To what extent scientists (or experts) were featured in the News24 coverage of the Covid-19 pandemic?

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Abstract

The coronavirus pandemic has led to a surge in news consumption. Therefore, coverage of the coronavirus has to be tailored in a way that people can understand it. With newsrooms shrinking, journalists need to consider which sources they use as sources add credibility and facts to a story. Through sampling of content over a four month period, the research sought to find the intersection of journalism and science in South Africa's most frequented online news site during the coronavirus pandemic period. The study addressed how News24 selected sources heard in the media over a four months period. It also analysed to what effect the media selected these sources to interview by adopting the sociology of news production theory and the agenda setting one. This study is significant because in complex matters such as a pandemic, the scientific voices present in the media have the ability to shape the agenda and foster understanding on the pandemic. To arrive at the results, the study reviewed bodies of literature relating to scientists and journalists and the contestation between the entities. It further looked at health journalism and the difficulties associated with it. The theoretical framework constituted a triangulation of theories. These included the agenda setting and gatekeeping theories, sources and the sociology of news production and journalism and science. Data was derived from News24 and subjected to a quantitative content analysis research method. The results indicate that official sources were the most prominently used by News24. General sources such as people in the workforce or students appeared more as sources than scientists. Scientists featured less than 30 percent of the time but more research must be conducted to understand why. Official sources were likely to be easier to contact as restrictions on movement and need for fast stories affected which sources were selected.

1.Introduction

In March 2020, the World Health Organization (WHO) declared coronavirus – popularly referred to as COVID-19 – a global pandemic to underline the fact that it was a deadly

disease spreading fast throughout the world (Cucinotta & Vanelli 2020). In the weeks and months that followed, a nervous world stepped up a host of measures aimed at containing it. The measures drew in and continue to draw in all facets of society in line with the fact that the pandemic has wide ranging impacts affecting all facets of life. Three of the segments of society that were forced to respond to the pandemic are the scientific community – writ large – government officials, and the media generally and journalists more specifically. It is the intersection of the scientists and journalists and to some extent government officials that this study is focused on. Just what does the relationship between scientists and journalists during the pandemic tell us about the dissemination of news and information during a period of heightened alertness, concern, and emotions as in the case of the ongoing pandemic? This is the broad area of focus for the current study as seen from a South African viewpoint.

The study is premised on the fact that understanding what role scientists play in the context of a pandemic will help further understanding and appreciation of the complex relationship it has with the media. Although there are many ways in which we can explore the question of scientists and the media, the preferred approach for this study is a deep delve into the sources journalists featured in their coverage of the pandemic. It is a well-known fact that in the course of their work, journalists rely heavily on sources to produce news items (Holland et al., 2011). This is part of journalism as a profession. However, the people that journalists choose as sources of information and knowledge come with many considerations worthy of analysis. For the purposes of this study, assessing News24's coverage of the pandemic and the extent at which scientists featured as sources will be explored.

Before delving into the sources that journalists used during the pandemic, it is however worthwhile establishing the background and context of journalism and science by drawing on past events of a similar nature. This helps not only build on knowledge from widespread diseases in the past but also introduces the potential for comparison.

Furthermore, the study of diseases and media coverage is not a new field of study, there has been a multitude of these types of studies over the various years (Lopes, 2012). Indeed, it is important to draw on the available literature on science, scientists,

and journalism in a broader sense before bringing a study such as this to the present COVID-19 circumstances. This gives the research sound foundation and background on the knowledge already generated as a starting point towards making a fresh contribution. Review of literature with the aim of taking it further to understand how the media went about seeking scientists for pandemic coverage in the present is therefore one of the key undertakings of this study. Particularly, an understanding of previous pandemics and the role scientists played can help answer the questions associated with journalistic sourcing of expert voices in the course of informing and educating publics. It presents a pathway to understanding the role of scientists in the current pandemic and more importantly, the extent to which they are featured. A quantitative study that looks at who the sources were and to what extent they featured will be the means forward in this study.

It is also imperative to understand what an informed public is and why it is important for a study on the link between science and journalism. It is evident that COVID-19 is a complicated disease not easily decipherable by common people. Scientists are knowledgeable in a technical sense on how the disease emerged, why it spreads fast, its impact on people and the scientific measures that can be adopted to contain it. Journalists, particularly those that disseminate news and information to general populaces, are often aware of the difficulties of understanding scientific concepts, formulas, and jargon. They therefore strive to make the scientific information as accessible as possible by keeping in the levels of public knowledgeability. This among other factors make the notion of an informed public important to consider in source selection (Happer, 2013).

The issue of journalism and media on the one hand and the scientific community on the other is particularly important at this point in time because of the assumption that today's world is more scientifically endowed and ready than the past. As Spratt (2001), noted during the time of the Spanish flu of 1918 there was a real difficulty in dispensing important health information to a lay audience. There was primarily a gap in scientific knowledge and understanding of health issues. It would be problematic in the current pandemic if this remained the case in that there would be a limited understanding of

circumstances and matters that affect people, therefore, making it more difficult to respond effectively. It would also suggest that the world and humanity remained as ill prepared in combining science and communication to manage and contain the disease. One of the pursuits of this study is to determine whether this science-media gap still exists in the current pandemic and whether scientists played a role in bridging this divide by analysing the extent of how they featured in the media or not.
The COVID-19 pandemic has had a global impact. According to data from John Hopkins University at the start of April 2021, South Africa saw a cumulative number of around 1,5 million positive COVID-19 cases (Dong et al., 2020). The total number of deaths included around 53,000 people (Our World in Data, 2021). Globally, the data at the start of April has the total number of cases at around 130 million cases. There were also cumulative deaths marked at about 2,8 million people (Our World in Data, 2021). The pandemic has also affected the country's economy severely. Early indications suggest that unemployment is on the rise, many businesses have shut down as a result of the early lockdowns and the country's gross domestic product is reducing (Chitiga Mabugu, et al., 2021). The above-mentioned information is important because it furthers understanding of the pandemic thereby increasing the importance of scientists and the extent to which they featured in coverage of the pandemic.

To address all these issues, the study will apply a quantitative research methodology in which content collected between May and August 2020 is subjected to a sampled content analysis procedure thus producing the statistics that inform us about the relationship between scientists and journalists. This will help determine the scientists who featured in the content and the extent to which the scientists featured in coverage of the pandemic. This study therefore seeks to address the extent to which scientists featured to determine whether they had a part to play in creating an informed public compared to past pandemics and epidemics.

2. Background and context

The current study seeks to contribute knowledge to the relationship between science and journalism during the ongoing COVID-19 period. A popular observation has been that as the pandemic spread, almost everybody became a medical expert, weighing in on everything from the origins of the disease to therapies that could be effective in managing infections and other phenomena in between (Brennen et al., 2020). This brings into sharp focus the question of who the scientists that we should trust are and whether media platforms that we should rely on have risen to the occasion.

In a pandemic, the media often rely on experts and government sources to be the voices of authority on risk relating to the pandemic (Holland et al., 2011). Health authorities and scientists are both important sources in a pandemic, with authorities playing the role in determining health policy and scientists the role of disseminating crucial scientific information (Vasterman & Ruigrok, 2013). There is a clear need to determine the extent of sources adopted in the media coverage of the pandemic.

As touched on in the introduction, epidemics and pandemics are not entirely new for humanity even as the current pandemic is being experienced on a level not seen in nearly a century. Vasterman & Ruigrok (2013) discuss how epidemics and diseases make for special stories because they are deeply rooted in sociocultural history. Since the outbreak of COVID-19, links have been made with the Spanish flu which claimed millions of lives after the First World War, becoming a big focus for journalists at the time (Alcabes, 2009). The point has been made that the media has always played a role in covering epidemics and pandemics thus presenting valuable opportunities for studies (Alcabes, 2009). In the midst of the current COVID-19 pandemic that swept the world, the media have, as expected, played an even larger role in coverage than before (Anwar et al., 2020).

Even as questions arise out of the poor link between the media and the scientific community during the Spanish flu era, the science-media gap has narrowed in subsequent cases. Lopes (2012), suggests that the media played a crucial role in the communication of public health situations such as information and communication relating to pandemics. For instance, there is also evidence to suggest that there was a

major reliance on official and specialised sources (Lopes, 2012) during the 2009 Influenza A case. The sources became imperative to telling the public about Influenza A in Portugal in 2009 because through the agenda-setting effect detailed by McCombs & Shaw (1972) the media began covering the virus extensively (Lopes, 2012). Scholars also found that the relationship between the media and official sources was symbiotic during coverage of the Influenza A coverage as both parties needed the other to disseminate effective communication around the virus. Pursuing the link between sources and communication in the current pandemic by understanding to what extent scientists and experts featured as sources can foster understanding of the coverage relating to the pandemic.

The nearly incontestable fact underlying this study is that the news media plays a crucial role in reporting and disseminating important information on infectious diseases (Holland et al., 2013). However, it is imperative for caution to be exercised with regards to the sources that provide the messages that go into the news items and are eventually received by audiences. Holland et al. (2013) warned of sources who have ulterior motives and agendas and those who lack credibility using the 2009 H1N1 outbreak. The authors also cautioned against journalism and personal feelings when reporting on pandemics, a problem that has been noted in the current pandemic. When COVID-19 struck, instances of misinformation and disinformation emerged almost immediately (Brennen et al., 2020). A study on misinformation and the pandemic found that public figures in society such as politicians or celebrities shared misinformation but because of their status this was shared further and wider on tools like social media (Brennen et al., 2020). Conspiracy theory and pseudo-science also rose to levels that threatened to drown credible information that would help the world to cope (Douglas, 2021). Some examples of this include that the virus was created in China as a bioweapon (Douglas, 2021). Other popular conspiracy theories include how the virus was created by the 5G internet work and how Bill Gates is intending to create a vaccine that can form part of a global surveillance mechanism (Shahsavari et al., 2020). In the context of this study, it is imperative to understand the sources that were selected for coverage of the

pandemic and whether they have credibility or not as well as how to determine the said credibility.

While the sources of information may take some blame, media organisations have also been found to be at fault (Vasterman & Ruigrok 2013). Some of the coverage during a pandemic can be alarmist and often, this alarmist information is a result of information from sources that are unverified. Vasterman & Ruigrok (2013) found as much in their study of the Dutch coverage of the 2009 Influenza A (H1N1) pandemic. The media and officials faced criticism for spreading panic and fear for a disease that barely affected many people. Despite indications that hundreds of people would die, only 63 people died, and of this, five had not been carrying any other disease than the new flu (Vasterman & Ruigrok, 2013). This alarmist bias was not isolated to the H1N1 pandemic, in fact in the US, coverage of the avian flu that was present in the US in 2005, showed that 40% of US newspapers had worst-case scenarios portrayed (Dudo et al., 2007). Was this the case in the coverage of the coronavirus and to what extent were sources attributable for this?

The relationship between the media and the scientific community is disconnected. In literature, it is commonly described as fraught and fractured (Cortinas-Rovira, et al., 2014). This is seen through the example of analysing swine flu coverage in Spain. Cortinas-Rovira, et al. (2014, p 160) point out that “one of the earliest research studies regarding Spanish media coverage of the swine flu virus, consisting of content analysis of the first week of the crisis by Spain's top five newspapers concluded that coverage was marked by scaremongering and sensationalism”. The problem with this relationship being fractured is that it stands to produce information on the pandemic that can be misconstrued or misunderstood (Peters, 2013). Ineffective communication between the two entities can be dangerous in a case where people seek proper information to stay alive. Science journalism has a role where it must disseminate scientific knowledge and knowledge about scientific topics (Peters, 2013). It has a role to make specialised knowledge widely accessible for audiences outside the scientific community (Peters,

2013). One of the problems scientists view with the media is a lack of control over what's being published. It is critical that this is a matter that can be resolved.

Understanding the extent to which scientists featured in stories that pandered to scare narratives will provide better insight into understanding the role scientists had as sources in South Africa. In South Africa a prominent scientist was often seen in much of the coverage during the early days of the pandemic. Professor Salim Abdool Karim is one of the country's most internationally renowned epidemiologists and was appointed to chair the Ministerial Advisory Committee on COVID-19 (Pillay & Damonse, 2020). Professor Abdool Karim was often seen on television, sources in articles and held a webinar disseminating important information to the public. However, news websites such as The Conversation Africa and Africa Check regularly published articles on the COVID-19 pandemic which featured expert sources. It is also worth mentioning that during the coverage of the coronavirus pandemic in South Africa, a conflict arose between government officials and scientists. One of the scientists included Dr Glenda Gray a member of the ministerial advisory committee and chairman of the South African Medical Research Council who was sourced extensively in criticising the government for its lockdown strategy, calling it unscientific and nonsensical (Karrim & Evans, 2020)**.** This was then followed up by the country's health minister slamming Professor Gray's criticism with attempts made to poke holes in her criticism (Karrim, 2020). The back and forth on the topic was played out in the media.

One study by Gupta et al,. (2020) looked at COVID-19 and the information present on it from a trustworthy point of view. The authors found that social media was the predominant place for misinformation. At the same time, it was where most people received information as well (Gupta et al,. 2020). In the study, many believed that the problem of misinformation was because people like reviewers and editors weren't doing enough to curb misinformation (Gupta et al,. 2020). This ties into the importance of this study in that it shows that editors need to do more by means of source and their own social media posts to ensure that misinformation does not take place.

Tying into the notion of journalists having a role in misinformation is a study conducted by Balod & Hameleers (2021) where it was determined that Filipino journalists had a massive role in publishing factual information and assuming the role of watchdog. In a climate where the journalists were constantly accused of fake news or propaganda made a challenging job, even more so (Balod & Hameleers, 2021). Therefore, the journalist had to work incredibly hard to ensure credibility in their reporting. This ties into information on the difficulties of being a journalist and not being the reason for misinformation. Generally speaking, journalists work hard to not be guilty of misinformation and disinformation.

3. Aims

In the background and contextual section above, perspectives have been provided to indicate the necessity of the current study. The foremost aim of this study is a pragmatic one. The statistics show that the COVID-19 has had a large and negative impact on livelihood in terms of health, socially, and economically. It has also had political dimensions as seen in the conflict between scientists and politicians. Yet, against this background, information dissemination has become critical in managing the disease with both journalists and scientists playing a prominent role in these respects.

The overall objective of the study is to determine whether scientists or experts were the predominant sources used by News24 in covering the COVID-19 pandemic. The study will assess a broad range of articles with the goal of understanding who the sources were to determine to what extent those were scientists or experts. It will look to explore how often specific sources featured when the pandemic was covered during the selected timeframe by News24. There is also a need to determine the specific topics that featured sources to better understand which ones prompted specific sources.

A major aim of this study is therefore to understand the intersection of journalism and science as a means of figuring out how they practically worked together to efficiently and effectively provide credible, useful, and timely information to the public. By understanding the factors that go behind the decisions on which scientists appear in

mainstream news during the coronavirus pandemic, we can determine whether normative news production practices are being implemented or not.

The second aim is motivated by the need to determine the importance or lack of importance of different voices in the media, especially experts and officials that are knowledgeable of the pandemic. The study will seek to define the sources present in the media by discussing concepts like experts and scientists. This is critical because information and knowledge that is relevant can help save lives. Science communication aims to help people make informed decisions. It is a concept that explores topics that are complex by nature and makes them understandable to the layman (Summ & Volpers, 2015). Science communication in this instance must be fashioned in a way that enables people to make better decisions about aspects that affect them such as the coronavirus pandemic (De Bruin & Bostrom, 2013).

