

APPENDIX C

QUALITATIVE DATA

RESPONSES TO QUESTIONNAIRE

The responses of the twelve interviewees as described in the Qualitative Data and Findings section of the study follows below. This is a compendium of the verbatim responses received from twelve interviewees mentioned in the study and makes up the qualitative component of the research.

Category	Interviewee	Institution / Publication /Title
Practicing science journalists in South Africa	Sarah Wild (SW)	Former <i>Mail & Guardian</i> Science Editor, now a freelance science journalist who writes for local and international publications
	Elsabe Brits (EB)	<i>Die Burger/Beeld</i> , now freelancing for News24
	Tamar Kahn (TK)	Business Day , Health, Education and Science Editor
	Tanya Farber (TF)	<i>Sunday Times</i> , science writer
	Pericles Anetos (PA)	<i>Sunday Times</i> science writer
Former Editors and News Editors (mix of daily, weekly, regional and national editors from different media houses)	Kevin Ritchie (KR)	<i>The Star</i> , now freelancing after 27 years of editing newspapers
	Schalk Mouton (SM)	Former news editor of <i>Beeld</i> and <i>The Times</i> newspaper, now employed at the University of the Witwatersrand
	Natasha Joseph (NJ)	Former news editor of <i>The Times</i> and <i>City Press</i> , now with <i>The Conversation</i>

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	Shaun Smillie (SS)	Former Science Desk incumbent at the <i>Saturday Star</i>
	News Editor	Editor at Independent Newspapers (incomplete, dropped from study)
Science communicators	Robert Inglis (RI)	CEO of Jive Media, a science communications agency that generates science news content
	Prim Gower (PG)	Former education editor of the <i>Mail & Guardian</i> , now at the University of Pretoria
Scientist	Prof. Lee Berger (LB)	Palaeoanthropologist, Professor of Evolutionary Studies and Reader in the Public Understanding of Science at the University of the Witwatersrand

RESPONSES

1. The role of the media

1.1 Do you believe that journalists have a responsibility to make scientific knowledge accessible to the public? Why?

TF: Yes, most definitely. Despite all the challenges in South Africa, we have an extremely robust research community in science and every bit of knowledge can play a role in a better country. There is no reason for such information to remain beyond the public gaze when much of it is generated by public institutions like universities.

TK: Yes. Firstly, because scientists should be held accountable to society, just like anyone else. Secondly, some of their work is publicly funded – we need to know what they are doing with our money.

EB: Absolutely, now more than ever. Ironically, we live in the information age but proper and quality information is so diluted, dumbed down, and riddled with unsubstantiated claims that we need to write science news which not only educates, but informs.

NJ: Absolutely. Most of the work that's emerging from universities and research institutions is funded by taxpayers, so pragmatically there's good reason to ensure those findings are widely disseminated.

KR: Yes, because science is critical to everything we do; it informs our past and (in the case of climate change and global warming) points out the way for our future. I do believe that journalists have this responsibility. I think the problem with academia is that scientific knowledge doesn't naturally filter down to the public. Scientific journals are not layman friendly, and high costs make them inaccessible. Without the media, scientific breakthroughs and discoveries would simply remain in the bubble of academia. An uninformed public is susceptible to the likes of fake news.

SM: Yes, I do. Journalism's role is to inform, educate and entertain. As part of both informing and educating the public, journalists have a responsibility to make scientific knowledge accessible to the public, especially where the science is of public interest. This is particularly important where it comes to issues like public health, environment, climate change, and social justice issues, amongst others. By saying this, however, I do not believe that journalists alone have the responsibility to make scientific knowledge accessible to the public. The main role players here would be scientists themselves, and science communicators.

SW: Scientific knowledge and literacy allow people to make informed decisions about their lives and bodies. Without this knowledge, they are at the vagaries of politicians and populists.

PA: I think the media has a responsibility to make valuable scientific knowledge accessible to the public. I think that access to scientific developments and knowledge has a wide range of benefits for the public, but I think that the media's responsibility is limited by the constraints of the news cycle that journalists operate under.

RI: Absolutely. Science has significant consequences for the society in which we live, it is crucial that our society understands the processes of science and the knowledge that is emerging from scientific processes. It is of public importance and different to how scientists communicate amongst themselves, it is the way the public integrates communication and the media have a role to play in bridging those language and cultural processes.

PG: Yes. Journalists have a key role to play in informing, educating the public and holding public institutions to account.

LB: Definitely, I am a keen advocate for open science and open access. How can we undertake science and not tell the public about it? I believe that scientists should work with the media to play an active role in enabling the public's access to science.

1.2 What or who do you believe influences the science news agenda in South Africa?

TF: I think in the current context of 'fast news' creates a highly competitive space regarding the quantity and speed of content production in mainstream media. The news agenda is set through three different sets of actors:

- communication departments at universities who know how to write an excellent press release,
- news editors who can quickly spot a news angle that would be of interest to a broad community, and
- journalists who can quickly ascertain how easy it would be to create an accessible news angle out of scientific press releases.

TK: Media are largely reactive - the news agenda is very much driven by researchers, universities, and the science department. There is very little investigative work in this arena.

EB: Science news in SA is not evolved enough to be influenced yet. I think it stands on very wobbly legs.

NJ: There isn't much of a science news culture in SA. Most newsrooms have done away with specialist journalists, including those who cover science. So I'd say a lot of science news features in the media as "fillers". Universities for instance send out press releases about new research, and those press releases are reworked (sometimes barely) into "news articles" that then fill a 300 or 400 word space. Obviously that's not always the case. Some papers (the *Sunday Times* and *Business Day* come to mind, although they're not consistent) have solid reporters who are able to interpret scientific findings and results, conduct researcher interviews and publish those. I'd guess that most of the science news that makes the newspapers/media is "sexy" like big new fossil finds, a medical breakthrough, or something that's got a catchy headline (recently, for instance, a UWC researcher's work about "cannibal snakes" made it into the papers – almost certainly because it's "quirky" rather than because of any broader public interest...which is not to say the research isn't good and valuable, but I don't think that's why it got space!)

