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# Expert voices in South African mass media during the COVID-19 pandemic

Scientists increasingly recognise that media visibility allows them to gain influence in public and policy spheres. However, some scientists shy away from publicity and journalists are purposefully selective when they seek out experts to interview. This may result in a skewed representation of scientists in the mass media. In this study, we explored which South African scientific experts at the academic rank of ‘professor’ were quoted in the local mass media during the initial 6 months of the COVID-19 pandemic. Our analysis of 1164 media articles related to COVID-19 showed that, as far as gender is concerned, men dominated as expert sources, with women accounting for only 30% of quoted professors. In terms of research field, most experts were from the broad field of health and medicine, with an under-representation of social scientists. We reflect on the implications and consequences of a skewed media representation of scientific expertise, as well as some of the options to remedy these imbalances.

**Significance:**

- This is the first study to identify the most visible science experts in the mass media in South Africa during the COVID-19 pandemic.
- We recommend options for institutions, researchers, media editors and journalists to help diversify expert sources that are featured or quoted in the mass media.

## Imbalances in scientists’ media visibility

During a public health crisis, experts are needed to explain complex topics and contextualise news for media consumers.<sup>1</sup> These experts are typically highly accomplished individuals who hold prestigious positions in the scientific world.<sup>2,3</sup> As such, journalists rely on experts to add insight, credibility and news value to science-related mass media coverage<sup>4</sup> and expert sources are regarded as essential contributors to journalistic practice and the production of news, especially when it comes to coverage of specialist topics of a scientific nature.

However, relationships between journalists and scientists are clearly symbiotic. Despite some of the inherent risks, scientists stand to benefit in several ways when they achieve a high profile in the mass media. Media visibility empowers scientists to establish themselves as public experts, and to become agents of change with influence in public and policy arenas<sup>5,6</sup> and helps them to attract research funding<sup>7</sup>. This implies that gender and field disparities amongst media-visible scientists could lead to a skewed representation of expert opinion and power imbalances amongst scientists. Scientists’ media visibility is influenced by several factors, including the ability and willingness of a scientist to take on the role of public expert<sup>8</sup>, as well as journalists’ selection criteria when identifying experts to interview<sup>9</sup>. From the perspective of journalists, the best sources are experts that are already visibly associated with a prestigious institution, but also accessible, able to provide relatable and relevant comments, and cooperative in terms of media demands.<sup>7,10</sup>

Earlier studies on *gender imbalances* in media representations of scientists show that female experts are notably under-represented when journalists report on new advances in science or write science feature articles.<sup>11</sup> The dominance of men as quoted experts and sources in the media has been confirmed in a study of news media in India, Kenya, Nigeria, South Africa, the UK, and the USA.<sup>12</sup> Even in Finland, which is believed to be a progressive and female-friendly Nordic country with a highly educated female workforce, less than 30% of scientific experts interviewed in the news media are women.<sup>13</sup>

Furthermore, female scientists are frequently portrayed in a tokenistic manner as being unusual within competitive research environments, while male scientists are represented as belonging in their professional positions.<sup>14</sup> Added to this, male scientists are in higher demand as expert media sources.<sup>15,16</sup> A study in South Africa<sup>17</sup> revealed that 63% of visible scientists in South Africa – as identified by journalists – were men. Female experts experience several prejudices when they appear in media interviews, including the perception that they are judged on their appearance, rather than their expertise.<sup>18</sup> These scholars discuss how the under-representation of female experts limits their power and influence, and affects public perceptions. Further negative consequences of excluding or underplaying female expertise in mass media coverage include that it perpetuates the notion that men are the only experts worth listening to, and dampens the professional aspirations of girls and young women regarding careers in science.<sup>19-21</sup>

Scholars have drawn attention to the scarcity of female expert voices in the mass media coverage of COVID-19.<sup>22-24</sup> There is evidence that women were far less likely to feature as experts compared to men<sup>12</sup> and that the views of female experts in COVID-19 stories were marginalised compared to non-COVID news stories<sup>25</sup>.