Thirdly, at an even more practical level, the study may be useful for the segments of society involved in communicating about the pandemic, namely, government officials, scientists, and journalists. As pointed out earlier, there exists a disconnect in the understanding of issues that are scientific and this disconnect has been there for many years (Vasterman & Ruigrok, 2013). This can be problematic when it comes to understanding complex scientific topics such as climate change, health and in the context of this research, pandemics. For this reason, scientists' role in helping inform the public is ever-increasing and makes this study relevant in these times. The final report may be used in developing strategies that address the problems that will be identified especially in the data analysis section.

The fourth aim of the study is an intellectual one. The pandemic provides an opportunity for the study and understanding of which scientists or experts featured as sources and to what extent. This will help determine which scientists are heard and have an influence on the news agenda by means of specific scientists or their specialties. The voices that feature in the media coverage will provide new perspectives on news production during crisis times as well as the agendas being set. This will thus help expound on and expand journalism, media and communication scholarship by enabling

a deeper delve into science communication forged in the relationship between scientists and media. The study is valuable because it assesses which sources are viewed as important and why. It will help to understand the science-media connection as well as the news sources used in the COVID-19 pandemic thereby contributing to issues around the applicability of media and journalism theories. The study seeks to understand not only the extent at which scientists featured, the processes taken to source scientists and why specific sources were selected. All these are conceptual and methodological issues that media and journalism scholarship have and continues to grapple with. Using Schudson's (1989), sociology of news production theories and in particular the social organisation of news work, this study seeks to address newsrooms and the role they play in selecting which voices are heard in the media on issues of the pandemic. This is a valuable theory to explore as it engages with journalists and sources which enables a better understanding of the two ends of the news spectrum: the journalistic end as well as the source end. Other theories such as the agenda setting one can be adopted.

The fifth aim of the study is essentially an expansion on the scholarship aim discussed above. The coronavirus or COVID-19 has resulted in global changes as countries endure lockdowns, loss of lives and interruptions to normal processes (Fatima, 2020). One of the key changes revolves around news production and consumption in the digital age. Tracy (2020) highlights how online news is being streamed more than ever and details about the virus are being consumed. This research first seeks to analyse content from South Africa's most popular online media outlet, News24, to determine how frequently scientists and experts featured in these outlets' coverage of the virus. For instance, in South Africa, many media houses terminated their physical news offerings such as hard copy newspapers and journalists had to work at home. It is probable that these shifts had an impact on sourcing information from scientists and experts with great implications for journalism as we have always known it. Closely related to digital media practices that have risen during the pandemic is the scourge of misinformation and disinformation that is now widespread and presents several dangers to society. Stanescu (2020) discusses how misinformation presents a danger in the

form of mistrust in public institutions and can cause people to undertake uninformed decisions. In a pandemic, this is dangerous as it can lead to public health initiatives being compromised due to misinformation being responsible for the erosion of trust in institutions and leaders (Stanescu, 2020). A real risk with misinformation opens opportunities for quackery where people can be deceived into purchasing fake antidotes or making bad decisions regarding their health. For the purposes of this study, misinformation and disinformation will not be studied at length, instead, the focus will be on the experts selected in the media during the pandemic. Journalistic decisions on sources and how they are featured in the pandemic lends itself better to the theories of sociology of news. It narrows the scope of the study to enable a better understanding of the pandemic and the sources present or absent in the coverage of the pandemic. What therefore are these digital media dynamics with regards to journalistic sourcing of news and information? What are the changes that occurred with regards to journalists working digitally?

The sixth aim, linked to the concepts of news production, relates to how journalists went about their work. For there to be an uninformed public on matters relating to science (see Scheufele & Krause, 2019) journalists have to source credible information. Yet, the traditional approach of beat journalism was already fading even before the pandemic landed as newsrooms are smaller and more journalists are expected to cover a wider range of topics (Finlay, 2018). This means that journalists must be skilled at covering a wider range of topics. At this point, sources become important and expert voices are needed to give stories credibility (Scharrer & Salmon 2016; Bavel, 2020). However, this presents a challenge in the case of a pandemic because additional health experts and officials are needed to shed light on difficult topics relating to the pandemic. Health sciences is a field where experts are needed to make complicated matters understandable to general audiences (Holland, 2013). Analysis of data would therefore help us to understand journalistic practices with regards to sourcing information and this may be useful not just for academia but for journalism as a professional practice.

3.1 Research Questions

Specifically, the research hopes to answer the following questions:

1. To what extent did scientists feature in Media24's coverage of COVID-19 during the months of May through to August?
2. How, why and to what effect did News24 select sources in their coverage of the COVID-19 pandemic?

Unpacking these questions will help determine who the scientists or experts were that News24 used. Further to that, it will enable understanding of the frequency in which these sources appeared when the pandemic was being covered. The questions will prompt who were the other sources that featured and if they were either official, in the form of governmental, or societal in the form of people in certain fields. These questions enable the study to understand under what circumstances did sources appear and whether there is a thematic resonance to this.

4. Rationale

In the aims section above, the compelling usefulness of the study was presented. Analyzing the intersection of journalists and scientists during COVID-19 is important foremostly because the pandemic is a scientific dynamic that needs to be communicated to publics. Yet, science is a complex field not easily understood by many journalists let alone publics. As discussed in the previous sections, there exists a disconnect in the understanding of issues that are scientific and this disconnect has been there for many years (Happer, 2013). It is the role of the media to inform society on subjects they are not well-informed about (Happer, 2013). This role is critical in creating an informed public that needs to know about aspects that directly affect them. The coronavirus is one such example where a lack of knowledge can be harmful and lead people to make decisions that could affect them negatively. For example, a study found that misinformation on the use of chloroquine saw people ingest dangerous amounts of it (Barua et al., 2020). The study also found that misinformation by religious leaders led people to believe they were safe from the virus in religious sites (Barua et al., 2020). An informed public that is knowledgeable of the virus can maintain safety. These problems are reflected in the fact that there is a dearth of academic discussions

in science journalism broadly but with regards to science journalism during the pandemic more specifically. One of the explanations for this is that the pandemic is still a new phenomenon and that it takes time for scholars to put together research projects that shed light on the link between science and journalism. However, the deadly nature of COVID-19 demands that scholars, particularly from the journalism and media end of things, work with speed in providing perspectives that aid not only journalists but also scientists thus bridging the gap between them for the benefit of the public (Patel, 2019).

Focusing on journalistic sources justifies the use of the theories of sociology of news and agenda setting in this study. It is important to note why scientific sources are important in journalism as understanding this sets the basis for the study by elaborating why they must be studied. Indeed, in a broader sense, sources are the lifeblood of journalism. Boyce (2007, p. 890) discusses why sources are important to journalists and explains it by saying, “journalists turn to expert sources for three main reasons: to provide facts, add credibility and present objectivity. Most commonly, expert-sources are used by journalists to verify and provide facts”. Boyce further enhances this perspective by explaining that sources with deep experience and knowledge enhance the credibility of the message being produced by the media. With this in mind, the current study is justified to the extent that we need to understand the sources adopted in the media with the overarching goal of determining the types of sources used and the specific reason they were adopted.

It is important to note why sources are important in journalism, understanding this sets the basis for the study by elaborating why they must be studied. Boyce (2007, p. 890) discusses why sources are important to journalists and explains it by saying, “journalists turn to expert-sources for three main reasons: to provide facts, add credibility and present objectivity. Most commonly, expert-sources are used by journalists to verify and provide facts”. Boyce further enhances the discussion by explaining that sources used with more experience and knowledge enhance the credibility of the message being produced by the media. With this in mind, the study seeks to understand the sources adopted in the media with the overarching goal of determining the types of sources used and the specific reason they were adopted.

Sources in journalism and therefore the primacy of the sociology of news and agenda setting theories are important for another set of reasons such as determining what messages sources are spreading and for understanding what agenda's they set out. Thus, the literature relied on in this study looks specifically at sources and what makes them newsworthy as well as the processes behind selecting them, in essence leveraging on the sociology of news production theory. More specifically, these theories will draw on professional news values, internal and external factors that influence coverage and the role the media played in making the coronavirus accessible to audiences. Sources can also be studied by using the agenda setting and gatekeeping theories as they can help us in at least two ways. First, they help us understand the interests of both the sources and the journalists. Just what did the journalists want from the sources and what did the sources want from the journalists? Secondly, a link can be provided with the agendas that have been set by sources and journalists in past pandemics.

Because lives and livelihoods are on the line during the pandemic, there is urgency for concise communications that is explanatory in these viral pandemic situations. In this context, interventions, communication and community cooperation are needed promptly to effectively manage a public health response (Schrinning, 2007). Source selection, therefore, plays a crucial role in the public's perception of the virus and it also impacts the public's response (Schrinning, 2007). To communicate topics of a scientific nature effectively, experts and officials need to comprehend what the public already understands and what they need to understand, thereby identifying the gaps and selecting sources to fill the void (De Bruin & Bostrom, 2013). It is these gaps, both at the practical and academic level, that this research attempts to analyse.

Content analysis which is described as the scientific study of content or communication (Prasad, 2008), is a data collection approach for this study. Content analysis enables the study to understand the type of sources and the extent at which they are featured. Science is not a common topic in the media and generally makes up for a small percentage of the content (Schäfer, Kessler, & Fähnrich, 2019). Naturally the nature of the pandemic means it requires a lot of media focus and it is scientific in nature. By

thorough content analysis, it will be possible to understand the content used in the coverage of the pandemic and whether it featured scientists or experts.

This far in establishing the foundational justifications of the study, we have emphasized and re-emphasized the central role played by sources in science journalism. Because scientists are also experts, it is important to define scientists and experts conceptually. These definitional considerations serve as the starting point for the literature review as they would pave the way for the more theoretical literature synthesis as evident below.

5. Literature review

In the rationale and justification section above, we indicated that sources are central to our understanding of the intersection of science and journalism with the COVID-19 pandemic as the locus of analysis. We further pointed out that there is a need to clearly understand what we mean by scientific sources as expert sources. It is therefore only logical that we start with general conception of science and expertise in journalism before discussing the various categories that are likely to have featured in the content that will be analysed.

In terms of general perspectives, Ericsson et al. (2007) defines an expert by using the phrase, practice deliberately. This can be seen in two types of learning. They include the ability to improve and hone in on skills already attained as well as the extension of skills (Ericcson, et al., 2007). Prietula & Simon (2001) also defined an expert as someone who knows more than just facts, they are someone who has deep knowledge on a specific field by gathering data and knowledge over a couple of years. It is experience in the field that defines an expert (Prietula & Simon, 2001). Through exploring both ideas on what being an expert is, the suggestion is that being an expert means being one of the best in a specific field. This research will use these analogies to determine whether expert sources were selected in the coverage of the pandemic.

Scientists and experts are an often-contested area in academia. In Gundersen (2018) it is highlighted that scientific research aims to create knowledge that is new by scientific methods for study, it is done internally through scientific institutions only. The study also

alludes to experts having a role in producing knowledge that is useful to policymakers and the public. Gundersen (2018, p, 12) highlights an important point in the discussion on scientists as experts “As experts, scientists apply established knowledge by translating the esoteric and often complex, uncertain, and inherently provisional knowledge from the scientific community for a political or public community of nonexperts”. Here, it is established that scientists can be adopted as experts as they disseminate knowledge to the public or non-experts which forms the basis of this research. For further understanding, scientists will be explored further.

5.1 Scientists and science journalism

To determine what a scientist is, it is important to define the concept. Science is synonymous with knowledge and gathering it (Ross, 2006). Ross (2006) further elaborated that science is achieved when knowledge is demonstrated, this can be demonstrated through experiments, data, deduction or other such means. Ross (2006) also indicated that science was defined by Newton as “any kind of knowledge acquired by observation or experiment”. This is a broad definition and could extend to social scientists as well. Therefore, using Ross’ (2006) definitions of what scientists are and the explanation that scientists will be defined by those individuals who have gained knowledge through means of experiment, research and studying, this research will proceed with these definitions. In the Centre for Disease Control (2016), virologists are described as medical doctors that work with diagnosis, management and prevention of infection. They’re also scientists, who drive research on aspects of viruses. A virologist can often be both a scientist and a physician. Epidemiologists also work on diseases but, more specifically, they search for what causes diseases, they seek out people who are at risk and work on stopping diseases from spreading (Centre for Disease Control, 2016). Both epidemiologists and virologists are extremely knowledgeable in the field of viruses and pandemics and as a result, will be drawn on to quantify experts.

Science journalism can be defined as content written for the science section of different media outlets, something that is about science or journalism which covers science findings (Hansen, 1994; Wormer, 2008). The connection between science and

journalism relies on the link of experts from both fields (Albæk et al., 2003). Journalists need scientists to get information on complex matters whereas scientists need journalists to improve their position and for exposure to their science (Patel, 2019). This idea of science and journalism is important because it fosters an understanding of complex issues like climate or health topics (Happer, 2013). The research seeks to understand whether this link of science and journalism was apparent in the pandemic coverage and to what extent scientists or experts featured.

Science and topics that are scientific in nature such as viruses are increasing in importance. These topics need to be presented with a degree of scientific knowledge. However, the way these topics are presented needs to be accessible and in a way the layman can comprehend them (Summ & Volpers, 2015). This can be understood from the context of agenda setting and through sources. The overarching aim of science communication is not to foster agreement over the virus, instead, it is to initiate less disagreement over public-health decisions (Fischhoff, 2013). Discovering whether scientists and experts featured as sources in the coverage of the pandemic can further understanding of science communication and the extent to which it featured in South Africa while the country was grappling with the virus.

It's important to understand the cultural systems of the audience. Communication initiatives, especially for viruses, need to be targeted at what people misunderstand and struggle to conceptualise. Scientific information needs to be tailored in a way that enables people to make better-informed decisions about factors that affect them such as a pandemic in this case (De Bruin & Bostrom, 2013). This can be analysed through understanding the sources that featured in the pandemic.

5.2 Scientists and journalists

Scientists and journalists often have a tense relationship. This is associated with both entities having different agendas in terms of the relationship. For example, Peters (2005) alludes to this by saying that their relationship is not antagonistic by its very nature but self-serving in a sense. Where scientists are interested in attaining a positive

public reputation, journalists are keener on a good story with the intent of reaching audiences. And, during a pandemic both are reliant on each other. Scientists play a role in being the sources of news, they are seen as the experts, the ones with knowledge whereas the media are the proponents of important information needing dissemination. Media often adopt the framework set out by the scientist and the more alarmist the frame, the more attractive it is for media (Vasterman & Ruigrok, 2013). With the current pandemic being of global interest, the intricacies at play between the two entities is a worthy cause for study particularly with regards to the tensions between scientists' need to put across messages and journalists' need for good stories often framed through controversy and sensation.

Massarani (2014) and Peters (1995) highlighted that communication barriers existed between scientists and journalists when covering topics that were scientific by nature and often enough this created a tense relationship. Dunwoody & Ryan (1985) alluded to how scientists preferred to remain in their bubble and keep science in its field and not to communicate beyond the science border (Dunwoody & Ryan, 1985). Claassen (2011) looked into the importance of science and journalism stating that the relationship needed improving. This is important as it will foster a better understanding of pertinent topics that commonly mislead the public through quackery and pseudoscience.

A lack of understanding of science topics is attributed to both parties: "The fault lies with both the media and scientists – the former because they quite often do not understand scientific research as a long process with preliminary findings, and the latter because they do not communicate the intricacies of research findings in a proper, direct way with science journalists, but rather work through secondary channels or media liaison officers" (Claassen, 2011, p, 355). This gap needs to be bridged. This study attempts to form a basis that can better enable understanding of this relationship by determining the extent to which scientists featured as well as the content produced.

