Expert Group "Communicating Sciences and Arts in Times of Digital Media"
of the Swiss Academies of Arts and Sciences

Draft Chapter

How Science is Publicly Presented and Discussed in Switzerland

Excerpt from of the Upcoming Expert Group Report "*Science in Public: The State of Science Communication and Public Engagement with Science in Switzerland*", to be published in 2021

«Communicating Sciences and Arts in Times of Digital Media»: About the Expert Group

In Switzerland and beyond, science communication – encompassing not only STEM subjects, but also humanities and arts – has received more attention from academia, (science) politics and society in recent years. But the science communication landscape is changing, creating new challenges such as economic pressures on science journalism, a pluralization of science communication actors and formats, and the emergence and growth of digital media.

The expert group “Communicating Sciences and Arts in Times of Digital Media” has been set up by the Swiss Academies of Arts and Sciences. Its mandate is twofold: First, it assesses the status quo and current trends in science communication in Switzerland. Second, it will develop scenarios for improving science communication and public engagement with science.

The group consists of 16 experts from science communication research, information and computer sciences, disciplines with high public visibility such as climate and health sciences, as well as practitioners from science journalism and institutional science communication ([more information on the expert group](#)).

The Expert Group’s Status Quo Report

The first part of the expert group’s mandate is to assess the status quo & current trends in science communication and public engagement with science in Switzerland. This assessment will culminate in a status quo report which will be published open access by the Swiss Academies of Arts and Sciences.

Based on scholarship on Switzerland and beyond, the report will focus on the perceptions and attitudes of the Swiss populations towards science and their sources of information about science related issues. It also assesses the science-related communication by different stakeholders and the role of journalists, technology platforms and other intermediaries of science communication (see the table of content on the next page). In doing so, it compiles the available scholarly evidence, assesses its robustness, identifies gaps in current knowledge and embeds it in a broader, international context.

The status quo report will also be the foundation for the recommendations on how to improve science communication in Switzerland, which is the second part of the expert group’s mandate.

Inviting Your Feedback on this Chapter

The status quo report will be reviewed and validated in different ways: by incorporating prior scholarship, by discussing it within the expert group, and by having the full report peer-reviewed by renowned experts of science communication in Switzerland and internationally.

Another step of this validation is to invite feedback on the report from stakeholders. This feedback will be invited chapter by chapter. The following text is the first draft of the chapter describing research on intermediaries of science communication in Switzerland.

We ask you to give us feedback on this final draft chapter. This feedback can refer to all levels, from structural and stylistic aspects to the interpretation of specific scientific evidence. Especially welcome are pointers to examples of engagement formats in Switzerland, as well as (qualitative!) scholarly studies, data sets or results that may help us to broaden the basis for the chapter. Please note that we will be able to consider feedback until the end of October 2020, when we will finalize the chapter.

You can give public feedback directly in this preprint by setting up an account with hypothes.is. You can also email t.fuechslin@ikmz.uzh.ch, or send regular mail to Dr. Tobias Füchslin, IKMZ, University of Zurich, Andreasstrasse 15, CH-8050 Zurich.

Thank you for your participation, which is highly appreciated and will help the work of the expert group!

Preliminary Table of Contents

Executive Summary.....	TBA
Assessing Science Communication in Switzerland: Introduction.....	TBA
Regulation, Funding and Structural Conditions: Relevant Contextual Factors for Science Communication in Switzerland.....	TBA
Science and the Swiss Public: Science-related Perceptions and Sources of Information in Switzerland.....	TBA
Science Communicators: Who Engages with the Swiss Public?	TBA
Journalists, Influencers or Platforms - Intermediaries of Science Communication.....	TBA
Journalists, Influencers or Platforms - Intermediaries of Science Communication.....	TBA
How Science is Publicly Presented and Discussed in Switzerland	4
Engagement Formats in Switzerland.....	4
Quantity and Characteristics of News and Mass Media Presentations of Science in Switzerland	6
(In)Accuracy: How Correct are News Media and Online Representations of Science?.....	10
How to Improve Science Communication in Switzerland: Recommendations.....	TBA
References.....	15

How Science is Publicly Presented and Discussed in Switzerland

Many representations of the natural sciences, the humanities and arts are available to the Swiss public – some of them originating in the country itself, many from abroad. As seen in the draft chapter on “Science and the Swiss Public” (A+ Expert Group, 2020b), the Swiss frequently encounter “science and research” in everyday life situations, e.g. in conversations with friends, when watching movies and TV shows, but also often online, on news media sites, Wikipedia or YouTube, or offline in printed newspapers, magazines and television.

This chapter aims at describing the science-related content encountered by the Swiss population through these diverse sources. In doing so, it faces several challenges. *First*, it is difficult to clearly define what qualifies as “science-related” content. This will be solved here by outlining the definitions that the mentioned studies themselves used. *Second*, in an online, social and mobile media environment, a myriad of sources are available to the public. This chapter focuses on the sources that are most frequently used by the population in Switzerland according to the most recent representative survey data (Science Barometer Switzerland, 2016, 2019). *Third*, there are many content characteristics such a description could focus on. This chapter describes the prevalence and quantity of science related content, on which data is readily available. Whenever possible, it also presents aspects like reporting style and information accuracy.

Engagement Formats in Switzerland

Public engagement with science entails a direct interaction between science-related actors and the public regarding a science-related object (e.g. an exposition or presentation). Public engagement formats have become a key component of science communication since the emergence of participatory and dialogical models of science communication (Fähnrich, 2017). Common formats are exhibitions and installations at museums, science centers and festivals, children universities, “Universities of the Age”, science slams, science cafés, and citizen science projects, as well as the more policy oriented consensus conferences, participatory variants of technology assessments and citizen round tables (Einsiedel, 2014; Fähnrich, 2017). The main purposes of the formats are public dialogue, knowledge transfer, and (input towards) policymaking (Einsiedel, 2014). Alternative formats can also take place online, such as participation in social media discussions/campaigns, contributing to crowdfunding projects, or participating in online citizen science projects by collecting observations or analysing scientific data. It is important to keep in mind that engagement can take place in varying degrees and can be directed at the content itself (user-to-medium-interactivity) or other people (user-to-user-interactivity) (Boczkowski & Mitchelstein, 2012).