In terms of *field imbalances*, it has been shown that, during a health pandemic, scientific experts are usually affiliated to research fields such as virology, epidemiology, medicine, biology and/or statistics, and are trained to understand and reflect on data and findings regarding pathogens.<sup>26</sup> The voices of epidemiologists and public health experts have inevitably dominated initial responses to the COVID-19 pandemic.<sup>27</sup> Media coverage and social platforms used biomedical data and concepts extensively and this, inevitably, influenced policy responses.<sup>28</sup> This

has meant that the social sciences have been sidelined and excluded from the processes informing the response and the way forward regarding the pandemic, despite recognition that social science expertise is crucial in order to understand and influence human behaviour during a pandemic.<sup>29</sup>

## Gender differences in terms of academics' public engagement roles

The dominance of men at higher levels of the academic hierarchy is well documented, as is the evidence for a general structural bias against women in science and the failure to recognise contributions by female scientists.<sup>30,31</sup> For example, a longitudinal study of gender inequality in scientific careers across 83 countries and 13 disciplines<sup>32</sup> confirms that women are under-represented in most scientific disciplines and publish fewer articles throughout their careers, as well as that their work acquires fewer citations.

Due to the pervasive nature of gendered processes throughout the practice and culture of science, it is reasonable to expect that male and female scientists will have different views and experiences when it comes to communicating about their research in the public arena.<sup>33</sup> It has been suggested that the involvement of female scientists may be hindered by the so-called 'Matthew effect', as well as by the associated 'Matilda effect'. The 'Matthew effect' explains why well-known scientists frequently get more credit compared to researchers that are less well known, despite the fact that their work may be of similar nature and quality<sup>34</sup>, while the 'Matilda effect' describes the systemic bias against women in science and the systematic under-recognition of their contributions<sup>35</sup>.

Based on research exploring scientists' motivations and perceptions regarding public engagement about their work, science communication scholars propose a range of potential explanations for observed gender-based differences. Consistently, normative influences, which cause scientists to respond differently to the public engagement activities of male versus female colleagues, emerge as a key explanation.<sup>36</sup> While outreach activities (for example school visits and acting as role models) are frequently stigmatised and delegated to women<sup>33,37</sup>, media visibility is associated with recognition and prestige, and men are especially in demand as media sources<sup>15,16</sup>.

A 2020 survey provides evidence that, compared to their male colleagues, women are generally more hesitant and concerned about media appearances.<sup>38</sup> Results from this study show that women were generally more worried and fearful about making mistakes, being put on the spot, and appearing to be uninformed. These findings are in line with the idea that there is a so-called 'confidence gap' that separates men and women, with men generally being more self-assured about their opinions and less worried about being publicly wrong.<sup>39</sup> Similarly, a study focused on female experts in Australia, reports that women were mostly willing to be interviewed and positive about prior media experiences but lacked confidence about appearing on camera and an understanding of how the news media operates.<sup>21</sup>

## Research question

Given the importance of achieving a balanced representation of scientists who become visible in the mass media during a public health crisis such as the COVID-19 pandemic, our study was guided by this research question: How prevalent are gender and field imbalances of expert voices in the South African mass media reporting on COVID-19?

## Methodology

With the help of Pear Africa, a media monitoring company, we identified and downloaded all media articles containing the keywords 'corona\*' and/or 'covid\*', published during the first 6 months of the COVID-19 pandemic in South Africa (7 January 2020 to 6 July 2020) across nine major newspapers and five online news sites. This resulted in a data set of 14 991 print articles and 29 335 online articles related to COVID-19, adding up to a total of 44 326 articles.

To reduce the 44 326 articles to a set of articles that would focus on the voices and views of scientific experts, we tested several terms that could be used as proxies for academic expertise. We found that the application of terms such as 'scientist(s)', 'researcher(s)' or 'doctor(s)' did not necessarily deliver articles in which experts were quoted. However, articles that contained the term 'professor' mostly contained text in which the journalists quoted one or more leading academics directly or indirectly, as the term is used to identify specific individuals that were interviewed or referred to. In South African universities, the term 'professor' indicates a senior academic ranking and position of academic credibility, authority and leadership. It is well known that journalists also use 'professor' as a title to give credibility to their articles. We therefore applied this term, i.e. 'professor', to select those articles in which journalists quoted a leading academic.

Filtering for articles containing the term 'professor' reduced our data set to 1891 articles. After excluding articles that did not quote a scientific source, or where the quoted expert was not associated with a South African institution, our final data set consisted of 1164 articles. These articles were analysed using quantitative content analysis, guided by a detailed codebook. Amongst other aspects, we captured information about the names, affiliations, fields and gender. Where articles quoted more than one professor, data were captured for all of them. Their fields of expertise were openly coded (in vivo) and later categorised into common scientific fields.<sup>26</sup>

Two coders attended several coding training sessions before they each coded the same randomly selected 200 articles for reliability testing. Cohen's  $\kappa$  and Holsti's reliability coefficient (CR) were used to measure inter-coder reliability. Cohen's  $\kappa$  for the formal variables was  $\kappa=0.94$  (CR=0.99); for the content-related variables,  $\kappa=0.90$  (CR=0.97). These values indicated good agreement among coders. Hence, each coder then coded half of the final sample independently.

