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WHAT DOES GERMANY THINK ABOUT RADIATION? 2025/26 Study

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1 Abstract

1.1 Background and Study Design

The most recent study, “What Does Germany Think About Radiation?” was conducted in 2025/26 as the fourth wave of the survey, following previous surveys in 2019, 2021/2022, and 2024. The goal was to assess the public’s knowledge, attitudes, and information needs regarding various types of radiation and associated risks. The findings are essential for developing targeted information and education initiatives, strengthening trust in government protective measures, and effectively protecting the public from the actual dangers posed by radiation.

The study included both qualitative and quantitative components; while the quantitative results allow for representative conclusions about the general population (ages 16 and older), the qualitative interviews aimed to uncover underlying attitudes, motivations, and thought processes. Using qualitative research methods, two focus groups and 40 individual interviews were conducted in October 2025. Transcripts were created for both the focus groups and the individual interviews and analyzed for content. Building on this and organized into analogous thematic blocks, a quantitative survey was conducted from January to March 2026, providing a representative sample of the German-speaking resident population aged 16 and older. The data are based on a telephone survey (CATI = Computer-Assisted Telephone Interview) among 2,032 individuals. The sample and survey method allow for a comparison of the results with those of the aforementioned previous studies. Because the start of the Iran War on February 28, 2026, coincide with the survey period of the quantitative survey, potential effects on response behavior from February 28, 2026, onward were taken into account in the data analysis.

This final report summarizes the results of both parts of the survey — that is, the qualitative and quantitative data — organized by thematic chapters.

1.2 Summary of Key Findings: General Section

The **spontaneous associations with the topic of radiation** collected at the beginning of the surveys **were diverse**. In the quantitative survey, radioactivity was the most frequently mentioned topic, accounting for 34 percent of responses. Thirty percent of respondents associated radiation with medical applications such as X-ray examinations, and 25 percent with the sun and light. The topic of cellular communications was spontaneously mentioned in 22 percent of cases, while electrical radiation spontaneously came to mind for 16 percent of respondents.

The **negative emotions — such as worry, fear, and uncertainty** — mentioned in 10 percent of cases in the quantitative survey were explored in greater detail in the qualitative analysis: some described a feeling of helplessness, since radiation is invisible and difficult to avoid. However, when asked a specific qualitative question about the positive aspects of radiation, many respondents also recognized benefits, for example in medicine, energy production, or in relation to vitamin D production through sunlight. Although mobile communications were sometimes associated with a sense of uncertainty and vague unease due to radiation, this rarely came to the forefront because of the simultaneous desire to use the technology. Overall, the assessment of radiation depended heavily on the context, with dosage being considered the decisive factor.

Analysis of the qualitative data showed that understanding of radiation and its various forms was often **characterized by significant uncertainties and gaps in knowledge**. Many respondents described their knowledge as superficial, with some deliberately avoiding further information to prevent fears or manipulation. Some perceived a distorted information landscape and the spread of conspiracy theories related to radiation. This also led to differing assessments of whether the risks are generally underestimated or overestimated among the general public. Some tended to view the risks as overestimated, as they did not perceive any immediate effects of radiation, while others assumed the risks were underestimated due to the invisibility of radiation. Overall, there was a discrepancy between the awareness that one should inform oneself and the actual engagement with the topic of radiation. The topic

was often approached pragmatically, and individual perceptions of risks and protective measures varied greatly.

The majority of participants in the qualitative interviews reported that **radiation hardly plays any role in their daily lives**, a view partly attributed to self-protection mechanisms designed to prevent the development of unnecessary fears. Thoughts about radiation were usually triggered by external factors such as media reports or medical examinations, rarely by intrinsic motivation. Conversations about radiation were rarely reported and were often avoided in order to prevent conflicts, especially when there were differing opinions within one's family. Events such as incidents at a nuclear power plant entailed brief spikes in attention, which, however, quickly subsided. Quantitatively, the relevance of radiation was assessed by asking about participants' previous engagement with the topic. Here, a comparison with previous studies confirms the **trend toward less engagement with radiation-related topics** since 2019: The proportion of those who had never or only rarely considered radiation has risen steadily since the 2019 survey, from 53 to 62 percent.

Personal **concern about various radiation-related issues** was also measured quantitatively in the context of other health concerns. **Nuclear weapons and the danger posed by nuclear power plant accidents were the biggest sources of concern**: 70 percent and 66 percent, respectively, reported being (very) concerned about them. In the previous survey conducted in 2024, these two issues also ranked at the top, though in reverse order. In the ranking of the listed health concerns, several non-radiation-related risks—such as multidrug-resistant bacteria—preceded other radiation-related concerns. UV radiation from tanning beds was perceived as more concerning (32%) than that from sunlight (25%).

Between 20 and 24 percent of respondents felt concerned or very concerned about radioactive exposure from nuclear power plants during normal operation, radiation from cell towers, magnetic and electric fields from high-voltage power lines, and radiation from cell phones, smartphones, and tablets. Natural radiation from radon and radiation emitted by a microwave oven were cited as (very) concerning in 16 and 13 percent of cases, respectively, while radiation from air travel and radiation in a medical context (X-rays, CT scans, MRI, or ultrasound examinations) were stated in nine to eleven percent of cases. Overall, the ranking of these criteria in terms of concern was similar to that of 2024.

In the qualitative survey, respondents' **assessments of their ability to protect themselves from radiation varied depending on** the specific type of **radiation**. Respondents felt they had the greatest ability to influence protection measures regarding sun protection, followed by mobile communications and Wi-Fi. In contrast, they considered their own ability to protect themselves to be limited when it came to medical examinations and radioactivity.

Sun protection behavior was surveyed in detail in the quantitative study. 81 percent stated that they always or at least sometimes avoided prolonged exposure to the sun; 73 percent reported using sunscreen at least sometimes; and 66 percent wore sunglasses. These percentages have remained at roughly the same level since 2024. According to their own reports, 64 percent wore head coverings at least sometimes, **and** 45 percent wore long clothing for sun protection. Although **43 percent (four percentage points less than in 2024) of respondents stated that they had not only heard of the UV index but also understood its significance, only 24 percent** checked the daily UV index value **always or sometimes**.

In the qualitative interviews, **attitudes toward sunscreen varied greatly from person to person**. Convenience and concerns about ingredients were cited as barriers. Personal experiences with skin cancer or sunburn influenced sun protection behavior, as did attitudes toward tanning — which some viewed as attractive, while others considered it harmful. Quantitatively, the polarizing attitude toward tanning caused by UV radiation was confirmed: 28 percent considered it (somewhat) healthy, while 45 percent disagreed or strongly disagreed.

In the qualitative survey, respondents frequently considered protective measures against cell phone radiation, but at the same time had doubts about their feasibility due to the ubiquity of the technology and the subjectively unacceptable restrictions that would result from completely avoiding it. 19 percent of respondents in the quantitative survey had **already taken measures to protect themselves from cell phone**

radiation, with keeping a distance (at night) being the most frequently cited measure. In the case of cell towers and high-voltage power lines, protective measures were less common (4% and 6%, respectively) and were mostly limited to maintaining a safe distance. Some respondents' choice of place of residence was influenced by proximity to potential radiation sources, with distance from high-voltage power lines being cited more frequently (10%) than distance from cell phone towers, nuclear power plants/nuclear research facilities (7% each), or radon deposits (3%).

In **the medical field**, the qualitative results indicate a **broad underlying trust in protective measures initiated by physicians**, with **respondents** largely leaving the decision regarding examinations to medical professionals. Perceptions of the necessity of radiation exposure varied by medical specialty, with X-ray examinations at the dentist's office being viewed most critically. Quantitatively, the majority (58%) emphasized that the final decision regarding a radiation-exposing examination rested with them.

The qualitative survey addressed **information-seeking behavior** as well as passive and active sources of information on the topic of radiation. The results show that knowledge about radiation was **mostly** acquired **passively** through traditional media such as news broadcasts and documentaries, as well as increasingly through social media and influencers (for example, regarding health-conscious lifestyle topics such as UV protection). School education primarily covered the physical fundamentals of radiation in general as well as radioactivity in particular, while parental guidance emphasized specific behaviors, particularly regarding UV protection. Active information-seeking was often triggered by chance encounters with information, product research, or events such as accidents at nuclear power plants.

The qualitative respondents described their search for information as **predominantly digital**, often by means of search engines, Wikipedia, or AI tools such as ChatGPT; for medical topics, healthcare professionals and personal networks were also important sources of information. Digital sources were viewed more critically than traditional ones, as respondents believed there was a risk of misinformation and conspiracy theories, particularly on social media. The respondents emphasized the need to verify information from various sources and placed importance on reliability and citations. During the qualitative interviews, many realized that they had not been sufficiently informed up to that point. They expressed a desire for more factual information from trustworthy sources, but at the same time described the distinction between credible and unreliable information as a difficult challenge.

Although **government and scientific institutions** were generally met with broad trust in the qualitative interviews, they were **rarely actively used to gather information**; rather, they were perceived primarily through search results or as sources in the media. Among those mentioned were the WHO, the RKI, the Fraunhofer Institutes, and the BfS, as well as government agencies and ministries in general. However, the image of government agencies is shaped by ambivalence stemming from experiences during the COVID-19 pandemic and perceived political entanglements. Some participants in the qualitative interviews expressed skepticism regarding the neutrality of scientific studies and feared that government agencies might rely on outdated methods or lack transparency. The communication from government agencies is criticized in part as downplaying the situation and in part as scaremongering.

The quantitative survey revealed that the **Federal Ministry for the Environment (BMUKN)** was **the best known**: 86 percent were familiar with it, at least by name. The Federal Office for Radiation Protection (BfS) was known to 69 percent, at least by name, and the International Atomic Energy Agency (IAEA) to 63 percent. The Radiation Protection Commission was known to significantly fewer people, at 45 percent.

The quantitative results showed that the public generally feels **better protected than informed by government radiation protection agencies**: 46 percent of respondents felt (very) well protected, but only 33 percent felt (very) well informed. This finding has been consistent across all previous studies since 2019. However, in 2026, compared to 2024, both the sense of protection and the sense of being informed had declined (46% vs. 52% in 2024 and 33% vs. 40% in 2024, respectively). Not only did the subjective sense of being informed increase, but so did the sense of being protected, in proportion to the extent to which respondents reported having already engaged with the topic of radiation prior to the survey: 61 percent of

those who had already dealt with radiation extensively considered themselves well or very well protected, compared to only 35 percent of respondents who had never dealt with radiation.

With regard to specific sources of radiation, respondents felt **most protected in the context of medical applications** (76% felt (very) well protected), while the sense of protection was lowest regarding radioactive materials in the event of an accident (39%) and UV radiation in tanning beds (34%). Above all, respondents wished for more transparent and understandable education and information, as well as the creation of more shaded areas in urban planning with regard to solar radiation.

The qualitative survey explored the image of the Federal Office for Radiation Protection in greater detail. Respondents **predominantly** held **a positive view of the BfS**, based on its government affiliation, technical expertise, trustworthiness, and the establishment of reliable standards. There was a **desire for greater public visibility and more proactive communication from the BfS**, particularly through digital channels such as social media and apps, to raise awareness of radiation protection issues. Respondents emphasized the need for the BfS to maintain its scientific independence and objectivity in order to distinguish itself from misinformation and remain a credible source of information.

1.3 Key Findings on the Focus Topic of Protection Against Radiological Emergencies and Civil Protection

The term “radiological emergency” was defined for respondents as a scenario “in which radioactive materials are released into the environment at significantly elevated levels, such that there could also be impacts on human health and the environment.” Most respondents in the qualitative survey considered such an event **unlikely but emphasized that it could not be ruled out**. The comparison with the COVID-19 pandemic reinforced the perception that even unlikely events can occur. In addition to nuclear power plant accidents, war, sabotage, and attacks were also cited as possible triggers, although nuclear weapons were considered rather unlikely. Proximity to nuclear power plants and current geopolitical events heightened the perceived threat level. Some respondents expressed misconceptions about radiological risks, for example, mistakenly linking them to solar radiation.

Thoughts of a radiological emergency were **hardly present in the daily lives** of the qualitative respondents, and when this was the case, these thoughts were triggered by news reports or specific events. Many displayed fatalism or a tendency to avoid the topic in order to stave off fears. What was striking was the discrepancy between the low relevance of the issue in daily life and the high level of concern when the topic was consciously addressed. For instance, high levels of agreement were measured regarding concern about current conflicts and wars around the world (68%), an incident at a nuclear power plant that might be triggered by such events (60%), and the possible use of nuclear weapons (60%). Fear of an incident at a nuclear power plant that could also affect Germany is less pronounced but has risen since 2024 (41% compared to 35% in 2024).

In terms of both quality and quantity, the majority felt unprepared for a radiological emergency and was unsure of how to respond. 41 percent of those surveyed in terms of quantity stated that they **had absolutely no idea what to do in an emergency**; another 22 percent said they were **somewhat** unsure. Even among the remaining respondents — those who had indicated they had an idea of how they would behave in an emergency — 22 percent were unable to provide a spontaneous answer when asked about specific actions, while 32 percent stated that they would not leave their homes, would seek shelter in the basement if necessary, or would in any case avoid staying outdoors. Other behaviors mentioned — with unprompted response rates ranging from 11 to 19 percent (among those who had an idea of how they would behave in an emergency) — included seeking information (from authorities, the media, the radio, or warning apps), taking medication (especially iodine tablets), keeping a safe distance from or fleeing the danger zone, and seeking shelter in safe rooms. The qualitative analysis puts the likelihood of these behaviors being carried out into perspective: It also revealed many gaps in knowledge, such as regarding suitable sources of information, the availability and dosage of iodine tablets, or the availability and locations of shelters. Many respondents in the qualitative survey emphasized the importance of clear

instructions and organization by government agencies, while others expressed a sense of helplessness and anticipated a possible breakdown of public order.

The quantitative results regarding the assessment of **civil protection** show that, while a large proportion (46%) of the population **trusted that the government would immediately implement all necessary measures in the event of a radiological emergency, only 22 percent believed that Germany was well prepared for such an emergency**. Consistent with this, doubts about the coordination and efficiency of the authorities in an emergency were frequently expressed in the qualitative interviews. A lack of preparedness, inadequate shelters, and concerns regarding the implementation of emergency plans were frequently cited. Differing assessments among respondents in the quantitative survey, depending on their reported prior engagement with the topic of radiation, suggest that while engaging with the topic of radiation generally led to a greater sense of protection provided by government institutions, it simultaneously resulted in lower trust in civil protection specifically in the event of a radiological emergency. For example, 29 percent of respondents who reported having never dealt with the topic of radiation prior to the survey believed that Germany is well prepared for a radiological emergency, compared to only 16 percent of those who had already dealt extensively with radiation.

The qualitative **requirements for communication** in the context of a radiological emergency included **centralized, consistent, and transparent information** from government sources. This information should be clear, understandable, and tailored to the needs of various target groups. In addition to traditional media, digital channels were also considered important. There was a desire for honest and open communication that also addressed uncertainties and risks.

The qualitative interviews revealed differing views on the appropriate timing of public information. While some participants considered early preparedness to be beneficial, others viewed it as alarmist. In contrast, the population-representative quantitative survey showed a clear preference for early information: a majority of 83 percent and 79 percent, respectively, supported the idea that the public **should be better informed about what to do in the event of a radiological emergency** resulting from an accident or a conflict/war in Europe. Drills were also supported by 65 percent. A smaller proportion — though still 23 percent — considered preventive information about radiological emergencies to be scaremongering.

1.4 Key Findings on the Focus Topic: Radon

The quantitative survey focused on the topic of radon. Without any prior explanation of radon, **roughly equal proportions of respondents** — 41 percent and 43 percent, **respectively** — **were certain they had heard of radon before and that they had not heard of it**. After radon was defined as “a natural gas that occurs in rocks and soil in varying concentrations, including in Germany” and the explanation that radon “accumulates in homes, especially in basements and lower floors, and at sufficient concentrations over a prolonged period can cause lung cancer,” the respondents’ subjective certainty regarding their familiarity with radon decreased.

Gaps in knowledge were evident both in general perceptions of radon and in knowledge about its occurrence: For example (before being informed about the definition of radon), only 56 percent of those who had previously stated that they had heard of radon knew that radon is a noble gas, while more than a quarter (26%) of the respondents mistakenly regarded radon as a heavy metal. While most respondents (78% of those who were familiar with radon without prompting) understood that radon occurs naturally in the soil, significantly fewer (41%) were aware of the possibility of radon in basements. In contrast, 12 percent believed that high concentrations of radon occur on the upper floors of buildings. Forty-five percent did not know whether they lived in an area with elevated radon levels, even though they had previously indicated that they had heard of radon.

Only 22 percent of respondents who were aware of radon had actively sought information on the topic. The internet and school/work settings were the most common sources of information. A small proportion had obtained information through traditional media such as newspapers or television. The Federal Office

for Radiation Protection was cited as a source of information by only one percent of those who had previously sought information on radon.

Less than half (46%) of those familiar with radon knew that radon concentrations can be measured in buildings, but only a small percentage of them (5%) had already conducted or planned a radon measurement. However, 13 percent of respondents who were generally aware of radon testing in buildings reported having conducted such a test in a private or professional setting.

1.5 Summary of Cross-Study Age and Gender Differences

The quantitative results highlighted some typical response patterns by age and gender. For example, on various topics, **younger people** tended to be **better informed** than older ones: The proportion of those who admitted to never having considered radiation before the survey increased with age (up to age 29: 16%; age 65 and older: 37%). Consistent with this, younger respondents up to age 29 felt significantly more frequently that they were well or very well informed by government institutions (45% compared to 29–32% in the other age groups), and the subjective sense of protection provided by government radiation protection agencies also decreased with increasing age (up to age 29: 58%, 65 and older: 34%). Specifically regarding the UV index, older respondents aged 65 and over reported significantly more often than younger age groups that they had never heard of it (47% compared to 18–25% in the other age groups).

A contrasting trend emerged regarding **radon**: here, **awareness increases with age** (up to age 29: 28%, 65 and older: 51%), although it should be noted that this trend decreases significantly after the explanation of the definition of radon. Among those who were familiar with radon, respondents aged 50 and older were more confident regarding whether they lived in an area with elevated radon concentrations (59–60% compared to 48–51% in the other age groups) and were specifically more likely to assume that they did **not** live in such an area.

Younger respondents up to age 39 **were more likely to favor preventive information regarding a radiological emergency**: 17% and 18%, respectively, wanted to be informed only if a radiological emergency actually occurred, but not beforehand, in contrast to 43% among those over 65.

Across all topics, there were also different response patterns between men and women with regard to gender. **Women generally** expressed **greater concern and felt less well-protected than men**. Women's higher levels of concern extended to both radiation-related and non-radiation-related health issues. The difference was particularly pronounced regarding concern about nuclear weapons (81% (high) concern among women vs. 59% among men). Consistent with this, women generally felt less well protected by government radiation protection agencies than men (43% vs. 50% among men). In the focus area "Radiological Emergency," women's greater concerns and lower sense of protection are reflected in their lower confidence in Germany's preparedness for such a radiological emergency (18% vs. 27% among men).

Both with regard to radiological emergencies and the topic of radon, **men assessed their own knowledge higher than women did**. Men were more likely to be certain that they had already heard or read something about radon (46% vs. 35% of women), were more likely to actively seek information about radon (25% vs. 18% of women, within the group of those who were familiar with radon), were more likely to know that radon levels inside buildings can be measured (49% vs. 43% for women, respectively, within the group of those who were aware of radon), and expressed greater confidence when asked whether they live in an area with elevated radon levels (58% vs. 52% for women, respectively within the group of those who were aware of radon). With regard to a radiological emergency, 25 percent of men — significantly more than women (10%) — stated that they knew what to do in such a case. Even within the group that stated they knew what to do, interesting gender differences emerged: Significantly more women spontaneously mentioned that they would stay at home and avoid going outdoors in an emergency (38% compared to 28% of men), while men were more likely than women to think about moving away or evacuating (14% compared to 9% of women).

Furthermore, there was a general **difference in preferences and areas of interest regarding various radiation-related topics between men and women**. When asked about spontaneous associations with radiation, women were more probable to think of medical topics (32% vs. 28% of men), cell phones (25% vs. 19% of men), and the sun/light (27% vs. 22% of men), while men were more likely to associate radiation with radioactivity (40% vs. 29% of women). Women were more likely to have already taken protective measures to shield themselves from cell phone radiation (22% vs. 16% of men). The topic **of sun protection** also **played a greater role for women**: They placed more importance on sun protection measures, particularly sunscreen and sunglasses, and were more consistent in using them: 60 percent of women reported “always” using sunscreen, compared to only 30 percent of men; for sunglasses with UV protection, 50 percent of women reported “always” using them, compared to only 38 percent of men. In addition, 31 percent of men — significantly more than women (26%) — mistakenly believed that a tan caused by UV radiation had a positive effect on health.

2 Study Design

2.1 Research Design of the Overall Study

The survey conducted as part of the study “What Does Germany Think About Radiation?” 2025/26 is divided into two phases, each with a different methodological approach:

- **Qualitative Survey**: Open-ended questions are asked using semi-structured interview guides and subsequently analyzed using content analysis. This method is suitable for investigating opinions, motivations, and thought processes.
- **Quantitative Survey**: A large, representative sample completes a structured questionnaire with predominantly predefined response options. This method allows for reliable conclusions to be drawn about the population (in this case: the entire population aged 16 and older in Germany).

The results of the qualitative survey served, on the one hand, as the basis for formulating questions and hypotheses for the quantitative survey; on the other hand, the representative data from the quantitative survey can also be enriched with qualitatively collected background information (for example, regarding the motives and attitudes underlying the responses).

After the analysis of the qualitative component was completed, the results were summarized in an interim report. In this final report, the results are not presented sequentially according to Work Package 1 (WP1, qualitative survey) and Work Package 2 (WP2, quantitative survey), but are integrated into chapters organized by content. This final report is the English translation of the original German report.

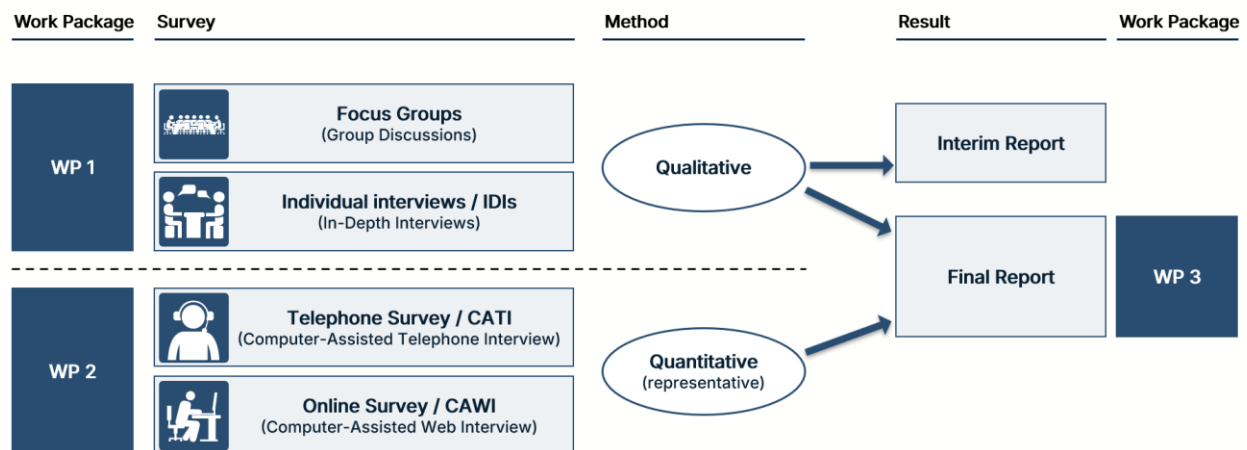


Fig.1 Research design of the overall study

2.2 WP1: Qualitative Survey

The qualitative survey component consisted of focus groups, which are particularly well-suited for identifying group dynamics and social aspects, and qualitative individual interviews, which are primarily used to explore individual levels of knowledge, attitudes, behaviors, and concerns.

2.2.1 Focus Groups

The focus groups took place on October 9, 2025, in a dedicated group discussion room at the m-s Test Studios, located in the heart of downtown Nuremberg. The first group consisted of six participants, the second of eight, with one moderator in each group. Both focus groups lasted 90 minutes.

Participants were recruited using a comprehensive screening questionnaire. The requirements for participation were as follows:

- Age range 18 to 75 years
- No professional involvement in market research or marketing industries; no medical professionals in the fields of radiology or dermatology; no direct professional connection to the topic of radiation
- No participation in a group discussion, survey, or other study on “radiation” in the past 12 months

To represent as broad a cross-section of the population as possible, quotas were also applied based on the following criteria, and a balanced mix was sought:

- Age, gender, place of residence (city/suburbs), housing situation (apartment/house, rent/homeownership), household size/children under 18 in the household, marital status, immigrant background, educational attainment, employment status, background in the natural sciences, net household income
- Health awareness, risk awareness, interest in technology, subjective level of knowledge regarding radiation-related topics, outlook on life / life satisfaction — each assessed via a battery of items with response options on a 6-point scale

Quota sampling and stratification based on the criteria listed above were applied equally to the recruitment of both focus groups to ensure groups with maximum diversity, a broad range of opinions, and discussions that were as dynamic as possible.

2.2.2 Individual Interviews

In addition to the focus groups, 40 IDIs (in-depth interviews) took place between October 6 and 21, 2025. The average interview duration was 61 minutes, with a maximum of 79 minutes and a minimum of 43 minutes.

Conducting the interviews via video chat allowed for a distribution of respondents' places of residence across the entire Federal Republic of Germany, including a spread across different population size categories. The following table shows the distribution of other important demographic characteristics of the respondents.

Table 1 Distribution of Demographic Characteristics in the Sample of Individual Interviews

		n	In percent
Gender	Male	20	50.0
	Female	20	50.0
Age group	Up to 29 years	6	15.0
	30–39 years	12	30.0
	40–49 years	11	27.5
	50–59 years	5	12.5
	Over 59 years	6	15.0
Children under 18 in the household	Children	15	37.5
	No children	25	62.5

As with the focus groups, participants in the individual interviews were excluded if they worked in market research or marketing, as healthcare professionals in radiology or dermatology, or had a direct professional connection to radiation-related topics. In addition to the characteristics listed in Table 1, quotas were also applied and the distribution of these variables was controlled for based on housing situation (apartment/house, rent/homeownership), household size, marital status, migration background, educational attainment, employment status, background in the natural sciences, and net household income. The same applies to the battery of items already discussed in the “Focus Groups” section regarding health awareness, risk awareness, interest in technology, subjective level of knowledge about radiation-related topics, and outlook on life/life satisfaction.

2.2.3 Analysis of Qualitative Data

Transcripts were created for both the focus groups and the individual interviews and analyzed using content analysis. The analysis and evaluation followed the **Grounded Theory** approach — a qualitative

research paradigm that aims to develop theories from the collected data, meaning it does not start from existing theories but rather anchors them “on the ground” (Ground) of empirical reality. This led to the identification of thematic clusters that were similar to, but not identical with, the questions and overarching sections of the discussion guides.

Based on these thematic clusters, the interview content was categorized and synthesized — generally independent of the point at which it was actually addressed in the focus group or interview. However, the course of the discussion up to that point was taken into account, so that it remains clear whether the respective content was expressed by the respondent spontaneously or only upon request, or — in the case of the focus groups — in response to statements made by other participants or the moderator. Subsequently, the collected content was further synthesized for each thematic block; typologies based on the identified response patterns, attitudes, and motives were developed and summarized in this report.

2.3 WP2: Quantitative Survey

2.3.1 Hybrid Survey Design with a Focus on CATI

Like the qualitative survey component, the quantitative survey also consists of two modules: a telephone survey (CATI = Computer-Assisted Telephone Interview) and an online survey (CAWI = Computer-Assisted Web Interview). The CAWI survey was conducted for the first time in 2026 alongside the CATI survey. The primary goal was to compare the CATI and CAWI results in order to identify differences between the two survey methods and to assess the extent to which CATI surveys might be supplemented or replaced by CAWI surveys in the future.

