Protocol radon internet webpages

The following indicators were used to evaluate webpages from a stakeholder engagement perspective : availability of the radon information on internet, accessibility, personalization/customization, presence/absence of broken links, stakeholder interaction, dialogue, responsiveness, content and design, transparency/openness (see Annex 2 for a summary).

Availability of radon information on the internet page was checked in both an automated and manual way. First, the word "radon" was included as a browser criterion if the search engine existed on the evaluated page. Second, the search was upgraded manually, by looking at all pages, sub-pages related to health, environment, policies and news in order to identify topics related to radon on the evaluated internet page.

Accessibility refers to the capability of making website content accessible to a wide array of possible stakeholders, with equal access to information and functionality, regardless of their technical skills or possible disabilities (Olalere & Lazar, 2011). Accessing information on mobile devices with a good user experience is more and more important, since most of the population accesses the internet via mobile devices (OECD, 2018; Yusuf & Adams, 2014). Accordingly, accessibility by mobile devices was tested. The mobile responsiveness of a website was measured using a smartphone indicating whether the application had a mobile friendly version or not.

Personalized/customizable websites offer tailored content and features to specific stakeholders, so that different stakeholders can see different things on the "same" page. Customization gives control to the stakeholder and personalization to the website. Both can enhance stakeholder' experience, but only when carefully implemented. The personalized and customizable features were evaluated by looking at the following indicators: possibility to obtain radon information (e.g. % houses exceeding action level) corresponding to a specific address or location (e.g. GPS coordinates in radon prone areas); provision of an interactive radon map (e.g. possibility to get radon information by click on a particular province or commune on the map); provision of a map with radon concentrations (not

necessarily interactive) but presenting radon measurements at place. The use of maps as a form of evidence to communicate about the multiple determinants of cancer has been recognised specifically for evaluated radon concentration in dwellings also in the U.S., for instance in the states Alabama and Washington) (Parrott, Hopfer, Ghetian, & Lengerich, 2007).

Broken links on the internet pages were counted since they are a major barrier to engagement, as citizens require consistent, reliable, and accurate access to information from authorities on their websites (CENDI, 2004; Karkin & Janssen, 2014). It is important that links to information are valid and up to date, as broken links frustrate stakeholders, discourage further website visits and engagement with the issue (e.g. radon). Broken links were evaluated automatically by the open source evaluation tool W3C validator[1] that checks links and anchors in Web pages or full Web sites. The radon internet pages were checked for all linked documents recursively and a recursion depth level 3 was used.

Stakeholder interaction via websites is enacted by tools that stakeholders can use to interact with authorities, such as satisfaction questionnaires, submission of requests (e.g. policy proposals) or feedback on authorities' initiatives. The website evaluation included a range of indicators: existence of feedback forms or satisfaction questionnaires, e.g. "was it helpful" or "like" symbol; existence of tools designed for collecting stakeholders Q&A as an open category on the internet page: e.g. "your comments"; the possibility to propose ideas e.g. related to radon actions or mitigation of radon prone areas; availability of broadcasting related to the radon program or radon related events/meetings, where questions, opinions can be shared on-line (e.g. radio shows, TV broadcasts, documentary movies, public meetings and Webinars); possibility for direct personal communication (e.g. e-mail address) with the person responsible for radon issues; opportunities for stakeholder participation and

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[1]
https://validator.w3.org/checklink?uri=http%3A%2F%2Fwww.baelen.be%2Fsearch%3FSearchableText%3Drad on&hide_type=all&recursive=on&depth=3&check=Check

data transformation, and user-centred design (e.g. Web 2.0 (Buccoliero & Bellio, 2010): Facebook, Twitter, YouTube).

Dialogue with stakeholders was evaluated through the presence or absence of chat areas or message boards. This is an interactive feature, public and open to everyone (e.g. the chat can be followed by any stakeholder) and it should be at least two-way communication. The presence or absence of institutional email addresses and email updates also in the form of a newsletter was evaluated, for instance subscription to email updates, regularly sent out newsletters detailing tasks or activities that community have taken up.

Responsiveness of the authorities was tested by sending an e-mail to each institution dealing with radon issues presented on the website and measuring the time for receiving a response. The following e-mail has been sent: *"Dear Sir, Dear Madam, I recently watched a documentary related to radon on internet and I am worried! I would like to know where I can obtain a Radon Test, how much it would cost, where I would bring the kit and where the results will be published (and when!). Thank you in advance for the attention you will grant to this email."* This email allows to share factual data, increase the radon awareness, express empathy and address stakeholder's risk perception. Responsiveness was evaluated quantitatively (number of days waiting for response), and qualitatively, to assess whether the answer addressed empathy and risk perception factors. Another indicator was the use of social media plug-ins, since these have become a key tool for authority's responsiveness. For each feature, the number of posts related to radon and the number of comments on posts were counted (e.g. radon related posts on Twitter or Facebook), as well as number of visitors, "likes", followers and shares were counted. For Facebook sites, it was checked whether they gave an opportunity to share the post within a stakeholder's network. Values for the responsiveness indicators were coded as 1 (no) or 2 (yes).