This study was approved by the Research Ethics Committee: Social Behavioural and Education Research of Stellenbosch University on 22 February 2021, with the Project Number: CREST-2020-17119.

## Results

In our analysis of 1164 articles, we found 1458 distinct voices of professors, representing 430 individuals (Table 1). Most of the voices were counted from online ( $n=1098$ , 75%) as compared to print news media ( $n=360$ , 25%). While most articles quoted one professor only ( $n=943$ , 65%), some quoted two ( $n=330$ , 23%), three ( $n=129$ , 9%) or even more professors ( $n=56$ , 4%). Most frequently, direct quotes were used ( $n=855$ , 59%), as compared to indirect quotes ( $n=296$ , 20%); however, there was also a proportion of self-written copies ( $n=305$ , 21%).

Professor Salim Abdool Karim was quoted most frequently ( $n=155$ , 11%), followed by Professor Shabir Madhi ( $n=83$ , 6%) and Professor Glenda Gray ( $n=47$ , 3%). Table 2 provides an overview of the 10 most frequently quoted professors, showing that 7 out of 10 were from the broad field of health sciences and medicine, and 8 out of 10 were men.

The majority of the 1458 distinct voices (i.e. professors quoted) in the 1164 articles were male ( $n=1024$ , 70%), while female professors accounted for only 30% ( $n=434$ ).

There were slight differences between print and online media ( $\chi^2=5.819$ ; d.f.=1;  $\phi=0.063$ ) in terms of gender balance: in print media, the dominance of male ( $n=271$ , 75%) as compared to female professors ( $n=89$ , 25%) was more prevalent than in online media (male:  $n=753$ , 69%; female:  $n=345$ , 31%). Furthermore, there were slight differences regarding the type of publication ( $\chi^2=8.403$ ; d.f.=2;  $V=0.076$ ): special interest publications exhibited a higher gender imbalance (male:  $n=56$ , 84%; female:  $n=11$ , 16%) than tabloid publications (male:  $n=27$ , 82%; female:  $n=6$ , 18%), with quality publications noting the lowest gender imbalance (male:  $n=941$ , 69%; female:  $n=417$ , 31%).

**Table 1:** Information on the 14 media sources included in this study

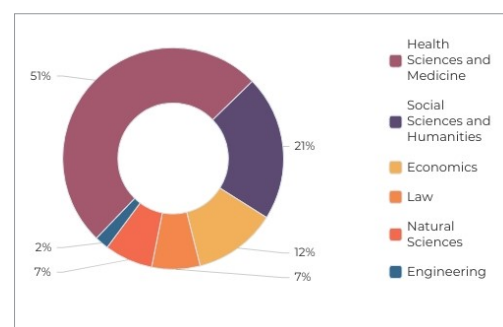
Media source	Print or online	Number of articles	% Total articles	Frequency	Type/genre	Publisher
<i>Business Day</i>	Print	42	3	Weekdays	Special interest	Arena Holdings
<i>City Press</i>	Print	37	3	Weekly (Sunday newspaper)	Quality	Naspers
<i>Daily Sun</i>	Print	6	0.4	Daily	Tabloid	Naspers
<i>Engineering News &amp; Mining Weekly</i>	Print	11	1	Weekly	Special interest	Creamer Media
<i>Financial Mail</i>	Print	14	1	Weekly	Special interest	Arena Holdings
<i>Mail &amp; Guardian</i>	Print	39	3	Weekly	Quality	Mail & Guardian Media (Pty) Ltd
<i>The Star</i>	Print	110	8	Daily	Quality	Sekunjalo Independent Media
<i>Sunday Times</i>	Print	74	5	Weekly (Sunday newspaper)	Quality	Arena Holdings
<i>You</i>	Print	27	2	Weekly magazine	Tabloid	Naspers
<i>Eyewitness News (EWN)</i>	Online	125	9	Daily	Quality	Primedia Broadcasting
<i>Independent Online (IOL)</i>	Online	39	3	Daily	Quality	Sekunjalo Independent Media
<i>Daily Maverick</i>	Online	406	28	Daily	Quality	Independently owned
<i>News 24</i>	Online	383	26	Daily	Quality	Naspers
<i>TimesLIVE</i>	Online	145	10	Daily	Quality	Arena Holdings

