Original Paper

Quality Assessment of Official Online Cancer Screening Information Materials in Europe: Cross-Sectional Analysis

Bernd Kerschner[1], MSc; Julia Harlfinger[1], MSc, BSc; Sigrid Moick[1], PhD, MA, BA; Ivana Brkić Biloš[2], MD; Auksė Domeikienė[3,4], MD, PhD; Rugilė Ivanauskienė[3,4], PhD; Gunda Jauntēva[5], MSc; Diana Kolesnik[4], MD; Gordan Sarajlić[2], MD; Inese Stars[5], PhD; Edith Flaschberger[6], PhD

[1]Department for Evidence-based Medicine and Evaluation, University for Continuing Education Krems, Krems an der Donau, Lower Austria, Austria
[2]Division for Epidemiology and Prevention of Noncommunicable Chronic Diseases, Croatian Institute of Public Health, Zagreb, Croatia
[3]Department of Preventative Medicine, Lithuanian University of Health Sciences, Kaunas, Lithuania
[4]Department of Preventive Programs, Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Kaunas, Lithuania
[5]Institute of Public Health, Riga Stradiņš University, Riga, Latvia
[6]Competence Centre for Health Promotion and Healthcare, Austrian National Public Health Institute, Vienna, Austria

Corresponding Author:

Bernd Kerschner, MSc
Department for Evidence-based Medicine and Evaluation
University for Continuing Education Krems
Dr.-Karl-Dorrek-Straße 30
Krems an der Donau, Lower Austria 3500
Austria
Phone: 43 2732 893 ext 2922
Email: bernd.kerschner@donau-uni.ac.at

Abstract

Background: To make informed decisions about cancer screening, people need access to understandable, evidence-based, and transparent information. While prior studies show quality gaps in online information, it remains unclear whether official European cancer screening information materials meet these standards.

Objective: This study evaluated the quality of official online information materials for organized breast, cervical, and colorectal cancer screening programs across Europe as part of the European Joint Action on Cancer Screening project.

Methods: We conducted a descriptive cross-sectional study. Between October 2024 and April 2025, we collected 182 official online materials on breast, cervical, and colorectal cancer screening from 26 European countries and translated them into English. We evaluated their quality using the validated Mapping the Quality of Health Information checklist for assessing the extent (0%-100%) to which the materials support informed decision-making across 4 domains: definition, transparency, content, and presentation.

Results: The mean score was 25.7% (SD 15.0%), ranging from 6.8% to 78.3%, with no differences by cancer type. Sixteen of the 182 materials achieved a score of 50% or higher, and 3 exceeded 75%. The definition domain achieved the highest mean score (60.3%, SD 21.9%). The transparency domain obtained the lowest score (8.8%, SD 9.4%), with none of the materials reporting conflicts of interest or systematic search strategies. Most materials avoided persuasive language (n=143, 78.6%) and narrative elements (n=159, 87.4%). Mean scores for adequate presentation were 15.4% (SD 36.1%) for benefits, 13.2% (SD 33.8%) for harms, and 14.8% (SD 35.5%) for test accuracy. Information on cancer prevalence or incidence was mentioned in 20.9% (n=38) of the materials.

Conclusions: Most analyzed information materials showed limited adherence to criteria considered important for informed decision-making. There are major shortcomings in transparency and in the communication of benefits and harms.

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Keywords: online health information; informed decision-making; cancer screening; quality; Europe; Mapping the Quality of Health Information; MAPPinfo; European Joint Action on Cancer Screening; EuCanScreen

Introduction

The internet has become an essential source of health information, with up to 82% of internet users searching for health-related content online [1]. However, the European Health Literacy Survey showed that more than half of adults struggle to evaluate the trustworthiness and reliability of the health information available online [2]. Moreover, past systematic reviews that assessed the quality of health information websites on various topics have concluded that their quality is mostly inadequate to poor [3-8]. To make informed health decisions, people need access to accurate, unbiased, and comprehensible online health information.

