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# Claiming Credibility in Online Comments: Popular Debate Surrounding the COVID-19 Vaccine

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**Abstract:** At times of crisis, access to information takes on special importance, and in the Internet age of constant connectedness, this is truer than ever. Over the course of the pandemic, the huge public demand for constantly updated health information has been met with a massive response from official and scientific sources, as well as from the mainstream media. However, it has also generated a vast stream of user-generated digital postings. Such phenomena are often regarded as unhelpful or even dangerous since they unwittingly spread misinformation or make it easier for potentially harmful disinformation to circulate. However, little is known about the dynamics of such forums or how scientific issues are represented there. To address this knowledge gap, this chapter uses a corpus-assisted discourse approach to examine how “expert” knowledge and other sources of authority are represented and contested in a corpus of 10,880 reader comments responding to Mail Online articles on the development of the COVID-19 vaccine in February–July 2020. The results show how “expert” knowledge is increasingly problematized and politicized, while other strategies are used to claim authority. The implications of these findings are discussed in the context of sociological theories, and some tentative solutions are proposed.

**Keywords:** COVID-19; health communication; user-generated content; reader comments; social media; vaccines; vaccine denial; conspiracy theories



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## 1. Introduction

The scientific evidence on any given topic today is often extremely complex or even contradictory, posing difficulties for the journalists who report on it and the public who read about it, as the COVID-19 pandemic has made abundantly clear. Research on issues such as infectious disease, vaccination, genetically modified food or climate change generates massive amounts of data and relies on increasingly sophisticated subject knowledge and statistical analysis for interpretation, so that strong scientific literacy skills may be needed to discern important trends or evaluate speculative ideas. The abundant coverage of scientific topics in the media of all kinds means that people are constantly being bombarded with information about health, disease, diet, climate and so on, and although much of this reporting may be accurate, it is very likely that large sectors of the public lack the background needed to evaluate the kind of claims made and what they mean for the average person [1,2]. If we add to this the massive proliferation of user-generated comments, misinformation and disinformation on social media, the situation becomes even more confusing. In the light of recent global health crises such as COVID-19, which pose a significant risk to the general public, this scenario is a growing cause for concern among health authorities, governmental and international bodies, but unfortunately, little is known about how scientific information is formulated and communicated in informal public settings.

Social media experts and discourse analysts have made various attempts to address the situation of public incomprehension of scientific information. One first possible starting point is the notion of scientific consensus, a key concept, but one that is poorly understood. In fact, there is some evidence that the public is receptive to the notion of a division of

cognitive labor, and to the idea that scientists, say, as opposed to politicians or celebrities, have privileged knowledge of health or environmental issues and that a consensus among them has greater weight than a mere agreement among lay people [3]. On the other hand, opinion polls show that people frequently fail to recognize that an expert consensus exists or misunderstand its nature [4]. This has been attributed to false media bias, that is, the media's tendency to present issues as a two-sided debate, even when the preponderance of evidence is on one side [5,6]. It may also be due to misinformation spread by groups opposed to specific health policies [7]. In view of this, some authors believe that it would be useful to educate the public on how scientific research works and try to correct misperceptions concerning the nature of scientific consensus. It has been proposed that a better comprehension of expert consensus would act as a "gateway belief", enabling positive changes in public attitudes [8]. One further twist to this story is that official reactions to some recent health scares were found to be counterproductive, leading to public mistrust of information campaigns and a general reduction of people's risk perception [9], undermining the notion of a reliable expert consensus in many people's minds.

A second point of departure is to examine user contents themselves to find out about their dynamics and reach a deeper understanding of what leads people to be receptive to mis- or disinformation. Although the messages that circulate at the grassroots level among lay publics might be regarded as unimportant in discussions of public health policy and communication, it is increasingly becoming clear that these representations have power to sway the debate and color the public vision of important issues [10]. In studies of social media messaging in some recent epidemics, it was found that there is an alarming tendency to express distrust in official public health information and delegitimize official health spokespeople [11]. In this sense, some authors have argued that precisely in this context of emerging diseases where public health information is of paramount importance, it is essential to learn more about how social media users access, understand and pass on health-related information and how they perceive health risks [11]. Although health authorities increasingly use social media to provide information, they rarely engage in two-way interaction with their audiences, and large amounts of contradictory advice or deliberate disinformation also circulates through the same channels. Moreover, it would be naive to assume that even if clear messages are issued, the public as a whole would ever simply accept messages transmitted by authorities as true, providing these are suitably phrased. This would go against a large body of reader response research assembled over the years [12], which shows that readers are active agents, well capable of generating critical or deviant readings of the texts to which they are exposed. Evidence from a recent experimental study [3] shows that people who have already formed an opinion about a controversial issue are less likely to see health-related messages as representative of the scientific community as a whole, even if they are expressed in terms of high consensus. In fact, we know that the information provided by reliable sources on health-related topics is generally filtered through readers' values and pre-conceptions [13] and is strongly influenced by the well-known phenomenon of confirmation bias [14,15]. While some people are willing to modify the way they understand an issue, others cheerfully resolve cognitive dissonance simply by rejecting ideas that do not fit with their own preconceived notions [16].