Considering the fact that the previous studies, “What Does Germany Think About Radiation?” conducted in 2024, 2022, and 2019, were conducted exclusively by telephone, the results are only partially comparable to the 2026 CAWI results due to the different survey methods. The following sections on the study design therefore refer exclusively to the CATI portion of the survey. The presentation of results integrates qualitative and quantitative findings, with the latter **based solely on the CATI data**. An appendix containing the complete data from both the CATI and CAWI surveys is included in the original German report.

2.3.2 Sample

To ensure that the quantitative CATI survey provided a representative picture of the German-speaking resident population aged 16 and older and was comparable to the previous 2024 survey, the survey was based on the **ADM dual-frame telephone sample**. A proportional, multistage stratified sampling approach combining landline and mobile networks was chosen to fully cover the resident population. The selection basis was established using the methodology developed by Gabler/Häder (Center for Surveys, Methods, and Analyses e.V., ZUMA). It consists of all registered telephone numbers and additionally generated numbers.

For **regional control**, the data sets from the landline sample are enriched with additional information, in particular the eight-digit municipality code (GKZ). This code is unique for registered numbers; for the generated numbers, the estimated probability of their affiliation with one or more municipalities is provided. For mobile phone numbers, the distribution across providers is available as a stratification criterion. The assignment of municipality codes to telephone numbers enables territorial stratification of the population at the regional level. This is verified through dynamic municipality assignment during the interview.

The landline telephone samples drawn are household samples. For each household, the respondent is identified using the “last birthday” **method**, while for mobile numbers, it is always the person who answers the call.

With a target sample size of at least $n=2,000$, a **net sample size of 2,032 completed interviews** was achieved. The following table provides an overview of the most important demographic characteristics of the sample.

Table 2 Distribution of Demographic Characteristics in the CATI Survey Sample

		In percent (weighted)
Gender	Male	49
	Female	51
	Other	< 0.5
Age group	Up to 29 years old	18
	30–39 years	14
	40–49 years	16
	50–64 years	26
	65 years and older	27
Highest level of education	Elementary/middle school diploma (or equivalent)	31
	Middle School Diploma (or equivalent)	30
	Technical College Entrance Qualification (or equivalent)	7
	Abitur (or equivalent)	26
	Other (including those without a high school diploma)	6
State / Region	North (SH, HH, NI, HB)	16
	West (NW, HE, RP, SL)	35
	South (BW, BY)	29
	East (BE, BB, MV, SN, ST, TH)	20

2.3.3 Survey

The fieldwork was conducted by IM Field GmbH in its telephone studios in Leipzig and Röthenbach an der Pegnitz using the established and data-protection-compliant interview software INGRESS KeyIngress.

Before starting the interviews for this study, all interviewers received comprehensive training on the project. To **ensure quality** during the survey, silent monitoring (listening in on interviews and checking the interviewers' data entry), recording of selected interviews (provided the interviewees had explicitly consented), and ongoing supervision throughout the study were implemented. In cases of uncertainty or inaccuracies on the part of the interviewers, these were immediately pointed out, and the questions and/or

issues were resolved in one-on-one discussions following the interview. Isolated data entry errors were corrected immediately. The supervisors were available to the interviewers as points of contact throughout the entire field phase.

Prior to the main survey, a **pretest** with n=30 interviews took place from January 20 to 24, 2026. The pretest served to verify the methodological, content-related, and technical field suitability of the CATI survey in accordance with the ADM's quality standards. Specifically, the comprehensibility and neutrality of the questions, the functionality of the filter and branching logic, the interview duration, the respondents' acceptance of the questions, and the practicality in the field (feedback from the interviewers) were examined. For all of the points mentioned, the pretest yielded predominantly positive results or revealed no significant issues. The wording of a few questions was adjusted to improve clarity. For example, the item "I consider it scaremongering to provide information about how to behave in the event of a radiological emergency when one has not even occurred" was rephrased to "I consider preventive information about radiological emergencies to be scaremongering." For a few questions, respondents asked for clarification; for instance, there was a query about what exactly was meant by "drills" in the item: "The public should learn through drills how to protect themselves, even in the event of a nuclear weapons attack." The following note was added for the interviewers: "If asked: Drills in which people practice what to do in an emergency, similar to a fire drill." All adjustments made to the questionnaire as a result of the pretest are documented in a pretest report, which is available to the BfS.

The final questionnaire was divided into the following sections:

- Screening / Quota Sampling
- Associations with Radiation / Awareness of Radon and Nuclear Fusion
- Radiation Protection: Awareness of Government Institutions / General Sense of Information and Protection
- Health Aspects / Health-Related Concerns
- Radiation protection: Specific sense of protection and potential for improvement
- Focus Topic: Radiological Emergency
- Focus Topic: Radon
- Sociodemographics

The **main survey** was conducted between January 29 and March 11, 2026. The start of the Iran War on February 28, 2026, thus falls within the survey period of the quantitative survey. 150 of the 2,032 interviews were conducted on or after February 28, 2026. This is referenced in Chapter 3.6 (Results on the Focus Topic: Protection Against Radiological Emergencies and Civil Defense).

A restrictively programmed, high-performance sample management system (SMS) was used for the main survey. Among other things, this system controls the entire scheduling and callback management (by default, ten follow-up calls at different times and on different days). To minimize the number of gross contacts, processing existing appointments and previously used phone numbers always took priority over using new phone numbers.

The fieldwork was conducted in strict compliance with the data protection provisions of the GDPR as well as the guidelines of the ADM, the DGOF, and ESOMAR. No personal data was stored that would allow for the subsequent identification of interviewees. All interviews were conducted anonymously. Supervisors and interviewers were bound by data confidentiality obligations. The study data will be used exclusively for scientific analysis and will not be disclosed to third parties. Secure software systems with servers located in Germany were used.

The average **interview duration** of 24.4 minutes corresponded to the time allocated in the study plan and also to the duration of the previous survey, "What Does Germany Think About Radiation?" conducted in 2024.

2.3.4 Data Processing, Analysis, and Weighting

The collected data were continuously reviewed during the fieldwork period and again after the surveys had been completed, based on various methodological criteria such as plausibility, completeness, the scope of responses to open-ended questions, the proportion of “don’t know / no answer” responses etc. In the event of irregularities, the interviewers in question received additional training and intensive supervision, and the relevant interviews were excluded from the analysis.

Responses to open-ended questions were manually coded by an experienced project staff member. For questions that had already been asked in a similar manner in previous surveys (particularly the question about spontaneous associations with radiation), the underlying coding scheme was based on the previous year’s surveys, although additions to the coding scheme were explicitly permitted. For newly included open-ended questions, the coding scheme was redeveloped based on the responses provided.

After the survey was completed, the data were **weighted** using a two-stage procedure. The first step consisted of a design weighting. In a dual-frame survey, not all individuals have an equal chance of being included in the sample. A person who can be reached via both landline and cell phone can be included in the sample through both channels and thus has a higher probability of selection than a person who can be reached through only one of these channels. In addition, disparities in selection probabilities arise due to the number of available and working telephones in the household and the number of people in the household. Design weighting corrects for these differences by assigning a lower weight to individuals with a higher probability of selection and vice versa. The procedure follows the ADM standard approach for dual-frame studies.

To ensure that the sample accurately reflects the demographic structure of Germany, the data underwent a process known as structural weighting in a second step. This better aligns the distribution of sociodemographic characteristics — such as age and gender — with the actual demographic structure. This weighting step was also carried out in accordance with the ADM’s recommendations. The most recent Microcensus data, provided by the Federal Statistical Office, served as the basis for the target distribution. Specifically, the following variables were taken into account in the structural weighting: age and gender (a combined weighting was used for both characteristics), federal state, highest level of education, and size of the place of residence.

The weighted results were statistically analyzed and presented in cross-tabulations. The subgroups considered included age, gender, region (aggregation of federal states; see Table 2), household size, children in the household, educational attainment, size of the locality, and prior exposure to radiation. Percentages were rounded to one decimal place in the cross-tabulations but are presented without a decimal place in this final report. Differences between subgroups, such as men versus women, were tested for **statistical significance**. The differences marked as significant in the presentation of results are significant at the 5% level ($p < .05$).

2.4 Notes on the Presentation of Results

Since the following presentation of results collates qualitatively and quantitatively collected data into thematic chapters, the text will specify the data source (qualitative or quantitative/representative) for each specific result. For the figures, a corresponding note is included in the figure caption, and a tab labeled “Qualitative” and/or “Quantitative” appears in the upper-left corner of each figure. Findings labeled as qualitative are based on summarized results from focus groups and individual interviews.

For surveys using a scale, for example from 1 (very good) to 4 (not good at all), so-called “Top2Boxes” are often reported. These represent the sum of the two extreme values on the scale (in the example given, scale value 1 plus scale value 2).

Percentage values that do not add up to 100 percent per question are either due to the possibility of multiple responses or results from rounding. The latter also applies to the sum of percentage values for responses, such as Top2Boxes in scale-based surveys.

Direct quotes from the qualitative survey or from open-ended questions in the representative survey are presented in quotation marks and italics.

3 Results

3.1 Radiation: Knowledge, Perception, and Myths

3.1.1 Spontaneous Associations

In both the qualitative discussions and focus groups as well as in the quantitative interviews, participants were asked at the outset to openly share their spontaneous thoughts and associations regarding the topic of radiation. More than one-third of the respondents in the quantitative survey (34%) thought of the topic **of radioactivity**, which — as in the 2024 study — was the most frequently associated concept. Specifically, this primarily included thoughts about nuclear power plants (13%) or radioactivity in general (12%).

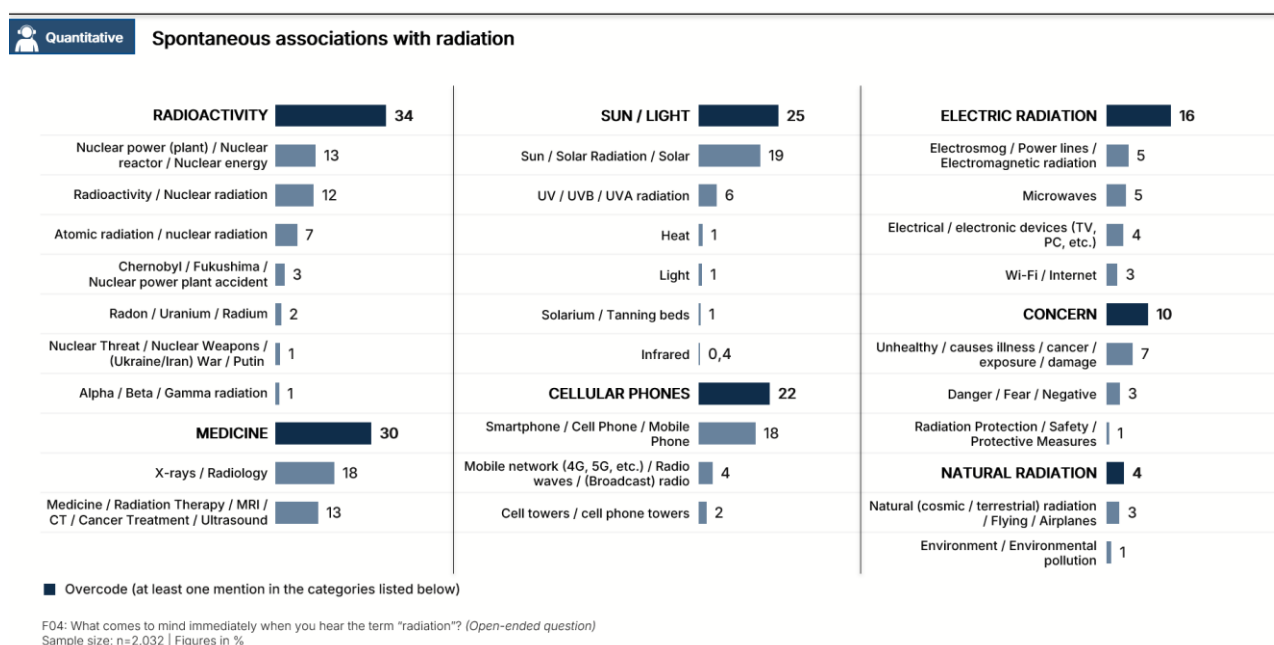


Fig.2 Spontaneous associations with radiation (quantitative)

In the qualitative interviews, participants were specifically asked about the emotional connotations of the spontaneous associations with radiation they mentioned; for example, when radioactivity was mentioned: *"How do you feel when you think of radioactivity? Does it trigger a positive or negative mood in you?"* In connection with the term "radioactivity", predominantly negative feelings were expressed. Thus, when used in the context of nuclear power plants, the term "radiation" rarely evoked thoughts of energy production, but rather of accidents such as those in Chernobyl or Fukushima, or of the transport and disposal of nuclear waste. The accidents at nuclear power plants — such as those in Chernobyl or Fukushima (3%) — or a nuclear threat posed by nuclear weapons or war (1%), which were generally associated with "radiation" in the quantitative survey, came more strongly to the fore in the qualitative analysis when respondents were specifically asked about the associated emotions, and in some cases triggered strongly negative chains of thought. Severe damage to health and genetic material, as well as long-term consequences for the environment and the uninhabitability of entire regions, were mentioned in

this context. Radiation from radioactivity was described as lethal or causing long-term contamination. Naturally occurring radioactivity and technical physics terms such as alpha, beta, and gamma radiation, on the other hand, were rarely mentioned, either quantitatively or qualitatively. In the qualitative survey, while participants occasionally recalled these terms from school or media reports, they were unable to explain them when asked.

30 percent of interviewees in the quantitative survey spontaneously mentioned topics related to the **medical field**, particularly X-rays (18%). The additional associations identified in the qualitative survey were ambivalent: While radiation itself tends to be perceived negatively, *it is “accepted”* for the overarching positive goal of diagnosis or cancer treatment. There were significant differences in knowledge regarding radiation exposure during various examinations or therapies. Although nearly all respondents knew that X-rays are more harmful than, for example, ultrasound examinations, their understanding of CT, MRI, and mammography — as well as the differences between these examinations and whether they actually result in radiation exposure for patients — was only partial. In isolated cases, radiation exposure was also mistakenly assumed to occur during diagnostic procedures such as EEGs, EKGs, and “nerve measurements” (NLG), or during chemotherapy. Ultrasound applications, laser treatments, and infrared radiation/lamps were predominantly classified as harmless, although some doubts were also expressed regarding these.

Twenty-five percent of the representative sample of respondents spontaneously associated the term “radiation” with **sun, light, or UV radiation**. Six percent specifically mentioned the term “UV” (or “UVA”/“UVB”) radiation, although the qualitative results suggest that, in most cases, only the terms themselves were known, not the underlying details. Associations with sunlight and UV radiation were also ambivalent among nearly all interviewees in the qualitative survey: On the one hand, they were perceived as natural and important for well-being and health (vitamin D production), but at the same time, they were associated with sunburn, skin aging, and skin cancer. Many emphasized that the dose of UV radiation determines whether it is beneficial or harmful and that there are regional differences, such as stronger solar radiation in southern vacation destinations. Several respondents thought of the ozone layer as a natural protection against solar radiation, even though some did not describe it as such; for example, one respondent referred to it as a *“protective shield surrounding the Earth”*. In this context, the term “ozone hole” was also mentioned, though opinions varied between a view of continuous deterioration or expansion of the ozone hole and a view that recovery has been underway since the turn of the millennium. Overall, many felt uncertain about precise terminology, effects, and how these phenomena can be measured in everyday life. Only one percent of interviewees in the quantitative survey spontaneously thought of tanning beds as a source of artificial UV radiation. When asked in the qualitative survey, tanning beds were predominantly viewed as critical or unnecessary.

When polled about radiation, 22 percent of the representative sample spontaneously thought of the topic **of mobile communications**, with mobile devices taking center stage at 18 percent of mentions, though mobile networks (4%) and cell towers (2%) were also mentioned. In the qualitative interviews, respondents often referred to their own subjectively perceived lack of knowledge or “half-knowledge” in this context. This leads to a vague sense of unease triggered in everyday life by media influences, the visible expansion of the 5G network, or the observation that their cell phone heats up during use or while on a call. The discrepancy with the simultaneous desire for everyday utility leads to the suppression of critical thoughts or to adopting a positive stance without engaging more deeply with the topic: *“Many people demonize it, but I’m not like that (...), because I also use all these devices and want to continue using them.”* The situation was similar with the expansion of mobile networks, particularly 5G, which emits radiation that was considered ubiquitous regardless of one’s own smartphone usage. Here, too, uncertainty about the exact mechanism of action and lack of clarity regarding radiation exposure shaped public sentiment. For example, people were unsure whether 5G results in higher radiation exposure for individuals or not, and whether living in close proximity to transmission towers is problematic or not. This was counterbalanced by broad support for a nationwide network, which led to an overall positive assessment of the network expansion.

About one in six people surveyed in the representative sample (16%) spontaneously thought of **electrical radiation** when asked about radiation. In addition to thoughts of “electrosmog,” power lines, and

electromagnetic radiation (5%), specific electrical appliances — particularly microwave ovens — were mentioned. Wi-Fi was mentioned spontaneously relatively rarely; in the qualitative interviews, it was often only when asked that respondents made a connection to the topic of radiation. Some interviewees stated that they turn off Wi-Fi at night, although this behavior appears to be more of a habit than a conscious effort to avoid radiation. Overall, there was also a great deal of uncertainty here regarding how to classify the radiation emitted by Wi-Fi.

The **analysis of subgroups** revealed, in some cases, significant differences in spontaneous associations with radiation. Older individuals aged 65 and over generally had fewer associations with radiation, while the youngest age group (16 to 29 years) mentioned radioactivity (41%) and the sun/light (35%) significantly more often. Mobile phone networks were most frequently mentioned by 30- to 49-year-olds (26% and 28%, respectively) and least frequently by respondents aged 65 and over (16%).

Significant differences were also observed by gender: While women were more likely to think of medical topics (32% vs. 28% for men), cell phone radiation (25% vs. 19% for men), and the sun/light (27% vs. 22% for men), men focused significantly more strongly on the topic of radioactivity (40%) than women (29%).

Regardless of the specific radiation-related topic, **generally negative feelings** such as worry, fear, uncertainty, and danger emerged even in the initial associations — reported by 10 percent of respondents in the quantitative survey. Some participants in the qualitative survey reported a general feeling of helplessness regarding radiation, since, on the one hand, little was known about it and, on the other hand, radiation is subjectively difficult to avoid or limit. Because of its invisibility, radiation was described as “insidious”. Interviewees also frequently mentioned radiation protection measures directly, such as not taking a cell phone into the bedroom, which further points to the aversive connotation of the term “radiation”.

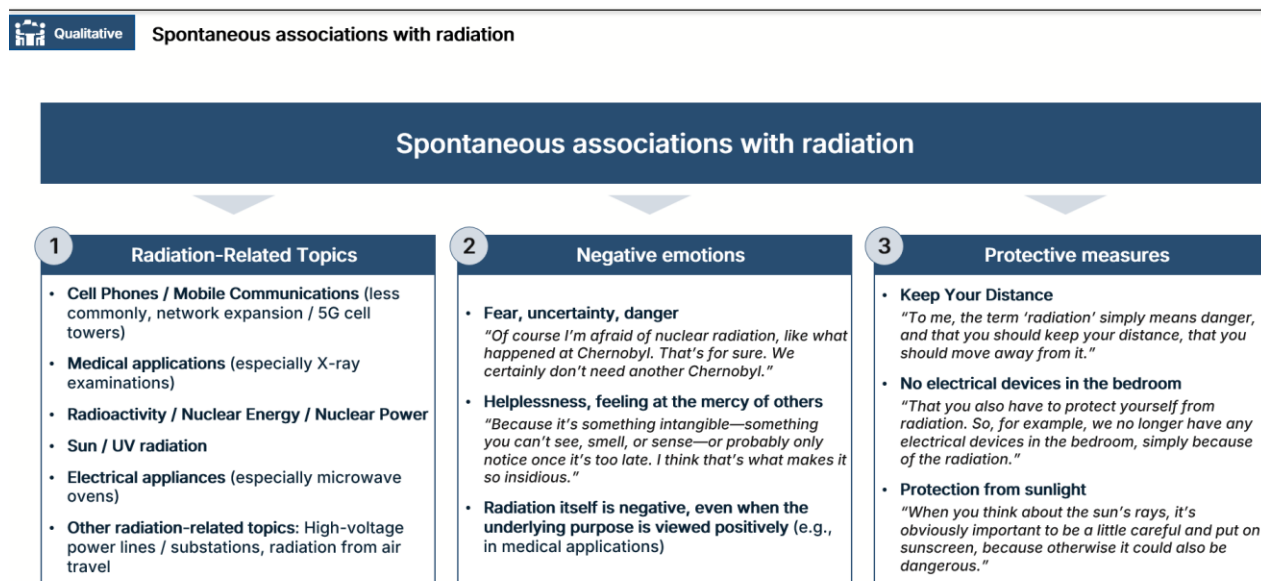


Fig.3 Spontaneous associations with radiation (qualitative)

3.1.2 Prior Knowledge and Relevance in Everyday Life

The **relevance of radiation-related topics in everyday life** was addressed in the qualitative survey. As was already evident in the 2024 survey, radiation continues to play virtually no role in the daily lives of most people. The limited engagement with the topic was partly attributed to self-protection. As one respondent stated: *"In everyday life, I don't worry about it too much; otherwise, I wouldn't be able to sleep peacefully."*

The low importance of radiation in daily life was also explained by the perception that individuals have little subjective control over their own radiation exposure. Nevertheless, respondents frequently added that people should pay more attention to the issue — and not wait until it is “*too late*,” meaning after potential long-term effects of radiation (such as skin cancer) have already occurred.

According to the participants themselves, thoughts about radiation were almost never triggered intrinsically, but rather resulted from external circumstances such as media reports, visible infrastructure (cell towers / high-voltage power lines), or upcoming medical examinations. Sunlight came to mind seasonally or in connection with an upcoming vacation. In some cases, people briefly thought about radiation when using smartphones, computers, microwaves, routers, or contactless payment systems, but in most usage situations, they did not.

According to the qualitative interviewees, radiation was also rarely a topic of conversation with others, and when it was, it was usually only briefly touched upon. Discussions often arise in specific situations, such as when applying sunscreen or using a microwave in the workplace with colleagues. Medical radiation is discussed specifically with doctors or within the family circle. Another occasion for a conversation about radiation is the purchase of a new electronic device, such as a microwave oven or a smartphone. Some people reported that they had only considered the radiation emitted by these devices and discussed it with others in the context of the purchasing decision, but not before or after that.

Several participants in the qualitative study spontaneously stated that they consciously avoided conversations about radiation with certain individuals because such discussions often led to arguments. These arguments typically centered on the extent of the danger posed by radiation or the necessity of protective measures, particularly regarding radiation from smartphones and sun protection. The respective conversation partners — who often had very close relationships with the respondents (spouses, siblings, children) — were accused of either taking an overly strict or an exaggeratedly carefree stance toward radiation, a conflict that was resolved through a pragmatic coexistence of differing opinions. Parallels emerge with discussions about COVID-19 safety measures, where the potential for conflict due to polarized views was also successfully mitigated by avoiding discussions on the topic altogether.

According to the participants, accidents at nuclear power plants such as those in Fukushima or Chernobyl, as well as the shelling of the Zaporizhzhia Nuclear Power Plant during the war in Ukraine, led to a temporary increase in thoughts and conversations about radiation and the dangers posed by nuclear power plants. Typically, while the prominence of the topic declined relatively quickly, it was repeatedly brought to mind by media reports, resulting in cyclical fluctuations in its subjective relevance. Some older individuals reported that the topic of radiation in connection with nuclear energy was significantly more relevant in the 1980s. In particular, they noted that the final disposal of radioactive waste was more omnipresent during that period than it is today.

In contrast, the relevance of the topic of solar radiation had increased at the time of the survey compared to earlier periods. Older respondents reported that they had given the issue less thought when they were younger. This also applied to artificial UV radiation in the form of tanning beds, which was described as a “youthful indiscretion.” Progressive climate change was cited as another reason for the increasing importance of the topic of solar radiation.

As part of the quantitative survey, interviewees were asked to assess the extent to which they had already **engaged with the topic of radiation** prior to the survey. Just as in 2024, 10 percent of respondents stated that they had already dealt extensively with the topic of radiation. However, the proportion of those who, by their own account, had never considered the topic was 29 percent — nine percentage points higher than in 2024 — while the proportion of those who had “considered it somewhat” fell from 31 to 28 percent and the proportion of those who had “considered it only a little” fell from 38 to 33 percent. In the longer-term time series, the trend toward less engagement with radiation was confirmed: The proportion of those who had never or only slightly engaged with radiation has risen continuously since the 2019 survey, from 53 to 62 percent (2019: 53%, 2022: 58%, 2024: 59%, 2026: 62%), while the proportion of those who had dealt with radiation a lot or somewhat fell accordingly from 47 to 38 percent.

When comparing the subgroups, it is striking that the proportion of those who had never considered radiation increases with age. Statistical analysis revealed significant differences in the youngest age group (up to age 29: 16%) compared to all other age groups, as well as a significantly higher percentage in the oldest group (age 65 and older: 37%) compared to the two youngest groups (up to age 39). Differences based on educational attainment were also significant: the higher the level of education, the more likely respondents were to already have considered radiation. In the group of individuals with a secondary school diploma, 46 percent reported never having considered radiation, while only 5 percent reported having considered it extensively. In contrast, among those with a high school diploma as their highest level of education, these proportions were nearly equal at 17 percent and 16 percent, respectively.

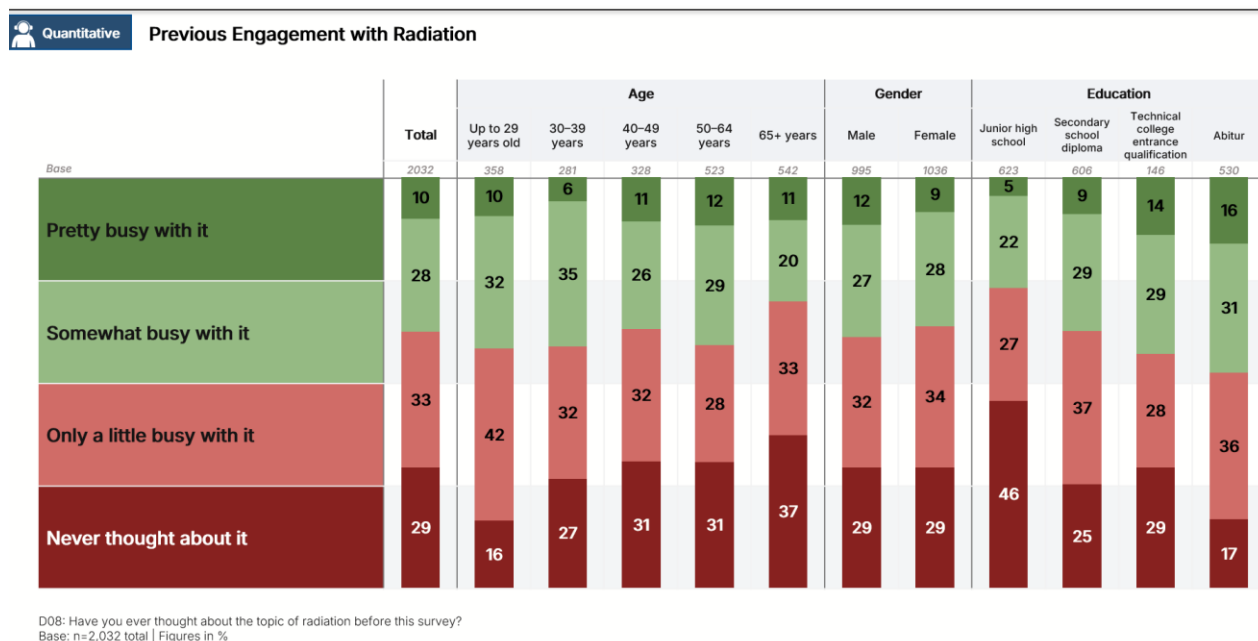


Fig.4 Previous engagement with radiation (quantitative)

The qualitative results provided background information on the relatively high proportion of participants who had not yet engaged with the topic of radiation, or had done so only to a limited extent: Participants often described their own knowledge as superficial; while they were familiar with the terms, the details and consequences remained unclear, and much of their understanding was marked by a high degree of subjective uncertainty. Personal experience and professional or educational connections provided some specific knowledge, but this remained limited. However, participants' assessments of their own limited level of knowledge varied: Some regretted their lack of knowledge, even expressing a certain sense of embarrassment due to their poor understanding, and resolved to inform themselves more in the future. Other participants, however, stated that they deliberately avoided seeking in-depth information in order to avoid uncertainty, fear, or even manipulation by fake news: *"I think I'm the kind of person who gets manipulated by weird stuff, and then I kind of flip out and start wearing aluminum foil hats. Or I panic and say, 'Oh my God, we have to shield our house now and we can't leave the Wi-Fi on anymore.'"*

Some qualitative interviewees perceived a distorted information landscape and a tendency toward conspiracy theories among certain population groups regarding radiation. An extreme example is the belief that hostile groups or the government are intentionally emitting radiation toward the population. These conspiracy theories were almost always viewed very critically or as absurd, but some respondents also admitted to being open to the theories, as they sometimes contained a grain of truth.