KR: *The Star* used to be very good with doing just that, today it's mostly the *Mail & Guardian*. It's predicated on back desks being interested and journalists being committed. At *The Star* that was a combination of people like Cecilia Russell and Jillian Green on the desk and Shaun Smillie as the writer.

SS: The big discoveries and announcements. This is where universities use their PR machinery to get the message out there. Also easy to understand science stories.

SM: The science news agenda is dominantly driven by the research output from research facilities and universities – either through the researchers themselves, or through the communications departments of these institutions. While journalists may believe that they drive the science news agenda (and while working as a journalist I would have argued the same), this is far from the truth. Journalists rely greatly on science research output from

communications departments of universities.

SW: South African patriotism (for some reason, in South Africa, scientific achievement or discoveries are often equated with patriotism -- a very dangerous framing, to my mind); novelty; the news diary (and what is happening on a given day); the character of the particular news outlet; the availability of the reporter to cover the story; and the perceived news value.

PA: I think the science news agenda in SA is influenced by the general news agenda of the day and is overshadowed by that news agenda. The reality is a result of lack of staff in newsrooms and editors needing to be very discerning with the resources they have. Science news unfortunately falls lower on the agenda. I think that other factors that influence the science news agenda in South Africa are international wires or platforms like *The Conversation* which SA publications are more likely to publish than commission their own article on the subject in question. Lack of understanding about science is also a factor. Another factor is that many of the scientific discoveries may be too niche for mainstream publications in SA.

RI: The science news agenda is influenced by perceptions of what people are interested in reading. Perceptions are largely in the minds of news editors. There is a strong developmental agenda and I believe that the entire public discourse centres around how science impacts or supports the development agenda in SA from a socioeconomic perspective. Social perceptions also impact on science news and have implications for science in SA. The economic benefits of science to South Africa centre largely around benefits to people or the country. Environmental and health are two topics that are seen as growing in relevance. Health and environmental sustainability usually makes the news on the basis of reducing risk to the public.

PG: It depends on the news happening that day, tips from people in universities or research organisations, and new research.

LB: Scientists are the experts and they should be setting the science agenda in their respective areas of expertise, but sadly this is not the reality.

1.3 Do you believe that the media's role in society is to inform, educate and empower citizens through the provision of quality science news?

TF: Most definitely. Not at the expense of all the other beats, of course - we also do need politics and crime and arts and sports and everything else - but science is particularly important in this era of 'fake news' because it creates a mindset in which empirical evidence and data become highly valued over opinions disguised as news.

TK: Partly. The role of the media is also to hold people, institutions, and government accountable.

EB: Yes, the editors and news editors just do not know it yet.

NJ: Certainly that's part of the media's role. Especially in a world where fact and science are becoming increasingly threatened by rhetoric and bluster.

KR: *The Star* used to be very good with doing just that, today it's mostly the *Mail & Guardian*. It's predicated on back desks being interested and journalists being committed. At *The Star* that was a combination of people like Cecilia Russell and Jillian Green on the desk and Shaun Smillie as the writer.

SS: Yes

SM: Yes, I do. However, this role is being undermined by increasing pressures on journalists to cover a wider variety of news, and no news institution has the luxury of having science as a dedicated news beat anymore.

SW: Yes

PA: I think that providing quality science news is one of the roles of the media.

RI: Yes. It is not its only role. Its role is to challenge and promotes critical questioning around science (output of research) and the impact of that knowledge in society, some of which may be technological development (applied research). A strong role is to raise awareness of the science through informing the public of science. Science has the power to connect people to one another. Media has a strong role to play in the science process in terms of connecting people who can advance knowledge production and has an important role to put information out and to ensure that a response is elicited. It also encourages public debate and engagement around emerging sciences.

PG: Definitely

LB: Absolutely. It would be great if journalists could spend more time producing quality science news, investing time in understanding the subject matter and understanding the science better.

2. News selection

EB: One of the biggest issues is that news editors and content editors do not see science as "breaking news" even if it is. They don't understand the scientific

process at all. Not at all. Nor do they really understand what research methods are followed and why a typical “PR piece” which quotes stats from the air regarding nutrition/depression, is not proven science, but just piece a pseudoscience to sell some product. They mostly do not differentiate between a PR company and a research institution/science communicator at a University. I can write 10 000 words about this.

2.1 What are the practical factors that influence the selection of science for publication?

TF: The key practical factors are:

- the news value in terms of the daily lived experience - for example, research on sugar and lifestyle and diet and its effect on the body will be more interesting to people than, say, quantum physics
- as mentioned above, the crafting ability of the PR department sending out the release
- the value of some disciplines within science in terms of popular culture - for example, palaeontology and forensics will have broader appeal than, say, mathematics which is more abstract.

So in sum, people like science they can relate to, imagine in the physical world, and that which affects their lives.

TK: Time; competition with other stories/events; location; our audience; is it interesting, or significant

EB: I don't let it influence me, it needs to be news.

NJ: As above – is it “sexy”, or “quirky”; does it have huge societal impact (like a vaccine for instance), or is it relevant to a big “wicked problem” like climate change. Also, frankly, has all the work been done for the journalist – quotes provided, a simple summary etc.? That saves time and means a story can basically be put onto the page without much more time and effort.