In short, the combination of conflicting authoritative accounts or hyped campaigns, information overload and massive social media interaction generates widely divergent social constructions of health risks and how they should be avoided [10]. The complexity of such situations is nowhere more clearly manifest than in the case of COVID-19 vaccination and vaccine denial. In this particular context, a bewildering proliferation of fact, opinion, fake news and disinformation is circulating through user-generated media, strongly laced with personal experiences, strong feelings and violent reactions. In the midst of this, a substantial minority of people persistently resists official health messages issued by governmental authorities and not only heed alternative views but also propagate them.

In principle, then, it is important to obtain a better understanding of the dynamics of health-related interactions in social media networks, and how official and expert opinion are received there. This would complement other focuses, such as sociological studies of vaccine denial or communication studies about how to explain health issues, by shedding light on the way messages are received and relayed by members of the public. However, such studies are rare, probably because one of the main problems facing anyone who wants to understand what is happening in such venues is the sheer quantity of comments, almost all of which are available only in fragmentary form. Although user-generated media have proliferated in recent years, with massive circulation of news and opinions through Facebook, Twitter, reader comments pages and so on, their incomplete nature and the absence of continuous coherent discourse means that they still pose a major challenge to analysts [17]. For this reason, the focus is limited to the way “experts” were represented and the way commenters otherwise constructed their claims to knowledge about the pandemic and vaccination issues. This made it possible to cut through the vast mass of data obtained from one reader comments site on COVID-19 vaccination by conducting a corpus-assisted search for a number of frequent key terms (representations of expertise, ideas and ways of knowing, roles in interaction, etc.), to perform a vertical reading of the main ways in which expert authority, credibility and knowledge were represented in this dataset. The main research question to be addressed is thus: how is “expert” knowledge represented and/or contested in this forum, and what other kinds of authority do people claim or draw upon?

## 2. Materials and Methods

The *Mail Online* is the web version of one of the most widely read British tabloid newspapers, the *Daily Mail*, a right-wing daily with a circulation of around one million copies. Thanks to its open access policy, it has a vast online readership with one of the most active reader comments pages in the UK. This chapter examines a corpus of 10,880 reader comments responding to all the *Mail Online* articles containing substantial coverage of the COVID-19 vaccine development program published between 28 February and 23 July 2020 that generated more than 10 comments (see Appendix A for the full list of articles included). This dataset thus represents the crucial period during which the first vaccines in the UK, USA and elsewhere were undergoing clinical trials (the first vaccine was approved for general use in December 2020). A total of 25 articles were identified that met these criteria, and the reader comments were scraped from the online newspaper site using a web scraping application developed using the R environment for statistical computing and text processing. In accordance with a corpus-assisted discourse analysis approach [18], the most frequent search terms related to sources of expertise (e.g., “vaccine”, “vaccination”, “expert”, “doctor”, “scientist”, “scientific”, “pharmacist”, “research”, “government”, “NHS”), ways of knowing (e.g., “know”, “think”, “idea”) and interpersonal interaction (pronouns “I”, “you” and “we”; interaction markers “OK” and “so”; imperatives and direct questions) were used to extract all relevant concordance lines. These were then analyzed qualitatively in order to determine the strategies used by participants to attract attention, build their own credibility and undermine that of others and appeal to or dismiss authority. After a reiterative process of reading and re-reading the relevant comments, these were assigned to four major themes reflecting different attitudes to the issue of scientific authority. The examples in each category were analyzed through a further process of reflective reading in order to establish how these commentators discursively framed the status of expert knowledge and the “right” to have an opinion on COVID-19 vaccines. The process of analysis was thus similar to a classic thematic analysis, rather than one based on quantitative criteria. In the presentation of the results below, the four recurring themes are illustrated and discussed in order to shed light on the broad patterns that characterize the public discussion of vaccines in this platform, but the design of the study does not permit comparisons regarding frequency, for which it would have been necessary to code and quantify all the comments individually along the

lines of content analysis. The conclusions suggest how these findings could be useful for professionals engaged in providing public health information.

### 3. Results

#### 3.1. The Contested Nature of “Expert” Knowledge

One of the most often used strategies employed by traditional media sources for boosting the credibility of scientific and health-related information is that of referring to “experts”, generally elite scientists/researchers and official spokespeople [19]. This trend was also perceptible in some reader comments that cited “experts” uncritically as agents with privileged knowledge that they place at the service of society. We may note how the plural form, sometimes with the definite article, implies a reliable consensus, as evidenced by examples (1) and (2):

- (1) *I think with the information we had from the **experts** we’re doing the best we can.*
- (2) *I owe my life to the skills and **experts** who work in big pharma.*

A few contributors display more familiarity with the gatekeeping mechanisms of science, as shown below, but none of the examples in the present corpus made reference to the notion of scientific consensus (3):

- (3) *There is no peer reviewed scientific research that says **vaccines** are unsafe or they are a way of controlling people.*

This confidence in (unspecified, presumably authoritative) experts is here sometimes underpinned by belief in accepted British establishments, often expressed in markedly patriotic terms (4)–(7):