What scientific evidence is available?

Amount of data available for CH:
Only very little data is available on the prevalence and importance of engagement formats of science communication in Switzerland.

Quality of data available for CH:
Mostly, the data is presented in “grey literature” and institutional reports highlighting specific aspects of the field, sometimes without a comprehensive and systematic assessment.

Analyses available for CH:
No published scholarly analyses are on participatory formats of science communication in Switzerland.

Data on Switzerland

A wide variety of participatory science communication formats is held regularly in Switzerland. Unfortunately, there is a lack of data or reports that systematically describe and assess this diversity. Exceptions are two reports by the Swiss Science Council (Bendix, 2017; Strasser & Haklay, 2018) and a systematic review of extracurricular formats for youths to engage with STEM topics (Miller, Weidmann, Jacob, & Paulsen, 2017). For citizen science, one report describes the diversity of citizen science projects in Switzerland (Science et Cité, 2015), while an online databases tracking projects is being built (e.g. Citizen Science Center Zürich, 2019; Schweiz Forscht, 2020). Beyond that, the best way to gather information on the frequency, characteristics and quality of participatory formats in Switzerland are the annual reports and overviews of various organisations regarding the science communication efforts they did on their own or they funded.

Findings on Switzerland

A variety of participatory and dialogical science communication formats are available to the Swiss public. They range from exhibitions, to public lectures, to and citizen science projects.

Exhibitions

Exhibitions in museums, science centers etc. offer infrastructures to engage the public with science in various creative ways. According to the Federal Statistical Office (2019b), Switzerland has more than 1100 museums, with about a third focusing permanently on scientific topics (i.e. technology, history, natural sciences, and archaeology). Strongly frequented examples are the the Swiss Museum of Transport in Lucerne, the Natural History Museum in Geneva, and the Swiss Science Center Technorama in Winterthur (Statista, 2016).

Science Cafés

Science cafés invite citizens to restaurants, bars and cafés, and to discuss selected science-related topics there with researchers present (Science et Cité, 2020b). 2016 alone, the foundation Science et Cité organised 59 science cafés across 11 cities, bringing together 130 scientists and some 2800 visitors (Science et Cité, 2016).

Citizen Science Projects

Citizen science is a format “where people produce scientific knowledge outside of traditional scientific institutions” (Strasser & Haklay, 2018, p. 22). This “production” ranges from collecting or categorising evidence (online) to creating and conducting full-fledged research projects (Strasser & Haklay, 2018). At least 66 projects are available in Switzerland (Schweiz Forscht, 2020), most of them tied to disciplines such as biology and social sciences more generally (e.g. linguistics) (Science et Cité, 2015).

Citizen Workshops and Participatory Technology Assessment

Citizen workshops invite citizens to discuss and elaborate their views and concerns on complex scientific issues such as automation and gene editing. The foundations TA-SWISS and Science et Cité have been organizing yearly workshops in Berne and documenting their results (e.g. TA-Swiss, 2019).

(Online) Talks & Presentations

Publicly held talks and presentations are one of the most common formats of public engagement with science. They differ regarding their degree of “multimodality, interactivity, performance, and event and entertainment orientation” (Niemann, Bittner, Hauser, & Schrögel, 2020). Examples in Switzerland are public lectures during events like “La Nuit de la Science” in Geneva or the “Scientifica” in Zürich. In addition, the Swiss public has the opportunity to attend online talks in event series like Science at Noon (Swiss Academies Of Arts And Sciences, 2020) or Brain Snack (Science et Cité, 2020a), or in international formats like TED talks.

Online Engagement with Science

The internet not only hosts large amounts of science-related content, it also allows the public to engage with this content in social media and discussion forums (Hargittai, Fücksin, & Schäfer, 2018). Prominent channels for this kind of participation are Twitter, which is also widely used by many scientists (van Noorden, 2014), as well as message boards like reddit which features sub-reddits like “change my view” where discussions about topics like climate change are commonplace.

Novel Formats and Tools

There are numerous novel participatory and engagements formats such as science slams or fuckup events, which combine aspects of science cafés, presentations, and theatrical performances. Online tools like La moulinette (2020) or wissenschaftskommunikation.de (2020) help people to discover and incorporate many established formats.

Quantity and Characteristics of News and Mass Media Presentations of Science in Switzerland

A large amount of science-related media content is available to the Swiss public. Some of this content is produced domestically and monitored by Swiss institutions. For example, data suggest that most science-related TV content produced in Switzerland comes from SRG SSR, whose output is tracked by the Federal Statistical Office (2019a). Other science-related content, e.g. the representations of science online, in films, series and TV shows, stems from more diverse and mostly international sources which are not tracked by Swiss institutions and whose importance on the Swiss market is more difficult to assess.

The Swiss population encounters science-related content in all these sources to varying degrees. The subchapter assesses science-related content in mass media. This includes content in (online) newspapers and magazines, on television, and on the radio. It assesses both the amount of science-related content in media and how science is presented there.

What scientific evidence is available?

Amount of data available for CH:
Comprehensive data are available on the quantity of science-related content in print and online news, television, and radio – at least of the part that is produced domestically. Most of this data is, however, not publicly available.

Quality of data available for CH:
High quality and reliably sampled data are available.

Analyses available for CH:
A considerable amount of scholarly analyses are available for Switzerland, often using their own, sometimes topic-specific data sources.

Data on Switzerland

A considerable amount of data on the quantity and content characteristics is available for Swiss news media. While most older studies focused on print media (Eisenegger & Gedamke, 2013; Näf & Schanne, 2006a; e.g. Näf & Schanne, 2006c; Schanne, 1986), more recent data from the Research Institute for the Public Sphere and Society at the University of Zürich (fög) also considers online news and news formats on radio and television (Vogler & Schäfer, 2020a).