KR: Whether the publication actually understands the importance of the revelation; being tipped off well beforehand and able to prepare (Lee Berger has been outstanding at this) in terms of writing the story and preparing the full package of infographics, sidebars, leads, interviews and anchor stories, as well as analysis.

SS: The easy to understand science stories and those that are easy to access. Especially stories with themes that readers can relate to.

SM: Time, space (or airtime for broadcast), and resources are the predominant factors that influence the selection of science for a publication. The importance of a science story and how interesting it is, and what impact it might have on the public almost plays a secondary role. When making a decision

on whether to carry a science story, a news editor would mainly consider the following:

- Do we have time to turn the story around?
- Do we have space to carry the story?
- Do we have someone in the newsroom to actually do the story?
- Are there any other more important stories that we should be focussing on?

While science articles would not normally compete with what are perceived as “more important” news such as politics, it will compete with more “softer” articles such as lifestyle articles. For this reason, science stories – unless it is a massive story that has great impact or interest on the public will rarely be featured on the front page. A science article would usually be carried more to the back of a news section of the paper, which usually has earlier deadlines. The easier it is to do the story, the more likely it will be to be included in the newspaper.

SW: Availability of expertise; able journalist; the interests of the news editor; space in the medium (paper, broadcast time); time of press briefing; exclusivity of story.

PA: The availability of reporters is the main factor and where the news cycle is in a day is another important factor. Access and availability of information is also crucial. If a reporter can't get comment fast enough, the editor is likely to instruct the reporter to drop the story or the reporter may drop it themselves. Proximity is also a factor "Is it a local discovery? I think that the impact of the discovery will determine coverage as well.

RI: Information of relevance to the target audience, will it help them in some way? Novelty or innovativeness of the science in respect of the way it can solve a challenge that people can easily identify with

PG: Health dominates as does social development research, as long as it is relevant to the target audience. Deadlines are also a key factor. Also the Availability of journalists, exclusivity, access to information, access to sources.

LB: I believe that giving journalists as much information, including multimedia material, empowers them to put together great stories.

2.2 In your opinion, which of the following practical factors influence the publication of science?**a. Commercialisation**

TF: No

TK: No

EB: I don't let it influence me, it needs to be news.

NJ: No

KR: Not really

SS: No

SM: No

SW: Definitely not

PA: When it comes to business publications commercialisation is a factor in reporting but that is only true if it is a local company and the article will be able to speak on what impact the discovery will have on the company. If that can be shown a story should be published especially if the company is listed. Economic contribution to the country would also be a reason for publication but I think that media has come to shy away from unsubstantiated expectations in economic development.

RI: I don't think so, not in South Africa but elsewhere in Africa

PG: No, there are lines between editorial and advertorial in South African newsrooms.

LB: I don't think so.

b. Resources (proximity to news events)

TF: Definitely

TK: Sometimes

EB: No

NJ: Definitely a factor

KR: Very much so

SS: Yes.

SM: Budgetary constraints in news organisations can be a factor that influences the publication of science. The cost of travel can be an inhibitor. In an age of depleted newsrooms there is a tendency for news editors to be reluctant to send reporters out of the office on stories. The reason for this is that reporters are often working on several daily stories at one time.

SW: Yes

PA: Proximity is a factor but it is more about being able to speak to those involved, even if that is by phone

RI: Yes

PG: Yes

LB: I assume so

c. Audiences (relevant to audience or cultivating audiences that advertisers want to reach)

TF: It can be a tough sell with science when competing with things like celebrity news, but the more well-heeled audience so adored by advertisers are often quite keenly interested in science, I think

TK: Yes

EB: I/we don't have contact with the advertising department and have complete editorial independence. I really try not to write for an audience.

NJ: Probably not much at all

KR: Very much so

SS: No

SM: Yes

SW: Yes - First and foremost, the story has to be relevant to a media outlet's audience. That perception of value usually has to hold true for a number of individuals in the production process before it even gets to the reader -- notably, the journalist, the news editor, the publication editor.

PA: I think this is an issue for the larger main news outlets in SA

RI: Definitely

PG: Not always

LB: Depends on the publication

d. News subsidies (any measures that make it easy to cover news including events, media releases and media conferences, and public relations material)

TF: It is a balancing act ... journalists want low hanging fruit but they also want exclusive content (I personally do not enjoy events like news conferences and mass press release distribution because I know so many other journos will be writing on the identical topic quoting the exact same people)

TK: Yes

EB: I do find it very helpful due to the distances in SA, one can't travel to everything and there is just no budget for it. In science writing one needs a factsheet to explain certain things. But I differentiate between PR material and the material from universities and research institutions. There are very few reliable PR companies in SA regarding science news, compared to excellent media material supplied by most universities.

NJ: Huge factor

KR: This is as relevant for science as it is for any other event or subject

SS: Yes. Media releases, media conferences and public relations material definitely do make it easier to cover science stories. They are a good way of letting journalists know about a story, and if there is an embargo, provides time to gather all the relevant information for an article. Not sure if this falls under news subsidies but grants and funding are also useful in providing the financial assistance for journalists to work on particular in depth stories.

SM: Yes

SW: No

PA: I think those are the important aids to help get the story published. But it depends on what the aim is. If the aim is just for the news to be published from a press release then sending one out may achieve that goal. But if one wants to educate the public as is one of the goals of the media more needs to be offered to the reporter.

RI: Yes

PG: Yes

LB: Definitely, the more you give the journalist in terms of material, especially multimedia material, the more likely they are to cover the story comprehensively.

e. Sources (access to available sources, including influential or elite people, experts, specialists)

TF: Most definitely

TK: Yes

EB: There is access to sources, but the time they sometimes take to respond can be problematic. These days news is faster, and it is online first.

