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ARTICLE

# Disease, denomination and de-stigmatisation: a content analysis of SARS-CoV-2 variant naming and re-naming in Australian news media

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**Abstract**

In May 2021, the World Health Organization announced a new naming system for SARS-CoV-2 variants intended to replace potentially stigmatising names referencing geographic locations. A quantitative content analysis was conducted to identify the names and frames present in Australian news media coverage before and after the new names were announced. Results demonstrate uptake of the new names but also indicate the potential for intended outcomes of de-stigmatisation to be compromised, particularly by persistent negative framing. These findings indicate that future health communication efforts might be strengthened by integrating disease naming considerations into ongoing public health preparedness efforts and support ongoing scholarly inquiry into naming and framing in news media communication.

**Keywords**

Health communication; Public understanding of science and technology; Science and media

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## 1 ▪ Introduction

In 2020, the onset of the COVID-19 pandemic brought about dramatic change to human life, lifestyle and language. As disease spread, so did new words, including the neologisms COVID-19 (for the disease) and SARS-CoV-2 (for its viral cause). As the pandemic progressed, the virus itself evolved, as did language. Specifically, when variants of SARS-CoV-2 began to emerge, a diversity of names and phrases for them also arose, ranging from alphanumeric codes to the names of countries [Janik et al., 2021; Nature, 2021]. While identifying the earliest adopters of these names is beyond the scope of this paper, these names have been identified in contexts of public communication spanning scientific journals, news media coverage and public health advice [Courjon et al., 2021; Government of Western Australia Department of Health, 2021; Lord, 2021; Sun et al., 2021].

Amid the proliferation of variants and names for them, concerns began to be raised. Stakeholders including researchers and journalists warned that the multiplicity of naming systems was confusing, and that geographic names carried particular associative and implicative risks [Callaway, 2021b; Chamary, 2021; Nature, 2021; Prakash, 2021; Rambaut et al., 2020]. Concerns about stigmatisation and discrimination were lent credence by the Indian government's appeal early in the pandemic for the removal of references to the "Indian variant" from social media [Perrigo, 2021] and the Australian Human Rights Commission's [2021] statement on country-specific travel bans.

In response to concerns raised, the World Health Organization (WHO) convened a group of experts in taxonomy and nomenclature to deliberate and decide on a new variant naming system. Each variant was subsequently assigned a letter of the Greek alphabet; what had been known as the UK variant or B.1.1.7 was now to be referred to as the Alpha variant, and the so-called Indian variant or B.1.617 was now to be called the Delta variant. The new naming system was intended to replace the stigmatising identification of variants by locations, but uncertainty about uptake prevailed.

Underlying the intervention, but acknowledged only in commentary, was the assumption that "an agreed nomenclature will stop the use of place-based names" [Nature, 2021]. Meanwhile, there was suspicion that existing names would persist [Callaway, 2021a]. The change was to be adopted in communication by national authorities and media outlets [World Health Organization, 2021], but what became of variant naming practices in these contexts of intended communication change has remained largely undocumented.

In the context of the COVID-19 pandemic more broadly, a name change was previously solicited by the introduction of the name "COVID-19" for the disease caused by the so-called "China virus" (i.e. the virus now known as SARS-COV-2) [World Health Organization, 2020]. Accordant language change has since been substantiated (to some extent) by the work of Prieto-Ramos et al. [2020], Nida et al. [2021] and Rizzuto [2020], although de-stigmatisation effects remain ostensibly under-explored.

In relation to the renaming of SARS-CoV-2 variants in particular, gaps and uncertainties persist. Amongst grey literature, indications of uptake — or rather, lack thereof — range from lingering preference for geographic descriptors [Callaway, 2021b] to recognition of contrary news media naming practices [Poole, 2021]. One infodemiological analysis found marked inconsistencies in uptake [Rovetta & Castaldo, 2022], whereas by other accounts rapid

terminological adjustments have occurred in accordance with WHO recommendations [Dimitrov et al., 2022]. This situation invites closer scholarly attention to the contexts of SARS-CoV-2 variant-related communication.

### 1.1 ▪ *News media as a medium and mediator*

The circumstances of the COVID-19 pandemic have upheld the significance of news media communication about science and, in particular, significant global health threats. Corresponding with the recognition of disease outbreaks as particularly newsworthy phenomena [Hallin et al., 2020], the media has been identified as a site of extensive communication during the pandemic to date, including in Australia [Nolan et al., 2021; O'Connor et al., 2021]. Moreover, a critical information dissemination role for news media has been acknowledged [Thomas et al., 2020]. The critical importance of this role is reinforced by the high, even "insatiable", demand for information recognised in the midst of a rapidly developing and uncertain situation [Nolan et al., 2021, p. 11].

