Exploring Vaccination Debates through Corpus-Assisted Discourse Analysis

The MMR vaccine debate and its relevance to the Covid-19 pandemic

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Sommario

Foreword

This project was first devised in 2018, with the aim of studying dis- and misinformation about vaccines conveyed by the British press using the tools of discourse analysis and corpus linguistics. In 2018, research on so-called "fake news" was on the rise, given also the centrality of the topic within the public debate (Kakutani 2019). The very idea of a "post-truth era" was also being theorised, precisely to describe the tension between emotionalism and factuality which was becoming more and more evident in the arguments of various political figures as well as in the press (D'Ancona 2017). The choice to focus on a topic such as vaccination, which is medico-scientific in nature but linked to the political dimension for its implementation in public health, stemmed precisely from the desire to investigate this tension in an area where the concepts of factuality and evidence are central, but often complex for the generalist press to convey, and sometimes ambiguously exploited by the political will (Kata 2009). The choice to focus on the controversy over the measles, mumps, and rubella (MMR) vaccine and its alleged links to the onset of autism was justified by the resonance that this case had – and to some extent continues to have – in the British press and society, with spillovers throughout Europe and the United States (Boyce 2007; Clarke 2008; Stöckl and Smajdor 2017; Deer 2020).

The research and writing began in 2019 and continued in 2020 and 2021, ending in April 2022. Therefore, the process was strongly influenced by the Covid-19 pandemic: this contingency made it possible to highlight aspects of continuity between the analysed texts – published in Great Britain since 1998 – and the newspaper articles that were being written in those very months, variably discussing anti-Covid vaccines, the promotion of mass vaccination campaigns, compulsory vaccination, as well as the social, cultural and political role of scientists, doctors and researchers. Despite the fact that the texts analysed in this volume had all been published by 2019 and had the trivalent MMR vaccine as their main topic, the Covid-19 pandemic inevitably entered the analysis, variously affecting their reading and interpretation.

Then, on 5th May 2023, the World Health Organization (WHO) Director-General officially declared the end of the Covid-19 as a global health emergency, meaning that «it is time for countries to transition from emergency mode to managing COVID-19 alongside other infectious diseases», and noting that «we have arrived at this moment thanks to the incredible skill and selfless dedication of health and care workers; the innovation of vaccine researchers and developers; the tough decisions governments have had to make in the face of changing evidence; and the sacrifices that all of us have made as individuals, families, and communities to keep ourselves and each other safe» (World Health Organization 2023a).

This hoped-for return to a "new normal", however, has come up against a new present in which European soil has been affected by the Russian invasion of Ukraine (which began in February 2022 and is still ongoing at the time of writing, in March 2024); and the political situation in the Middle East has been shaken by a new Israeli-Palestinian conflict, which began on 7th October 2023, with an attack by Hamas and continued with the invasion of the Israeli army into the Gaza Strip. These conflicts also had very serious repercussions on the economies (and energy policies) of many countries around the world and can be said to be reshaping many social and political balances. Moreover, the effects of climate change are also becoming increasingly evident and tangible in Europe and the United States, fuelling popular movements and protests and encouraging the debate on the measures, especially political ones, to be taken now and in the years to come. Within this framework, in which scientific and political issues intertwine and populate the social and cultural life of large sections of the world's population, this volume attempts at a reflection on the ways scientific debates are communicated in the generalist press, the role played by scientific evidence and personal stories within the proposed argumentation, and the ways in which what happened in the past can be reread and evaluated in order to understand the present.

The monograph is ambitiously aimed at an audience consisting not only of linguists and communication experts, but also professionals and researchers in the medical-scientific, health, political, and journalistic fields, with the ultimate goal of enhancing a dialogue that is as interdisciplinary as possible. In order to be accessible to a potentially wide audience, maintaining a discursive slant, but without sacrificing academic rigour, it was decided to adopt a reduced theoretical framework, referring in particular to corpus-assisted discourse analysis and argumentative narratives. Results focus on the ways in which evidence and sources of knowledge are discursively constructed, the extent to which personal narratives can constitute argumentative evidence, and the ways in which they can be used argumentatively.

More specifically, the book is organised as follows: Chapter 1 presents an overview of the MMR vaccine controversy as it unfolded in Great Britain and in the British press, with a review of the relevant literature, a contextualisation of the topic, and its bearing on the "post-truth" era. Dealing with multiple issues, the chapter serves to lay the groundwork for all the elements that will emerge and will be commented on in the analysis presented in the following chapters. Chapter 2 describes the methods used to build the corpus and provides a brief description of its main features and composition. Chapters 3-5 present the main results of the analysis, with a focus on discursive construction of medico-scientific controversies and debates (Chapter 3), of medico-scientific evidence and expert actors in the news (Chapter 4), and on the role of argumentative narratives and narrative evidence in such debates (Chapter 5). Each

Chapter closes with a discussion of the similarities and differences between the aspects discussed in the chapter and discourse(s) of the Covid-19 pandemic. The full wordlists and keyword lists detailing the results of the quantitative analysis are reported in the Appendix at the end of the volume. The goal is to show the legacy and potential relevance of the MMR vaccine debate on contemporary (discourse) societies.

Disclaimer

It is important to state explicitly that the researcher personally supports vaccines and mass immunisation campaigns, strongly believes in their safety and effectiveness, and refutes the link between any vaccine and the onset of autism spectrum disorders. Personal beliefs and ideologies can influence linguistic analyses and inform interpretations, directing the way the researcher approaches a text; this is also why Fairclough states that there can be no completely objective analysis (Fairclough 2003: 14). Recognising them beforehand allows the researcher to remain aware of them in the course of the analysis, which is nonetheless carried out following accepted methodologies which ensure a certain degree of objectivity.

Chapter 1
Discourses of and about vaccines, the MMR vaccine, and the post-truth era

1.1. Discourses of and about vaccines

Many studies have examined vaccination discourses from a variety of perspectives; and it can be said that the advent of the Covid-19 pandemic spurred a further wave of studies on vaccine hesitancy and vaccine communication. The following is therefore not intended as a comprehensive and exhaustive overview of such a fertile and interdisciplinary academic field, but a selection of the studies which most influenced the analysis expounded in this volume.

1.1.1. Vaccination discourses past and present

Vaccination is an extremely complex and fascinating issue which stands at the intersection between the medico-scientific, the political, and the public sphere, in that it is a public health practice with direct consequences on the health of the individual who submits to it and of the community in which they live. It raises questions about freedom over one's own body and responsibility towards one's fellow human beings, often linked to overtly political stances, and consequently it may attract considerable hostility. Thoughts as to how to communicate effectively the science of vaccines recur frequently in science popularisation discussions, where anti-vaccination arguments are often interpreted as defying established knowledge and resisting recognised notions of expertise and authority. For these reasons, anti-vaccination arguments and conspiracy theories (CTs) seem to thrive in the contemporary, post-truth era, «the golden age of anti-vaccine CTs» (Stein 2017), because they often capitalise on emotion, personal beliefs, and anecdotes over hard evidence and facts (see also the following sections). Nevertheless, it is the very nature of vaccination as a prophylactic medical practice which makes it particularly susceptible to criticism and scepticism, as is demonstrated by the fact that it has met with resistance and condemnation from its very invention.