5.3 Health journalism

Health journalism is often made up of complex issues especially when it is related to viruses or complex diseases. It often takes careful communication to ensure that the correct information is being disseminated. The importance of it is seen in La et al,. (2020) where COVID-19 communication was explored in the media in Vietnam. The media and scientists, both, worked really hard and well in covering the pandemic and promoting information in various media platforms. There was a distinct link in health journalism and science journalism combining to communicate effectively.
A study by Lee & Basnyat (2013) iterated that health journalism, in particular, is reliant on source expertise and public relations because specialised knowledge is required. This in itself explains that health journalism requires a proficient amount of scientific knowledge on the various health topics making it a vital part of science journalism. The current pandemic is no different in terms of its reliance on specialised knowledge. Patel (2019) described how health scientists are increasingly coming to the fore in specialist science journalism thereby intertwining the two fields. The reason for this is that topics related to health are increasing in importance and therefore are covered frequently. It's important to ascertain what sources were adopted in health journalism coverage of the pandemic. Segawa (2019) studied financial reporting but also alluded to the importance of news sources. The study shed light on sources and the importance they have in providing journalists with objective information. Furthermore, sources play a crucial role in disseminating important information to journalists and by extension, the public. A variety of sources enables objectivity by providing opposing viewpoints and expertise on matters.

Journalists enable fact-checking through the attribution of claims and information that is provided by the source. There is a belief in journalism that the sources that are generally favoured have a semblance of elitism, this can be seen in the work of Manning (2001) and Lau (2004). The reason for this as established by Lau (2004) is because a source with prominence, such as a state president or health minister, generates more trust in the statement than a general member of the public would. Within the confines of this research, the study seeks to understand the sources, experts

and scientists that were adopted or not adopted by the media during coverage of the coronavirus.

In Keshvari et al. (2018) it was determined that health journalism was lacking and suffered a dearth in knowledge by journalists. Around 82% of journalists sourced health experts for health-related stories and around 30% of these journalists attested to not fully comprehend health issues. This shows what a crucial role sources play because where a lack of knowledge exists, sources are needed to fill that void and present work in a salient manner. In the case of the pandemic, this presents a role to discuss health journalism and the concept of sources more broadly.

5.4 Theories and concepts of sociology of news, sources and production

Having reviewed literature on science and journalism, the next level of progression is to understand explicitly the media and journalism end of things as a means of bringing us closer to the intersections of the two. Broadly speaking, the relevant body of research in these respects is scholarship on sociology of news which incorporates related concepts such as journalistic sources and news production as well as journalistic practices and professionalism. Speaking to the roots of sociology of news research, Reese & Ballinger (2001: p. 641), using the term “media sociology”, noted that classical works dating back to the 1950 linking sociology and media as; media forces that shape messages, media agendas, personal views and roles of media workers (journalists), media (newsroom) routines, organizational and institutional analyses and ideologies. Building on these historical and enduring conceptions, latter day scholars have grasped the sociology of news as forged in the fact that “journalists are socialized not just to feel part of a particular group but also to do things in a particular way, coming to see that way as natural and desirable” (Singer, 2004). It has eventually been understood that media and news are social constructions comprising traits as: time and space boundedness on basis of newsroom routines and structures; professionalism based on expertise and skill, ethics, public service, and autonomy all contributing journalistic or media cultures, among other factors. Within these conceptual understandings of the link between the

fields of sociology on the one hand and media and journalism, sources figure prominently.

In the preceding sections of this report, we have touched on who sources are generally and who scientific sources are specifically. We have also alluded to how journalists engage and relate with sources. In view of this, there is no major reason why we should regurgitate previous discussions. It suffices to link sources and sourcing to the sociology of news scholarship in passing. Sources are often called upon to be in the news due to their stature in society (Herman & Chomsky, 1988; Hall, 1980). In this regard a summary of Matthews (2010) Doctor of Philosophy thesis suffices, it speaks to the professional aspects of journalism by taking stock of the following: the need for facts to be confirmed by credible and reliable and independent sources; direct sources who are witnesses with no vested interest should be preferred over second- or third-party sources; understand the sources motives beforehand; need to be wary of communication professionals; keep socialization and advice with a news source to the minimum; ensure transparency ; attribute information as much as possible; where necessary provide information on sourcing to the audience; avoid anonymity as much as possible; adhere to the news organization's editorial guidelines (Matthews, 2010: p. 36-38).

These professional practices around sourcing in the broader context of the sociology of news remain important even as newsroom practices have shifted in the digital age. Anderson (2017) for instance notes that "across many parts of the globe the relationship between journalists and news sources has been transformed by digital technologies, increased reliance on public relations practitioners, and the rise of citizen journalism". The study goes on to observe that "with fewer gatekeepers, and the growing influence of digital and social media, identifying whose voices are authoritative in making sense of complex … [of] science proves an increasing challenge [as there is] an increasing array of news sources are vying for their particular perspective to be established including scientists, government, industry, environmental NGOs, individual citizens and, more recently, celebrities".

Patel (2019) indicates that sources are newsworthy because of the role they play in society where they are regularly called upon to comment on topics of importance in the news cycle. Prominent people or the elite tend to feature more in the news because the public trusts them and because they have powerful voices (Hall, 1980). These perspectives are instructive for the current study because they point to primary and official sources being called upon more regularly than others because they are the agenda setters in the world. These sources are trusted because of their rank in society, and they are the ones journalists tend to go for. In the context of this research, scientists and experts are newsworthy because of the wealth of knowledge they possess. The aim of the journalist is to tap into that knowledge and disseminate it to the public with the hope of helping people understand a complex virus. Scientists and experts are regularly relied on because they are seen as the knowledge experts and it is believed that they advance the public good (Patel, 2019).

The sociological perspectives discussed above, to re-emphasize the arguments made in the background and context section of this report, apply to epidemics and pandemics perhaps in a more acute way than in situations that may be considered run of the mill. Cortina-Riveros (2014) in a study understanding media and swine flu in Spain found that predominant sources in coverage of the disease were mostly official sources. This influenced coverage in that the overwhelming information presented was official data including mortality numbers. There was a dearth of information around how to address the epidemic in Spain. The paper further highlighted an example of good journalism where the director-general of the World Health Organisation at the time was cited in an article reassuring people of the situation.

Shih et al. (2008) expressed how the media covers complex topics such as health issues and this is often the most important information for a lay audience. Understanding how the news is constructed can be determined by examining the sources (Shih et al., 2008). This study recognises the importance of a source especially pertaining to the provision of context, explanation and general information for journalists (Shih et al., 2008).

Story construction is particularly reliant on sources especially when the topic is a complex one as Holland et al. (2014) noted in their study on sources and conflicts of interest. The sources adopted were readily trusted because of their expertise on the topics (Holland et al., 2014). Official sources were also likely to be trusted as they provide a modicum of trust in a time of uncertainty (Holland et al., 2014).

Experience and research are crucial elements in the dissemination of information by sources that relate to pandemics; this is because they are synonymous with what makes for an expert or a scientific source. In this regard, sources need to be trustworthy, and messages need to be communicated in a salient attainable manner for it to have a real impact on people (Glik, 2007). This ties into literature by Boyce (2007) on sources and whether the expertise they possess makes them a reliable source.

5.5 Why, how and to what effect sources are selected

The sociology of news production theory will feature as a prominent theory to explore the extent at which scientists featured. Through this theory, there will be a need to seek out how journalists adopted these sources and whether they were prominent members of society exploring gatekeeping, cultural approaches, and critical political economy (Guyot, 2011) notions of the sociology of news production. Further, understanding how scientific sources can tie into cultural approaches as well as gatekeeping approaches in conjunction with the sociology of news production will be important in understanding source selection. To a lesser extent, critical political economy will feature in the study on what extent scientists featured in the pandemic.

Mondragon (2017, pp 101–124) found that mass media played a pivotal role in helping the public understand scientific knowledge especially in the context of the Ebola virus. The study expressed that often a public's first interaction with the disease is through the media and the media tries to make sense of the science of the situation. This is done through experts who try to make these topics understandable. However, for this to be effective, proper communication strategies need to be in place. It is not as simple as

disseminating information as this could have adverse effects if not understood properly (Mondragon, 2017). For coverage of the current pandemic, it's worth looking at the communication and the sources adopted. The sociology of news production theory will be useful in determining how journalists went about sourcing these experts.

In Mondragon (2017) the discussion centred around the Ebola virus and expressed how a lack of proper sources - officials, experts, journalists - led to rumours surfacing and creating potential for false information to become rife. With the advent of social media, this notion is propagated and false information about how the virus is spread can be shared further enhancing the need for effective communicators who can be trusted. This false information has the potential to be dangerous as well as to foster mistrust of doctors and health workers. This was evident in the attacks of health workers who were targeted due to the mistrust of people and the work health workers were doing (Mondragon, 2017). Further understanding of what effect sources featured, or didn't feature, in coverage will enable better understanding if sources played a role in the coronavirus. It will also enable better understanding of the sociology of news production aspects and determine whether the sources were selected because there weren't any other options or simply because they were the easiest to access.

In a study exploring HIV/AIDS in South Africa, Shepperson (2000) found that media coverage primarily relied on official government sources and corporate experts such as health industry workers as the predominant sources. This further ties into previous theories exploring coverage of previous diseases like swine flu which relied on official sources as the ones often relied on when covering topics that affect the public. This will be an interesting aspect to understand in the context of this study, the understanding of whether or not official government sources featured regularly in the coverage of the pandemic is an important point to focus on. It enables further understanding of how, why and to what effect journalists select the sources heard in the media. The HIV/AIDS aspect makes for interesting literature as one can assess various aspects of sociology of news production. In this case, analysing this literature can help understand who the sources were thereby giving a guide as to whether there were gatekeeping processes taking place. The study on HIV/AIDS can also determine the culturological aspect of

sociology of news production by determining who were the sources and to what extent they featured. The critical political economy facet of this theory will be difficult to ascertain but there is room to question why political experts were selected.

However, it's important to note theories that believe secondary sources from unofficial entities provide a valuable service as well (Muchendo, 2005). In studying communications and media around HIV/AIDS, Muchendo (2005) explored the activists as sources and found that they, too, credibly provided valuable information to South Africa's press. In terms of the sociology of news production, the cultural aspect can be looked at here. Understanding the voices that were used and the type of sources the media selected could indicate a certain type of culture in a newsroom or media organisation. It also talks to gatekeeping and which sources the media allow out. These types of sources were seen as unofficial and secondary by scholars such as Manning (2001). This study will seek to assess the various sources when the virus was being covered and will assess the type of sources they were.

5.6 Agenda setting

As indicated by the expansive journalism and media scholarship on sources and sourcing, issues around the credibility of sources tie in with practice and professional concerns. One of the major factors impelling the need for credibility and reliability is that both sources and journalists often have motives and interests that find their way into content. Conceptually, this provides a bridge between different journalism theories. A continuum can be seen between the sociology of news bodies of knowledge and theories of media effects, particularly the well-established theories of agenda setting and gate-keeping.

McCombs & Shaw (1972) described agenda setting as an important tool that the media uses to shape reality. The pair described it as the public finding issues important simply because the media deemed it to be important. It is clear that the pandemic is an important issue that needs coverage, this study can delve deeper into understanding to what extent expert voices were used. This enables a better understanding of the agenda the media attempted to create. It ties into the age-old notion of the media that

doesn’t tell you what to think but what to think about (McCombs & Shaw, 1972). For purposes of this study, understanding elements of agenda-setting theories will be useful in determining sources and coverage. It enables the potential for further knowledge of whether scientists had a role in setting the agenda in a pandemic.

Lopes (2012) illustrated in a study on Influenza A, that health sources were receiving more airtime in the media. It further found that marketing techniques were ubiquitous with the aim of using official sources to make an impact on shaping public opinion and driving agendas. In relation to the agenda-setting theory, it suggests that official sources and health sources were used equally to drive the agenda that the issue of Influenza A is important, and people need to know about it. Further to this, Aziz (2017) found that there were several factors that have an impact on shaping public opinion. These were government bias, level of education of the public, editorial policy, the audience of the publication and the marketing. The authors further argue that health officials are where journalists turn to first because their communications are succinct and concise. Often, journalists tend to source public officials as they’re less cumbersome in terms of reporting and their messages are clearer (Lopes, 2012). This is important as health officials will carry a different message to what an expert would, thereby setting a different agenda.

Scientists can be seen to set agendas and lessen panic around previous pandemics. They can also be adopted to reiterate important frames and agendas that governments are adopting in order to save lives (Collinson et al., 2015). One example that can be drawn on is whether preventative measures were given prominence by scientists in the COVID-19 pandemic as it were in previous pandemics (Collinson et al., 2015). This ties into agenda setting and source selection theories which the study seeks to explore in the context of the virus.

In a study conducted to understand communications surrounding the Ebola virus, Roberts et al. (2017) found that when it comes to communications about epidemics or complex health topics a few voices are the prominent ones heard in the media. These

are the trusted voices and the ones the public look to for guidance (Barabási, 1999 pp 509–512). In the study, Robinson et al., (2017) also found that health and infectious diseases authorities were the most trusted amongst the public, more so than stories read on social media about Ebola. This ties into theories by Manning (2001) and Hall (1980) that suggest that experts from accredited institutions with various degrees of power are often called upon as sources. Their status in society, their prominence and wealth of knowledge make them highly attractive options for appearing as frequent sources. There were only a few elite actors who would have a meaningful influence on public sentiment about a given topic. The agenda-setting aspect can be seen here, that the voices used by media houses are the ones that should be believed. The Ebola studies show that the specific voices are the ones people will take guidance from.

Like agenda setting, gatekeeping theory is equally linked to the theories of sociology of news to the extent that both theories invoke journalistic professionalism to control the sourcing processes. Gatekeeping is a popular mass communication theory that can be featured in the sociology of news production (Schudson, 1989). In this theory the construction of news is addressed, the social construction of reality and how news is manufactured by journalists are the topics explored. For this study, the aim is to delve deeper into these issues from a science and journalism perspective. More specifically the study hopes to address whether journalists, gatekeepers and factors that influence news production have a profound impact on what extent scientists are featured in media coverage during the coronavirus pandemic in South Africa.

Gatekeeping has featured prominently in the media through the decades. A journalist, a person with ideas, opinions and beliefs decides what makes the news (Schudson, 1989). Shoemaker & Reese (1996) contested that journalism does not form in isolation, instead, it is a combination of audiences, commercialisation, resources, and a variety of aspects which contribute to a story. For the purposes of this research, is gatekeeping preventing or encouraging scientific sources to feature prominently in the media? To a larger extent, is there any evidence of gatekeeping, to begin with? Determining

scientists and the extent at which they featured can be understood through the knowledge of gatekeeping.

Gatekeeping on its own offers a holistic view of news and how it is selected. Essentially it looks at how writing, editing and generally taking information and the process it follows to become news (Tandoc, 2014). This research will be driven by the news-making process and whether that featured scientists in a prominent way or if it was merely tangential. Gatekeeping paves the way to a discussion on the sociology of news production and the three major factors behind the production of news.

In Van de Meer et al. (2017) there is a discussion on sources and gatekeeping in crisis communication. The discussion entails news construction being unequivocally reliant on sources as they provide the information needed to make the news. This makes source selection an integral part of this study as it will determine whether the sources selected were responsible for news-making in coverage of the pandemic. Van de Meer et al, (2017) also alluded to source credibility in crisis communication and how important it is for a journalist to have reliable sources with knowledge and accuracy which is critical in gatekeeping practice. The study of sources and the gatekeeping processes journalists employ will enable a better understanding of how, why and to what extent sources featured in the coverage of the pandemic.

