

Science Communication practices and Trust in information sources amongst Nigerian scientists and journalists

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Abstract

Relatively few studies have explored the communication practices of researchers and journalists working in African contexts. We set out to explore the communication activities undertaken by Nigerian health researchers and journalists, their motivations and the barriers they face in communicating about health topics with lay audiences, as well as their trust in a range of sources of scientific information. The study adopted a survey methodology, recruiting 69 participants at a communications training workshop for both health researchers and journalists. We found high levels of participation in research communication amongst health researchers compared with previous work. While many barriers are similar to those faced by researchers in other contexts, our respondents highlighted that lack of support from managers is a significant hurdle, which has not been highlighted in other studies. Both journalists and researchers primarily communicate science with the aim of educating, informing, entertaining or inspiring their audiences. Regarding trust, both researchers and journalists broadly trust sources linked to science, such as academic journals. However, trust in industry, NGOs and other media was higher amongst journalists than health researchers. Least trust was invested in social media sources, with the exception of material posted on accounts linked to universities.

Keywords

Professionalism, professional development and training in science communication; Science and media; Science communication in the developing world

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Introduction

Much literature on science communication has focused on westernized contexts [Guenther & Joubert, 2017], with the continent of Africa particularly under-represented. A recent scoping review exploring health researchers' use of

social media also finds a dominance of research carried out in anglophone and western contexts [Dol et al., 2019]. Those studies that explore African contexts point to particular challenges, such as funding and infrastructure [Bakyawa, Devlin, Serwadda & Ijsselmuiden, 2013], lack of institutional support [Appiah, Gastel, Burdine & Russell, 2015] and that science journalists may lack access to news sources [Clayton & Joubert, 2012] and training [Appiah et al., 2015]. Recent research also suggests that there is a lack of science communication training within science curricula in Nigeria [Ali, Batta, Ekeanyanwu, Obot & Batta, 2023].

Although universities and scientific research institutions abound in Nigeria, science communication is not ingrained in the scientific community and there is paucity of data on science communication in Nigeria. However, among scientists and researchers in academia the practice is not widespread. And even the few who take part in activities related to science communication consider it secondary when compared to their peers in countries like the United States, where a robust science communication field already exists. To extend scientific knowledge beyond academia, the industry and into the public domain, Nigerian scientists need to effectively communicate and engage the public with science. Many scientific findings must gain trust by the public to become real-life innovations. Scientists need to participate in good science communication practices to help move research to innovation. This exploratory study seeks to understand the existing practices of health researchers and journalists from Nigeria who elected to participate in a science communication training programme held in Abuja, Nigeria. This two-year training programme offered initial training to a cohort of 76 scientists and journalists, who were later matched together and encouraged to work on joint science communication activities. The survey reported here covers their experiences of science communication and their trust in a range of sources of scientific information before undertaking the training.

Literature review

Prior research has examined the science communication and public engagement practices of scientists, focusing on a range of contexts. Science communication and public engagement are sometimes used interchangeably within this community and sometimes distinguish between activities which are oriented towards dissemination (science communication) and those which seek to involve the public in research (public engagement). Within this paper, we use a broader definition of science communication, to encompass the full spectrum of activities that seek to share research with the public in some way, including those which involve the public in research and those which might be seen as primarily about dissemination of research findings. Previous studies suggest that this broad approach mirrors scientists' own understandings of science communication. For example, researchers were found to understand science communication to 'refer to all of their activities that are non-research/teaching/administration/(clinical)' [Hamlyn et al., 2015]. Among these activities are public talks and working with schools. To these, Ndlovu, Joubert and Boshoff [2016] add media interviews, participation at science cafes or museum events, collaborative projects (e.g. involving the public or policymakers).

Although surveys have explored U.K. researchers' communication practices [Hamlyn et al., 2015; The Royal Society, 2006], little work has explored the practices of researchers in non-western contexts. Ndlovu et al. [2016] found that researchers

in Zimbabwe focus primarily on scholarly communication, rather than communication aimed at wider publics, suggesting that these scholars do not see public engagement as integral to their research roles [Casini & Neresini, 2012]. Indeed, few respondents to this study communicated with the public, media or policy communities, a finding in sharp contrast to work in countries such as the U.K. [The Royal Society, 2006]. A study of scientists and science communicators in the Philippines finds that scientists' lack opportunities and support to undertake science communication activities, including public talks and events [Navarro & McKinnon, 2020]. Similarly, although studies have explored the motivations of researchers in relation to science communication in western contexts, few have considered the reasons why researchers from the global majority communicate science. Studies from Europe and North America suggest that informing and raising awareness dominate the motivations of scientists [BBSRC External Relations Unit, 2014; Dudo & Besley, 2016; Horst, 2013; The Royal Society, 2006]. A global survey of science journalists suggests that informing and educating are prominent motivations [Bauer, Howard, Romo Ramos, Massarani & Amorim, 2013]. Looking more broadly at science communicators, Wilkinson, Milani, Ridgway and Weitkamp [2023] indicate that personal enthusiasm, education and countering misinformation featured as motivators across several European countries. This study also explored barriers to communication, finding lack of time or resources and challenges in gaining participation from others as key issues.