Even prior to the COVID-19 pandemic, researchers have advocated for greater attention to media coverage of global health threats [Pieri, 2019]. The dynamic and largely undocumented nature of variant-specific news media communication offers reason to renew this call. Moreover, as the constitution of scientific subjects at the interface of highly technical and specialised disciplines and wider society is both complex and multifaceted, multiple communicative characteristics warrant consideration. In the present context, there is particular congruence between news media communication and two specific constructs of communication: naming and framing.

Naming is a fundamental element of news media coverage, as it is in all forms of communication. The media have a recognised capacity to bring novel scientific phenomena into broader societal awareness [Joffe & Haarhoff, 2002], and to facilitate the uptake of words and phrases (including names) not typically a feature of the common lexicon [Masters-Waage et al., 2020]. In terms of previous naming changes in the domain of health and disease, this role is demonstrated in shifts away from headlines referencing the "China virus" in favour of those using the name "COVID-19" (for the disease caused by the virus), in the early days of the pandemic [Prieto-Ramos et al., 2020]. The introduction of the latter name by the WHO in 2020, amid circulating geographic names, is comparable to the focus of the present study, namely the introduction of the Greek letter variant naming system in 2021. The findings of Prieto-Ramos et al. [2020] demonstrate the potential for communication change. However, in news media communication specific to SARS-CoV-2 variants, there has been limited documentation of change — or nuances thereof.

Framing in news media communication is also prevalent and well recognised. To frame, by the widely cited definition of Robert Entman [1993], is to elevate the salience of certain aspects of a perceived reality over others. Frames can influence how people come to understand problems and their causes [Entman, 1993], and single out responsible parties [Elliott, 2012]. This is exemplified in many contemporary issues, from the presentation of climate change information in terms of scientific uncertainty [Nisbet, 2009] to the discussion of COVID-19 in terms of outgroup threats [Dhanani & Franz, 2021]. With respect to infectious diseases, a dominant frame of responsibility was identified during the H1N1 influenza pandemic [Chang et al., 2010; Sandell et al., 2013] and has also been documented

during the COVID-19 pandemic [Rodelo, 2021]. By elucidating patterns of both naming and framing, a more nuanced characterisation of response dynamics can be generated.

Beyond targeted analysis of media coverage in terms of intended language change, science communication research has a role to play in embracing all that is said about a particular topic, upholding a sensitivity to various manifestations and meaning acquisitions along the way [Bucchi & Trench, 2021]. Furthermore, as Farrimond [2023] proposes, seeking to understand the processes behind the metaphorical mutation of stigma itself may also aid the identification of opportunities for stigma disruption. Thus, in the context of potentially stigmatising pandemic communication and intended change therein, this study sought to address the primary research question of how SARS-CoV-2 variants were named and framed in news media communication at the time the new naming system was introduced.

## 2 ▪ Method

Quantitative content analysis was selected as a means of identifying, classifying and comparing salient characteristics of SARS-CoV-2 variant-related communication. This methodological decision was underpinned by the method's characterisation as a means of exploring how language operates in the world, how social phenomena play out, and how patterns are reflected in or perpetuated through various forms of communication [Krippendorff, 2019; Lombard et al., 2017]. The analysis of frames was informed by Robert Entman's [1993] conceptualisation of framing and Entman's advocacy for content analysis guided by this theoretical perspective.

### 2.1 ▪ *Corpus construction*

Articles from Australian news media publications were collated to form the study corpus. This scope was informed by the WHO's identification of media communication as a primary target for uptake of the new variant names. The geographic boundary of Australia was defined as a pragmatic parameter, given the location of the researchers. This decision was further supported by the significant role of news media in the provision of pandemic-related information in Australia [Faasse & Newby, 2020; Nolan et al., 2021; Thomas et al., 2020] and its potential for influence beyond national borders [Dickey et al., 2019].

Articles were sourced from the Dow Jones Factiva database, which collates content from a range of sources to support media coverage analysis. This database is recognised as a valuable and viable resource for content analysis [Neuendorf, 2017] and has been employed as such by, for example, Zimmermann et al. [2019]. Within the Factiva database, a range of specific search parameters were applied (summarily depicted in Figure 1).