1.1.2.1. Variolation and the origins of vaccination

The origins of vaccination are to be traced back to the practice of variolation against smallpox, which was already widely performed in 16th-century Turkey. This practice consisted in exposing the patient to material infected with a small amount of the smallpox virus, in the hope of inducing a mild form of the

disease which would provide immunity from further infection. It goes without saying that the procedure carried some risks, but it was often effective in reducing fatal cases and controlling the rates of infection. The practice of variolation was introduced in England from Turkey by Lady Mary Wortley Montague in the 17th century. She was an English aristocrat and writer who followed her husband to Turkey once he was appointed Ambassador in Istanbul, where she learned the Ottoman practice of variolation which she then enthusiastically brought back to England. The introduction of the practice of variolation in England and Britain was at first accompanied by hostility and resistance from the medical class as well as from the general population, who were suspicious of the procedure because of its "Eastern" origin, and because it was promoted by a woman. Still, Lady Montague continued to ask for trials to be performed to demonstrate the safety and effectiveness of variolation, and finally, on 9th August 1791 a Royal Experiment was carried out on six prisoners at Newgate, who were submitted to the practice, survived, and were then granted a full pardon. The procedure started to gain general acceptance after the two daughters of the Princess of Wales were successfully treated by Charles Maitland – then Embassy surgeon – on 17th April 1792 (for a more detailed account of Lady Mary Montague and the practice of variolation, see for example: Halsall 1998, Grundy 2001, Kinch 2018).

The origins of the medical practice we now know as vaccination, however, are to be traced back to the experiments of the British doctor Edward Jenner in the late 17th-beginning of the 18th century. Jenner learnt that milkmaids and farmworkers who came into direct contact with cows infected with cowpox did not contract human smallpox. He thus reasoned that cowpox provided some sort of protection against smallpox and tried injecting cowpox virus matter into the arm of a local child. Jenner afterwards deliberately exposed the same child to the smallpox virus, and he did not develop the disease (Riedel 2005). This and subsequent similar experiments resulted in the publication of an essay titled *Inquiry into the Variolae vaccinae known as the Cow Pox* (Jenner 1798), where Jenner exposed his theories about the benefits of the practice, which he termed "vaccination" from the noun *vaccinia*, the Latin word for cowpox. Although the paper was met with a mixed reaction by the medical authorities of the time, some of them ignoring or scorning the work, vaccination began to spread rapidly in England, thanks to mounting evidence of its effectiveness. By 1800, it had also reached most European countries (Willis 1997). Eventually, both the British medical community and the British Government became convinced of the necessity of vaccination to face the epidemics of smallpox that routinely devastated the country: in 1853, a first Vaccination Act demanded vaccination in England and Wales for infants up to three months of age; then, in 1867, a new Vaccination Act further enforced compulsory vaccination for all children under 14. The 1871 Vaccination Act mandated the employment of vaccination officers; and finally, the 1898 Vaccination

Bill introduced exemptions for conscientious objectors (Bennett 2020: 94-121). This was the result of years of protests from various organised anti-vaccination movements opposing both the practice and its compulsory enforcement (Durbach 2005) (see also Section 1.1.2.2. below).

The science behind this new medical technique was not fully understood, and therefore its potentials were not fully explored and implemented, until the discovery of the germ theory of disease by Louis Pasteur in the mid-19th century. This theory, too, encountered significant resistance and hostility both from the public and the established medical community, mainly because it was deemed implausible and counterintuitive: it required to believe that serious diseases were caused by invisible organisms – and vaccination required to understand that these diseases could be prevented by injecting the same organisms into the body (Lowry 2018). Nevertheless, the theory was eventually accepted by the scientific community, and the 20th century consequently saw the invention and vast-scale administration of numerous vaccines which were fundamental in the fight against infectious diseases which had plagued humankind for centuries, such as smallpox, cholera, and poliomyelitis. Throughout the 1960s and the 1970s the coordinated, global effort launched by the World Health Organization (WHO) to eradicate smallpox effectively led to the last naturally acquired case of smallpox to be registered in Somalia in 1977; the world was officially certified free of naturally occurring smallpox in 1980. Nowadays, campaigns of mass vaccination, often implemented and coordinated by the WHO, have the objective of eradicating dangerous infectious diseases like polio (in 2014, for example, India received official polio-free status from the WHO), and research centres across the world are still studying to find effective vaccines against viruses and diseases like HIV/AIDS and tuberculosis (World Health Organization 2023b). The Covid-19 pandemic which hit the world in 2020 once again underlined the necessity to find effective vaccines against highly contagious infectious diseases.

Despite what is largely recognised as one of the most important technological and medical advances of all time, however, vaccination is often fiercely criticised and opposed by large portions of society, with anti-vaccination controversies regularly resurfacing; the Covid-19 pandemic has been no exception. The ensuing paragraphs are thus dedicated to the exploration of the history of anti-vaccination arguments and to the description of their characteristics, in the belief that it is crucial to understand and interpret anti-vaccination instances in a diachronic perspective, to understand them as socially situated and fundamentally cultural movements.

1.1.2.2. Anti-vaccination movements in Victorian England

European anti-vaccination movements arose soon after the invention and introduction of the first vaccine against smallpox.

Anti-vaccination movements in 19th century England were prevalent across the working classes and the less affluent layers of society, and indeed, according to Durbach (2005) they were part of a growing class consciousness and of more general demands for the working classes' rights and dignity to be recognised. The bills rendering vaccination compulsory were onerous for the working classes. Moreover, they were seen as placing stigma over the poorest families and their ways of living, which were often considered as a threat to public health, especially in the cities. Consequently, anti-vaccination arguments were from the very start connected with political positions about dignity, freedom, and the need for recognition.