In the context of cancer screening, accurate and balanced information on the benefits and harms is essential for informed decision-making. Screening involves trade-offs between benefits, such as early detection, and harms, including false positives, overdiagnosis, and overtreatment. Without high-quality information addressing these aspects, individuals are unable to make an informed decision about whether to participate in a cancer screening program. However, websites providing information on cancer screening appear to have similar quality deficits to websites on other health topics. An evaluation of the top 30 English-language websites on colorectal cancer screening found considerable variation in quality [9]. On average, the websites met only 45% of the maximum quality score on the DISCERN instrument [10].

A review of 37 German-language materials on colorectal cancer screening reported similar findings. The materials fulfilled an average of 69% of the criteria on an in-house rating scale and were judged to be of "mediocre" quality [11]. A key criticism was that screening risks were only minimally addressed or omitted entirely.

An evaluation of online information materials on breast cancer screening in English, Spanish, and Chinese found that the resources achieved between 33% (Chinese) and 63% (English) of the maximum DISCERN score [12]. An analysis of the 100 most popular websites on cervical cancer screening found that they achieved 60% of the maximum score on a self-developed rating scale [13].

These findings suggest that deficits in the quality of online cancer screening information are widespread across cancer types, languages, and information material providers. As a result, individuals searching the internet for information on cancer screening may be impaired in their informed decision-making process.

In organized cancer screening programs, individuals are usually provided with official information materials, often in the form of websites. These materials are intended to provide the information needed without requiring individuals to search for it themselves. However, it remains unclear whether official information materials provided by organized screening programs across Europe meet the standards required to support informed decision-making.

This study is part of the European Joint Action on Cancer Screening (EuCanScreen) program [14], which aims to assure sustainable implementation of high-quality cancer screening. The objective was to systematically evaluate the quality of official online information materials for organized breast, cervical, and colorectal cancer screening programs across Europe and assess the extent to which current information materials support informed decision-making. On the basis of these results, we plan to develop a toolkit with recommendations for improving the evidence base, accuracy, neutrality, and comprehensibility of cancer screening materials.

Methods

Design

This study used a descriptive, cross-sectional design. For reporting, we adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement [15].

Collection of Information Materials

Cancer screening information materials were collected between October 2024 and April 2025. Responsible authorities in all 29 EuCanScreen partner countries provided links to official websites and downloadable online brochures containing information on organized screening programs for breast, cervical, and colorectal cancer. Information materials were collected at the national or regional level depending on the countries' federal structure. If more than one official website existed per cancer type, all were considered and assessed individually. For countries lacking official websites, official brochures in digital format were considered as alternative sources.

A list of websites and digital brochures included in the assessment can be found in Multimedia Appendices 1-3.

We defined the unit of analysis as an official website, including any digital brochures directly linked from it. Video content was not considered for analysis as the Mapping the Quality of Health Information (MAPPinfo) checklist was not specifically developed to rate videos.

Quality Assessment

According to the authors of the guideline for evidence-based health information [16], a quality assessment tool for health information must (1) consist of validated criteria, (2) use criteria that are evidence based, (3) avoid non–evidence-based criteria, and (4) ensure that criteria are operationalized [17].

Although there are many rating instruments for assessing the quality of health information [10,18-23], only the MAPPinfo instrument fulfills all these requirements [17,24]. The MAPPinfo instrument is a validated 19-item checklist organized into four domains: (1) definition (whether the target population, topic, and purpose of the information are specified), (2) transparency (how explicitly the creators, developers, funding bodies, conflicts of interest, and information provenance are revealed), (3) content (how completely the information covers aspects such as prevalence

or incidence, benefits, and harms of all treatment options; accuracy of diagnostic tests where relevant; and existing uncertainties), and (4) presentation (whether the methods used to present information are evidence based, particularly those used to convey quantitative information such as risks or treatment effects). MAPPinfo scores range from 0% to 100%, representing the percentage of items fulfilled. Eleven of the 19 items are dichotomous (fulfilled or not fulfilled). Thus, the mean scores of these items represent the percentages of materials fulfilling the respective criteria. The other 8 items are trichotomous (partially fulfilled, completely fulfilled, or not fulfilled).