NJ: Big factor

KR: Absolutely

SS: Yes

SM: Yes

SW: Yes - This determines whether a journalist will continue chasing the story. If it is too difficult to get comment or sourcing, then they will have to give up on the story to follow something else.

PA: Crucial

RI: Yes

PG: Yes – this is immensely important

LB: Yes

f. Production processes (including deadlines, space constraints and format limitations)

TF: Yes definitely

TK: Yes

EB: Space is only a constraint for print, not online. I don't struggle to meet deadlines, but stories can be stuck for hours in the production process due to too few people left to do the work.

NJ: Somewhat of a factor

KR: Very much so

SS: Yes

SM: Tight deadlines can limit the amount of reporting on a story. It might mean having to limit the number of voices in a story, particularly if those voices are hard to track down. The problem with space constraints in a newspaper environment is that it is often up to the sub-editor to make the cuts on a story. This often occurs without consultation with the journalist. At times this can lead to inaccuracies creeping into the story. A new trend in journalism is the use of "fast news" teams - these are deskbound online reporters who aggregate the news. What they do is often rewrite press releases and articles that appear in other media. The result is superficial reporting, where sources aren't interviewed and stories not interrogated. Also different angles aren't pursued.

SW: Yes. This depends on the medium. Many of these constraints fall away in the online space, but print and broadcast continue to be perceived as higher value to communicators and politicians. I am not sure whether that is true, especially considering how many more people read a story online than in a print publication. But the perception of influence remains. In traditional media, production processes are important considerations in whether a science story will

be included in a given publication or broadcast.

PA: Yes. This is important.

RI: Yes. Off the wires is best way to get a South African science news story going via an international news network, then publish it in SA. Well-written content and how far along the path has been developed, are crucial factors for publication.

PG: Yes. Deadlines are critical – journalists cannot miss deadlines

LB: Without a doubt, the same holds true for newsrooms across the world.

g. None of the above

Why do you think so?

KR: Science, if handled well, can provide incredible content for newspapers. In the case of *The Star* we only have to think about *Homo naledi* and before that Little Foot. The problem starts with resources, pulling someone off the general news diary of crime, council, courts and breaking stories to spend time with researchers and then negotiating for enough space to do justice to the story. You also have to find a reporter who really wants to do the story, not everyone is interested in the subject or, if they are, have the writing skills to match their passion. The newspaper's job is to make the science accessible, relevant and, quite frankly, fascinating for the reader.

SM: There has to be a story. Often, a simple discovery is not enough. There needs to be a "so what" attached to it to make it newsworthy. The idea of a story is often linked to a narrative and accessibility. These elements affect whether it will be relevant to the perceived audience. Exclusivity also affects whether a journalist will follow a story. Media officers often believe that a press briefing or media event will get them more coverage, and thus result in greater impact. That is not always the case. Exclusivity means that the story will reach a more targeted audience.

<p>3. News values</p>
<p>3.1 What do you believe makes news worthy of publication? Select the appropriate categories from the list below:</p>
<p>- Exclusivity</p> <p>TF: Yes TK: Yes EB: It is very hard to get an exclusive these days, maybe an investigative piece. I don't support exclusive stories in science and health reporting, it should be open. Yet on other beats it is still something big. NJ: Yes KR: Yes SS: Yes SM: Yes SW: Yes PA: Yes RI: Yes PG: Yes LB: Definitely</p>
<p>- Breaking news</p> <p>TF: Yes TK: Yes EB: No. Not necessarily NJ: Yes KR: Yes SS: Yes SM: Yes SW: Yes PA: Yes RI: Yes</p>

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PG: Yes LB: Yes
- Relevance to audiences
TF: Yes TK: Yes EB: Yes NJ: Yes KR: Yes SS: Yes SM: Yes SW: Yes PA: Yes RI: Yes PG: Yes LB: Yes
- Human or public interest stories
TF: Sometimes TK: Yes EB: Yes NJ: Yes KR: Yes SS: Yes SM: Yes SW: Depends PA: Yes RI: Yes PG: Yes LB: Yes

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- **Close to home (proximity)**

TF: Yes

TK: Yes

EB: Yes

NJ: Not necessarily

KR: Yes

SS: Yes

SM: Yes

SW: Yes

PA: Not always

RI: Yes

PG: Yes

LB: Yes, although you can make a global story relevant to local audiences.

- **Very good or bad news (including conflict)**

TF: Yes

TK: Yes

EB: Yes

NJ: Yes

KR: Yes

SS: Yes

SM: Yes. Unfortunately more and more violent news makes the news

SW: Yes

PA: Yes

RI: Yes

PG: Yes

LB: Yes

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- **News significant in magnitude**

TF: Yes
TK: Yes
EB: Yes
NJ: Depends
KR: Yes
SS: Yes
SM: Yes
SW: Yes
PA: Yes
RI: Yes
PG: Yes
LB: Yes

- **Stories with an element of surprise or entertainment**

TF: Yes
TK: Yes
EB: No
NJ: Yes
KR: Yes
SS: Yes
SM: Yes
SW: Not always
PA: Yes
RI: Yes
PG: Yes
LB: Yes

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- Contentious or dramatic stories

TF: Yes

TK: No

EB: No

NJ: Yes

KR: Yes

SS: Yes

SM: No. Science news does not have to be dramatic.

SW: Yes

PA: Yes

RI: Yes

PG: Yes

LB: Yes

- **Good visuals (pictures, infographics)**

TF: Depends, only works if the story itself has news value, can't just be good visually with an empty angle

TK: Yes

EB: No

NJ: No

KR: Yes

SS: Yes

SM: Yes

SW: Yes

PA: Yes

RI: Yes.

PG: Yes. Definitely

LB: Yes. From experience, this is a no-brainer.