Anti-vaccinators united in formal, organised associations like the Anti-Vaccination League (established in London in 1853) and the Anti-Compulsory Vaccination League of Great Britain (established in 1867); the activities promoted by these movements were aided and influenced by social and technological developments, as urban rallies were organised to protest compulsory vaccination, publicised through pamphlets that were written and distributed in great quantities, with the result that more than 100,000 people attended an anti-vaccination demonstration in Leicester in 1885 (Wolfe and Sharp 2002; on the Leicester anti-vaccination movement, see Swales 1992). The pressure from anti-vaccination groups was so strong that the question reached the government and influenced political decisions about vaccination laws; and indeed, following the Leicester demonstration, the Government appointed a commission to investigate the safety and efficacy of the smallpox vaccine. Note that this investigation had some legitimacy, as the process of vaccination at the time was still not closely regulated, and most importantly, rules of hygiene and sanitation were only then starting to be codified scientifically and to be applied consistently. What is more, not everyone could afford to be vaccinated at home; on the contrary, vaccination was often performed arm-to-arm in public vaccination stations, a practice that exposed children to the risk of blood infections, as the lymph used was sometimes impure and the stations themselves were often unsanitary (Durbach 2005: 113-149).

These incidents were widely reported in the anti-vaccination press, often in heart-wrenching tones (see, for example: Gibbs 1854, 1856). This kind of anti-vaccination rhetoric was so effective that the then editor of the British Medical Journal, Ernest Hart, lamented their «extremely energetic system of distributing tracts, inflammatory postcards, grotesquely drawn envelopes, and other means of disseminating their views» (quoted in Durbach 2005: 50). He also noted that «[t]here is nothing on the other side […] as an accessible antidote to these productions» (*ibidem*).

Although the report issued by the commission in 1896 unequivocally supported compulsory vaccination against smallpox, at the same time it tried to appease anti-vaccinationists by asking for the abolition of penalties for non-compliers.

A similar compromise between pro- and anti-vaccination stances was attempted with the 1898 Vaccination Bill, which introduced conscientious objection for anti-vaccinators. This clause was considered a victory for anti-vaccinators, because it considerably affected vaccine uptake in various regions of England: for example, magistrates in Oldham were said to have issued 40,000 certificates by December 1898, and in some districts like Southwark and Heywood coverage was said to have decreased from 95% to 2% following the introduction of the clause (see Durbach 2005: 186-187).

Controversies and protests against other vaccines followed the Victorian anti-vaccination movement, in many cases repeating similar claims and adapting them to the cultural, social, and political climate of the time. One such example is the polio vaccine.

1.1.2.3. The polio vaccine and the Cutter incident

The development of a vaccine against poliomyelitis and the implementation of mass vaccination campaigns led to the eradication of the illness in the Western Hemisphere; as to 2021, wild-type polio only remains endemic in Afghanistan and Pakistan (Bigouette et al. 2021).

The first licensed vaccine against polio was developed by the American virologist Jonas Salk in 1955 and used a formalin-inactivated virus (IPV); a second, live-attenuated oral vaccine was developed by the Polish-American medical researcher Albert Sabin in 1962. The history of the Salk polio vaccine, however, was tragically marked by the Cutter incident which occurred immediately after the start of a mass vaccination campaign in 1955: a batch of the vaccine produced at Cutter Laboratories in the United States contained an incorrectly inactivated virus, which was inadvertently administered to 120,000 children before being withdrawn; as a consequence, 70,000 suffered mild polio, 200 were severely and permanently paralysed, and 10 died (Offit 2011; see also, and more specifically, Offit 2005). This disaster led to better vaccine regulatory systems but undermined trust in pharmaceutical companies. Although it did not spur significant anti-vaccine activity, and uptake of the polio vaccine remained high in the Western hemisphere, a general mistrust of the vaccine lingers in some African and Asian countries, sometimes incited by religious movements spreading claims that vaccination campaigns are part of a "Western plot" to sterilise non-White communities. Consequently, violent physical attacks towards vaccinators have also been reported (Warraich 2009).

1.1.2.4. The DTP vaccine and the VAERS

The combined vaccine against diphtheria, tetanus, and pertussis (whooping cough) came into widespread clinical use in the 1940s, and it significantly reduced the incidence and mortality rate of said diseases (Centers for Disease Control and Prevention 2022). However, the vaccine was at the centre of a major health scare in Great Britain in the 1970s, and in the United States in the

1980s. In 1974, a case series was issued from the Hospital for Sick Children at Great Ormond Street, which described 36 children who allegedly suffered severe neurological complications following their DTP immunisation. This case series received wide coverage in television documentaries and newspaper reports dramatizing tragic stories of severely neurologically impaired children, whose disability was linked by the authors to the vaccine. Moreover, their parents formed an advocacy group, named the Association of Parents of Vaccine-Damaged Children, which was very vocal in focussing public attention on the issue (Baker 2003: 4004). Consequently, and despite the fact that the Joint Committee on Vaccination and Immunisation (JCVI) endorsed it, uptake of the DTP vaccine fell dramatically in later years, a situation which was exacerbated by the fact that the British government did not launch any major campaign to restore public confidence in the vaccine at the outset. This caused a series of whooping cough epidemics sweeping Britain between 1977 and 1979.

Public controversy and confusion were initially compounded by a division within the medical profession, with advisory bodies continuing to recommend the vaccine as opposed to general practitioners and home visitors who were hesitant and sceptical. A change occurred in 1981, when the National Childhood Encephalopathy Study launched by the JCVI concluded that the pertussis vaccine was not a significant risk factor for neurological illness. This study convinced the government and the mainstream media, which finally launched a major immunisation campaign in support of the DTP vaccine. Although there remains a portion of parents who are still convinced that the vaccine damaged their children's health, DTP continues to be recommended and little debate accompanies it in Britain nowadays (Baker 2003: 4006).

Scepticism and fear towards the DTP vaccine in the United States stemmed instead from a 1982 documentary titled *DPT: Vaccine Roulette*, which purported the same claims of vaccine-induced neurological damages and cover-ups by major pharmaceutical companies and governments. Following this documentary, many parents of allegedly vaccine-damaged children united to form advocacy groups: most notably, Dr Harris Coulter and Barbara Loe Fisher founded the National Vaccine Information Center and also authored a book titled *DPT: A Shot in the Dark,* which arguably influenced the imagery and vocabulary of the MMR vaccine-autism controversy.

Another important consequence of the DTP vaccine controversy in the USA was a significant rise in litigation, which led to the passing of the National Childhood Vaccine Injury Act in 1989 and to the establishment of the Vaccine Adverse Event Reporting System (VAERS), the National Vaccine Injury Compensation Program (NVICP), and the National Vaccine Program Office (Mariner 1992). The existence of the VAERS in particular is frequently mentioned by anti-vaccinators in the MMR controversy as proof of the reality of vaccine harm, although it actually is a free system allowing health professionals

as well as the general public to submit reports describing alleged adverse reactions to vaccines, which then have to be scientifically scrutinised.