- (4) *He’s not one of our **experts**. We have a far more talented pool of academia at Oxford and Cambridge.*
- (5) *This is the one and only Oxford if they say they’ll have a **vaccine** by fall, I will take then for their word Sorry Bill Gates, someone beat you to it.*
- (6) *Congratulations British **scientists** for being the best in the world.*
- (7) *Through all of this there’s one thing I’ve been totally confident of—the finest **scientific** minds on this planet are right here in Britain.*

However, it is notable that in this dataset, the attribution to an “expert” was far from universally accepted as a way of legitimizing a claim. Out of 213 occurrences of this lemma, 157 were here associated with a negative semantic prosody, in which the credibility of the experts or “experts” was undermined. In most cases, this was delivered in ironic terms (8)–(10):

- (8) *Was it a DM Australian **expert** that created it out of herbs and spices?*
- (9) *And just who are these mysterious sources and **experts**. Is it Brenda at number 47 because apparently she’s an expert on this?*
- (10) *Everybody is an arm chair **expert** these days.*

One of the phenomena observable in the media during the pandemic months was the emergence of public figures of many different kinds—often lacking any scientific expertise—who made statements about how the pandemic should be handled. The obvious ironies of this are clearly perceived by various commenters, who pick up on claims made by people who are felt to lack medical expertise (11) and (12).

- (11) *Bill Gates is now a medical **expert** advising the world!*
- (12) *How nice to see that acclaimed doctor and **scientist** (probably a Nobel Prize winner) Elle Macpherson giving us all the benefit of her huge intellect and years of good scientific research and experience.*

Notably, inverted commas are often used to underline this critical, ironizing stance towards experts, as in (13) and (14):

- (13) *I’m still waiting for the DM to publish its usual realistic article by its ‘**expert**’ astrologers on which star signs will catch the virus.*

(14) *Next they will be telling us not to obey the traffic lights. The ‘experts’ have cried wolf so often that nobody knows what to believe.*

More worryingly, some participants appeared to dismiss the possibility of expert knowledge, in a tone reminiscent of populist political campaigns [20,21] (15) and (16):

(15) *Better be fake news Forget experts! Like I said 3 days ago. If you listen to experts you are done and dusted Experts don’t know anything.*

(16) *Does anyone else want to just scream when they hear the word Expert anymore?*

This is often linked explicitly to populist distrust of government, which is allied to distrust of experts (17):

(17) *Mishandled from the beginning by government and their so-called experts.*

This fundamentally populist theme is developed through allusions to an establishment conspiracy and is given greater appeal by references to the class system. In the following comment, it can be observed how the vaccine is associated with the despised “middle class know-it-alls” (18) or “elites” (19) who have a contemptuous attitude to “independent researchers” while having a vested interest in the pharmaceutical establishment:

(18) *The middle class know-it-alls will be the first to roll up their sleeves. The ones with pension stock in Astrazeneca who look down their noses at anyone who does any independent research. We all know one or two of them.*

(19) *I would rather be dead than be forced to have a vaccination and be controlled by the elites!*

Another pattern that recurs in this dataset is the expression of frustration with an overload of “expert opinion”, a view which probably reflects considerable public confusion over the way in which the media tend to stack their articles with brief statements from scientists and spokespeople of different kinds, and which could easily produce fatigue in media consumers (20) and (21):

(20) *All I see in this article are unfounded opinions and assumptions from numerous “sources, experts, professors” nothing more.*

(21) *Anti vaxxers, and especially this doctor, prove that qualifications do not mean a person is intelligent and understand what they supposedly “know”.*

However, it is very striking that while experts are widely denigrated by participants who are skeptical of mainstream science and establishment viewpoints, another frequent pattern found here is the term “expert” used with positive valence in order to build support for alternative (non-consensus) views of the pandemic (22):

(22) *Despite a massive and coordinated attempt to silence alternative voices, many of them experts in their field, the message is getting through that there has not been a pandemic.*

Alternative views of vaccination are also expressed in this context (23)–(26):

(23) *ARE PEOPLE NOT ENTITLED TO BE SUSPICIOUS?? there are many “experts” who disagree with the current vaccine programme....that doesn’t mean they are anti-vaccine types.*

(24) *Dr. Wolfgang Wodarg, an experienced doctor, said In reality, this “promising vaccine” for the vast majority of people is in fact prohibited genetic manipulation!”*

(25) *I refused to have it after reading what is in the vaccine. About 20,000 doctors and nurses also refused to be vaccinated so they can’t be wrong either.*

(26) *As a pharmacist with 26 years’ experience I agree with Wakefield.*

A lack of transparency in the medical profession is also occasionally cited as a reason why readers distrust mainstream scientific messages (27):

(27) *Doctors who have twenty to thirty years’ experience couldn’t tell me any ingredients in any vaccine over the years. Yet they want to believe and make us believe that vaccines are safe and effective.*

The patterns emerging here point to the contested nature of “expert” status. On the one hand, there is a public perception that some people (medical doctors, scientists) do have access to privileged knowledge and thus do have the “right” to speak and be listened to. However, consensus of scientific opinion is not mentioned explicitly in any

of the posts, even in statements where “experts” or “the experts” are cited as providing authority. Although it is difficult to build a strong argument on negative evidence, this absence seems to suggest that the notion of consensus is not prominent in public framings of scientific affairs. Conversely, some figures who are prominent in the media discussions of COVID-19 do not have this status, and their opinions are not granted credence. On the whole, participants reject the media practice of publishing the views held by celebrities on this topic. However, this picture is complicated by the fact that in the representations of some participants, at least, certain people who do not represent mainstream scientific opinion can also be defined as “experts”, and their views are given equal or superior weighting.

