

# Coronavirus and the Internet: is information readable and reliable?

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**Word Count: 800 words**

## **Abstract**

This was a review of the quality and readability of online resources relating to the coronavirus. We used Google to search for the terms "COVID-19" and "coronavirus disease 2019" and reviewed the top 50 results. Quality was measured using the Journal of the American Medical Association (JAMA)

benchmark, the DISCERN instrument and Health on the Net code (HONcode) accreditation. Readability was analysed using the Flesch Reading Ease Score (FRES) and Gunning Fog Index (GFI). The study included 33 sites. None of the sites were HONcode accredited. The mean (SD) JAMA and DISCERN scores were 1.24/4 (1.2) and 42.85/80 (12.66) respectively, indicating 'fair' quality. Mean (SD) GFI and FRES scores were 13.74 (1.98) and 50.1 (11.25) respectively, indicating a lack of comprehensibility. Websites targeted at the public had a significantly lower DISCERN score ( $p=0.03$ ) but were more readable ( $p=0.02$ ). Websites adhering to the JAMA benchmarks would improve quality, whilst shortening sentences and removing medical jargon would improve readability.

## **Introduction**

Since January 2020 the novel coronavirus has made its way across the globe and has since been declared a pandemic by the World Health Organisation (WHO)<sup>(1)</sup>. The UK's response to the pandemic has been focussed on containment, identification and isolation. Mild cases are being managed at home, with those more seriously affected receiving supportive treatment in the hospital setting<sup>(2,3)</sup>.

The UK office of statistics states that 63% of the UK population use the internet for health information<sup>(4)</sup> and this is largely biased and unregulated. Additionally, a majority of these resources are incomprehensible due to 61% of the public having poor health literacy<sup>(5)</sup>.

The rapid escalation and spread of the virus has led to 49% of the public reporting increased feelings of anxiety or depression since the outbreak<sup>(6)</sup>. Additionally, 25% of the public have admitted to searching the internet multiple times a day for information about the virus<sup>(6)</sup>. We aim to provide an insight into the quality and readability of online resources relating to the coronavirus.

## **Methods**

Google ([www.google.com](http://www.google.com)) is the most widely used search engine in the UK, comprising 87.5% of the market share<sup>(7)</sup>, and thus we used this site alone to search for resources. It was conducted on 21<sup>st</sup> April 2020 in London, UK and all filters were inactive. We entered the terms "COVID-19" and "coronavirus

disease 2019” and reviewed the top 50 results. Websites were excluded if they were inaccessible, irrelevant, in a language other than English, video only or duplicated.

The quality of each resource was assessed by the presence of health related seals of approval (HRSA) such as the HONcode (Health On the Net) accreditation and two independent quality tools, the JAMA (Journal of the American Medical Association) benchmarks and DISCERN questionnaire<sup>(8,9)</sup>. Readability was evaluated using the Flesch Reading Ease Score (FRES) and Gunning Fog Index (GFI). Tools used in this study have been summarised in table 1.

Two clinicians reviewed each resource and a mean score was obtained. Data was recorded on Microsoft Excel and analysed using independent t-tests. A p value of <0.05 was deemed statistically significant.

<u>Tool</u>	<u>Format</u>	<u>Interpretation</u>
JAMA benchmark	A total score out of 4 is given based on evidence of authorship, attribution, disclosure, and currency	A score of 4 indicates that the resource is of high quality
DISCERN tool	A total score out of 80 is given based on 16 questions designed to assess the reliability of the publication, and quality of the information  Maximum of 5 points per question.	> 63 is excellent 39-50 is fair < 26 is very poor
Flesch reading ease score	$206.835 - (1.015 \text{ (total words/total sentences)}) - (84.6 \text{ (total syllables/total words)})$  Maximum score 100	90–100 is easily readable < 50 is difficult (university level and above)
Gunning’s fog index	$0.4 \text{ ((words/sentences) + 100 (complex words/words))}$  Complex words $\geq$ 2 syllables	7-8 is easily readable 12+ is difficult (university level and above)

Table 1: The quality and readability formulas used and the interpretation of their scores.

## Results

Out of the 50 websites, 33 met our inclusion criteria with 17 being excluded primarily due to irrelevance (n=9) and duplication (n=6). Professional bodies such as the NHS and WHO produced 39.4% (n=13) of websites, whereas 27.2% (n=9) were forms of social media. None of the websites were Google adverts. A majority of websites (75.8%) were UK based, with 84.8% of sites targeting the public rather than health professionals.

The mean (SD) JAMA score for all included sites was 1.24/4 (1.2), this was the same for both clinicians. No websites had any HRSA's. The two clinicians mean DISCERN scores were slightly different at 43.00 and 42.70. This gave an overall mean (SD) of 42.85/80 (12.66) indicating 'fair' quality<sup>(9)</sup>. The mean (SD) GFI score was 13.74 (1.98) and FRES score was 50.1 (11.25), indicating a 'moderately difficult' level of readability. This again was identical for both clinicians.

There was no statistically significant difference in quality and readability of websites produced by professional bodies versus other authors ( $p>0.05$ ). However, the difference in the readability of resources targeted at professionals versus the public was statistically significant, with resources aimed at the public showing a lower GFI score ( $p=0.01$ ) and higher FRES score ( $p=0.02$ ). Websites targeted at professionals had significantly higher DISCERN scores ( $p=0.03$ ), although this did not extend to the JAMA scores ( $p=0.08$ ).

## Discussion

Our results indicate that online resources relating to coronavirus are not high quality, and are often only fully comprehensible to people with a university level education. The low JAMA scores were chiefly due to a general lack of referencing and authorship, which are important quality indicators.

The modest DISCERN scores reinforced a lack of referencing and currency, with an additional lack of quality information on self-care advice and risk-benefit profiles. We know that since the start of the coronavirus pandemic, there are increasing numbers of people are turning to the internet as a source

of health information<sup>(6)</sup> and the significantly lower DISCERN scores for websites targeted at the public compared to professionals is concerning, especially from a patient safety perspective.

Resources aimed at professionals had more difficult readability scores, as one would expect. The lack of readability could mean patients are forced to use poorer quality websites due to comprehensibility reasons. Using shorter sentences, reducing the number of syllables and removing medical jargon will ensure that resources are more readable by a layperson<sup>(8)</sup>.

The major limit of this study is that it was only conducted in one location, at one time and with one search engine, thus making it less representative. In addition, the readability scores are only an estimate of comprehensibility and the use of the DISCERN tool has some subjectivity.

The constantly evolving wave of new resources published online in response to the coronavirus pandemic thus far are not high quality and may be incomprehensible. The public should be encouraged to look for higher quality resources such as those written by the NHS, GOV.uk and WHO, or alternative government resources specific to their own countries. Additionally, as clinicians we can signpost our patients to these resources with the ultimate aim of ensuring reliable and readable health information relating to coronavirus is conveyed.

## **Conflict of Interest**

We have no conflicts of interest.

## **Ethics Statement/confirmation of patients permission/funding**

No ethics approval required. No patient consent required. No funding was required.

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