Digital media are also attracting attention as spaces for the communication of research [Collins, Shiffman & Rock, 2016; Wilkinson & Weitkamp, 2013]. Collins et al. [2016] explored scientists' views on the use of social media for personal, professional and public engagement purposes, finding different platforms used for different purposes. Looking specifically at health researchers, Dol et al. [2019] identified a range of uses that support research, ranging from participant recruitment and data collection, to sharing research findings and engaging end users. They also identified uses that fall within personal professional development, such as conference tweeting and research education (virtual journal clubs). Exploring how these activities align with different social media platforms reveals extensive use of Twitter and Facebook, with blogs, YouTube and Instagram, for example, used more selectively.

Researchers are one of many voices present in the science communication landscape [Weitkamp, Milani, Ridgway & Wilkinson, 2021], with media and journalistic sources remaining highly visible sources of scientific information online. A systematic review of research into science journalism in the Global South identified a number of challenges faced by journalists, including a dependence on foreign sources (particularly media), with little provision of local context [Nguyen & Tran, 2019]. While Nguyen and Tran identified challenges with the visibility of scientists nationally, Appiah et al. [2015] found health professionals and scientists to be important sources for Ghanaian journalists, with business community and non-governmental organisations (NGO) rated less important. However, this study only explored human sources of information (as opposed to e.g. written sources such as research articles) and while the authors speculate that credibility may be a factor in the importance of these sources, they did not explore journalists' trust in these or other information sources. Sources of information were also explored in the context of an Ebola outbreak in Ghana, where journalists turned to official sources (e.g. government, health experts), but also relied on international media

and sources identified via social media [Thompson, 2019]. Other studies suggest that health journalists rely on Internet searches for information, though it remains unclear what role social media play [Shoenberger & Rodgers, 2017; Ing, 2014]. To fill this gap, we explored the sources of scientific information used by journalists and their evaluation of the trustworthiness of sources, alongside a similar evaluation of trustworthiness from scientists.

Nevertheless, little work has explored how journalists evaluate the trustworthiness of these sources. Manninen [2017] presents five rationales journalists gave for trusting sources: ideological, pragmatic, cynically pragmatic, consensual and contextual trust. Ideological trust arises when the credibility of sources is not questioned or contested. Pragmatic trust emerges when a source is used despite concerns about trustworthiness — the source is ‘trustworthy enough’. Cynically pragmatic trust arises when the punitive impacts on the source of lying or misleading are thought to reduce the risk sufficiently for an otherwise untrusted source to be used. Consensual trust is built when multiple sources produce a consensus which is perceived as reliable. Finally, contextual trust develops once the journalist understands a source’s underlying interests which can then be evaluated before trust is given.

This study seeks to fill gaps in our understanding of the communication practices of Nigerian health researchers and journalists and the role that trust plays in their decisions. We set out to explore how researchers and health professionals in Nigeria use a range of communication tools for public engagement and compare this with the use of these same tools by Nigerian journalists.

This leads to three research questions:

RQ1: *What public communication activities do Nigerian health researchers and journalists undertake?*

RQ2: *What motivates them to undertake — and what stops them from undertaking — these activities?*

RQ3: *How do Nigerian health researchers and journalists evaluate the trustworthiness of a range of information sources?*

Methods

This study adopted a quantitative approach to investigate the motivations and barriers faced by health researchers and journalists. Drawing on previously validated survey tools [Ridgway, Milani, Weitkamp & Wilkinson, 2020; Wilkinson et al., 2023], a survey was developed to investigate the research questions. The survey was distributed in paper form at a training workshop for health researchers and journalists held in Abuja, Nigeria in 15–16 October, 2019. 302 applications were received to participate in the workshop, from which 70 were chosen to attend (six additional attendees joined on the day). The training event brought together health researchers and journalists for training in science communication, enabling both groups to be approached at a single event. For this reason, one survey was developed which comprised questions aimed at both groups, a section specifically for scientists and a section specifically for journalists. Instructions directed respondents to only complete the relevant section.