### 3.2. Claiming the Right to Speak

It is noticeable that when the participants express their own ideas, they often feel obliged to provide some reasons why they feel they have the right to speak on this topic, or else admit their lack of expertise before indicating why they think this does not disqualify them from opining on the subject. Let us look first at those participants who claim personal expertise or contact to underpin their right to speak. The epistemics of everyday interaction broadly revolve around knowledge imbalance among participants, and the fact that they recognize each another to have different levels of knowledge about a specific field or point [22]. We may note that the kind of experience claimed is presented rather vaguely, ranging from healthcare in general (“I work in the NHS”) (28) and (29) to more specific descriptors indicating a direct link with COVID-19 (30)–(32):

(28) *I know I work in the NHS.*

(29) *I work with covids. Some have no symptoms, some have only a sore throat, others require oxygen or mechanical ventilation. The ones that didn't know they had it, infected others*

(30) *I work in vaccine manufacturing and to be fair there is a small risk in all vaccines having a side effect but this on the whole is negated by the benefits.*

(31) *I worked for a global pharmaceutical company for 15 years. They're only about profiting from Patient Care.*

(32) *I'm a hospital based physician with decades of experience. I'm involved with caring for patients with C19. I've read everything there is to read on the subject.*

Participants bring in first-hand experience as a potential source of trustworthy information. On the one hand, people who have had personal contact with the disease are keen to share their experience (33) and (34):

(33) *Sadly the virus is not a hoax as I lost someone and **my** friend lost her brother but I do believe that the vast majority of the population is safe.*

(34) *I know several people who have had covid and have after affects. These people are young. Its not simply a mild cold or flu. Dont be deluded.*

On the other, those who lack personal experience of it apparently feel authorized to shed doubt on its existence (35):

(35) *In a few months the virus will be gone. Just before **we** all panic, does anyone personally know someone that has it yet?? I dont and havent met anyone that does know someone!!*

Notably, even conversations with people who have some professional expertise are also presented as authorizing moves to claim epistemic rights (36):

(36) *Just been talking via Skype to a friend of mine who's a doctor who I used to work with many years ago and **we** were talking about vaccines and he said he would not recommend anyone having a vaccine that has been rushed through in less than a few months.*

In the case of people who lack professional contact, the use of a “disclaimer” often precedes the claim (37) and (38):

(37) *I'm not proclaiming to be an expert, but wouldn't it make more sense injecting the partial gene sequence into a larger animal?*

- (38) *I'm no doctor but it would appear that the side effects of the vaccine may include contracting Coronavirus.*

However, in many cases an appeal to common knowledge is used, again generally presented before the claim (39)–(44):

- (39) *All **cures** will be downgraded by our media until after November (and we all know why)...*  
 (40) *We all know China started this mess with the intention of hurting innocent people.*  
 (41) *We all know there will be no vaccine this year*  
 (42) *Covid 19 won't be here again. We'll all know this. We've been conned folks. Big Pharma runs the world.*  
 (43) *We please all know, the world knows, Trump has been an inept, incompetent, leader.*  
 (44) *We all know Bill Gates is behind this, that alone should send folk running to the hills.*

Other people appeal to “common sense” to found their arguments (45) and (46):

- (45) *Vaccines take 10-15 years to be developed and deemed safe for humans so **common sense** should tell you that they have had this vaccine for many years*  
 (46) *A vaccine is a weakened version of whatever your body is going to generate antibodies for, whatever happened to good old fashioned **common sense**.*

Along similar lines, participants occasionally draw parallels between medicine/science and other aspects of life (47):

- (47) *Sensible shoppers always check out what they are buying or look at food labels for nasty additives. But when it comes to injecting stuff into our bodies, few ask their doctor what's in it—and most doctors probably don't really **know**.*

There is also evidence in this dataset that some people are operating from very different underlying constructions of reality. In the following case, we can observe how some anti-vaccine participants build a link to various other conspiracy theories current at this time (NWO, Gates, 5G, microchips), which come together to build what might be termed an alternative worldview that has inner coherence but is incompatible with the mainstream representation of the issues [23,24] (48) and (49):

- (48) *A mass march on the authorities is in order after the numbers fall!!!!!!!!!!!! This is all a con from the New World Order, Bill Gates can p@ss right off if he thinks he's giving it to **me!** Full of nano technology to go hand in hand with 5G which they cant I dont want that crap injecting into my viens developed by Bill ppphhhooking Gates, the man is a megalomaniac!!!! people are flaunting the rules everywhere. the police cant stop everyone doing it, its futile.*  
 (49) *No **vaccines** are good enough to stop powerful 5G beams entering the body and causing covid FACT*

