Communication role on perception and beliefs of EU citizens about science

Policy Brief 2020

Recommendations for European policymakers and communicators

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CONCISE project

CONCISE's main objective is to determine the role that science communication plays in shaping beliefs, perceptions and knowledge of scientific issues. To achieve this aim, CONCISE carried out **five public consultations** in Lisbon (Portugal), Valencia (Spain), Vicenza (Italy), Trnava (Slovakia) and Lodz (Poland), with the participation of **near on 500 citizens**. This allowed the consortium to gather testimonies from different EU regions, thus providing CONCISE with comparable and reliable information on **EU citizens' general perceptions** of the four 'burning' scientific issues under study, namely, **vaccines**, **complementary and alternative medicine** (hereinafter CAM), **climate change and genetically modified organisms** (hereinafter GMOs).

The intention of CONCISE is **to open up a Europe-wide debate on science communication**, involving a wide array of stakeholders, from media outlets to policymakers, from scientists to business companies and from science communicators to civil society organisations. Thanks to the public consultations, the project has served to generate qualitative knowledge of the means/channels (the traditional mass media and social networking sites, life experiences, family, religion, political ideology, educational system, etc.) through which EU citizens acquire their scientific knowledge and how it influences their beliefs, opinions and perceptions.

Project Objectives

1. To gain a better understanding of how beliefs, perceptions and knowledge of science- and technology-related issues originate among EU citizens.
2. To review the existing structural obstacles that scientists and other R&I stakeholders, including policymakers, currently face when attempting to communicate science successfully.
3. To evaluate the existing models for teaching science communication to communicators and scientists in Europe, and to analyse how to elaborate an action plan, including recommendations and the issues that should be explored.
4. To enable active citizen participation in scientific research processes, in line with the concept of responsible research and innovation (RRI), by employing a public consultation methodology.
5. To gauge the positive or negative perceptions of a selection of scientific issues held by the EU citizens participating in the public consultations.

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Coordination: University of Valencia, Spain

Partnership: Observa Science in Society (Italy), FyG Consultores (Spain), University of Łódź Faculty of Economics and Sociology (Poland), Trnava University (Slovakia), Danmar Computers (Poland), The Institute of Social Science of the University of Lisbon (Portugal), Asociación Española de Comunicación Científica (Spain), Studies Center on Science, Communication and Society - CSS - University Pompeu Fabra (Spain)

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Methodology

The core methodology underpinning the CONCISE project involved organising and staging **public consultations with EU citizens** in each country to enquire into the sources/channels through which they receive science information, the trust they place in these channels and their proposals for enhancing the quality of science communication.

The **discussions** during the public consultations focused on four scientific topics: vaccines, CAM, climate change and GMOs. The discussions, whose aim was to enquire into EU citizens' beliefs and attitudes towards science, had three main **objectives**:

- To enquire into **how citizens are informed.**
- To determine the **reliability of sources and channels**.
- To receive **proposals for improving science communication**.

The EU **citizens were recruited using a variety of channels**: traditional and social media, institutional mailing lists, posters and leaflets, and targeted email campaigns.

The public consultations, which were successfully staged in Italy, Poland, Spain, Slovakia and Portugal between September and November 2019, were **attended by a total of 497 citizens**, with a slight over-representation of women.

The idea was not so much to create a representative sample as a diverse one with different points of view.

The **participants were divided into groups**, with between seven and 10 at each table, together with a moderator and an observer. The public consultations lasted a whole day, with two topics being discussed in the morning and another two in the afternoon. The **discussions**, which were conducted using a common script agreed on by all the consortium members, **were tape-recorded and then fully transcribed**.

Both a **quantitative lexicometric analysis** and a **qualitative content analysis** were performed on the transcriptions, with all the consortium members using a common codebook. This policy brief, based on the two aforementioned analyses, contains some of the EU citizens' most illustrative opinions.

This policy brief, based on the two aforementioned analyses, contains some of the citizens' most illustrative opinions. It summarises the results achieved in the 5 countries.

CONCISE DATA ANALYSIS METHODOLOGY

How citizens are informed: Findings

For citizens, **traditional media and digital media are the main channels** for keeping abreast of science news.
In relation to their consumption of media to inform themselves about some or other science topic, the balance tilts in favour of the conventional media in the southern countries participating in the consortium (Italy, Portugal, and Spain). Furthermore, the older citizens from all the countries involved also prefer the conventional media. In contrast, there is by and large a greater consumption of digital media in the eastern countries (Poland and Slovakia), while the younger citizens from all the countries involved also prefer them.