MAPPinfo assessments were conducted between January 2025 and November 2025. All information materials were rated using the English-language version of the MAPPinfo instrument [25]. Raters assessed the information material in the original languages if they were proficient in that language. Otherwise, they relied on the English-language version provided by the authority or a machine translation by Google Translate after it had been verified by a native speaker of the corresponding language.

The information material was rated according to the 19 items provided in the MAPPinfo instrument, using "completely met" (1), "partially met" (0.5), "not met" (0), or "not applicable" (99).

MAPPinfo ratings were conducted independently by 2 raters each (6 raters in total). Accordingly, each rater independently completed a Microsoft Excel rating sheet developed by a member of our research team (BK) indicating the grading for each item, a reference to the relevant section of the website or information brochure, and a brief explanation for the assigned grading. Assessments were conducted after a piloting round, which led to slight adaptations of the rating sheet. The assessments were discussed in group meetings country by country. Any disagreements were resolved through discussion or, when necessary, adjudication by a third rater.

In 2 overall team meetings, any general questions or difficulties about the weighing and rating criteria were addressed. These meetings resulted in further specifications of the applications of items T2, T4, P8, C2, C4/P1, and P7 (Multimedia Appendix 4). For instance, it was decided to extend the item C4/P1 to also include cancer incidence in addition to prevalence, as was originally foreseen by the MAPPinfo instrument.

Descriptive analysis was conducted using a Microsoft Excel sheet provided by the MAPPinfo developers [26]. Further statistical testing was performed using SPSS (version 29; IBM Corp). The Shapiro-Wilk test indicated that scores were not normally distributed ($P<.001$); therefore, scores across the 3 cancer types were compared using the nonparametric Friedman test. This analysis was restricted to 55 countries or regions that provided information materials for all 3 cancer types (n=165). Interrater reliability was calculated using the T coefficient, which is a modified version of the Cohen $\varkappa$ [27,28].

Ethical Considerations

This study did not involve participants or participant data. Thus, ethics approval and informed consent were not applicable.

Results

Collection of Information Materials

In total, 182 information materials from 26 countries were included: 63 for breast cancer screening, 61 for cervical cancer screening, and 58 for colorectal cancer screening. A list of countries, regions, and references to materials is provided in Multimedia Appendices 1-3.

Three countries (Cyprus, Poland, and Portugal) did not provide information materials. In some cases, this was because organized screening programs do not currently exist.

In 3 countries, organized screening programs operate at the regional level: Belgium (3 regions), Italy (21 regions), and Spain (17 regions). For the Italian region of Sicily, we could not obtain materials at a regional level because screening is organized by multiple subregions with separate programs.

Most countries and regions provided information through websites with downloadable brochures. Two countries (Lithuania and Ukraine) and 1 Italian region (Abruzzo) provided only digital brochures, which served as the unit of analysis. For 3 countries (Germany, Iceland, and Latvia), 2 official websites existed for some cancer types; each website was analyzed separately.

Quality Assessment

Overview

The MAPPinfo score reflects the proportion of MAPPinfo items that are fulfilled by each information material and, therefore, represents an indicator of quality. The interrater reliability for the quality assessment using MAPPinfo was moderate, with a T coefficient of 0.65. Unfortunately, the interrater variability was not documented for 43 of the 182 information materials. Therefore, the T coefficient could only be calculated for 139 (139/182, 76.4%) information materials.

In our descriptive analysis, on average, the 182 information materials fulfilled 25.7% (SD 15.0%) of all items, with MAPPinfo scores ranging from 6.8% (material with the lowest quality) to 78.3% (material with the highest quality; Table 1). Sixteen materials obtained at least a score of 50%, and 3 exceeded 75%. Detailed scoring data for all information materials will be provided upon request.

Table 1. Mapping the Quality of Health Information scores for all information materials and by cancer type (N=182).

