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Science News Agencies in SciComm: an exploratory index for evaluating and enhancing public interest in mass-distributed press releases

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1 **Science News Agencies in** 2 **SciComm: an exploratory index for** 3 **evaluating and enhancing public** 4 **interest in mass-distributed press** 5 **releases**

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33
34 *ABSTRACT:* Scientific press releases are reaching the public directly through press
35 reproduction or institutional dissemination. Science News Agencies (SNAs) mediate
36 this process, distributing texts to thousands of journalists while also "leaking" them on
37 their websites and social media. This comparative case study examines four SNAs —
38 BORI, SMC UK, AlphaGalileo, and EurekAlert! — regarding their role in circulating
39 public scientific information. Through literature review and principles such as openness

40 and inclusion in science, we converted scholars' concerns into a preliminary index
41 potentially capable of assessing SNAs' public suitability. The SNAPI (Science News
42 Agencies Public Index) suggests a shift from purely public relations content towards
43 serving the public interest, highlighting areas needing attention in SNAs' social
44 function, to be refined in future research. Clear guidelines, links to open scientific
45 articles, and explicit notices on press releases' purposes are simple yet effective ways
46 to address issues concerning science public relations' pervasiveness in the public
47 sphere.

48
49 **Keywords:** Science and media; Diversity, equity, inclusion and accessibility in
50 science communication; Popularization of science and technology

51

52

53 **Context: SNAs and the role of press releases in SciComm**

54

55 A fundamental concern that defines science communication (SciComm) studies is the
56 process by which scientific material reaches the public (Horst et al., 2017) in an
57 operation that has been defined as “social conversation around science” (Bucchi &
58 Trench, 2021). Traditionally, this flux involves journalists developing their own stories,
59 conducting interviews with experts and other social actors, and then reaching their
60 audience. Alternatively, scientific press releases may reach reporters, who are
61 expected to use the material as inspiration. Evidence from the literature detailed below,
62 however, suggests that this pathway has experienced various disruptions — not to
63 mention the complex multi-agent system involving digital information today. Our focus
64 is on the increasing trend of press releases reaching the reader directly, with some
65 arguing that, as a result of this, “science is no longer given a forum for further
66 discussion” (Göpfert, 2007, p. 215). We provide a starting point for filling an important
67 gap, as limited attention has been given to how the mass distribution of press releases
68 by Science News Agencies (SNAs) affects public perception, understanding, and
69 engagement with science.

70

71 Major SNAs primarily provide services to organizations and journalists by maintaining
72 a mailing list of reporters who use institutional press releases as a basis for their news
73 stories. Smaller agencies also provide original material to journalists by curating and
74 writing press releases themselves (Remy Melanie, 2010; de Vrieze, J., 2018; Broer &
75 Pröschel, 2022; Righetti et al., 2022). Although targeted at journalists, these materials
76 also reach citizens through nearly *verbatim* media reproduction or direct access on
77 SNAs websites (Comfort et al., 2022). That's why it's pressing to investigate how SNAs
78 operate and the effects they have in SciComm. They can potentially help bridge the
79 gap between citizens and scientific knowledge, and address classic and contemporary
80 SciComm opportunities and challenges, such as controversies related to mediation
81 and the growing influence of public relations materials in the field (Weingart, 2022).

82

83 Issues raised in the literature regarding the role of SNAs in SciComm tend not to focus
84 directly on them, but rather on how press releases have been "leaking" to the public

85 directly, without mediation. One of the reasons cited for this is related to economic
86 pressures in journalism (Allan, 2011; Franks et al., 2023), with this leading to the
87 continuous decrease to the already limited number of science journalists in mass
88 media (Massarani et al., 2021, p. 36). This situation has resulted in a "hybridization in
89 science communication" — with the mixing of promotional and scientific discourse
90 (Zhang, 2018) — and science journalists shifting from original material to the use of
91 press releases (Bossema et al., 2019; Murcott & Williams, 2013). Institutional efforts
92 to disseminate (and, typically, promote) science can bypass the role of journalists,
93 informing what science stories make headlines and how they are told (Franks et al.,
94 2023) — to the point that some have argued that science journalism only persists in
95 newsrooms due to the widespread use of public relations materials from science
96 institutions (Ashwell, 2016).