As to the traditional media, **television** is by far the most frequent channel used, whereas newspapers, magazines, radio and books come in a distant second place. With respect to digital media, citizens mention more frequently the Internet "in general", followed by **social media** (above all Facebook) and search engines ('Dr Google', 'St Google'). Younger age groups also mention WhatsApp and YouTube.

Regarding **institutional science information sources**, international bodies (WHO, IPCC, EC) and national governments are favoured by citizens over private organisations (profit or non-profit). Opinion leaders are recruited from among activists, actors and celebrities, but scientists and health practitioners are also highly valued as information sources. Journalists are seldom mentioned, but when they are it is rarely in a positive light.

Moving on to citizens' perceptions of science information, they are **ambivalent about the quantity** to which they have access, claiming that there is both a lack and overload of information. Although there is plenty of media coverage of scientific issues, they consider that these are not presented in depth. They are also

Climate change

- It is the most widely discussed and covered topic in the traditional and digital media. Citizens access the largest number and variety of information sources when following developments in this regard. They do not need to search for information, for **they are literally bombarded with it.**

- It has a strong **international dimension**: citizens most frequently mention international politicians (Trump, Bolsonaro, Al Gore), activists (Greta Thunberg, Rigoberta Menchú), public figures (Leonardo Di Caprio), organisations (UN, IPCC) and TV programmes in foreign languages.

- Citizens are most impacted by **visuals**: photographs, films and documentaries. We are living in an age of signs and meanings which implies that special care should be taken to foster understanding between scientists and the public at large.

- Older people tend to receive information from their **younger relatives**.

GMOs

- Although this topic arouses **interest** in all the countries to a greater or lesser extent, it currently does not seem to be widely discussed.

- GMOs are perceived more as a technological than a scientific issue, with the focus being placed on their **applications** (e.g. seeds, food, cloning).

- Citizens tend to highlight the role of **companies** and to relate GMOs to wider problems, such as famine in Africa.

critical of the quality of science information, highlighting problems such as sensationalism, superficiality, bias, contradictions, politicisation and the circulation of fake news. Their awareness of and interest in the four topics strongly depend on their profiles: educational background, occupation, hobbies, shared interests and pursuits with friends and acquaintances.
They often refer to the **personal responsibility** that **communicators** have in the correct treatment and dissemination of science news. Overall, they believe the role of institutions to be essential, while also contenting that scientists are closer to civil society. Accordingly, they could contribute to tackle the post-truth phenomena and to open channels through which the citizenry can voice their most urgent needs.

In short, **the role of communicators** should be to keep information channels open and to facilitate a more fluid dialogue between scientists and society. Communicating with the general public involves playing a mediating role that should combine the ability to be understood and an accurate understanding of scientific and technological issues.

Vaccines

- This is mostly an issue debated at the **national level.**
- Doctors, **health institutions and government** are the main information sources as regards vaccines.
- Vaccines are mostly discussed by **young mothers** on social media, who focus on their personal experiences more than on corroborated science information. Citizens often rely on the Internet to search for vaccine-related information.

CAM

- The key sources of information on CAM are **family members**, **friends and acquaintances**, as well as the personal experience of people with these therapies.
- **Medical doctors**, but in some cases also CAM practitioners, are the most trusted sources of information.
- The Internet and social media, plus **books**, are the most popular channels for accessing information on CAM.

I say this because, of course, it is very important that the journalist who's covering this information be a specialist or at least has access to expert sources...
(GMOs, Spain)

I do it mainly out of passion, for ever since I was a child I've been curious about nature, about understanding how the world works. So, basically now that climate change is a burning issue, I'm now motivated, because of my passion and academic training and curiosity…
(Climate Change, Italy)

You can find everything on the Internet. Sometimes there's quite a lot of information. Drawing on my own experience with seeking medical information on the Internet, I'm rather sceptical…
(CAM, Slovakia)

Recommendations for policymakers

• Opening spaces for **public debate**, addressing even the most controversial issues and emergencies in which science can offer useful advice.