Beyond news, data is also available on the quantity of science and science-related topics in Swiss television and radio programming more generally. A longitudinal monitoring of schedule and content of subsidised private radio stations in Switzerland captures „science, research and technology“ and “environment” topics (Grossenbacher, Brändli, Sasso, & Eichenberger, 2018; Grossenbacher & Sasso, 2014; Grossenbacher, Sasso, & Glaab-Seuken, 2016). A similar monitoring of Swiss public TV captures „science, research and technology“, “nature, humans, environment” and “health” topics (Trebbe, Wagner, Fehr, Spittka, & Beier, 2015). In addition, the Federal Statistical Office tracks the annual hours of “science” programming on national public television (Federal Statistical Office, 2019a), while companies like Mediapulse and WEMF own extensive data on broadcasting and print media respectively. These data, however, do not provide insights into the actual content beyond its quantity.

Additionally, a number of scientific publications are available for news media coverage about specific issues like mobile communication technology (Schanne, 2003), nuclear energy (Kristiansen, 2017), biotechnology (Bonfadelli, 2017b; Zimmermann, Aebi, Kolb, Shaw, & Elger, 2019), climate change (Bonfadelli, 2017a; Oehl, 2015; Siegen, 2020), geothermal energy (Stauffacher, Muggli, Scolobig, & Moser, 2015), communication science (Brantner & Huber, 2013), and on the appearance of scientists in Swiss media (Rauchfleisch, Schäfer, & Siegen, 2020).

While the quantity and general characteristics of science-related (news) content are well documented for Switzerland, and many specific issues have been analyzed, these insights are also limited in at least three aspects: First, there is a lack of qualitative studies that analyse portrayals of science and scientists in popular media formats, including edutainment programs as well as regular films and TV shows (e.g. Tintori & Palomba, 2017). Second, science-related media content from other countries such as France, Italy or Germany, that permeate the Swiss media market strongly (Künzler, 2013), are almost entirely overlooked. Third, the quantity and characteristics of science-related content on the internet is almost impossible to assess adequately. While some reports have tried to analyse the science that is presented on social media (Hitlin & Olmstead, 2018), such analyses are very time-

platform-, and language-specific and only scratch the surface of what the public is encountering online (e.g. Ke, Ahn, & Sugimoto, 2017).

Findings on Switzerland

Overall, science-related topics account for 1-3% of news media coverage in Switzerland. Between 2015 and 2019, science-related coverage accounted for 2.1% of the entire Swiss news media coverage (Vogler & Schäfer, 2020a). This average varies by media type and by linguistic region: With 2,5%, the average is higher in French-speaking Switzerland and lower in the German- (1.9%) and Italian-speaking region (1.6%) (Vogler & Schäfer, 2020a). The proportion is highest in online news media with around 3%, while it is around 2% in print media, 1.7% in public radio and television, and below one percent in printed tabloids and private radio and television (Figure 1). These numbers by Vogler and Schäfer (2020a) are based on a random sample of Swiss media content used in a yearly report assessing news media quality in Switzerland (fög, 2020). 2429 articles in this sample were categorized as “science-related” because their main focus was the topic of science, in contrast to articles that merely cite a scientific study.

Figure 1: Proportion of science-related news coverage in Swiss media by media type. Sample: «Jahrbuch Qualität der Medien», 2015 - 2019, 66 media outlets, artificial week per year, manual content analysis

These numbers are largely in line with older data on Swiss print media coverage, where science-related content accounted for 3.5% in 2005 (Näf & Schanne, 2006a, p. 63, 2006b); with data on Swiss radio, where “science, research and technology” has a share around 5% (Grossenbacher et al., 2016; Grossenbacher et al., 2018; Grossenbacher & Sasso, 2014); and with data on Swiss public TV, where „science, research and technology” makes up about 2,5% of all coverage, “nature, humans and environment” about 3%, and “health” about 1% (Federal Statistical Office, 2019a; Trebbe et al., 2015). It also corresponds with international results which show that “science has never been a major media topic, with studies in the US, Australia, Germany and Greece, for example, finding between one and three percent of media coverage being devoted to science” (Schäfer, 2017, p. 54).

The share of science-related coverage has risen in Switzerland in past decades. Although they focus on different media sources and employ slightly different understandings of science-related content, four studies indicate a rise in science-related media coverage over

time: Analyzing the 20 most covered annual news events between 1945 and 2013, Eisenegger and Gedamke (2013) show an increase of science-related topics, driven by debates around nuclear energy in the 1970s, biotechnology in the 1990s and 2000s, and by higher education and science politics from the mid-2000s onwards. In national public television (Figure 2), the annual hours devoted to “science” rose between 1998 and 2018, with a peak between 2009 and 2011. The main reason for this increase, however, are re-runs (Federal Statistical Office, 2019a). Lastly, science-related coverage in a selection of Swiss print media grew from 1.8% in 1982 to 3.5% in 2005 (Näf & Schanne, 2006b; Schanne, 1986). Internationally, an increase in science reporting has also been shown in other countries like the US, Germany, Italy, the UK or Bulgaria (Bauer, 2012; for an overview see Schäfer, 2011). Notably, this growth of science coverage across countries coincided with an intensifying crisis of science journalism in Switzerland and other countries (see previous Pre-print on “Intermediaries” by A+ Expert Group (2020a)).

Figure 2: Annual hours devoted to the category “science” between 1998 and 2018 across all SRG SSR TV programming, incl. Euronews content.

Science news coverage is less emotional, less focused on Switzerland, and (still) more contextualising than other news coverage. It rarely features interviews and opinion pieces, while its share of editorial contributions greatly varies by media type. Vogler and Schäfer (2020a) compared science-related news articles across time, between media types and with articles focused on other topics. They showed that science-related news articles are rarely emotional (ca. 4%); about 90% are neutral, factual reports (rather than interviews and opinion pieces). Tabloids and online news contain more emotional reporting. Only about one Third of science-related news articles refer to Switzerland – a proportion well above the 50% found for articles about politics, economics, and culture – while the editorial contributions by journalists vary strongly by media type: national public television and radio consist almost exclusively (ca. 90%) of editorial content, while about 50% of online news, 60% of commuter newspapers articles (e.g. 20 minutes), and 75% of tabloid articles were provided by news agencies.