The six-week timeframe of 11 May 2021 to 21 June 2021 (inclusive) was applied, centring the date the new naming system was announced and thereby capturing media communication about the variants in the weeks directly before, at the point of, and immediately following the name change. The following search string was adopted: *(sars-cov-2 OR covid OR covid19 OR covid-19 OR coronavirus) AND (variant OR strain OR mutation)*. The scope of the keyword search was constrained to free-text terms within the headline and lead paragraph of articles, in acknowledgement of the centrality of these structural elements in news media communication [Spinks, 2001]. Consistent with the established geographic scope of the

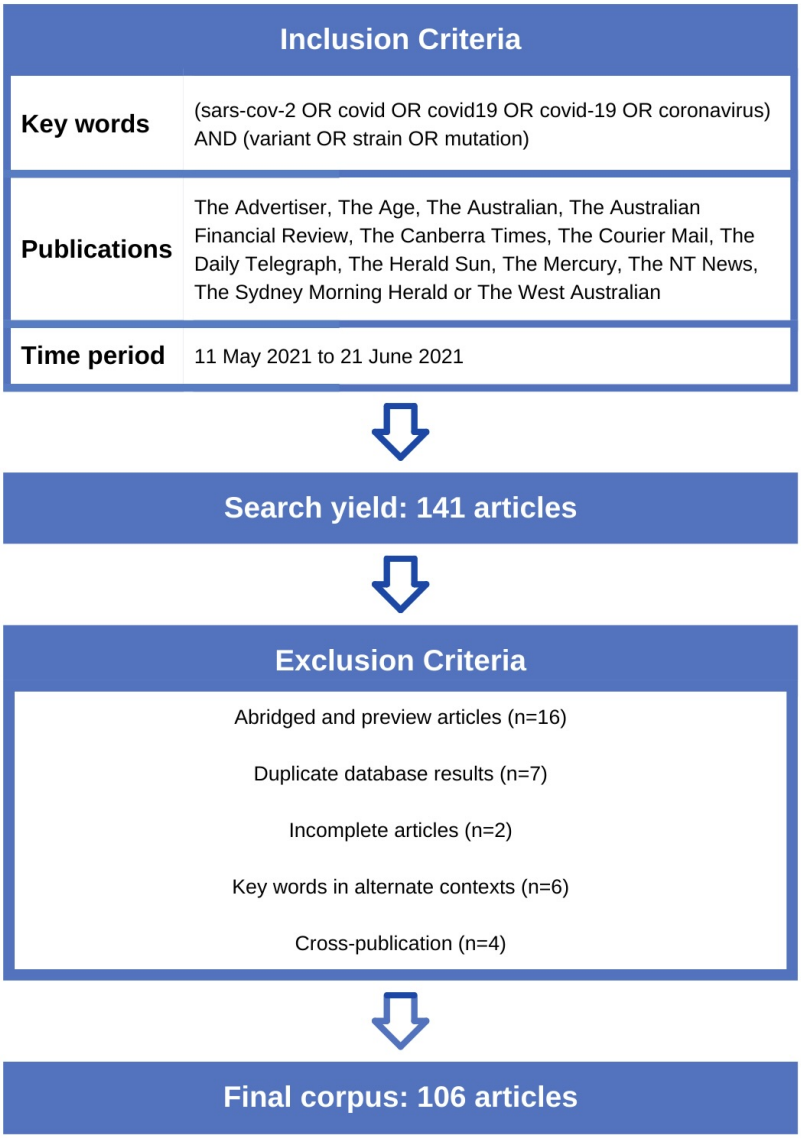


**Figure 1.** Article inclusion and exclusion criteria.

research, the inbuilt Factiva database filter "Group: Aust Newspapers" was applied. This constrained search results to news articles from the print editions of Australian legacy media publications (detailed further below). While formats for modern-day news consumption are diverse, print readership persists in Australia and is in some cases even preferred [Roy Morgan & ThinkNewsBrands, 2021; Hess & Waller, 2021].

The search parameters presently described yielded a provisional corpus of 141 articles which were then subject to manual review. A total of 35 articles were excluded, including abridged or preview articles (n = 16), duplicate database results (n = 7), and incomplete articles (n = 2). Articles identified as using key words in alternate contexts, such as "strain" in terms of severe or excessive demand, were also excluded (n = 6). (Articles with these terms that also made specific reference SARS-CoV-2 variants per the search criteria were retained.) On two occasions, the database identified an identical article published in two different newspapers

(i.e. cross-publication), thereby yielding four separate database results. These articles (n = 4) were excluded to avoid skewing subsequent analysis, should either or both iterations of each article have been retained. A final corpus of 106 unique articles was collated for analysis.