5.7 Summary

Science and journalism are often contested, some notions believe that the two areas are largely unhelpful in that they oppose each other and there is a distance between the two areas of speciality (Patel, 2019). The disconnect arrives from both having respective agendas and through media focusing on other topical issues such as crime and politics instead of scientific issues. This contest is drawn in what is seen as newsworthy with science often being relegated to other topical subjects. In the public health arena specifically, journalists have been lambasted for spreading misinformation. There is also criticism for the lack of science journalists or publications which focus on science-related topics. There is interest in these themes and whether they are similar in

the context of the pandemic and understanding to what extent scientists featured will enable understanding of whether there is the disconnect as mentioned in previous studies.

Overall, the current body of literature points to the existence of scientists in media coverage of previous pandemics. This paves a way forward for this body of research in that it will help to understand to what extent scientists featured in coverage of the virus in South Africa. Through literature on the sociology of news production, source determination and agenda setting, the research will enable a better understanding of the coverage on the pandemic and how scientists featured. Furthermore, it will look to discuss the appropriate sources selected by the media to disseminate information on the virus.

6. Theoretical framework

Having discussed the relevant literature, the question that arises is the applicability of the perspectives from the studies on past pandemics, debates around journalism and science, and the ideas gained from journalism theories to the current pandemic in South Africa. In order to effectively apply these theories to current pandemic, the current study adopts an approach in which perspective, concept, theory and idea is applied to the specific research questions. These questions are:

- To what extent did scientists feature in News24 coverage of COVID-19 during the months of April and May 2020?
- How, why and to what effect did News24 select sources in their coverage of the COVID-19 pandemic?

A reading of these questions indicates that agenda setting, and gatekeeping are well placed in responding to issues around the extent to which scientists featured in the content. This is because one can attempt to identify the agendas that were prominent and pair them with the scientists that featured and vice versa. The question of how and why the specific scientists were selected can be answered via the sociology of news

theory along with its concepts and principles such as sourcing and professionalism. This helps in linking the agendas to the practices that produced them. These theories further understanding of news and the processes associated with news that enable this research to determine how journalists adopted scientists as sources in the pandemic. The theories of sociology of news production can enable this study to understand the constructs of news production in tandem with science journalism and to what extent scientists featured in media coverage of the pandemic. The question of what the coverage tells us about the relationship between journalists and scientists is a meta one that pulls the rest of the questions together. Thus, the scholarship on science and journalism discussed in various parts of this report would apply. At the same time, the agenda setting, and sociology of news theories would also apply to this question in an overall sense.

In the rest of this section, the researcher explains how the reviewed literature is applicable to the study.

6.1 Research Question 1 and agenda setting and gatekeeping

McCombs & Shaw (1972) described agenda setting as an important tool that the media uses to shape reality. The pair described it as the public finding issues important simply because the media deemed it to be important. It is clear that the pandemic is an important issue that needs coverage, this study can delve deeper into understanding to what extent expert voices were used. This enables a better understanding of the agenda the media attempted to create. It ties into the age-old notion of the media that doesn't tell you what to think but what to think about (McCombs & Shaw, 1972). For purposes of this study, understanding agenda-setting theories will be useful in determining sources and coverage. It enables the potential for further knowledge of whether scientists had a role in setting the agenda in a pandemic.

The media plays a huge role in disseminating information surrounding the pandemic to the public. Sources are important factors to note in this context. The media is often an important tool in disseminating health communication and information to the public (Lee & Basnyat, 2013).

The key issues this research seeks to address is to what extent did scientists feature in the coverage of the COVID-19 pandemic in South Africa. The optimum way to understand this topic is through theories such as the sociology of news production. Subsequent theories of culture, critical political economy and agenda setting can help determine whether there is potential for understanding to what extent scientists featured and the processes journalists followed to feature scientists when covering the pandemic. Understanding the agenda setting as well could enable further understanding of scientists' role in covering the pandemic. Through agenda setting it is possible to determine to what extent scientists featured and whether any agendas were prominent in the coverage. This could also enable the study to determine how and what sources featured during the pandemic.

Agenda setting as a framework was explored in a study on neglected tropical diseases and policy priorities. The study makes reference to how policy makers can articulate certain priorities in a vague manner with an eye on generating agreement to the public and in the hopes of not displaying the harsh reality of a situation (Iltis & Matthews, 2017). In the case of this research it will be prudent to analyse how and to what extent sources were used to better understand any agenda's being adopted.

Further to this, the research questions who are the agenda-setters in the coverage of the pandemic (Iltis & Matthews, 2017). It makes the point that a variety of stakeholders should be represented in the form of researchers, communities, scientists and policy makers. This is an important aspect in the context of this research as an overrepresentation of certain parties could lead to an imbalance in coverage thereby affecting the agenda.

The function of gatekeeping is one that the media is wholly responsible for (Van der Meer, et al., 2017). In the time of a crisis, the media have a critical role to play in disseminating accurate information (Sorribes & Rovira 2011). The media must provide information to the public in a time where uncertainty is rife and the world can be seen to be in a chaotic state, it is the media's role to share information that is accurate and void of confusion (Van der Meer, et al., 2017). It can certainly be argued that the COVID-19

pandemic is one such time. Gatekeeping theory is powerful in that it offers theory that sets a benchmark in understanding how a particular crisis event was covered. The sources adopted by the media are critical to study as these sources have significant framing power and an ability to shape how people act. The challenge of needing sources rapidly comes in during a crisis and this makes it difficult as journalists would tend to turn to the most accessible ones. These generally would be official sources. Van der Meer, et al. (2017) found that in a crisis, journalists are the main gatekeepers, they are the ones selecting sources and making decisions about who disseminates what information. The tendency is to rely on familiar sources and to disregard alternate sources which can have an impact on framing and coverage. This study will assess the sources selected by the media with the goal of understanding what gatekeeping processes went into selecting sources.

6.2 Research question 2 and sociology of news, sources and professionalism

A key component of the sociology of news production is a critical political economy of the media organisation and whether the news output is influenced by an economic structure. Scholars have long argued that content will always be at the mercy of where the money comes from (Herman & Chomsky, 1998; McChesney, 2001; Schudson, 1993). However, this notion is questioned by Schudson (1989) by critiquing critical political economy theories believing they are limited as they don't take into account journalists' autonomy and ability to think for themselves. The author also believes that the notion of the ruling elite being behind powerful media organisations agendas is limited. In the context of this study, the economic structure of the media that produce coverage of the pandemic have factors that affect the production of news. These can be economic, agenda-based, or even from a gatekeeping perspective. How so, if at all, do they influence what extent scientists featured in coverage of the pandemic. Or is it simply that media owners and funders determine the type of content produced and whether it has a focus or is agenda-driven. The study will seek to understand what sources prevailed in the pandemic's coverage and whether it was a result of any influence from economic ownership.

In the social organisation of news work, Schudson (1989) explores the concept of social realities in news production. Here, the link between journalists and sources are examined to an extent where the power dynamics between the two are discussed. The variant viewpoints on news creation discuss whether it is a social production of reality or is it socially manufactured and organised. Determining whether these sources are scientific or not in the context of pandemic coverage is worth exploring. It enables a deeper understanding of scientists as sources as well as how the media go about selecting these scientists as sources.

Patel (2019) looked into the various intricacies at play between journalists, sources, editors into what makes news and how it is constructed. This study is relevant in trying to understand sources and the selection process of journalists to determine them. The critique for journalists and sources is that facts are hidden or buried and usually not explicitly told, this ties into a framing narrative that states journalists select which aspects of a story to make relevant. With the proposed research, these issues become more relevant as it further enhances the study between scientists and journalism. It is also useful as it can leave an imprint on a new field which is the current pandemic and its coverage. Are the predominant sources in the coverage scientific ones who understand the complexity of the subject more than anyone else, or have they been excluded?

This notion of news being constructed by external factors is contradicted by Chan (2015). The counter looks at the ethos that journalists have ingrained in them to discuss their need to get the truth out, to provide evidence and facts of realities surrounding us. For this study the adoption of scientists or researchers with adequate knowledge on the topic ties into Chan's theory that the ethos present in journalists is stronger than external influences. Chan (2015) sheds light on this contestation through the notion that journalism's criticism of not being objective and being agenda-driven is dispelled under the notion that journalists are objective and only have a desire to share the truth. The study also addresses the weight thrown behind authoritative sources who are believed to produce neutral and trustworthy social facts. In this time of a pandemic, one can see how fake news and deception are rife leading to journalists sourcing health experts and

official voices to tell the public important information about the virus. Since the pandemic has become a reality, globally, this study looks to understand the extent to which sources featured in the coverage of the pandemic.

In this approach, Schudson (1989) discusses varieties of culturalogical approaches to news and draws the distinction that more than social factors, media employs in a cultural world and are adopted to use cultural symbols. This approach believes the notion that events occur all over the world but the media are the ones with the skills and perceptions to decide which of these events are worth sharing to the public. This was echoed by Tuchman (1972) who believed that newsmakers have a sacred job in determining news which sets them apart from other people. One can see the relevance of this theory in the study of this pandemic. Through analyses of the coverage, it becomes possible to see whether cultural symbols were adopted when sources were selected.

Culture as a concept is not singular, in fact, in a society, there are numerous cultures all contending for hegemony and power to be the predominant culture. It can be said that cultures with more power, such as political or economic ones, are the more powerful cultures seeking to control organisations which produce culture and media (Hall, 1980). Cultural approaches to media help understand generalisations and stereotypes often seen in the news. This study will provide a good basis to understand culture as it enables understanding of the role scientists played in the media culture.

Schudson & Waisbord (2005) highlighted that an important topic worth exploring is culture and the role of media in moral panics. This is prudent in the context of this research as the public fear, anxiety and worry could all be heightened by coverage of the COVID-19 pandemic. The concern in this sense is that the media does not contribute to already heightened worries people have about the disease ravaging through countries. Further to this is the research exploring the language used, whether it was sensational and how it may or may not have contributed to public fear.

Cultural contexts are important to understand because they play a crucial role in how messages from officials are received. This, in turn, affects how people respond to a

pandemic. At-risk groups who feel marginalised or who are facing constant life issues and challenges are more inclined to be distrustful of government and leaders (Wasserman, 2020). There are pertinent grounds for inquiring whether adequate representation can be seen to allay fears the public have over the pandemic. This requires effective and clear communication to justify actions taken that can explain why decisions are made to avert social disruptions which affect public health interventions.

Vaughan & Tinker (2009, p 7) succinctly described it as “effective communication strategies must fit the cultural values, life circumstances, and risk perceptions of targeted audiences”. Wassermann (2020) enables understanding of misinformation by explaining it through trust in that if the public lack trust of official communications, they will see alternate sources of information and often these may be imbued with inaccuracies. For this reason, cultural nuances are crucial when it comes to coverage of health-related issues that have outcomes on people’s lives, are these nuances portrayed by sources when the virus is being covered? The research will address the cultural nuances through interviews with journalists who featured prominently in covering the pandemic.

6.3 Research question 3 journalism and science

Ericsson et al., (2007) defined an expert by the ability to practice a skill deliberately, improving on a skill and the means of extending that skill. In this context, it is someone particularly knowledgeable on a particular subject. A more thorough explanation of an expert is a person who has attained deep knowledge through data and learning on a subject over a variety of years (Prietula & Simon, 2001). At the same time, a scientist is defined by Gundersen (2018) as a person who takes part in the application of an established field through gathering knowledge. Science is seen as knowledge gathered through data, experiments deduction, research and means synonymous with epistemology methods.

For this research, the purpose will be to seek out what sources were adopted by the media when covering the virus. This will be to determine who was an expert or scientist.

It will establish a set of criteria that determines whether sources featured had depths of knowledge through research and expertise on topics. It will further focus on the institutions in which they were attached to, in order to determine their affiliations. The research will address the frequency of these experts in media coverage of the pandemic. It will also assess other sources adopted with the intent of comparing the frequency of experts and non-experts. Through source selection and analysing to what extent these sources featured, the research will enable more understanding of these sources.

Expert sources have long been contentious in journalism. This study will refer to the study done by Boyce (2006) in which expert sources are referred to as having specialised knowledge. It further defines an expert as having expertise that is interactional by means of engaging with peers or contributory to areas already explored. Finally, the study explains experts as having specialist skills in a field through practice, immersion in a subject and contributing to the field (Boyce, 2006). Journalists rely on expert sources for three main reasons: for facts, credibility and objectivity (Boyce, 2006). In the case of this research it will be important to look at whether the sources that were expert or scientific by nature were called upon for these specific reasons. For this research it will be prudent to understand whether the expert sources were called on for specific beats which will determine whether they were adopted to comment on a particular agenda or topic (Boyce, 2006). In previous decades experts were generally sources when discussing their own research, currently they are seen commenting on general issues or their broad areas of expertise (Boyce, 2006). This will be an interesting point to zoom in on during the research.

6.4 Summary

The predominant theories the research will focus on are the sociology of news production, gatekeeping, news source selection and agenda setting. Through these theories and a dual research approach, the goal is to present a balanced study that assesses journalistic decisions and content over a period intending to understand to what extent scientists featured in the coverage of the pandemic. The second goal of the

study is to understand how, why and to what effect the media select sources that were heard in the media during the pandemic. The ideal means of achieving this approach will be through sampling and content analysis with a code sheet to determine how often scientists and experts featured in the coverage coupled with a secondary element of interview questions posed to journalists prominent in coverage of the pandemic.

7. Methodology

For this study, a quantitative method will be adopted. It is the most appropriate method for this study as it would help determine the extent at which scientific sources featured in News24's media coverage. Furthermore it will help interpret the data present on journalistic choices and decision making when selecting sources and by extension the relationship between journalists and sources. Moreover, the quantitative approach will enable insight into news agendas and will enable numerical availability of sources but will be limited in understanding of decisions made by journalists. For the first part, quantitative content analysis will be used to determine to what extent sources featured in the media coverage of the pandemic, and how many of them were present and what type of sources featured in the media. The sections below will define the usefulness of this chosen method and why it will be the best way forward for this study.

7.1 The quantitative approach

In order to understand the extent that scientists featured in coverage of the pandemic, it is important to analyse content on the website mentioned. In this instance, the method the study will adopt is sampling for content analysis. Weekly sampling is the approach the study will undertake as it presents a more efficient mode as opposed to daily sampling (Hester & Dougall, 2007).

Hester & Dougall (2007, p.1) in their study on sampling believed that for a study of online news, "at least two constructed weeks, and as many as five constructed weeks, are needed to accurately represent online news content gathered during the same period". For this study, three months or around 12 weeks, May to August, were studied in one-week segments to compare content and determine sources and the extent at

which they featured in coverage of the pandemic. The study will seek out five random stories per week during the timeframe for a more systematic sampling method.

In Smith et al. (2002) a study was done seeking to understand media coverage of tobacco and it was found that quantitative approaches such as sampling and content analysis were a useful tool to determine the frequency of tobacco-related content. This type of analysis has relevance for a study of this nature as this quantitative content analysis and sampling can determine how many sources in the pandemic's coverage were expert. In Smith (2002) the authors note the limitations of quantitative methods for media studies and highlight how qualitative studies are needed to have a more nuanced in-depth analysis. Both qualitative and quantitative methods have limits and advantages. In the case of qualitative, the limits are that the findings cannot be extended to wider populations (Atieno, 2009). The answers provided from interviews are limited to that person or to that organisation. The limitations for quantitative research is that it is difficult to comprehend the more complex nuances, often it is not robust enough (Atieno, 2009). Both research methods have advantages as well. Qualitative research provides more detail to research and quantitative research is easy to analyse with findings more generalised (Atieno, 2009).