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- **Stories that involve the powerful, the elite or celebrities (prominence)**

TF: Those don't have value for me but our news editors understand it has value to growing audiences unfortunately

TK: Not celebrities

EB: No

NJ: Not necessarily

KR: Yes

SS: No

SM: Yes

SW: No

PA: Yes

RI: No

PG: No

LB: I assume so

- **Follow up stories**

TF: Yes

TK: Yes

EB: No

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NJ: No

KR: Yes, on the proviso that the foundation has been laid properly with the first story.

SS: No

SM: Yes, but more because of sustainability of the story

SW: No

PA: Yes

RI: No

PG: It depends on the topic, if there is new research or a new angle.

LB: There are always follow up stories to tell.

- **Stories that are easy to share**

TF: Yes

TK: Yes

EB: No

NJ: Yes

KR: Absolutely

SS: Yes. If the story is newsworthy, this will happen automatically

SM: No

SW: No

PA: No

RI: Yes

PG: No

LB: Definitely. All print stories need social media angles.

3.2 Do you believe that there is dissonance between your professional news values and the news that is eventually published?

TF: Off the record ...

TK: No.

EB: No, not generally.

NJ: Sometimes, yes (though very different in my professional world these days, given the focus of *The Conversation Africa* and particularly my beat – science and tech). Far less dissonance here than in conventional newsrooms.

KR: Yes, because newsrooms are increasingly smaller, the news hole to do justice to these kinds of stories is diminishing and the reporters that would have done these stories were mostly senior writers who have either been culled through restructuring or promoted up onto desks where they no longer write.

SS: Sometimes. There have been occasions where a sub-editor might write a headline, or sub-head, that are not scientifically accurate and go against the context of the article. An example might be where I have written an article on hominids and a sub-editor uses the rather archaic term of ape man in the heading.

SM: This depends on the publication. At *Beeld*, there was a definitive dissonance between the staff and the reader. Where the staff were as a whole more liberally inclined, they wrote for a more conservative readership, and focussed on things that the readership wanted – such as crime, farm murders etc. The victims are almost exclusively white. This, I felt was dissonance between my news values and the paper's. At *The Times*, everything had to be “sexed up”, especially the front page “splash”. I believe if the story is strong enough, it will come through. You don't need to dramatise it. I often told journalists to cut phrases like “In a dramatic turn of events”. As an environmental reporter, I was often frustrated with how stories that I saw as highly important are pushed to the back and cut into a bite sized article.

SW: Once again, freelancing means that I can tailor a story to an outlet. However, there are instances in which something I believe should be published cannot find a “home”.

PA: To some extent I think that is true.

RI: Not sure

PG: Sometimes when you don't have control over the original story you write and it is changed by subs or accompanied by a different picture altogether.

LB: Not applicable

3.3 Do you think that science news stories are ignored, excluded or bumped to the middle pages of the newspaper in favour of other news genres like politics?

TF: Yes, science has a legacy of being seen as soft or technical news when I believe it deserves more prominence, but it is up to us journalists to make science sexy.

TK: Yes

EB: Yes, it has been like that since when I started my career in 1993 and it is still. I do however believe it is not like that in Europe and the USA. I have seen instances where South African science news has made front page news overseas, but not here, to my extreme frustration. Our own stories are not deemed newsworthy enough, but foreign countries realise the potential. We would rather put sport, politics and violence on p.1. Science news rarely makes it to p.1, unless when it is negative news, and possibly when sex is involved. The majority of stories I could manage to get onto the front page were palaeontology

from Wits, which I felt was taken for granted and news editors and editors still did not grasp the true uniqueness of our palaeontological landscape, and then stories about the SKA and MeerKAT. South Africa, in general, has not released the power of science and technology, which is a tragedy.

NJ: Absolutely

KR: Yes, because of the points in 3.2 but also because there is no one on the paper who champions the cause and perhaps no one on the part of the institution marketing it. The exceptions traditionally were Lee Berger and the Wits Communications department.

SS: Yes I do. Of course, the importance of a science news story depends on where it ends up in a newspaper. Often though I feel that news editors and even editors have a fear of science stories, that they are too complicated for their readership to understand, or they won't be able to understand them. This fear can at time even result in a news editor dropping the story before even hearing out the reporter. To counter this, a reporter needs to put in a good pitch on a story.

SM: They are not necessarily ignored, but they certainly don't carry the weight that issues like politics carry, and are usually pushed to the back. On one occasion I attended a highly important news event for *The Times*, and briefed the then News Editor that it is a highly important story and issue and that she needed to keep decent space up front in the paper. The news event started at 11 and at about 11:15 I got a call from the news editor to tell me that I had to file a couple of paragraphs before 12, so that they can send the page (it was page 8) off. She didn't even consider what the story was that came out of the news event, she just wanted to fill an early page and get it off.

SW: Yes. South Africans are, in general, interested in politics (and corruption), sport and celebrities. The reality is that South Africa is not a science literate country. News editors are trained to recognise what their audience would like to read/engage with, and the majority of citizens (and thus compartmentalised audiences) are not interested in science.

PA: Yes

RI: Yes. Hardly see science leading – it is usually politics, economics and crime.

PG: Yes. Someone has to make a case for science in the newsroom otherwise it is forgotten and sourced from press releases and newswires.

LB: I have had science related to new discoveries make the front pages locally and abroad.

3.4 How do you decide what becomes news?

TF: The first gatekeeping is the nature of the press release sent to me. If it is too technical, I tend to move on. Then, if it is accessible, I see if it can be simplified into a news angle that is both accurate but accessible (to avoid the accusations from academics of 'dumbing down' their research while also avoiding accusations from news editors that the story is 'too technical' - it is a balancing act!)