• Providing support and incentives for primetime **science programmes on public TV**: documentaries, debates, interviews, etc.

• Providing **science journalists** with specialised training.

• Engaging with professional **science communicators in government agencies** and departments in order to encourage them to convey science-based messages and recommendations more efficiently.

• Increasing **public funding** for science and science communication, thus helping to avoid funding sources that may lead to conflicts of interest, interfere with the results or limit intellectual freedom.

• Giving a more central role to **universities and public research centres** in science dissemination, due to their image of impartiality, independence and public service.

Recommendations for communicators

• Engaging diverse audiences by using a **variety of tailored methods** and tools.

• Increasing the use of **social media** (particularly for engaging younger audiences), offering content in suitable formats (videos, infographics), using clear language and taking advantage of the two-way communication afforded by digital platforms.

• Avoiding the belief that only the newsworthiness of a scientific fact will attract the attention of the public. Selecting and publishing only **verified and relevant information** based on factual data and scientific knowledge.

• Developing a science communication that is balanced, fact-based (non-sensational) and straightforward, and offering **different levels of depth** depending on the audience's capacity. Information should be expressed, organised and designed in an appealing and simple manner.

Citizens' perceptions of whether science information is trustworthy or not is particularly relevant at a time when disinformation and misinformation about science is on the rise. Trust and credibility are vital to science communication. They affect the amount of attention that citizens pay to science information and expertise and their acceptance of it, as well as their endorsement of science-related decisions, while also shaping individual attitudes or behaviours.

Levels of trust vary across countries and individuals. The results show that several factors play a role in this respect: proximity (family, friends, family doctor), familiarity with the topic, credibility of institutions (governments, universities) and scientists and the perception of vested interests (research funders). These factors highlight the processes with which trust is developed. If news is easy to understand and explained in depth, trust increases. This is particularly the case of institutional sources of information.

The types of channel also play a relevant role. **Digital media are often perceived as a channel with less reliable scientific information**, especially in comparison with the legacy media. Social media are often seen as breeding grounds for fake news. Anyone can post dubious information, sometimes relying on sources that are difficult to track and check, which is then freely shared. For this reason, discussions on this issue often become polarised. However, citizens recognise that it is a question of 'who you follow', with some sources being more reliable than others. Closed networks such as WhatsApp and Telegram are more highly valued because they reflect personal connections. Therefore, the information that

Climate change

- The **reliability of information** on climate change is deemed as low in Poland, but as high in all the other countries, and linked to the amount of public debate on the topic.
- **Citizens place more trust in information coming from scientists and public figures.**
- Trust is associated here with **transparency and independence** (in terms of funding and ideology).

GMOs

- There is currently little public debate on GMOs, which leads to uncertainty when assessing the **trustworthiness** of the information available.
- The direct impact on food and the role of companies both raise concerns among citizens, some of whom also **appear to distrust scientists** and political officials.

Vaccines

- Vaccines are a **polarised topic** in some countries and **more consensual** in others.
- Trust is placed mainly in government agencies, family doctors and healthcare institutions, whereas **pharmaceutical companies** and non-verified websites are **distrusted**.

is shared on them is considered to be more accurate, suitable for practical purposes and closer to the users' interests, with the value added of strengthening emotional bonds among them.

Format and design are considered just as important as message content. A poorly articulated source is perceived as less precise.

Verification. Citizens implement multiple strategies to verify information: assessing sources (who authored the study, who funded it, etc.), searching for confirmation on other channels and sources, triangulating information, using personal criteria such as their own experience, relying on common sense, etc.

- In some cases, **citizens feel confused** when family doctors are inattentive or leave the decision to vaccinate up to parents. **Whereby they** ask for clearer advice and 'personal' involvement from physicians.

CAM

- CAM is also a **highly polarised** topic not only among its advocates (users) and critics, but also as regards the different types of therapies available.

- Trust in this topic is **highly personal**, depending on relational factors (information provided by trustworthy people) and on direct experience (users).

- **Scientific evidence** about the efficacy of CAM is a bone of contention.

- Unlike other topics, support for CAM from pharmaceutical companies is considered as **a sign of reliability.**

I trust in the doctor! In doctors as conveyer of science.

(Vaccines, Portugal)

Most information's on the Internet, also a lot of spuriousness, it's difficult to distinguish between them.