### *2.2 ▪ Data collection and analysis*

Units of analysis by which to characterise and compare full-text articles and their headlines were identified in an iterative and cumulative manner by the first author in discussion with the second author. The reliability of preliminary coding outcomes (specifically in relation to the codes set out in Part 2 of the coding scheme) was assessed by the first author in terms of internal (intra-coder) percent agreement. Inter-coder reliability was subsequently assessed by the first author and an independent third party for a random sample of 20% of the corpus (n = 21). Percent agreement scores and the chance-corrected Cohen's kappa coefficient guided revisions of code definitions. The final coding scheme (see supplementary information) addressed the following article characteristics: publication date, publisher, publication ownership, geographic focus, variant naming, headline framing, article framing, source citation and acknowledgement of variant history. Coding of the final corpus in full was carried out by the first author.

Baseline characterisation of the corpus based on Part 1 of the coding scheme identified articles from 11 distinct Australian newspapers (specifically, *The Australian*, *The Australian Financial Review*, *The NT News*, *The Courier Mail*, *The Sydney Morning Herald*, *The Daily Telegraph*, *The Canberra Times*, *The Age*, *The Herald Sun*, *The Mercury* and *The Advertiser*). These data indicated the presence of articles from two newspapers with nominally national reach and nine with a focus on one particular state or territory of Australia. Consistent with the highly concentrated media landscape in Australia, publication ownership was dominated by News Corp and Nine Entertainment Co (previously Fairfax).

Frames were identified inductively by the first author in discussion and agreement with the second author. This process was informed by existing literature, particularly the five news frames set out by Semetko and Valkenburg [2000], and then the scope of consideration was expanded to accommodate a greater degree of nuance — for example, positive and negative causal attribution under the overarching notion of responsibility. The framing of headlines and that of article body text were considered separately, informed by existing scholarly emphasis on headline framing and the perceivable potential for variation. Preliminary code categories and definitions were then subject to exploratory testing with a subset of articles, yielding insights into their viability and opportunities for refinement.

Data were recorded in a Microsoft Excel spreadsheet and analysis pursued through the application of descriptive statistics. Initial analysis comprised counts of code category membership and assessments of frequency distributions. To account for the possibility of multiple codes applying to each article, relative proportions were calculated based on the total number of times codes were recorded within the relevant frame of reference. For example, the relative frequency of alphanumeric variant naming in May was calculated as a proportion of the total number of times a different naming system was recorded within that time frame. Comparisons of communication patterns before and after the variant naming intervention were made based on a temporal divide in the corpus between May and June (the former including the date of the name change announcement, 31 May 2021).

Observed patterns of bivariate association were subject to significance testing in IBM SPSS Statistics version 26. Tests of significance were carried out and the two-tailed p-value was pursued to assess the probability of difference without assuming the direction of that difference [McCrindle, 2010; Moore et al., 2017]. Where appropriate, Pearson Chi-Square tests were applied. In cases where less than 80% of expected cell frequencies were less than five, Fisher's exact test was used.

# 3 ▪ Results

## 3.1 ▪ *The vocabulary of viral variation*

The vocabulary utilised to distinguish between different SARS-CoV-2 variants included alphanumeric names, geographic (location) names, and — following the WHO announcement on 31 May 2021 — Greek letter names.

In the weeks preceding the WHO announcement, Australian news media articles (published between 11 May 2021 and 31 May 2021, up to and including the date of the WHO's announcement), showed a strong preference for geographic naming (Figure 2). These geographic names varied in their manifestations such that some were qualified, with quotation marks or phrases like "so-called" preceding them, and others were unqualified. The latter, unqualified geographic names, were the most prevalent, with a relative frequency of 57% (n = 25, N = 44), based on the total number of variant naming systems present in the corpus in May. Use of unqualified geographic names was exemplified in references to the "UK variant" and the "Wuhan strain" (*The Australian*, 14 May 2021) as well as the "Indian variant" (*The Australian Financial Review*, 15 May 2021).