Prior knowledge specifically regarding nuclear fusion was also assessed as part of the quantitative survey: 61 percent of the total sample stated that they were certain they had heard or read something about

nuclear fusion at least once, while 19 percent each answered this question with “Yes, I think so” and “No”. Here, too, prior knowledge increased with a higher level of education. In addition, men were significantly more certain than women that they had heard or read something about nuclear fusion (66% vs. 56%).

Overall, both qualitative and quantitative results point to knowledge gaps and a need for information regarding the topic of radiation (see also Chapter 3.5.3 on the relationship between subjective perceptions of information and previous engagement with radiation).

3.2 Hazard/Risk Assessment and Individual Concern

3.2.1 Classification of Good/Useful vs. Bad/Dangerous Radiation

The qualitative survey also explicitly asked about **the positive aspects of radiation**. While respondents spontaneously cited mainly negative aspects of radiation, a more nuanced picture emerged when specifically asked about “good” vs. “bad” or useful vs. dangerous radiation: Benefits and risks were weighed against one another, and the overwhelming majority recognized advantages in nearly all radiation-related topics.

In the case of medical applications, nuclear power, and cellular communications, radiation was viewed as an unpleasant but necessary side effect of a goal generally considered to be of higher priority: Thus, diagnostics and therapy using radiation were regarded not only as useful but as a major medical advance. Regarding nuclear power, depending on their political views, some interviewees recognized electricity generation and security aspects as useful or significant, while others viewed these exclusively in a negative light — for example, in light of their preference for alternative energy sources. Mobile communications and the use of cell phones were regarded as an indispensable part of everyday communication.

In the case of solar/UV radiation, however, the positive effects of the radiation itself were emphasized: According to the participants, it was considered vital and played a decisive role, especially for well-being (*“When the sun shines, you just feel better.”*) The necessity of the sun for the body’s own production of vitamin D was also mentioned several times.

Even though the qualitative respondents recognized the positive aspects of radiation or viewed them as part of an overarching positive goal, radiation itself was predominantly assessed as **a health risk**, with the extent and specific symptoms depending on the type of radiation in question.

Positive Aspects / Benefits		Negative Aspects / Risks
Vital, well-being, vitamin D synthesis	Solar/UV Radiation 	Effects on the skin: sunburn, skin aging, long-term effects such as skin cancer
An indispensable component of modern everyday communication	Mobile Communications 	Non-specific health complaints: headaches, sleep disturbances, or general malaise
Useful and, in some cases, essential applications in diagnostics and therapy	Medical Applications 	Risks associated with excessive use (usually without being able to specify concrete consequences)
Power generation (nuclear power plants) Deterrence (nuclear weapons)	Radioactivity 	Severe damage to health and genetic material, long-term consequences for the environment and the habitability of entire regions

Fig.5 Most frequently cited positive and negative aspects of individual radiation topics (qualitative)

Overall, it was emphasized that radiation must be assessed based on the context and a situational cost-benefit analysis, and that *the principle “the dose makes the poison”* also applies to radiation.

3.2.2 Concerns Regarding Radiation-Related Topics

Quantitatively, respondents were asked about their personal concerns regarding various radiation-related topics, as well as other health concerns. The highest level of concern was expressed regarding nuclear weapons and radioactive contamination from nuclear power plants following an accident or incident. Measured using the Top2Box method (scores of 4 and 5 on a 5-point scale ranging from 1 = does not concern me at all to 5 = concerns me greatly), these two aspects were already at the top in the previous 2024 survey, though in reverse order (nuclear weapons: 70% in 2026 vs. 67% in 2024; radioactive contamination from nuclear power plants following an accident or incident: 66% in 2026 vs. 76% in 2024). Fear of a nuclear threat in the form of the use of nuclear weapons has thus increased over the past two years compared to fear of an accident at a nuclear power plant. However, the survey period must also be taken into account, as it included the start of the war in Iran (see Chapter 2.3.3); given the relatively small number of 150 interviews conducted from the start of the war, this had little impact on the overall figure (see also Chapters 3.6.2 and 3.6.4).

In the ranking of the specified health concerns, several non-radiation-related risks followed in both 2026 and 2024: multidrug-resistant bacteria in hospitals, food-related hazards, and air pollution from automobile traffic. At 32 percent, the criterion “UV radiation in tanning beds”—newly included in 2026—was perceived as more concerning than UV radiation from sunlight (25%). In 2024, an even higher level of concern was identified for UV radiation from sunlight (32% Top2Box), although anchoring effects from the newly added item on UV radiation from tanning beds may have played a role. This means that UV radiation from sunlight may have been rated as less concerning due to comparison with that from tanning beds.

Just under one in four interviewees (24%) expressed concern about radioactive exposure from nuclear power plants operating under normal conditions, while 20 to 21 percent each expressed concern about radiation from cell towers, magnetic fields and electric fields from high-voltage power lines, and radiation from cell phones, smartphones, and tablets. As was already the case in 2024, 16 percent of respondents reported feeling concerned about natural radiation from radon. Comparatively small proportions — between 9 and 13 percent — expressed concern about radiation from microwave ovens, radiation

encountered while flying, or radiation in a medical context (X-rays, CT scans, MRI scans, or ultrasound examinations). Overall, the ranking of these criteria in terms of concern was similar to that of 2024.

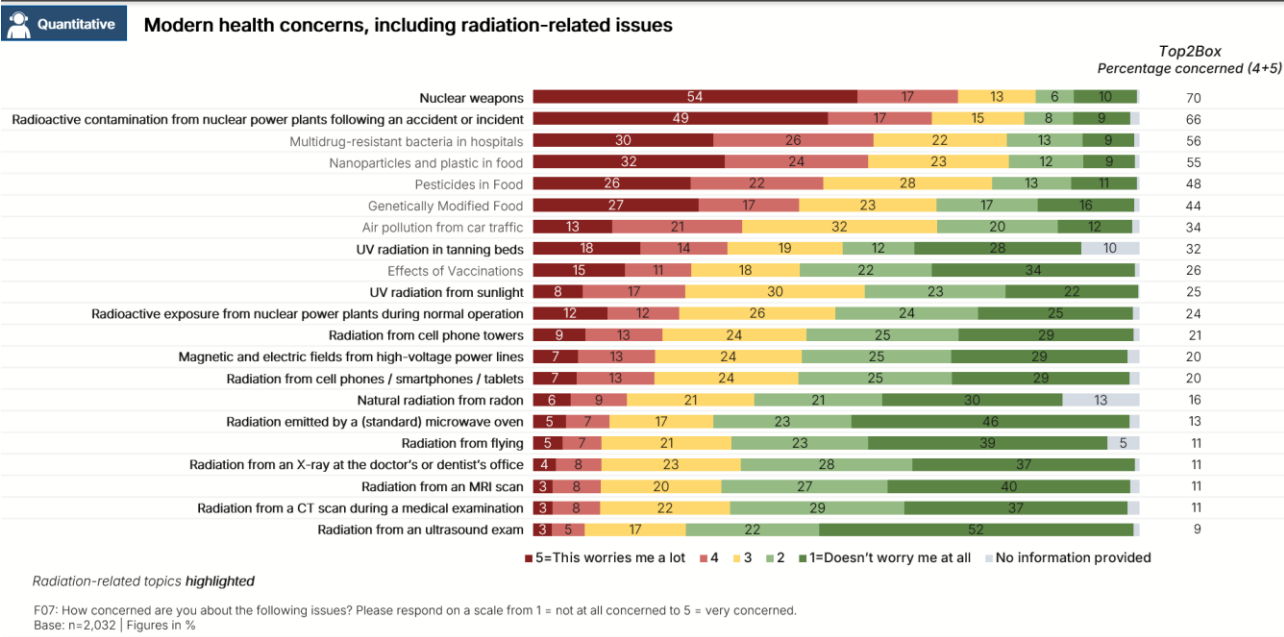


Fig.6 Modern health concerns, including radiation-related issues (quantitative)

Consistent with the 2024 results, **women** expressed **greater concern than men across all topics** — both radiation-related and non-radiation-related. With regard to radiation-related criteria, the differences are particularly pronounced when it comes to nuclear weapons. Here, 81 percent (Top2Box) of women expressed concern, compared to 59 percent of men, representing a difference of 22 percentage points. For radioactive exposure from nuclear power plants — both during normal operation and following an accident or incident — the difference is 12 and 10 percentage points, respectively; for UV radiation from tanning beds or sunlight, the difference is 10 and 9 percentage points, respectively. These differences are statistically significant. Slightly lower but still significant differences — ranging from three to seven percentage points — indicating greater concern among women compared to men were observed regarding radiation from cell phone towers, magnetic and electric fields from high-voltage power lines, as well as radiation from X-rays, CT scans, or MRIs. With a view to radiation from cell phones, smartphones, and tablet, natural radiation from radon, and radiation from an ultrasound examination, a microwave oven, or flying, only minor — and thus not statistically significant — differences of less than three percentage points were found between men’s and women’s levels of concern.

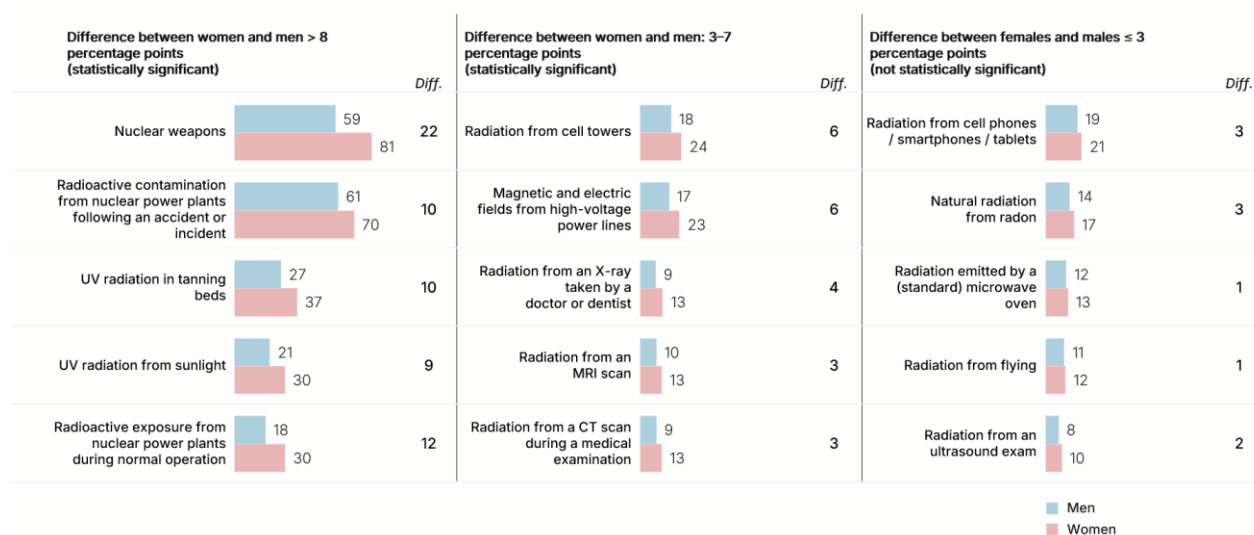


Fig.7 Concern regarding radiation-related health issues by gender (quantitative)

The qualitative results regarding the assessment of radiation-related risks revealed, on the one hand, a general sense of uncertainty among respondents, who often described their own knowledge of the subject as limited or incomplete, and, on the other hand, a risk assessment that varied greatly from person to person. This corresponded to differing assessments of whether the risks are generally underestimated or overestimated by the general public. Those who tended to believe the risks were overestimated cited, on the one hand, the lack of noticeable effects despite using cell phones or microwaves or despite unprotected sun exposure, and, on the other hand, relevant past experiences: *"In the 1990s, we had the ozone hole, and we were told that within—I think—ten years, the ozone layer would be completely eroded by CFCs, and that just by stepping outside, we would immediately get a fatal sunburn."* An underestimation of the risks was attributed to the invisibility of radiation and the general public's limited knowledge on the subject.

3.3 Precautionary / Protective Behavior

3.3.1 General assessment of protection options and personal protective behavior

Does the public see ways to protect themselves as individuals from radiation, or do they feel helplessly at its mercy? This question was explored in the qualitative interviews and led to different results depending on the radiation-related topic. Interviewees saw the greatest potential for individual influence in sun protection, followed by the area of cell phone radiation and Wi-Fi. In contrast, when it came to medical examinations and radioactivity, they judged their own protective options as limited. According to the respondents, this also influences individual responsibility — both in relation to oneself and in terms of expectations of others. For example, each person can be responsible for their own sun protection, but not for protection against radiation emitted by radioactive substances. With regard to children, parental responsibility was particularly emphasized, and, for instance, allowing a child to spend extended periods of time in the sun without protection was criticized as irresponsible behavior on the part of the parents.

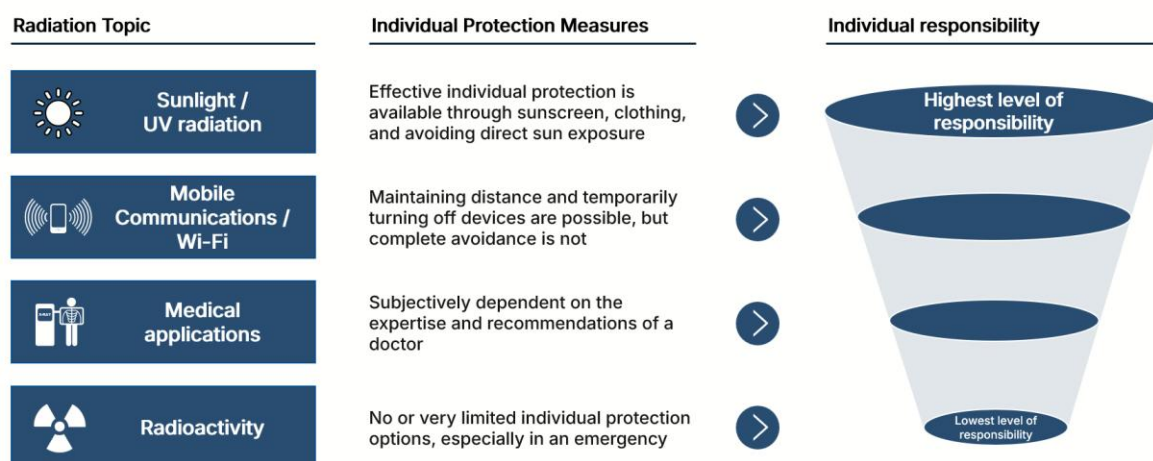


Fig.8 Protection options and the resulting attribution of responsibility (qualitative)

Maintaining distance from the respective radiation source, limiting exposure time, and avoidance in general were qualitatively mentioned as overarching individual protection strategies; however, complete protection appeared difficult to impossible, as radiation was perceived as ubiquitous.

According to the qualitative respondents, radiation protection was a low priority among the general public, and participants also rated their own protective behavior as rather low or nonexistent. This corresponds to the fact that, when it came to radiation, there was hardly any current personal distress that would make consistent protective behavior seem necessary. The lack of visibility of radiation, convenience, and conflicting goals (such as the desire for good cell phone reception) dampened the motivation to take protective measures.

Some participants in the qualitative survey reported incorporating simple protective or preventive routines into their daily lives without always being consciously aware that these were measures to protect against radiation—such as the routine use of sunscreen or wired headphones. Overall, occasional thoughts about radiation protection possibly being insufficient usually did not lead to a concrete change in behavior. A few interviewees generally rejected protective measures and expressed a fatalistic attitude toward the possible consequences of insufficient protection (*“If it happens to me, then that’s just bad luck”*).

3.3.2 Sun Protection Behavior

Before addressing specific sun protection measures, the quantitative survey measured **awareness of the UV index**, as it had in 2024. The results show a slight decline: While in 2024, 47 percent of respondents stated that they had not only heard of the UV index but also understood its significance, this figure dropped by four percentage points to 43 percent in 2026. The proportion of those who had heard of the UV Index but did not understand its significance, as well as those who were completely unfamiliar with the UV Index, rose slightly from 27 to 28 percent and from 26 to 29 percent, respectively.

Awareness of the UV Index varies significantly among different subgroups. In particular, older respondents aged 65 and older — at 47 percent — are significantly more likely to report never having heard of the UV Index. In younger age groups, however, the corresponding figure ranges between 18 and 25. Less than one-third (31%) of those aged 65 and older understand the significance of the index, while between 46 and 52 percent of younger age groups affirm this understanding. In addition to age, awareness of the UV index also

correlates with household size and, consequently, with the presence of children in the household. This is consistent with the results of the qualitative survey, in which parents reported particularly consistent sun protection practices regarding their children (although they did not explicitly refer to the UV index in that context). As expected, awareness of the UV Index also increases with higher levels of education: It was completely unknown to 45 percent of those with a secondary school diploma, 25 percent of respondents with a high school diploma, and 17 percent each of interviewees with higher educational qualifications. There are no significant differences in awareness of the UV Index by gender.

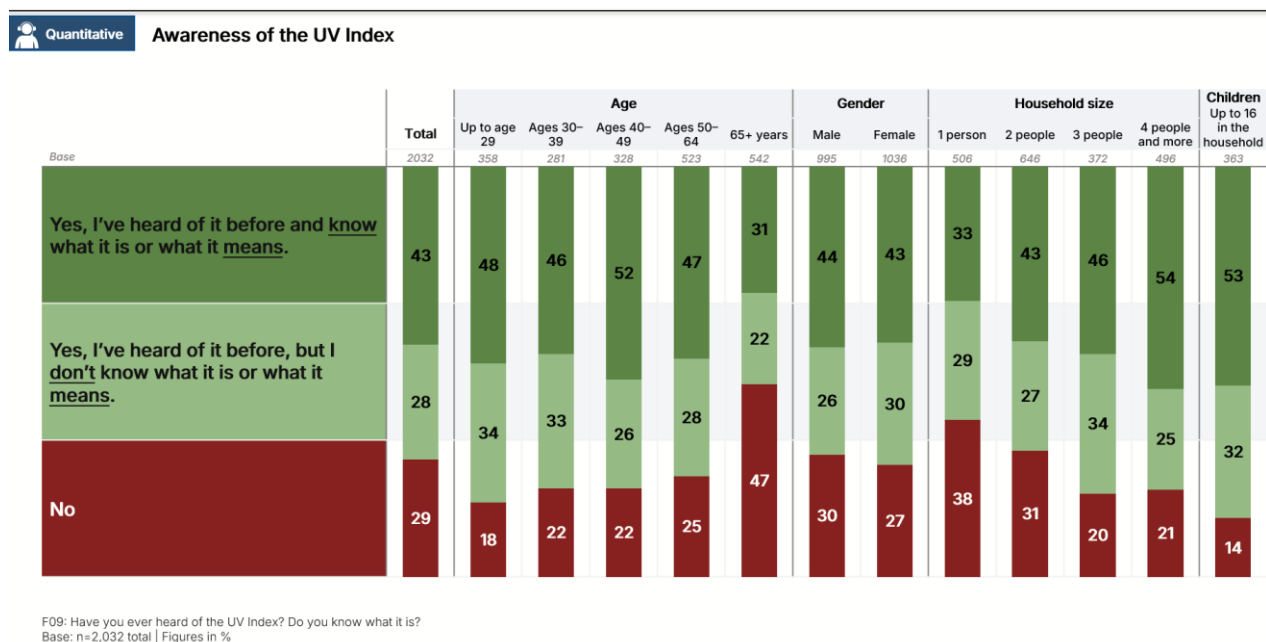


Fig.9 Awareness of the UV Index (quantitative)

Awareness of the UV Index — or knowledge of its significance — did not necessarily lead respondents to check the daily value. According to their own statements, 8 percent always did so, 16 percent sometimes, 12 percent rarely, and 63 percent never. These figures remained virtually unchanged — or showed only minor variations — in both the 2024 and 2022 surveys. Specifically, 7 percent reported always checking the daily UV Index in both 2022 and 2024. Accordingly, 61 percent never checked it in 2024, and 64 percent never checked it in 2022.

The differences among subgroups regarding information about the UV index are similar to those regarding awareness of the index in terms of household size and educational attainment: 78 percent of respondents with a secondary school diploma stated that they never check the UV index, a significantly higher proportion than among those with a middle school diploma (61%), a technical college entrance qualification (49%), or a high school diploma (53%). Among interviewees who live alone, 74 percent never check the UV index — a figure that is also significantly higher than in multi-person households (two people: 62%, three people: 63%, four or more people: 55%). Accordingly, respondents from households with children aged 16 and under were significantly less likely to report that they never check the UV index (55% compared to 65% in households without children).

The picture is more nuanced when it comes to age and gender. In terms of age, the youngest group — those up to age 29 — stood out in particular, with 18 percent stating that they always check the current UV index. The corresponding figure for older age groups ranges between four and eight percent, which is significantly lower. With regard to gender — where no differences in awareness of the index were observed — the extent to which people checked it, however, varied considerably: Women reported significantly

more often that they always (10% compared to 6% of men) or at least sometimes (19% vs. 12% of men) check the daily UV index.

In addition to information about the daily UV index, **other aspects of sun protection behavior** were also surveyed quantitatively. Between 44 and 45 percent of respondents reported that they always avoid prolonged exposure to the sun, apply sunscreen or sun spray, and wear sunglasses with UV protection. Only 37 percent “sometimes” did so when it came to avoiding prolonged exposure to the sun, 27 percent when it came to using sunscreen or sun spray, and 22 percent when it came to wearing sunglasses with UV protection, resulting in a Top2Box (sum of “Always” and “Sometimes”) of at least two-thirds (81% / 73% / 66%). This was also the case in the 2024 and 2022 surveys, although in 2022, fewer interviewees reported avoiding prolonged exposure to the sun compared to the more recent surveys (75% compared to 81% and 82% Top2Box), but more used sunscreen or sun spray (77% compared to 73% Top2Box). Slightly more often than in 2024, respondents reported always or sometimes wearing a hat when out in the sun (64% compared to 59% in 2024; this item was not included in the 2022 survey). At 45 percent, the proportion of those who always or sometimes wore long clothing for sun protection was lower compared to the other sun protection measures mentioned. This was also observed in 2024 and 2022 (48% in 2024, 46% in 2022).

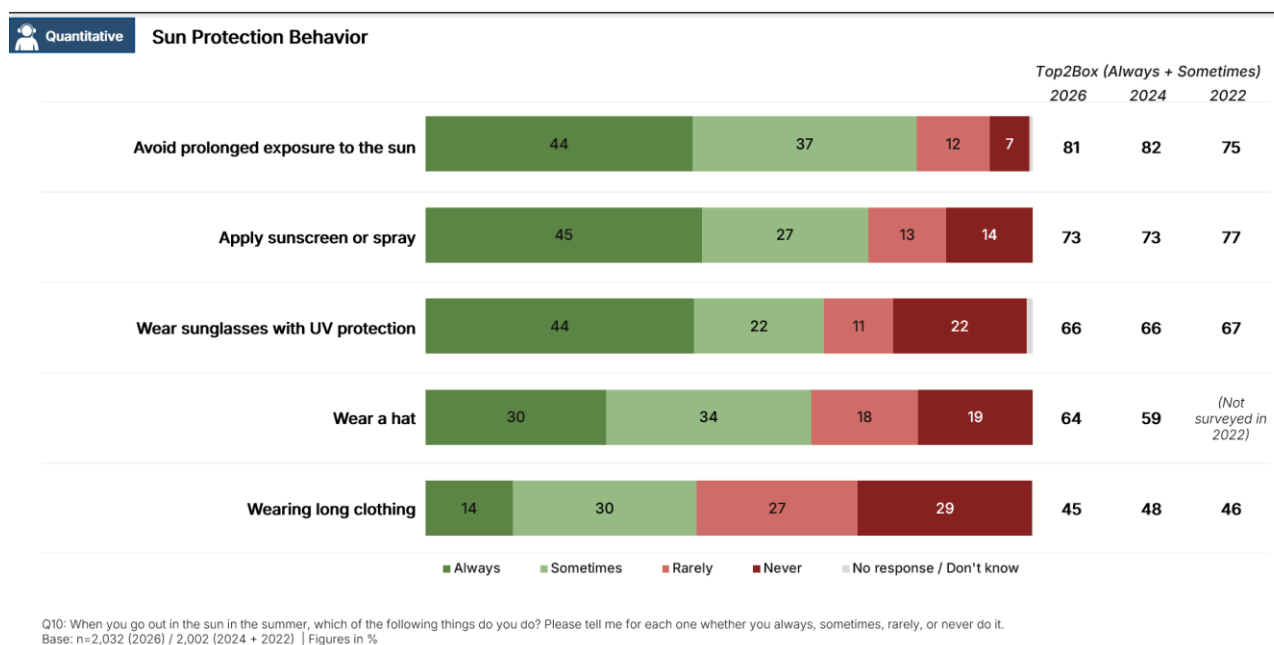


Fig.10 Sun protection behavior (quantitative)

The qualitative interviews explored in particular the wide variation in individual use of sunscreen or sun spray. While most participants reported using sunscreen depending on the season and situation, some used it daily, regardless of the season or actual sun exposure. Others, however, completely rejected the use of sunscreen. This revealed various barriers that prevented the regular and consistent use of sunscreen, particularly convenience (*“It really gets on my nerves”*). In some cases, however, there was also a fear that sunscreen contains harmful ingredients, with preservatives, “unnatural” additives, or microplastics specifically mentioned. This was believed to result in (unspecified) damage to skin health; one respondent suspected “hormonal imbalances” and damage to internal organs as a result of using sunscreen. In isolated cases, extreme aversion to sunscreen was also expressed: *“I can’t stand the feeling of that damn sunscreen. It always makes me feel like I’m in a cocoon — disgusting.”*

The quantitative data revealed clear gender-specific differences in the use of sun protection measures. These were particularly evident when comparing consistent protection behavior as indicated by the response category “always.” According to their own reports, women were twice as likely as men to always

use sunscreen or sun spray (60% compared to 30% for men). Significant differences in favor of more consistent sun protection behavior among women were also observed regarding the wearing of sunglasses with UV protection (50% of women vs. 38% of men) and avoiding prolonged exposure to the sun (49% of women vs. 39% of men). Men, on the other hand, reported more frequently that they always wear head coverings (38% vs. 22% of women) or long clothing (16% vs. 13% of women) for sun protection. All of the gender differences mentioned are statistically significant.