	Information materials, n	Score (%), mean (SD)	Range (%)
All cancers	182	25.7 (15.0)	6.8-78.3
Breast cancer screening	63	29.9 (18.5)	6.8-78.3
Cervical cancer screening	61	22.1 (10.6)	8.7-63.6
Colorectal cancer screening	58	24.7 (13.4)	9.1-71.7

Mean MAPPinfo scores differed only slightly between cancer types, with materials on breast cancer screening achieving a mean score of 29.9% (SD 18.5%), materials on colorectal cancer screening achieving a score of 24.7% (SD 13.4%), and cervical cancer screening materials achieving a score of 22.1% (SD 10.6%; Table 1). However, a comparison across cancer types revealed that the difference was not statistically significant (P=.06; Friedman test for n=55 countries or regions having published screening information materials for all 3 cancer types).

This means that the overall fulfillment levels appear comparable across breast, colorectal, and cervical cancer information materials. In addition, the pattern of highest- and lowest-scoring items seemed to be consistent across all 3 screening types. For this reason, the results are presented at the overall level rather than stratified by cancer type subgroups. Still, a graphical overview of item fulfillment per cancer type is provided in Figures S1 to S3 in Multimedia Appendix 5.

The MAPPinfo scores across the 4 quality domains (definition, transparency, content, and presentation) are summarized in Table 2. Mean scores for each item are listed in Table 3.

Table 2. Mapping the Quality of Health Information (MAPPinfo) score for all information materials by domain (N=182).

MAPPinfo domain	Score (%), mean (SD)
Definition	60.3 (21.9)
Transparency	8.8 (9.4)
Content	21.9 (22.7)
Presentation	33.7 (19.1)

Table 3. Mapping the Quality of Health Information (MAPPinfo) item scores for all cancer information materials (N=182).

MAPPinfo items	Score (%), mean (SD)	Materials with partial fulfillment, n (%)	Materials with complete fulfillment, n (%)
Definition domain			
D1[a]—target group defined	96.7 (17.9)	—[b]	176 (96.7)
D2[c]—objective of informed decision mentioned	23.9 (39.5)	19 (10.4)	34 (18.7)
Transparency domain			
T1[c]—authors named	8.2 (23.2)	16 (8.8)	7 (3.8)
T2[a]—funding source declared	10.4 (30.6)	—	19 (10.4)
T3[a]—conflicts of interest made transparent	0 (0)	—	0 (0)
T4[c]—up-to-dateness	25.8 (30.9)	70 (38.5)	12 (6.6)
T5[c]—references cited	8.2 (23.2)	16 (8.8)	7 (3.8)
T6[c]—systematic search strategy reported	0 (0)	0 (0)	0 (0)
Content domain			
C1[a]—health problem explained	59.9 (49.0)	—	109 (59.9)
C2[c]—options named and explained	26.9 (37.7)	40 (22.0)	29 (15.9)
C3[a]—stochastic uncertainty explained	2.2 (14.7)	—	4 (2.2)
Content and presentation domain			
C4/P1[a]—prevalence and incidence presented adequately	20.9 (40.6)	—	38 (20.9)
C5/P2[a]—benefits presented adequately	15.4 (36.1)	—	28 (15.4)
C6/P3[a]—harms presented adequately	13.2 (33.8)	—	24 (13.2)
C7/P4[a]—test accuracy presented adequately	14.8 (35.5)	—	27 (14.8)
Presentation domain			
P5[a]—neutral language	78.6 (41.0)	—	143 (78.6)

MAPPinfo items	Score (%), mean (SD)	Materials with partial fulfillment, n (%)	Materials with complete fulfillment, n (%)
P6[a]—narratives avoided	87.4 (33.2)	—	159 (87.4)
P7[c]—graphical representation of frequencies adequate	54.7 (49.0)[d]	1 (3.1)[d]	17 (53.1)[d]
P8[c]—gain and loss framing	5.8 (20.5)	9 (4.9)	6 (3.3)

[a]Dichotomous items (fulfilled or not fulfilled); the mean score also represents the percentage of materials fulfilling this item.
[b]Not applicable.
[c]Trichotomous items (fulfilled, partially fulfilled, or not fulfilled).
[d]Item P7 only applies to 32 out of the 182 materials with graphical representations of frequencies.