Percentage of respondents selecting each role

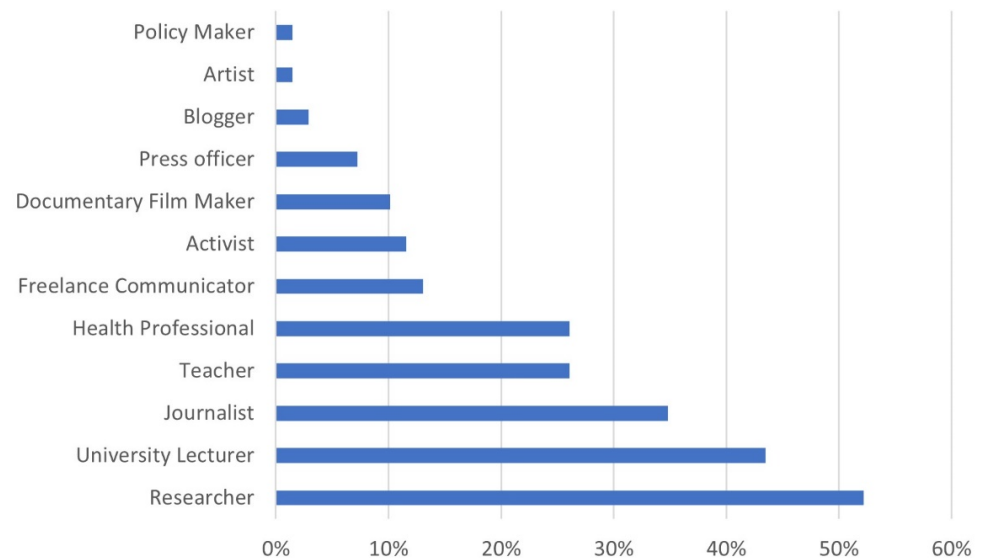


Figure 1. Respondents self-reported work roles. Respondents were able to select up to 3 roles. The percentage refer to the number of respondents selecting the role ($n = 69$).

Workshop participants (76) were asked to fill out the survey and hand it back during the workshop. In practice around 30% of the completed surveys were handed back before the first training session started, and the remaining 70% were handed back during the training days or at the end of the workshop. Completed surveys were received from 69 workshop participants, giving a response rate of 92% relative to the 76 people in attendance. Survey respondents were asked to select up to three professional roles with which to identify themselves. While all respondents selected at least one role, 53 opted to self-identify with at least two roles and 40 self-identified using three roles. Thus, we have a broad picture of the types of roles that respondents undertake (Figure 1). Grouped together, the majority of respondents hold roles associated with research, as health professionals or within academia (52%, $n = 84$; referred to as researcher roles). Communicator roles (journalist, freelance, documentary maker, press officer, blogger) were held by 30% of respondents ($n = 48$), with teachers, activists, policy makers and artists combined representing 18% ($n = 29$) of identified roles. However, when it came to answering the survey, 26 (38%) respondents answered the section specifically for journalists/communicators (including two who identified as freelance communicators and one as a documentary maker rather than as a journalist) and 43 (62%) responded to the questions directed towards scientists. 70% of respondents self-identified as male, and 30% self-identified as female, the ratio was similar for both journalists and scientists. No respondents chose to identify through another gender or declined to respond to this question.

Comparing work roles reported by those in communicator roles and those in researcher roles reveals that communicators typically undertake the following roles in addition to their role as journalist; documentary film-making ($n = 7$), freelance communication ($n = 7$), press officer ($n = 5$), teachers ($n = 4$), bloggers ($n = 3$), health professionals ($n = 2$) and one each, researcher, activist and artist. In contrast, researchers reported being researchers ($n = 35$) and health professionals

($n = 16$) alongside roles as university lecturers ($n = 30$), teachers ($n = 14$), activists ($n = 7$), freelance communicators ($n = 2$) and one each, blogger, policy officer, journalist/editor and artists.

Statistical analysis was conducted using SPSS (v28). For nominal data, Pearson's chi squared (χ^2) test was used and is reported here.

Results

This exploratory study, focuses on the science and health communication experience and trust in information sources expressed by scientists and journalists in Nigeria who were attending a science communication training programme. At the time of participation in the first survey, most respondents had between 5–8 years' experience (26%, $n = 18$), with a further 22% ($n = 15$) having 10–15 years and 16% ($n = 11$) having 3–5 years experience. 16% ($n = 11$) had 2 or fewer years experience, while 29% ($n = 13$) had 15 or more years experience. One respondent declined to indicate their level of experience. Journalists were more likely to have less than 5 years' experience (46%, $n = 12$) compared with scientists (23%, $n = 10$).

Communication tools and activities

Respondents used a range of different tools to communicate science or health topics or issues on behalf of a community, in a professional capacity or in a personal capacity (or indicated that they had no experience of a particular communication tool). Respondents were asked to indicate experience in any or all categories. Most journalists and researchers had some experience of writing for the public, giving public talks, using social media, working with teachers and face to face public engagement (Figure 2). There were a number of communication tools which were much less commonly used (Figure 3). There were several areas where the experiences of journalists and researchers differed, with journalists having more experience of arts, festivals, working with policymakers and producing videos, while scientists had more experience of working with other scientists. Journalists also appear to do more work on behalf of communities, likely applying their skills sets (such as social media or writing skills) to further community goals, whereas scientists undertake communication activities (such as working with teachers, writing and face-to-face engagements) in a personal capacity more than journalists.