(GMOs, Slovakia)

Information without a source is simply rubbish!

(Climate Change, Poland)

I usually compare, if I find news, something new, which seems neutral, I compare it with sources that I consider to be reliable.

(Vaccines, Italy)

Recommendations for policymakers

• Working towards **centralising validated and reliable information** on controversial science topics, with the support of the S&T System and through databases, websites, fact-checking services or science shops.

• Making a greater effort to support and **promote popular science magazines**, forums and spaces for science debate, since they are information sources that increase people's trust.

• Launching campaigns to raise **awareness about misinformation and disinformation.**

• Promoting programmes aimed at increasing the **digital literacy of the public** and developing evaluation strategies (how to deepen, debunk and triangulate information).

Recommendations for communicators

• Giving prominence to recognised **credible mediators** (scientists, science communicators, journalists, health professionals, etc.) who can interpret and present science information on particular topics.

• Encouraging scientists to avoid **offering an image of omniscience, namely, people who have an answer for everything.** The possibility of enjoying good media visibility should not encourage scientists to step out of their field of expertise, even though the media sometimes require researchers to express their views on topics relating to various fields of interest.

• Ensuring that science-based information is supported by **appropriate referencing**: identification of authors, affiliation, citations, sources, funders, methodology and sampling.

• Supplying only information that has been confirmed by multiple **independent organisations**, institutions and researcher groups.

• Including **multiple sources, arguments and positions** on the same topic, from different disciplinary approaches, and, whenever necessary, broaching controversial subjects. Avoiding the temptation of offer a single point of view in news stories that may make the audience doubt whether it is information or advertising.

• Encouraging science communicators to offer better explanations of how science is done in terms of **methods and methodologies**, in order that citizens should understand its construction.

• Making it clear that science and technology are at times **unpredictable activities** and, because they are based on evidence and facts, often fail to give complete and immediate answers to problems of public interest.

Citizens' suggestions for improving science communication: Findings

As to **suggestions for improving science communication**, citizens believe that **scientific institutions and scientists should play a leading role** in producing information and communicating scientific findings. In some countries, the role of intermediaries, such as science communicators and journalists, has yet to be recognised, whereas in others it is already well regarded.

As to health topics, professionals such **as doctors and nurses should be more involved in science communication.**

Citizens explicitly refer to the role that television should play, for instance, by creating a specific science section on the news, broadcasting science programmes on primetime and inviting scientists to participate in programmes with high audience ratings. The education system is expected not only to convey science information, but also to offer students a solid training in critical thinking. Science training for professionals, such as journalists, is also highlighted.

Citizens stress that the content of science news should be factual and truthful.
They call for relevant information to be made available to them, for example, through repositories or institutional platforms where they can easily find relevant and reliable information on specific topics.

Climate change

- This topic should be given more prominence both in the **school curriculum and in the mass media**, above all on television.

- There should be more **local lectures and initiatives** that promote active engagement between institutions, scientists and citizens and which take into consideration the impact of climate change on different communities.

- As to messages, citizens consider that it is very important that they include not only **practical information**, which they can leverage so as to do their bit for combating climate change (messages that should also be conveyed at schools, in order that children should influence adults), but also explicit information on how climate change will impact their lives.

- Information has to be tailored to the needs of specific groups and communicated in an **accessible manner**.

- Any 'perceived politicisation' weakens the **arguments of authority** of scientists and perverts the most objective science information.

- Information should have a **'quality seal'**, awarded by a scientific institution.

GMOs

- Citizens call for the **bioethical questions** that GMOs raise to be clarified.

- They underscore the **lack of accessible**, rigorous and neutral information, based on independent research, on what they are, and on their pros and cons.

Citizens also underscore the relevance of a practical knowledge of science communication. Science news should include concrete actions that citizens can perform themselves and explain what personal consequences certain actions/issues may have. Product labels should include relevant information to help citizens to make more informed choices.

There is a demand for a variety of formats (serious, visually appealing, traditional, entertaining, sensational, highlighting pros and cons, etc.) to be used to present science content to different audiences. Multimedia channels should be used simultaneously to reach different audiences (especially through social and information campaigns).

The language employed should be understandable, objective and adjusted to the type of audience, namely, by age, level of education and profession. A lack of fluency in English prevents most citizens from accessing quality science news.