TK: Local science, or international science with a local aspect/ involvement

EB: Honestly, I have been a journalist for 25 years, and it is so inside me to determine what news is and what not. I feel it automatically. Even when I am on holiday, I would see a person, scene, anything and I would think: "That's a nice story!" I always have a camera, pen and notebook with me. I feel news, I feel what is a feature and what should be investigated further. I also feel BS. I also believe that you can teach a person up to a point that news and news values are, but you either have it, or you don't.

NJ: I consider relevance, interest, and whether it's the sort of thing that will engage our audience's curiosity.

KR: Your list on 3.1 is one of the best summaries yet of news values.

SS: A big decider for me is if the story is local. Publications are more likely to use wire copy, which is often cheaper than paying a freelancer. As a freelancer I need to find a news outlet that will go for the story. A lot also depends on the news editor or editor I am pitching too. The story does have to be relevant to the readership of the publication and provide a good narrative. It also comes down to how easy I can explain the science to the readers.

SM: My personal most important consideration is "why should anyone care"? If you can answer that question, you have a story. Whether it is an important news story, a softer human interest story or an informative science piece. The impact of the story is most important.

SW: Years of experience in recognising what can be turned into a story. It is about pattern recognition and mapping stories to audiences.

PA: It is guided by the factors listed above in 3.1

RI: Personal interest is a big factor

PG: Issues that impact on people, proximity of the event or news (local) and access to sources

LB: Not applicable

3.5 Which science topics or themes becomes news?

TF: I would say those with a local angle, those in a popular sub-discipline of science, those that can be visualised in the real world by the journalists and aren't too abstract and those that have a human face or champion (I sometimes intro on the scientist rather than what they've done or discovered).

TK: Local science, or international science with a local aspect/ involvement

EB: I try not to exclude anything – I also have my personal preferences – areas which I don't like to write about. Stories I pass to others. I believe you write best, when you write in the beat you love. Topics which affect people's health will always be news, because everyone is scared to die/to be ill. Lots of people still don't want to read about the environment, but they need to. Astronomy has become big news in SA, palaeontology has always been but since the late 1990s there was been a huge revival, climate change, water and food security, genetics (one would like to see more), TB and HIV.

NJ: Climate change. A lot to do with water, given Cape Town's recent troubles. Animals , especially "popular" creatures like rhino or lions. In SA, quite a lot of fossil news, given our rich fossil heritage. Inventions or innovations.

KR: Likewise, the more boxes it ticks in 3.1 against the other stories on the diary, the closer it gets to being the page 1 lead story. In granular terms, stories that give hope, dramatic discoveries close to home or end of the world discoveries, generally should own page 1.

SS: I think dinosaurs are a biggie. Hominid stories are good too. Quirky stories become news. Science stories on sex or dagga use, that kind of thing. The good quirky stories often end up on the down pages of page one, in a newspaper.

SM: While there is no specific topic or theme that guarantees something becoming news, there are some favourites, such as climate change, health, and wildlife poaching. Human origins have also become a hot topic, and people's fascination with their past and where they come from. Technology stories are

always interesting, especially where there are novel ways of using it, or where it becomes a perceived threat, such as the Fourth Industrial Revolution. If it impacts people, it is news.

SW: Too many to list, I'm afraid. That is like asking how long is a piece of string? Topics which are NOT likely to become news: internal institutional achievements; rags to riches graduation stories; a staged media event; a launch of a launch; institutional appointments (unless there is something really special about the role or the person); claiming an international discovery as a South African achievement because there was one South African on the team.

PA: Discovery and investment

RI: Health and environment and human development (social sciences) especially those that include statistics like the census for example, crime stats, poverty or jobs

PG: Definitely discoveries, health issues, environmental matters like water and energy

LB: Depends on the news of the day but the environment and climate change should make the news and ofcourse the palaeosciences!

4. The role of journalists, news generators and news editors in news selection

4.1 To what extent do journalists influence the publication of science news?

TF: I would say around 50% - we can select stories and pitch them but sometimes we are given stories, and sometimes they are packaged in a way that is different to what we envisaged

TK: It depends on the newsroom

EB: It depends how much experience you have, how much influence you have at an outlet, and how senior you are.

NJ: Barely, in modern newsrooms.

KR: Very much. They are on the front line, the first responders in the newspaper.

SS: A great deal. It is often the journalist who will approach a news editor with a story. The journalist also has to sell the story idea to the news editor. If it is a

good sell, the story will go into the publication.

SM: Journalists usually have to “sell” a story to a news editor. If a journalist can convince the news editor that the story is worthy of publication, and that he or she has space and time to do the story, the story has a good chance of being covered. If the news editor believes that the story can wait, and that the journalist can rather spend time on an alternative, more important or time dependent story, the journalist will be told to do the science story on another day (or keep it for the weekend). This happens very often. The journalist is the eyes and the ears of the publication. They know what’s going on out there. However, they can only convince a news editor if their story is strong and important enough.

SW: In my experience in SA newsrooms, I was seldom commissioned to follow a story. I usually brought the stories to my news desks. If I hadn’t found them and pushed for them, they would not have been published.

PA: They have influence in identifying the stories and pitching them to editors.

RI: It’s about stimulating public conversations about certain topics. Ultimately decision-makers are taking their cues from what the voices in the public are saying. Science communicators start conversations that policy makers pay attention to. Policymakers’ perceptions or awareness of the appropriate research on the topic must be included in their decision making and must feed into public debates on certain topics.

PG: Science news generators can influence journalists who have to sell the story to their news editors.

LB: Scientists, PIOs and science communicators can definitely influence the science news agenda.

4.2 Are journalists assigned to specific beats in your newsroom?

TF: Yes, but because of shrinkage in the newsrooms, we tend to write within our beats while also covering many other topics

TK: Yes

EB: We used to have beats, but not anymore. Since 2018 that is in my opinion, there is a tragic loss of expertise. It is the basis of all journalism. It was also the reason for me leaving permanent employment and starting a freelance career.