97

98 In the face of the widespread use of press releases in SciComm, many scholars have
99 expressed concerns about their public influence (Gilbert & Ovadia, 2011; De
100 Dobbelaer et al., 2017; Koso, 2021), with some noting that their use in journalism may
101 contribute to science communication tending to value science positively, prioritizing
102 scientific interests (Intemann, 2022). Press releases can also distort or exaggerate the
103 science they promote (Brechman et al., 2009; Choi & Feller, 2022; Petrocelli et al.,
104 2022; Sumner et al., 2016). An investigation produced by 20 British universities
105 showed that 40% contained exaggerated advice, 33% presented exaggerated causal
106 claims, and 36% suggested that results based on animal research applied to humans
107 (Sumner et al., 2014). In Health Sciences, press releases are reported to fail in
108 informing readers about therapy risks, often presenting experimental treatments in an
109 overly optimistic manner (Sumner et al., 2016).

110

111 Similarly, researchers have identified frequent use of clickbait headlines,
112 colloquialisms, hyperbole, and superlative adjectives in press releases (Dolgova &
113 Orekhova, 2022), as well as information presented in a deterministic and simplified
114 way (Brechman et al., 2009). From a more positive perspective, press releases may
115 encourage media outlets to publish more science news (Comfort et al., 2022), and
116 materials that accurately communicate study results can have a positive impact on
117 science news (Franks et al., 2023). Local science coverage, however, can overly rely
118 on these materials, resulting in a heavy dependence on international sources
119 (Massarani et al., 2007; González-Pedraz et al., 2017). Press releases have become
120 so pervasive in SciComm that even social media posts by citizens have been found to
121 originate from these materials (Verstappen et al., 2022).

122

123 To our knowledge, no study has directly examined SNAs' role in disseminating
124 scientific information to the broader public, beyond their function as support for
125 journalists. This research aims to address this gap through a comparative case study
126 of four SNAs: EurekAlert!, AlphaGalileo, Science Media Centre (SMC) UK, and BORI
127 Agency. The study explores the mechanisms by which these agencies distribute
128 material to the public and identifies criteria that could enhance their public suitability.

129

130 **Objectives**

131 We provide a fresh perspective on the role SNAs play in mediating science directly to
132 the public by examining the following specific research questions:

133

134 **RQ1:** Do SNAs conceive public science communication as part of their role and to
135 what degree are press releases distributed by SNAs suitable to a public audience?

136 **RQ2:** What criteria could be used to evaluate SNAs' ability to have a boundary-
137 spanning function (i.e., building bridges between science and society)?

138 **RQ3:** Based on the framework, would a mixed qualitative-quantitative indicator help
139 synthesize and evaluate how SNAs shape science's interaction with the public?

140

141 **Theoretical framework**

142

143 Many issues raised by the literature review on the pervasiveness of press releases in
144 science communication can be summarized as facets of the "mediation problem".
145 Historically, journalistic mediation plays a role in sparking public debate about science,
146 not only by translating knowledge or informing, but also by ensuring accountability,
147 particularly in societies where public policies are increasingly influenced by science
148 and technology (Kennedy, 2010). Texts with journalistic mediation tend to have greater
149 polyphony and heterogeneity, as they assemble different voices and public views
150 (Botelho et al., 2016). They also include more "knowledge translation" practices,
151 highlighting the relevance of scientific studies for society (Botelho et al., 2016).

152 Mediation, therefore, not only makes science knowledge more accessible to a larger
153 audience, it also brings societal demands and values into the scientific field. It blurs
154 the boundaries between science and society that scientists construct through
155 "boundary work" (Rödder, 2012). This concept, first presented by Gieryn (1983),
156 describes how scientists maintain their cultural authority by labeling non-scientific
157 knowledge as pseudoscience and by keeping scientific knowledge encoded. Scientific
158 dissemination materials, such as news stories, press releases, and research articles
159 can facilitate boundary work by promoting the interests of scientists. However, if such
160 materials highlight the relevance of science to society, use understandable language,
161 and provide public access to scientific knowledge, they can act as "boundary spanning
162 units," or contact points between the scientific community and other environments
163 (Rödder, 2012). These activities can enable SNAs to also act as knowledge brokers,
164 or "people whose job it is to move knowledge around and create connections between
165 researchers and their various audiences" (Meyer, 2010, p. 118).

166

167 Broadly, communication is a key factor in the relationship between science and society.
168 It plays a role in the development of scientific culture, in terms of making methods and
169 epistemologies known to the public — both in terms of opening science to the demands
170 and participation of society and in opening society to scientific methods and claims
171 (Godin & Gingras, 2000; Vogt, 2012). Openness is essential to enabling these science-
172 society interconnections. As the recent COVID-19 pandemic has made clear, everyone

173 benefits when scientific information is made widely, rapidly, and freely accessible to all
174 (Wellcome Trust, 2020).

