and with available resources. The desired change in behavior, social norms, or policies - What do we want to happen? The intended effect of the change - How will this change affect the individual, community, and society? The timeframe required for the change - When do we want these changes? Objectives should be: Specific, Measurable, Appropriate, Realistic & Time-bound 10	 SMART objectives Specific: Does the objective say who or what is the focus of the effort? Does this objective say what type of change is intended? Does the objective cover only one challenge? Measurable: Can your objective be measured in some way? Does the objective include a verifiable amount or proportion of change expected? Appropriate: Is the objective sensitive to audience needs and preferences? Is the objective sensitive to societal norms and expectations? Realistic: Can you realistically achieve the objective with the time and resources available? Is the degree of expected change reasonable given these conditions? Time-bound: Does the objective state the time period for achieving change? The project has received funding from the European Union's Horizon research and innovation programme (2019-2023) under grant agreement 101019166 11
 First step: Define your objectives Objectives are <u>specific results</u> that we aim to achieve within a time frame and with available resources. Objectives are <u>specific and measurable</u>. Objectives of the radon action plan (examples): - People in affected area will know that radon is dangerous. - People will know how to protect their families. - New legislation will be accepted and applied. - Every house will be tested on radon before selling it. 30% of buildings in the area will be tested. 12	 First step: Define your objectives Objectives are <u>specific results</u> that we aim to achieve within a time frame and with available resources. Objectives are <u>specific and measurable</u>. Objectives of a communication strategy (general): - Engage effectively with stakeholders. - Change behaviour and perceptions where necessary. - Demonstrate the success of our work. - Ensure people understand what we do... 13
 First step: Define your objectives Objectives are <u>specific results</u> that we aim to achieve within a time frame and with available resources. Objectives are <u>specific and measurable</u>. Objectives of the communication strategy (examples): - We make one meeting with residents in each local community. - At least 30% of adult population will attend the meeting. - We distribute one leaflet with information about radon per household. 400 measurement kits with instructions will be distributed. - Radon concentration in house will appear as a standard information about building (similar to energy certificate) - We appear in all local media with at least one article about radon. 10 experts from our institution will attend media and public speaking training... 14	 First step: Define your objectives Objectives are <u>specific results</u> that we aim to achieve within a time frame and with available resources. Objectives are <u>specific and measurable</u>. Objectives of the communication strategy (examples): - We make one meeting with residents in each local community. - At least 30% of adult population will attend the meeting. - We distribute one leaflet with information about radon per household. 400 measurement kits with instructions will be distributed. - Radon concentration in house will appear as a standard information about building (similar to energy certificate) - We appear in all local media with at least one article about radon. 10 experts from our institution will attend media and public speaking training... 15
 Second step: Identify the audience (stakeholders) Who will be affected? Who makes decisions? Who is influential? Who can promote a decision? Who can obstruct a decision? Who can help? ... Give a detailed description of your main audiences both external and internal. 16	 Second step: Identify the audience (stakeholders) Example for the objective: "400 measurement kits with instructions will be distributed." Who will be affected? Who makes decisions? Who is influential? Who can promote a decision? Who can obstruct a decision? Who can help? ... Give a detailed description of your main audiences both external and internal. 17
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Third step: Develop messages, examples of text or graphics.

- Describe the messages that will form your communications.
- Develop specific examples of text and graphics.

18

Third step: Develop messages, examples of text or graphics.

- Describe the messages that will form your communications.
- Develop specific examples of text and graphics.

19

Third step: Select key communications methods/channels

Describe the forms that your messages will take and how they will be disseminated, including details about mailings, social media platforms, media destinations, etc.

20

Third step: Select key communications methods/channels

Describe the forms that your messages will take and how they will be disseminated, including details about mailings, social media platforms, media destinations, etc.

- Personal communication:
 - Face to face, letter...
 - Focus group, meeting...
- Media:
 - Posters, leaflets
 - TV, Radio, Newspapers
 - Web page...
- New media:
 - Facebook
 - X, sms
 - Other social networking

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Fourth step: Plan your work: resources and timing

- Describe the human and budget resources that you will use to support your communications strategy, including projections of future costs.
- Provide a time-line for the implementation of your communications strategy, integrated in a radon action plan.
 - Identify milestones

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Fifth step: Evaluate and improve your strategy

- Propose methods for evaluating the success of your communication strategy:
 - surveys you hope to carry out,
 - results you hope to see at certain dates,
 - number of measurement kits distributed,
 - responses you wish to receive from residents or media...
- Ensure that there is a definite way to gauge whether your strategy has failed or succeeded.
- Identify ways in which your strategy can be adapted to changing conditions
- Improve the strategy, if necessary.

23

What do we have to communicate?

- Why and where is the radon issue important for the residents.

24

What do we have to communicate?