NJ: Yes, because that’s how our model was designed.

KR: Not any more after the first restructure in 2016.

SS: I freelance, but from my interactions with newsrooms, beat reporting is dying a slow death. Often specific beats are more like a side interest that a general reporter has.

SM: To a certain degree, yes. However, all journalists are told that they are “general” reporters first, and then have a beat that interests them. If there is a story outside of the journalist’s beat, and the journalist doesn’t have a strong enough story inside their beat for the day, they will often be assigned the story. It must be noted that this was four years ago, and from frequent media contacts I believe this is even worse now, where even section editors have to stand in for colleagues and have to carry the responsibility for a colleagues’ section when they are not available. The situation changed drastically over the past 10 or so years. At Beeld (2006 – 2009) we used to have specific “beats” or areas, and had even two or more reporters on “more important” beats like crime, politics etc. We also had a dedicated night shift reporter who would come in at 2pm and work until after the latest edition is sent off for printing. We dropped the night shift reporter in about 2008 due to resource pressures.

SW: They were, but I do not think that is still the case for science journalists

PA: They have influence in identifying the stories and pitching them to editors

RI: Not applicable

PG: Not anymore

LB: Not applicable

4.3 Do you have a specialist science news desk or reporter in your organisation?

TF: Yes

TK: Yes. A fair amount

EB: Not anymore, it was me.

NJ: Indeed – I’m the science and tech editor.

KR: I think there is a national science writer at Independent Media, but I don’t know for certain

SS: Not applicable

SM: Four years ago, at The Times, I was the specialist science reporter (There’s no media organisation with a dedicated science desk in South Africa that I know of). When I left, the beat was not replaced.

SW: I was a science desk editor, but was retrenched and told that science was a “nice to have”.

PA: As far as I am aware the health and science fall into one beat.

RI: Not applicable

PG: Yes when I was at the *Mail & Guardian*

LB: Not applicable

4.4 How much autonomy do you have in the newsroom?

TF: As a journalist, I have a fair amount of autonomy over what I write about but I have to write a damn good pitch, and then accept that once it has been subbed and has a headline and caption on it, it may not be how I envisaged it. This is a bone of contention for many of us journalists.

TK: Sort of – I cover science, but it is only part of my beat (I do health, education and some political reporting in parliament)

EB: I had a lot of autonomy for 21 years and suddenly it stopped. Unfortunately.

NJ: A great deal (but worth noting that I am a senior journalist whose held senior positions, and that tends to lead to greater autonomy in journalism’s hierarchy)

KR: When I was editor, total. Now I don't know.

SS: When I was in a newsroom, autonomy was dictated by the amount of news happening, and the availability of reporters. It would mean having to drop what you are doing to work on a breaking story.

SM: As described above, a journalist has relatively high levels of autonomy, but only to the extent where he or she can convince the news editor of the importance of the story. In the writing and content of the story, the journalist is mostly autonomous. However, the news editor will often insist on covering certain bases in the story, such as speaking to an analyst, having at least three sources, etc. Also the news editor might change the angle or rewrite for clarity. The more senior a reporter, the more authority (in general).

SW: I had complete autonomy, but that was mainly because I don't think anyone else knew what I was talking about. I had never had a "hard edit" (in which my copy was closely scrutinised, torn apart, and put back together) until I began writing for international audiences. South African newsrooms -- and I've written for most SA media houses -- do not have that rigour.

PA: The amount of autonomy a journalist has depends on the editor they have, I have had both periods when I have a lot of autonomy and other times when I have had very little.

RI: Not applicable

PG: Depends on the newsroom, not applicable anymore

LB: Not applicable

4.5 Describe your relationship with scientists and science communicators

TF: Mainly really good - I find scientists and science news generators really clever and interesting people. Some delight me with how they break the knowledge down and some infuriate me because they are so far down the rabbit holes of their research that they sometimes miss the main news angle completely when telling you about their work, or fail to make the content accessible even to the journalist who then still has to make it accessible to the public.

TK: Professional

EB: I hope it is a good one, one can't write stories without either one.

NJ: Cordial, even warm – they value what we do here at *The Conversation Africa*, and enjoy our system of collaborative editing.

KR: Personally, I had a great relationship with Wits in particular, while the people I worked with had incredible relationships with the actual scientists themselves.

SS: Pretty good, I think. Often they tip me off about a story that is about to break.

SM: My relationship as a journalist with scientists and science communicators was generally professional and respectful. Never friendly.

SW: For the most part, I have a very good relationship with scientists (there are one or two notable exceptions). I find that scientists are my first port of call for story generation - before communications officers, as they often offer stories to multiple outlets at once which make it difficult for me to pitch the story.

PA: I think overall I have had positive experiences, but I think it depends on the person and in some cases some scientists have not been willing to give me their time.

RI: I try to keep an open relationship with journalists

PG: Professional

LB: Professional, sometimes friendly

4.6 What role do news editors play in selecting science for publication?

TF: No role

TK: Very little – they take guidance from me

EB: Huge, as well as the content editors. The lack of understanding of what the scientific process is, even a peer review study remains a massive challenge.

NJ: When I was a news editor (two different titles, from 2009 to 2015), I was able to push quite a lot of science stories into the news pages because it's always been an interest of mine and I think science has huge value to the general public.

KR: Major. They fight for space and placement.

SS: Pretty good, I think. Often they tip me off about a story that is about to break.