**Table 2:** Gender and broad scientific field of the 10 most frequently quoted professors

Name	n	%	Gender	Broad scientific field
Salim Abdool Karim	155	11%	Male	Health sciences and medicine (epidemiology)
Shabir Madhi	83	6%	Male	Health sciences and medicine (vaccinology)
Glenda Gray	47	3%	Female	Health sciences and medicine (paediatrics)
Cheryl Cohen	42	3%	Female	Health sciences and medicine (epidemiology)
Alex van den Heever	35	2%	Male	Economics
Marc Mendelson	18	1%	Male	Health sciences and medicine (infectious diseases)
Charles Parry	18	1%	Male	Social sciences and humanities (psychology)
Lungile Pepeta	16	1%	Male	Health sciences and medicine (paediatrics)
François Venter	15	1%	Male	Health sciences and medicine (virology)
Raymond Parsons	15	1%	Male	Economics

Regarding scientific fields (see Figure 1), we found that 'health sciences and medicine' was most dominant ( $n=723$ , 51%), followed by 'social sciences and humanities' ( $n=307$ , 21%) and 'economics' ( $n=181$ , 12%).

There were gender differences according to the scientific fields of the quoted professors ( $\chi^2=64.428$ ; d.f.=5;  $V=0.209$ ). Most prevalent was the gender imbalance with professors from engineering (male:  $n=30$ , 91%; female:  $n=3$ , 9%), followed by economics (male:  $n=157$ , 87%; female:  $n=24$ , 13%), natural sciences (male:  $n=79$ , 77%; female:  $n=24$ , 23%), and health sciences and medicine (male:  $n=509$ , 70%; female:  $n=214$ , 30%). There was more balance when professors from social sciences were quoted (male:  $n=193$ , 63%; female:  $n=114$ , 37%); for law, there was indeed a balance in genders (female:  $n=55$ , 51%; male:  $n=53$ , 49%).



**Figure 1:** Broad scientific fields of professors quoted in COVID-19 related media articles.

## Discussion

Our study confirms the existence of gender and field imbalances regarding experts who were quoted in the South African mass media during the first 6 months of the COVID-19 pandemic.

When considering the gender imbalance, the 70:30 dominance of male experts in the mass media, as revealed in our study, should be viewed in the context of the make-up of the South African academic workforce. Data from the South African Higher Education Management System (HEMIS) for 2019 show that, across all higher education institutions in South Africa, 48% of all staff responsible for instruction and research were women.<sup>40</sup> In addition, 2020 data from the South African Knowledgebase shows that female professors produced 40% of the publication outputs in 2020.<sup>41</sup> These figures already point towards an under-representation of women in the academic environment, especially when considering academic outputs by professors. However, our findings show that this under-representation (only 30% female voices amongst professors quoted) is further exacerbated in the mass media.

It is suggested that the under-representation of women at leadership levels in the academic arena is linked to socio-cultural constructs of women in South African society that promote male dominance and sustain institutional sexism, at the expense of the professional aspirations of female academics.<sup>42,43</sup> The situation is aggravated by societal expectations that women should take on specific gender roles and family responsibilities such as housework and childcare, which is structurally apparent in the disproportionate durations of maternity and paternity leave, and regularly disadvantages women's career progression to senior academic positions which require long working hours.<sup>44</sup> Another reason is that women often take on the advising and mentoring load in their faculty because they are perceived as intuitive and compassionate towards their students' needs, and, in turn, have less time to do media engagement than their male colleagues.<sup>44</sup> Further factors that impede women's advancement along the academic career ladder include feelings of isolation, and lack of childcare facilities and suitable role models.<sup>45</sup> These expectations, demands and burdens on female academics have intensified during the COVID-19 pandemic.<sup>46-48</sup>

In general, our findings highlight the need to ensure that women in science are equipped with confidence and skills to engage pro-actively and reactively with the mass media, and that they have the opportunities and support to do so. At the same time, more could be done to make media editors and journalists aware of the importance of diverse expert sources, and journalists should be encouraged and helped to diversify their expert sources.