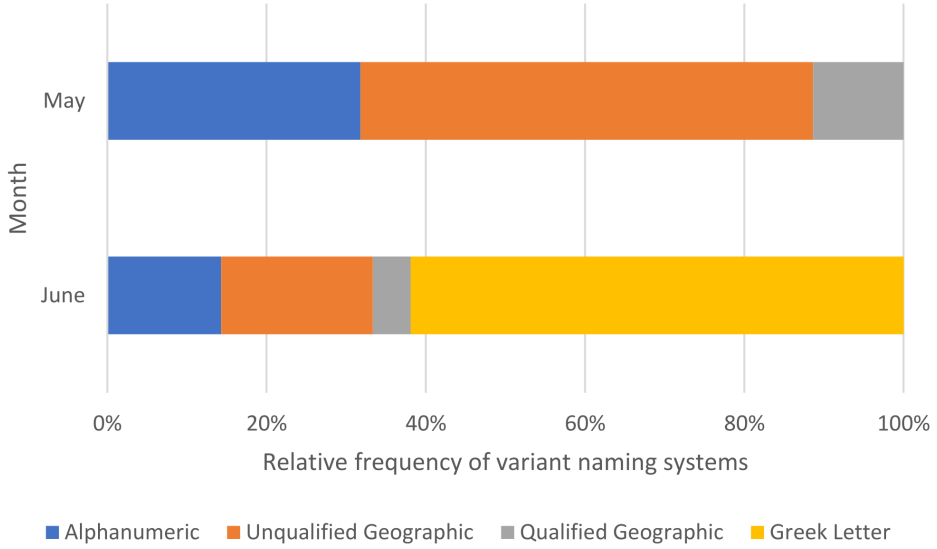


**Figure 2.** Relative frequency of variant naming systems during May and June 2021. Calculated as a proportion of total instances per month (May: N = 44; June: N = 105).

In June, use of Greek letter names markedly displaced the frequency of the three variant naming systems present in May. Amongst articles published after the change in recommended nomenclature, Greek letter names accounted for 62% of variant references

(n = 65, N = 105). Specifically, these included the "Alpha variant" (*The Age*, 5 June 2021), as well as the "Beta variant" and "Delta variant" (*The Sydney Morning Herald*, 4 June 2021). Amongst non-recommended naming systems, unqualified geographic names persisted to the greatest extent, accounting for 19% of variant specific references in June (n = 20). This form of geographic nomenclature manifested in references to variants including the "Wuhan strain" (*The Age*, 5 June 2021) and the "UK variant" (*The Australian*, 8 June 2021).

Overall, patterns of variant reference between May and June indicate marked but incomplete adoption of the Greek letter naming system. From the three-week period leading up to (and including) the announcement of the new variant naming system, to the three weeks after, the relative frequency of geographic naming forms declined, concurrent with an increase in the frequency of Greek letter variant names (from a structural zero). Pearson Chi-Square tests of independence showed evidence of a significant difference in the frequency of unqualified geographic naming (Pearson Chi-Square: 28.623; $p < 0.000$).

### 3.2 ▪ *The framing of SARS-CoV-2 variant coverage*

Australian news media coverage of SARS-CoV-2 variants showed a persisting prevalence of threat and negative causal attribution frames, in both headlines and body text, between May and June.

Amongst article headlines, the frame of threat was present with the highest relative frequency in both May (29%, n = 10, N = 34) and June (32%, n = 30, N = 93) (Figure 3). The second most prominent frame was negative causal attribution, exemplified in the headline "Indian variant's high speed stuns contact tracers" (*The Australian Financial Review*, 28 May 2021). This frame showed a decline in relative frequency, from 26% in May (n = 9) to 18% in June (n = 17).