In his historical assessment of the DTP vaccine controversy in Great Britain, Baker (2003: 4008) identifies several similarities with the MMR vaccine controversy:

> Any hopes that the pertussis vaccine controversy would prove to be an isolated episode on the British medical scene were dashed in 1997 when another routine childhood vaccine, MMR, became the focus of a new debate concerning whether it was linked to autism. […] The two controversies have shared a number of features. In each case, a routine vaccine has been linked to an unexplained yet devastating condition presenting at the same time in infancy or childhood. The MMR allegations have generated fierce debate in medical journals. […] The physician Andrew Wakefield has acted as medical spokesman […]. Anti-vaccine groups have played a yet more prominent role, now assisted by the powerful technology of the Internet. […] Immunization rates against measles are declining once again. […] From many perspectives history appears to be repeating itself.

1.1.2.5. The HPV vaccine and thiomersal

Finally, another recent controversy was spurred by the human papilloma virus (HPV) vaccine, and thiomersal. The HPV vaccine protects against various types of cancer caused by the human papilloma virus, including cervical cancer, some mouth and throat (head and neck) cancers, and some cancers of the anal and genital areas; in the UK it is part of the National Health Service (NHS) vaccination programme, and is offered to both boys and girls aged 12 to 13 years (NHS 2019). Despite the fact that it has never been involved in major health scares the likes of the polio Cutter incident, uptake rates remain low because parents express concerns over its safety and efficacy, especially about its long-term side-effects; moreover, many believe that the vaccine encourages adolescents to become sexually active, which is still considered taboo in many cultures, including some European ones (Gilkey et al. 2017).

This reluctance to vaccinate with the HPV vaccine can thus be interpreted as one possible manifestation of the widespread distrust towards the practice of vaccination. Indeed, it has frequently been said that vaccines are «victims of their own success» (Offit 2011: 174), meaning that anti-vaccination arguments tend to flourish when the remembrance of certain diseases fades, due precisely to their eradication through campaigns of mass vaccination.

During the 20th century, vaccination was often met favourably by the general population, who was scared by the cyclical outbreaks of epidemics which left people – often children – dead or disabled (most prominently, the summer outbreaks of polio which killed young children, imprisoned them in iron lungs, or compromised their ability to walk and move unassisted; this fear was probably

the reason why even the Cutter incident did not significantly affect the uptake of vaccination). However, at the end of 20th-beginning of the 21st century concerns over the safety of vaccines began to re-emerge: although populations in industrialised countries now live longer and healthier than ever, they are paradoxically more concerned than ever about their health and safety, longing to return to a supposed naturalness, to a mythical unpolluted world following the rules of nature, a world in which vaccines often appear as a manufactured cocktail of poisoning chemicals (Clifford and Wendell 2016). Evidence of this *forma mentis*, and of the complex interaction between politics, science, and popular understanding, is the controversy surrounding thiomersal (also known as thimerosal, or sometimes thimerasol).

Thiomersal is an organomercury compound which used to be employed as a vaccine preservative. In 1999 (one year after Wakefield first proposed his MMR vaccine-autism hypothesis) and following a review of mercury-containing food and drugs, the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) mandated vaccine manufacturers to remove thiomersal from vaccines; this directive was soon imitated by Europe, too. However, they failed to communicate that this was a purely precautionary measure, and what is more, they based it on safety guidelines for methylmercury – while vaccines contain ethylmercury (note also that thiomersal was never used as a preservative for the MMR vaccine) (Offit 2008: 75-89; see also Baker 2008). Subsequent scientific studies proved that the amount of ethylmercury contained in recommended childhood vaccinations did not exceed safety measures and disproved its alleged link to autism (Doja and Roberts 2006; Gołoś and Lutińska 2015). However, the decision to remove a mercury-based preservative from all childhood vaccinations scared many parents, who were led to believe that the risk that their children had been poisoned truly existed. Note that this caused some parents to undertake potentially dangerous medical treatments, like chelation, to "remove the mercury" from their children's bodies to "cure" their autism, in some cases with dire consequences for their health (Offit 2005).

This episode demonstrates the importance of correct and precise scientific communication which highlights complexity and avoids simplifications that can lead to incorrect statements. It also underlines the importance of avoiding hasty political decisions which have the potential to undermine trust in scientific organisations, often irremediably. Moreover, it is proof of the pervasiveness of the belief in a dichotomy between nature and technology, with nature being conceptualised as positive and technology being seen as negative for human health. This is also closely linked to questions about risk communication and the fact that we now live in what has been called a «risk society» (Beck 1999) where perceived risks far outweigh concrete risks, especially as far as diseases and hygiene are concerned (Wilkinson 2001).

1.1.2.6. The BSE crisis

Concerns over the safety of vaccines which tap into wider discourses of wellness and wellbeing often appear coupled with wider concerns over pollution and food safety. One such concern indeed had profound implications on how the MMR vaccine was discursively constructed in the British press and public discourse, namely the BSE / CJD crisis.

The BSE and CJD crises refer respectively to the Bovine Spongiform Encephalopathy (also known as mad cow disease), a neurodegenerative disease of cattle, and its spread to humans, which is known as variant Creutzfeldt-Jacob Disease. Both BSE and CJD afflicted the UK in the 1980s-1990s, killing over four million heads of cattle and 177 human beings. The British government was harshly criticised for the way it managed the BSE crisis, particularly because at first it denied the danger it could pose for humans: for example, in May 1990 the then Minister of Agriculture John Gummer notoriously publicly fed his daughter a beef hamburger in an attempt to prove its safety – a strategy that later backfired as the incidence of both BSE and CDJ continued to rise, and the link between the two was scientifically established in the late 1990s (see also Kitzinger and Reilly 1997 for an account of the media's coverage of the BSE crisis, and Jasanoff 1997 for a sociologist of science's perspective on the controversy). This event severely undermined trust in the government and its officials, as was underlined also by Boyce (2007) who talks about a «BSE effect» in the subsequent media coverage of health and science:

> It was apparent in interviews with both sources and journalists that the BSE was a frame used by journalists and sources when deciding how to report the story. […] the production analysis in the MMR/autism story reveals the powerful frame the BSE crisis had over this story. With the BSE/CJD controversy not long from the top of the news agenda, journalists were quick to view the MMR/autism story as the next possible government cover-up, or "BSE part two". […] Both sources and journalists continue to regard the BSE crisis as an influential frame in the reporting of science and health. Scientific and government statements about the safety of the MMR vaccine were thus received with scepticism and suspicion. The BSE crisis, now more than 10 years old, continues to have considerable influence on how science and health stories are reported in the UK. (40-43)

All the episodes briefly recounted in this section testify to the importance of previous health scares in the framing of subsequent debates over scientific and medical issues, suggesting that a correct managing of communication during health scares and controversies is crucial in order not to fuel the public's

anxieties and suspicions, so as not to negatively prime their future responses to official communication.