### 3.3. Denying the Right to Speak

A large proportion of the posts that reject a previous participant's claim found their argumentation on the notion that contributors lack intelligence or a sound understanding of science. These are usually delivered in insulting terms (50) and (51):

- (50) *We all **know** the immense brain power tabloid “readers” possess.*  
 (51) ***Know** it alls on virology out in force today, **you** lot should really do a little research on how viruses & the immune system actually work before commenting on this nonsense state the bleeding obvious!?*

Sarcasm is also used to delegitimize others' claims (52):

- (52) *I didn't **realize** the UK was blessed with so many keyboard scientists and doctors who appear to know so much more than real doctors and nurses on the front line.*

Participants delegitimize anti-vaccine opinions by exaggeration, mocking their epistemological naivety (53) and (54):

- (53) ***OK so** by anti vaxxers way of thinking “one of my friends children had the mmr **vaccine** and developed autism “ . . . ” one of my dads friends ate a banana and got cancer” Total twaddle, does he still believe the Earth is flat! Measles can kill and can cause blindness.*

(54) *I love a good conspiracy theory as much as most people. The moon landing, JFK, Princess Di, 9/11, 5G, etc. etc. But if **you** look at the number of lives that have been positively impacted by vaccines I simply don't buy it.*

For their part, those opposed to the vaccine generally represent people who support it as lacking the ability to think for themselves: they are “under complete mind control” or “willing sheep” (55):

(55) *There are loads of willing sheep who will accept any poison if they are fed by the **government**.*

Other sources of legitimation mentioned in the foregoing section, such as “common sense”, are also disputed in sarcastic terms (56):

(56) *What we want is a **common sense** vaccine from someone like Nigel Farage or that bloke who owns Wetherspoons.*

Thus, both sides are represented as gullible and naive: antivaxxers are “flat earth” and “dense and ignorant”, while pro-vaccine participants are “under complete mind control”. Disputing the right to speak involves discrediting adversaries by attacking their intelligence or ability for independent thinking, but also attacking their credibility in rational terms (57):

(57) *This sort of muddled thinking is really unhelpful. **Try looking up** how vaccines work. **Educate yourself.***

Importantly, a party-political dimension is often apparent in these posts, with a clear alignment proposed between certain political stances and certain stances towards mainstream COVID-19 health policies. Predictably, perhaps, a position that is critical of the Conservative government tends to be distrustful of official health policies (58) and (59):

(58) *Vaccine should be ready when mostly elderly people have passed away exactly what this **Tory government** wants.*

(59) *Has Oxford developed the Boris vaccine? Full of promise but poor on delivery.*

More interestingly, perhaps, Brexit-related issues appear in a variety of ways. Through processes of assimilation that involve considerable simplification and are doubtless intended to be offensive, Remain voters (60) and (61) are denigrated as disloyal to Britain and are grouped together with supporters of Bill Gates (60), while Brexit voters (62–63) are positioned with conspiracy theorists such as David Icke (63).

(60) *Great but they should test it on remainers **Take Bill Gates' vaccine you sheep.***

(61) *Remain supporters should wait for the EU to provide it, while those who are confident in our country as an independent nation can benefit from the **vaccine***

(62) *I hope it is tested on Brexit voters and other expendables before it is given to important people such as **myself***

(63) *Brexit voters won't take this **vaccine** because David Icke told them not to.*

It is striking that a few voices on these highly combative discussion boards are raised in support of “debate”, that is, hearing both sides of the question (64):

(64) *I respect anyone who is pro vaccine. But I also want to hear opposing views without name calling.*

However, at the same time, suggestions are frequently made that debate is being closed down (65) and (66):

(65) *Giving up, obviously only certain **ideas** are allowed on here*

(66) *Trump has the right **idea**, obviously misinterpreted as per usual by the media but the hydroxychloroquine treatment works.*

### 3.4. Sources of Authority

As the above sections have shown, while some commenters express trust in authoritative institutions such as the political establishment, scientific or university research centers, for others any messages emanating from such sources are merely part of an establishment conspiracy. Their distrust in politics, or in the scientific establishment, or in the media,



leads them to seek certainty in other representations that purport to speak with authority, often making them fall victim to conspiracy theories. At the same time, a large number of people seem to rely mostly on first-hand experience, “common sense” and even hearsay in order to construct their own view of the pandemic and the vaccine. In particular, those with personal experience seem to feel authorized to contribute their opinions. Table 1 shows the way in which different sources of authority are broadly represented by those in favor of and critical of the proposed vaccine.