Higher education institutions are represented in almost 2% of news media coverage in Switzerland – and their share is increasing. The overall share of news media coverage that mentions Swiss universities and universities of applied sciences rose from 1.2% in 2011 to 1.7% in 2017. Vogler and Schäfer (2020b) focused on the University of Zürich specifically and showed that its visibility also rose in Switzerland between 2003 to 2017 with an average share of 0.8%.

The arts and social sciences are prominent in Swiss media. They were the most prominent scientific disciplines appearing in Swiss news media already in the 1980s (Hutter, 2004 & Näf, 2004 cited in Näf & Schanne, 2006a). For the 2000s, Näf and Schanne (Näf & Schanne, 2006c) show that the arts and social sciences made up over a third (35%) of science-related coverage, with STEM subjects accounting for 30%, and that the latter trended downwards since the 1980s (Näf & Schanne, 2006b). It is notable, however, that almost three quarters of all coverage about the arts and social sciences appear outside the media's science sections, a finding already reported in the 1980s (Näf & Schanne, 2006a, 63f.). Both the prominence of the arts and particularly the social sciences as well as their appearance outside the news media's science sections mirror international findings from Denmark, Germany, Great Britain and the US (Albaek, Christiansen, & Togeby, 2003; Elmer, Baddenschier, & Wormer, 2008; Summ & Volpers, 2016).

Only few individual scientists appear in Swiss media – and among those, social scientists are the most prominent. An automated content analysis of the coverage of approximately 80 Swiss print and online news media in 2016 shows that 1'877 Swiss university professors (out of approx. 5'500 covered in the "proff.ch" database provided by swissuniversities at the time) were mentioned in the media. Most of them appeared only once, whereas 188 professors (equivalent to 3% of all professors) accounted for 50% of all the news media mentions (Rauchfleisch & Schäfer, 2018). The professors with the highest average of news media appearances are political scientists and sociologists. Chemistry and veterinary science professors appear least often on average. The strong presence of the social sciences is linked to the presence of professors from different institutions: professors from the University St. Gallen, which has a strong economic focus, are most often presented in the media, followed by the social-scientific IHEID institute in Geneva (Rauchfleisch & Schäfer, 2018).

(In)Accuracy: How Correct are News Media and Online Representations of Science?

Scientific knowledge is often highly complex, fraught with uncertainties, and therefore difficult to understand and communicate (Liebert & Weitze, 2015). Communicating this knowledge has the potential to convey different levels of "inaccurate" information ranging from factual errors to faulty simplifications or inaccuracies introduced by invalid interpretations and omissions of relevant aspects (Lehmkuhl, 2019). For this report, we are interested in the frequency and degree of inaccuracies and do not discern between mis- and disinformation, which hinge on the intent of the communicator (Humprecht, Esser, & van Aelst, 2020).

What scientific evidence is available?

Amount of data available (for CH):
Only little and circumstantial data available on the accuracy of science-related content in Swiss media. Considerable amount of data available for online content on some topics.

Quality of data available (for CH):
Data often limited to case-studies using small and sometimes biased samples to represent content of interest.

Analyses available (for CH):
A considerable amount of scholarly analyses available for online content. Only very few analyses on content produced in Switzerland.

Data on Switzerland

There are no overall assessments of the accuracy of scientific information in Swiss media. On that level, we can only infer accuracy by looking at a study that identified the sources of science-related news articles (Eisenegger & Gedamke, 2013), as well as a study that measured the level of emotional language and the format of science news stories (Vogler & Schäfer, 2020a). Science-related quality- and fact-checking platforms like Mediendoktor.de and Medienwoche.ch have published critiques and quality assessments of individual articles from university press releases, news media articles, as well as coverage of a certain topic like COVID-19 (e.g. medien-doktor.de, 2020).

There are, however, a number of analyses on the accuracy of science-related content on the internet – the domain where younger people in particular frequently encounter scientific information (see previous preprint on “publics” by A+ Expert Group (2020b)). These studies attempt to determine how correctly scientific knowledge is communicated to the public and criticise any deviations. Recent studies looked at the accuracy of climate change videos on YouTube (Allgaier, 2019), while there are a number of studies that assessed the accuracy of health information online (Caulfield et al., 2019). These content analyses usually work with samples of content on a specific topic within a specific online channel. They are, therefore, limited in scope, but nonetheless allow for plausible wider conclusions.

Findings on Switzerland

News media reporting on science can likely be considered mostly accurate but vulnerable to biased framing. No definitive analyses assess the factual accuracy of science news reporting in Switzerland. However, a number of indicators suggest that the reporting can be considered factually accurate. First, Switzerland has a highly developed and professional journalistic media landscape which is both under public as well self-regulatory and community scrutiny. Second, a long-term content analysis of scientific articles in Swiss print media shows that most of the reporting directly feeds of professional university press releases or, in rarer instances, represents critical reporting by science journalists (Eisenegger & Gedamke, 2013). Third, Vogler and Schäfer (2020a) showed that science news articles from 2015 to 2019 rarely used formats such as opinion pieces and interviews and that emotionally charged articles appeared in less than 5% of articles. Studies from other countries showed that most mistakes in science news reporting originate from quoted sources – something that likely applies to Swiss media, and has potentially increased due to the worsened working conditions of Swiss (science) journalists nowadays (see previous preprint on “Intermediaries” by A+ Expert Group (2020a)).

Figure 3: Popular Swiss tabloid (*Blick*) and broadsheet (*Neue Zürcher Zeitung*) reporting on a preliminary in-vitro study on their respective online platforms.