1.2. The alleged link between the MMR vaccine and autism

1.2.1. The MMR vaccine

Measles is a highly contagious, air-borne infectious disease whose typical symptoms are fever, cough, runny nose, inflamed eyes, and a rash covering the face and the body of the infected person. Its complications include diarrhoea, middle ear infections, pneumonia, and even seizures, blindness, and inflammation of the brain; measles can be fatal to both children and adults. Mumps is a viral disease whose specific symptoms include a painful swelling of the parotid glands (parotitis); its complications include deafness and a wide range of inflammatory conditions, in particular testicular inflammation which can result in reduced fertility or even sterility. Finally, rubella (also known as German measles) is an infection whose symptoms include a rash on the patient's face and body; a fever, sore throat, fatigue, and joint pain are also common, while complications may include testicular swelling, bleeding problems, encephalitis, and inflammation of nerves. Most importantly, infection during early pregnancy may result in miscarriage or a child born with congenital rubella syndrome, which could affect its heart and brain and cause deafness (see, for example, Milner 2015: 24, 98, 100)[1].

The vaccine against measles, mumps, and rubella was developed by Maurice Hilleman and licensed for use in the USA by Merck in 1971. Nowadays it is widely used around the world, with 575 million doses administered since the vaccine's introduction worldwide. It is routinely given to children around 9 to 15 months of age, with a second dose at 15 months to 6 years of age. After two doses, 97% of people are protected against measles, 88% against mumps, and at least 97% against rubella. Side effects of immunisation are generally mild and resolve without any specific treatment; these may include fever, pain, or redness at the injection site, while severe allergic reactions occur in about one in a million people. Because it contains live viruses, the MMR vaccine is not recommended during pregnancy; however, it may be given while breastfeeding and it is safe to give at the same time as other vaccines (Centers for Disease Control and Prevention 2021).

1 On the 25th July 2023, the Regional Verification Commission of the World Health Organization (WHO) for the elimination of measles and rubella in the European Region declared that Italy has eliminated rubella, which is no longer endemic in the country; increase in vaccination coverage was linked to this result (Istituto Superiore di Sanità 2023).

In the UK, there is no law requiring vaccination for schoolchildren; however, a suggested vaccine schedule is given by the NHS which also provides the recommended vaccines for free (Freed 2005). By way of comparison, all fifty states in the USA mandate immunisations for children to enrol in public schools, although they also offer exemptions on various (chiefly medical and religious) grounds. The issue of compulsory vaccination is not trivial and is strictly dependent on the social and cultural history of a country: in the UK, for example, anti-vaccinators in the Victorian era vocally protested mandatory, state-enforced vaccination, and since then, mass immunisations campaigns have relied on persuasion rather than compulsion (Colgrove 2004) (see also Section 1.1.2.2. in this chapter). Moreover, the availability of the triple vaccine freely provided by the NHS, as opposed to private clinics selling single injections, also became an important element in the public debate on the MMR vaccine, especially for those parents who adopted a patient-as-consumer attitude (Mold 2015), claiming to be willing to pay for separate vaccinations if these proved to be the safest option (see also the next section). On this subject, Tony Blair's government was often accused of having ignored the parents' fears in its refusal to provide single injections against measles (Stöckl and Smajdor 2017).

Finally, it is worth highlighting that the MMR vaccine is given to children, and therefore the decision (not) to vaccinate is taken by the child's parents or caregivers. In this situation the patient – meaning the person potentially receiving the medical treatment – is oftentimes not the same person talking to the medical doctor and making decisions. Parents and caregivers are thus entrusted with another person's health, and this may have repercussions on their feelings of responsibility and guilt as well as on the way the issue is tackled and communicated in different circumstances. This element may have facilitated the dissemination of very emotional arguments with a strong hold on the audience composed mostly of parents of very young children.

1.2.2. Timeline

The MMR vaccine was first launched in Great Britain in October 1988 and began to attract sporadic court litigation in the early 1990s, as in February 1994 Jackie Fletcher, a British mother of an autistic child, became known as an anti-vaccination activist by launching a campaign claiming that MMR had damaged her son's brain, also planning to sue the manufacturers. In September of the same year, lawyer Richard Barr decided to represent litigants in a potential class action lawsuit against MMR and hired Andrew Wakefield – then medical doctor who had already published a paper claiming to have found a link between the measles virus and Chron's disease – with the aim of building a case against the triple vaccine.

In 1998, the controversy against MMR and its alleged link to autism came to wider public notice due to an article published in the prestigious medical journal *The Lancet* and authored by Andrew Wakefield and twelve of his collaborators at the Royal Free Hospital in London. In this paper, the authors claimed to have found a link between the measles virus and a new bowel syndrome affecting autistic children which they named «autistic enterocolitis». Most importantly, during the press conference that preceded the publication of the article Wakefield claimed that the presence of the virus could be due to the MMR vaccine, but failed to disclose his potential conflicts of interest due to his activities with lawyer Richard Barr. He also urged parents to opt for single injections rather than the combined vaccine (Boyce 2007: 2-10), despite the fact that single injections were not and have never been available as part of the National Health Service (NHS) vaccination programme. This is because they are deemed potentially dangerous for children's health in that they unnecessarily stretch the time between injections, thus leaving them exposed to the risk of contracting infectious illnesses (Oxford Vaccine Knowledge Project 2018).

In March 2004, ten out of the thirteen authors retracted Andrew Wakefield's interpretation of the paper (Mayor 2004); and in February 2010, *The Lancet* fully retracted the paper (Boseley 2010). Furthermore, in May 2010, Andrew Wakefield was banned from medical practice by the UK doctors' regulator, the General Medical Council, because he was found guilty of dishonesty, fraud, and a «callous disregard» for children's suffering (Boseley 2010). These decisions came after *Sunday Times* investigative journalist Brian Deer conducted a series of investigations revealing that Wakefield had failed to disclose major conflicts of interest affecting his research (Deer 2020). Moreover, his data and conclusions were proven impossible to replicate and unfounded by several subsequent major scientific, epidemiological studies, all of them rejecting the hypothesis of a link between the MMR vaccine and autism (see for example: Di Pietrantonj et al. 2020).

Despite criticisms and rejection by the medico-scientific community, the case received major media attention, first in the UK and then in the USA, thence spreading to Europe and other parts of the world. Several well-known personalities publicly took a stand against the MMR vaccine (notably, model Jenny McCarthy and actor Robert de Niro, both parents of autistic children), thus further amplifying and legitimising these claims in the eyes of the public.

Table 1 presents a timeline including the major events of the controversy, from 1988 to 2019, compiled following Deer (2020: 329-331).