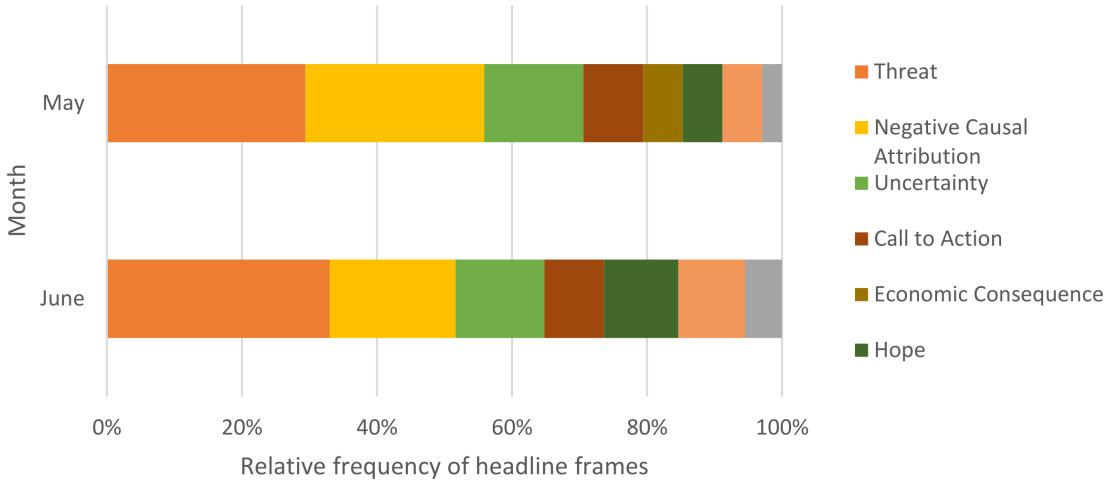


**Figure 3.** Relative frequency of headline frames over time. Calculated as a proportion of total instances per month (May: N = 34; June: N = 93).

Within the bodies of articles, threat persisted as the frame present with the highest relative frequency in both May (31%, n = 26, N = 84) and June (29%, n = 59, N = 203) (Figure 4). Once again, negative causal attribution constituted the second most prevalent frame and showed a slight decline in relative frequency, from 29% in May (n = 24) to 27% in June (n = 54). This

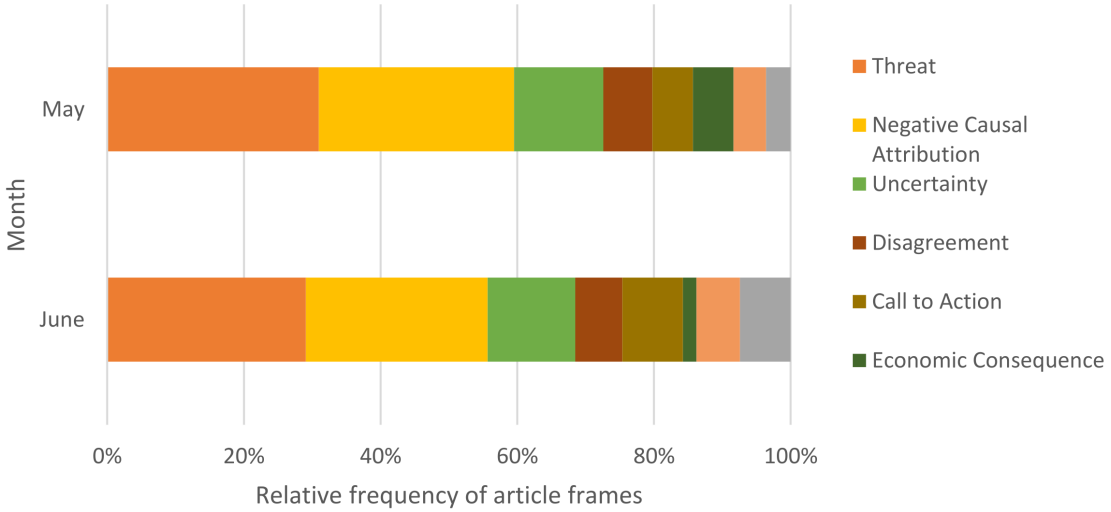


**Figure 4.** Relative frequency of article frames over time. Calculated as a proportion of total instances per month (May: N = 84; June: N = 203).

frame was exemplified in such variant descriptions as "more infectious than the original Wuhan virus, which killed about 900 Australians" (*The Australian*, 7 June 2021).

News media coverage of SARS-CoV-2 variants also made explicit (albeit occasional) references to variant history outside Australia (Figure 5). These manifested as both implicating (attributing) references to the location of initial variant identification and impartial (neutral and descriptive) references. The former were exemplified in phrases such as "the new strain from India" (*The Australian Financial Review*, 15 May 2021) and the latter in reference to the "variant first detected in India" (*The Age*, 3 June 2021).