- Why and where is the radon issue important for the residents.
- Risks to human health:
 - Effective dose (compare it with other doses)
 - Radon concentration
 - Risk for kids
 - Risk for smokers

25

What do we have to communicate? - Why and where is the radon issue important for the residents. - Risks to human health: - Effective dose (compare it with other doses) - Radon concentration - Risk for kids - Risk for smokers - Measurements? How does a radon measurement work? - A radon measurement is usually carried out by placing two small detectors, about the size of an air freshener, in your home for three months. - One detector is placed in a bedroom the other in a living room – the places most occupied by the homeowner and family. - Because they are measuring radon all the time, it is important to place the detectors in the rooms immediately and always within seven days. - After three months, when the detectors are returned to the laboratory, they are analysed to see how much radon they have been exposed to. - Once the results are known, a report is issued to the person who requested the measurement indicating the average level of radon in their home and advice on what to do next if it is a high result. Where can I get a radon measurement? - The EPA provide a simple and inexpensive radon measurement service for your home and for the workplace. - You can apply and pay through our online service. - Alternatively, you can download, print and fill in an application form for your home or workplace; and, depending on your payment method, post or take it to us. - Other companies also provide a measurement service. http://www.epa.ie/ 27	What do we have to communicate? - Why and where is the radon issue important for the residents. - Risks to human health: - Effective dose (compare it with other doses and communicate also uncertainties) - Radon concentration - Risk for kids - Risk for smokers - Measurements? - What to do with a result? (on the personal level, on the system level) - Possibilities of solving the situation - corrective actions (CA) and preventive measures (PM): - What do we mean by CA and PM? - What is not CA and PM? - What are principles for successful CA and PM? 28
The perfect strategy does not exist National radon communication strategy always depends on the actual situation in each country ↓ You have to develop your own strategy! 29	Conclusions 5 steps in strategy making: - Define your objectives - Identify the audience (stakeholders) - Develop messages, examples of text or graphics. - Select key communications methods/channels - Evaluate and improve your strategy - Communicate characteristics of radon and "how and what people can do, and why is this important". 30

7. Communication channels: Focus on the internet pages

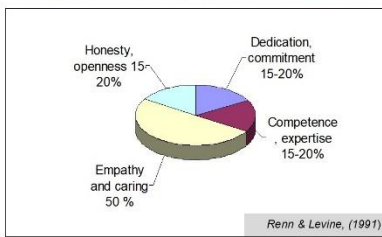


Communication channels: Focus on the internet pages

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 For successful <u>communication</u> you need to involve many communication <u>channels</u>, selected based on stakeholders <u>use in daily life</u> and your <u>available resources</u>.	 Your experiences with comm. channels? - Which communication channels could you use in optimal conditions? - Which communication channels could you use in optimal conditions? - Why can you not use some of the channels? Availabilities Practice Resources - limitations
 Communication channels Personal communication: Radon days, Home-visits for groups or families, Lectures, Info-evenings, Radon telephone line, Informative discussion (e.g. with local authorities), ... Informative material: Brochures, Leaflets, Advertisements (e.g. sponsoring public events) Mass Media: Newspapers – magazines, Internet pages, TV documentary series, Infotainment (e.g. Quiz) Social media channels: Facebook, Twitter, Blog, Other social networking	 Personal communication Face to face communication = the most effective, demanding and time and costs consuming type of communication. 
 How to do it? - Identify place and time based on your stakeholders availabilities. - Select people to communicate that are "culturally and geographically close" to the area with radon problem. - Train experts for public speaking. - Don't change main communicators during comm. campaign. - Listen to people's concerns. - Resolve people's concern. - Admit uncertainties, problems ... - Develop responsible relationship. Always add a personal touch.	 Personal communication and influence on trust  Renn & Levine, (1991)

How to do it?

- Identify knowledge, behaviour, needs and preferences of your stakeholders to be addressed in the informative material.
- Adopt the explanation to a stakeholder level (e.g. for kids, parents, construction workers...).
- Involve stakeholders in a development of the material.
- Distribute the material (the most expensive part).
- Update and improve the material after some time.
- Redistribution of the material.

Radon bulletin, Cz – periodical magazine

Special issues

<http://chemistry.about.com/od/elementquizcollection/f/bradonquiz.htm>

Social media

Requires proactive and constant involvement, continuation and engagement.

Radon on web pages

Attention to:

- Availability of radon information;
- Accessibility;
- Stakeholder interaction;
- Dialogue
 - responsiveness,
 - content / design for stakeholders
 - stakeholders addressed,
- Transparency/openness

Perko T. & Turcanu C. (Journal of Environmental Radioactivity, in submission., 2019)

Good practice: Availability of radon information

- Webpages of national and local authorities include radon related topics.
- A special, dedicated radon internet page is developed at national level.
- The internet page of the local community has a special radon sub-page.
- Radon information is clearly identified and all information is collected on one sub-page.
- The internet page includes outreach documents, such as brochures.
- National and local radon webpages are cross-linked.