Communication goals

Respondents were asked about what they are trying to achieve when they communicate with an audience about science and/or health. The most frequent response, across all respondents was 'Educate' (94%, $n = 65$ of respondents). This was followed by, in order, 'Inform' (93%, $n = 64$), 'Inspire young people' (83%, $n = 57$), 'Encourage evidence-based attitudes' (64%, $n = 44$), 'Counter misinformation' (58%, $n = 40$), 'Create conversations' (52%, $n = 36$) and 'Promote my work/project/myself' (51%, $n = 35$). 'Entertain' and 'Persuade them to adopt my point of view' were least frequent responses overall, with 20% ($n = 14$) and 15% ($n = 10$) of respondents choosing these options, respectively. One respondent wasn't sure and another chose not to respond to this question. There was no measurable difference between journalists and researchers, except in three cases:

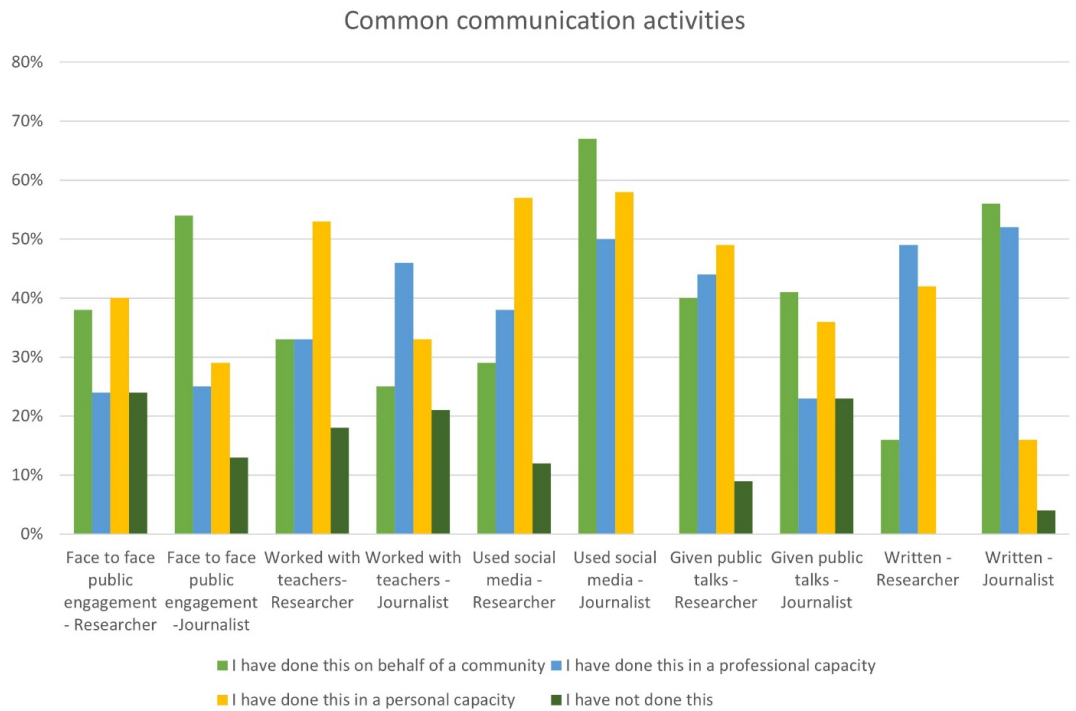


Figure 2. Communication activities undertaken on behalf of a community, in a professional or personal capacity or which the respondent has not undertaken. Responses are presented as the percentage of scientists or journalists selecting each category.