7.2 Content analysis

Content analysis has a high value when it comes to studying mass media content. Citing previous studies, Wimmer & Dominick (2000) define content analysis as studying and analysing communication to answer research questions and measure aspects. Krippendorff (2004) discussed how it is extremely valuable when studying ideas, phenomena, attitudes and themes in text. It will also address what other sources were adopted by the media. McNamara (2005) found that content analysis was a good way to study texts as it enabled the researcher to pick up on themes and understanding of messages. He further posited that to study messages in texts, content analysis was an optimum choice as opposed to interviewing journalists. McNamara (2005) saw content analysis gain popularity in the 1920s and 1930s, it enjoyed proliferation from then as it became one of the most popular tools in studying media texts. Neuendorf (2002)

described content analysis as the studying of messages that is reliant on scientific means to gain answers. This will provide a sample size. Studying text on the virus by News24 will enable the research to gain more insights into the type of sources the research produces. A code sheet will be created counting the number of articles, and the various types of sources, separating experts, scientists and other sources that were featured.

The code sheet will be in a tabular format and used to decipher frequency of experts in COVID-19/coronavirus content, where experts hailed from, who were scientists and which sources were official, such as government officials.

For research such as this to be successful, the research must be conducted using mediums that are appropriate with enough content in order for the research to be effective. The first step will be determining which media outlets will present optimum results. Online publications that would have covered the pandemic thoroughly present the best opportunity for this type of research. In this instance, News24 provides one such option. News24 is South Africa's dominant online news platform according to Roper et al. (2019) the website dominates the market in South Africa with people accessing the site more than any other. It is in part due to News24 and it's early adoption of digital technologies and the focus on creating news to an online audience (Roper et al., 2019). When comparing reach with other websites, News24 totally dominated and the state broadcaster, SABC, came in second and eNCA was third (Roper et al., 2019). The reason this research selected News24 is due to its status as South Africa's most accessed website for news (Finlay, 2020). News24 has website traffic of 6,5 million unique users monthly. The site enjoys significant traffic and is likely to cover the pandemic thoroughly (Finlay, 2020). In terms of digital news consumption it is South Africa's most frequented website and therefore a perfect case study for this research.

For the purposes of this study, the focus is on News24 in particular. The online media platform is a part of a major conglomerate in Naspers, and Media24 is one branch of its massive media tree (Wasserman, 2020). Media24 ranges from websites, newspapers

and magazines. News24 forms part of this. News24 is the leading online daily news provider with the most unique users to the site per month. That number is at 6,5 million unique users and in comparison TimesLive, which comes in second, has 6 million (Finlay, 2020). Separately, a Reuters study also listed News24 as the top news website accessed in South Africa (Roper, 2021).

7.3 Introduction to findings

The findings for the research were based on a quantitative approach. The study assessed the pandemic content from News24 during the months of May through to August 2020. May was still early on in the pandemic where the lockdown was the prevailing topic. Studying it over the four months presented an opportunity to understand a longer period of coverage. There was also huge amounts of content to cover. For this reason, five articles were randomly selected per month over four months presenting a total of 80 articles. The content sought out five articles per week where a total of 80 articles were selected by separating each month into four-week segments. This approach sought out the news sources from the selection of articles with the aim of understanding who these sources were and to what extent they featured per topic. This sort of random sampling is defined as the selection of texts by chance but with a known possibility of selection, this means that the articles selected are chosen at random with the hope that the articles selected will have a source that can be analysed (Lavrakas, 2008). This sampling method draws on randomly selected articles with a known probability of the selection, it is the appropriate method of study to determine who the sources were and how they featured (Lavrakas, 2008). It will be important for purposive sampling, best defined as selective, purposeful sampling, to not intrude with the sampling (Palinkas et al., 2015). This is because it will skew the results and the research will be better suited if articles are selected at random (Palinkas et al., 2015).

In collecting the data, I took each of the articles and counted the number of sources. From here, I broke the sources down into three categories. The first category was government or official sources. The second was an expert or scientist. The final category was society. Society ranged from public sources such as students or family members to anonymous ones. The articles were classified into the sections that they

focused on such as the COVID-19 numbers, testing, the impact on families, business industries and travel for example.

8. Results and findings

8.1 Determining the sources

Vasterman and Ruigrok (2013) defined a source “an actor to whom the information in the statement is attributed by quoting or paraphrasing this actor”. In this research, a source will be defined using this definition. The overall aim is to ascertain who the sources were and to what extent they featured. A code sheet was used in the understanding of these sources. They were subdivided into categories that included: government sources, scientists or experts, society and anonymous people who weren’t named. Further to that, coding the articles by subject matter defining them thematically enabled an understanding of what topics contained sources, who they were and to what extent they featured.

8.1.1 May

A codesheet was used to determine the type of sources, whether they were official government sources, science experts or society at large. The first week of the timeframe was the first week of May and it yielded a selection of five articles. In this, the articles varied from kids infecting elders, numbers, testing numbers, wearing a mask and comorbidities. This variety of articles presented nine sources in five articles. Of these, the majority of sources were governmental or official sources. A doctor featured in content covering whether kids could affect elders. The other anomaly was an attorney who was the director of a company discussing mask-wearing. This puts official government sources as the predominant source. Interestingly, the numbers of articles reporting on tests or infections and deaths all featured government officials.

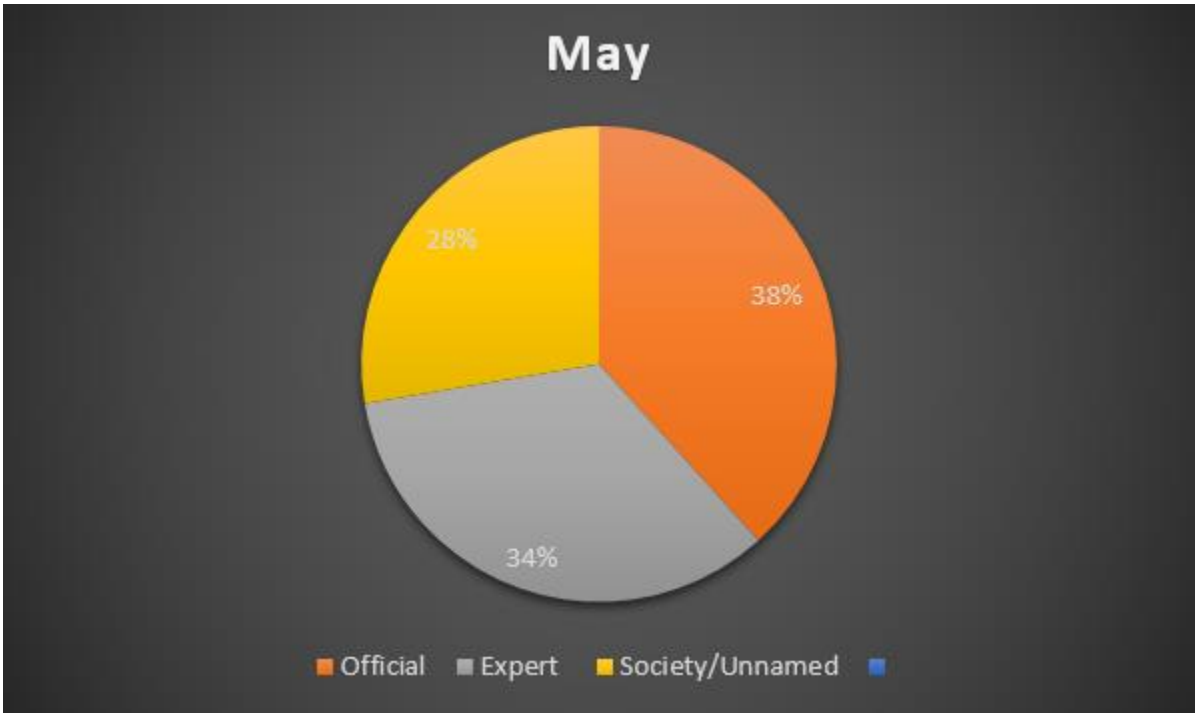
For the second week of May, the five articles selected had an array of topics relating to the pandemic. These included one on numbers, worker payments, kids online activity, the safety of going to classrooms and fake news on the virus. In total, five sources

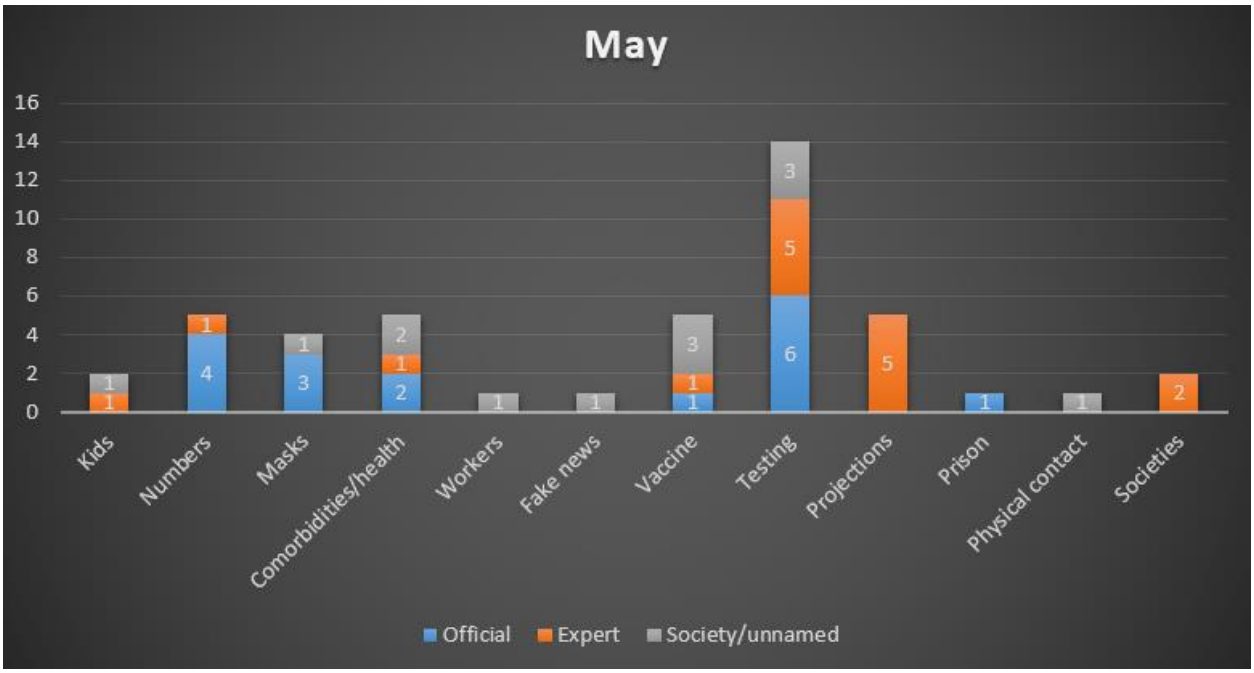
appeared this week. Once again concerning numbers, South African health minister Zweli Mkhize was the focal source. The sources selected relating to worker payments, child safety and fake news featured societal workers from specific fields. The people featured were a law worker, the head of child safety of an organisation and a media outreach manager.

The third week of May saw an array of stories that included struggles of vaccines and economies. There are also articles on testing and COVID information. The final batch of articles explain the projections for the virus. Interestingly, the economies and vaccine struggle story featured no less than five sources. These were predominantly society members with the exception of former President Donald Trump. These were people whom the pandemic affected directly from an income perspective except for the former US president. The article on testing for COVID-19 had a vast number of sources. The majority of these were health workers including academic experts such as Professor Shabir Madhi, Salim Abdool Karim and Marc Mendehlsoon, these are noted as top experts in their fields which work on viruses and vaccines all with a direct link to COVID-19. It also featured nurses, society in the form of a taxi driver and an MSF doctor. The additional official source was South African president Ramaphosa. In the piece on COVID-19 info, two sources featured. This was in the form of an official source, the health minister Mkhize and an expert source in health systems, Professor Van den Heever. When it came to projections, these were synonymous with experts with four of the five expert modellers or an epidemiologist. The final source was an actuary.

The final week of May had five articles of a different nature. The first was on COVID-19 testing kits and the shortage thereof. The four sources in this article were all official ones. They ranged from members of parliament (MP) to the director-general at the department of health and an opposition MP. The shortage showed how official sources were predominantly called upon. The story on releasing prisoners also featured an official source in the form of the justice minister. Following on from this was an article that related to maternal and neonatal health in the time of a pandemic. The number of sources in this article extended to four. They ranged from a professor in maternal health

to two members of society working in the maternal and neonatal fields, in particular milk banks. The article also featured a department of health chief director rounding up an array of sources from different sectors. The final article looks into the virus and how it has a different impact on people of colour and how it affects poorer people more. This piece featured two sources, both of which were professors in the health sector and had worked with pandemic and seen firsthand its impacts.





8.1.2 June

For the first week of June, the articles selected varied from treatment for COVID-19, how it compares in South Africa and other countries and the way kids are affected by the pandemic. There are also articles on how lockdown has induced alienation for some parents and the reopening of airports. In the first piece, the article focused on a treatment for COVID-19 and how high flow nasal oxygen was being attempted as a treatment for people who have contracted the virus. The article had a solitary source and that was the head of the department at a hospital in the Western Cape who was at the forefront of implementing the treatment. The second article compared the virus in South Africa to other countries but featured no source. The subsequent story discussed what parents need to know when their kids go back to school. This piece focused more on kids and how the virus affects them or can impact them. The single source was a professor and member of the paediatric association named Professor Haroon Saloojee. The article that followed looked into parents suffering from alienation as a result of the lockdown and the inability to have human contact with other people other than immediate family. There was only one source which was an attorney working on divorce and custody issues. The final article discussed the reopening of airports and airlines as restrictions eased. This piece had four sources. Amongst these sources were a senior

official at a prominent airline in South Africa, a very senior government source, the minister of transport, and the airport commission's spokesperson. The first week of June featured a low number of sources with a low representation of expert sources.

During the second week of June, the selected articles drew on different topics in ascertaining sources. These articles focused on people with HIV and TB and their risk of COVID-19. There was also an article on a new field hospital setting up, how teachers were contracting COVID-19, the ban on alcohol in South Africa and finally, a plan to reignite the country's tourism sector. In the first article, there was a focus on people with HIV and TB and the higher COVID-19 risk they have. The article featured two sources. The first was a professor and public health specialist affiliated with the department. The second was a professor and the executive director of HIV and reproductive health at Wits University in South Africa. In the next article, the content looks at the launch of a new field hospital in the KwaZulu Natal province. The single source is the premier of the province which is a governmental one. The next selection discusses teachers contracting the virus and has a total of three sources. Two of these sources are departmental ones with fairly senior members. The third is a paediatrician affiliated with the Red Cross. The fourth selection for this week of June is an article that discusses South Africa's alcohol ban. It is an analysis written by two emeritus editors at the South African medical journal both of whom are medical doctors. The concluding selected article for this week is South Africa's endeavours to reinvigorate its tourism sector. There are four sources in this article, three of these are governmental and they are members of parliament. The one alternate source is the CEO of a major tourism company. This second week in June had a variety of sources, some of which were expert sources and the rest were official governmental sources. Overall it seems this week had a blend of sources with official and governmental sources appearing slightly more.