Accessibility of radon information

capability of making websites accessible to a wide array of possible stakeholders, have equal access to information and functionality, regardless of their technical skills or possible disabilities

- Accessibility by mobile devices
- Personalized/customizable features
- Broken links

Good practice Stakeholder interaction

- Feedback forms and satisfaction questionnaire are included in webpages.
- Tools designed for collecting stakeholder questions and answers are on-line and open to all stakeholders, not only to residents.
- A stakeholder can follow radon-related discussions by broadcastings and can participate in Webinars related to radon.
- Information for direct personal communication about radon is available and inviting.
- New social media are integrated and encourage enhanced stakeholder engagement in radon issues (e.g. Facebook, Twitter, YouTube).

Responsiveness

"While it is important to have e-mail addresses available on websites, they serve no purpose unless someone actually reads and responds to the messages received"

A response should be:

- meaningful
- provide at least a requested information,
- address risk characteristics, for instance dread, controllability and familiarity.

Content and design for different stakeholders groups

If stakeholders cannot figure out where can they find the information, and what kind of information is available on www, they become frustrated and quickly leave

- engaging website should be user-friendly
- and have a content that has an informational value and
- design that has a presentational dimension with a special attention to different stakeholder groups' needs, capacities, interests.

Radon is a health hazard with a simple solution.
Test. Fix. Save a Life.

A customized message should engage with the www visitors and turn them into an active stakeholder.

Good practice Content for different stakeholders groups

- The organizational structure of the webpage is clear and easy-to-use.
- The webpage is user orientated and user-friendly.
- The webpage story is clearly structured around radon issues.
- The content is personalized and includes greetings for radon stakeholder.
- Different stakeholder groups have special sub-pages and designed content.
- Webpage is easy to learn.
- Basic radon information is easy to find: where to get self-radon test, how much the kit cost, where will be results published.

Transparency and openness www improve transparency and openness related to radon issues to a limited extent.

Tenders for labs for the radon analysis
National (draft) action radon plan
Financial documents related to radon action plan
The new BBS Directive
Other national legislative documents
A radon mapping plan
Announcement where the radon mitigation activities are taking place

Good practice Transparency and openness

- The radon action plan is published online.
- Radon subventions and applications are published online.
- Tenders for radon mitigation activities are published online.
- Financial documents related to radon action plan are published online.
- The new Basic Safety Standards Directive is published on the webpage.
- National legislative documents directly or indirectly linked to the radon issues are easy to find.
- Radon mapping activities and plans are easy to find and follow.
- Mitigation activities are regularly and transparently reported.

Conclusions

What communication channels could you use for your communication about radon issues?

For successful communication
you need to involve many communication channels,
selected based on stakeholders use in daily life
and your available resources

8. Evaluation template for internet pages as communication tools

Evaluation criteria	Indicators	Coding	Result of the evaluation
Availability of the radon information on internet	Webpage of a national and local authorities includes radon related topics.	1=no internet page; 2= nothing related to radon; 3=only brochure or other pdf related to radon available; 4=dispersed radon information on different subpages; 5=dedicated radon internet page	
Accessibility	Design of the webpage is adapted to different mobile applications and devices (e.g. computer, smartphone)	1=mobile unfriendly; 2=mobile friendly	
	Personalized/customizable features:	GPS coordinates linked to radon prone areas: no (1), yes (2); Interactive radon map no (1), yes (2); Radiation measurements at place no (1), yes (2);	
	Number of Broken links (W3C validator)	Number	
<i>Stakeholder interaction</i>	Feedback forms and satisfaction questionnaires	no (1), yes (2)	
	Q&A	no (1), yes (2)	
	Broadcastings, webinars	no (1), yes (2)	
	Facebook, Twitter, YouTube, etc..	no (1), yes (2)	
Dialogue	Chat areas/message boards	no (1), yes (2)	
	Institutional email addresses	no (1), yes (2)	
	Email updates, newsletters	no (1), yes (2)	
<i>Responsiveness</i>	Response to the e-mail	Not received (1), received (2)	
	Time for the response	Number of working days	
	Information	Does not respond with the information (1); information included in the response (2)	
	Empathy	Not expressed (1); expressed (2)	
	Risk perception characteristics	Not addressed (1); addressed (2)	
	Social media plug-ins: User participation: possibilities	Post (1); follow (2)	

	Visitors, likes, followers and share for social media	Number	
Content and design for different stakeholders groups	Website story: jingle/tune, red-line, clear organization structure, easy-to-use navigation system, user-centred design	clear webpage story (1), some dispersed elements of a story (2), unclear or no story (3)	
	Personalisation	Not personalised at all (1), a bit personalised (2), personalised (3)	
	Different sub-pages for different stakeholder groups	no (1), yes (2) open category	
	Number of clicks: how easy is to learn where to get radon test; how much does the measurement kit cost; where to bring dosimeter; where will be results published	Number of clicks	
Transparency and openness	Tenders for labs for the analysis on-line; (Draft) national action radon plan on-line; Financial documents related to radon action plan published; The new Basic Safety Standards Directive on-line; Other national legislative documents on-line; Radon mapping plan online; Announcement where the radon mitigation activities are taking place on-line	no (1), yes (2)	

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