175
176 Historically, the open science movement has emphasized how providing free access
177 to scientific research leads to a more inclusive science, fostering wider use and
178 participation in knowledge creation (Barbour & Borchert, 2020; UNESCO, 2021). While
179 the scientific community is partially engaged in the open science debate (David, 2008;
180 Burgelman et al., 2019), the discussion surrounding "openness" is still in its early
181 stages in SciComm (Barata, 2022; Fleerackers et al., 2023). Openness is a valuable
182 consideration in the context of press releases, as both journalistic material and
183 scientific papers are often behind paywalls, accessible only to subscribers. Therefore,
184 press releases frequently serve as the only openly available information about new
185 research findings. These open texts are distributed by SNAs and, potentially, reach the
186 public.

187 188 **Methods and analytical framework**

189
190 This exploratory comparative case study analyzes four SNAs using a three-step
191 process, culminating in a mixed qualitative-quantitative index we will call SNAPI
192 (Science News Agencies Public Index). Case studies are appropriate when certain
193 institutions (SNAs in this case) exemplify social phenomena (i.e., science
194 communication), and can contribute to the advancement of scientific theory in the field
195 (Walton, 2009). SNAPI synthesizes these institutions' materials suitability for the
196 public, drawing on criteria and concerns highlighted by SciComm scholars in previous
197 literature and grounded in our theoretical framework. The mixed-method perspective
198 argues for combining qualitative and quantitative resources to achieve both depth and
199 synthesis (Leavy, 2017; Tashakkori et al., 2021). Our preliminary approach considers
200 the index feasibility, in a first step of a practical-theoretical framework that, at this stage,
201 aims to demonstrate the index's potential utility. We take a pragmatic stance that
202 implies potentially useful research, with the guiding principle of considering the
203 consequences of knowledge in a creative appeal, according to a view that "science,
204 within the context of democracy, could improve society" (Gillespie et al., 2024, p. 11).
205 Each stage of the analysis addresses a research question (see Objectives section)
206 and contributes to the formulation of the subsequent investigation phase, culminating
207 in the index construction.

- 208
- 209 1. A general characterization of each agency, including their goals and
210 social media presence;
 - 211 2. An analysis of a sample of press releases distributed by these agencies
212 guided by a framework that assesses SNAs' suitability as boundary
213 spanning units (the ability of bridging science and society);
 - 214 3. The construction of a preliminary mixed qualitative-quantitative index to
215 be refined in future research.

216
217 *Phase 1 – SNAs profiles and online presence*

218

219 The initial phase involved selecting agencies for analysis and assessing the extent to
220 which they consider their distributed material to have a public function. This step tested
221 the hypothesis if these institutions have a public social role, and whether an index in
222 this regard would be justifiable beyond the concerns of SciComm scholars. We
223 examined four science news agencies: two national — BORI Agency (Brazil) and
224 Science Media Centre (UK) — and two international — AlphaGalileo and EurekAlert!.
225 These organizations were chosen as they represent diverse content production and
226 distribution models across different geographic and cultural contexts. Additionally,
227 each SNA is backed by a prestigious scientific organization (see results for SNAs
228 description). In this phase, we also conducted an analysis of each agency's mission
229 statement and social media presence.

230

231 *Phase 2: A Framework for Science-Society Boundary Spanning*

232

233 Since the case study methodology provides empirical grounding for social theories
234 using in-depth qualitative analysis (Babbie, 2007), it is well-suited to small samples. As
235 such, we performed a qualitative analysis of 20 press releases from these agencies
236 (five documents from each one), available on each agency's homepage on February
237 21, 2023. We contextualized our analysis by examining each SNA's website and
238 policies, allowing us to ensure the selected texts reflect the editorial rules these
239 agencies follow to standardize their content. For instance, SMC UK maintains an
240 editorial policy of interviewing sources who are not directly involved in the scientific
241 study (Rödger, 2015), and this criterion was observed in the analyzed sample of texts.
242 However, our small sample and qualitative approach do not allow generalized
243 conclusions; instead, it provides a framework to be refined in future investigations.

244

245 After selecting the agencies and the sample, we developed an analytical framework
246 for evaluating to what degree press releases distributed by each SNA enabled
247 boundary spanning (i.e., building bridges between science and society). To assess
248 press release suitability for the public, we derived criteria from the literature reviewed
249 above, acknowledging what scholars have observed as key concerns. From this
250 literature, we identified three main press releases public suitability criteria: "Public
251 Impact", "Hyper PR Influence", and "Source Diversity". "Public Impact" refers to
252 whether the text discusses how the reported study impacts society or the scientific
253 field, making it a category related to the mediation problem. The category of "Hyper
254 PR Influence" focuses on exaggerated or sensationalized language, such as
255 descriptions of studies as breakthroughs without supporting data, a concern pointed
256 out in the literature review. "Source Diversity" assesses whether sources unrelated to
257 the study were interviewed, an item also related to mediation issues. Open science
258 practices, such as making scientific articles freely available to readers, were also
259 considered a necessary boundary-spanning function of SciComm material and
260 included as an element in the framework. To these criteria, we added quality criteria
261 from science journalism proposed by Eysenbach *et al.* (2002): "Technical Information",
262 "Design", and "Readability". Collectively, these criteria enabled us to assess whether

263 press releases made the research “conceptually accessible” to the public (Kelly &
264 Autry, 2013). The final analytical framework consisted of seven criteria, outlined in
265 detail below.