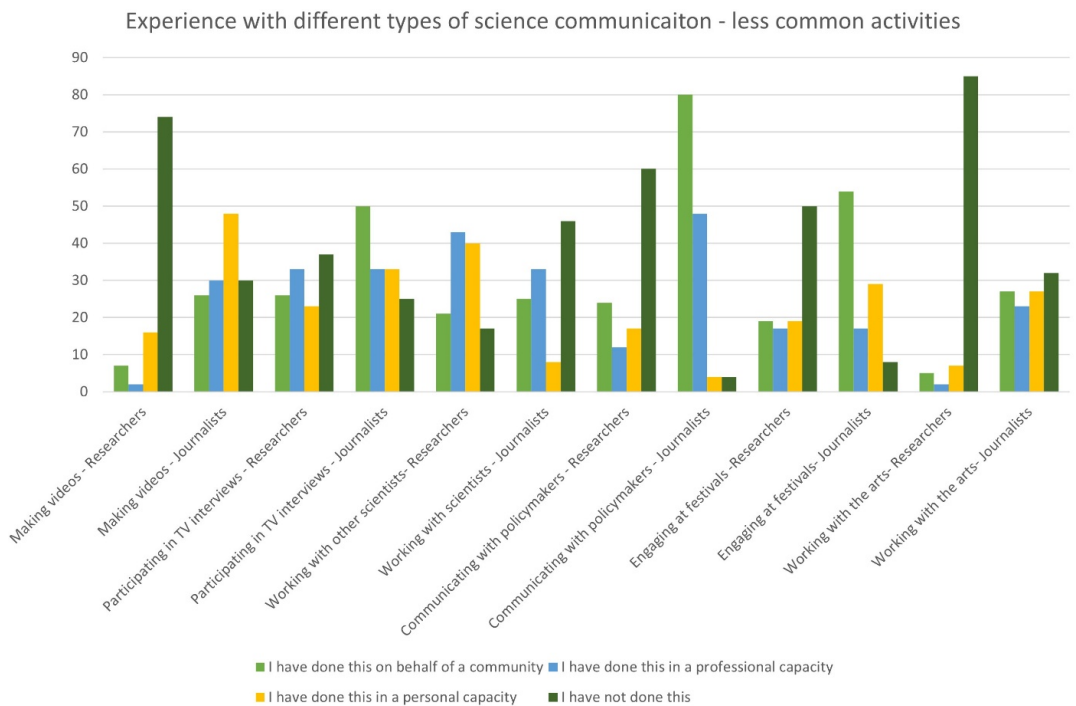


Figure 3. Communication activities which were less commonly practiced by either journalists or health researchers. Respondents could provide answers in more than one category. Responses are presented as the percentage of scientists or journalists indicating each response category.

journalists were more likely to seek to 'Encourage evidence-based attitudes or behaviours' ($p < 0.05$) and 'Persuade people to adopt my view' ($p < 0.5$), while scientists were more likely to seek to 'Entertain' ($p < 0.5$) with their communication activities.

In a further analysis, we looked at the effect of years of experience on communication goals. Between those with more than ($>$) 10 years' experience, and those with less than ($<$) 10 years' experience, communication goals were generally similar, with a few notable exceptions. The goal with the greatest difference by level of experience was 'Promote my work/project/myself'; 58% of those with <10 years' experience chose this option, compared with only 39% with >10 years' experience. 'Persuade others to adopt my point of view' and 'Encourage evidence-based attitudes and behaviour' also had a larger difference between those with more and less than 10 years' experience, with 20% vs. 7%, and 70% vs. 57%, respectively. The only goal that was chosen by more respondents with >10 years' experience than those with <10 years' experience was 'counter misinformation'; the rest of the goals had more respondents with <10 years' experience.

We asked the scientist respondents about the barriers they faced in undertaking science communication activities. The top six reasons given were: a lack of resources for science communication work (50%, $n = 21$); insufficient support from manager or organisation and insufficient encouragement from funders for science communication work (both selected by 38%; $n = 16$), a feeling that they lack the right skills/training (29%; $n = 12$) and difficulty in getting others involved in science communication work (24%; $n = 10$). No respondents reported a lack of willingness to participate in science communication activities or concern over such activities having a negative impact on their career.

In a further analysis, we looked at whether level of experience had any effect on the perceived barriers. As it was a small sample who responded to this question (only those who filled out the section for scientists, $n = 43$), most responses were very similar for those with over ($>$) and under ($<$) 10 years' experience. However, there was a more marked difference for two of the barriers. More respondents with >10 years' experience reported insufficient encouragement from funders for science communication work ($n = 11$, in contrast with $n = 5$ for those with <10), and lack of time ($n = 5$ >10 yr: $n = 1$ <10 yr).

Trust in sources

We explored with respondents the sources of information they use and their views on their trustworthiness. The following options were given alongside a range of sources of information: I consult it and I trust it; I consult it but I *do not* trust it; I *do not* consult it but I trust it; I *do not* consult it and I *do not* trust it. Initially, we explored which sources were consulted (whether or not trusted) and which sources were trusted (whether or not consulted). Most respondents consult and trust scientific journals (98%, $n = 41$, researchers; 71%, $n = 24$ journalists $p < 0.05$) and conferences (88%, $n = 42$ researchers; 72% $n = 25$ journalists), though scientists both use and trust these sources more than journalists. However, when it comes to popular media, differences appear: international news media are widely trusted (researchers, 62%, $n = 37$; journalists, 71%, $n = 21$) but rarely consulted

Table 1. Use and trust in media and organisational materials.

		I consult and trust	I consult but <i>do not</i> trust	I <i>do not</i> consult but trust	I <i>do not</i> consult and <i>do not</i> trust
Nigerian newspapers	Researchers	39%	26%	5%	29%
	Journalists	76%	0	19%	5%
NGOs websites and press materials	Researchers	14%	33%	21%	31%
	Journalists	54%	29%	8%	8%
Industry websites and press materials	Researchers	12%	43%	19%	26%
	Journalists	46%	13%	33%	8%
Journalist blog	Researchers	20%	38%	13%	30%
	journalists	57%	13%	22%	9%