Definition Domain

Overall, the definition domain showed a comparatively high mean fulfillment score of 60.3% (SD 21.9%) but with a clear contrast between the 2 items belonging to this domain. The target group was defined in 176 out of 182 information materials (item D1), making it the item with the highest score (mean 96.7%, SD 17.9%) among all MAPPinfo items. However, with 23.9% (SD 39.5%), the mean score for item D2 (declaring explicitly that the information material is intended to facilitate an informed choice) was substantially lower (Table 3). It was completely fulfilled in 18.7% (n=34) of the materials and partially fulfilled in 10.4% (n=19).

Transparency Domain

The transparency domain with 6 items showed the lowest overall fulfillment, with a mean score of 8.8% (SD 9.4%). Two items (T3—conflicts of interest made transparent and T6—systematic search strategy reported) were not fulfilled by any of the 182 analyzed information materials. Item T4 (up-to-dateness) had a mean score of 25.8% (SD 30.9%). It was completely fulfilled in 6.6% (n=12) of the materials. Partial fulfillment (indication of either date of last update or planned date for future update) was observed in 38.5% (n=70) of the materials. Item T1 (naming of authors and providing contact details) had a mean score of 8.2% (SD 23.2%). It was completely fulfilled in 3.9% (n=7) of the materials and partially fulfilled in 8.8% (n=16) of the materials. Item T2 (disclosure of funding source) was fulfilled in 10.4% (n=19) of the materials. Item T5 (information sources) had a mean score of 8.2% (SD 23.2%). Complete fulfillment was reached in only 3.9% (n=7) of the materials, and partial fulfillment was observed in 8.8% (n=16) of the materials, meaning that it was an exception when materials provided references and even less likely that the references were visibly linked to text sections.

Content Domain

Items from the content domain presented a heterogeneous pattern. Overall, the fulfillment score was 21.9% (SD 22.7%). The item with the highest score in this domain was C1. It was fulfilled in 59.9% (109/182) of the materials, meaning that the symptoms, pathophysiology, and etiology of the cancer relevant to the corresponding screening program were explained. Item C2 (options named and explained) had a mean score of 26.9% (SD 37.7%). It was completely fulfilled in 15.9% (n=29) of the materials and partially fulfilled in 22.0% (n=40), indicating that descriptions of available options, which also include the option not to participate in screening, appeared in approximately a quarter of the analyzed materials. Item C3 (explanation of stochastic uncertainty) was fulfilled in 2.2% (n=4) of the materials. This means that almost none of the analyzed materials explained that numerical results from scientific studies usually represent estimates and do not allow predictions for individual persons.

Items Overlapping Between Content and Presentation Domains

The 4 items overlapping between the content and presentation domains refer to the presentation of numbers regarding the occurrence of the health condition (cancer in this case) and quality parameters of the corresponding screening program. Item C4/P1 (prevalence and incidence presented adequately) was fulfilled in 20.8% (38/182) of the materials, meaning that information on the course of the condition with and without screening or on disease prevalence or incidence appeared in approximately 1 of 5 documents only. Item C5/P2 (benefits presented adequately) was fulfilled in 15.4% (n=28) of the materials, indicating that appropriate quantitative descriptions of the expected benefits of screening were present in a rather small proportion of information materials. Item C6/P3 (harms presented adequately) was fulfilled in 13.2% (n=24) of the materials, meaning that appropriate quantitative information on potential harms or downsides of screening was included only in a limited number of materials. Item C7/P4 (diagnostic test accuracy presented adequately) was fulfilled in 14.8% (n=27) of the materials, showing that comprehensive quantitative information on test performance characteristics did not appear in most materials.