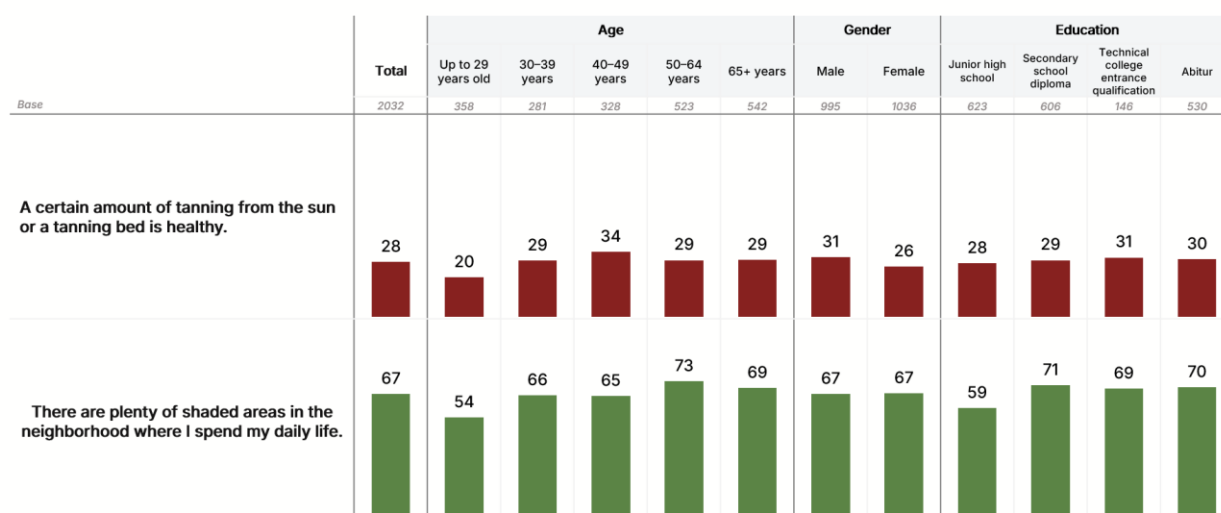
Overall UV protection was found to depend on **individual experiences and attitudes**. As the qualitative results had already revealed, both personal assessments of the health consequences of UV radiation and aesthetic preferences differed: A visible tan was sometimes perceived as very attractive and sought after, but was also sometimes associated with premature skin aging and therefore deliberately avoided. Participants reported varying sensitivities to sunlight based on their skin type, leading to subjectively different assessments of the need for individual protective measures. Cases of skin cancer among personal acquaintances or family members significantly increased the motivation to protect oneself, whereas experiences with sunburn often triggered only short-term behavioral changes and were then quickly forgotten.

In the context of sunlight, the body's own vitamin D production was mentioned repeatedly in the qualitative statements, though with differing conclusions: Some rejected consistently avoiding sunlight on the grounds that vitamin D production is necessary; they feared a vitamin D deficiency if they spent too little time in the sun and therefore advocated for at least moderate exposure. Others viewed the negative effects of sunlight as more serious and preferred vitamin D supplementation through dietary supplements, if necessary following a prior determination of vitamin D levels via a medical examination.

In the quantitative survey, attitudes toward skin tanning caused by UV radiation were assessed using the statement: "A certain degree of skin tanning from the sun or a tanning bed is healthy." On a scale from 1 (strongly agree) to 5 (strongly disagree), 14 percent of interviewees rated the statement a 1, and another 15 percent rated it a 2. The resulting rounded Top2Box (28%) is roughly equivalent to that of the 2024 survey (27%). At the other end of the scale, however, the figures differ more markedly: While 45 percent in 2026 selected a 4 or 5 — indicating low agreement —, the corresponding figure in 2024 was still over half of the respondents (52%). The proportion of respondents who selected the midpoint of the scale (3) rose from 20 percent in 2024 to 25 percent in 2026. Overall, these results pointed to increasing uncertainty or lack of knowledge regarding the health effects of skin tanning caused by UV radiation.

In the context of their own sun protection behaviors, interviewees were also asked about their subjective assessment of shaded areas in the environments where they spend their daily lives. Fifty percent of respondents strongly agreed that there was a sufficient number of shaded areas, while another 16 percent selected a score of 2 on the scale ranging from 1 (strongly agree) to 5 (strongly disagree). Here, too, the Top2Box result (67%) was nearly identical to that measured in 2024 (66%); at the other end of the scale, the proportion of those who disagreed (scores 4 and 5) decreased slightly from 16 to 12 percent.

For both the statement "A certain amount of skin tanning from the sun or a tanning bed is healthy" and "There are enough shaded areas in the area where I spend my daily life," agreement is lowest among the youngest age group under 30 (20% compared to 29–34% among older adults, and 54% compared to 65–73% among older adults). Furthermore, at 31 percent, significantly more men than women (26%) believe that a tan caused by UV radiation has a positive effect on health, while no gender differences are evident in the assessment of whether there are enough shaded areas. Taken together with the more detailed information on the daily UV index reported above, these results suggest that women and young people under 30 are more aware of the need for protection from UV radiation. With regard to educational attainment, individuals with a secondary school diploma are more likely to perceive a lack of shaded areas in the environments where they spend their daily lives, possibly due to differences in career choices and residential locations.



F08: I will now read you a few statements about dealing with radiation in everyday life. To what extent do you agree with the following statements?
 Base: n=2,032 total | Figures in %, Top2Box (agreement 1-2 on a 5-point scale)

Fig.11 Agreement on sun/UV radiation-related topics (quantitative)

3.3.3 Preventive Behaviors Regarding other Radiation-Related Topics

In addition to UV protection, the topic **of mobile communications** was a focus of preventive behavior in both the qualitative and quantitative surveys. According to the qualitative respondents, while there were several individual protection options regarding mobile communications, comprehensive protection was practically unfeasible due to the ubiquity of the technology and the subjectively unacceptable restrictions involved in completely avoiding it. However, the consequences of this realization varied significantly from person to person: Some viewed their own protective measures as *“a drop in the bucket”* and thus useless. Others tried to do at least what they could, thereby avoiding cognitive dissonance and a perceived loss of control.

In the quantitative sub-study, 19 percent of interviewees stated that they had already taken measures to protect themselves from radiation emitted by cell phones or smartphones. In 2024, this percentage was slightly higher at 22 percent. The quantitative survey also asked respondents openly about the specific measures they had already implemented. The responses largely corresponded with those mentioned in the qualitative interviews. They primarily involved maintaining distance, such as not carrying the smartphone close to the body or not holding the phone to the head while talking. Calls were kept brief, speakerphone or headphones were used, and the cell phone was sometimes set aside in places where the person did not spend most of their time (for example, the coat check). In the qualitative interviews, participants repeatedly reported a subjectively improved sense of general well-being during *“cell phone breaks”* such as walks in the woods where they deliberately left their cell phones behind. However, the apparent main motivation for this behavior was not the reduction of radiation exposure; rather, this was merely a positive side effect of the intended *“time out”*.

Especially at night, many saw the possibility of changing their behavior without significant drawbacks by *“banning”* the cell phone *from the bedroom*, turning it off, putting it on airplane mode, or at least not placing it at head level. There were multiple (qualitative) reports that participants' sleep quality had improved since they stopped keeping their cell phones in the bedroom, or they described feeling guilty when they accidentally had their cell phone nearby at night. *“Sometimes you fall asleep and forget your cell phone on your pillow. The next day you wake up and think to yourself: Oh my God, do I have a tumor in my head now because of that?”* At the same time, however, there were also some qualitative respondents who, while acknowledging the possibility of keeping their cell phone away at night, had consciously decided

against it because they used their smartphone as an alarm clock in the morning, wanted to use it right before falling asleep (“*I can’t fall asleep without a podcast*”), or wanted or needed to be reachable at night in case of an emergency.

Analysis of the qualitative statements showed that some protective measures had become part of behavioral routines, even though their actual effectiveness was simultaneously questioned. For example, it was often unclear whether and to what extent the smartphone emits radiation even when offline, and whether radiation exposure is increased during charging or while in a moving vehicle. Opinions on the use of phone cases, stickers, and protective films were divided: Some had equipped their smartphones with these items and were convinced they reduced radiation, while others called it “nonsense” or considered it counterproductive because it impaired cell phone reception.

Several participants in the qualitative survey stated that they had paid particular attention to low radiation levels when purchasing a new cell phone. In this context, there was a general assumption that more modern devices result in lower radiation exposure: “*I remember back in the day, people would say, ‘Wow, that’s a cool phone — I want it right now,’ and then they’d just go ahead and buy it. But now you do pay attention to it. I mean, you shouldn’t be buying some twenty-year-old discontinued models anymore, because the radiation levels look a lot more reasonable these days.*”

Even in the qualitative interviews, it became clear that parents of teenagers are especially strict regarding their children’s use of cell phones. In particular, parents of teenagers placed great importance on their children refraining from using smartphones at night. In this context, concerns about radiation and other negative consequences of excessive smartphone use or its omnipresence were often conflated: “*I also read once that when children talk on the phone and hold the cell phone so close to their ear, the effects are much greater than for adults. That this electromagnetic radiation makes children much more restless and nervous, much more irritable, due to the sensory overload caused by electronic devices.*” The finding that parents are highly sensitive to their children’s smartphone use was confirmed in the quantitative survey by a significantly higher proportion (26%) of interviewees who had already taken measures to protect against cell phone radiation in households with children up to age 16. Significant differences were also observed by age and gender: At 22 percent, women were significantly more probable to have already taken protective measures than men (16%). People aged 65 and older reported taking protective measures in 12 percent of cases — significantly less frequently than younger age groups (between 19% and 24%).

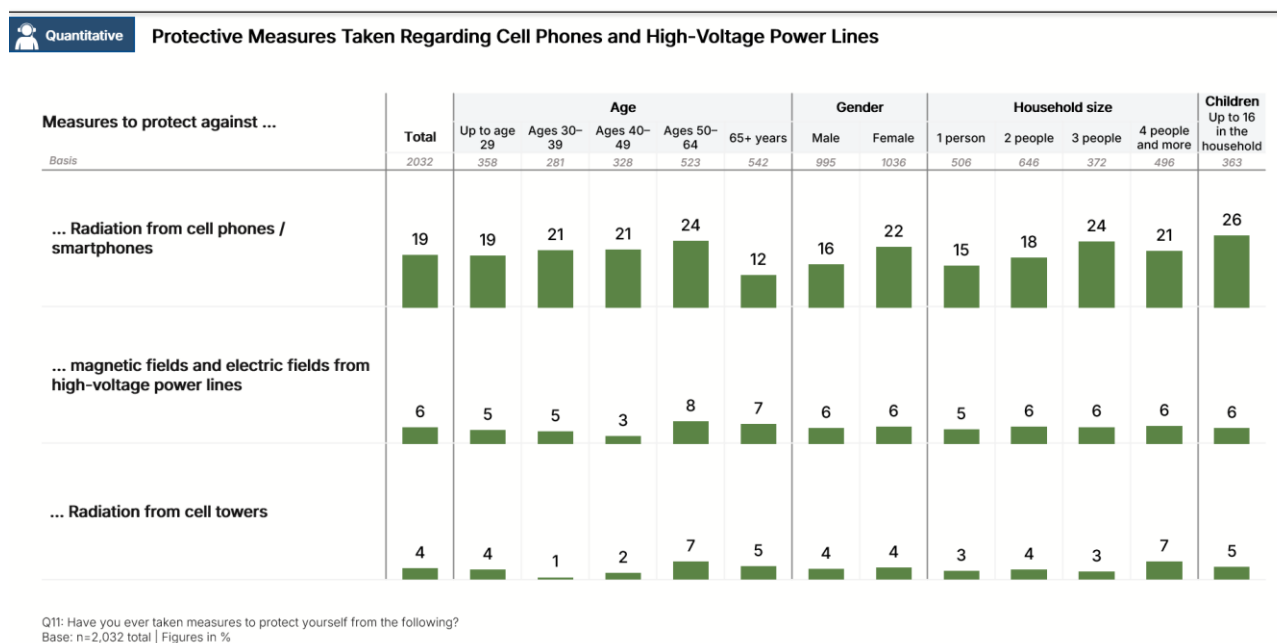


Fig.12 Protective measures taken regarding cell phones and high-voltage power lines (quantitative)

Protective measures already taken against radiation emitted by cell towers were cited significantly less often — at 4 percent (2024: 3%) — than those taken regarding mobile devices. In these cases, people rely on keeping a distance; very rarely do they use radiation shielding in or around their homes (Faraday cage, house walls, fences, shielding).

The question regarding protective measures already taken was also posed in relation to **magnetic and electric fields from high-voltage power lines**. At six percent, the proportion was slightly higher than that for cell towers and was also primarily addressed by maintaining a safe distance.

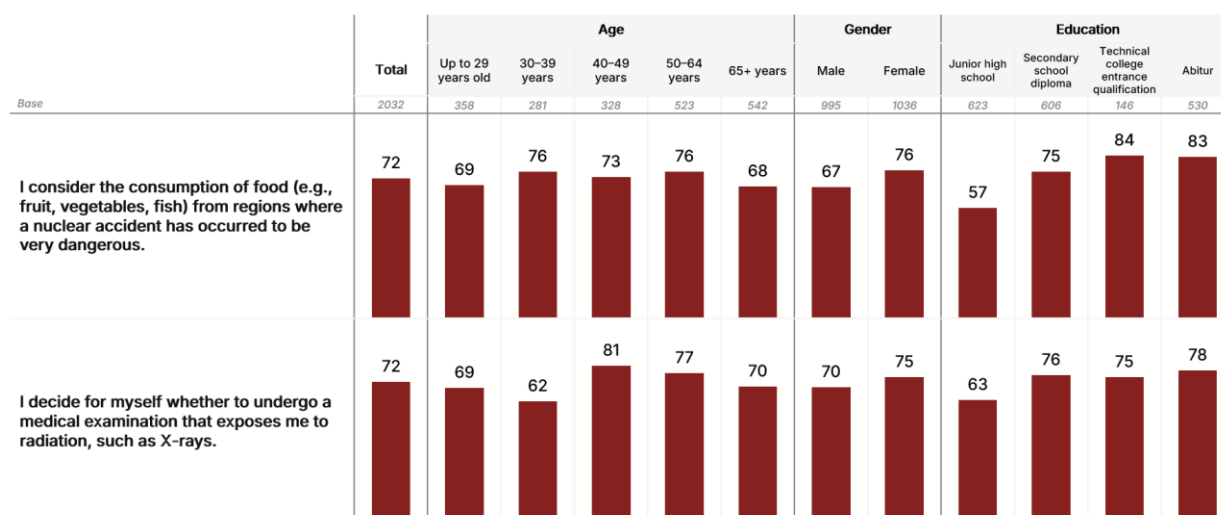
The distance to high-voltage power lines or substations was also the one of the four specified factors that had played the greatest role in the **choice of place of residence or house/apartment**. Ten percent of respondents confirmed this (2024: 8%). According to the respondents, the distance to a cell tower and to a nuclear power plant or a nuclear research facility was relevant for seven percent in each case (2024: 6% and 9%, respectively). In contrast, in both the current study and the 2024 study, only three percent each stated that they had taken elevated radon levels or the presence of radon into account when choosing their place of residence or house/apartment.

With regard to **protective measures during medical examinations and treatments**, the qualitative interviewees often saw only limited individual options for protection. Protective measures initiated by medical professionals—such as wearing a lead vest or recording X-ray examinations in an X-ray log—raised awareness of radiation exposure, but at the same time conveyed a sense of safety and reduced anxiety. In many cases, this led to a transfer of responsibility and a pragmatic acceptance of the doctor's recommendation, without questioning whether one could personally contribute to one's own protection. Accordingly, the overwhelming majority trusted that the examinations suggested by the doctor were truly necessary.

The quantitative results showed that, nevertheless, the majority was aware that the final decision regarding an examination or treatment involving radiation exposure rests with the patient. Accordingly, as in 2024, the vast majority of respondents agreed with the statement: "I decide for myself whether to undergo an examination that exposes me to radiation, such as X-rays." Fifty-eight percent selected a score of 1 on the scale from 1 (strongly agree) to 5 (strongly disagree), while another 15 percent selected a score of 2. The resulting Top2Box score was significantly higher among women (75%) than among men (70%). In addition, significantly higher agreement was observed in the 40–49 age group (81% Top2Box) and the 50–64 age group (77% Top2Box) compared to younger respondents (up to age 29: 69%, ages 30–39: 62%) as well as older individuals aged 65 and older (70%).

Furthermore, the qualitative results revealed varying attitudes toward the necessity of radiation exposure in a medical context depending on the medical specialty: For example, X-ray examinations at the dentist's office were most frequently questioned, whereas in other medical specialties (such as the diagnosis of a bone fracture in orthopedics) or radiation therapy for the treatment of cancer, such questioning was rare.

Another item related to precautionary and protective behavior concerned the **contamination of food following a radiological emergency**. As in 2024, the majority of interviewees agreed with the statement: "I consider the consumption of food (e.g., fruit, vegetables, fish) from regions where a nuclear accident has occurred to be very dangerous." The Top2Box result on a scale from 1 (strongly agree) to 5 (strongly disagree) was 72 percent (61% at level 1 plus 11% at level 2). At 76 percent, this proportion was significantly higher among women than among men (67%). No significant differences were observed by age, but there were differences based on educational attainment: Respondents with a secondary school diploma agreed with the statement only 57 percent (Top2Box), and thus were less likely to consider the consumption of food from regions where a "nuclear accident" had occurred to be dangerous than those with a high school diploma (75% Top2Box) or higher educational qualifications (83% and 84% Top2Box, respectively).



F08: I will now read you a few statements about dealing with radiation in everyday life. To what extent do you agree with the following statements?
 Base: n=2,032 total | Figures in %, Top2Box (agreement 1-2 on a 5-point scale)

Fig.13 Assessments of one's own behavior in the event of potential radiation exposure (quantitative)

3.4 Information-Seeking Behavior

Before addressing the subjective sense of being informed and protected — particularly by government institutions —, the qualitative survey examined information-seeking behavior as well as passive and active sources of information in general. The statements of most participants indicated that their knowledge and attitudes toward radiation-related topics were not the result of active research, but rather of **passive, often incidental information intake**. This often took place through traditional news programs or documentaries. Radio, print media, and television remained important sources of information, particularly for older adults. It was reported on multiple occasions that radiation-related content was encountered in programs on public broadcasters such as ARD and ZDF (for example, *Tagesschau* and *Terra X*) without having specifically sought it out beforehand. This is recalled particularly in connection with acute events such as incidents at nuclear power plants: “When there’s just been an accident at a nuclear power plant, you get informed again. Television shows all kinds of advice programs, etc., on how nuclear radiation affects the body, etc.”

In addition, digital sources — such as online news feeds or portals — played a major role in the context of passive information intake. Social media was mentioned very frequently, especially Instagram, TikTok, and YouTube. Among social media users, platform preferences varied by age group, with TikTok and Instagram dominating among younger users and Facebook and LinkedIn among older users. Algorithmic feeds brought topics to users’ attention more frequently, thereby increasing their interest.

The role of social media was particularly emphasized in relation to UV protection: “I feel that, thanks to social media, the younger generation in particular is currently trying to live a healthy lifestyle. Everyone is exercising, everyone is trying to eat healthily. And I believe that with this awareness of living healthier, people, for example, avoid tanning beds or don’t go out into the blazing sun without sunscreen.” The importance of influencers was also emphasized, particularly in relation to a health-conscious lifestyle and, specifically, UV protection, with mention of “skinfluencers.”

A large part of their own knowledge about radiation was described as “general knowledge” acquired through school or upbringing. School education primarily focused on the fundamentals of physics and radioactivity, while parental guidance mainly instilled awareness of UV protection—such as the use of sunscreen: “Use sunscreen regularly. Pay attention to how long you actually are in the sun, especially in the

blazing midday sun, and wear a cap sometimes when you're outside in the sun. These are the classic protective measures that your parents taught you."

The triggers for **actively researching** radiation-related topics were varied. Information "picked up" by chance often served as the initial impetus for conducting one's own active research on the respective radiation-related topic. For example, Reels and Shorts provided accessible bite-sized pieces of information on radiation topics that sparked interest in more detailed information. Product research and specific purchasing decisions — for example, regarding smartphones or microwave ovens — were also common reasons for targeted information searches. Some respondents reported that when purchasing devices, they systematically compared radiation levels — such as SAR values for cell phones — or used user experiences, tests, and reviews to help make their decisions. The Chernobyl and Fukushima disasters were the primary triggers for targeted research on the topic of radioactivity. In the case of medical applications and also when forming opinions on radiation-related infrastructure such as transmission towers or high-voltage power lines, a targeted search for information was usually triggered by a personal or local connection, such as the observed construction of the relevant facility.

In the vast majority of cases, a targeted search for information started on digital media. Many people initially searched using a smartphone, typically via a search engine (primarily Google) or Wikipedia. AI tools were increasingly used, with ChatGPT being mentioned by name most frequently. Medical applications represented a special case, where healthcare professionals, health insurance providers, and personal networks provided information on an as-needed basis. Medical counseling was the primary source of information regarding risks, benefits, and protective measures in these instances. Particularly in cases of significant personal involvement, such as radiation therapy, people also actively sought out additional information, with digital sources — starting with a search engine query — again taking center stage.

The sources of information mentioned were assessed as having varying degrees of reliability. Doctors, pharmacies, and health insurance companies were predominantly considered trustworthy; concerns about information being distorted to recommend treatments that were not strictly necessary were rare (see Section 3.3.5). Digital sources were assessed much more critically: For instance, the need for critical scrutiny was repeatedly expressed regarding Google search results, social media, and AI outputs. In some cases, social media platforms were generally avoided because *"you just don't know anymore whether the information and videos are fake or real"* and because *"all those conspiracy theorists are active there, too."* Otherwise, writing style, citations, and the consistency of information across different sources served as filters for credibility. Several interviewees stated that their distrust of misinformation, populism, and conflicts of interest had increased significantly compared to the past and that one could *"no longer rely on anything"*.

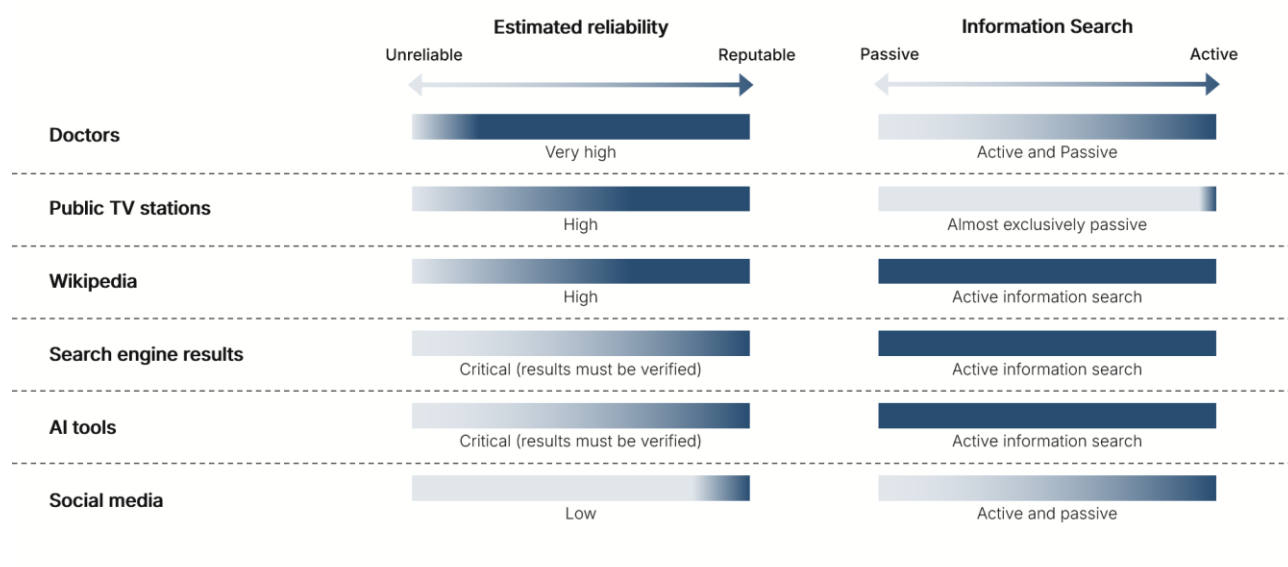


Fig.14 Most frequently cited information sources and their subjective reliability (qualitative)

During the qualitative interviews, many respondents realized that they were (too) poorly informed about radiation-related topics. Many expressed a desire for more media coverage and factual information from reputable sources — especially given the ubiquitous flood of misinformation stemming from rumors, fake news, and conspiracy theories.

3.5 Government Institutions: Awareness, Image, Subjective Sense of Information and Protection

3.5.1 Institutions/Organizations Mentioned Without Prompting and Their Image

When asked about suitable sources of information on radiation-related topics, government and scientific institutions were also mentioned during the qualitative interviews. Participants rarely reported that they would specifically contact scientific institutions or government agencies to search for information or visit their websites directly. However, within a search engine's results list — the example given was a search query about the harmfulness of radiation emitted by a microwave oven — or when cited as a source by AI or social media, these institutions enjoyed a very positive image characterized by trustworthiness and credibility: *"And if it's something from a government agency or an institute, that has a sense of reliability; that's where I'd be most likely to go and hope to get comprehensive information there."*

In addition to universities and public institutions in general, respondents spontaneously and specifically mentioned the World Health Organization (WHO), the Robert Koch Institute (RKI), Fraunhofer and Max Planck Institutes, the Jülich Research Center, consumer protection agencies, and public health departments. Less frequently, participants in the qualitative study spontaneously mentioned federal agencies. In some cases, they recalled the correct name, "Federal Office for Radiation Protection", but often cited incorrect names, such as *"Federal Office for Disaster Control,"* or simply referred to *"some federal agency."*

Despite the predominantly positive associations, however, there was also noticeable skepticism toward science and government agencies: A few interviewees mentioned that even in the case of "seemingly" scientific studies, the client must be scrutinized for neutrality. It was also pointed out that there may not yet be any long-term studies on the effects of radiation from cell phones. Another barrier to searching for information from scientific sources was the fear that the content would be too difficult for non-academics to understand.

The image of government agencies in general was profoundly shaped by the events and communication during the COVID-19 pandemic and the subsequent analysis of those events. This had both positive and negative effects: Many people relied on official sources such as the RKI, the WHO, and ministry websites, which provided guidance during the pandemic, and placed their trust in regulation within a reasonable framework. On the other hand, political and economic entanglements and the perceived contradictory reporting fueled lasting skepticism: *“Take COVID-19, for example — with the tests and masks. When it turns out that politicians are somehow involved with these companies or hold shares in them, that doesn’t give me a trustworthy impression — it makes me doubt whether I can rely on this information or whether there’s some ulterior motive behind the article.”*

In addition, the qualitative comments reveal an image of government agencies shaped by various prejudices. One respondent suspected a way of working *“... from the stone age. They do their jobs because they have to, and that’s it.”* Others reported negative experiences regarding the availability of contact persons by phone and a lack of clarity about responsibilities. Furthermore, public authorities were accused of a certain sluggishness in providing information: *“By the time a public authority actually takes the initiative to write, ‘This is now our opinion,’ many other research-based companies and institutions, such as universities, etc., have already published their findings long before an authority dares to be bold enough to make such a statement.”* Specifically regarding warnings about hazards, while authorities were generally credited with communicating in a responsible manner, in individual cases they were accused of either downplaying risks for political reasons or, conversely, of using fear-mongering and “scaremongering”.

3.5.2 Awareness of Selected Institutions

Four government institutions were surveyed quantitatively regarding their level of recognition. The survey distinguished between respondents who were unfamiliar with the institution in question, knew it only by name, or had more detailed knowledge of it. In the latter case, interviewees were also asked to indicate whether they were familiar with the agency’s specific responsibilities and/or whether they had ever visited its website.

The best-known of the four institutions was the **Federal Ministry for the Environment, Climate Action, Nature Conservation, and Nuclear Safety (BMUKN)**. Only 14 percent of respondents stated that they were not at all familiar with the BMUKN. However, the proportion of those who knew the ministry only by name was highest here, at 56 percent. More than a quarter (26%) reported that they were also familiar with the BMUKN’s responsibilities, and as many as eight percent stated that they had visited the website at least once.

The **Federal Office for Radiation Protection (BfS)** ranked second in terms of awareness. Just under one-third (31%) were not familiar with the BfS, while 50 percent knew it only by name. According to their self-assessment, about one in six respondents (17%) was also familiar with the BfS’s responsibilities, and four percent had visited the website at least once. The qualitative data provide very similar results regarding awareness and, in addition, supplementary background information, as previous interactions with the BfS were explored in greater detail here. For example, regarding visits to the BfS website, it became apparent that users almost never accessed it directly but rather reached it via a search engine’s results page. In one qualitative case, there was a specific recollection of the website, which was consistently described in positive terms as well-organized, easy to navigate, authoritative, and understandable. Overall, the name “Federal Office for Radiation Protection” frequently elicited spontaneous recognition, though most interviewees could not recall the source or further details. When they could, the encounter did not occur through direct personal contact but rather through the media, information sheets, links, and flyers.