(researchers, 38%, $n = 37$; journalists 29%, $n = 21$). Nigerian newspapers are trusted by journalists but not scientists, though consulted by both ($p < 0.01$; Table 1). Science magazines, like journals and conferences are both trusted (researchers 83%, $n = 41$; journalists 81%, $n = 21$) and consulted (researchers, 63%, $n = 41$; journalists 71%, $n = 21$). We also asked about communication (e.g. press releases, blogs) produced on behalf of universities, which are broadly trusted (researchers, 78%, $n = 40$; journalists 75%, $n = 24$) and consulted (researchers 76%, $n = 40$; journalists 92%, $n = 24$), NGOs which are not trusted or consulted by researchers ($p < 0.05$), industry which is not trusted by researchers ($p < 0.01$) and government which is less trusted by researchers (40%, $n = 42$) than journalists (63%, $n = 24$) but consulted by both (researchers 64%, $n = 42$; journalists, 75%, $n = 24$). Although researchers' blogs are widely trusted (researchers, 51%, $n = 41$; journalists 78%, $n = 23$) and consulted (researchers, 75%, $n = 41$; journalists, 70%, $n = 23$), a substantial minority of researchers consulted them but did not trust them (39%, $n = 41$). In contrast, there was a significant difference ($p < 0.5$) between researchers and journalists use and trust in journalists' blogs (Table 1).

Turning to social media (Table 2), we considered use and trust of a range of account types. Researchers were less trusting in material posted on Twitter by individuals ($p < 0.05$) and NGOs ($p < 0.05$), though universities were broadly trusted by both groups, and although less trusted (researchers 44%, $n = 43$; journalists 74%, $n = 23$)

Table 2. Use and trust in materials posted on social media (selected results).

		I consult and trust	I consult but <i>do not</i> trust	I <i>do not</i> consult but trust	I <i>do not</i> consult and <i>do not</i> trust
Individual Twitter accounts	Researchers	28%	37%	7%	27%
	Journalists	29%	50%	21%	0
NGO Twitter accounts	Researchers	26%	33%	14%	28%
	Journalists	58%	25%	8%	8%
NGO Facebook site	Researchers	23%	28%	26%	23%
	Journalists	42%	42%	17%	0
Government Facebook site	Researchers	26%	30%	12%	33%
	Journalists	52%	30%	13%	4%

by researchers, industry was consulted by both groups (researchers 58%, $n = 43$; journalists 65%, $n = 23$). Government was similarly less trusted (researchers 42%, $n = 43$; journalists 61%, $n = 23$) and used (researchers 56%, $n = 43$; journalists 70%, $n = 23$) by researchers than journalists. Information on an individual Facebook account was viewed as largely untrustworthy. 79% ($n = 43$) of researchers and 67% ($n = 23$) do not trust this source, though around half of both groups consult it. In contrast, university Facebook sites are broadly trusted (researchers, 65%, $n = 43$; journalists 70%, $n = 23$). Industry Facebook sites were viewed similarly to their Twitter accounts, with researchers less trusting (40%, $n = 42$) than journalists (67%, $n = 24$), though use was similar (researchers 60%, $n = 42$; journalists 75%, $n = 24$). Significant differences ($p < 0.05$) were observed between trust and use of Facebook sites from NGOs and Government (Table 2). Reddit received amongst the lowest trust scores (29% from both researchers and journalists), though it was consulted more often by researchers (53%, $n = 34$) than journalists (24%, $n = 17$).

Continuing the theme of trust, we asked about trust in specific organisations or the scientists that represent them. Respondents were asked how much they trusted each organisation or scientists from specific sectors, with the options ‘a lot’, ‘some’, ‘not much’, ‘not at all’ and ‘don’t know’. Means were calculated based on ‘a lot’ scoring 1 and ‘not at all’ scoring 4 (‘don’t know’ answers were excluded), see Table 3. Journalists were significantly more trusting of other journalists than scientists were. Interestingly, scientists within industry were widely trusted, despite industry being somewhat less trusted overall. Of the sources considered, the government was least trusted by both researchers and journalists.

Table 3. Trust in sources of scientific information.

<i>How much to you trust:</i>	<i>Mean (sd)</i>
National government	2.72 (0.77)
Scientists at universities	1.91 (0.64)
Scientists in private sector	1.90 (0.84)
Medical/health professionals	1.70 (0.62)
Journalists	2.12 (0.75)*
Science as a discipline	1.20 (0.44)

* Mean for researchers 2.37 and journalists 1.69 ($p < 0.05$).

Overall, we found that only 32% of respondents trusted national government (i.e. respondents chose ‘a lot’ or ‘some’ responses), while 74% trusted journalists, 84% of respondents trusted scientists working in universities and colleges, 85% trusted scientists working in the private sector, 91% trusted medical and/or health professionals, and 99% trusted science as a discipline.

In a further analysis, we also looked at whether experience had any influence on trust in sources of scientific information. The responses were consistently similar for respondents who had less than (<) 10 years’ experience, and those who had more than (>) 10 years’ experience. The only question where this trend diverged somewhat was when respondents were asked about scientists at universities. Here, those respondents who had >10 years’ experience were more trusting; 89% of those with >10 years’ experience trusted scientists at universities, as opposed to 79% of those with <10 years’ experience.