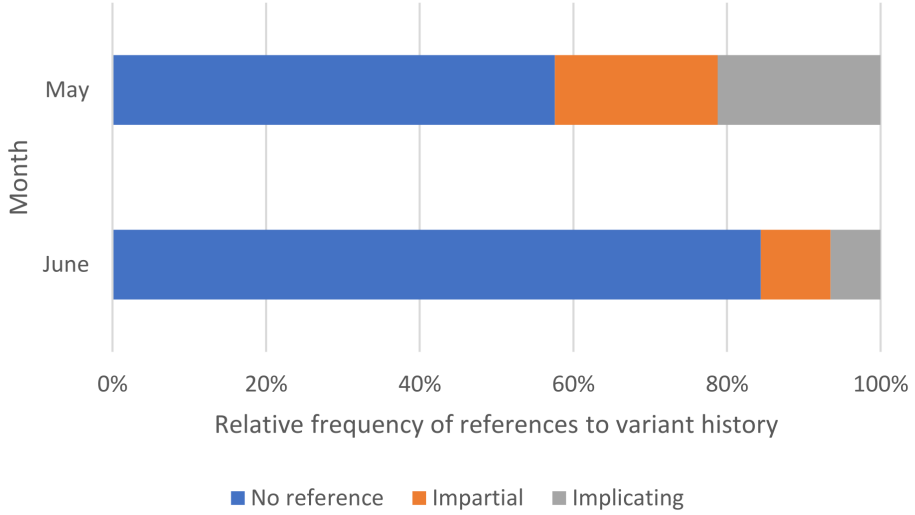


**Figure 5.** Relative frequency of references to variant history over time. Calculated as a proportion of the total number of instances per month (May: N = 33; June: N = 77).

The frequency of both impartial and implicating references to variant history outside Australia declined from May to June: implicating references declined from a frequency of

21% (n = 7) to 6% (n = 5) and impartial references declined in frequency from 21% (n = 7) to 9% (n = 7) (Figure 5). Fisher-Irwin tests of association indicated a significant difference in the frequency of implicating references between May and June (p = 0.035). The declining frequency of these frames demonstrates contextual support for declining references to geographic locations by way of geographic variant names (as per Figure 2).

## 4 ▪ Discussion

The results of this study provide a unique characterisation of SARS-CoV-2 variant-related communication at the time the WHO's new Greek letter variant labelling system was introduced. Quantified SARS-CoV-2 variant naming practices demonstrate the responsiveness of Australian news media to the solicited change but also reveal nuances and limitations to that change which have the potential to compromise intended outcomes of de-stigmatisation. These findings indicate the value of ongoing and pre-emptive consideration of disease naming and underscore the enduring relevance of media communication research.

### 4.1 ▪ *From implication to vindication*

In the WHO's declaration of a new naming system for SARS-CoV-2 variants, news media was established and upheld as an entity of science communication significance. In a broader social context, engagement of news media in this way aligns with encouragement of those in positions of power to lead by example when it comes to language use [Moon & Pérez-Hämmerle, 2022]. It also resonates with aspirations of accuracy and responsiveness to change articulated in guidelines for science communication [Schuster, 2020]. There is then some scholarly support for the role of this communication medium in advancing the new variant naming system.

Congruently, and consistent with the intentions underlying the WHO's intervention, Greek letter names were taken up as a tool to identify viral variants in news media coverage in Australia. The adoption of these names within a matter of weeks is commensurate with the uptake of the official name "COVID-19" in favour of location-specific alternatives in news reports at the start of the pandemic [Prieto-Ramos et al., 2020]. These positive response dynamics are also consistent with documented language change (in this case, on social media over an eight-month timescale) during the influenza pandemic of 2009 [Chew & Eysenbach, 2010]. In both of these comparative examples, official disease names were endorsed for use in favour of existing names deemed to be stigmatising, and documented uptake indicates receptivity to this call. Together, these studies proffer some evidence to allay concerns that established, potentially stigmatising names would persist.

The declining frequency of potentially stigmatising geographic variant names in news media coverage also tracked with a decline in references to the geographic history of SARS-CoV-2 variants outside of Australia. This characteristic has the perceivable potential to reinforce a decline in communication-mediated blame. However, the substantiation of such a de-stigmatisation effect necessitates further research. In Australia and beyond, the human impact of the nomenclature in use and shifts therein remain, ostensibly, underexplored. The outcomes of such research may, however, may be influenced by emergent limitations of the new naming system.

### 4.2 ▪ *The constraints of change*

The framing of news media headlines and articles demonstrated persisting communication-mediated blame, particularly in the frame of *negative causal attribution*. In the context of existing literature, the presence of this frame is broadly consistent with the most prevalent frames identified by Rodelo [2021] in news coverage in Mexico a full year earlier in the pandemic (that is, May 2020). The identification of this frame even in the absence of geographically named variants suggests that names are not the only linguistic entities of concern in broader de-stigmatisation efforts. Moreover, these studies together demonstrate the long-term persistence of blame in pandemic reporting, ostensibly compromising a fundamental ethical principle of framing. As Nisbet [2009] exhorts, framing should not be used to denigrate, attack, or alienate. Alas, in news media coverage of SARS-CoV-2 variants, frame-based blame perceivably persists.