Presentation Domain

Presentation-related items obtained a mean score of 33.7% (SD 19.1%). However, they displayed a mixed pattern, with the fulfillment scores of individual items widely ranging from 5.8% to 87.4%. Item P5 (neutral language) was fulfilled in 78.6% (143/182) of all materials, indicating that most documents used language that avoided strongly persuasive or directive wording. Item P6 (narratives avoided) was fulfilled in 87.4% (n=159) of the materials, showing that narrative elements such as brief stories about individual experiences or illustrative examples were avoided in most analyzed information materials. Item P7 concerned the adequate graphical representation of frequencies (bar charts or sorted pictograms with complete captions). The item was not applicable to 82.4% (n=150) of the materials because these documents did not include graphics to show numerical data. Of the 32 materials to which the item applied, 17 (53%)

fulfilled the item partially, and 1 (3.1%) did so fully. Item P8 (gain and loss framing) had a mean score of 5.8% (SD 20.5%). Complete fulfillment was observed in 3.3% (n=6) of the materials, and partial fulfillment was observed in 4.9% (n=9) of the materials, indicating that only a small proportion presented outcomes using both gain- and loss-oriented phrasing.

Discussion

Summary of Main Findings

This study analyzed 182 information materials on breast, cervical, and colorectal cancer screening from 26 European countries using the MAPPinfo quality assessment tool [17]. The average quality score across all materials was 25.7% (SD 15.0%), with scores ranging from 6.8% to 78.3% out of a possible 100%. This indicates that average fulfillment of MAPPinfo quality criteria was low for most information materials. Still, 16 materials achieved a score of 50% or more, and 3 exceeded 75%. No statistically significant differences in quality scores were found across different cancer types.

The results revealed substantial variation in the extent to which the 19 MAPPinfo quality criteria were fulfilled. The definition domain obtained the highest score, with a mean of 60.3% (SD 21.9%), primarily because most materials clearly identified their target group—that is, those invited to participate in the screenings—although few explicitly stated the aim of facilitating informed choice. The transparency domain had the lowest mean score (8.8%, SD 9.4%), and 2 of 6 items were not fulfilled as the materials failed to declare how conflicts of interest were handled and on what systematic search strategies the content was based. The content (mean score 21.9%, SD 22.7%) and presentation (mean score 33.7%, SD 19.1%) domains showed mixed patterns on average, with most materials avoiding persuasive language and narratives but failing to provide adequate quantitative information about the benefits, harms, and test accuracy of the screening programs.

Our Findings in the Context of the Literature

As MAPPinfo is a relatively new instrument, we could only identify three peer-reviewed studies that have used it to rate health information materials. An analysis of 1948 Norwegian web-based health information materials covering 16 diverse health topics yielded a mean MAPPinfo score of 22%, ranging from 0% to 73% [29]. This aligns with the low scores found in our study, although it did not include information materials on cancer screening. An analysis of 94 German-language web-based information materials on the treatment of knee osteoarthritis produced similar results, with a mean MAPPinfo score of 14.6%, ranging from 0% to 69% [30]. A recent analysis of 50 German-language health information video materials on YouTube about knee osteoarthritis yielded even lower results, with mean scores ranging from 5% to 25% [31]. Taken together, these findings suggest that scores of 75% or above are rare. In our study, only 3 information materials exceeded this threshold. Detailed scoring data for all information materials will be provided upon request.

Possible Reasons for the Low Scores of Most Information Materials

There may be several reasons why most of the information materials examined were of poor quality. Developers may be unfamiliar with the evidence-based communication standards summarized in the guideline for evidence-based health information [16]. Many decision-makers may not prioritize informed decision-making, resulting in limited resources being dedicated to developing high-quality information materials. Small regions or countries often develop their own materials independently rather than pooling resources to create materials meeting the quality criteria better, which could then be adapted to local organizational requirements. In addition, some materials appear to be designed primarily to promote participation in screening programs rather than support informed decision-making. Concerns that information about potential harms might alarm the population may therefore lead to such information being omitted, which in turn undermines the ability to make an informed decision.

Implications for Practice

An average quality score of more than 50% was achieved only for five quality criteria: (1) D1—target group defined (mean score 96.7%, SD 17.9%), (2) P6—narratives avoided (mean score 87.4%, SD 33.2%), (3) P5—neutral language (mean score 78.6%, SD 41.0%), (4) C1—health problem explained (mean score 59.9%, SD 49.0%), and (5) P7—graphical representation of frequencies adequate (mean score 54.7%, SD 49.0%; mean scores were calculated only among applicable materials).