**Table 1.** Sources of authority in pro- and anti-vaccine comments.

Source of Authority	Pro-Vaccine Commenters	Anti-Vaccine Commenters
Government	Government has the responsibility and knowhow to solve the pandemic through appropriate vaccines.	Government uses vaccines to increase its power and reduce citizens’ personal freedom.
Scientific establishment	Scientists have access to privileged knowledge and place this at the service of society. Scientists provide accurate information and advice.	Universities/research institutes are part of the (political and social) establishment and only seek establishment interests. Scientists are anxious to push the vaccine through too quickly for personal gain.
Pharmaceutical companies	Companies research and produce vaccines in a highly professional way.	Companies generate large profits by producing vaccines.
Alternative scientific sources	Alternative sources are discredited, associated with conspiracy theories.	Alternative sources are well qualified but persecuted by the establishment.
Primary investors	Investors such as Bill Gates are a legitimate source of authority.	Investors are only interested in profit or control.
Media	Media provide clear information. Media give contradictory information that must be filtered. Media give too much credence to alternative theories.	Media brainwash the public and give too much credence to “official” sources. Media are at the service of government, establishment and “big pharma” and silence alternative voices.

#### 4. Discussion

This chapter contributes to the growing body of research on the social media reception of health-related topics, and sheds light on the construction of authority and knowledge claims in online forums. This discussion begins by addressing the findings concerning the contested notion of expert status and knowledge, which has considerable political and cultural implications. To conclude, some possible implications for public health communication in contexts such as the 2020–2021 pandemic are explored.

Regarding the first research question, namely, how “expert” knowledge is represented or contested in this forum, the most striking finding from this study concerns the way trust in experts is vehemently contested. Let us first approach this in terms of the grassroots epistemological premises operating in society. In general terms, a claim is thought to be more likely to be accepted if it is backed by someone who has a privileged position for knowing thanks to his/her superior knowledge and training (see [25–29] on “epistemic authority”). However, although this is in itself a reasonably compelling principle, in the media context, it is currently being subverted by three trends observable here. First, the mainstream media themselves show increasing confusion over who can claim to be an expert on science-related topics and have, on occasion, been indiscriminate in according equal status to statements by established and alternative figures, as was the case during the MMR vaccine controversy [5,6]. Secondly, fake news sources, including deliberate disinformation, also regularly have recourse to “experts” in order to bolster their claims [15] to such an extent that some commentators have even proposed that vague reference to “experts” could serve as a marker of fake news [30]. Finally, social media in particular suffer from a notorious degree of epistemological simplification and flattening: as Salaverría et al. [31]

point out, there is an observable trend for users to attribute the same level of authority to anyone remotely close to having special knowledge (i.e., a general practitioner's opinion is held to be equal to that of a specialist virologist, or one COVID-19 victim's experience is accorded more weight than statistical data obtained across a huge sample). In a radical approach to this phenomenon, Harsin [32] posits that many people now operate within a post-truth paradigm, resulting partly from the democratization of media and communication in general. This has brought about a situation in which media audiences no longer acknowledge that some entities may hold superior knowledge on any given topic. As a result, scientists committed to rational argumentation are dismissed as irrelevant, and primacy is given to personal feelings and experience, so that an assertion is accepted as true if it "feels" true. This erosion of epistemological standards would appear to be a further instance of the phenomenon of "truth-subversion" [33], which is currently receiving considerable critical attention, and the current media landscape offers little scope for improvement.

On the other hand, if we move beyond the purely epistemological realm, the current findings also suggest that present-day distrust in experts is more than just confusion arising from a lack of criteria on what constitutes expert knowledge. Considered in socio-political terms, this evidence shows that suspicion of experts is often closely linked with distrust of the establishment and those in authority, variously grounded in political party rivalry, general anti-elitism or suspected financial corruption. In a social perspective, the present dataset provides evidence of the "distrust of expert systems" identified by Giddens [34] as a latent factor in late modern societies. Importantly, one of the consequences that Giddens ascribes to this distrust of authority is that individuals are increasingly likely to feel that they should make their own risk calculations, even though—particularly in cases such as COVID-19—they patently lack the expertise and information that might enable them to do so. During the pandemic, public trust/distrust in government has been found to have a strong impact on behaviour patterns in different countries [35]. If we try to look beyond the (real) confusion and disorganization that characterized public health policy and messages at the time, we can observe that this manifest distrust of "the system" bears traces of three potent driving forces: communicative overkill, attribution of profit motives and suspicion of elite knowledge institutions.

First, the constant stream of alarming messages, supposedly backed by expert authority, tends to give rise to fatigue in the public mind, "an 'exhaustion' with repeated series of threats about the danger of the 'next big killer' that results in a lack of risk perception" [11,36]. The mass media's role in this is clear. These media drive distrust by exposing the public to massive quantities of information about risk of which they would formerly never have been aware [37]. At the same time, they also enable the growth of public contestation of expert authority, and the rise of social media has driven us to a new level of information dissemination, which is faster and less controlled than ever before. One outcome of this is the massive circulation of an indiscriminate panoply of views, which produces confusion and, importantly, fatigue [9], a phenomenon that was found to be particularly acute during the COVID-19 pandemic, with grave consequences for people's health [38].