The **International Atomic Energy Agency (IAEA)** was only slightly less well-known than the BfS. Thirty-seven percent were not familiar with it at all, and 47 percent knew it only by name. Fifteen percent reported having some idea of its responsibilities, and two percent had visited the website before.

The least well-known of the four government institutions listed was the **Radiation Protection Commission**. Here, the majority (55%) reported being completely unaware of it, and an additional 37 percent were familiar with it only by name. Still, seven percent said they were aware of the Radiation Protection Commission's responsibilities.

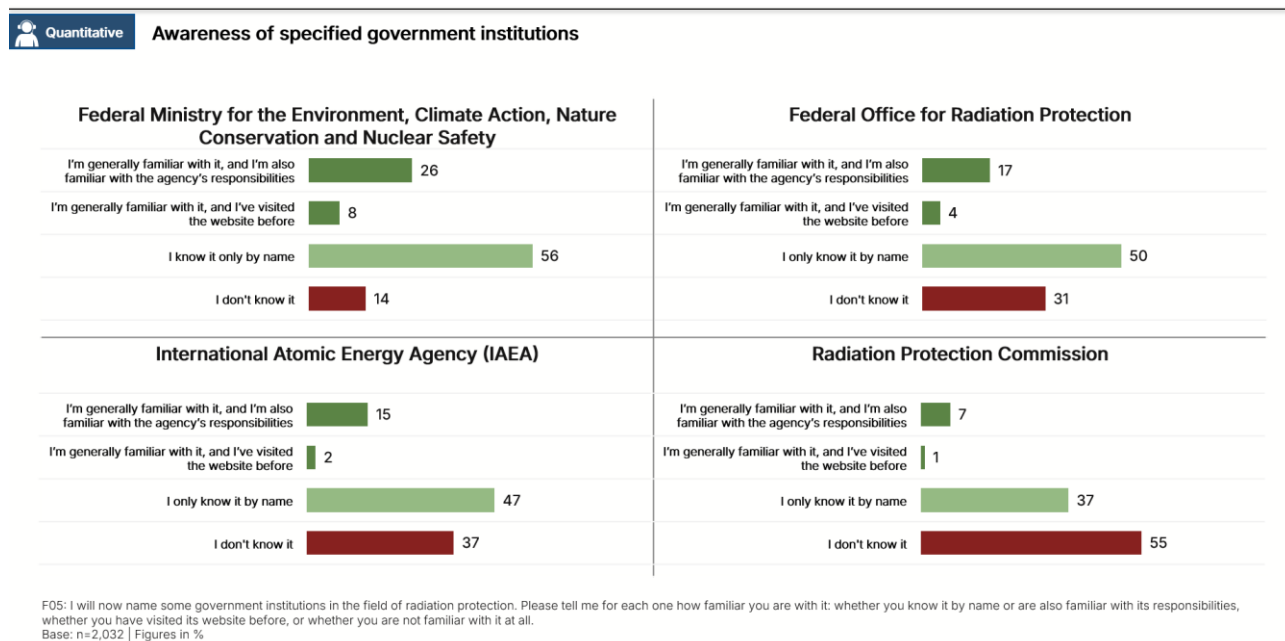


Fig.15 Awareness of specified government institutions (quantitative)

When analyzing awareness of the specified institutions **by subgroup**, it was initially noticeable that there were no significant differences in awareness of the Federal Ministry for the Environment, Climate Action, Nature Conservation, and Nuclear Safety across age groups. The other three government agencies, on the other hand, tended to be better known as age increased. The differences between the youngest age group (up to 29 years old) and the “older” subgroups were statistically significant for the Federal Office for Radiation Protection (50% vs. between 62% and 75% awareness in older age groups) and the Commission on Radiation Protection (29% vs. between 40% and 53% awareness in older age groups). The International Atomic Energy Agency was better known among people aged 40 and older (between 68% and 74%, depending on the age group) than among younger people (43% awareness among those under 30 and 52% awareness among those aged 30–39).

Overall, the differences based on educational attainment were smaller than those based on age. The only significant differences in this regard were those between individuals whose highest level of education was a secondary school diploma and those with a high school diploma (BMUKN: 80% vs. 90%, BfS: 65% vs. 78%, IAEA: 58% vs. 71%, Radiation Protection Commission: 41% vs. 51%).

By gender, a significant difference was observed only with a view to the International Atomic Energy Agency (IAEA), with higher awareness among men (69% compared to 58% among women). For the other institutions, the differences between men and women in both directions were at most two percent and were therefore not statistically significant.

		Age					Gender		Educational Attainment			
	Total	Up to 29 years old	30-39 years	40-49 years	50-64 years	65+ years	Male	Female	Junior high school	Secondary school diploma	Technical college entrance qualification	Abitur
Basis	2032	358	281	328	523	542	995	1036	623	606	148	530
Federal Ministry for the Environment, Climate Action, Nature Conservation, and Nuclear Safety	86	85	84	83	89	86	85	86	80	87	84	90
Federal Office for Radiation Protection	69	50	62	70	78	75	70	68	65	69	72	78
International Atomic Energy Agency (IAEA)	63	43	52	69	68	74	69	58	58	64	59	71
Radiation Protection Commission	45	29	40	41	53	52	44	45	41	47	49	51

F05: I will now name some government institutions in the field of radiation protection. Please tell me for each one how familiar you are with it: whether you know it by name, are familiar with its functions, have visited its website before, or are not familiar with it at all.

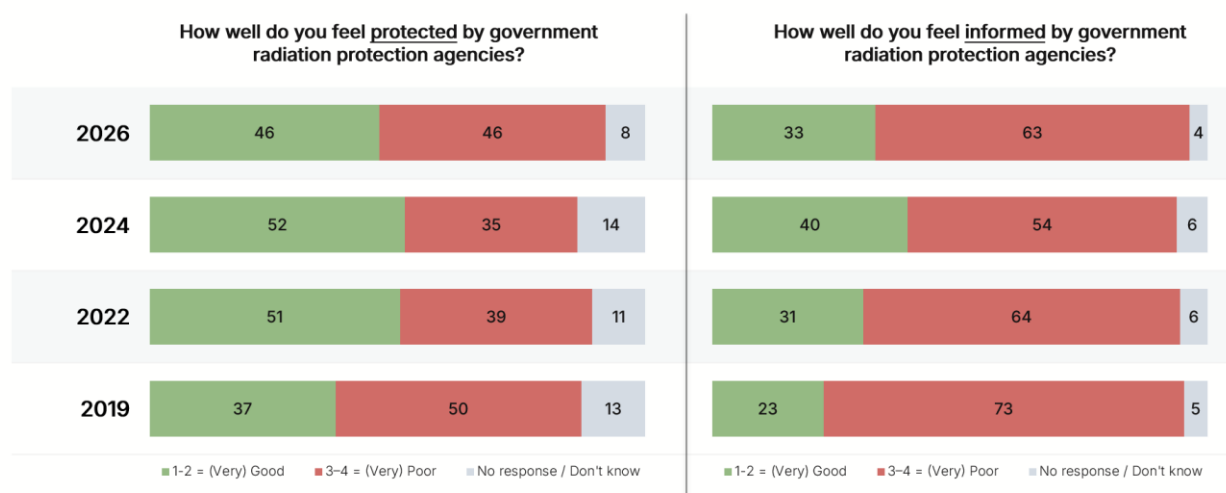
Base: n=2,032 total | Figures in %, sum of "well-known" and "known by name"

Fig.16 Awareness of specified government institutions by subgroup (quantitative)

3.5.3 Subjective Sense of Information and Protection

To what extent did the population feel informed by government institutions on the one hand, and protected by them on the other? In the quantitative results for this question, it was immediately apparent that the subjective sense of protection was significantly more positive than the assessment of the information provided by the institutions: 46 percent of respondents felt (very) well protected, but only 33 percent felt (very) well informed (in each case, the sum of values 1 and 2 on a scale from 1 = very good to 4 = very poor).

The fact that the public felt better protected than informed by government institutions had already been demonstrated in all previous surveys (2024, 2022, and 2019). In the current study, however, there was a decline in the sense of protection and information compared to 2024: The Top2Box — that is, the sum of scale values 1 and 2, and thus the proportion of those who felt well or very well informed or protected — decreased compared to 2024 from 52 to 46 percent (sense of protection) and from 40 to 33 percent (sense of being informed) — both of these findings contrary to the upward trend observed from 2019 to 2024.



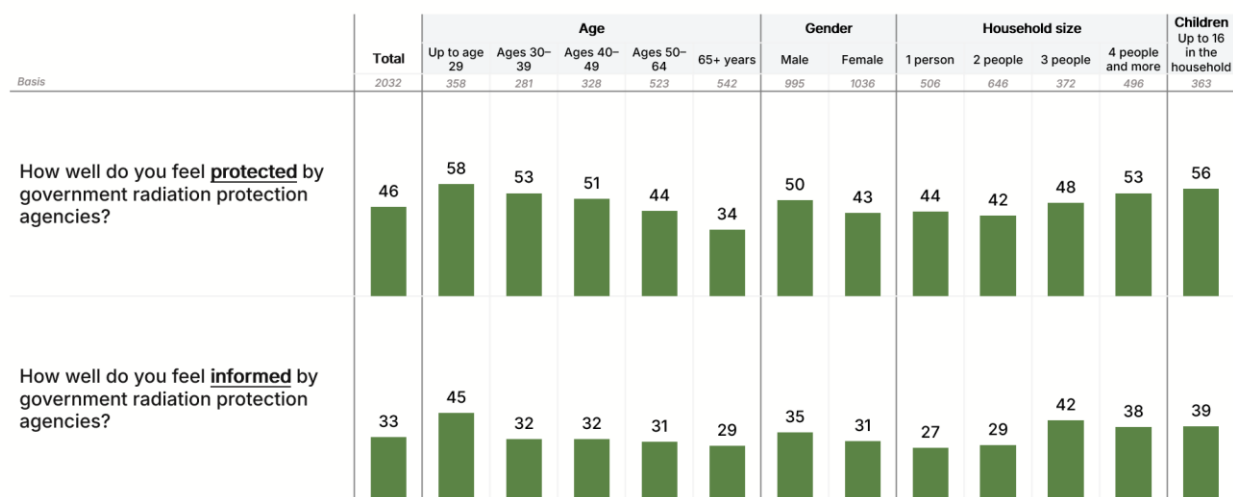
F06: How well do you feel protected by government radiation protection agencies? / How well do you feel informed by government radiation protection agencies?
 Base: n=2,032 (2026) / 2,002 (2024 + 2022) / 2,000 (2019) | Figures in %

Fig.17 Assessment of protection and information provided by government institutions (quantitative)

Among younger respondents aged 29 and under, 45 percent felt well or very well (Top2Box) informed, which was significantly higher than among older age groups (between 29% and 32% Top2Box). The sense of protection also correlated with age: the older the interviewee, the less protected they felt. For example, only about one-third (34%) of people aged 65 and older felt well or very well protected by government institutions (34% Top2Box), while the corresponding proportion in the younger age groups — 58 percent (up to age 29), 53 percent (ages 30–39), 51 percent (ages 40–49), and 44 percent (ages 50–64).

Although the gender differences were not as pronounced as those by age, they were nonetheless statistically significant: 50 percent of men considered themselves well or very well protected, but only 43 percent of women did. Thirty-five percent of men felt well or very well informed, but only 31 percent of women did.

The results by household size are also interesting, particularly in the case of households with children aged 16 or younger. Both the sense of being informed and, above all, the sense of being protected were significantly higher here — at 39 percent and 56 percent, respectively — than in households without children aged 16 or younger. Furthermore, a correlation existed between both the sense of being informed and the sense of being protected and educational attainment: The higher the level of education, the more likely respondents were to feel protected (40% among those with a secondary school diploma, 46% each for the intermediate school leaving certificate and the technical college entrance qualification, and 56% for those with a high school diploma) and also informed, although the differences in the sense of being informed were less pronounced (40% for those with a high school diploma and between 28% and 32% for the other qualifications).



F06: How well do you feel protected by government radiation protection agencies? / How well do you feel informed by government radiation protection agencies?
 Base: n=2,032 total | Figures in %, Top2Box (agreement 1-2 on a 4-point scale)

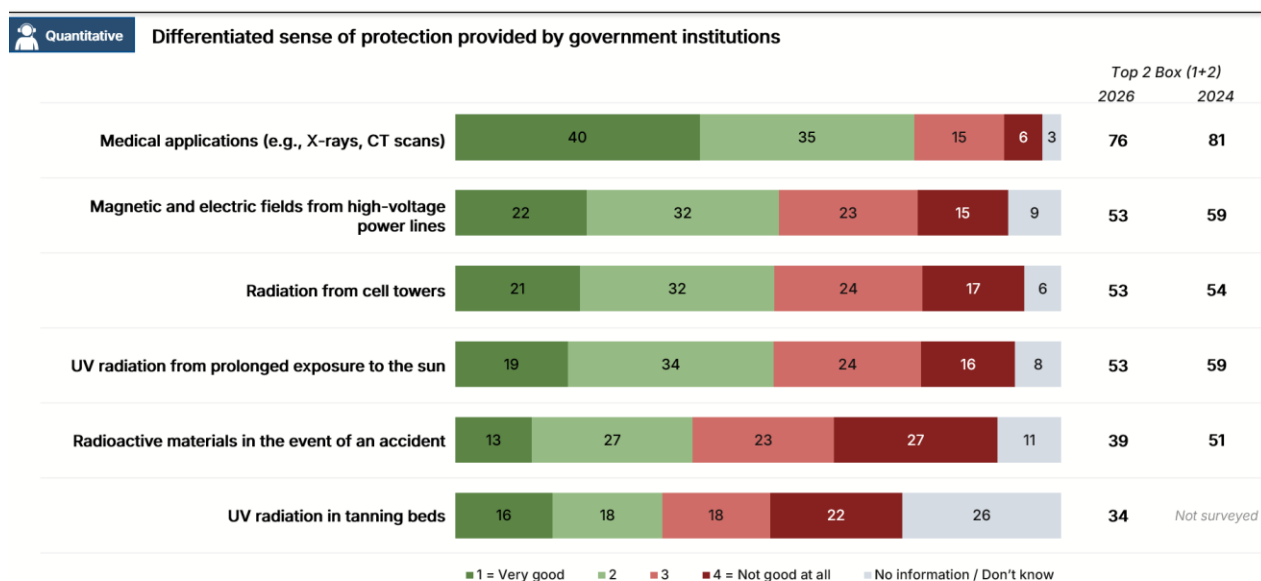
Fig.18 Subjective sense of being informed and protected by subgroup (quantitative)

The subjective sense of being informed increased with the extent to which respondents reported having already engaged with the topic of radiation prior to the survey (see Section 3.1.2). Forty-six percent of those who had already dealt extensively with radiation considered themselves well or very well informed (Top2Box), as did 41 percent of those who had dealt with radiation to some extent, 31 percent of those who had dealt with it only a little, and just 23 percent of interviewees who had never dealt with radiation. This significant correlation is hardly surprising. It is interesting, however, that the subjective sense of protection also correlated with previous engagement with radiation: 61 percent of those who had already dealt extensively with radiation felt well or very well protected by the government's radiation protection agencies. In cases where respondents had dealt with radiation to some extent or only a little, this proportion was significantly lower at 50 and 49 percent, respectively, and dropped significantly again among those who had never dealt with radiation, to just 35 percent. This finding suggests a causal relationship: engaging with the topic of radiation leads to a greater sense of protection provided by government institutions (see also Figure 27 in Section 3.6.4, where this result is revisited in the context of the assessment of civil protection in the event of a radiological emergency).

Regarding the assessment of protection provided by government institutions, there was another quantitative question that differentiated the **subjective sense of protection according to various radiation sources or topics**. According to the results, respondents felt most protected in the case of medical applications — which were illustrated to them with the specific examples of X-rays and CT scans: Overall, a good three-quarters (76%) selected a rating of 1 or 2 on a scale ranging from 1 (Very good) to 4 (Not good at all). In each case, 53 percent felt well or very well (Top2Box) protected by government agencies against magnetic fields and electric fields from high-voltage power lines, radiation from cell towers, and radiation from prolonged exposure to the sun. For each of these three (radiation) sources, however, there was also a proportion of 15 to 17 percent who did not feel well protected at all.

For two sources of radiation, the proportion of those who felt not well protected or not well protected at all (sum of scale values 3 and 4) was higher than that of those who felt well or very well protected (sum of scale values 1 and 2): radioactive materials in the event of an accident and UV radiation in tanning beds. Only 39 and 34 percent, respectively, felt well or very well protected in this regard by government agencies, compared to 50 and 40 percent, respectively, who selected scale values 3 or 4 (not well protected or not well protected at all). In addition, the "don't know" response rate was very high for these two topics: More than one in ten interviewees felt unable to assess their own level of protection in the event of radioactive

substances being released in an accident. Regarding UV radiation in tanning beds, this proportion was even higher than one quarter (26%).

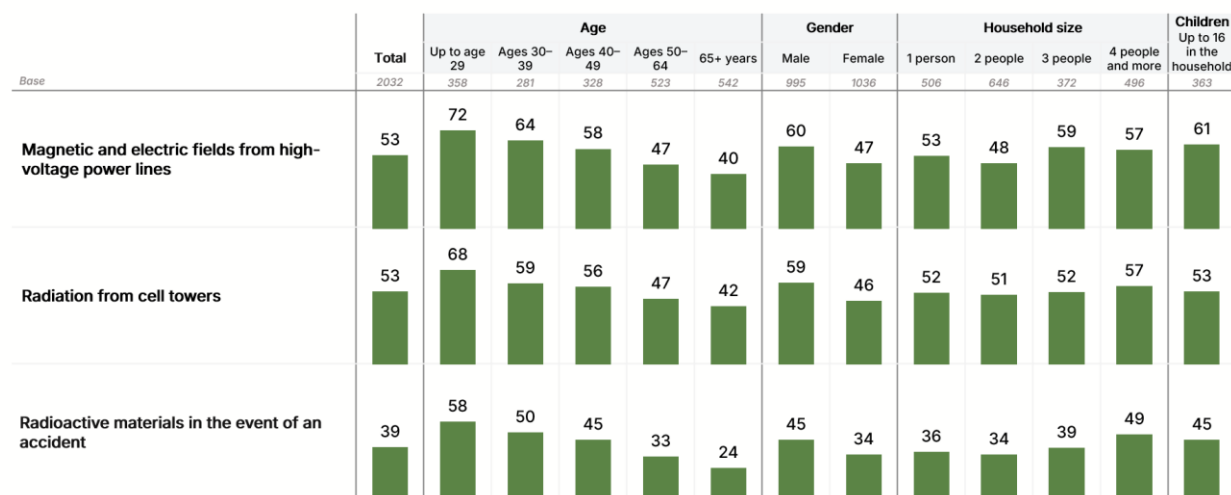


F12a: How well do you feel protected in Germany from these radiation sources by the measures taken by government institutions? Please answer on a scale from 1 = "Very well" to 4 = "Not at all well."
Base: n=2,032 (2026) / 2,002 (2024) | Figures in %

Fig.19 Differentiated sense of protection provided by government institutions (quantitative)

As was already the case with the question regarding the general sense of protection provided by government institutions, the survey — which differentiated according to radiation sources — also revealed an overall decline in the subjective sense of protection. The most significant decline in the reported sense of protection was observed regarding radioactive materials in the event of an accident: While more than half (51%) of respondents still felt well or very well protected against this in 2024, this figure had dropped to just 39 percent in the current survey. The Top2Box scores fell by five to six percentage points each for the criteria "UV radiation from prolonged exposure to the sun", "magnetic and electric fields from high-voltage power lines" (asked in 2024 with slightly different wording as "radiation from high-voltage power lines"), and "medical applications (e.g., X-rays, CT scans)". By contrast, the subjective sense of protection against radiation from cell towers has remained virtually unchanged. For the item on UV radiation in tanning beds, no comparative data from 2024 is available, as it was newly included in the questionnaire in 2026.

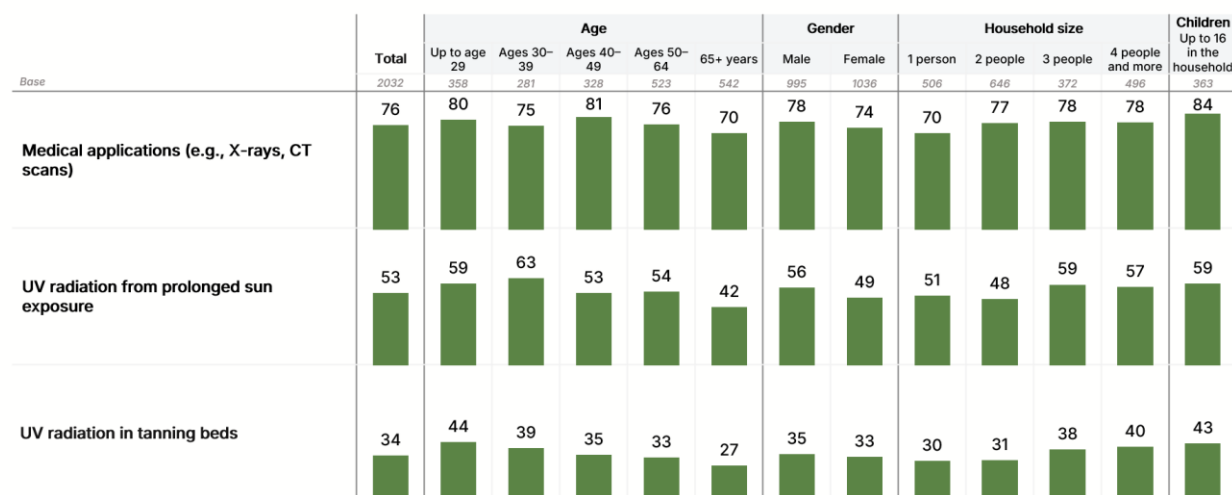
The analysis of the sense of protection from specific radiation sources by subgroup showed a similar pattern to that of the general question regarding the overall sense of protection: Older adults aged 65 and over as well as women, in particular, felt less well protected. This applies to all six items or (radiation) sources, but is particularly evident for magnetic fields and electric fields from high-voltage power lines, radiation from cell towers, and radioactive materials in the event of an accident. The significant difference in the Top2Box for the subjective sense of protection between men and women was at least ten percentage points for each of these three items. Furthermore, with increasing age, the subjective sense of protection regarding the three aforementioned (radiation) sources decreased, with a significant difference of at least 25 percentage points between the youngest group (up to age 29) and the oldest group (age 65 and older).



F12a: How well do you feel protected in Germany by the measures taken by government institutions against these radiation sources? Please answer on a scale from 1 = "Very well" to 4 = "Not at all well."
Base: n=2,032 total | Data in %, Top 2 Box (agreement 1-2 on a 4-point scale)

Fig.20 Sense of protection provided by government institutions regarding selected items (1/2) (quantitative)

Slightly smaller differences — though still pointing toward a lower sense of protection among the oldest age group (65 and older) and among women — were observed regarding UV radiation from prolonged sun exposure, UV radiation in tanning beds, and medical applications. The values for the youngest group (up to age 29) and the oldest group (age 65 and older) differed significantly by 17 percentage points for each item related to UV radiation; for medical applications, the corresponding difference was 10 percentage points. The gender difference was not significant for UV radiation from tanning beds (35% for men vs. 33% for women), but it was significant for UV radiation from prolonged exposure to the sun (56% for men vs. 49% for women) and for medical applications (78% for men vs. 74% for women). Furthermore, with the exception of the item "radiation from cell phone towers", all other (radiation) sources showed a significantly higher sense of protection among children up to age 16 in the household (between five and nine percentage points higher than the average in each case), which was consistent with the results from the question regarding the general sense of protection.



F12a: How well do you feel protected in Germany from these radiation sources by the measures taken by government institutions? Please answer on a scale from 1 = "Very well" to 4 = "Not at all well."
 Base: n=2,032 total | Data in %, Top 2 Box (agreement 1-2 on a 4-point scale)

Fig.211 Sense of protection provided by government institutions regarding selected items (2/2) (quantitative)

Those respondents who did not feel protected — or did not feel well protected at all — by government institutions with regard to the individual (radiation) sources, i.e., those who rated their response as 3 or 4 on the scale, were asked in the quantitative survey, without prompting, **what would need to improve specifically in order for them to feel more protected**. At the top of the open-ended responses was the desire for more education and information. This was expressed in general terms, regardless of the specific type of radiation (*"There should be more education. The public should be involved a little more."*) or specified in relation to specific hazards, effects, or possible protective measures. The information should be transparent and understandable — that is, *"not presented as a scientific treatise full of technical jargon, but explained simply for laypeople"*.

Depending on the (radiation) source, specific suggestions for improvement were also put forward. In the case of radioactive materials in the event of an accident, these were often linked to the aforementioned request for more information. For example, some interviewees called for a concrete (and clearly communicated) safety plan, more bunkers or shelters and appropriate information about them, compliance with or stricter enforcement of regulations and inspections, as well as information about iodine tablets and their availability. In isolated cases, there were also calls for a ban on radioactive materials or nuclear power in general.

Respondents who did not feel well protected from radiation emitted by cell towers or from the magnetic and electric fields of high-voltage power lines primarily suggested, in their proposals for improvement, increasing the distance between these structures and residential areas — for example, by avoiding the installation of cell towers in residential areas or by reducing the density of cell towers in general. Particularly in the case of high-voltage power lines, underground installation was also considered.

The requests from those who felt inadequately protected from solar radiation focused primarily on urban planning measures, such as creating more shaded areas, reducing impervious surfaces in urban areas, planting trees, or generally increasing greenery in city centers. UV radiation from tanning beds, on the other hand, would be addressed through a general ban or, at the very least, stricter regulation.

The fewest suggestions for improvement were made regarding protection from medical procedures such as X-rays or CT scans. In addition to avoiding or reducing (unnecessary) procedures, respondents expressed a desire for the development of new or alternative technologies, though without being able to specify these in more concrete terms.

3.5.4 Role of the Federal Office for Radiation Protection¹

Comments on the BfS's image were predominantly positive. Its status as a government agency and its recognized technical expertise fostered a broad sense of basic trust. Many associated the BfS with safety through regulation, monitoring, and the establishment of reliable standards. This resulted in a high level of trustworthiness and credibility.

As was the case in 2024, a number of interviewees criticized the BfS's low public visibility. In many cases, this led to the conclusion that the agency might be politically irrelevant, or to calls for stronger communication and media presence. Above all, respondents felt that digital visibility should be expanded to include not only the BfS website but also, for example, apps and portals. Younger respondents frequently called for a (stronger) social media presence: short clips, explanatory videos, advertisements, and influencer content could help boost the BfS's visibility and image. Older interviewees, as well as many younger ones, also called for more traditional public relations efforts such as advertisements, information screens, and TV segments.

At the same time, respondents wanted the BfS to play a more proactive role in communication: *"They need to be more proactive about it, rather than making us, the public, have to seek it out. In everyday life, it simply doesn't occur to you, so it should be done in a way that you're almost forced to notice it. You can't look away anymore. I think that would be effective."*

There were repeated calls to maintain the BfS's scientific rigor, independence, and objectivity (*"that it not bow to any lobby"*). These qualities should be used to distinguish itself from fake news and conspiracy theories—or, in other words, *"not to leave the field to them."* With regard to public education efforts on radiological emergencies, participants felt that information provided by the BfS had the advantage of gaining public attention through "less controversial" topics such as sun protection or cell phone radiation, and then being able to inform the public "incidentally" about how to behave in emergencies.

3.6 Key Topic: Protection Against Radiological Emergencies and Civil Defense

3.6.1 Possible Scenarios and Their Subjective Probability

A key focus of the study was the scenario of a radiological emergency, which was discussed in depth in the qualitative portion and also surveyed in the quantitative section, thereby providing representative data. Both qualitatively and quantitatively, at the beginning of the thematic interview section, the term "radiological emergency" was defined as follows: "A radiological emergency occurs when radioactive materials are released into the environment in significantly elevated quantities, such that there could be impacts on human health and the environment."