The third week of June had two of the five articles not having any source at all. However, two others had a big variety of sources. The fifth article had one source. The content related to COVID-19 testing, an increase in numbers, the rollout of a potential

treatment for the virus, how one can keep safe in a pandemic and finally, the way people are coping with the virus. The first article on testing had no sources, as well as the one on keeping safe in a pandemic and following the rules. The article on increased numbers which was expressed by health workers had no less than seven sources. These sources were mixed, they featured two unnamed nurses, three unnamed doctors and two governmental sources. The story on the rollout of a potential treatment had a solitary source which was the health minister. Finally, an article featured on the way people are coping with the virus. This article had many sources from society at large discussing their personal experiences on the pandemic. Names were changed for anonymity which is a practice in journalism in the interest of keeping sources safe. This week was peculiar in that some articles had no sources, others had many sources from society to government and nurses and doctors working in the field.

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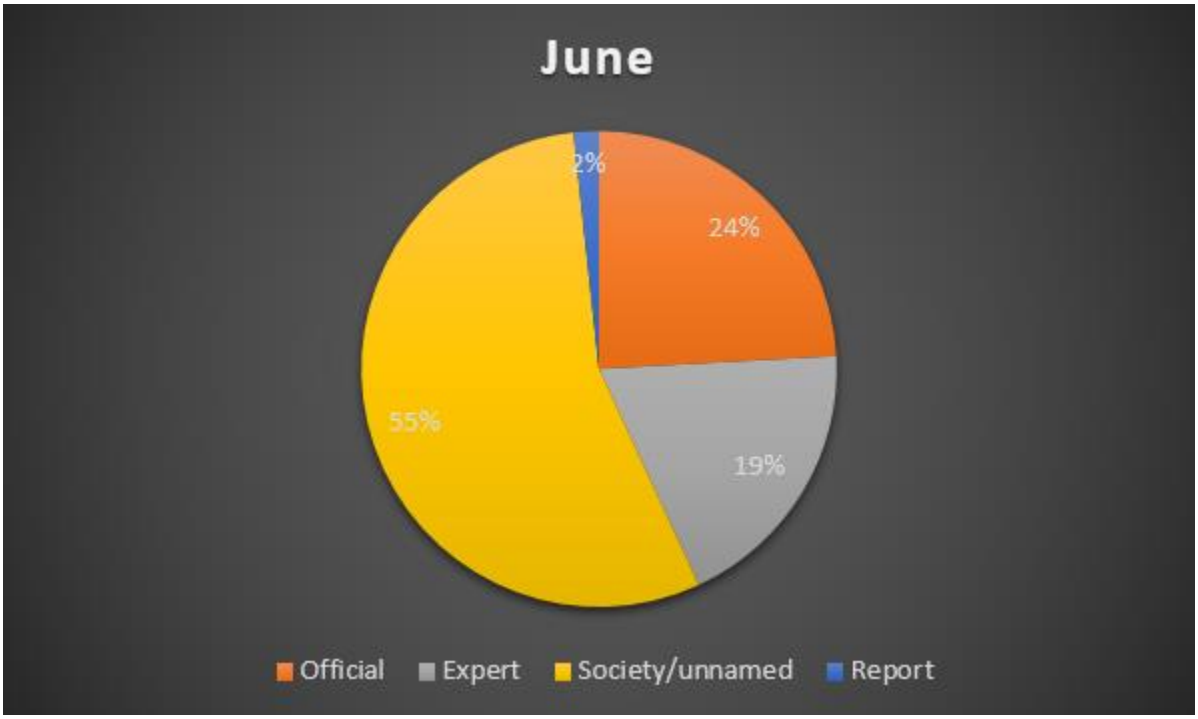
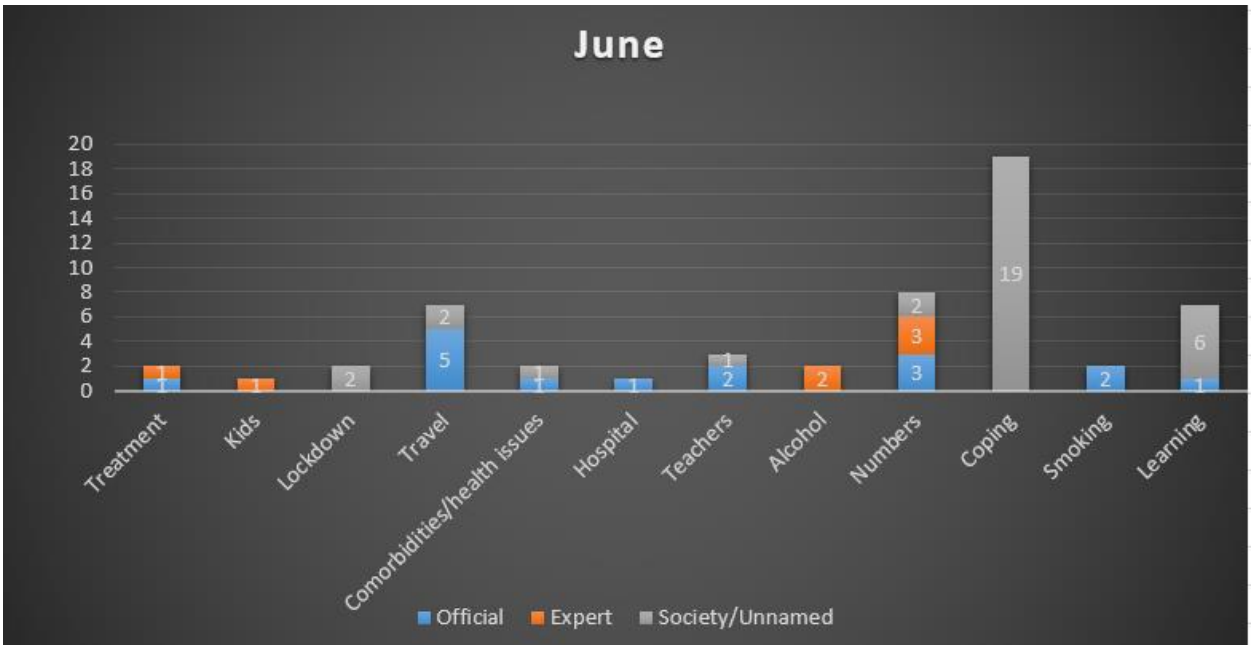
In the final week of June, the articles varied from gender-based violence and lockdown restrictions to COVID-19 numbers and data. There was also one on lockdown and marriage, smoking and COVID-19 and online learning. These were all widely different.

The gender-based violence piece had no sources. In the second article discussing the numbers, the health minister commented as a source. The article also featured quotes from the report which was authored by an array of academics. The article discussing lockdown and marriage featured a solitary source which was a divorce mediator and marriage coach. The next piece to draw on was one discussing the topic of smoking and COVID-19. This had two sources, both of which were governmental official sources. Finally, the article discussing the pitfalls of online learning had eight sources. The predominant sources here were students affected by the learning. An official source, a spokesperson, was the only anomaly. This month featured four official sources, there were two instances of expert sources being noted, the first through a report and the second through a mediator and coach. There were seven sources from society which were students who had name changes to protect their identities.





8.1.3 July

For the first week of July, the five articles selected were all different by topic. There was content on a surge in COVID-19 numbers, fake news on vaccines, the impact on doctors, the provincial measures of COVID-19 and the effectiveness of a fabric mask. The first article featured one source discussing a surge in numbers in the North West province in South Africa. The source selected is the health minister Zweli Mkhize. The second article was based in Nigeria and misinformation discussing the vaccine. There were three sources used in the article. Two of them are noted experts in the field, a scientist and a virology professor. The third source was the head of prevention programmes and knowledge management. The third piece discussed the battle doctors face dealing with the virus. There was a single source which was an anonymous doctor working in the field. The fourth article discussing measures in Gauteng had two sources, both of which were government sources. The final article drawing on what a fabric mask should look like to be effective was done by an associate professor who conducted a study of masks.

July's second week offered five different articles and in combination, there were 23 sources from many different sectors. The first article discussed the death of an infant

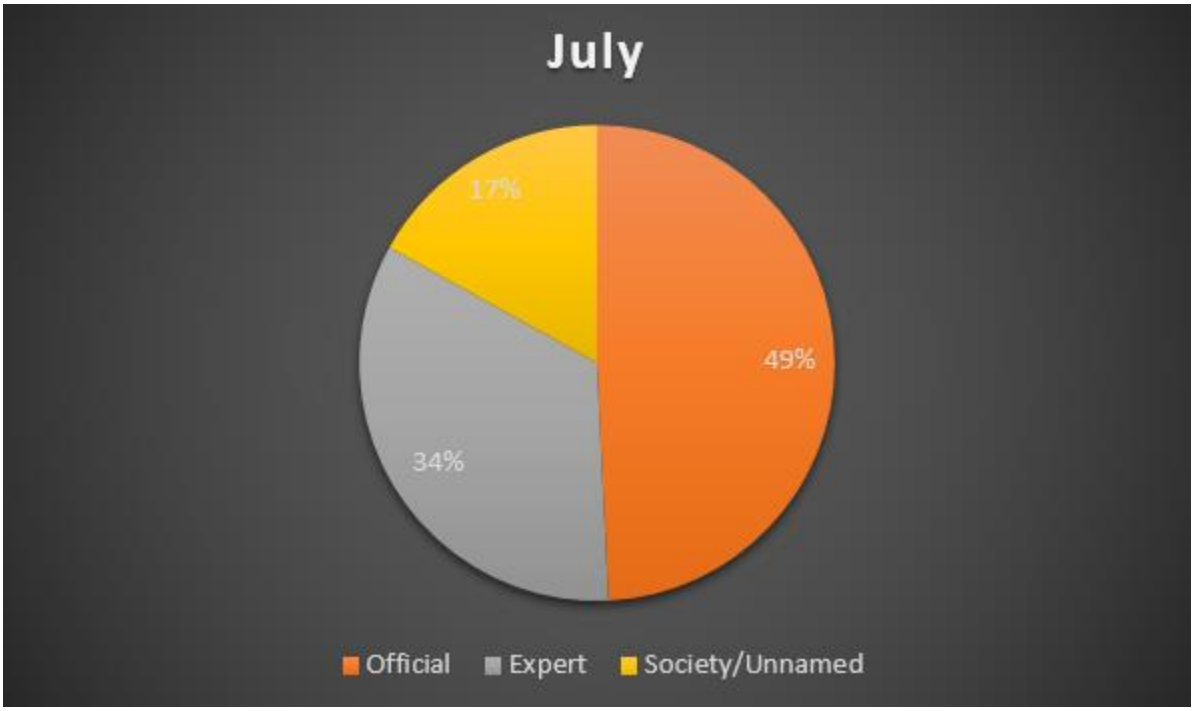
after contracting the virus. This article had two sources, the first source was the department of health as a collective and the second was the health minister. The next article looked at the virus on the continent and how a lack of data is causing a silent epidemic. This article had an extensive number of sources with no less than 12. Two of these were unnamed, but several belonged to continent-wide health bodies such as the World Health Organisation, the Africa Centre for Disease Control and Médecins Sans Frontières. These included an epidemiologist, the director of the institute and general WHO representatives. There were also official sources including the President and health minister of Tanzania as well as an unnamed official. An official source from the DRC was present as a source as well. The article also featured a member of society in the form of a member from Resolve to Save Lives. The third article discussed how people in South Africa are suffering from hunger exacerbated by COVID-19. The single source in this article was a social justice organisation representative. The third article discussed how people work from home and whether it was possible to “switch off” from work mode. The article had three sources. One of these sources was a technology writer. The other two were experts in the form of an emeritus professor and a lead author on the study which was a professor in physical activity and population health. The final article for the week had five sources. Of these, two were official sources who were members of the opposition party. Two other sources were health authorities in New Zealand and Australia. The single source was the National Institute for Communicable Diseases which commented as a collective. Overall, the week saw many sources all from a variety of different fields. Some were experts, many were officials and there were also society members.

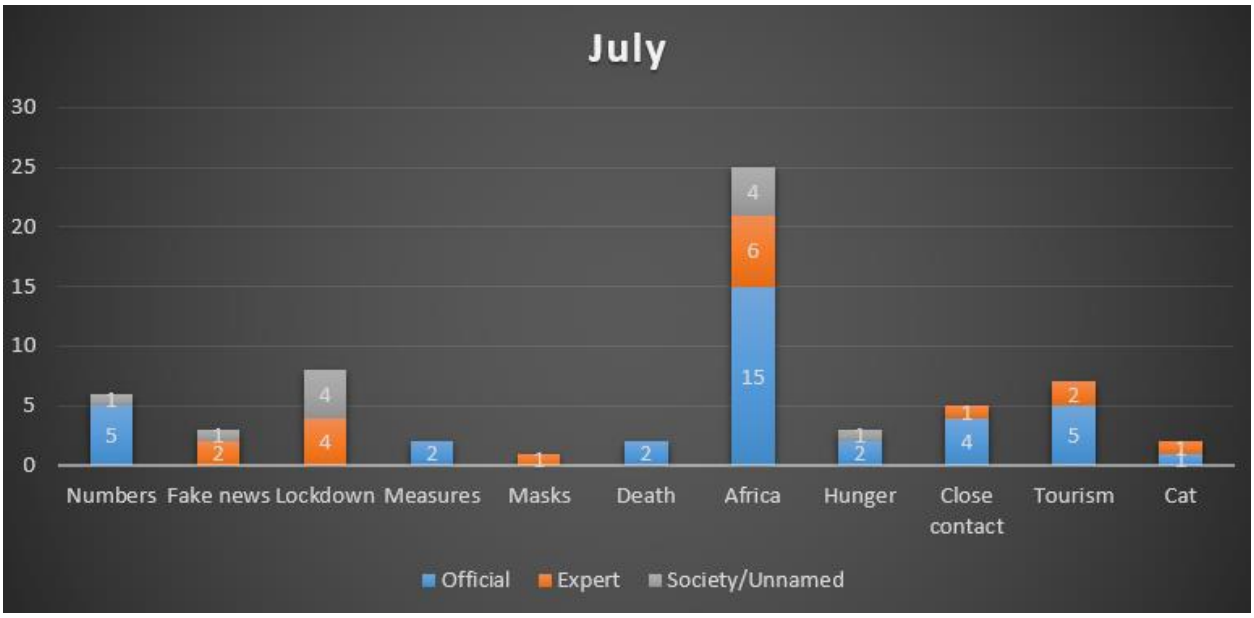
The selection of articles for the third week of July began with an article on the impact of the virus on tourism. It then had an article on the toll the lockdown was taking on South Africans. The third article discussed how lockdown caused job losses which in turn impacted social welfare and food shortages. The fourth article selected discussed the loneliness people feel as a result of COVID-19 and lockdown. The final article discussed how fast the numbers were growing in South Africa compared to other countries, it also drew on the country’s low mortality rate. Seven sources were prominent in the first

article on COVID-19's impact on tourism. These included UK health authorities which were followed by several official sources. This included the health minister, the president, the department of health and the South African Health Products Regulatory Authority. The article also featured the US National Academy of Sciences as a source and a WHO official. The second article on South Africans and the toll lockdown has had on them featured a survey, the survey was used as the source of information. The third article detailed job losses and the impact of COVID-19 and lockdown. It featured three sources in the article. The first of these was a society member part of an organisation called Business for South Africa. There was an expert source which was an Associate Professor in economics as well as the citing of a report by a media organisation, The Guardian, which was acknowledged as a source. This displays the trust in the aforementioned paper in it's acknowledgement as a source. The fourth article discussed loneliness and the virus and featured an account from a family. In the final article for this week, the discussion focused on infection numbers and mortality rates in the country. There were four sources utilised in this and these included three official sources including the President, the health minister and the South African Health Products Regulatory Authority. The final source was acknowledged as a study that drove the findings. Overall, this week had mostly official sources in the articles selected. An expert featured once but there were mostly official sources adopted.