Date	Event
October 1988	The three-in-one measles, mumps, and rubella vaccine (MMR) is launched in Britain.
November 1988	Andrew Wakefield starts working at the Royal Free medical school, Hampstead.
15th September 1992	The media reports the British government's discontinuation of two MMR brands due to the mumps viral component causing sporadic cases of meningitis.
23rd September 1992	Wakefield asks the government for money to research the MMR measles component and Chron's disease.
April 1993	Wakefield publishes a paper in which he claims to have photographed the measles virus in bowel tissues from Chron's patients.
February 1994	A British mother, Jackie Fletcher, launches a campaign group claiming that MMR damaged her infant son's brain. She plans to sue the manufacturers and seeks similar cases to her own.
September 1994	A small-town lawyer, Richard Barr, is awarded a contract by the British government's Legal Aid Board to represent litigants in a potential class action lawsuit over MMR.
19th February 1996	Wakefield accepts a deal to work for Barr to construct a case against MMR. The deal remains secret until exposed in Deer's investigation. A doctor refers the first child to Wakefield's research project after his mother is advised by Fletcher.
June 1996	Wakefield applies to the legal board for a grant to test for vaccine damage.
June 1997	Wakefield registers for a patent on his own single measles vaccine plus treatments for both autism and inflammatory bowel disease.
September 1997	Wakefield speaks at an anti-vaccine meeting near Washington, DC.
26th February 1998	At a press conference to announce a paper in *The Lancet*, Wakefield attacks MMR, urging parents to avoid it in favour of single measles vaccinations.
28th February 1998	*The Lancet* publishes Wakefield's paper claiming discovery of the bowel-brain «autistic enterocolitis» syndrome, putatively caused by MMR.
3rd March 1998	Wakefield meets to discuss about starting a private company of his own to develop products, including a measles vaccine.
October 1998	The first court claims are filed in the UK class action lawsuit against MMR vaccine manufacturers.
December 1999	Wakefield's university and medical school ask him to replicate his research claims; after months of delay, he refuses.
April 2000	Irish pathologist John O'Leary appears on Capitol Hill to give «independent testimony» to a congressional committee that Wakefield is «correct». He does not reveal that he in business with Wakefield, and that both work for the lawyer Barr.
November 2000	Appearing on CBS's *60 Minutes*, Wakefield claims that autism «took off dramatically» in the USA and later in Britain when MMR was introduced.
January 2001	British newspapers launch campaigns backing Wakefield after he publishes a review of vaccine safety studies, and repeats his calls for single vaccines.

January 2002	Wakefield's campaign moves to the USA.
October 2003	Barr's class action lawsuit against MMR makers collapses in London for lack of evidence.
February 2004	The *Sunday Times* of London runs Deer's page 1 story disclosing Wakefield's contract with Barr and the litigant status of children in *The Lancet* study.
March 2004	Ten of the thirteen authors of the *Lancet*'s original 1998 paper retract the article's interpretations linking autism and the MMR vaccine.
January 2005	Wakefield announces a libel lawsuit over Deer's revelations, but then drops the action and pays the costs.
April 2006	Measles outbreaks occur in Great Britain, including the first death from the disease in fourteen years.
February 2009	The *Sunday Times* of London runs another of Deer's page 1 stories revealing discrepancies between the *Lancet* paper and medical records.
February 2010	*The Lancet* fully retracts Wakefield's 1998 paper; editor-in-chief Richard Horton describes it as «utterly false» and claims that the journal had been deceived.
May 2010	The UK doctors' regulator, the General Medical Council, orders Wakefield to be banned from medical practice.
January 2011	CCN's Anderson Cooper reports an editorial in the *British Medical Journal* denouncing Wakefield's research as «an elaborate fraud».
March 2011	Wakefield appears in Minneapolis, addressing Somali Americans. Outbreaks of measles follow.
January 2011	Wakefield, funded by investment millionaire Bernard Selz, sues Deer and the BMJ in Texas. The defendants reject the sue as frivolous and counter-sue for their costs. The case is thrown out for lack of jurisdiction.
June 2014	Anti-vaccine campaigner Brian Hooker, acting with Wakefield, tries and fails to entrap a CDC scientist, William Thompson, into alleging fraud in US government vaccine research.
13th April 2016	Actor Robert De Niro appears on NBC's *Today* urging viewers to see *Vaxxed*, a ninety-one-minute video by Wakefield claiming that Thompson had alleged fraud at the CDC.
November 2018	The World Health Organization warns of a global resurgence of measles.
May 2019	At the centre of major measles outbreaks in New York, Wakefield appears via Skype dismissing risks from the disease. He says, «I have never been involved in scientific fraud».

Table 1. Timeline of the main events in the MMR vaccine-autism controversy, based on Deer 2020: 329-331

1.2.3. A note on the discursive representation of autism

The topic of autism and its discursive representation in the media is very complex and has been intensively studied by a number of authors in the fields of medicine, psychology, media and discourse studies, to name but a few. A complete review of such research is beyond the scope of the present volume;

therefore, this section will be limited to presenting some aspects which can play a role in the discursive unfolding of the controversy surrounding the MMR vaccine and its alleged link to the insurgence of autism in the British media.

The most common definition of autism, according to the DSM-5 diagnostic criteria, describes it as a lifelong developmental disability affecting how a person communicates with, and relates to, other people, as well as how they make sense of the world around them. To meet diagnostic criteria for autism spectrum disorder (ASD) according to DSM-5, a child must have persistent deficits in each of three areas of social communication and interaction plus at least two of four types of restricted, repetitive behaviours. However, because autism is a spectrum, important interpersonal differences can exist among people receiving the same diagnosis. The specifics of the diagnosis for autism are not the topic of the present chapter. It suffices to say here that this definition has met some criticism from some researchers in psychology, most notably by proponents of the theory of a «double empathy» who underline how both neurotypicals and autistic people have difficulties in understanding each other, as neither share the same frame of reference within social interactions (Milton 2012). Many authors also emphasise autistic people's cognitive «spiky» profile, meaning that they have an uneven set of abilities and capabilities, which however are not always recognised by service providers and caregivers (*ibidem*). These variations may also have repercussions on their diagnosis, which in some cases may be late or inaccurate (Davidovitch et al. 2015).

The debate linking the MMR vaccination to autism focuses on the causes of this condition, rather than on its diagnostic criteria or on the quality of the life led by people who received a diagnosis. The scientific community nowadays largely agrees that the causes of autism are genetic; however, the specific genes responsible for it still have not been identified (see, for example, Amaral 2017). The fact that the exact causes of this condition are still unknown arguably paves the way for anti-vaccination theories to sound convincing, because they seemingly fill a gap in scientific knowledge and understanding. Moreover, despite its likely genetic origin, the first manifest symptoms of autism often appear at around the same time of the child's first routine vaccination, thus leading many parents to believe a causal connection is possible. Additionally, the development of autistic children is often characterised by periods of seeming regression after reaching some developmental milestones, thus further convincing parents of the existence of an environmental "trigger" (Pearson et al. 2018).