266

267 • Technical Information: Includes the publication date and the institutional
268 source of the press release, and, when applicable, a link to the scientific
269 article.

270 • External sources: Incorporates other sources, including interviews with
271 authors not associated with the scientific study.

272 • Public Impact: Provides context to indicate the societal relevance and
273 public implications of the research.

274 • (Hyper) PR Influence: Use of sensationalized or exaggerated
275 expressions such as “breakthrough,” “innovative,” or “the first time”
276 without supporting explanation or data.

277 • Readability: Written in language that is understandable to a public
278 audience, i.e., without the use of jargon or unexplained technical terms.

279 • Design: Utilizes layout characteristics that enhance readability, such as
280 appropriate size of text, paragraph division, subheadings, sections, etc.

281 • Open Access: Ensures that the press release and, when applicable, the
282 cited materials (reports, scientific articles, etc.) are free for the public to
283 access in their entirety.

284

285 *Phase 3: A preliminary qualitative-quantitative index*

286

287 The construction of the indicator involved an exploratory analysis of a sample of press
288 releases distributed by these agencies. The aim was to verify whether these categories
289 could be identified in some of these texts, as they reflect these agencies’ editorial
290 policies. If so, this would affirm the suitability of the indicators for this kind of evaluation.
291 This phase could also serve as further evidence of the public aspect of this material.
292 We then evaluated each press release in our sample (N=20) against the criteria from
293 Phase 2. Texts were categorized as either “adequate” (A) if they met all criteria, or
294 “inadequate” (I) if they did not meet the criteria. We provided reasons for each
295 “inadequate” rating¹. Overall adequacy, or SNAPI (Science News Agency Public
296 Index), represents the proportion of “adequate” ratings an agency received across all
297 categories. A 100% SNAPI indicates full compliance with all criteria—suggesting the
298 press release has the potential to act as a boundary spanner between science and
299 society.

300

301 The scoring process constitutes the quantitative phase of our analysis, quantifying
302 adequacies through basic descriptive statistical frequency counts. This mixed-method
303 approach uses quantitative data to succinctly present qualitative analysis results. The

¹ Complete tables guiding this analysis, which include the titles of the press releases, links to the full texts, and reasons for inadequate ratings, are available at: <https://github.com/moniqueboliveira/sciencenewsagencies>

304 phase has precedents in communication indicators, such as the CDC's Clear
305 Communication Index (CDC, 2014), which assesses health text clarity based on
306 specific criteria. In the CDC index, when all criteria are met, the text receives a score
307 indicating its clarity level. It's worth noting, however, that given our small sample size,
308 the agency scores are experimental and intended solely to demonstrate SNAPI's
309 feasibility and potential utility.

310 **Results: Science news agencies and their potential as mediators of science**

311 This section is organized into three stages, following the research questions presented
312 above.

313

314 *SNA's public presence and operational models*

315

316 The analysis of the SNA websites revealed that all four agencies aim to reach the
317 general public indirectly by enhancing scientists' engagement with the media.
318 However, there's also evidence of a "hybrid model" (combining PR and journalism
319 practices) that seeks to reach the public directly. This shared goal of providing a service
320 that supports media coverage of research across all disciplines is rooted in the belief
321 that communicating research beyond academia is vital. AlphaGalileo's website, for
322 instance, asserts that "communication of scientific research is fundamental to the
323 creation of knowledge-based societies", while EurekAlert! and its operator, AAAS,
324 "encourage the broad communication of scientific research worldwide".

325

326 The operational models of these agencies provide additional evidence supporting the
327 hypothesis of a potential shift in public relations towards public interest. This shift
328 results in a more hybrid role for these agencies within the SciComm infrastructure. Two
329 agencies, BORI Agency and SMC UK, have explicitly adopted a hybrid approach to
330 producing texts that incorporate PR practices (i.e., promoting new studies) with
331 journalistic mediation principles that serve the public interest. These journalistic
332 practices include conducting interviews with experts not directly linked to the released
333 study (in the case of SMC UK) and implementing guidelines focused on impact,
334 diversity, and inclusion (as seen with BORI). Contrastingly, EurekAlert! and
335 AlphaGalileo operate on a more classic PR model, disseminating press releases
336 produced by scientific institutions and charging a fee for this service.