On the flipside, it is just as plausible that science news reporting in Switzerland is susceptible to be stylistically inaccurate. First, the aforementioned prevalence, and rise (Vogler & Schäfer, 2020b), of university press releases in science news reporting in Switzerland is paired with general research findings that research institutions tend to sensationalise their findings (Sumner et al., 2016). Second, media channels such as tabloids and online news platforms are more likely to feature stylistic inaccuracies, just as they demonstrably do in using emotional language (Vogler & Schäfer, 2020a). Sensationalising as well as framing as an emotional story were shown to be the main content-related characteristics that help science news stories to be more widely spread online (Milkman & Berger, 2014). As a result, examples as depicted on the left-hand panel in Figure 3, which are both factually and stylistically inaccurate are rare but not hard to find in the media. Less evidently, the right-hand panel in Figure 3 has also been criticised by *medien-doktor.de* for containing small factual inaccuracies and for failing to report conflicts of interests and expert opinions on the reported study (*medien-doktor.de*, 2020).

The internet is the most likely source for the Swiss population to encounter inaccurate scientific content. Structurally, the internet is most likely to feature inaccurate content because professional curation and quality control are often absent and various communicators with different agendas can directly communicate with the public, either by producing content or by commenting on available content (Brossard, 2013). The consequences of such structures are best documented for topics like climate change (Koteyko, Nerlich, & Hellsten, 2015) and health/medicine (Caulfield et al., 2019): Studies have shown that online communication on climate change in English-speaking countries sometimes deviates significantly from the state of scientific knowledge (Allgaier, 2019; Gavin & Marshall, 2011) and how climate change denial communities strategically connect and push their agendas on platforms like Facebook (Bloomfield & Tillery, 2019) and Twitter (Williams, McMurray, Kurz, & Hugo Lambert, 2015). Similarly, health-related information online and in social media (e.g. Madden, Nan, Briones, & Waks, 2012; Scullard, Peacock, & Davies, 2010) has been shown to be inaccurate to a considerable degree.

YouTube contains considerable amounts of inaccurate and potentially harmful information, while being one of the most relevant sources of science-related content in Switzerland. As discussed in the preprint on "Publics" (A+ Expert Group, 2020b), YouTube is one of the

most relevant online sources where people, and particularly younger people, encounter science-related content (Science Barometer Switzerland, 2019). While there are no large scale studies that analyse the accuracy of science-related information in YouTube videos, there are a number of individual studies that highlight problematic topics: Allgaier (2019) categorised 200 videos by combining the 20 most relevant videos for a total of 10 search terms related to climate change. He found that videos on search terms like “climate change” and “global warming” were mostly produced by media corporations and generally in line with the scientific consensus. Search terms like “geoengineering” and “fracking”, however, “largely led to videos that confront the users with positions that challenge mainstream scientific positions on climate change, or to outspoken conspiracy theories about so-called ‘chemtrails’” (Allgaier, 2019, p. 10).

YouTube videos on other science- or health-related topics also contained considerable inaccuracies (Allgaier, 2020). And while these inaccurate videos are often in the minority, they are particularly dangerous in the health-domain: These videos often hijack scientific terminology and use testimonials to strategically get their message across (Caulfield et al., 2019). Unfortunately, these messages are sometimes unproven (Hawke et al., 2019), or even harmful treatment recommendations (e.g. Unispital Basel, 2020).

Communication on the Pandemic: Online and Offline Content on COVID-19

Information accuracy becomes even more relevant during so-called “infodemics”, i.e. in times of an epidemic like COVID-19, when people are actively looking for accurate information within a flood of information that varies in quality, is sometimes strategically misleading and has considerable public health implications (World Health Organization, 2020). It seems that most of the findings on the accuracy of science-related content are echoed in studies that looked at online and offline communication in the context of the COVID-19 pandemic.

Regarding Switzerland, Zurich-based Research Institute on the Public Sphere and Society (fög; Eisenegger, Oehmer, Udriș, and Vogler 2020) assessed a large sample of Swiss news coverage on the novel Corona virus, using manual and automated content analyses. Using quality criteria derived from deliberative public sphere theory, they concluded that the overall quality of COVID-19-related news in Switzerland was good. It was shown to often apply a larger societal perspective, to not exaggerate the characteristics and implications of the pandemic and to be in line with the number of new infections quantitatively. The study criticized, however, that coverage often failed to contextualise reported statistics and only relied on a limited number of scientific sources, often overlooking insights from scientific disciplines other than medicine.

Analysing online content, the few existing studies classified up to one quarter of all posts on COVID-19 on social media as misinformation (e.g. for Twitter: Kouzy et al., 2020). To further investigate this online misinformation, a report by the Reuters Institute for the Study of Journalism at the University of Oxford (Brennen, Simon, Howard, and Kleis Nielsen, 2020) analysed “225 pieces of misinformation rated false or misleading by factcheckers” regarding COVID-19 on social media platforms such as Twitter, Facebook and YouTube, almost all of them in English. They showed that approximately 60% of these posts used misleading language and contextualisation, thus being “reconfigured” (mis)information (rather than completely fabricated misinformation), and that these “reconfigured” posts accounted for about 90% of social media interactions (i.e. likes, shares, comments). They further showed that only 20% of these posts originated from prominent public figures such as politicians and celebrities, but that these misinforming posts accounted for about 70% of all social media interactions. In addition, the report showed that YouTube and Facebook had taken down or flagged approximately three quarters of the problematic posts, while more than half of them remained up and unflagged on Twitter.