We have ample evidence that media organisations and individual science journalists are keen and willing to help remedy gender imbalances in media coverage. Around the world, major publishers and science communication initiatives are rolling out remedial initiatives. For example, the BBC announced that they were joining other media organisations in striving for a target of equal gender representation across all of the BBC's programmes and sites, including an equal split in how many men and women are interviewed on camera and quoted in stories.<sup>49</sup> In June 2021, the top-tier scientific journal *Nature* announced that it would work harder to overcome gender inequalities.<sup>50</sup> The editor responded to several studies showing that men were quoted twice as often as women in general news media, as well as in news reports in *Nature*. The award-winning science journalist Ed Yong writes how he tries to redress the balance by spending more time searching for women to interview, using various online and social media channels to find relevant female sources.<sup>51</sup>

Globally, a number of initiatives have been set up to help journalists who are seeking out female voices to identify female experts, for example the Women's Media Center, the 'WomenAlsoKnowStuff' and an organisation called '500 Women Scientists'.<sup>52-54</sup> The Expert Women Project, run by City University of London's Journalism Department, has been set up to monitor the number of expert women featured on the news and this project has an arm focused on the situation in Ghana.<sup>55</sup> 'Ingenium Women in STEM' is a Canadian initiative that strives to overcome gender

biases that continue to limit the roles of women in science, technology, engineering and mathematics, as well as to make female scientists more visible in society, and to celebrate their achievements.<sup>56</sup>

In South Africa, a non-profit company, Quote This Woman+, is growing a database of female experts to promote the inclusion of women's voices in the mass media, including female experts to appear on media panels.<sup>57</sup> The main aim of the Association of South African Women in Science and Engineering (SA WISE) is to strengthen the role of women in science and engineering in South Africa and to raise the profile of women scientists and engineers. During Women's Month, celebrated annually in August, the South African Department of Science and Innovation organises a series of events to celebrate and profile female scientists, including the South African Women in Science Awards.<sup>58</sup>

Institutions where scientists are employed are also well placed to help profile women as visible experts in the public sphere. A report by Boyce and Kitzinger<sup>59</sup> elaborates on the role that science media officers in research organisations and institutions can play to advance media interactions with female experts.

In terms of the field of expertise, we showed that voices from health sciences and medicine dominated and were present in 51% of the media content we analysed. However, we found that expertise from the social sciences was present in about one-fifth of the articles (21%) and was therefore not completely sidelined as feared by Bavel et al.<sup>29</sup> Notably, Connell<sup>60</sup> suggests that COVID-19 is a social emergency as much as a medical one, and Brossard (quoted in Lohwater<sup>61</sup>) points out that, with an issue as heavily politicised as COVID-19, we need expert guidance that goes beyond the medical sciences. Lohse and Canal<sup>28</sup> point out that social science expertise is needed to ensure sufficient attention to social issues, to identify gaps in policy, and to offer a more fine-grained harm-benefit analyses of different policy options. Soudien<sup>62</sup> highlights the importance of social science expertise to deal with the social trauma brought about by the pandemic, and outlines the work done by social scientists in South Africa – through research and grassroots involvement – during this public health crisis. Social scientists can help policymakers and colleagues from health and natural sciences to develop solutions that people are able and (crucially) willing to follow.<sup>63,64</sup> Political scientists could, for example, play a major role in terms of the pandemic response based on their knowledge of public risks and the role of governments.<sup>28</sup> Communication scientists know how to build public trust through credible public communication, which includes acknowledging uncertainty.<sup>65,66</sup>

## Conclusion

The media representation of scientists, including their gender and field, affects who gets to influence science policy and public opinion. The present study highlights that male academics, as well as academics working in the broad field of health and medicine, were disproportionately featured as expert voices during the COVID-19 pandemic in the South African mass media, to the detriment of women and experts from other fields. Therefore, it is necessary to consider ways to address these gender and field disparities. Clearly, the problem cannot be solved by researchers or journalists on their own. This issue needs to be addressed jointly by research institutions (and their PR departments) along with researchers, journalists, and media editors. In the long term, initiatives working towards gender equity in academic leadership positions will increase the presence of female voices in the mass media. But, in the shorter term, institutions could make a difference by supporting and incentivising female experts for their media engagement work, and by profiling female experts. As far as media editors and journalists are concerned, it could help to make them more aware of the existence and effects of gender disparities in media coverage and help them to diversify their sources.

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## Competing interests

We have no competing interests to declare.

## Authors' contributions

M.J.: Conceptualisation; methodology. L.G.: Conceptualisation; methodology; data analysis; data validation. L.R.: Data analysis. All authors collaborated on the processing, presentation, and discussion of the findings.

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