For the final week of the month, the five articles saw topics on COVID-19 in Zimbabwe, a cat with COVID-19, the virus on the continent, the virus in Gauteng and hunger as a result of the pandemic. The first article looked at the situation in Zimbabwe and how the virus is impacting the country. Four sources were used in the article. The first official source was the country's president and there was another one which was a Dutch embassy member. There were also two other sources acknowledged in the article which were society members at relief agencies. The second article selected discussed how a cat had contracted the virus. This featured two sources, the first was UK health authorities acknowledged as a collective. The second was a chief veterinarian. The third article discussed the situation with the virus on the continent. The total number of sources featured in the article was 9. They had a majority of official sources from a

variety of different countries. This included health ministers and presidents. Two experts, however, were also seen in the articles. One was affiliated to the WHO and another to the MSF. The fourth article in this series was looking into deaths in Gauteng and how diabetes and hypertension played a role in this. The source that featured was the Gauteng command council as a collective which is an official, governmental source. The final piece for the month was on how, through worsening economic conditions, the country was facing a hunger crisis. This has two sources and both of them were fairly high officials in government. The majority of sources for this month were official ones belonging to some sort of government institution. Three of the sources out of 18 were experts called on to comment on topics. There were also two members of societal organisations that featured. Overwhelmingly, official sources were the prevailing ones selected this week.





8.1.4 August

The first week in August saw a selection of five articles across a range of topics. These featured an article discussing the flu season in the time of the pandemic, isolation and quarantine, COVID-19 recoveries, statistics and death. There were numerous sources selected in these articles. In the first piece discussing the lack of a flu season for the first time in 36 years, a solitary source was selected. This was a Professor and epidemiologist named Cheryl Cohen. The next article selected was a fascinating case as it discussed isolation and quarantine. There were many sources here and all from a wide array of sectors. These included scientists, experts and ministerial committee members as well. The next two articles featured information relating to recoveries and statistics and had three sources, all of which were official sources with the health minister featuring in both. A member of parliament was also quoted in the statistics piece. The final piece for this week discussed the death of a man in a parking lot of a hospital. It had two sources, the daughter of the deceased and a departmental head.

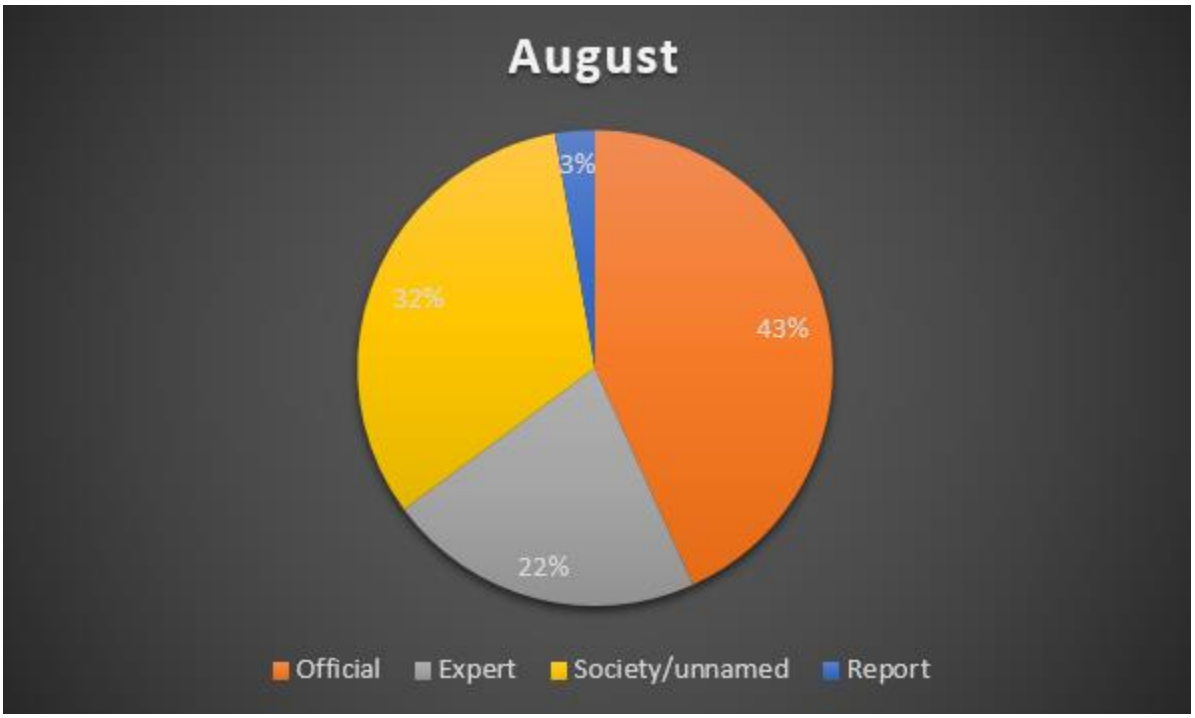
The second week in August featured a dearth in a variety of articles hence two articles focused on numbers. It may have been a period in which COVID-19 fatigue was taking over and the predominant stories were mostly on numbers and news. There were very few articles available from an analysis point of view. The other articles looked at COVID hospital admissions, the death of a prominent member of society and the ban on alcohol

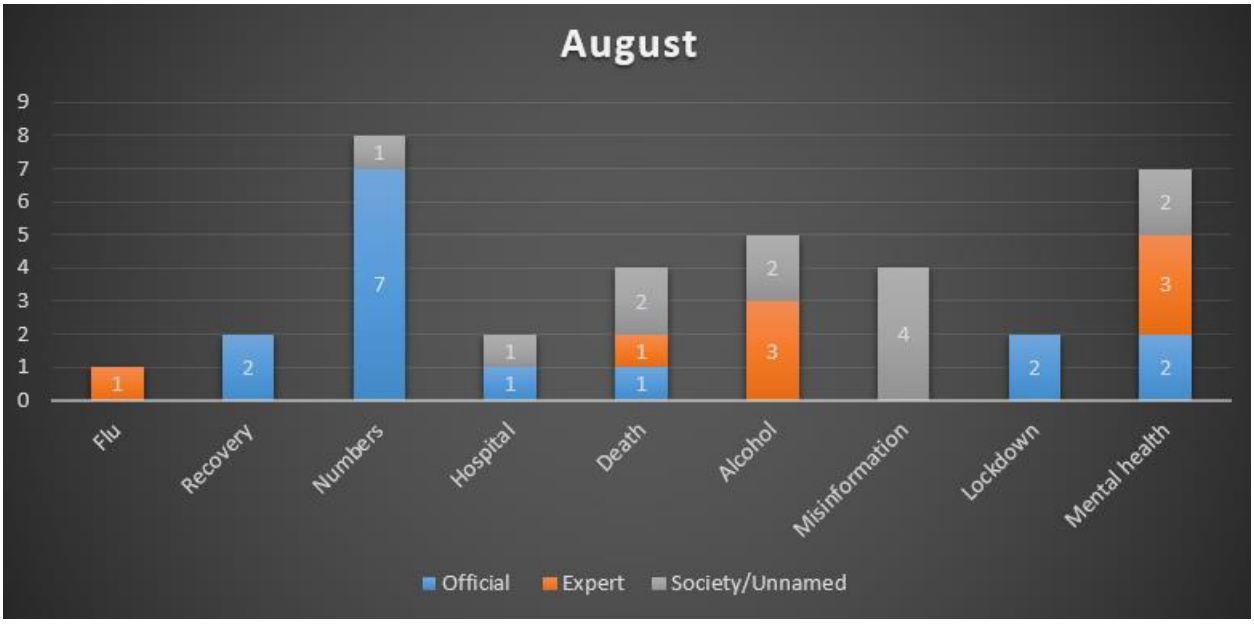
and its impact. The two numbers-related articles featured the same source, the health minister Zweli Mkhize. The hospital admissions article also had an official source as a spokesperson at the office of the MEC of Health, Kwara Kekana. The article drawing on a professor's death by COVID-19 featured two sources in a provincial premier and a professor and vice-chancellor of the Nelson Mandela University university, Professor Muthwa. The article on the impact the alcohol ban was having on the economy featured three sources. These included two members of society working in the industry and the third was a chief economist at a bank in Nicky Weimar.

In the third week of August, the five selected articles discussed the pandemic with each article focusing on a different topic. Furthermore, it touched on misinformation and stigma, the alcohol ban, deaths, numbers and finally, the lockdown. The five articles featured no less than 11 sources. The first article discussing misinformation and stigma had the most amount of sources amounting to five. These featured a member of the United Nations, the South African Human Rights Commission, an anonymous source and a member of a media monitoring organisation. These four sources are predominantly members of society. A case can be made that they are experts in a different sense without having the title of tertiary degrees; however, they can be seen to be doing research work for their respective institutes. The anonymous source remains unknown as to whether they're an expert. This first article is difficult to ascertain the expert level of the sources. For the article discussing the unbanning of alcohol sales in the country, two sources featured in the article. Both were respected scientists, one was locally based, a professor at the South African Medical Research Council and the other the highly respected Dr Anthony Fauci, the US director of infectious diseases and allergies. The third article discussing how well South Africa has done at reducing the COVID-19 deaths featured two authors from a news agency called GroundUp, these can be seen as members of society. In the fourth article for this week, the numbers of COVID-19 cases in South Africa were discussed. The solitary source for the article was the health minister of the country indicating a pattern of official sources being used predominantly for discussing numbers. The final article for the week discussed a new

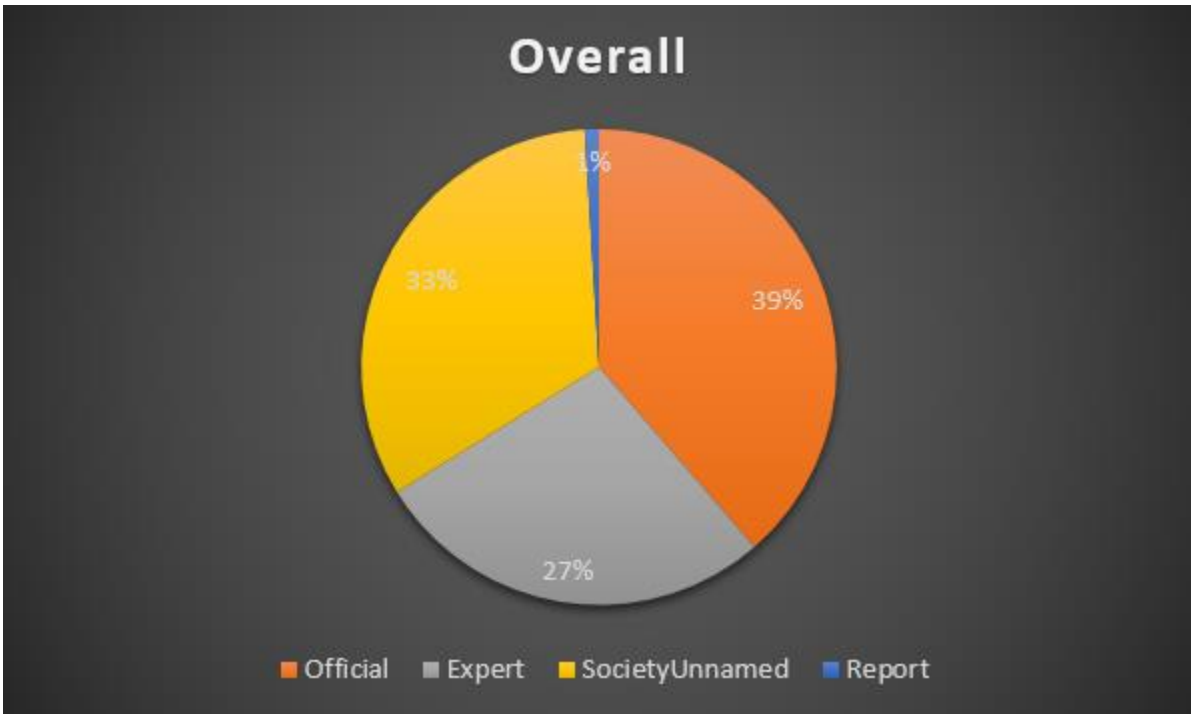
lockdown level in the country and it featured dual sources. Both were official in the form of the President of the country and a governmental spokesperson.

For the final week of the month, the five articles selected drew on five topics. Of the five, two discussed the numbers whereas one differed slightly drawing on the recovery rate. This was because of a dearth in the variety of articles. Both these articles had the same source in Dr Zweli Mkhize, the health minister. The first in the final week drew on comorbidities and deaths and featured a single source who was the Department of Health's chief operating officer. The second article for the week focused on a predicted spike in cases and the receiving of ventilators to deal with the spike in cases. The source adopted here was a member of society in the form of a fund's CEO. Finally, an article on mental health and repatriation was selected for this week. It had amassed six sources. Of the seven sources selected here, two were anonymous. The rest included three experts in the form of a clinical psychologist and two senior people at The Centre For HIV-AIDS Prevention Studies. The final two sources were official government sources. Overall, the majority of sources for this week were official government sources with three expert sources and a member of society.

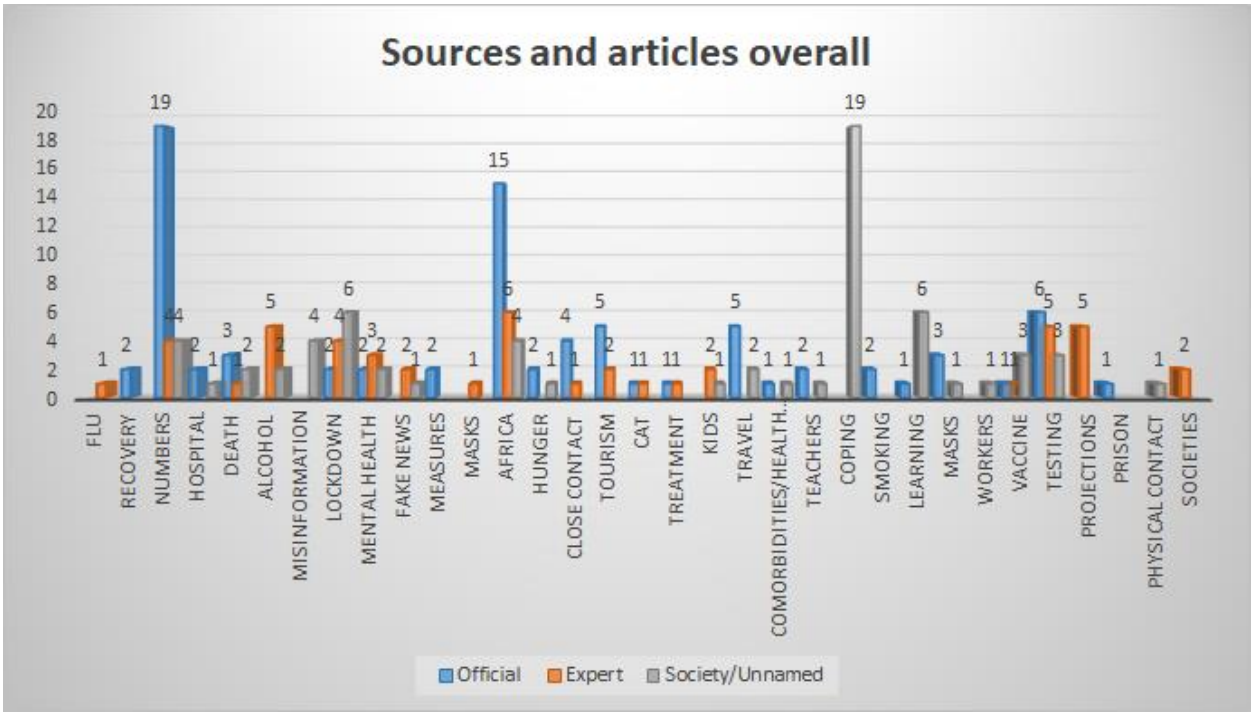




The following pie chart displays the sources by percentage for the four months of coverage to determine who they were and to what extent they featured.