Members of the Expert Group

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- **Dr. Ana Godinho (Co-Speaker)**, CERN, Geneva, Head of Education, Communications and Outreach
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References

- Albaek, E., Christiansen, P. M., & Togeby, L. (2003). Experts in the mass media: Researchers as sources in Danish daily newspapers, 1961–2001. *Journalism & Mass Communication Quarterly*, 80(4), 937–948.
- Allgaier, J. (2019). Science and Environmental Communication on YouTube: Strategically Distorted Communications in Online Videos on Climate Change and Climate Engineering. *Frontiers in Communication*, 4, 266. <https://doi.org/10.3389/fcomm.2019.00036>
- Allgaier, J. (2020). Science and Medicine on YouTube. In J. Hunsinger, M. M. Allen, & L. Klasturp (Eds.), *Second International Handbook of Internet Research* (pp. 7–27). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-024-1555-1_1
- Bauer, M. W. (2012). Public Attention to Science 1820–2010—A ‘Longue Durée’ Picture. In S. Rödder, M. Franzen, & P. Weingart (Eds.), *The Sciences’ Media Connection—Public Communication and its Repercussions* (pp. 35–57). Springer.
- Bendix, J. (2017). *Citizen Science: An Introduction*.
- Bloomfield, E. F., & Tillery, D. (2019). The Circulation of Climate Change Denial Online: Rhetorical and Networking Strategies on Facebook. *Environmental Communication—a Journal of Nature and Culture*, 13(1), 23–34. <https://doi.org/10.1080/17524032.2018.1527378>
- Boczkowski, P. J., & Mitchelstein, E. (2012). How Users Take Advantage of Different Forms of Interactivity on Online News Sites: Clicking, E-Mailing, and Commenting. *Human Communication Research*, 38(1), 1–22. <https://doi.org/10.1111/j.1468-2958.2011.01418.x>
- Bonfadelli, H. (2017a). Climate Change Communication in Switzerland. In M. C. Nisbet, S. S. Ho, E. Markowitz, S. J. O'Neill, M. S. Schäfer, & J. Thaker (Eds.), *Oxford Research Encyclopedia on Climate Change Communication*. New York & London: Oxford University Press.
- Bonfadelli, H. (2017b). Communications About Biotechnologies and GMOs Across Europe. In K. H. Jamieson, D. M. Kahan, & D. A. Scheufele (Eds.), *A The Oxford Handbook of the Science of Science Communication*. Oxford University Press.
- Brantner, C., & Huber, B. (2013). How visible is communication studies? Press coverage of the discipline in three German-language quality newspapers. *SCM Studies in Communication and Media*, 2(2), 247–264.
- Brennen, J. S., Simon, F. M., Howard, P. N., & Kleis Nielsen, R. (2020). Types, Sources, and Claims of COVID-19 Misinformation.
- Brossard, D. (2013). New media landscapes and the science information consumer. *Proceedings of the National Academy of Sciences of the United States of America*, 110 Suppl 3, 14096–14101. <https://doi.org/10.1073/pnas.1212744110>
- Caulfield, T., Marcon, A. R., Murdoch, B., Brown, J. M., Perrault, S. T., Jarry, J., . . . Hyde-Lay, R. (2019). Health Misinformation and the Power of Narrative Messaging in the Public Sphere. *Canadian Journal of Bioethics*, 2(2), 52–60. <https://doi.org/10.7202/1060911ar>
- Citizen Science Center Zürich (2019). Projekte. Retrieved from <https://citizenscience.ch/de/contribute/projects>
- Einsiedel, E. F. (2014). Publics and their participation in science and technology: Changing roles, blurring boundaries. In M. Bucchi & B. Trench (Eds.), *Routledge International Handbooks*. Routledge

- Handbook of Public Communication of Science and Technology*. London, New York: Routledge, Taylor & Francis Group.
- Eisenegger, M., & Gedamke, S. (2013). Wissenschaft in Medien: Zur Logik medialer Wissenschaftsthematisierung. *Medien & Zeit*, 28(4), 34–44.
- Eisenegger, M., Oehmer, F., Udrys, L., & Vogler, D. (2020). *Qualität der Medien Studie 1/2020: Die Qualität der Medienberichterstattung zur Corona-Pandemie*.
- Elmer, C., Badenschier, F., & Wormer, H. (2008). Science for Everybody?: How the Coverage of Research Issues in German Newspapers has Increased Dramatically. *Journalism & Mass Communication Quarterly*, 85(4), 878–893.
- A+ Expert Group (2020a). *Draft Chapter – Journalists, Influencers or Platforms: Intermediaries of Science Communication in Switzerland*. <https://doi.org/10.31219/osf.io/mu2f3>
- A+ Expert Group (2020b). *Draft Chapter – Science and the Swiss Public: Science-related Perceptions and Sources of Information in Switzerland*. <https://doi.org/10.31219/osf.io/a6cy5>
- Fährnrich, B. (2017). Wissenschaftsevents zwischen Popularisierung, Engagement und Partizipation. In H. Bonfadelli, B. Fährnrich, C. Lüthje, J. Milde, M. Rhomberg, & M. S. Schäfer (Eds.), *Forschungsfeld Wissenschaftskommunikation* (pp. 165–182). Springer Fachmedien Wiesbaden.
- Federal Statistical Office (2019a). Fernsehen: Programmangebot der SRG SSR nach Inhaltskategorien. Retrieved from <https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.9127492.html>
- Federal Statistical Office (2019b). Museen: Struktur und Finanzierung. Retrieved from <https://www.bfs.admin.ch/bfs/de/home/statistiken/kultur-medien-informationsgesellschaft-sport/kultur/museen/struktur-finanzierung.assetdetail.10489640.html>
- Fög (Ed.) (2020). *Qualität der Medien: Jahrbuch 2020*. Basel: Schwab.
- Gavin, N. T., & Marshall, T. (2011). Mediated climate change in Britain: Scepticism on the web and on television around Copenhagen. *Global Environmental Change*, 21(3), 1035–1044. <https://doi.org/10.1016/j.gloenvcha.2011.03.007>
- Grossenbacher, R., Brändli, M., Sasso, S., & Eichenberger, R. (2018). Programmanalyse der Schweizer Privatradios mit Leistungsauftrag 2018.
- Grossenbacher, R., & Sasso, S. (2014). Programmanalyse der Schweizer Privatradios mit Leistungsauftrag und Gebührenanteil 2014: Bericht.
- Grossenbacher, R., Sasso, S., & Glaab-Seuken, S. (2016). Programmanalyse der Schweizer Privatradios mit Leistungsauftrag 2016: Bericht.
- Hargittai, E., Fuchslin, T., & Schäfer, M. S. (2018). How Do Young Adults Engage With Science and Research on Social Media? Some Preliminary Findings and an Agenda for Future Research. *Social Media + Society*, 4(3), 205630511879772. <https://doi.org/10.1177/2056305118797720>
- Hawke, B., Przybylo, A. R., Paciulli, D., Caulfield, T., Zarzeczny, A., & Master, Z. (2019). How to Peddle Hope: An Analysis of YouTube Patient Testimonials of Unproven Stem Cell Treatments. *Stem Cell Reports*, 12(6), 1186–1189. <https://doi.org/10.1016/j.stemcr.2019.05.009>
- Hitlin, P., & Olmstead, K. (2018). *The Science People See on Social Media*.
- Humprecht, E., Esser, F., & van Aelst, P. (2020). Resilience to Online Disinformation: A Framework for Cross-National Comparative Research. *International Journal of Press-Politics*, 25(3), 493–516. <https://doi.org/10.1177/1940161219900126>