337

338 To analyze SNAs' ability to reach the public directly, we also characterized each
339 agency's presence on social media platforms (SMPs) and compared this information
340 with the objectives they report in public statements. Table 1 shows the active accounts
341 each SNA maintains on SMPs. Generally, all four SNAs had at least one active account
342 on an SMP. BORI was the most active SNA, with presence on all five analyzed SMPs,
343 while SMC UK was the least active, present on only the X platform. The data suggests
344 that these agencies work to maintain broad, public visibility, potentially reaching an
345 audience that extends beyond the journalists who subscribe to their services. Below,
346 the detailed analysis of these agencies' models and their presence in social media
347 highlights their tendency towards a hybrid nature.

Table 1 - SNAs presence in social media platforms

	X		Facebook		YouTube		Instagram		LinkedIn	
	AA	F	AA	F	AA	S	AA	F	AA	F
AlphaGalileo	yes	3.280K	yes	4.7K	no	-	no	-	yes	213
BORI	yes	12K	yes	2.3K	yes	386	yes	7K	yes	2K
EurekAlert!	yes	45.4K	yes	54K	yes	577	no	-	no	-
SMC UK	yes	23K	no	-	no	-	no	-	no	-

349 *Note: AA = Active accounts, F = Followers, S = Subscribers*

350

351 *EurekAlert!*

352

353 EurekAlert! is a SNA created by the American Association for the Advancement of
 354 Science (AAAS), based in the United States. According to information available in
 355 2015, the agency had 11,000 registered journalists and had released 270,000 press
 356 releases since its foundation in 1996, an average of 74 releases per day. Institutions
 357 pay an annual fee of up to USD \$4,725 to submit press releases to the service,
 358 although, according to EurekAlert!, acceptance is not guaranteed. Registered
 359 journalists have access to the reporter-only section, which includes the embargoed
 360 news releases and other PR materials. However, the website also has a section open
 361 to the general public. As it states on their website: “all embargoed news releases are
 362 made freely available to the public at designated embargo-release time”². EurekAlert!
 363 posts daily on X and Facebook, reposting content across both platforms. YouTube
 364 updates are less frequent, occurring every 2-3 months.

365

366 *AlphaGalileo*

367

368 AlphaGalileo³ is the European version of EurekAlert! created in 1998 in the United
 369 Kingdom to support “communication between researchers, journalists and the public”.
 370 Kiernan (2003) argues the agency was created as an alternative to EurekAlert! since
 371 researchers across Europe were concerned by the dominance of American science
 372 achievements in the news. Based on information from the agency's website, it was
 373 funded by the European Commission and the governments of France, Germany, and

² Information on the EurekAlert! agency website. Available at: <https://www.eurekalert.org/help#About>. Accessed: February 2023.

³ Information on the AlphaGalileo agency website. Available at: <https://www.alphagalileo.org/en-gb/AlphaGalileo/About-us/Who-we-are>. Accessed: February 2023.

374 the United Kingdom. Since 2013, the agency has been fully funded by subscriptions
375 and sponsorships and reaches more than 7,000 journalists. Research organizations
376 and businesses pay up to \$3,320 for a 12-month subscription to post press releases
377 and other materials. Journalists, contributors, bloggers, and journalism students can
378 subscribe for free. The agency keeps a portion of its content open to the public, and
379 designates the general public as one of its intended audiences. Certain materials,
380 however, remain exclusively accessible to journalists. Regarding social media
381 presence, AlphaGalileo is most active on X (formerly Twitter), posting daily and
382 engaging with contributors' content. The agency is less active on Facebook, posting
383 quarterly, and moderately active on LinkedIn, posting monthly. Both Facebook and
384 LinkedIn showcase content similar to X.

385 386 *SMC UK*

387
388 The clear intention of becoming a reliable source of quality science/research news is
389 particularly illustrated by SMC UK's approach of selecting experts whose quotes will
390 be sent to journalists. SMC⁴ was founded in the UK in 2002 and produces and
391 disseminates its own materials. Today, SMCs exist in Australia, Canada, New Zealand,
392 Germany, Taiwan, Kenya, and Spain. SMC UK pairs information about new studies
393 with quotes from unaffiliated experts, which are then sent to journalists. The agency
394 has a section in which scientists react to published studies guided by an official
395 philosophy that "the media will 'do' science better when scientists 'do' media better"
396 (Fox Fiona, 2012, p. 257). Other activities practiced by SMCs include maintaining a
397 database of academic experts, organizing press conferences, and disseminating
398 resources for journalists (Fox Fiona, 2012; Broer, 2020). From a business perspective,
399 SMC UK is funded through a mix of grant money and sponsorships and donations from
400 university and research centers, rather than collecting income through advertisers or
401 subscriptions (Fox Fiona, 2012). SMC maintains only one active social media account
402 on X. It posts once or twice daily, highlighting the latest content from its website.