The average scores of all other items were well below 50%. We believe that several of them could probably be improved without substantial effort as the necessary information should be readily available to information material providers. These items include those from the transparency domain (T1-T5) as well as items D2, C2, C3, and P8. They all stand out as practical starting points toward more complete information materials. In Table 4, we suggest how these criteria can be fulfilled.

Fulfilling items T1 through T5 would greatly increase the transparency of the materials and, thus, potentially also boost the target audience's trust in the information provided. Meeting item C3 would improve the intelligibility of numerical information about screening effects. Fulfilling items D2, C2, and P8 would better enable the target group to make an informed decision about participating in the screening program.

Fulfilling the items from the content and presentation domain appears to entail more substantial effort as they require the availability of specific numbers from modeling calculations. That said, explicitly stating that no numbers are available also constitutes a valid response. Nevertheless, these criteria are considered essential for enabling informed

decision-making. In Table 5, we make suggestions on how these criteria can be fulfilled.

Table 4. Suggestions for fulfillment of criteria requiring minor additional effort.

MAPPinfo[a] items	Score (%), mean (SD)	Suggested improvements
D2—objective of informed decision mentioned	23.9 (39.5)	Explanation that the information material's goal is to facilitate an informed choice about whether to participate in the given cancer screening program
T1—authors named	8.2 (23.2)	Making information material authors identifiable and providing a possibility to contact them
T2—funding source declared	10.4 (30.6)	Disclosure of funding of information material development and its dissemination
T3—conflicts of interest made transparent	0 (0)	Disclosure of a strategy on how to manage potential conflicts of interest
T4—up-to-dateness	25.8 (30.9)	Indication of the date when the information material was first developed and the date of the last update, as well as the date of the next update
T5—references cited	8.2 (23.2)	Transparent citation of scientific references that the information material is based on
C2—options named and explained	26.9 (37.7)	Equal description and explanation of all screening options (eg, different screening tests)—including the option of not participating
C3—stochastic uncertainty explained	2.2 (14.7)	Explanation that numerical study results are typically estimates and that it is not possible to derive reliable predictions for individuals from them
P8—gain and loss framing	5.8 (20.5)	Communication of screening program effects using both gain framing (eg, number of survivors after 10 y) and loss framing (eg, number of deaths after 10 y)

[a]MAPPinfo: Mapping the Quality of Health Information.

Table 5. Suggestions for fulfillment of criteria requiring substantial effort.

MAPPinfo[a] items	Score (%), mean (SD)	Suggested improvements
C4/P1—prevalence or incidence presented adequately	20.9 (40.6)	Numerical presentation (using absolute risk) of cancer prevalence or incidence and mortality without screening participation using a uniform reference value (eg, X out of 1000 persons in the next Y years)
C5/P2—benefits presented adequately	15.4 (36.1)	Numerical presentation (using absolute risk) of cancer prevalence or incidence and mortality with screening participation compared to no participation using a uniform reference value (eg, X out of 1000 persons in the next Y years)
C6/P3—harms presented adequately	13.2 (33.8)	Information about consequences resulting from false-positive and false-negative results, overdiagnoses, and overtreatment: numerical presentation (using absolute risk) of harms with screening participation compared to no participation using a uniform reference value (eg, X out of 1000 persons in the next Y years)
C7/P4—test accuracy presented adequately	14.8 (35.5)	Presentation of positive predictive value and negative predictive value or frequencies of false-positive and false-negative results using a uniform reference value (eg, out of 1000 persons with a positive test result, approximately X have cancer and Y do not have cancer)
T6—systematic search strategy reported	0 (0)	Transparent and accessible documentation of systematic search strategies underlying the generation of information with the aim of making the search reproducible

[a]MAPPinfo: Mapping the Quality of Health Information.

Although it can reasonably be assumed that a systematic literature search was conducted prior to the implementation of the screening program, none of the reviewed materials reported or documented this process, resulting in a score of 0% for item T6. Table 5 provides a suggestion on how to fulfill this item.