Discussion

Respondents to this survey were highly experienced, with the majority having more than 5 years of experience communicating science, though journalists tended to have fewer years' experience when compared with researchers. When it comes to job roles, as journalists report a range of communication-oriented roles, though three also reported being researchers or health professionals and none worked as university lecturers. Scientists undertake the expected roles of researchers, health professionals, university lecturers and teachers, but several also carried out communication roles, including as activists, freelance communicators, bloggers and artists. One scientist also reported working as a policy officer. This multiplicity of roles was also found in a European study [Wilkinson et al., 2023] and may reflect changing expectations of and opportunities available to researchers, as well as changes in the broader media landscape that affect journalists. The range of roles undertaken by our respondents, combined with the wide range of communication activities reported by respondents suggest a group of researchers who are more committed to public engagement than those explored by Ndlovu et al. [2016], and with experiences closer to those reported in the U.K. [Hamlyn et al., 2015]. However, as these respondents were participating in a science communication training programme, they may not be representative of the broader Nigerian health research community. Nevertheless, the research suggests that there is a community of researchers in Nigeria who actively participate in science communication activities. These committed researchers could be supported to become ambassadors, encouraging their colleagues to undertake science communication activities as a way to further support the sharing of quality scientific and health information with the public.

RQ1: What public communication activities do Nigerian health researchers and journalists undertake?

Turning to specific activities, we see scientists participating in a wide range of activities including written communication, public talks, social media, working with teachers and face to face public engagement, activities journalists also undertake. These might be considered traditional forms of public engagement [Hamlyn et al., 2015; Ridgway et al., 2020], especially given the increased use of social media by researchers [e.g. Collins et al., 2016; Dol et al., 2019]. In contrast with journalists, researchers have little experience working with the arts, making videos, communicating with policymakers or engaging in festivals. The high levels of participation in research communication activities by our scientist and health professional respondents contrasts with earlier studies suggesting such activities are 'an adjunct to their research work, something that takes up time and resources that could instead be devoted to research' [Casini & Neresini, 2012, p. 58].

Journalists' expertise with a wide range of media, such as videos, may reflect the broader shift within this field toward multimedia journalism [Neuberger, Nuernbergk & Langenohl, 2019]. The broad range of communication activities undertaken by both groups is reflective of recent research from Europe into the practices of science communicators (which included scientists, journalists and press officers amongst others), where writing for the public, social media activities, public engagement and outreach events and engaging at festivals were amongst the most commonly reported [Ridgway et al., 2020]. However, notable in journalists' responses was that 45% ($n = 11$) have no experience of working with

scientists. Other studies have highlighted the challenges faced by a variety of science communicators in reaching scientists [e.g. Casini & Neresini, 2012; Neresini & Bucchi, 2011; Wilkinson et al., 2023].

Our study also explored the capacities in which researchers and journalists undertake their communication activities, which we believe has not previously been explored. While both journalists and researchers undertake a range of communication activities as part of their professional roles, they also do these activities in a personal capacity and on behalf of communities. Further research is warranted to explore their motivations for undertaking communications activities either on behalf of communities or in a personal capacity.

RQ2: What motivates them to undertake — and what stops them from undertaking — these activities?

We explored the communication goals of researchers and journalists, to better understand why they undertake public engagement activities. Much like previous studies, both journalists and researchers indicate a desire to educate, inform, entertain and inspire, motivations which could be argued to align with one-way models of science communication [Dudo & Besley, 2016; Ridgway et al., 2020]. Notable differences between journalists, who were more likely to seek to persuade, and scientists, who were more likely to seek to entertain, did exist. Those with under 10 years experience were more likely to want to influence others (encourage or persuade) or to want to promote themselves, their work or their projects, than those with over 10 years experience, perhaps indicating a shift in motivation that could be followed up in further studies.

Although participation rates amongst our sample are high, the barriers they face match previous work in other contexts, including lack of resources and the challenge of getting others involved [Wilkinson et al., 2023]. However, it is notable that lack of time did not feature as a key barrier to this group (reported as a barrier by 17%, $n = 7$), who instead felt they lacked support from managers and encouragement from funders. It could be argued that funders have been a key driver behind moves to increase scientists' public engagement in Europe and North America, which may explain this difference and suggests an opportunity for funders in Nigeria to encourage their awardees to undertake communication activities.

RQ3: How do Nigerian health researchers and journalists evaluate the trustworthiness of a range of information sources?

Regarding trust, our study sheds some light on the extent to which researchers and journalists trust particular sources of information. Broadly, researchers and journalists trust information sources linked to research/science, such as academic journals, conferences, science magazines and material produced on behalf of universities. This is mirrored by the high levels of trust in the discipline of science and those with science/health credentials. This is similar to findings from a European study which found the highest levels of trust accorded to scientific journals, conferences and magazines and university sources, though personal networks were also rated highly [Ridgway et al., 2020].