In the qualitative interviews, the initial focus was on capturing respondents' spontaneous assessments of the general likelihood of such an event. This revealed significant individual differences: Most interviewees considered the hypothetical scenario to be (very) unlikely, but not impossible. High safety standards and effective monitoring were cited as reasons for the perceived low probability. However, some also described the radiological emergency as realistic — and possible at any time. Comparisons with the COVID-19 pandemic reinforce the subjective assessment of the possibility: *"I still remember where the news came from: something was happening in Asia. Everyone said, 'Oh, it won't reach Germany anyway.' But unfortunately, we've learned from that it can happen very quickly. It can always happen — that much is clear."*

¹ The BfS works to ensure the safety and protection of people and the environment from harm caused by ionizing and non-ionizing radiation. In the field of ionizing radiation, its work includes, for example, radiation-based diagnostics and medical applications, the protection of the public during nationwide radiological emergencies, and protection against elevated levels of natural radioactivity, such as radon. Areas of focus in the field of non-ionizing radiation include, among others, protection against ultraviolet radiation and the effects of mobile communications. This and further information about the BfS can be found at https://www.bfs.de/DE/bfs/amt/amt_node.html [last accessed on July 29, 2026].

When asked about a radiological emergency as defined above, most respondents in the qualitative study envisioned an incident at a nuclear power plant. Incidents abroad could affect Germany, since it is *“surrounded by nuclear reactors,”* and older respondents in particular recalled from the disasters at Fukushima and Chernobyl that large regions could be affected. Natural disasters, human error, or technical failure were seen as plausible causes. Added to this was the perception of a higher risk of an incident at foreign nuclear power plants, which were sometimes assumed to have inadequate safety standards and a high tolerance for risk. Older nuclear power plants in neighboring countries — the Czech Republic, Belgium, Switzerland, and France — were perceived as potentially dangerous. Many envisioned that, in the event of an incident, radiation would spread over a wide area via the air, clouds, and rain, and consequently also anticipated radioactive contamination of food.

War, sabotage, and external attacks were also spontaneously cited in the qualitative survey as possible triggers of a radiological emergency. The subjective perception of threat was increasingly reinforced by news reports on current conflicts and the military buildup of various countries. The war in Ukraine was spontaneously mentioned several times or stated as a source of danger when asked. When considering a war scenario, the majority did not assume the use of nuclear weapons, but rather drone attacks and sabotage of radiation-related critical infrastructure. Thus, in the context of a war, attacks on nuclear power plants were considered by some interviewees to be likely to realistic.

By contrast, the overwhelming majority considered the use of nuclear weapons to be very unlikely; mutual deterrence, a sense of responsibility among decision-makers, as well as general optimism and trust in common sense were cited as reasons for this. However, concerns regarding tactical nuclear weapons with shorter ranges were also expressed in isolated cases: *“Yes, in the end they’ll come at us with — I don’t remember what they’re called — mini or micro nuclear bombs, where they’ll basically try not to go too far, so that everything isn’t destroyed right away. But that can still affect an entire major city, throw everything into chaos, and cause all the people there to suffer.”* Furthermore, political decision-makers perceived as impulsive or irrational were seen as a risk factor, and perceived or feared political provocations and escalations fueled the fear of a nuclear “push of a button”. A few respondents viewed Germany as a potential target due to its proximity to the war zone, arms deliveries, and its geopolitical situation.

Some pointed out that even minor incidents could lead to regionally limited emergency situations: *“So let’s say Siemens sold a new product to a hospital that contains a radioactive source; it’s being transported, and an accident happens. It doesn’t have to be a level of radiation that’s lethal within minutes, but one that still causes health damage. I think that such a situation can happen — and does happen.”* Potential incidents involving Castor transports or accidents in laboratories working with radioactive material were also cited as possible triggers for regionally limited radiological emergencies.

In isolated cases, misconceptions and false analogies found their way into the scenarios mentioned spontaneously. For example, it was speculated that *“if the sun shines too brightly, that might also be a radiological emergency,”* that even without a critical event *“we could reach a certain measurement value, a point like the tipping point in climate change,”* or that a radiological emergency would occur if *“a data center that also uses Wi-Fi were to explode”*.

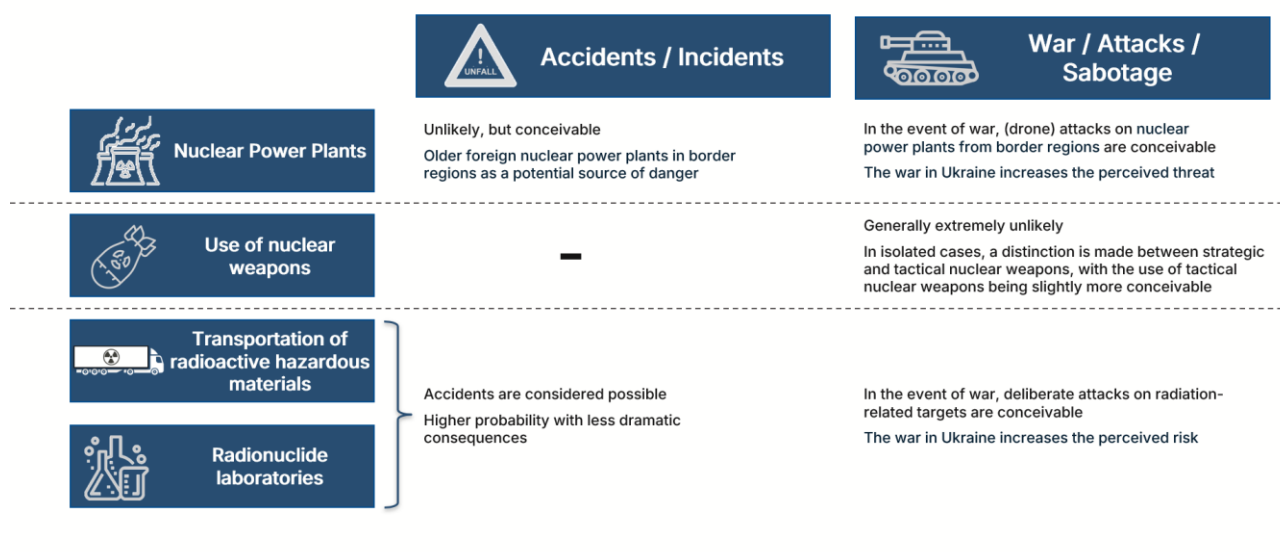


Fig.22 Scenarios of a radiological emergency and their subjective probability (qualitative)

3.6.2 Relevance and Concern in Everyday Life

The qualitative results show that thoughts of a radiological emergency are rarely present in everyday life and are often triggered only sporadically by news reports, social media, and specific events, such as incidents at nuclear power plants. Fatalism and feelings of powerlessness on the one hand (*“There’s nothing you can do; you can only wait and see”*) and low risk perceptions on the other hand result in a subjectively low sense of urgency regarding the issue.

However, when people spent more time considering the possibility of a radiological emergency — whether due to a specific trigger or as part of the interview —, this elicited very different levels of anxiety. On several occasions, respondents admitted to mentally distancing themselves from or consciously suppressing the topic to avoid negative thoughts: *“... so that I don’t think about it all the time, because otherwise I’d just worry more and more. Then you’d be living in constant fear, and that’s not what you want.”* According to the qualitative interviewees, the topic was also rarely discussed among friends and family, and when it was, children’s questions were often the trigger: Topics discussed in school, such as radioactivity or war, are brought up at home, discussed with parents and siblings, and in the process, the danger of a radiological emergency is also addressed. Parents often saw their role in this context as addressing their children’s fears and helping to alleviate them.

Different trends in the topic’s relevance to everyday life were reported: Many qualitative respondents noted a more pronounced presence and concern recently, primarily due to the war in Ukraine and more intensive media coverage. At the same time, some attitudes remained unchanged or diminished — due to deliberate distancing, habituation, or fatigue. For older respondents, the possibility of an incident at a nuclear power plant was often significantly less present in their minds than it had been in the past: *“I think it’s fading further and further into the background of people’s consciousness. Chernobyl was, after all, a massive disaster. And then there was Fukushima as well, but I think it affects people less and less now.”* Changes in personal circumstances also influenced the extent to which interviewees thought about a future radiological emergency: parenthood and the resulting increased responsibility for the next generation made the risks seem more significant in the long term.

In the quantitative survey, the relevance of the topic “radiological emergency” to everyday life was assessed using four items, for each of which respondents were asked to rate their level of concern. When specifically asked about this, this level of concern turned out to be greater than what the qualitative

statements regarding the extent to which people think about it in everyday life would suggest. However, this is consistent with the aforementioned finding that the topic is largely ignored in normal daily life, giving way to a comparatively high level of anxiety once these thoughts are brought specifically to mind.

Based on the Top2Box (scores 1 and 2) on a scale from 1 (strongly agree) to 5 (strongly disagree), more than two-thirds of respondents (68%) expressed great concern in general about current conflicts and wars around the world. The fact that these conflicts and wars could trigger a “nuclear accident at a nuclear power plant” or lead to the use of nuclear weapons is a major concern for 60 percent of interviewees in each case. Forty-one percent of respondents expressed great concern about a “nuclear accident at a nuclear power plant” that could also affect Germany, with this percentage having risen by six percentage points from 35 percent in 2024. It should be noted, however, that unlike in 2024, the 2026 survey was preceded by the above-mentioned definition of a radiological emergency (see Section 3.6.1).

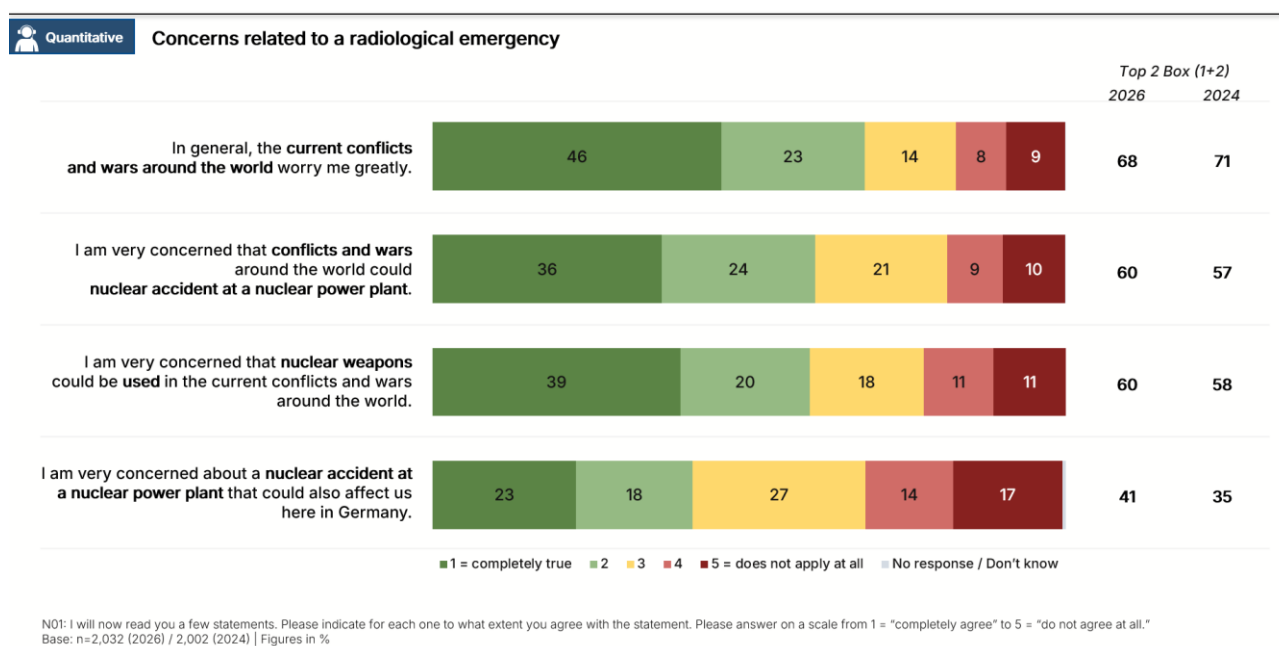


Fig.23 Concerns related to a radiological emergency (quantitative)

As was already the case with general radiation-related health issues (see Section 3.2.2), women expressed significantly greater concern than men across all aspects. The difference in the Top2Box was particularly large — at over 20 percentage points — regarding concern about the use of nuclear weapons (70% among women vs. 49% among men). For the other items, the Top2Box values for women were, on average, nine percentage points higher than those for men.

Consistent with the qualitative findings, there was also an increase in concern about a potential “nuclear accident at a nuclear power plant” with increasing age. More than half (53% Top2Box) of respondents aged 65 and older expressed great concern in this regard; in the youngest age group (up to age 29), the corresponding proportion was only about half as high (27% Top2Box).

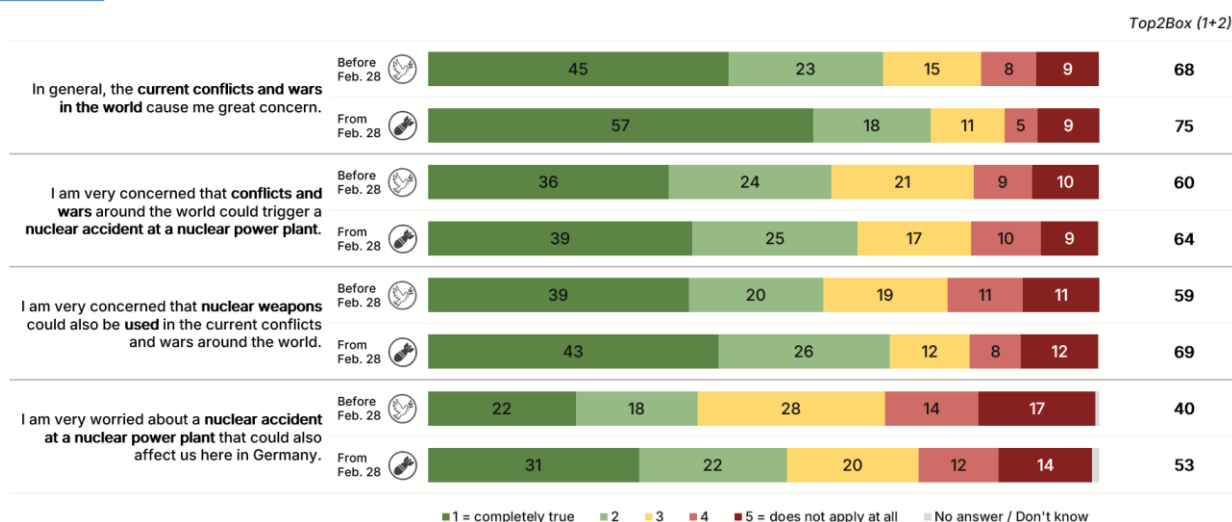
Regional differences were also evident regarding the same issue — namely, concern about a “nuclear accident at a nuclear power plant”: In the west (the states of North Rhine-Westphalia, Hesse, Rhineland-Palatinate, and Saarland) — and thus the region with the highest number of active nuclear power plants near the border — the proportion of those concerned was significantly higher than in the other regions. There were also tentative (though not statistically significant) regional differences indicating higher levels of concern due to current wars and conflicts in eastern Germany.

	Total	Age					Gender		Region			
Basis	2032	Up to 29 years old	30-39 years	40-49 years	50-64 years	65+ years	Male	Female	North	East	West	South
		358	281	328	523	542	995	1036	328	390	714	594
In general, I am very concerned about the current conflicts and wars around the world.	68	66	61	63	74	71	64	72	61	75	67	69
I am very concerned that conflicts and wars around the world could trigger a nuclear accident at a nuclear power plant.	60	57	57	58	62	64	56	65	54	65	60	62
I am very concerned that nuclear weapons could also be used in the current conflicts and wars around the world.	60	56	55	55	64	63	49	70	57	58	62	59
I am very concerned about a nuclear accident at a nuclear power plant that could also affect us here in Germany.	41	27	33	39	44	53	37	45	38	37	50	34

N01: I will now read you a few statements. Please indicate for each one to what extent you agree with the statement. Please answer on a scale from 1 = "completely agree" to 5 = "do not agree at all."
 Base: n=2,032 total | Figures in %, Top 2 Box (agreement 1-2 on a 5-point scale)

Fig.24 Concerns regarding a radiological emergency by subgroup (quantitative)

An analysis of the data by survey date — specifically, before or on or after the start of the Iran War on February 28, 2026 — reveals a significant increase in concern since the outbreak of the war. Fifty-seven percent of those surveyed after the war started strongly agreed with the statement “In general, the current conflicts and wars in the world worry me greatly,” compared to 45 percent of those surveyed before the war broke out. Higher levels of agreement — and thus greater concern — were also evident for the other items following the outbreak of the Iran War. However, this had little effect on the overall score, as the vast majority of interviews were conducted before February 28, 2026. For all individual scale items as well as for the Top2Box (sum of scale values 1 and 2), there was a maximum difference of one percentage point between the total sample and the subsample of interviewees surveyed before February 28, 2026.



N01: I will now read you a few statements. Please indicate for each one to what extent you agree with the statement. Please answer on a scale from 1 = "completely agree" to 5 = "do not agree at all."
 Base: n=1,882 / 150 | Figures in %

Fig.25 Concerns regarding a radiological emergency before vs. after the start of the Iran war (quantitative)

3.6.3 Behavior in an Emergency

"I wouldn't know what to do. I have no idea. Run somewhere—should I run to the basement? Or pray? I don't know." This is how one respondent described his **helplessness in the event of a radiological emergency** during a qualitative individual interview. Many had no idea at all, and some only very vague notions, about what behavior would be appropriate. Participants often only became aware of their own lack of knowledge during the interview.

This corresponds with the results of the quantitative representative survey. On a scale from 1 (strongly agree) to 5 (strongly disagree), only 9 percent of respondents strongly agreed with the statement "In the event of a radiological emergency, I would know what to do", while another 9 percent selected a rating of 2. In contrast, 41 percent stated that they had no idea what to do (score 5), and another 22 percent said they were "somewhat unsure" (score 4). The agreement rates have declined slightly compared to the 2024 and 2022 surveys, reflecting a greater acknowledgment of one's own lack of knowledge regarding how to behave in an emergency. However, it must be noted that the wording of the item was adjusted in 2026: While the term "nuclear accident" was used in 2024 and 2022, this term was replaced in 2026 with "radiological emergency," which, unlike in previous surveys, was also specifically defined beforehand (see Section 3.6.1).

Men reported having a plan for how to respond to a radiological emergency significantly more often than women. Specifically, 25 percent of men selected the top two response options indicating agreement (scale values 1 and 2), compared to only 10 percent of women. Fifty percent of women admitted that they had no idea what to do in a radiological emergency, compared to less than one-third (32%) of men. In contrast, there were no significant differences based on age, household size, presence of children in the household, educational attainment, or region.

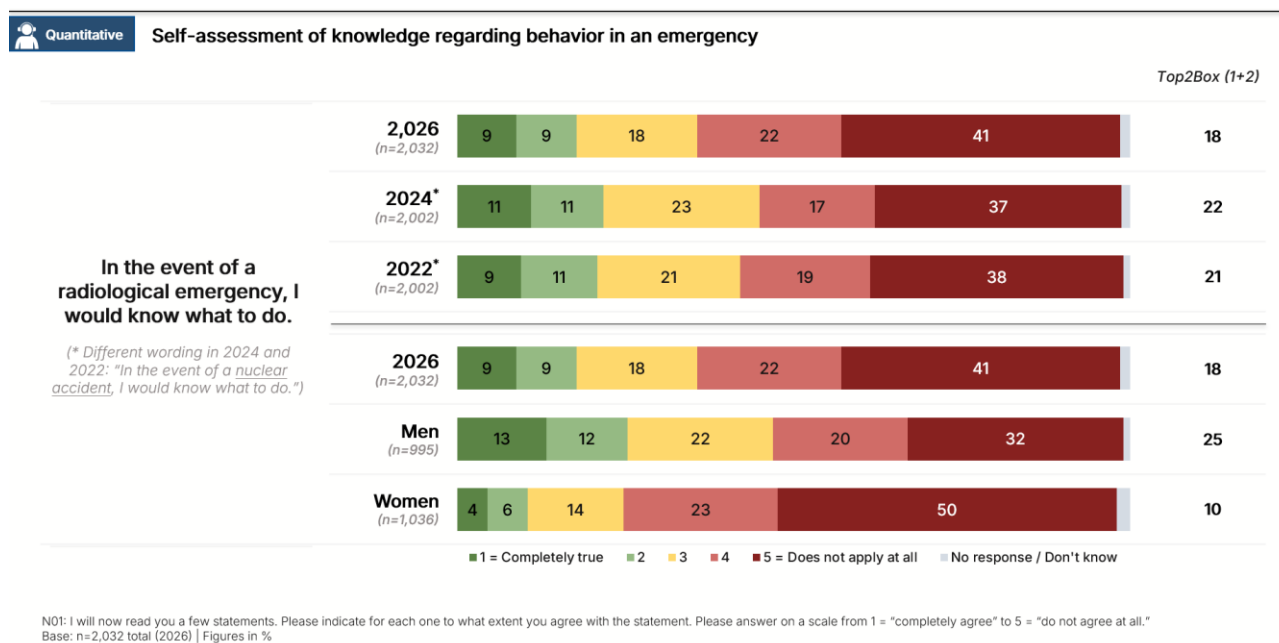


Fig.26 Self-assessment of knowledge regarding behavior in an emergency (quantitative)

Respondents were asked, both qualitatively and quantitatively without prompting, **what exactly they would do in the event of a radiological emergency**. The question was not asked quantitatively of those who had previously indicated a scale score of 4 or 5 — that is, those who, by their own account, did not know or had absolutely no idea what to do in a radiological emergency. What is immediately striking about the quantitative results is that, despite this question filter, more than one-fifth (22%) were unable to

provide a spontaneous response when asked about specific actions. This finding puts the results into perspective, suggesting an even higher level of uncertainty regarding one's own emergency response.

Nearly one-third (32%) of those who, according to the preliminary question, had an idea of how they would behave in an emergency (corresponding to 11% of the total sample) stated, without prompting, that they would not want to leave their own home, would seek refuge in the basement if necessary, or would in any case avoid staying outdoors. Second among the categorized open-ended responses was the search for information, with authorities, the media, and warning apps sometimes explicitly mentioned. The qualitative results, however, suggested that there is widespread uncertainty regarding specific, appropriate sources of information in an acute emergency. Many expected active warnings and explicit recommendations for action from authorities, the police, and the fire department (see Section 3.6.5).

15 percent of interviewees who were asked about their own behavior in an emergency (corresponding to 5% of the total sample) considered taking medication or dietary supplements in response to a radiological emergency. Iodine tablets were specifically mentioned in this context. In the qualitative analysis, however, many participants also expressed uncertainty about whether and where they could obtain iodine tablets and, in some cases, voiced doubts about their effectiveness.

Twelve percent of respondents who had ideas about their own behavior in an emergency (corresponding to 4% of the total sample) mentioned moving away from or fleeing the danger zone. However, in the qualitative interviews, concerns were also raised that this behavior would already be too late once the emergency occurred: *"I think that by the time it happens, it'll be too late anyway — then there's nothing we can do. You'd have to know about it beforehand to be able to save yourself."* Furthermore, respondents viewed the expected panic among the population and the resulting "chaos" caused by overcrowded escape routes as obstacles to their own effective evacuation behavior.

Eleven percent of interviewees who had ideas about their own behavior in an emergency (corresponding to 4% of the total sample) stated that they would seek out a bunker or shelter. However, this figure is put into perspective by the results of the qualitative interviews: All participants who spontaneously mentioned this also had to admit their lack of knowledge regarding the existence or even the specific locations of bunkers.

Seven percent of respondents who had ideas about their own behavior in an emergency (corresponding to 3% of the total sample) spontaneously thought of keeping windows and doors closed or sealed and/or turning off ventilation systems; the same proportion thought of avoiding contaminated food or water.

The importance of maintaining adequate food reserves was mentioned by 6 percent of interviewees who had ideas about their own behavior in an emergency (corresponding to 2 percent of the total sample); in this context, the qualitative interviews emphasized not only behavior during an acute emergency but also the need for more proactive food stockpiling — a practice that was rarely implemented, however. In addition, there were isolated qualitative reports in this context of preparations already made for a disaster, though these did not directly relate to radiation protection but rather to power or water supply outages or general health emergencies — for example, purchasing a solar-powered or hand-crank radio or taking a first-aid course.

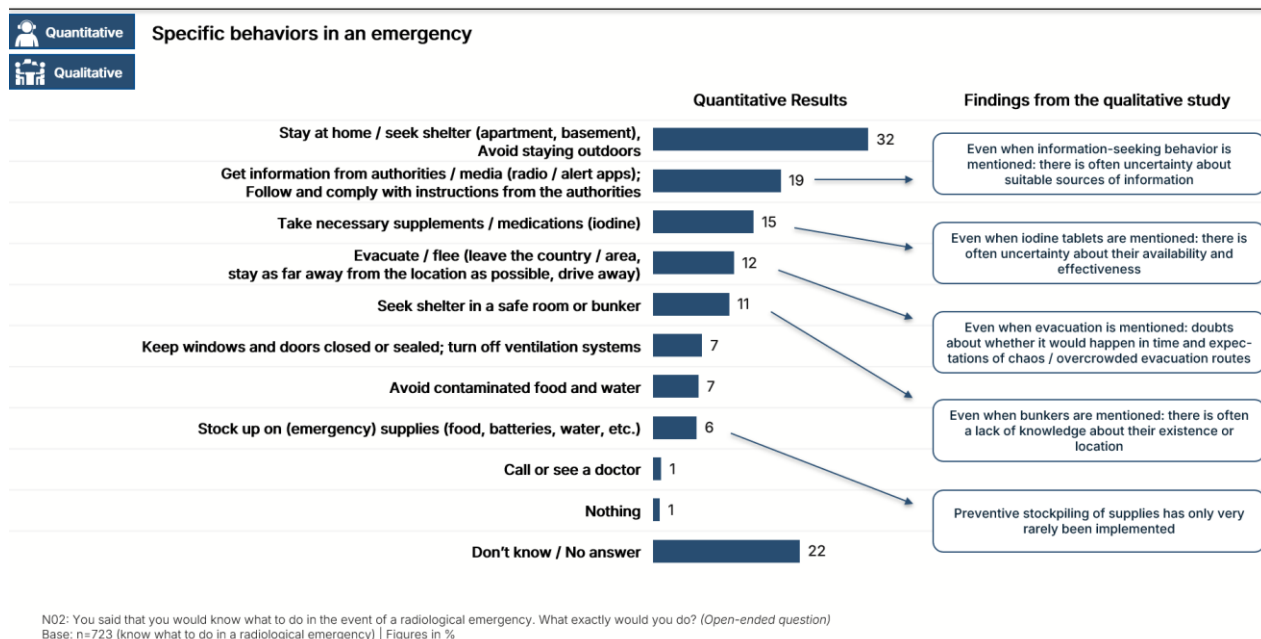


Fig.27 Specific behaviors in an emergency (qualitative and quantitative)

In addition to the quantitatively identified aspects, many qualitative respondents placed a high priority on contacting and protecting family members and relatives, especially parents and children outside their own household. For example, the very first thing one would try to do is *“get the family together and then perhaps decide together what to do or not to do, and how dangerous the situation is or isn’t”*. Several qualitative interviewees saw no chance of rescue in the event of a serious emergency or doubted whether survival would be worth living, even going so far as to have suicidal thoughts.

In certain quantitative categories, significant gender differences emerged within the group of those who, based on the preliminary question, had an idea of how they would behave in an emergency: 38 percent of women spontaneously stated that, in an emergency, they would stay at home and avoid spending any time outdoors. The corresponding proportion among men was significantly lower at 28 percent. Conversely, 14 percent of men considered keeping their distance or fleeing, but only 9 percent of women did — another significant difference. When broken down by age, these two categories show a tendency toward more distancing and fleeing behavior among younger people, while older people would be more likely to stay at home. However, since the question about specific behavior was only asked of those who had previously indicated that they knew what to do in an emergency, the age differences were merely indicative trends and not statistically significant due to the small sample size.