Second, we have seen that distrust was fueled in many cases by suspicion of "Big Pharma". This concurs with recent research on social media postings about infectious diseases that revealed considerable skepticism of the public health sector, and a widespread tendency to attribute ulterior motives to "big Pharma" and government collusion. In some cases, these notions were also linked to other conspiracy theories: as previous researchers have observed, some people seem to have a "general propensity towards conspiratorial thinking" [24], and seize upon inconsistencies or possible instances of collusion to confirm their habitual framing of social affairs [23]. In the case of health issues, these conspiracy theories may pose a real threat to societal wellbeing, particularly if they circulate widely to credulous or uneducated audiences. As Laurent-Simpson and Lo [11] put it: "the social construction of [health-related] risks ( . . . ) as products of an ultimately profit-

driven medicopharmaceutical complex saps public trust in the first-line defenses devised and advocated by the experts." The findings of the present paper echo these authors' observations that in social media forums "a clear sense of doubt is present about the likelihood of a non-corrupt science" [11]. As we can observe here, this phenomenon may have worrying consequences for public health.

Third, the theme of suspicion of experts takes on a particularly interesting political dimension in the particular context of the UK media in 2020. Rejection of "experts" and of elite knowledge systems in general was a notable characteristic of populist messages circulating in English-language discourse in the years preceding the Brexit referendum and its aftermath, mirroring parallel developments among Trump's supporters in the USA. Clarke and Newman [20] compellingly analyzed how suspicion of experts was integral to the Brexit-era conjuncture: in the words of Vote Leave campaigner Michael Gove, "I think people in this country have had enough of experts" [39]. This rejection of expert opinions may have been at least partly motivated by the failure of technocratic neo-liberal governments to address issues arising out of globalization in a way that failed to satisfy the demands of the disaffected or fire the popular imagination. Even more, according to Clarke and Newman [20]: "The revolt against 'expertise' in the moment of Brexit refracted questions of both class (antipathy to ruling elites, the very architects of austerity) and nation (expertise symbolized 'elsewhere'; international institutions, EU bureaucrats and those seeking to protect global free trade)." In the context of COVID-19, it should be noted that although the rejection of "expertise" in the Brexit period was initially associated with predictions concerning the economic or social sphere, universities and scientists were consistently associated with the Remain agenda. It seems quite likely that subliminal associations placed universities on the list of suspicious "experts" in the public mind. The Brexit-era Zeitgeist converged with the specifically British variety of anti-intellectual anti-elitism to undermine the credibility of scientific research. It is notable that when the commenters here countered "expert" knowledge, they had continuous recourse to what "we all know", showing evidence of a strong current at work to reframe anti-scientific stances as "common sense" [40]. It is a sign of the times that during the COVID-19 pandemic, suspicion of "experts" was a potent political force in public debate.

To sum up, this paper contributes to our knowledge of how important health issues are discussed in online forums. It has shown that the appeal to "expert" knowledge is no longer a foolproof means of guaranteeing that information is accorded importance in the public arena. Indeed, the status of the "expert" is increasingly problematized in public discourse. The social consequences of this undermining of expert knowledge systems have been discussed in the light of theoretical analyses concerning information overload, epistemological flattening, conspiracy theories, the post-truth paradigm and the populist mindset. In methodological terms, this paper has provided an innovative solution to the problem of social media data, showing how corpus-assisted discourse analysis can be applied to fragmentary textual data in order to establish patterns that are reproduced across large datasets.

The question remains as to how this situation could be addressed. Widespread distrust in authority reduces the impact of health messages, so we should assume that, conversely, trust in authority would be associated with receptivity to official messages. In parallel to this, where distrust of government is common, the mainstream scientific consensus is also likely to be less well accepted [41], but where people have confidence in government and establishment, they are more receptive to scientific information and comply with health policies. One message in this sense might be a call to politicians and establishment figures to behave responsibly, exercise transparency to rebuild trust and communicate risk in ways that are accessible and meaningful for the wider public. At the same time, experts could exercise greater transparency and provide stronger justifications for their pronouncements [42], and pharmaceutical companies could put procedures in place to make sure that safe and affordable vaccines are available for all [43]. Concerning the communication of science, it has been suggested that stronger scientific literacy could be

fostered in which the “social and conversational nature” of scientific knowledge production is promoted so that people can build informed trust in science and engage more actively with its epistemological and processual complexities [28].

In all of this, however, the very real difficulties of communicating complex information to the general public should not be underestimated. In his overview of the opposition to vaccination over the last two hundred years, Baxter [2] commented that “the complexity of the arguments involved in universal prophylactic vaccination programmes” frequently made it hard for health authorities to convey the benefits of vaccines to the general public. Discussing earlier controversies, he points out that “neither protection nor adverse events around pertussis or MMR could easily be discussed in the usual three minutes news slot”. If this is true, the situation is even more challenging in the current social media age in which information is habitually reduced to the size of a tweet or Facebook post. A further proposal would be to provide more effective educational programs including media literacy, basic scientific literacy, including notions of expert consensus [3], and basic principles of public health, including “vaccine literacy” [41]. However, the notion that better education on science and scientific consensus would be a panacea is problematic, not least because real consensus is sometimes lacking, and the competent authorities themselves often issue contradictory information when faced with an emergency.