Detailed information on requirements to fulfill all criteria can be found in the MAPPinfo checklist documentation [25].

Limitations

Our study has several limitations. Interrater reliability was only moderate, with aT coefficient of 0.65. This was mainly due to disagreements within one of the three pairs of raters. Nevertheless, we are confident that the consented ratings are accurate as an experienced third rater was consulted if conflicts could not be resolved through discussion.

We only assessed official information materials. This means that we do not know about the quality of other information materials that individuals might encounter while searching the internet for information on the screening program of their corresponding country or region. However, we think that individuals will be automatically referred to official information materials when invited to participate in a screening program. These are therefore the first and most important materials that individuals will consult.

We only considered quality criteria that could be evaluated based on the information materials alone. We did not contact providers of materials for in-depth information, and we also did not assess the accuracy of the provided information. However, the MAPPinfo instrument has been validated as a tool measuring the fulfillment of the most important quality criteria according to the guideline for evidence-based health information [16].

Although MAPPinfo is a validated tool reflecting evidence-based recommendations for health information [16], it has limitations as well. It is unclear what score is required for information materials to enable informed decision-making in practice to a sufficient degree. It is also unclear which MAPPinfo items contribute to this and to what extent and whether some items have a greater impact than others. It is unknown to what extent screening participation is influenced by MAPPinfo scores of information materials.

Improvement Within the Scope of EuCanScreen

As part of the EuCanScreen program (in work package 6, task 7), we are planning to develop a toolkit to support the improvement of information materials on organized cancer screening programs. The primary aim is to assist the developers of these materials, ensuring that websites and brochures enable the public to make informed decisions about participation in cancer screening.

The toolkit will include templates for text and graphics to support adherence to the recommendations set out in the guideline on evidence-based health information [16]. As this guideline forms the basis of the MAPPinfo checklist, the toolkit will also ensure that textual and graphical information meets the MAPPinfo quality criteria. Given that the guideline for evidence-based health information is currently under revision, the toolkit will be updated accordingly whenever new evidence on communicating health information emerges or the evidence base for cancer screening is revised.

The toolkit will also provide best practice guidance on communicating in a manner that is accessible to laypeople, avoiding biased and persuasive language, and presenting risks and numerical data appropriately both graphically and in text. Additional guidance will address the adaptation of content to country- or region-specific cultural characteristics, as well as the needs of migrant populations, gender minority groups, and people with intellectual disabilities.

Conclusions

Most official information materials on organized breast, cervical, and colorectal cancer screening across Europe fulfilled less than 50% of the MAPPinfo quality criteria required to support informed decision-making. These deficiencies were consistent across cancer types and align with previous findings from other health information contexts, suggesting a systemic problem rather than isolated weaknesses. Many quality criteria—particularly those related to transparency—may be improved with relative ease, whereas others may require greater effort. Overall, the findings highlight the need for coordinated efforts and practical tools such as the toolkit planned within the EuCanScreen program.

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Generative AI Use

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Conflicts of Interest

None declared.

Multimedia Appendix 1

Breast cancer screening online materials.
[XLSX File (Microsoft Excel File), 18 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Cervical cancer screening online materials.
[XLSX File (Microsoft Excel File), 17 KB-Multimedia Appendix 2]

Multimedia Appendix 3

Colorectal cancer screening online materials.
[XLSX File (Microsoft Excel File), 17 KB-Multimedia Appendix 3]

Multimedia Appendix 4

Mapping the Quality of Health Information assessment specifications.
[DOCX File (Microsoft Word File), 19 KB-Multimedia Appendix 4]

Multimedia Appendix 5

Graphical representation of Mapping the Quality of Health Information scores for each cancer type.
[PDF File (Adobe File), 179 KB-Multimedia Appendix 5]

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Abbreviations

EuCanScreen: European Joint Action on Cancer Screening
MAPPinfo: Mapping the Quality of Health Information
STROBE: Strengthening the Reporting of Observational Studies in Epidemiology

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