3.6.4 Civil Protection / Roles of the Authorities

Most respondents in the qualitative survey rated civil protection in Germany as weak to, at best, mediocre. Although (evacuation) plans and structures exist, respondents often expected failures in implementation, equipment, and capacity in the event of an emergency. Experiences of perceived poor performance during the COVID-19 pandemic, the Ahr Valley floods, or even regionally limited fire department operations or power outages reinforced doubts about the effectiveness of civil protection. Military comparisons also led to a pessimistic outlook: *“I would say that in Germany, action is usually taken or a response is made only when it is already too late — at the moment, for example, with regard to the war, as far as the Bundeswehr is concerned.”*

Specifically, qualitative statements regarding inadequate precautions often referred to a lack of or insufficient shelters: In addition to a lack of knowledge about the general existence and specific locations of existing bunkers (see Section 3.6.3), it was assumed that these were outdated and that their capacity was

insufficient for the entire population. Subway tunnels or basements were mentioned as alternative shelters, though their suitability was often questioned. Many hoped that, in an emergency, iodine tablets and radiation protection suits would be distributed to the population. However, their availability was also deemed insufficient.

The assumption of tight budgets and low priority given to the issue also shaped the negative expectations of the qualitative interviewees. In some cases, international comparisons were drawn, with Switzerland, the U.S., and China specifically perceived as being better prepared. However, several respondents also assessed the situation in Germany as comparatively good: *“Well, I believe that we are indeed a very progressive country, also when it comes to science, technology, and things like that. So I think we’re actually doing relatively well in that regard.”* Positive individual experiences with warning and emergency procedures — such as alerts from the warning app or the rapid arrival of an emergency physician during a medical emergency — occasionally bolstered confidence.

In the quantitative part of the survey, the population’s subjective perception of civil protection was assessed using two items: trust in the government’s implementation of all important measures and an assessment of the extent to which the country is prepared for a radiological emergency. Overall, the results showed that while a large portion of the population trusts that the government will immediately implement all important measures in the event of a radiological emergency, many respondents — in line with the qualitative findings described above — rated Germany as generally not well prepared for a radiological emergency.

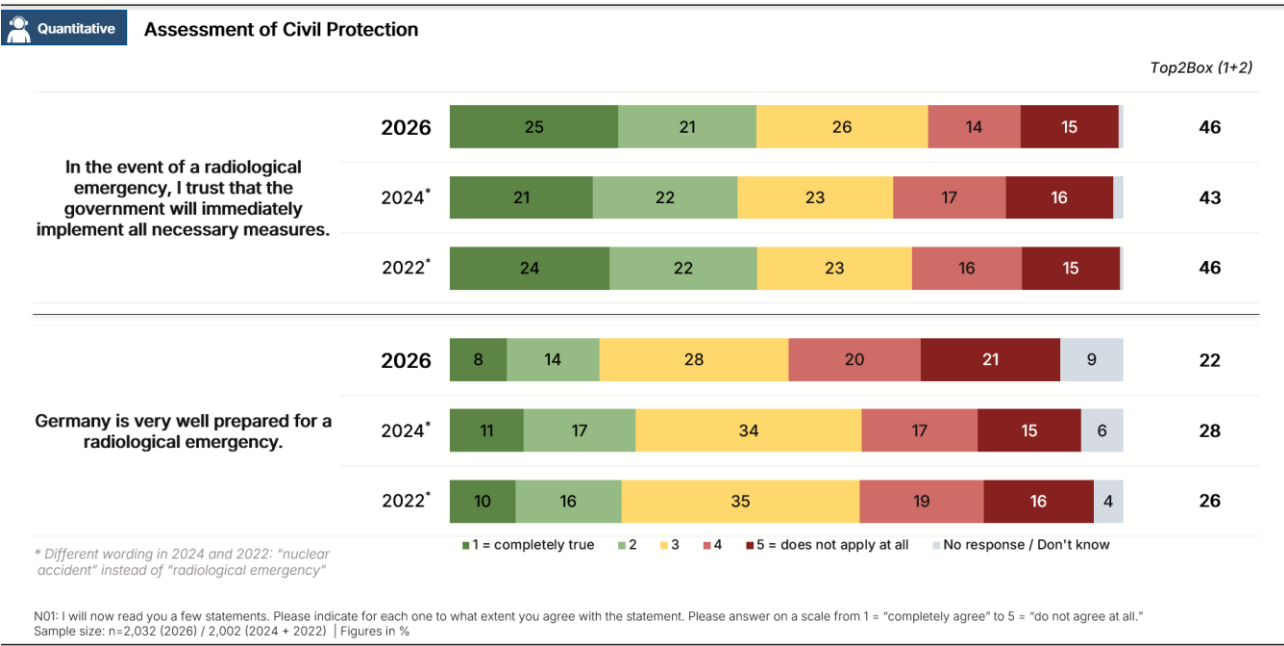


Fig.28 Assessment of Civil Protection (Quantitative)

Twenty-five percent of interviewees strongly agreed with the statement, “In the event of a radiological emergency, I trust that the government will immediately implement all necessary measures”. Another 21 percent selected a rating of 2 on a scale ranging from 1 (strongly agree) to 5 (strongly disagree). Fifteen percent expressed no confidence at all (scale value 5), while 14 percent expressed somewhat less confidence (scale value 4). These figures were roughly in line with those measured in 2024 and 2022, although the term used there was “nuclear accident” rather than “radiological emergency,” which — unlike in the current survey — was not explicitly defined (see Section 3.6.1). There were no significant differences in confidence in the government’s ability to implement all key measures in the event of a radiological

emergency based on age, gender, household size, presence of children in the household, educational attainment, or region.

Only 8 percent fully believed (scale value 1) that Germany is very well prepared for a radiological emergency; 14 percent, however, selected scale value 2 on a scale ranging from 1 (completely agree) to 5 (completely disagree). At the other end of the scale, however, about one-fifth (21%) were convinced that this was not true at all or rather not true. Nine percent felt completely unable to provide a rating. Given the previously described limitation on comparability due to the specified definition of a radiological emergency in 2026 and the changed wording (“nuclear accident” in 2022 and 2024 instead of “radiological emergency” in 2026), confidence in civil protection was found to be declining.

Based on the Top2Box (sum of scale value 5 = “fully agree” and scale value 4), men (27%) were significantly more likely than women (18%) to view Germany as prepared for a radiological emergency. Furthermore, an interesting correlation emerged regarding respondents’ self-assessment of their prior engagement with the topic of radiation: 29 percent (Top2Box) of respondents who reported having never considered the topic of radiation prior to the survey expected Germany to be very well prepared for a radiological emergency — significantly more than in the subgroups that had already given more thought to radiation (between 16% and 22% Top2Box). This finding is particularly noteworthy in light of the fact that people who, by their own account, had already dealt extensively with the topic of radiation prior to the survey generally felt significantly better protected by government radiation protection agencies (see Chapter 3.5.3). The results thus suggest that while engaging with the topic of radiation leads to a greater sense of protection provided by government institutions in general, it simultaneously results in lower trust in civil protection specifically in the event of a radiological emergency.

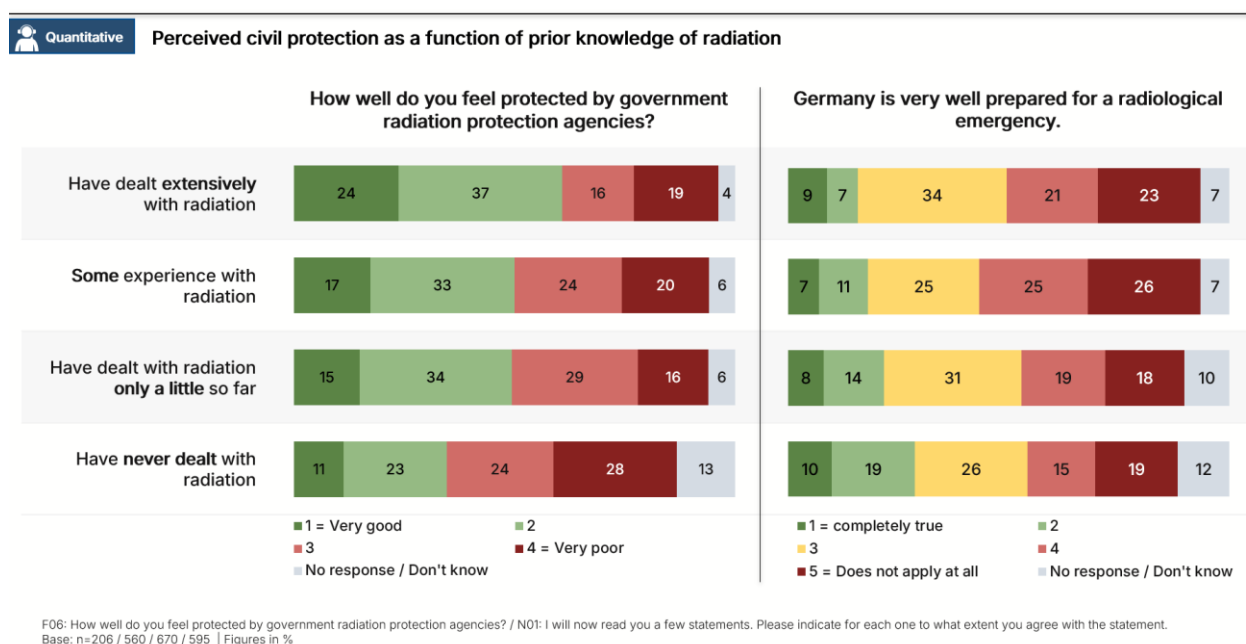


Fig.29 Perceived civil protection as a function of prior knowledge of radiation (quantitative)

Perceptions of civil protection in the event of a radiological emergency varied depending on the time of the survey: Starting with the outbreak of the Iran War on February 28, 2026, greater uncertainty and doubts emerged regarding whether Germany is well prepared for a radiological emergency. While 9 percent of interviewees were convinced before February 28, 2026, that Germany was very well prepared for a radiological emergency (scale value 1 = “completely agree”), only 4 percent — less than half — held this view after February 28, 2026. At the same time, the proportion of those who were unsure (answer “Don’t know”) rose by 10 percentage points from 9 percent to 19 percent. Confidence that the government would

immediately implement all necessary measures in the event of a radiological emergency also declined as of February 28, 2026. However, due to the relatively small number of interviews conducted from February 28, 2026, onward, this had little effect on the overall value; thus, for the two items on civil protection — as was already the case with the items on concern (see Chapter 3.6.2) — the difference between the total sample and the subsample of respondents surveyed before February 28, 2026, was no more than one percentage point for all individual scale points and also for the Top2Box (sum of scale values 1 and 2), the difference between the total sample and the subsample of respondents surveyed before February 28, 2026, was at most one percentage point.

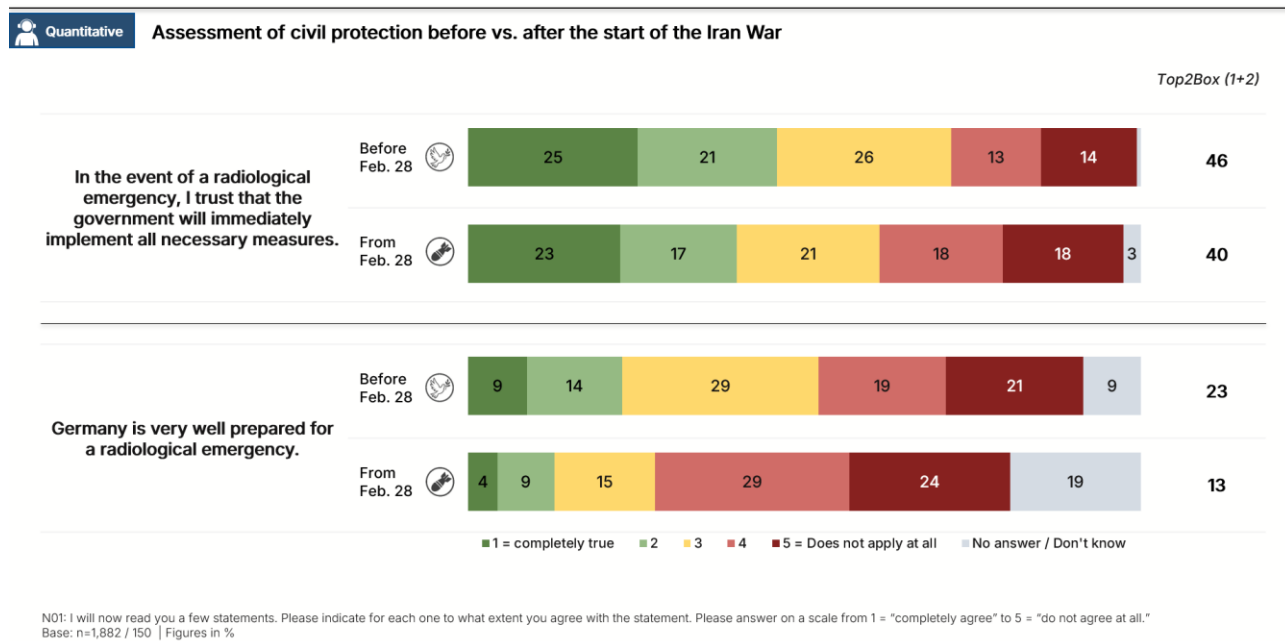


Fig.30 Assessment of civil protection before vs. after the start of the Iran War (quantitative)

Respondents were also asked, in qualitative terms, which authority was responsible for civil protection in the event of a radiological emergency, a question that often caused uncertainty. Politicians and the government in general were seen as primarily responsible, and problems were frequently and spontaneously associated with a perceived lack of unity — for example, as a result of the federal structure: *"Here we go again: Who's in charge? So, is it the federal government, or is it the states? They'll just start arguing about it again."* Ministries (the Ministry of the Environment, the Ministry of the Interior) as well as specialized agencies, including the BfS, were also named as responsible players. In some cases, a distinction was made between these bodies as organizing authorities, while the Bundeswehr, THW, fire department, and police were seen as responsible for security, logistics, and on-site support.

3.6.5 Requirements for Information and Communication

In the qualitative survey, interviewees consistently emphasized the need for centralized, uniform information from higher-level authorities and clear government instructions in the context of a radiological emergency. However, opinions were divided regarding the **optimal timing of public information efforts**: Focus groups engaged in heated debate over whether the public should be informed in advance or only once the emergency had occurred. From the respondents' perspective, the reassuring effect of emergency plans and preparatory measures was cited as an argument in favor of advance information. At the same time, the fear that the public might not be informed quickly or fully in the event of an emergency was also mentioned as a reason for raising awareness beforehand.

At the same time, though, it was acknowledged that advance information can easily get lost amid the flood of news and would therefore need to be refreshed regularly — something that would likely not happen due to a lack of urgency. Added to this was the expectation that, under stress, existing knowledge is often inaccessible, and spontaneous “knee-jerk reactions” would therefore dominate: *“I think that if the situation were to actually occur, there would be a mental blank at that moment, and people would no longer react rationally — it would all just be spontaneous and emotional. That means that the moment the situation occurs, people need to be guided, and then it doesn’t matter whether they were informed beforehand.”*

Some of the respondents viewed proactive advance information as unnecessary and counterproductive in principle and preferred passive online availability of information that interested parties could access as needed. Even among those who wanted active information, there were significant differences regarding interest and the desired depth of the messages. Some viewed comprehensive and transparent public education as necessary and justified due to potentially serious consequences, despite low probabilities. Others preferred limiting information to the bare essentials, such as incorporating short behavioral checklists into general news reports or overviews of bunker locations distributed by the city or municipality.

Overall, many of the interviewees viewed providing advance information to the public as a balancing act between necessary education and the potential to trigger panic. The current geopolitical context makes preventive information particularly sensitive at this time, in the view of some respondents, as some citizens might misinterpret the communication as preparation for an imminent emergency. The most common solution to this dilemma is seen as careful communication, a tone that avoids drama, and messages grounded in everyday life — for example, *“not starting a news report directly with a worst-case scenario, but instead gradually introducing these topics”*. The low probability of occurrence should be emphasized to instill a sense of security rather than fear. Continuous, honest, “unemotional” factual information *“in small doses”* is welcomed.

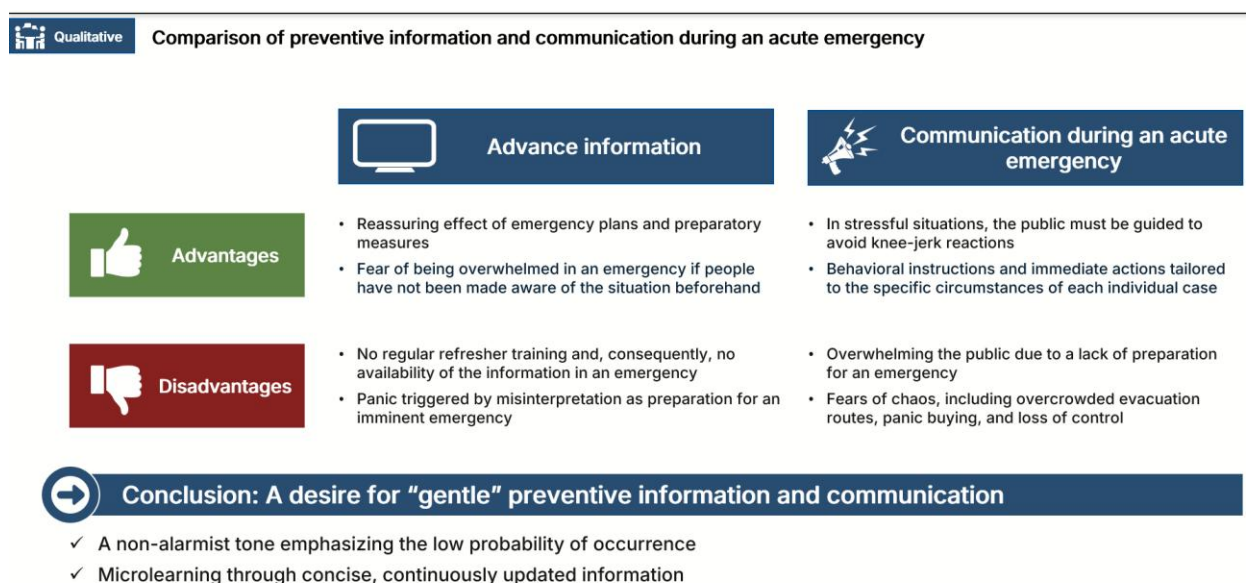


Fig.31 Comparison of preventive information and communication during an acute emergency (qualitative)

In the quantitative representative survey, the overwhelming majority of respondents supported preventive information. It made little difference whether the radiological emergency was triggered by an accident or by a conflict/war in Europe. Sixty percent and 62 percent of interviewees, respectively, strongly agreed with the statements “The public should be better informed about what to do in the event of a radiological emergency caused by an accident or a conflict/war in Europe.” In the Top2Box for values 1 and 2 on a scale

from 1 (strongly agree) to 5 (strongly disagree), a clear majority of 83 and 79 percent, respectively, agreed, while at the other end of the scale, only seven and eight percent, respectively, selected a value of 4 or 5—indicating they did not agree or strongly disagreed.

Women welcomed the information about how to behave in a radiological emergency significantly more than men: The difference in the Top2Box was five to six percentage points in each case (“in the event of an accident”: 86% of women vs. 80% of men; “in the event of a conflict/war in Europe”: 82% of women vs. 77% of men). There were no significant differences in agreement on these two items based on age.

Drills were also overwhelmingly supported, albeit not as strongly as the unspecified general public information. Just under two-thirds (65% Top2Box) agreed with the statement: “The public should learn through drills how to protect themselves, even in the event of a nuclear attack.” This contrasted with 15 percent who rejected the drills described in this way (scale values 4 and 5). Here, too, agreement was significantly higher among women (69%) than among men (60%), while once again no significant age differences were observed.

Attitudes toward drills or warning days were discussed in greater detail during the qualitative interviews, with evaluations tending to depend on the scope of the drills. For example, a test warning message via the cell broadcast system received broad support, while drills that take up an entire day were often rejected as excessive or panic-inducing. According to the respondents, voluntary participation and digital formats facilitated engagement and reach. Targeted campaigns in schools, businesses, and for young people were often considered more effective than initiatives aimed at the general population. According to the respondents in the qualitative study, educational institutions generally played a particularly important role in preventive communication. For example, many interviewees believed that young people should receive practical instruction on radiation-related topics in schools and training facilities.

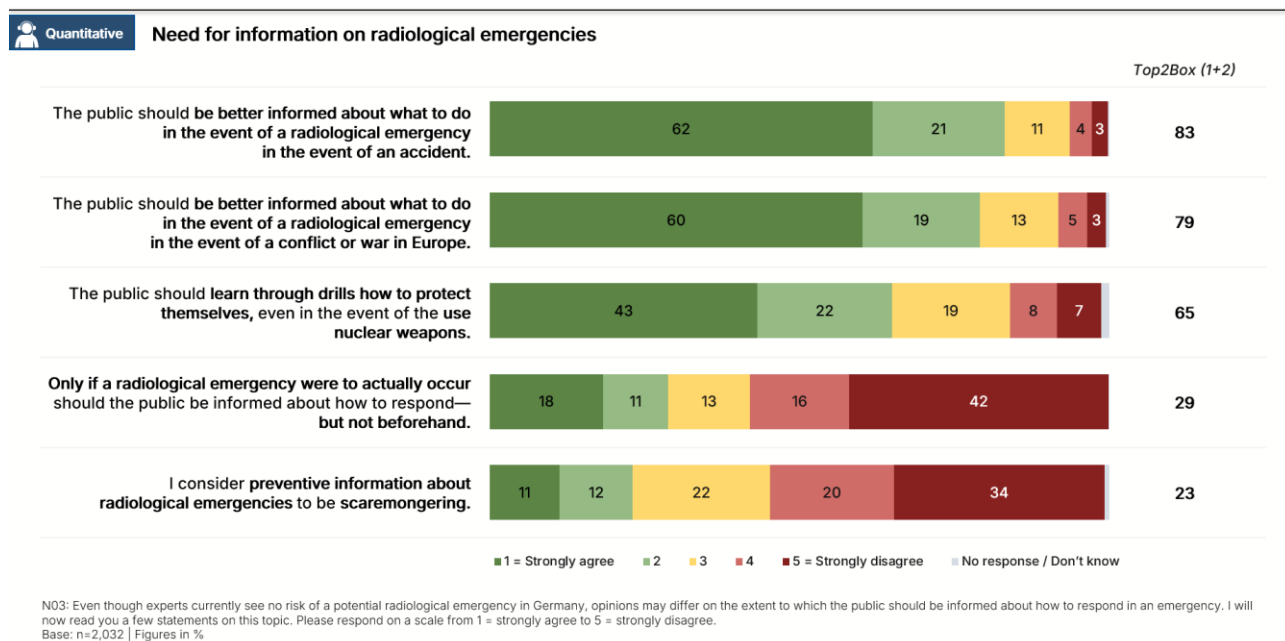


Fig.32 Need for information on radiological emergencies (quantitative)

The qualitatively controversial question of **whether preventive information on radiological emergencies is appropriate** or, on the contrary, has a counterproductive effect — for example, by “spreading panic” — was addressed in the representative survey through two items. Quantitatively as well, the picture was ambivalent, though with a higher level of support for preventive communication. While 11 percent of respondents agreed completely (scale value 1) that preventive information about radiological emergencies amounts to scaremongering, more than one-third (34%) disagreed completely (scale value 5) with this

statement. The results for the statement “The public should only be informed about how to respond if a radiological emergency actually occurs, but not beforehand” followed a similar pattern, though with even more pronounced polarization at the extremes. Eighteen percent agreed completely with this statement, while 42 percent disagreed completely.

When examining the differences by subgroup, significant results emerge primarily based on age and educational attainment. Thirty percent of respondents (Top2Box) aged 65 and older considered preventive information about radiological emergencies to be scaremongering, compared to 17 to 23 percent in the other age groups. In the younger groups up to age 39, only 17 and 18 percent, respectively, wanted to be informed only after a radiological emergency actually occurred, but not beforehand. In the intermediate age groups (40 to 64 years), this proportion rose to 26 and 29 percent, respectively, and was significantly highest among those over 65, at 43 percent. Respondents with a secondary school diploma showed significantly higher levels of agreement on both items than those with higher levels of education. Consequently, the latter would be more likely to support preventive information about a potential radiological emergency.

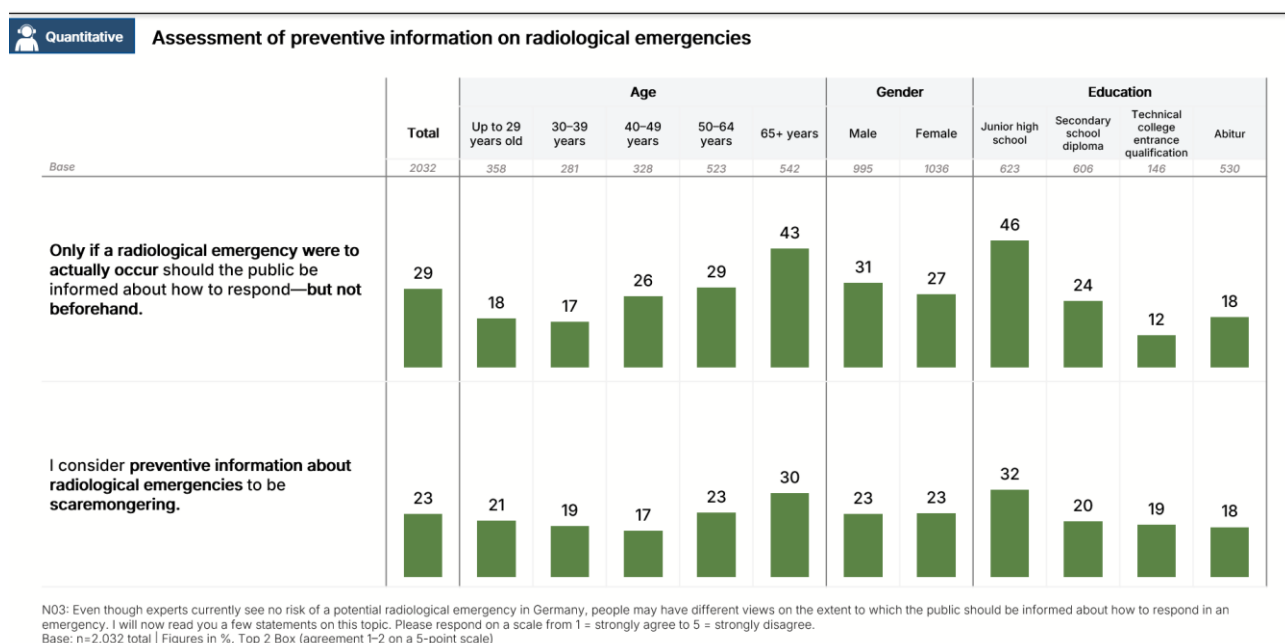


Fig.33 Assessment of preventive information on radiological emergencies (quantitative)

The qualitative interviews explored exactly what **communication** should look like **during an acute emergency**. In particular, immediate information via as many channels as possible — to reach all segments of the population — was not only desired but also expected. Various communication channels were mentioned, ranging from warning apps and smartphone alerts via cell broadcast to various online sources (Google search results, social media), as well as television, radio, loudspeaker trucks, and siren alarms.

Information as honest and as transparent as possible is also demanded, and in this regard, concerns are frequently expressed that information is sugarcoated or withheld: “If you can’t sweep it under the rug at all, then it’s downplayed when it’s released, and they say something like ‘Keep your windows closed.’ That doesn’t help.” Some older interviewees cited the communication following the Chernobyl disaster — where they felt information was not provided early enough or honestly — as a negative example.

In terms of content, respondents primarily expect specific behavioral guidelines and immediate actions presented in as concise and understandable a form as possible. This should also include information on affected areas, evacuation destinations, clear escape routes, and available transportation. “You’re relying on the government to say, ‘Hey, get moving, gather there, and do this and that.’ Sure, I’d do everything I

could to protect my family, but I wouldn't have a safe haven where I could say, 'I'm going there; I know I'll be safe there.'"

3.7 Featured Topic: Radon

3.7.1 Awareness of Radon

Another focus of the quantitative study was the topic of radon. **General awareness** of radon was surveyed at the beginning of the quantitative study, immediately following questions about spontaneous associations with radiation, to avoid any influence from the rest of the questionnaire's content. When asked whether they had ever heard or read anything about radon, 41 percent answered "Yes, definitely," and 17 percent answered "Yes, I think so." The remaining 43 percent of respondents (rounded) could not recall ever having heard or read anything about radon.