403 404 *BORI agency*

405
406 BORI Agency⁵ is a Brazilian SNA that focuses on disseminating Brazilian research to
407 journalists, reaching around 3,000 reporters in the country. It was founded in 2020 and
408 has received funding by various organizations such as Google, the São Paulo
409 Research Foundation (Fapesp), Serrapilheira Institute, and Getúlio Vargas Foundation
410 (FGV). BORI has a designated press team that curates scientific articles from Brazilian
411 and Ibero-American journals index (e.g., SciELO). Press releases are partially
412 produced by a team of freelance journalists who follow a hybrid-text model established
413 by BORI's editorial team. The model contains criteria that reporters must attend to
414 when writing the releases. The resulting "explanatory texts" describe four essential

⁴ Information on the SMC UK agency website. Available at: <https://www.sciencemediacentre.org/>. Accessed: February 2023

⁵ Information on the BORI agency website. Available at: <https://abori.com.br/>. Accessed: February 2023.

415 aspects of the research in question: “1) What is the main finding of the research? 2)
 416 How was the research conducted? 3) How do the results impact people's lives? 4) How
 417 do the results change what we already know in the field of knowledge?” (Righetti et al.,
 418 2022, p. 11). BORI is the agency in our sample with the greatest number of active
 419 social media accounts. They maintain X, Facebook, Instagram, and LinkedIn profiles
 420 as well as a YouTube channel.

421

422 *Testing SNAs materials for public suitability*

423

424 The preceding analysis of RQ1 shows that these agencies have connections with the
 425 public directly and some employ operational models that blend press releases with
 426 journalistic content, already incorporating criteria for public suitability. This finding,
 427 along with the literature review, points to the importance of understanding the public
 428 adequacy of SNAs' content. RQ2 contributes to developing this understanding by
 429 exploring the feasibility of establishing criteria for SNAs to have a boundary-spanning
 430 function. Press releases (N=20) were evaluated considering the following categories
 431 (see methodology section for detailed description): Technical Information, External
 432 Sources, Public Impact, (Hyper) PR influence, Readability, Design, and Open Access.

433

434 Tables were constructed to evaluate press releases of each of the four agencies. Each
 435 table contained the press release title, access link, and a classification of "adequate"
 436 or "inadequate" based on selected criteria ^[1]. Reasons were given for each
 437 "inadequate" rating. Table 2 shows the adequacy percentage for each agency,
 438 indicating how often their press releases met the criteria across all analyzed press
 439 releases. The Science News Agency Public Index (SNAPI) represents the overall
 440 adequacy—the proportion of "adequate" ratings an agency received across all
 441 categories. For instance, an agency achieving 100% suitability had press releases
 442 meeting all criteria (such as external sources and public impact).

443

444 **Table 2 - Science News Agencies' Adherence to Public Suitability Criteria**

Agency	TI	ES	PI	HPR-I	R	D	OA	SNAPI
SMC UK	100%	100%	100%	100%	80%	100%	80%	94%
BORI Agency	40%	I	100%	100%	100%	100%	40%	68%
EurekAlert!	80%	I	80%	60%	100%	100%	40%	66%

AlphaGalileo	80%	I	80%	80%	80%	100%	I	60%
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445

446 *Note:* TI = Technical Info, ES = External Sources, PI = Public Impact, HPR-I = Hyper
 447 Public Relations Influence, R = Readability, D = Design, OA = Open Access,
 448 SNAPI = Science News Agency Public Adequacy Index

449

450 The analysis demonstrates the feasibility of creating an indicator to assess the public
 451 adequacy of press releases. All categories were present in the evaluated texts,
 452 allowing classification as either "adequate" or "inadequate" based on established
 453 criteria. While the indicator is exploratory and cannot hierarchically classify agencies,
 454 it could be enhanced with larger samples and additional categories beyond
 455 dichotomous classifications. Still, the case study reveals that some agencies and their
 456 materials already follow rigorous public adequacy criteria. Notably, in this analysis, all
 457 agencies achieved a SNAPI above 60% — indicating potential to reach the public with
 458 some degree of adequacy and also demonstrating room for improvement, without a
 459 need to completely change the text structure or their operational model.