A more detailed graph on the types of articles can be seen below:



In the month of May, the sources were spread fairly evenly across the stories selected. There were articles looking at the coronavirus and how it affects kids. There were articles looking at masks, workers, vaccines and prison. There were articles on numbers, testing and projections which are similar in nature. The month also featured articles on physical contact and societies. The sources that were prominent this month were a total of 46 sources in the 20 articles selected. Of these, 13 were society, 16 were experts and 17 were official sources. There is no major disparity in the numbers but experts featured in the articles on kids, numbers, comorbidities, the vaccine, testing, projections and societies.

For the month of June, there were a mere 7expert used in the articles selected. The largest for this month was the 33 sources from society which could largely be attributed to an article on coping with COVID-19 and lockdown which yielded 19 sources. The official sources were noted at 16. The articles for this month were on treatment, comorbidities, hospital, coping, smoking and travel. There were also numbers on kids, teachers, alcohol, the COVID-19 numbers and learning. Expert sources featured when articles were about treatment, kids, alcohol and numbers.

For July expert sources featured 17 times. Whereas official sources were used 36 times and sources from society 11 times. This month saw articles featured on numbers, measures, masks and close contact. There were also articles on fake news, lockdown, death, hunger and COVID-19 on the continent. Expert sources featured when articles discussed fake news, the lockdown, mask-wearing, the continent, close contact, tourism and a cat with COVID-19.

For the month of August, experts featured eight times in coverage. Official sources were used 15 times and society 12 times. The articles looked into the flu, recovery from COVID-19, death and mental health. There were also articles on numbers, hospital admissions, misinformation and lockdown. The experts featured in articles on flu, death, alcohol and mental health.

9. Discussion

This study sought to respond to the question of linkages or lack thereof of journalists and scientists during the COVID-19 period. By selecting certain sources and leaving out others, journalists are in a powerful position to drive agendas during a period of intense news and information consumption as is the case with the pandemic. The coverage tells us a lot about the sources that are favoured.

As we saw in the data, official sources linked to the government and ranging from the health minister to the spokespersons of various departments were ubiquitous in coverage of the pandemic. They were the most accessible and vocal especially when it came to topics such as the numbers, testing, the continent and local initiatives. This tells us that journalists are more likely to rely on official sources thereby giving them the opportunity to set agendas.

Society can range from lawyers, to unnamed sources, nurses and general people of the public. They also featured in many articles and as sources. When it came to misinformation and coping with the virus, these sources were regularly called upon.

Experts featured the least out of the three. But that's not to say that they didn't feature at all. They were regularly used as sources in certain articles as well. In topics that were fairly scientific such as testing and projections, expert sources were regularly found in the pandemic coverage. Interestingly, they featured in the alcohol debate as well. Expert sources were also featured when discussing the pandemic on the continent and issues relating to lockdown. Aside from that, they were generally sparse and scant use of them as sources.

Overall, the results from the research were fairly conclusive. Official sources were the predominant ones during the pandemic at 39%. Expert sources featured at 27% which is low comparatively. Members of society, anonymous sources and people who belonged to other organisations featured fairly high and made up 33% of the sources featured. Articles that featured a report as a source made up a mere 1%. It is important to look at these results in relation to the theories that were noted early.

In line with the first research question trying to understand what extent scientists or experts featured, the study found that scientists or experts featured the least from the three subgroups. The group that featured the most were official ones where government sources were selected most often. People who were anonymous or societal workers featured fairly high in second.

When answering the final question of how, why and to what effect did News24 select sources in their coverage of the COVID-19 pandemic, it can be determined that sources were selected either with ease or by topic. Certain experts featured often and it could be argued that this is because they are close to News24 or that they have proficient communication departments. When it came to making sense of COVID-19 numbers, it's clear that official sources were the most selected. It could be assumed that the reason for this was to give people some sort of assurity.It is interesting that official sources featured the most, it can be seen as though they are the most trusted source for people who covered the pandemic. However, it is certainly a symbiotic relationship in that official sources would need a news organisation like News24 to get their desired

messages into a public domain. News24 is also trusted in South Africa so it would be beneficial for official sources to get their messages out to the people especially during a pandemic. At the same time News24 would need to get articles out with credibility in a timely manner, and this could be a reason why official sources were the most common ones in the articles selected. It could also be that people trust their leaders and their voices are the one people turn to in a time of such uncertainty and a time where misinformation is rife.

The number and nature of sources tell us that in terms of the agenda setting theory, that sources were crucial for making points in stories. Depending on who was used as a source, the seriousness of the article can be seen. It can also be argued that sources that were easier to access were obtained. This is more the sociology of news and a trend in newsrooms rather than an agenda setting mechanic. It's safe to say it's a culture of newsrooms to access sources who are quicker and easier to reach but also they must have some credibility. The research picked up that scientific or expert sources weren't frequented as much as official sources or even prominent people in society. This tells us that the cultural and social organisation of newsrooms favour scientific or expert sources much less than official or societal sources. Assumptions can be made as to why this is, and they range from ease of access or speed, but the limitation in the study is that a qualitative aspect that asks journalists why certain sources were selected is lacking.

When comparing sources that were local or international, it is important to note that international sources only featured non-South African stories. These sources were called upon to discuss international articles or research from abroad. Often they feature on articles discussing the COVID-19 pandemic on the African continent. It was rarely the case for foreign sources to be used in local stories. In the time period, a total of 14 articles out of the total amount of around 80 featured a source that was international.

Overall the selection of stories featured a good balance of stories that ranged between scientific, economic, misinformation and articles on numbers. It's not evident that

articles featured more economic themes than others. Therefore it can be concluded that no special preference was given to livelihoods over saving lives, a common narrative discussed in South Africa.

9.1 Agenda setting and gatekeeping

In terms of agenda setting, the results indicate that the sources often dictated what the articles were about. This can be seen in the month of May where an expert featured in an article looking at whether kids can pass the virus on to elder caregivers. This set the agenda in that children who live with the elderly and compromised pose a risk to them and the expert proposed suggestions for how to avoid risking the elderly. Sources that were official featured predominantly on articles discussing numbers therefore supposing that when it came to the numbers assurance was needed and someone from the government was used as the source. The official sources drove home the seriousness of the matter with an urgent agenda that people must stick to the rules and the situation can escalate. COVID projections also featured expert sources which can be seen to use experts to give people a realistic sense of the numbers with the hope of helping them understand the complexities and possible scenarios better. These also featured a mix with official governmental sources. The takeaway from it is that sources here can be seen to set the agenda that unless action is taken the situation will become dire. There is an alarming sense in the articles and sources. Overall, the availability of sources to journalists seems to be a major agenda-setting ingredient in the production of the news. What this means is that journalists may be leaving out sources that are not easily accessible meaning that some agendas remain unknown.

When it comes to gatekeeping, these sources were adopted to shed light on complex topics which is inherently the journalists job. The expert sources adopted were called upon to make sense of the complexities surrounding the virus. An example of this would be an article looking into kids and COVID and what people need to know. An expert in paediatrics was selected as the source because of their expertise and this ties into gatekeeping notions that these experts are used to present accurate information void of confusion. Gatekeeping theories also discussed having official sources close at hand as this helped with rapidly producing articles. This is a limitation of the study in that the

journalists could not be questioned to enquire further which will be explained later. However it is clear with the amount of times the health minister was used as a source, there was ease of access and he was called upon regularly to set the agenda and because the media decided his voice should be a prominent one in the pandemic.
In the month of May, articles ranged from kids, the numbers, mask-wearing, lockdown, testing, societies and physical contact. Issues reported on were similar across the four months. This can be seen in June where the articles were on with the exception of impacts on industries like alcohol and tobacco. There were also articles on teachers and learning. In June, the articles discussed similar things as the previous two months with the exception being an article that compared COVID-19 on the continent and different measures taken by other African countries. There was also an article about a cat having contracted the virus. The final month saw content again that was similar, it is interesting to note that articles on numbers featured across all months. The different articles for this final month looked at hospital admissions and misinformation.
The link between agenda setting and gatekeeping can be seen in the fact that the topics of coverage shifted from one period to another.
Several articles had a number of sources in them as opposed to one or two. These tended to be the more in-depth articles that were longer. They were more inclined to be feature type articles discussing traveling or topics that required a number of sources to strengthen the line of argument in the article. An example of this can be seen in the article looking into isolation and quarantining where multiple expert sources were used. It can be assumed that scientific and expert sources which featured strongly in the article were needed to drive home the point of importance in isolating and quarantining. Another article with a fair amount of sources was the article drawing on a lack of data regarding the pandemic on the continent. It can be argued that the number of sources were needed to elaborate on the situation across the continent. The articles with relatively few sources were numbers. These appear to be articles that need fairly swift turn around times. For this reason it can be assumed that these articles in particular had the Health Minister quoted as a source due to the ease at which he could be reached and the speed of it.

9.2 Sociology of news production

The sociology of news production theory looks at three facets of the newsroom: the critical political economy which is hardly relevant for this study, social organisation of the newsroom and cultural approaches.

The social realities of the newsroom indicate that overall, government or official sources were the predominant sources. They were the easier sources to obtain and that expert sources were used occasionally. There is evidence that people of society, be it members of the public or people belonging to other institutes were also more readily available and for this reason featured more frequently than expert sources. From a social reality perspective, it appears that journalists held the power in determining who they selected as sources. Sources who were experts featured occasionally but not as much as other sources. This is an interesting observation because it would have been expected that experts would play a far larger role and at least be the major sources of information than government officials at some point during the study period. There wasn't a major disparity but the overall sense is that from a cultural perspective, officials and society members were the easier and prevailing sources selected by the publication. This raises the question of whether a newsroom such as News24 was constrained by the pandemic such that journalists chose to use sources that were readily available even if they may have lacked the requisite expertise. News being constructed by the source is part of the social construct of news in this theory by looking into gatekeeping as well. This can be seen in examples like the fact check on whether Nigeria found the vaccine, experts led the story in a direction that clearly stated that the vaccine was not found in Nigeria at the time. Another example of this can be seen in an article discussing what a fabric mask should look like. The source in this case was an expert who had done a study on the topic.

These types of examples explain the sociology of news production theory. More specifically, for the purposes of this study, gatekeeping and the cultural practices of journalists seeking out convenient, trustworthy sources are abundantly clear in the study. In terms of sources, the official ones that featured the most were the health minister Zweli Mkhize, spokesperson for the MEC of health, Kwara Kekana and government spokesperson Popo Maja. The expert sources that featured did not contain

a specific one that was a regular source, they all varied per the story and per their expertise. For example, this was evident in a story on health economics where a health economist featured. In stories on the virus, different epidemiologists were featured as sources. The story on testing featured a number of health experts all from a variety of different health fields. The official sources can be seen to have built a relationship with News24 in that they featured regularly as sources. In the production of news, the prominent sources are something akin to a shortcut for journalists especially with the restrictions posed by the pandemic where journalists could not meet sources physically. It could also be said that they were perhaps the easiest to contact and were more willing to comment on topics.

9.3 Journalism and science

The definition of an expert or a scientist varies in publications. In this research the expert source and scientist are regarded as the same. The defining factor used to describe this source in this study is the application of skill, knowledge gathering, specialised expertise in a subject and immersion and contribution to a field.

All the experts sourced in this study meet these criteria. The experts range from epidemiologists, modellers, professors in economics and researchers in viruses. These types of sources were relied on to share their knowledge on topics that were complex. They were called to share expertise in a way that was accessible and through this dissemination they were primary sources. The study by Boyce (2006) highlighted how journalists needed sources for facts, credibility and objectivity. In the case of this research, expert sources were called on to discuss the flu season, isolation and quarantine and many other stores. They played a role in providing facts and credibility to the stories they were mentioned in. It is also important to note that other sources featured as well. They played a part in sources to beef up stories and to add facts. Government officials provided facts and credibility in the stories they featured in.

In articles where people were affected such as students, business or livelihoods those people were featured as sources and were noted as society. People who were workers

in certain fields but not seen as experts were also noted as society. An example of this was an airline spokesperson for a company in an article of airports reopening.

It is worth noting that the sources mentioned that were official were primarily in articles that affected citizens. These officials were noted in the numbers, lockdowns, deaths, measures and basically all the articles which affected the vast majority of the public.

As mentioned earlier, the expectation that experts, particularly scientists, would feature prominently did not materialize. This suggests that while the relationship between journalists and experts does exist, the said relationship could do with a further boost. One important note worth mentioning is that many of the sources that were experts belonged to universities such as Wits University. An argument can be made that this is fairly close to News24's headquarters in Johannesburg. It could also be said that the university has a proficient communication department which made these sources accessible.

9.4 Limitations

This study was limited in that it didn't have a qualitative aspect. The initial idea was to do a two-pronged study with a qualitative approach as well. Unfortunately time constraints did not allow for that to take place but it paves the way for future studies. The future research can take up the qualitative dimension of the study thus providing a full picture. Shoemaker & Reese (1996) also studied different methods of researching journalism and found that qualitative content analysis was the most effective way of determining certain topics, messages or issues in the media. Interviewing the journalists who covered the pandemic can be a useful tool to determine the processes of journalists in selecting scientific sources that are featured in coverage of the pandemic and the decisions that go behind seeking the associated sources. It could also be valuable in comparing content on the pandemic that features a scientist, expert and the various sources adopted. This study has limitations in that it will be difficult to measure the impact that has been disseminated in the coverage of the pandemic.

Qualitative research emphasizes the qualities of entities, in this case, the decisions that went behind how sources were selected (Labaree, 2009). It helps process the meaning of the words selected from the text and enables further understanding of decision making. Through qualitative interviews, the researcher can immerse in the details and specifics of the data to seek patterns and themes by exploring what sources featured and how these decisions were made (Labaree, 2009). Qualitative research is noted as an empirical research method that has the data collected not in a number format (Labaree, 2009). It is concerned with human behaviour from a media perspective. This method allows a researcher to study and interpret something in its natural setting (McLeod, 2008). In this case, it is the natural decisions of journalists and gatekeepers that will be analysed. This further ties into the sociology of news production theories where questions on ownership, culture and the thought processes behind journalistic decisions can be asked.

The qualitative approach is integral in this type of study as it enables a better understanding of how and why decisions undertaken by journalists to seek their decisions on selecting sources. The questions posed to these journalists and gatekeepers will range from how, why and will look at the selection process undertaken by the media. The aim will be to understand the factors behind who was selected in coverage of the pandemic and to what effect.

Further research areas can include framing and understanding how the media framed the pandemic. This could look into sources and the things they have said. Further research could also be used to understand misinformation and disinformation around the pandemic.

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