- Ke, Q., Ahn, Y.-Y., & Sugimoto, C. R. (2017). A systematic identification and analysis of scientists on Twitter. *Plos One*, 12(4), e0175368.
- Koteyko, N., Nerlich, B., & Hellsten, I. (2015). Climate Change Communication and the Internet: Challenges and Opportunities for Research. *Environmental Communication-a Journal of Nature and Culture*, 9(2), 149–152. <https://doi.org/10.1080/17524032.2015.1029297>
- Kouzy, R., Abi Jaoude, J., Kraitem, A., El Alam, M. B., Karam, B., Adib, E., . . . Baddour, K. (2020). Coronavirus Goes Viral: Quantifying the COVID-19 Misinformation Epidemic on Twitter. *Cureus*, 12(3), e7255. <https://doi.org/10.7759/cureus.7255>
- Kristiansen, S. (2017). *Media and risk: A phase model elucidating media attention to nuclear energy risk* (Vol. 5): Univ.-Verl. Ilmenau.
- Künzler, M. (2013). *Mediensystem Schweiz. Kommunikationswissenschaft*. Konstanz: UVK Verlagsgesellschaft. Retrieved from https://www.content-select.com/index.php?id=bib_view&ean=9783864961748
- Lehmkuhl, M. (2019). Defizite im Wissenschaftsjournalismus: Fehlerhaftes und Fehlendes. In W. Göpfert (Ed.), *Wissenschafts-Journalismus* (pp. 199–209). Wiesbaden: Springer Fachmedien Wiesbaden.
- Liebert, W.-A., & Weitze, M.-D. (2015). *Kontroversen als Schlüssel zur Wissenschaft?: Wissenskulturen in sprachlicher Interaktion*: transcript Verlag.
- Madden, K., Nan, X., Briones, R., & Waks, L. (2012). Sorting through search results: A content analysis of HPV vaccine information online. *Vaccine*, 30(25), 3741–3746. <https://doi.org/10.1016/j.vaccine.2011.10.025>
- Medien-doktor.de (2020). „Echinacea-Extrakt kann Sars-CoV-2 in der Zellkultur inaktivieren – doch wird das helfen?“. Retrieved from <http://www.medien-doktor.de/gesundheits/2020/09/echinacea-extrakt-kann-sars-cov-2-in-der-zellkultur-inaktivieren-doch-wird-das-helfen/>
- Milkman, K. L., & Berger, J. (2014). The science of sharing and the sharing of science. *Proceedings of the National Academy of Sciences of the United States of America*, 111 Suppl 4, 13642–13649. <https://doi.org/10.1073/pnas.1317511111>
- Miller, B., Weidmann, B., Jacob, A., & Paulsen, T. (2017). Ausserschulische Mint-Angebote In Der Schweiz. Übersicht Und Analyse 2016. *Swiss Academies Communications*, 12(6), 1–56. Retrieved from 10.5281/ZENODO.1063660
- La moulinette (2020). La moulinette: Hachez menu votre projet de médiation scientifique. Retrieved from <https://www.moulinette.ch/>
- Näf, M., & Schanne, M. (2006a). Wissenschaftsjournalismus: eine aktuelle, explorative Bestandesaufnahme. *Medienwissenschaft Schweiz*, 2006(1-2), 61–68.
- Näf, M., & Schanne, M. (2006b). Wissenschaftsjournalismus in der Schweiz. In W. Göpfert (Ed.), *Journalistische Praxis. Wissenschafts-Journalismus: Ein Handbuch für Ausbildung und Praxis* (5th ed., pp. 283–286). Berlin: Econ-Verl.
- Näf, M., & Schanne, M. (2006c). *Wissenschaftsjournalismus in der Schweiz*: Econ.
- Niemann, P., Bittner, L., Hauser, C., & Schrögel, P. (2020). 24. Forms of science presentations in public settings. In A. Leßmöllmann, M. Dascal, & T. Gloning (Eds.), *Handbooks of communication science. Science communication* (pp. 515–544). Berlin, Boston: de Gruyter. <https://doi.org/10.1515/9783110255522-024>