460

461 Additional preliminary conclusions, to be verified in larger samples, can be drawn from
 462 this multiple case study. Design and readability are categories likely well-addressed by
 463 the agencies. All SNAs employed well-structured texts with sections and subheadings
 464 (100%) and used language that was relatively easy to understand, even without
 465 scientific expertise. However, except for SMC, agencies seldom provided links to
 466 scientific articles, negatively affecting their adequacy score for the technical info
 467 category. The open access category — which requires not only a link but also free
 468 access to the scientific article — also warrants further investigation, as no agency
 469 achieved 100% suitability in this area. AlphaGalileo's absence of a score in the open
 470 access category stems from their decision to restrict public access to press releases
 471 after a certain period — a change that occurred between data collection, analysis, and
 472 drafting of this research article. The agency's website lacks clarity on why some texts
 473 remain open while others don't. The low scores in these categories, and the lack of a
 474 stated mission by SNAs to lead citizens to scientific sources, indicate this issue is both
 475 low-priority and neglected. Access to original sources not only democratizes scientific
 476 knowledge but also allows for fact-checking of press release information. Press
 477 releases that provide such access could play a relevant role in leading citizens toward
 478 scientific knowledge, enabling them to analyze scientific data themselves.

479

480 Though the sample is too small for a definitive ranking, SMC UK's experimental SNAPI
 481 of 94% stands out. This may be attributed to their editorial policy of interviewing experts
 482 unaffiliated with the study under discussion — a common element in all their analyzed
 483 texts (see "external sources" category). We do recognize that this practice arguably
 484 leads to the production of content that goes beyond the traditional definition of a press
 485 release; however, as stated previously, some agencies have been adopting hybrid
 486 practices — and SMC UK is one of them. However, since this strategy is uncommon

487 and likely requires a dedicated team, testing was conducted with this category
488 excluded. The resulting SNAPIs were: SMC UK (90%), BORI Agency (80%),
489 EurekAlert! (77%), and AlphaGalileo (70%). Reiterating that this indicator is still being
490 refined and under construction, we can draw from this analysis a plausible hypothesis
491 that hybrid models, with specific guidelines for public adequacy (such as those
492 employed by SMC UK and BORI), might have an advantage over other models in terms
493 of facilitating boundary-spanning between science and society.

494

495 Concerning these hypotheses, we can add that BORI Agency and SMC UK scored
496 slightly higher in public impact and Hyper PR Influence, likely due to their editorial
497 models. Nevertheless, it's plausible that EurekAlert! and AlphaGalileo could introduce
498 public suitability guidelines for organizations submitting press releases and still
499 improve their SNAPi scores without needing to hire a dedicated team. This provides
500 one example of how the index could be used to synthesize and evaluate how SNAs
501 influence science's interaction with the public, as well as point to potentially more
502 suitable operational models and specific criteria for improvement.

503

504 **Final remarks**

505

506 Previous research has described SNAs as "boundary-spanning units" (Rödder, 2012),
507 "knowledge brokers" (Meyer, 2010), and "network gatekeepers" (Barzilai-Nahon,
508 2008), however, these terms are typically used to describe how SNAs bridge gaps
509 between science and journalism, rather than science and the public. As such, a
510 valuable contribution of this article was to consider how SNAs directly engage the
511 public with science through press releases. It did so by converting concerns about
512 press release quality found in existing literature into an index that may help scholars
513 and practitioners succinctly assess the public suitability of this circulating material,
514 considering the boundary-spanning potential of these organizations.

515

516 The mass distribution of press releases by SNAs positions them as key targets for
517 improving the public adequacy of this content. This can occur both during the writing
518 of these texts — for agencies with in-house newsrooms — and through guidelines for
519 screening materials submitted by science institutions to SNAs. The index criteria
520 capture characteristics of the press releases that provide the public with “conceptual
521 access” to research (Kelly & Autry, 2013) — i.e., communicating new findings in ways
522 that are accurate, understandable, and relevant to society — as well as “material
523 access”— i.e., ensuring research articles are freely available to interested readers. The
524 analytical framework proposed here provides a lens for supporting both types of
525 accessibility and for addressing scholars’ concerns about the growing importance of
526 SNAs in SciComm. The proposed index prompts questions warranting further
527 consideration from scholars and practitioners, such as: how can institutional promotion
528 be mitigated in press releases, what language should be avoided, and how can the
529 public implications of research be effectively communicated?

530

531 The constructed categories and corresponding ratings, culminating in the preliminary
532 index, provide a foundation for potential action to address these questions. Some of
533 the adequacies are easily achievable, such as a better management of hyperlinks to
534 scientific articles. Enhancing inclusion in science can also be achieved by pointing
535 interested readers to the original source, where they can fact-check the information
536 presented in the press release, and gain more context and detail about the study.
537 These refinements could be implemented through the development of guidelines or a
538 checklist, potentially based on our framework, during the production of these texts.