Various authors, especially within the framework of disability studies, have recently explored the media representation of autism and generally found a high incidence of stereotypical, discriminating representations of autistic people, especially by non-autistic writers. One among these is worth mentioning here because it specifically examined the representation of autistic people in articles published on the BBC website dedicated to the MMR vaccine controversy:

O'Dell and Brownlow (2005) found out that within the debate on the supposed safety and/or dangerousness of vaccines there is indeed an underlying notion that an autistic child is less acceptable than a neurotypical child. Other authors have highlighted how such debates risk– directly or indirectly – blaming parents for their children's autism, leading them to speculate that if they had avoided vaccinating their children, these wouldn't have developed autism.

Indeed, the topic of guilt and blame seems to resurface regularly in discourses about autism: for example, Leo Kanner, one of the first psychologists who studied this condition, suggested in a 1949 paper that the insurgence of autism could be caused by a lack of maternal warmth, and identified parental – and specifically mothers' – supposed coldness as a cause for autism (Kanner 1949). Another specialist, Bruno Bettelheim, subsequently contributed to the spreading of what he called the «refrigerator mothers' theory», defining autism as a disorder of parenting (Bettelheim 1967). The theory has now been definitively discredited; however, its upholding caused significant distress in parents, and especially mothers (see, for example, the 2002 documentary *Refrigerator Mothers* by Simpson et al.). Similar guilt is felt by parents who are convinced of having caused their children's autism by vaccinating them. As doctor Michael Fitzpatrick, whose son is autistic, nicely summarises in his 2004 book tellingly titled *MMR and autism: what parents need to know*:

> While the unorthodox biomedical movement claims to empower parents, it has done much to restore feelings of parental guilt that had been greatly diminished following the demise of psychogenic theories. While parents were once blamed for their frigid personalities, they now blame themselves for exposing their children to immunisations and other interventions deemed "toxic" by the new movement. […] It is iniquitous that the unorthodox biomedical movement should have brought parents in a full circle back to the guilt and self-recrimination suffered by an earlier generation of parents. (83-84)

Finally, activists in disability rights movements frequently denounce the lack of representation and agency for autistic people in such debates, which are frequently dominated by neurotypicals. Autistic people have reacted to this domination and discrimination by fostering the slogan «Nothing about us, without us», which has been widespread by disabilities rights' groups ever since the 1980s and is aimed at underlining the necessity of listening to autistic people's voices, especially before framing their own experience using neurotypical terms and before devising policies to regulate healthcare and assistance (see, for example, Huws and Jones 2011 on the representation of autism in the UK press, and Pellicano 2018 on autism advocacy). In linguistics and media studies, the topic of the representation of disabled people's voices has also been linked to the rise of Computer Mediated Communication (CMC), as briefly explained in the following section.

One final comment concerns the phrases used to refer to autistic people. These expressions can be referred to a debate, which has been widespread in the autism community for some time, on "identity-first" (autistic person) vs. "person-first" (person with autism) language. Kenny et al. (2016) carried out a survey to explore the preferences expressed by people in the autism community, their caregivers, and professionals, but discovered considerable disagreement both within and among these categories. Overall, caregivers and professionals seem to prefer person-first language, because they feel it emphasises the value of that person's humanity over any other quality which may be attributed to them due to their condition; however, many people in the autism community seem to prefer to use identity-first language, as they see autism as an inextricable part of their identity and their existence. Moreover, they may feel that separating the diagnosis from the person using person-first language contributes to the stigma attached to autism, implying that it is a disease or an illness that needs to be cured or at least overcome. Throughout this volume, the original language choices are maintained when quoting excerpts. However, when discussing these findings identity-first language is preferred.

1.2.4. The alleged link between the MMR vaccine and autism in the post-truth era

1.2.4.1. Post-truth and science denialism

The adjective "post-truth" is defined by the Oxford English Dictionary (OED) as «relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal beliefs» (post-truth, adj., OED). It was chosen as word of the year by Oxford English Dictionaries in 2016, mainly in relation to politics, which in that year was marked by the USA presidential election and the EU referendum in the United Kingdom:

> The term has moved from being relatively new to being widely understood in the course of a year – demonstrating its impact on the national and international consciousness. The concept of post-truth has been simmering for the past decade, but Oxford shows the word spiking in frequency this year in the context of the Brexit referendum in the UK and the presidential election in the US, and becoming associated overwhelmingly with a particular noun, in the phrase post-truth politics. (Oxford University Press 2016)

It is important to note that the prefix "post" in the adjective "post-truth" does not simply establish a temporal relation, referring to the time after a specified situation or event (as in, for example, "post-match", "post-war" or "post-doctoral"), but denotes circumstances in which that situation, event, or concept are systematically transcended, becoming unimportant or irrelevant.

Again according to Oxford University Press (2016), this nuance of the prefix "post" seems to have originated in the mid-20th century, with formations such as "post-national" (1945) and "post-racial" (1971) and has become increasingly prominent in recent years. Although some attestations of the adjective "post-truth" can be found in early documents with the transparent, temporal meaning of "after the truth was known", the first text where "post-truth" is used with its current meaning seems to be a 1992 essay by the late Serbian-American playwright Steve Tesich in the magazine *The Nation*. The author uses the adjective to discuss the Persian Gulf War and the Iran-Contra scandal, stating that:

> We are rapidly becoming prototypes of a people that totalitarian monsters could only drool about in their dreams. All the dictators up to now have had to work hard at suppressing the truth. We, by our actions, are saying that this is no longer necessary, that we have acquired a spiritual mechanism that can denude truth of any significance. In a very fundamental way we, as a free people, have freely decided that we want to live in some post-truth world (quoted in Kreitner 2016)

Subsequent studies have examined the usage of the term and the meanings it acquires in context: for instance, Prazmo (2020) stresses how the term is most frequently found in social and political contexts, and that in these cases its meaning is not neutral, but activates negative pragmatic attitudes. Furthermore, she adds that the adjective can be synonym with "post-factual", again chiefly referring to politics and political campaigns: «a world of post-facts, just like a world of post-truths, is a world in which no source of information can be trusted, deliberate misinformation is common and widespread. Post-facts are used in order to score political points by addressing people's emotions rather than reason» (Prazmo 2020: 406-407). Additionally, she lists a less common but equally important compound of the prefix "post", namely "post-trust", defined as «a (political) environment in which trust is no longer a value in itself, and building trust is used only, if at all, in order to score political points. Post-trust times are the times in which trust is scarce, hesitant, and not taken for granted» (*ibidem*: 407).