- Oehl, B. (2015). *Public Demand and Climate Change Policy Making in OECD Countries: From Dynamics of the Demand to Policy Responsiveness*. ETH Zurich. <https://doi.org/10.3929/ETHZ-A-010432416>
- Rauchfleisch, A., & Schäfer, M. S. (2018). Welche Forschenden erscheinen in den Medien? Befunde aus der Schweiz. *Wissenschaftskommunikation.De*, 2018, online. Retrieved from <https://www.wissenschaftskommunikation.de/welche-forschenden-erscheinen-in-den-medien-befunde-aus-der-schweiz-21015/>
- Rauchfleisch, A., Schäfer, M. S., & Siegen, D. (2020). Beyond the ivory tower: Measuring and explaining scholars' contacts with journalists, politicians and industry representatives. *Public Understanding of Science*.
- Schäfer, M. S. (2011). Sources, Characteristics and Effects of Mass Media Communication on Science: A Review of the Literature, Current Trends and Areas for Future Research. *Sociology Compass*, 5(6), 399–412. <https://doi.org/10.1111/j.1751-9020.2011.00373.x>
- Schäfer, M. S. (2017). How Changing Media Structures Are Affecting Science News Coverage. In K. H. Jamieson, D. M. Kahan, & D. A. Scheufele (Eds.), *A The Oxford Handbook of the Science of Science Communication* (pp. 51–59). Oxford University Press.
- Schanne, M. (1986). *Wissenschaft in den Tageszeitungen der Schweiz*. Zürich.
- Schanne, M. (2003). *Macht Mobilfunk krank?: Berichterstattung von Tageszeitungen und Tagesschau unter der Lupe*.
- Schweiz Forscht (2020). Citizen Science Schweiz. Retrieved from <https://www.schweiz-forscht.ch/de/citizen-science-projekte>
- Science Barometer Switzerland (2016). Ergebnisse 2016 / Résultats 2016. Retrieved from http://www.wissenschaftsbarometer.ch/result_2016/
- Science Barometer Switzerland (2019). Ergebnisse 2019 / Résultats 2019. Retrieved from http://www.wissenschaftsbarometer.ch/result_2019/
- Science et Cité (2015). *Citizen Science in der Schweiz: Situationsanalyse und Zukunftsperspektiven*. Retrieved from https://www.science-et-cite.ch/docs/projekte/150130_CitizenScienceSchweiz_VersandNetzwerk.pdf
- Science et Cité (2016). *Jahresbericht 2016*. Retrieved from https://www.science-et-cite.ch/docs/jahresberichte/s+c_jahresbericht_2016_v2_druck.pdf
- Science et Cité (2020a). BrainSnack. Retrieved from <https://www.science-et-cite.ch/de/brainsnack>
- Science et Cité (2020b). Wissenschaftscafés. Retrieved from <https://www.science-et-cite.ch/de/wissenschaftscafes>
- Scullard, P., Peacock, C., & Davies, P. (2010). Googling children's health: Reliability of medical advice on the internet. *Archives of Disease in Childhood*, 95(8), 580–582. <https://doi.org/10.1136/adc.2009.168856>
- Siegen, D. (2020). *News Media Coverage of Environmental Policy in Switzerland 2000-2019: Using Automated Content Analysis to Explore Topics and Themes*. Graduate Institute of International and Development Studies, Geneva.
- Statista (2016). Die meistbesuchten Museen in der Schweiz nach Anzahl der Eintritte im Jahr 2016. Retrieved from <https://de.statista.com/statistik/daten/studie/368841/umfrage/meistbesuchte-schweizer-museen-nach-anzahl-der-eintritte/>

- Stauffacher, M., Muggli, N., Scolobig, A., & Moser, C. (2015). Framing deep geothermal energy in mass media: the case of Switzerland. *Technological Forecasting and Social Change*, 98, 60–70. <https://doi.org/10.1016/j.techfore.2015.05.018>
- Strasser, B. J., & Haklay, M. (2018). *Citizen Science: Expertise, Demokratie und öffentliche Partizipation*. Empfehlungen des Schweizerischen Wissenschaftsrates SWR und Expertenbericht. Politische Analyse 1/2018. Bern.
- Summ, A., & Volpers, A.-M. (2016). What's science? Where's science? Science journalism in German print media. *Public Understanding of Science (Bristol, England)*, 25(7), 775–790. <https://doi.org/10.1177/0963662515583419>
- Sumner, P., Vivian-Griffiths, S., Boivin, J., Williams, A., Bott, L., Adams, R., . . . Chambers, C. D. (2016). Exaggerations and caveats in press releases and health-related science news. *Plos One*, 11(12), e0168217.
- Swiss Academies Of Arts And Sciences (2020). Science at Noon. Retrieved from <http://akademien-schweiz.ch/index/Aktuell/Science-at-Noon.html>
- TA-Swiss (2019). *Schlussbericht Focus Robots*. Bern.
- Tintori, A., & Palomba, R. (Eds.) (2017). *Turn on the light on science: A research-based guide to break down popular stereotypes about science and scientists*. Ubiquity Press. <https://doi.org/10.5334/bba>
- Trebbe, J., Wagner, M., Fehr, A., Spittka, E., & Beier, A. (2015). Kontinuierliche Fernsehprogrammforschung in der Schweiz: Stichprobenbericht Herbst 2015.
- Unispital Basel (2020, September 23). Medienmitteilungen des Universitätsspitals Basel. Retrieved from <https://www.unispital-basel.ch/medien/medienmitteilungen/details/article/dr-youtube-ist-ein-quacksalber/?cHash=03a051955fd627835d8a3afc1f41d5>
- Van Noorden, R. (2014). Online collaboration: Scientists and the social network. *Nature News*, 512(7513), 126.
- Vogler, D., & Schäfer, M. S. (2020a). Bedeutung und Qualität der Wissenschaftsberichterstattung in Schweizer Medien. In fög (Ed.), *Qualität der Medien: Jahrbuch 2020*. Basel: Schwab.
- Vogler, D., & Schäfer, M. S. (2020b). Growing Influence of University PR on Science News Coverage?: A Longitudinal Automated Content Analysis of University Media Releases and Newspaper Coverage in Switzerland, 2003–2017. *International Journal of Communication*.
- Williams, H. T.P., McMurray, J. R., Kurz, T., & Hugo Lambert, F. (2015). Network analysis reveals open forums and echo chambers in social media discussions of climate change. *Global Environmental Change*, 32, 126–138. <https://doi.org/10.1016/j.gloenvcha.2015.03.006>
- Wissenschaftskommunikation.de (2020). Formate. Retrieved from <https://www.wissenschaftskommunikation.de/formate/>
- World Health Organization (2020). 1st WHO Infodemiology Conference. Retrieved from <https://www.who.int/news-room/events/detail/2020/06/30/default-calendar/1st-who-infodemiology-conference>
- Zimmermann, B. M., Aebi, N., Kolb, S., Shaw, D., & Elger, B. S. (2019). Content, evaluations and influences in newspaper coverage of predictive genetic testing: A comparative media content analysis from the United Kingdom and Switzerland. *Public Understanding of Science (Bristol, England)*, 28(3), 256–274. <https://doi.org/10.1177/0963662518816014>