Content and design for different stakeholders groups: the content of the website is an important indicator for engagement. In the research by Coleman et al. (2008) the "story content" and "site appearance" showed strong correlations with engagement attitudes by stakeholders (R. Coleman, P.

Lieber, A. L. Mendelson, & D. D. Kurpius, 2008a). A clear organization structure with an easy-to-use navigation system and user-centered design is essential. The website should attend to the informational (content) and presentational (design) dimensions with a special attention to different stakeholder groups that have different needs as users of an internet page. The website should also be user-friendly. Usability can be measured by how easy a website is to learn, how quickly a user can accomplish a task, how error-proof the site is, how satisfied the user is with the experience and how often users return to the site (Coleman et al., 2008a; Gould & Lewis, 1985; Nelson, K.A., & S, 1999). In addition, this study evaluated whether the webpages had a story, for instance jingle/tune and redline. Values of these indicators were clear webpage story (1), some dispersed elements of a story (2), unclear or no story (3); for personalisation of the internet page: not personalised at all (1), somewhat personalised (2), personalised (3). It was also checked whether the internet page has different sub-pages for different stakeholder groups and if yes, the stakeholder groups addressed were listed (open category). Through the number of clicks we measured how easy it is to learn where to get radon test, how much does the measurement kit cost, where to bring the dosimeter and where will the results be published. The value of a reporting variable was the number of clicks from a home page starting with a keyword "radon" in a site search engine.

Transparency and openness in the context of the radon websites can be achieved through dissemination of vital information such as online tenders, live broadcast of meetings, financial statements of government agencies/departments, legislative information, policy strategy, regular reports of government activities and projects, contact information of public officials, and the ability for citizens to submit complaints online (Bertot, Jaeger, & Grimes, 2010; Karkin & Janssen, 2014). By publishing legislative drafts online, stakeholder engagement and transparency can be enhanced, as stakeholders will have the chance to participate in policy discussions. This acts as an enabler for deliberative and participatory democracy (Cegarra-Navarro & Garcia-Perez, 2014; Coleman et al., 2008a). Transparency and openness was measured by answering the following questions: are tenders for analysis laboratories online; is the (draft) national action radon plan on-line; are financial

documents related to radon action plan published; is the new Basic Safety Standards Directive on-line; are other national legislative documents on-line; is the radon mapping plan online; and is it announced where the radon mitigation activities are taking place?

Stakeholder engagement criteria	Indicators	Evaluation Values
Availability of the radon information on internet	Webpage of a national and local authorities include radon related topics.	1=no internet page; 2= nothing related to radon; 3=only brochure or other pdf related to radon available; 4=dispersed radon information on different subpages; 5=dedicated radon internet page
Accessibility	Design of the webpage is adopted to different mobile applications and devices (e.g. computer, smartphone)	1=mobile unfriendly; 2=mobile friendly
	Personalized/customizable features:	GPS coordinates linked to radon prone areas: no (1), yes (2); Interactive radon map no (1), yes (2); Radiation measurements at place no (1), yes (2);
	Number of Broken links (W3C validator)	Number
Stakeholder interaction	Feedback forms and satisfaction questionnaires	no (1), yes (2)
	Q&A	no (1), yes (2)
	Broadcastings, webinars	no (1), yes (2)
	Facebook, Twitter, YouTube, etc..	no (1), yes (2)
Dialogue	Chat areas/message boards	no (1), yes (2)
	Institutional email addresses	no (1), yes (2)
	Email updates, newsletters	no (1), yes (2)
Responsiveness	Response to the e-mail	Not recived (1), recieved (2)
	Time for the response	Number of working days
	Information	Dosen't respond with the information (1); information included in the response (2)
	Empathy	Not expressed (1); expressed (2)
	Risk perception characteristics	Not addressed (1); addressed (2)
	Social media plug-ins: User participation: possibilities	Post (1); follow (2)
	Visitors, likes, followers and share for social media	Number
Content and design for different stakeholders groups	Website story: jingle/tune, red-line, clear organization structure, easy-to-use navigation system, user-centred design	clear webpage story (1), average (2), unclear (3)
	Personalisation	Not personalised at all (1), a bit personalised (2), personalised (3)

	Different sub-pages for different stakeholder groups	no (1), yes (2) open category
	Number of clicks: how easy is to learn where to get radon test; how much does the measurement kit cost; where to bring dosimeter; where will be results published	Number of clicks
Transparency and openness	Tenders for labs for the analysis on-line; (Draft) national action radon plan on-line; Financial documents related to radon action plan published; The new Basic Safety Standards Directive on-line; Other national legislative documents on-line; Radon mapping plan online; Announcement where the radon mitigation activities are taking place on-line	no (1), yes (2)