In short, in the age of social media, proliferation of distrust of the medical and scientific communities has challenged the authority of health organizations. To combat this, health and other scientific professionals need to examine closely the user reception of public health representations, deconstruct the various counter-discourses that circulate, and explore practices that might help to rebuild trust among the population. More research along the lines of the present study is needed in order to obtain deeper insights into the reception of health messages and the proliferation of different types of information through interactive media. Systematic content analysis or big data techniques could be used to test these findings and explore the patterns that occur across larger datasets. Finally, it is important to point out that this dataset was collected during the period when the vaccines were being developed and trialed. It is therefore understandable that the vaccines inspired people with a certain degree of trepidation. It would be useful to replicate this study using data from a later phase in order to trace how trust evolves as real answers are provided to a pandemic and examine how people weigh the benefits of vaccination against the messages from its detractors.

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#### Appendix A. List of Mail Online Articles from Which Comments Were Scraped

Headline	No. of Comments	Date Published
1, “Israeli scientists say they are just WEEKS away from developing a vaccine which will beat coronavirus”	167	28 February 2020
2, “Australian scientists claim they’ve ALREADY developed a vaccine for coronavirus—but they can’t roll it out to people just yet”	197	13 March 2020

Headline	No. of Comments	Date Published
3, "‘I’m feeling great’: Mother of two becomes first person in the US to get injected with experimental coronavirus vaccine—but it won’t be ready for at least a year"	50	15 March 2020
4, "First patient will get an experimental coronavirus vaccine TODAY—but scientists warn it will be at least a YEAR before the jab could be rolled out to the rest of the world"	138	16 March 2020
5, "Coronavirus VACCINE that scientists claim can neutralise the deadly virus for at least a year could be approved for human trials ‘within months’"	171	2 April 2020
6, "Coronavirus death rate is SIX TIMES lower in countries that use the century-old tuberculosis BCG vaccine"	738	7 April 2020
7, "Coronavirus vaccine could be ready by AUTUMN, say Oxford University researchers behind major trial "	414	10 April 2020
8, "Coronavirus vaccine could be ready by September with an 80% likelihood it will work, says Oxford University expert leading research team"	695	10 April 2020
9, "UK will have to live with some restrictions until coronavirus vaccine is developed, say officials, as new survey reveals that nine out of 10 Britons are observing ‘stay home’ advice after 980 daily death toll "	995	10 April 2020
10, "Oxford University to begin tests of its coronavirus vaccine on humans NEXT WEEK in hope of having a jab ready for autumn"	330	15 April 2020
11, "Trials of a SECOND coronavirus vaccine set to begin in June as Imperial College London scientists move towards human testing after Oxford experiments begin tomorrow"	512	22 April 2020
12, "One of Britain’s first coronavirus vaccine volunteers reveals side effects could include flu-like symptoms and a fever that lasts several days as trials start today",	437	23 April 2020
13, "First coronavirus vaccine could be ready by September, head of China’s CDC claims"	175	24 April 2020
14, "World-leading Australian scientists say a vaccine may be ready for widespread use at the start of next year—and that’s under an ‘incredibly ambitious’ timeline"	13	29 April 2020
15, "Experts warn a coronavirus vaccine may not be available until 2036—despite Dr Anthony Fauci saying ‘hundreds of millions’ of doses could be ready as soon as January"	264	1 May 2020
16, "Italian researchers claim to have ‘the first vaccine in the world’ that kills the coronavirus and are now planning human trials as Health Secretary Matt Hancock admits a jab may NEVER be found"	249	6 May 2020
17, "Coronavirus vaccine hope as Oxford University’s experimental jab prevents the infection from penetrating the lungs in monkeys"	422	14 May 2020
18, "Doubts raised over Oxford coronavirus vaccine after ALL of the monkeys that took part in the trial are found to have contracted the disease"	491	18 May 2020
19, "Pharmaceutical giant AstraZeneca has capacity to make ONE BILLION doses of Oxford University’s experimental COVID-19 vaccine amid hopes it could be ready for September"	155	21 May 2020
20, "China’s coronavirus vaccine is deemed ‘safe’ and triggers an immune response in world’s first completed human trial of 108 volunteers—but it may not ‘neutralize’ infection, expert says"	34	22 May 2020
21, "Britain WILL get a coronavirus vaccine by September (if it works), says AstraZeneca CEO despite his lead scientist giving it only a 50% chance of success because COVID-19 could vanish before trials finish"	549	24 May 2020
22, "Hopes rise of a Covid-19 vaccine breakthrough as TWO trials in the UK and US show volunteers injected with experimental jabs have signs of immunity against the disease"	743	15 July 2020

Headline	No. of Comments	Date Published
23, “Could this conspiracy theory kill thousands? Disgraced British doctor Andrew Wakefield, who lost his licence for saying the MMR jab caused autism, is already at heart of a movement that says the pandemic is a hoax and NO ONE should have vac”	992	16 July 2020
24, “Hopes rise for a coronavirus vaccine ‘by Christmas’: First trial results of Oxford’s Covid-19 jab reveal it is safe and provokes an immune reaction that lasts for two months—as Chinese candidate also looks promising”	986	20 July 2020
25, “Bill Gates warns that multiple doses of any coronavirus vaccine may be necessary, schools could be closed until fall 2021 and says ‘serious mistakes were made’ by the US with the handling of COVID-19”	956	23 July 2020

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