Finally, **citizens call for more direct engagement with scientists.** They also demand more opportunities for participating in scientific debates, local initiatives and consultations, as well as specific formats that put scientists and science students in contact with them and offer them the opportunity to ask questions.

- Information on this issue should be disseminated in a clear language accessible to the general public and should be included in the **school curriculum**.

- Simple, clear and precise **product labelling** is also required.

Vaccines

- For citizens, information on vaccines should be made available in **multiple languages** and via multiple channels.

- Information should be expressed, organised and designed in an appealing, **simple and clear** way.

- **Health professionals** and institutions should play a role in disseminating information.

- Some citizens are **concerned** about the anti-vaccine movement and demand action to curtail it.

CAM

- Citizens believe that there should be clearer **formal regulations** in this sector so as to make informed choices and to give credibility to legitimate practices, while reporting fraudulent ones.

- They also suggest giving health professionals more **training in empathic listening and communication skills** (which at times is one of the reasons why patients turn to CAM practitioners).

- They call for objective, **neutral information** from an independent scientific body, in particular about scientific evidence for CAM.

…in my opinion, the state should create the conditions for a public debate.

(GMOs, Slovakia)

Scientists should speak out when something's untrue.

(CAM, Poland)

In schools as well. That communication needs to include schools, teachers, and students. Organisations whose science communication activities are validated should make sure that this information reaches schools. Schools are natural reproducers of knowledge and so they could be a target for science communication.

(Vaccines, Portugal)

I offer my opinion on individual initiatives, which I do, I recycle and I do as much as possible because I try to ensure that my consumption habits are fairly ecological and responsible. But I think that there's really a whole socio-political system behind this and for many individual initiatives to work what has to change is the system and the production system, which is the one that produces the rubbish.

(Climate Change, Spain)

Citizens' suggestions for improving science communication

Recommendations for policymakers

- **Motivating and supporting** scientists and institutions, in their communication role, to disseminate scientific findings, through funding and regulation.

- Guaranteeing **the availability of relevant information for all citizens on an equal footing** by creating reference platforms that aggregate content on specific science topics in an accessible language.

- Including the transversal importance of science and scientific issues in all subjects during **compulsory education** and highlighting the relevance of the 'scientific method' throughout the educational path. Including more opportunities for discussing scientific issues and enhancing critical thinking skills in the curriculum at all educational levels.

- Supporting the creation of a network of onsite and virtual **science shops** that operate as myth-busters and places to verify news; this should serve as a 'defence system' for combating pseudoscience and for promoting scientific facts.

- Introducing clear **labelling practices** and scientific evidence-based **certification** for consumer goods (including GMOs in food, non-conventional medicines, etc.) to help consumers to make informed choices.

• Providing **health professionals** with incentives and training in order to help them to communicate science-based information on health topics to the citizenry.

• Implementing a comprehensive global **policy on climate change**. Generally, citizens think that it is not only necessary to change individual behaviours but also the production system per se. There is also a demand for clear laws and guidelines that can be followed and enforced.

• Designing clear **legal frameworks** for regulating the practice of CAM, including the certification of professionals, safety guidelines and greater control over the advertising of scientifically unproven products.

Recommendations for communicators

• Providing institutional **support to scientists** for the dissemination of research findings, by offering professional development solutions to improve skills in the use of the traditional and digital media.

• Developing academic science communication programmes to provide **training to science communicators, journalists** and other intermediaries.

• Organising **participatory initiatives** that actively involve scientists and citizens in scientific debates. It is important that citizens have the opportunity to discuss research results with scientists, while giving the latter the chance to listen to the demands of civil society, through two-way communication. This might help to legitimise research activities and results, while promoting the acceptance of research outcomes.

• Including **practical information** in science communication that people can relate to (what they can do, how they are going to be directly affected, etc.). Citizens do not want or need categorical impositions or affirmations, but rather **recommendations and scientific evidence** that allows them to gain a better understanding of some phenomena.

• Devising specific formats to reach new and **hard-to-reach target audiences**, such as informal meetings, scientists in daily life contexts, etc.

• Leveraging **visual communication** to make information more accessible and appealing.

• Adapting the **language** employed by experts and scientists to the skills of the average reader. Publishing more popular scientific articles that are easy to read and to understand.