Although negative causal attribution persisted as a frame in both headlines and the body text of articles in the study corpus, a degree of temporal decline in its frequency was observed. Notably, this decline was more marked in headlines than in the body text of articles, which may have the potential to strengthen de-stigmatisation. Headlines have long been recognised as powerful framing devices [Pan & Kosicki, 1993] and, more recently, researchers have acknowledged the power of headlines to shape the outcomes of communication and provide clues as to the influence of news coverage [Liu et al., 2019; Papacharissi, 2019]. By elucidating the framing of headlines in addition to that of more contextually rich body text, this study provides a nuanced foundation for future research exploring the human impact of media communication in headlines and beyond.

### 4.3 ▪ *Research limitations and future opportunities*

The research findings presently described indicate temporal associations but cannot fully account for the potential influence of other variables, particularly the continued spread of variants and their emergence as a more proximate threat in Australia over time. The scope of the research was also constrained to legacy media in Australia, specifically print newspaper publications. Comparisons might yet be made with respect to patterns of naming in other countries and languages. This could extend research insights to the international scale at which the Greek letter naming system applies and, furthermore, draw into consideration communication patterns in countries previously sharing their name with a variant.

Future research might also elucidate naming and framing patterns in other media formats. There is, however, reason to believe in the enduring relevance of legacy news media forms, such as newspapers, as a science communication medium (and research subject). Beyond the significance — and official demarcation of — newspapers as an information source during the pandemic [Massarani & Neves, 2021; Thomas et al., 2020], there are social dependencies and nuanced uptake dynamics to consider. For example, Nygren et al. [2018] acknowledge the potential for interdependence between old and new media formats, and Langer and Gruber [2021] recognise the enduring audience reach of legacy news media. The responsiveness of newspaper media to a new variant naming system offers some challenge to assertions that newspapers are usually slow in embracing and disseminating new names [Caulfield et al., 2021; Langer & Gruber, 2021]. Recognising such names as the foundation for science communication, as per Schuster [2020], this domain of news media communication maintains relevance to modern day discussions of science.

Building on the foundational language change dynamics documented by this study, future research might also seek to substantiate the impacts on stigmatisation perceived and experienced at a personal level. This is particularly noteworthy considering the prevailing challenge of undoing damage once it is already done [Caulfield et al., 2021]. In this respect, the many and varied contributors to news coverage and their potential influences may also warrant attention. The potential significance of this factor is emphasised by the increasing polarisation of media ownership [Muller, 2017]. Although divergent reporting patterns were not identified in early COVID-19 media framing in Australia [Thomas et al., 2020], they have been documented internationally [Mach et al., 2021; Motta et al., 2020].

The challenges and nuances of changing established naming practices also provide support for pre-emptively addressing potentially problematic naming. It has indeed been recommended that the many infectious diseases with geographically-oriented names be renamed before the next outbreak occurs [The Lancet Regional Health — Europe, 2022]. Yet, in the time since this recommendation was made and SARS-CoV-2 variants were renamed, Japanese encephalitis virus, geographically named as it is, has risen in prevalence and garnered renewed attention from news media publishers and public health officials alike. This highlights the persistence of potentially problematic nomenclature in the context of public health threats and proffers justification for integrating naming considerations into ongoing public health preparedness efforts.

### 4.4 ▪ *Research conclusions*

This study has elucidated naming and framing patterns in Australian news media coverage following the introduction of new names for circulating SARS-CoV-2 variants. Documented response dynamics indicate avoidance of potentially stigmatising names as intended. However, the persistence of attributing and implicating frames is a perceivable foil. Tension between names and frames suggests that there may be more to communication-mediated stigma than names alone, inviting reflection on the value and means of promoting solidarity and de-stigmatisation at a societal scale — action The Lancet COVID-19 Commission has called for more broadly [Sachs et al., 2022]. Future health communication activity may be bolstered by integrating naming considerations into pandemic preparedness activities and by further research into the nature and human impact of names and frames in news media communication. Only then may the complex linguistic reality of infectious diseases be respected as social, biological, and economic impacts are already.

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