539
540 Furthermore, this analysis and the SNAPI suggest a plausible hypothesis: the elevated
541 public suitability of a hybrid model where agencies adopt criteria closely aligned with
542 journalistic practices. Key in this regard is the SMC's approach of consulting external
543 sources to evaluate the study's social and scientific impact. Although this is a relevant
544 choice for ensuring public suitability, it's worth considering the logistical challenges
545 associated with such a practice, including potential reductions in press release output.
546 To address this issue when external consultation is not feasible, press releases could
547 include a notice acknowledging that interviews were conducted with the study authors
548 themselves. This transparency would highlight potential bias in the text, which is
549 particularly relevant given that press release quotations often appear in journalistic
550 texts without additional sourcing. For instance, a study of science coverage in British
551 and Dutch press revealed that only 7% of journalistic pieces derived from press
552 releases incorporated an original quotation; the few articles that *did* include external
553 quotes showed a lower tendency to exaggerate study findings (Bossema et al., 2019).
554 Moreover, SNAs should include a notice to inform readers about the implications of a
555 press release. Merely stating the source of the information, as most agencies do, may
556 not be sufficient. Instead, it would be advisable to specify what considerations should
557 be taken into account when interpreting a seemingly journalistic text produced by the
558 institution where the study took place.

559
560 Also, beyond SNAs, various stakeholders within scientific institutions are well-
561 positioned to undertake the social responsibility of making press releases more
562 suitable for the general public. This process can be initiated within the dissemination
563 of material orchestrated by these organizations, enabling them to transition beyond the
564 realm of public relations and engage in communication with the public. Considering the
565 mission of science institutions — some of which are publicly funded — the move
566 towards scientific dissemination that perceives the press release not merely as cost-
567 free publicity (Sleurs et al., 2003), but as a means of inclusion in science, would be a
568 welcome step. Scientists and science institutions must initiate internal dialogues
569 concerning their roles in society (Rowe & Alexander, 2010), given the observed
570 stagnation in their communication practices and attitudes (Peters, 2013), despite
571 societal changes. This means a hybridization of existing types of texts and narratives,
572 as well as the materializing of values, such as the democratization of science being
573 aligned with inclusive science communication and open science practices.

574

575 Although the SNAPI intended to include categories associated with openness and
576 inclusion, it's worth noting that, due to an attempt to contribute feasibly, it can be seen
577 as relatively conservative, aligned with conventional journalism practices. It does not
578 integrate recent dialogues pertaining to the necessity for more dialogic models of
579 communication (Brossard & Lewenstein, 2009; Metcalfe, 2022), the requirement for
580 epistemic flexibility to engage in public dialogue (Broer & Pröschel, 2022), or the
581 employment of external sources encompassing diverse disciplines and even the
582 public, considering citizen science approaches.

583
584 Nevertheless, the analysis provides a fresh perspective on the role of SNAs in
585 enhancing public inclusion in science and identifying areas that could enable these
586 institutions to fully realize this potential. By adopting specific criteria for making
587 scientific knowledge accessible and societally relevant, SNAs can work as
588 intermediaries between science and the public, potentially assuming, at least partially,
589 the mediator role that has classically been played by journalism. The data suggests
590 that these agencies already work to maintain broad, public visibility, potentially
591 engaging an audience that extends beyond the journalists who subscribe to their
592 services, with some of them implementing specific, public-oriented guidelines.

593
594 The primary purpose of the SNAPI is to demonstrate to agencies, scientific institutions,
595 and communicators that there are opportunities to enhance the public suitability of
596 institutional press releases, considering that such public access is already occurring
597 and that many organizations are public-oriented and funded. This index can serve as
598 a benchmark to determine if there is an SNA operational model best suited for this
599 public responsibility and to identify categories for improvement, if resources and
600 intentions allow. The inclusion of additional categories and the analysis of larger
601 samples, as well as more nuanced classifications that go beyond the adequate-
602 inadequate dichotomy, could help refine the index. These enhancements could turn
603 SNAPI into a tool for guiding the public-oriented mission of these agencies, extending
604 beyond the preliminary nature of this study.

605

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607 MO: Conceptualization, Writing – original draft, Writing – review & editing. MH: Writing
608 – original draft, Writing – review & editing. AF: Writing – original draft, Writing – review
609 & editing. LN: Writing – review & editing. GB: Conceptualization, Funding
610 acquisition, Writing – original draft, Writing – review & editing.

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626

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