Awareness increased with age: More than half of those aged 65 and older (51%) confirmed they had definitely heard or read something about radon, compared to only 41% and 43% of those aged 40 to 64, and 28% and 31% of interviewees under 39, respectively. Conversely, according to their own statements, more than half (55% and 54%, respectively) of the younger age groups up to age 39 had never heard or read anything about radon, compared to 43 percent of those aged 40 to 49, 38 percent of those aged 50 to 64, and less than a third (32%) of those aged 65 and older. The proportion of those who believed they had already heard of radon but were unsure about it remained at roughly the same level across all age groups, ranging between 15 and 18 percent.

Men (46%) were significantly more certain than women (35%) that they had already noticed something related to radon. In contrast, 48 percent of women admitted to never having heard or read anything about radon, compared to only 37 percent of men. In addition, awareness of radon increased with higher levels of educational attainment: 55 percent of respondents with a high school diploma were certain they had heard of it, 45 percent with a technical college entrance qualification, 39 percent with a secondary school diploma, and 31 percent with a basic school diploma. Differences were also evident by region: Awareness of radon is highest in the east (46% "Yes, definitely," 36% unaware) and lowest in the west (37% "Yes, definitely," 49% unaware).

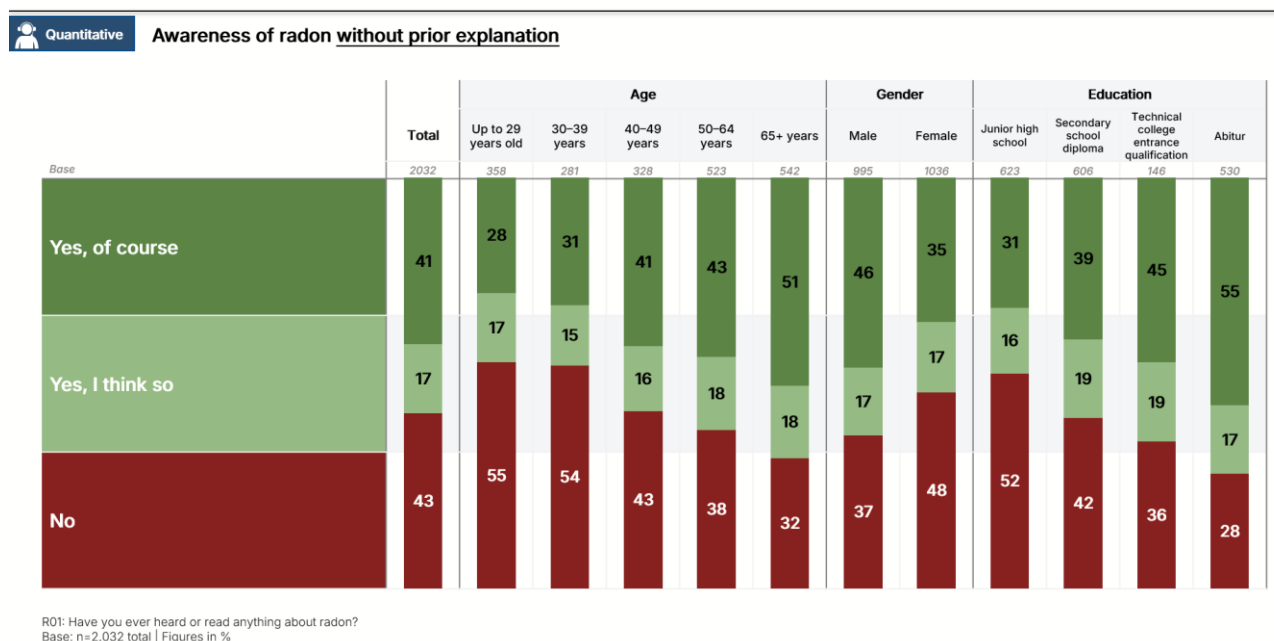


Fig.34 Awareness of radon (unprompted, without prior explanation) (quantitative)

The additional questions on the focus topic of radon were asked at the end of the questionnaire, i.e., after the topics on radiation in general described in the previous chapters. This must be taken into account when interpreting the results, as an in-depth engagement with radiation-related content and the inclusion of radon in the context of various health concerns (see Section 3.2.2) may have influenced respondents' answers.

In addition to measuring spontaneous awareness of radon without further explanation, awareness was assessed **following this preliminary explanation**: "Radon is a natural gas that occurs in rocks and soil in varying concentrations, including in Germany. Radon can accumulate in homes, especially in basements and lower floors, and at certain concentrations over a prolonged period, it can cause lung cancer." Following this explanation, uncertainty regarding awareness of radon increased. As a result, only 35 percent of interviewees were certain they had ever heard of or read about the noble gas radon. In contrast, the proportion of those who believed they had but were not certain was significantly higher at 23 percent than in the unprompted survey without a prior explanation. Even with the prompt — that is, with a prior explanation —, radon remained completely unknown to 42 percent of respondents, a proportion roughly equal to that in the unprompted survey.

The increase in uncertainty regarding awareness of radon following a prior explanation was nearly parallel among men and women; that is, even with the prompt, the proportion of women who reported never having heard of radon was eleven percentage points higher than that of men. In contrast, the age differences were significantly smaller in the prompted survey: In the youngest age group, after the interviewer read aloud the definition of radon, one-third (33%) — five percentage points more than in the unprompted survey — believed they had already heard or read something about radon. In contrast, a smaller proportion of respondents in the older age groups were certain of their awareness after the explanation than before it. In particular, among those aged 65 and older, only 40 percent of respondents stated that they were certain they had heard or read something about radon before, compared to 51 percent in the unprompted survey. Regional differences in prompted awareness were also less pronounced, but here too there was a tendency toward lower awareness in the west (31% "Yes, definitely," 44 percent unaware) compared to the other regions (between 37% and 39% "Yes, definitely," between 39% and 42% unaware).

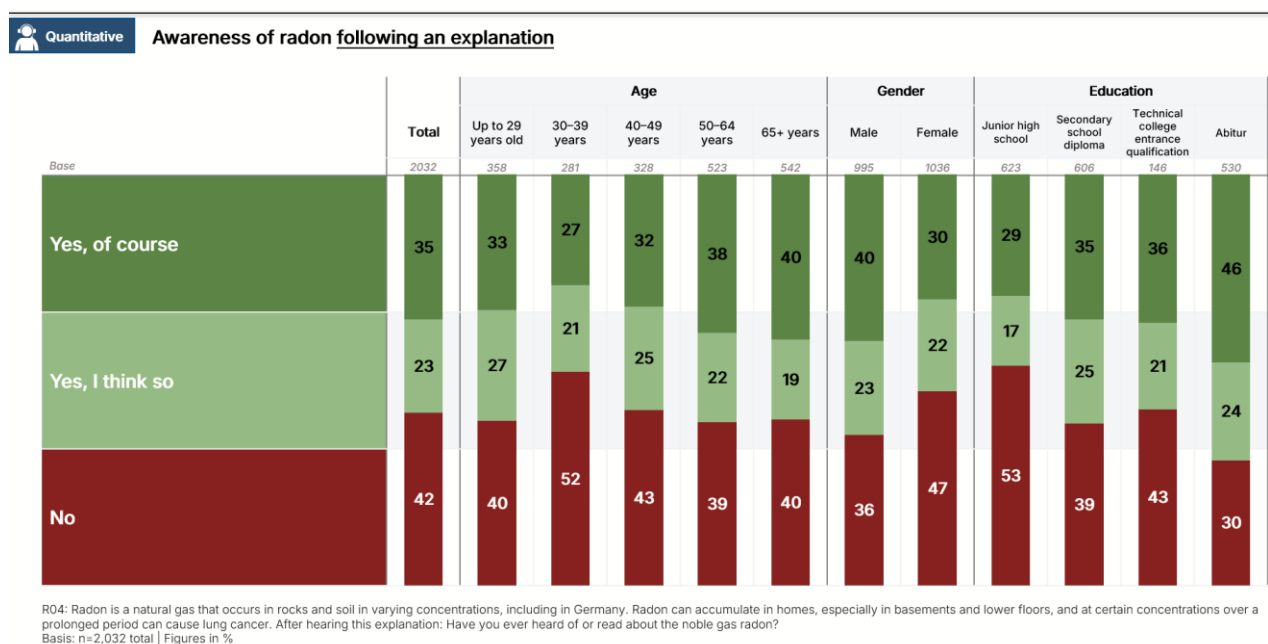


Fig.35 Awareness of radon (prompted, with prior explanation) (quantitative)

Before the prompted question on awareness — that is, the information regarding the definition of radon as a noble gas — interviewees who were aware of radon without prompting were asked about their **perceptions of radon**. Among the given options, more than three-quarters agreed that radon is a radioactive element (79%), occurs naturally (78%), and poses a health hazard (75%). Agreement was significantly lower — at only 56 percent — for “noble gas,” which explains the discrepancy between unprompted and prompted awareness: Since only a little over half of those who had already heard of radon recalled it as a noble gas, the higher level of uncertainty regarding awareness after the definition as a noble gas is plausible.

The other predefined aspects of radon were confirmed much less frequently. Twenty-six percent of respondents mistakenly viewed radon as a heavy metal, and just as many assumed it was a substance found in drinking water. Just under a quarter (24%) assumed that radon is man-made or industrial in origin. 18 percent believed that radon is beneficial to health, and seven percent thought of radon as a bicycle brand.

Men were significantly more likely (82% compared to 73% of women) to know that radon occurs naturally, as well as that radon is also a bicycle brand (9% compared to 5% of women). For all other aspects, the gender differences were not statistically significant.

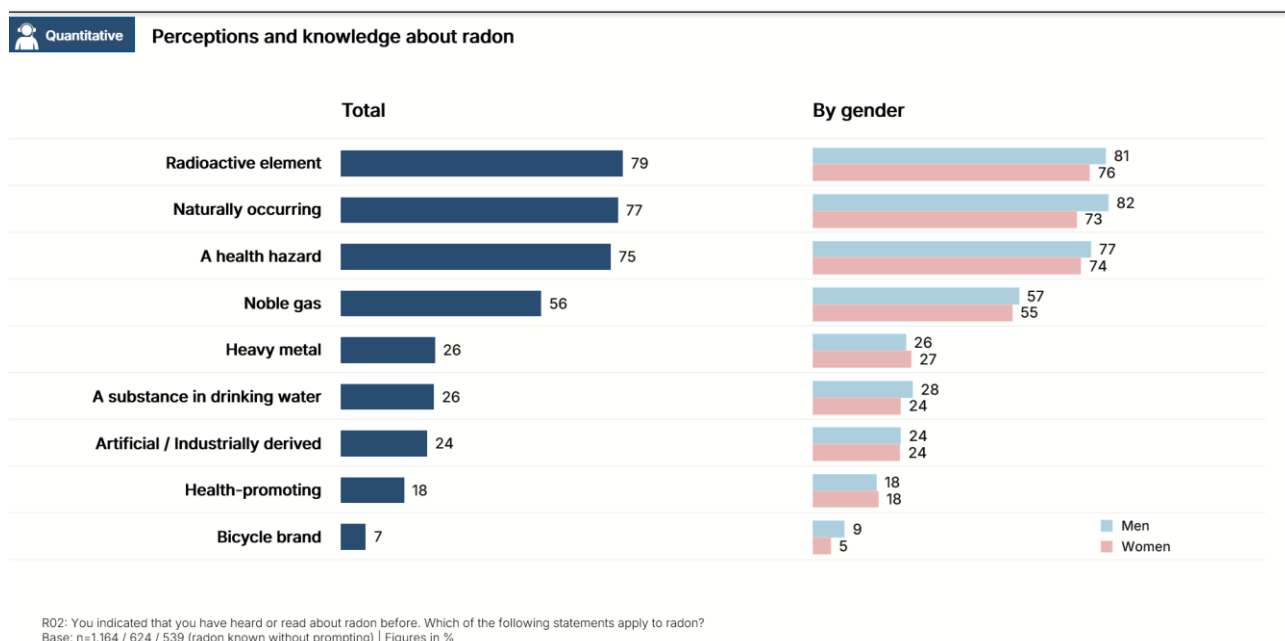


Fig.36 Perceptions and knowledge about radon (quantitative)

The results of the qualitative survey also confirm that many respondents, who reported being familiar with radon at least by name, often had only vague or even incorrect perceptions of it. For example, due to confusion with the heavy metal radium, some participants associated its use with smoke detectors or the former use of radium to make watch dials visible in the dark.

3.7.2 Knowledge of Radon Occurrence

Respondents were asked about their views on **where radon might occur in high concentrations** before radon was explained or defined. Here, too, knowledge gaps were evident among some of those who had previously stated, without prompting, that they had heard of or read about radon before. Still, 78 percent of this group knew that radon occurs naturally in the soil. Just under half (48%) expected it to occur in high concentrations outdoors in nature. Only 41 percent were aware that radon occurs in basements, while 12

percent believed it occurs in high concentrations on upper floors of buildings. Five percent held the mistaken belief that none of the given options for its occurrence applied. An additional five percent admitted to having no knowledge of the matter.

There were no significant gender differences in the responses regarding the occurrence of high concentrations of radon. By age, the only notable difference was in the response option “Outdoors in nature,” which was selected more frequently with increasing age: from 37 percent among those under 30, to between 44 and 49 percent in the middle age groups, up to 54 percent among interviewees aged 65 and older.

Following the explanation cited in Section 3.7.1 regarding the definition of radon as a noble gas, all subsequent questions were directed at the group that had indicated, either unprompted and/or with prompting, that they were aware of radon. The survey also asked whether interviewees believed **they lived in an area with elevated radon concentrations**. Five percent of this subgroup of respondents — filtered by their awareness of radon — answered in the affirmative, while approximately half (51%) believed they did not live in an area with elevated radon concentrations. The remaining 45 percent did not know whether they lived in an area with elevated radon concentrations or not, even though they had previously indicated that they had heard of or read about radon.

Older respondents aged 50 and over — at 57% and 56%, respectively — were significantly more likely than those aged 30 to 49 (42% and 43%, respectively) to be convinced that they did not live in an area with elevated radon levels. By gender, a significantly higher proportion of women (48%) compared to men (42%) admitted to having no knowledge of the radon concentration in their living environment. In contrast, more men than women assumed that radon concentrations in their residential area were either elevated or not elevated.

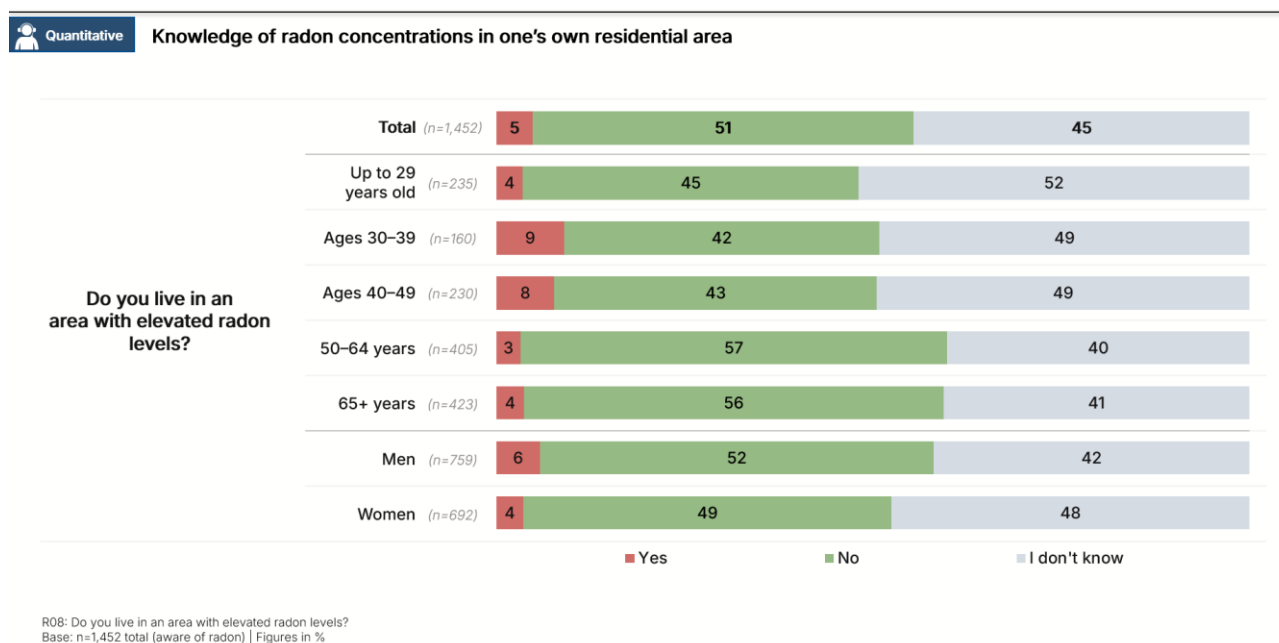


Fig.37 Knowledge of radon concentrations in one's own residential area (quantitative)

In western Germany (the states of North Rhine-Westphalia, Hesse, Rhineland-Palatinate, and Saarland), only 1 percent of interviewees believed they lived in an area with elevated radon levels. This was a significantly lower proportion compared to the other regions (east: 5%, north: 7%, south: 8%).

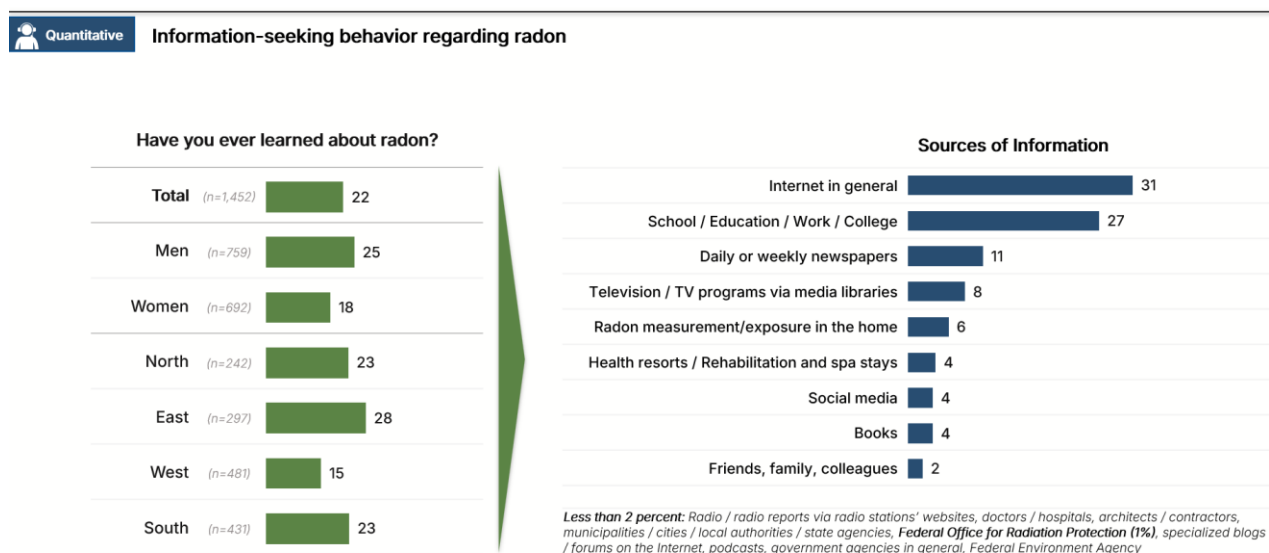
3.7.3 Information-Seeking Behavior Regarding Radon

22 percent of respondents who were aware of radon—whether prompted or unprompted—reported that they had sought information about radon at least once. Among them, 25 percent of men—a significantly higher proportion than women (18%)—had sought information about radon at least once. Here, too, given the question filter regarding awareness of radon, an even more pronounced gender difference can be assumed in the general population (see the relevant explanations in the previous section).

When it came to information-seeking behavior, no significant differences by age were observed within the sample of those who were aware of radon; however, significant differences were found by region: In the East, a significantly higher proportion of respondents — 28 percent — reported having sought information about radon at least once, compared to only 15 percent in the West. At 23 percent each, the other two regions — the North and the South — were roughly in line with the overall average.

Respondents were asked to list specific **sources of information** in an open-ended format, which were subsequently categorized (coded). The Internet in general was cited most frequently as a source of information. Just over three in ten interviewees (31%) who had already sought information did so via this source. School or work-related contexts followed closely behind in the ranking of the most frequently cited sources (27%). Eleven percent reported having obtained information from daily or weekly newspapers, and eight percent from television broadcasts or media libraries. When asked about sources of information without prompting, six percent mentioned a radon measurement either in their own home or in a private or professional setting (see also Section 3.7.4 on the results of the prompted survey regarding this topic). Between two and five percent of respondents each obtained information during a rehabilitation or spa stay, via social media, books, or through personal contacts (friends, family, colleagues).

The Federal Office for Radiation Protection was also mentioned as a source of information on radon that respondents had already used, though it accounted for only one percent of the filtered sample. The categories “radio” or “radio programs” via radio stations’ websites, “doctor/hospital,” “architects/contractors,” “municipality/city/local government/state authorities,” “specialized blogs/forums on the Internet,” “podcasts,” “government agencies in general,” and the Federal Environment Agency were also mentioned by only a few people — less than two percent of those who had already sought information.



R05: Have you ever sought information on the topic of radon? / R06: Where exactly have you sought information on the topic of radon? (Open-ended question)
Base: n=1,452 (aware of radon) / n=313 (have sought information before) | Figures in %

Fig.38 Information-seeking behavior regarding radon (quantitative)

3.7.4 Radon Measurements

Less than half (46%) of those who were familiar with the term “radon” — whether prompted or unprompted — also knew that radon concentrations inside buildings can be measured. On this question as well, men (49%) were more informed than women (43%). Extrapolated to the unfiltered total sample, the difference would be even greater (see discussion in Section 3.7.2). Consistent with the previous findings on prior knowledge of radon, the knowledge gap regarding awareness of radon measurements is also greatest among interviewees from the western federal states (North Rhine-Westphalia, Hesse, Rhineland-Palatinate, and Saarland). Here, only 36 percent were aware of the possibility of conducting radon measurements inside buildings, whereas in the east and north, more than half were aware (52% and 54%, respectively). In the southern federal states of Bavaria and Baden-Württemberg, 48 percent were aware of this.

Even among those aware of the possibility of conducting a radon measurement, the proportion of those who had already taken advantage of this option was relatively low at five percent. At the time of the survey, virtually no one was currently preparing for a radon measurement (less than 0.5%, rounded, for the response option “I have already ordered a test kit / commissioned a radon measurement”). However, 13 percent of respondents who were generally aware of radon measurements in buildings reported having conducted such a test in a private or professional setting.

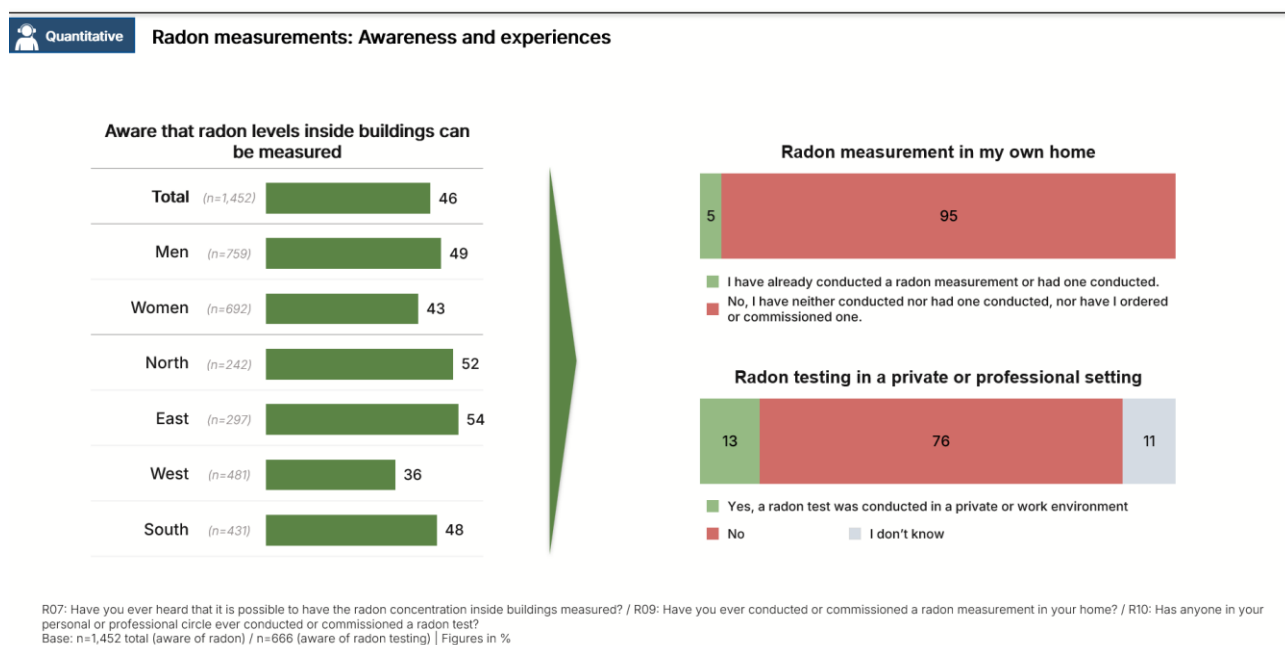


Fig.39 Radon measurements: Awareness and experiences (quantitative)

4 Conclusion, and Implications for Communication

This study builds on the results of the “What Does Germany Think About Radiation?” surveys conducted in 2019, 2021/2022, and 2024. It provides important, up-to-date insights into the level of knowledge and attitudes of the general public and specific demographic groups regarding various radiation-related topics.

There continues to be a wide range of spontaneous associations regarding radiation, alongside significant gaps in knowledge among the general public. The time series since 2019 shows a trend toward less public engagement with the topic of radiation. This was also evident in specific topics such as UV protection: The results point to increasing uncertainty or lack of knowledge regarding the health effects of skin tanning caused by UV radiation. Declining levels of awareness of the UV index were also measured. However, younger people tended to be better informed on this topic — as well as on other topics — than older people (with the exception of radon).

The results reveal citizens' information needs and gaps, as well as recommendations for communication and public outreach in the field of radiation protection. Respondents' subjective sense of being informed and protected had declined since the last survey in 2024. Older people and women, in particular, felt more concerned than average and less protected than average. Many expressed concern that Germany was not prepared for a radiological emergency. This was compounded by a growing acknowledgment of their own lack of knowledge regarding how to behave in such an emergency. Preventive information on proper behavior during a radiological emergency was widely supported and was not perceived as scaremongering, particularly by younger people.

A similar ranking of health concerns (both radiation-related and non-radiation-related) emerged as in 2024, although in 2026, concerns about nuclear weapons moved to the top of the list, ahead of concerns about radioactive contamination from nuclear power plants following an incident. Following the outbreak of the Iran War, which occurred during the survey period, concern regarding conflicts and wars worldwide in general — as well as specifically regarding a radiological emergency — increased. In addition, greater uncertainty and doubts emerged as to whether Germany is well-prepared for a radiological emergency, and confidence that the government would immediately implement all necessary measures in the event of a radiological emergency declined. Since the vast majority of the interviews took place before the war began, this had little impact on the overall results; however, it suggests the hypothesis that not only concern about a radiological emergency but also trust in government institutions in general is negatively influenced by a global political situation characterized by increasing potential for conflict.

Government organizations such as the Federal Office for Radiation Protection (BfS) were considered by the public to play a very important role in raising awareness of radiation protection issues, due to their scientific independence and objectivity. Particularly in times of ubiquitous “fake news” and conspiracy theories, distinguishing the BfS as a credible and neutral source of information was viewed as essential. With regard to public education efforts concerning radiological emergencies, interviewees believed that information provided by the BfS has the advantage of being perceived by the public in the context of less controversial topics such as sun protection or cell phone radiation, and then using microlearning to inform the public about how to behave in emergencies without this being perceived as alarmism.

Overall, the study results illustrate that while there was a broad level of basic trust in government institutions in the field of radiation protection, respondents also criticized the lack of public visibility and called for more proactive communication. This could begin as early as childhood through playful explanations or by providing informational materials for schools.

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