The perspective of science communication researchers and practitioners

In line with the Objective 2 of the project (see page 2), it was sought to **identify the barriers and incentives for science communication**. To this end, besides carrying out a literature review (scientific literature, policy documents and grey literature), 26 semi-structured interviews were conducted with science communication researchers from 15 different countries and one contrast online workshop with 18 science communication practitioners (journalists, communication officers, science museum directors, etc.) from 15 different countries. A **qualitative methodology** was chosen due to the intention to explore the personal perceptions of these science communication researchers and practitioners, and their arguments regarding different barriers and incentives for engaging in science communication. Findings are divided into the comments on science communication done by scientists and done by professional communicators, while recommendations are aimed at policymakers and at practitioners (communicators, journalists, science institutions and mass media organisations).

As to scientists engaged in science communication activities, a set of **incentives** has been identified, some of which are based on a vision of science communication as a **social commitment**. It is seen as a return to society for funding science, a way of improving democracy and protecting responsible science and a tool for raising awareness, enhancing scientific culture and promoting scientific callings.

Some incentives are grounded in a vision of science communication as a **strategy for obtaining personal or professional benefits**. It plays a role in attracting either funding or scientific collaboration and in persuading strategic stakeholders. Or, alternatively, it is seen as simply a way of 'enjoying' themselves.

There is also a vision of science communication as **part of a scientist's job**. Communication plans and activities involving scientists are often formally included in (and required by) grant agreements as part of research projects receiving public funding.

Science communicators list a number of **barriers to the active engagement of scientists** in science communication:

- A lack of (formal and informal) **recognition**.
- A lack of **time** due to the excessive red tape and the competitiveness of science itself.
- A lack of specialised **training** in science communication.
- A fear of **being misunderstood** by the public or by journalists.
- A fear of being discredited by peers.

Recommendations for supporting scientists

For policymakers

- Including the requirement of science communication activities in the calls for proposals of **scientific programmes**.
- Launching dedicated **calls for funding** science communication activities.
- Promoting science communication as part of **scientists' jobs**.
- Including formally science communication activities as a criterion of value in the **evaluation of scientists'** careers (i.e., in Tenure Track).
- Providing 'rewards' for researchers participating in science communication activities.

For practitioners

- Offering adequate science communication **training** to scientists, including specific workshops for PhD students, postdocs or senior researchers.
- Including science communication subjects in **undergraduate science degree programmes** as part of the necessary skillset.
- Considering participation in science communication activities as an additional **indicator of scientific productivity and excellence** during the recruitment and career of research staff at universities, research centres, etc.
- Offering scientists **institutional support** (financial, technical and human resources) for carrying out their science communication activities.

Enhancing science communication by communicators: Findings

Regarding the incentives for professional engagement in science communication, we found that new specialised job positions have emerged as a reaction to the crisis in journalism and the changes in the communication world. Communication can be an alternative career path for scientists. But it also helps them to fulfil their personal interests or curiosity. Professionals also mention communication as an answer to social responsibility. It allows them to combat hoaxes and science misinformation, to increase public knowledge, to help people to make informed decisions and to facilitate scientific and non-scientific dialogues.

As regards the barriers that professional communicators encounter, they mostly mention the lack of resources (mainly funding). They also refer to the need for specialised knowledge to work in this sector, in particular scientific knowledge of the social relevance of science and/or how to develop and evaluate science communication activities efficiently. To their mind, there is also a lack of support from research institutions, mass media organisations and governments. In many institutions, job positions relating to science communication are temporary, rely on specific projects or do not fit in with the institutional strategy in place.

Recommendations for supporting science communicators

For policymakers

- Earmarking specific resources for promoting **specialisation** in science communication.
- Establishing **awards or recognitions** to reward science communication actions and professional science communicators.
- Promoting the **stability** of these new science communication jobs in public science institutions.
- Promoting science communication as an **alternative career path** for people with scientific training, with a proper structure and rewards (in terms of wages and evaluation) system.

For practitioners

- Offering communicators specialised training in science, like, for example, subjects included in undergraduate or postgraduate degree programmes.
- Including science communication in institutional strategies.
- Creating institutional positions relating to science communication in research institutions.
- Promoting specialised science communication among legacy and digital mass media organisations.

2020 Policy Brief

CONCISE WEBSITE

https://concise-h2020.eu

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Partnership

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