SM: News editors probably have the most important role in a newspaper in selecting which stories are covered, and eventually published. After consultation with the reporters in the morning, the news editor decides which stories will be covered for the day, compiles the news diary and presents it to the senior editorial team. If the story is not on the diary, chances are it will not make it to the paper the next day (unless it breaks later in the day). The news editor also decides which stories are lead stories, and which are secondary or shorter stories. The news editor therefore is almost the main decision-maker on which science stories will be covered for the publication.

SW: In my experience, news editors have always been obstacles to overcome. You have to cajole and convince them to take a story. But they are the gatekeepers. Without their buy-in, a story won't get published.

PA: They are the final arbiters of what will make it into the paper or onto the website.

RI: I expect that they play a crucial role as decision-makers.

PG: A key role

LB: Not applicable

4.7 What role do science communicators play in influencing decision-making?

TF: None

TK: None

EB: None

NJ: Probably quite a big role – a Professor Lee Berger, for instance, brings his own “rock star” reputation to bear on anything he’s involved in, and that will

make his work particularly interesting to the media.

KR: When you trust someone and they give you a tip that's major you drop everything and start covering it. But if they're not known, it'll be an uphill battle. In that case, they normally need to be vouched for by colleagues or other scientists.

SS: Would that be decision-making in a newsroom or on a national level? On a national level, news does inform decision-makers.

SM: Science news generators have a large and increasing role in influencing the decision-making. As newsrooms get smaller and more junior, and resources shrink, news-editors don't have the luxury of having a reporter on a beat such as science (science as a beat is dying out in South Africa with most dedicated science reporters leaving their positions and not being refilled). Science communicators have an increasing role in almost doing the reporters' job in telling the news editor what the story is and why it is important. The easier science communicators make it for the reporter or news editor, the more likely the story will get covered. Journalists won't admit to it, but often a whole story is taken from a news release and published as is, with minor alterations to the intro/angle and perhaps the addition of an alternative analyst or expert in the field.

With increasing pressures on newsrooms, very few stories are actually originated by the journalist themselves. There is very little investigation of issues – such as on research done by the pharmaceutical industry etc. – especially in the science field. There is also very little understanding of – and training in – science and the scientific process for journalists, so most of the stories are originated either from contact with a scientist themselves, or through communications provided through the research organisations media office.

SW: With respect to science media officers, the way that we usually interact is that they will give me a heads-up about a story and then I will follow up with interviews. I am less likely to follow a story if the press officer has written a press release and disseminated it to others. I prefer to follow stories myself, but the tip-off can be invaluable in determining whether I follow a story.

PA: I think they can alert reporters and also direct them who to speak to on stories so their influence is quite large.

RI: I have good relationship with journalists and editors

PG: Professional relationships are important

LB: It is good to take journalists into your confidence, on expeditions so that you build a relationship with them.

4.8 How are sources selected and included in science news stories?

TF: First and foremost, it is about how available they make themselves. Some say "sure you can interview me - I am free in two weeks' time". Those who understand the news cycle are the best sources, as are those who understand how to make their research interesting, accessible, and fresh, and can answer the simple question of "how does this research change things for the world, the country or a community?"

TK: (a) from the source of the story – for example, a corresponding author on a science paper; and (b) from other / rival institutions or research groups ; and (c) from the first scientist (d) existing contacts

EB: A credible source is a huge part of my process. Due the massive amounts of information I have to process each day, I seldom look at sources I regard as not credible.

NJ: Probably quite a big role – a Professor Lee Berger, for instance, brings his own “rock star” reputation to bear on anything he’s involved in, and that will make his work particularly interesting to the media.

KR: Normally it’s based on the experience of the senior writer handling the story, people s/he has worked with before who are acknowledged subject experts. Often the original source will provide secondary sources to the reporter.

SS: First of all, it comes down to their expertise in a particular topic. Other criteria include how accessible they are, this is particularly important when there is a tight deadline.

SM: They must be accessible and credible.

SW: I want them to be an expert, to be able to comment authoritatively. It helps if they are senior academics or officials - I wouldn't, for example, quote a postgraduate researcher. For particularly controversial stories, trust also plays a large role. I would go to sources who I've spoken to a number of times and with whom I have a working relationship. I consider source relationships to be a fundamental part of science journalist (especially in such a country with a relatively small science system), and this also influences my source selection.

PA: I think availability is a crucial factor. Also if I can identify they have knowledge on the subject by reading articles or papers they have published helps me

choose a source. As a last resort I call the department and explain what I am writing about and they direct me to the relevant person which in most cases has been very helpful. I and a number of other reporters I know have made use of university directories which can be very helpful in identifying sources but many of those have seemingly disappeared from the web.

RI: Not applicable but experts are always in demand

PG: Depends on the issue or theme

LB: I am usually approached by journalists who require expert opinion on a range of matters related to the palaeosciences and anthropology.

5. Any other comments?

TF: Science communicators can do the following to better their chances of getting science into newspapers:

- offer exclusives instead of sending out a blanket press release to all and sundry
- include a visual where you can so journalists can picture the story in its published form
- offer academics in-house training on how to explain their research in a compelling and accessible way
- offer exclusive follow-ups to those who you believe are doing a good job at reporting on the research at your institution

KR: I am writing on the back of a 27-year career in South African print media, I am no longer a practising journalist, so some of my information might be dated. I am a former editor of *The Star* in Johannesburg and then Independent Media's regional executive editor for Gauteng and Northern Cape which included *The Star*, *Pretoria News*, *Pretoria News Weekend*, *Saturday Star*, *Sunday Independent* and *Diamond Fields Advertiser*.

SW: There has to be a story. Often, a simple discovery is not enough. There needs to be a "so what" attached to it to make it newsworthy. The idea of story is often linked to narrative and accessibility. These elements affect whether it will be relevant to the perceived audience. Exclusivity also affects whether a journalist will follow a story.