The picture is more mixed when it comes to industry, government and NGO sources. Although scientists in the private sector are trusted, industry sources are treated with more scepticism by researchers than by journalists. Further investigation is needed to understand this difference as a similar percentage of respondents consult industry sources (55% of researchers and 59% of journalists consult industry websites and press releases). A similar picture arises in relation to trust in media and NGO sources. It may be that the experience that journalists have with these sources has enabled either pragmatic or contextual trust to arise [Manninen, 2017]. Further research is needed to understand trust issues in the Nigerian context. In any case, journalists in Nigeria seem willing to trust a broader range of sources than the science communicators responding to Ridgway et al.'s [2020] survey.

Both groups considered material posted on social media as largely untrustworthy, though this did depend on the source, with universities the only source trusted by both groups. Although treated skeptically by researchers, industry and NGOs were broadly trusted by journalists. Government social media accounts were the least trusted of the organisational sources suggested, mirroring the relatively low level of trust given to the National Government as a source of scientific information by our respondents. While these findings would need further study, it perhaps highlights an opportunity for Nigeria's Government to increase their engagement with scientists and science as a starting point to increase consensual trust, at least among scientists and journalists. There are also opportunities for researchers and journalists to partner with government to co-create science engagement solutions, particularly for public health problems. Such an approach could increase trust in scientific information provided by government sources, such as public health messaging.

This study is limited in scale, drawing on the perspectives of only 69 respondents and drawing from a pool of people who had voluntarily chosen to undertake training in science communication. It seems likely that these respondents are already interested in science communication and may not be reflective of the wider population of Nigerian researchers and journalists. Equally, with more than 300 applicants for this training programme, there is clearly an interest in science communication in Nigeria. Nevertheless, the research reported here should not be considered representative of the wider population of Nigerian health researchers/professionals and journalists and further research is needed to explore how representative these findings are. Nonetheless, these findings gesture towards the potential for future studies, while giving a flavour of some perspectives on science communication in the Nigerian context and going some way to fill gaps in our understanding of the perspectives of researchers and journalists from the Global majority.

Conclusion

This study sought to fill a gap in our understanding of the communication practices of researchers and journalists from Nigeria. This study found both groups to be actively involved in science communication, though journalists indicated familiarity with a greater range of communication tools. Both researchers and journalists indicate high levels of trust in science and scientific sources of information with more mixed views on the trustworthiness of industry, NGOs and governmental sources. Journalists were consistently more trusting of these sources,

perhaps reflecting their familiarity with them, though both groups report consulting a wide range of sources. Our research suggests a broad range of motivations for communicating science and health information, with some striking differences between scientists (more likely to seek to entertain) and journalists (more likely to seek to encourage evidence-based attitudes and persuade people to adopt their views). Both researchers and journalists indicate high levels of trust in science and scientific sources of information with more mixed views on the trustworthiness of industry, NGOs and governmental sources. Journalists were consistently more trusting of these sources, perhaps reflecting their familiarity with them, though both groups report consulting a wide range of sources.

This study suggests several areas for future research: the particular challenges that the Nigerian researcher respondents faced in gaining support from managers for their work — which has not been reflected in other contexts studied — points to a need for further research in Nigeria. This could look to engage the hierarchies in academic organisations to examine similar questions about the barriers to science communication they experience. Further research could explore the motivations of Nigerian researchers and journalists for undertaking communication activities on behalf of communities, the challenges they face and how these activities are recognised within their professional roles. Our research also points to both groups undertaking a range of communication activities in a personal capacity, and research could usefully explore the motivations and barriers for such activities.

In terms of practical recommendations to improve science communication, it seems that the researchers and journalists surveyed may benefit from projects or interventions to provide further training or experience in creating podcasts, educational games, museums collaborations and infographics. For the surveyed researchers, they may benefit from greater support to work with the arts, to make videos, or to communicate with policymakers. Radio is a popular medium in Nigeria and there are opportunities to merge formats, such as producing docu-dramas and training could be delivered to both researchers and journalists to support such programming. The extent to which these findings apply to Nigerian science communicators more generally may be a fruitful line of questioning for future studies.

Our findings also suggest that researchers could be further supported or encouraged to participate in science communication, pointing to the role that funders could play in promoting such activities and the support that managers could provide to enable them to take place. Those researchers who are experienced and active in science communication could also share their expertise with more reticent colleagues to foster a culture of communication. Training journalists would support them to actively seek information from local researchers and health practitioners, with a view to improving the quality of information available to the public. There are also opportunities for researchers and journalists to partner with government to co-create science engagement solutions, particularly for public health problems. Such an approach could increase trust in scientific information provided by government sources, such as public health messaging.

This exploratory study involved researchers and journalists who had chosen to participate in science communication training and were therefore likely to be undertaking some science communication activities already. As such, the sample

may not be representative of the wider community of researchers and journalists in Nigeria.

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