One of the first scholarly contributions to the examination of a post-truth society is Keyes's 2004 volume *The Post-Truth Era: Dishonesty and Deception in Contemporary Life*, where the author argues that we are nowadays seeing a «routinization of dishonesty» (Keyes 2004: 10), in a cultural landscape that actively promotes lying by downplaying ethical issues, at the same time emphasising emotional health through personal, professional, and national myth making. As a consequence, high-profile liars have emerged, notably among journalists and

politicians. Moreover, he notes that a culture which does not effectively sanction liars risks producing a climate of rising suspicion.

More than ten years later, and following both the USA 2016 election and the Brexit referendum, Evan Davis and James Ball each issued a volume on post-truth where they colourfully refer to post-factual knowledge as «bullshit», their volumes being entitled respectively *Post-Truth: Why We Have Reached Peak Bullshit and What We Can Do About It*, (Davis 2017) and *Post-Truth: How Bullshit Conquered the World* (Ball 2017) (both base their definition of post-facts on philosopher Harry Frankfurt's 2005 essay *On Bullshit*, where he discusses the instrumental nature of lying). The two works are not dissimilar in recounting how lying seems to pervade every aspect of contemporary public (political) discourse. Additionally, Ball dedicates a few lines to the vaccine-autism controversy while he discusses why humans are likely to misunderstand statistics, and how the news often plays with this weakness to distort objective facts and perceptions of the truth:

> For all sorts of reasons, we both struggle to understand statistics in news and also tend to disbelieve them if they contradict our anecdotal experience. This is compounded by journalists and others – whether due to their own poor grasp of statistics or in order to push an agenda – often distorting how statistics are presented to the public, with serious and detrimental effects. One fallacy with severe real-world consequences was to confuse correlation and causation: assuming that because something happens shortly after something else, the one caused the other. This was one of the main drivers of a huge outbreak of public concern that the vaccination for measles, mumps and rubella (MMR) was causing autism in children. This claim was not only fuelled by a fraudulent doctor, Andrew Wakefield, but also spread across the media – but it was never supported by a single piece of high-quality evidence. However, it seemed plausible simply because the two events were correlated: children receive their first jab around the age of one, and autism generally first manifests in those children with the condition when they're toddlers – shortly afterwards. The whole controversy led to thousands of parents deciding not to give their children the MMR vaccine, reducing the level below what's necessary for "herd immunity", leading in turn to a number of outbreaks across the country. Nine years after being discredited in the UK, Wakefield is near the centre of US politics, pictured at inauguration balls, with Trump apparently endorsing his baseless anti-vaccination views. (Ball 2017: 152)

Published in the same year, journalist Matthew D'Ancona's short volume *Post-Truth: The New War on Truth and How to Fight Back* similarly explores «the declining value of truth as society's reserve currency» (from the preface to the volume). What makes his study particularly interesting for the present analysis is that the author devotes a full chapter to science denialism, which he defines as «the growing conviction that scientists, in league with government and pharmaceutical corporations […] are at war with nature and the best interests of

humanity» (D'Ancona 2017: 52). In this perspective, he deems the MMR vaccine-autism story an «egregious form of denialism – a case study in post-truth» (*ibidem*).

Similarly, Lee McIntyre's 2018 volume *Post-Truth* also discusses the vaccine-autism story in relation to science denial, which he also sees as a central feature of post-truth epistemology. McIntyre unequivocally blames the media and journalists for the hype they have created around Wakefield's theory, in the name of a misleading journalistic bias (or balance as bias, in Boykoff and Boykoff's 2004 terminology):

> [S]cience deniers have figured out how to exploit media worries about objectivity. […] All they have to do is bully the media into believing that if "other research" exists on scientific topics but they aren't covering it, it must be because they are biased. Journalists took the bait and started to cover both sides of "controversial" issues like climate change and vaccines, even if the controversy had been generated only by those who had something financial or political at stake. And the consequence for the general public was utter confusion over what amounted to a media-abetted campaign of disinformation. (77-79)
>
> […] it happened […] on the subject of the alleged link between vaccines and autism, based on the bogus research of Dr. Andrew Wakefield in 1998. Here the drama was even higher. Sick kids and their grieving parents! Hollywood celebrities taking sides! Maybe a conspiracy and a governmental cover-up! And again, the media failed utterly to report the most likely conclusion based on the evidence: Wakefield's research was almost certainly bogus. (82-83)

Nevertheless, he concludes on a more optimistic note, reasserting the power (and also the newsworthiness) of facts to counter these emotional narratives:

> Although the voices on the other side may be loud, it is a powerful thing to have the facts. This is to say that even in an era of partisan bloviating and noisy "skepticism," the facts about reality can only be denied for so long. The media stopped telling "both sides of the story" about vaccines and autism once there was a measles outbreak in fourteen states in 2015. All of a sudden, the facts of Wakefield's fraud made better copy. (157)

However, even if we accept that the facts about the link between the MMR vaccine and autism have indeed lost their appeal to journalists, we cannot say the same about more general, unfounded claims of vaccine harm, which continue to be upheld by non-negligible parts of the population and continue to be covered by the press – both mainstream and on social media. Recounting a debate happened in 2017 at the London's Science Museum among Davis, D'Ancona, and Ball, journalist Nigel Hawkes reports the answers that the three authors gave to those who asked about the implication of this conceptualisation of post-truth for science communication:

> D'Ancona […] saw the need for charismatic leadership by scientists to turn the tide. "Truth always requires an emotional delivery system", he said. Davis took a contrary view, calling for scientists to be more modest in their claims rather than more strident. "[…] Shouting is not the way to do it. They should be more open minded and respectful." Ball was probably more realistic than either, when he said that researchers were more likely simply to keep their heads down. And those brave enough to peep above the parapet always sought to win the argument on their own terms, while what they should be doing – he said – was to win old fights in new ways. (Hawks 2017: 1)

Despite their different approaches and proposed solutions, it is evident that all three authors highlight the inadequacy of current scientific communication by scientists and researchers, and the need to avoid patronising and dismissing attitudes towards public engagement.

On the other hand, it is important to note that many proponents of fringe scientific theories purport to have authority and expertise, and point to sources and data which allegedly back their statements, thus trying to give their claims the coat of objectivity. This observation forms the basis for Lynch's (2020) critique of the very definition of "post-truth" and scientific denialism: he questions the idea that fringe scientific discourses rest solely or mainly upon emotional appeals, because they actually strive to make alternative science credible and authoritative using facts and figures. This effort creates a parallel universe to mainstream media, where these sources and experts are genuinely considered authoritative and credible. These two parallel universes are joined by mutual accusations of spreading fake news and misinformation:

> The contrast the Oxford Dictionaries' definition draws between "objective facts" and "appeals to emotion and personal belief" does not quite capture the challenge to science in the current era. Instead of an outright rejection of science and objectivity, what is involved is an effort to produce adversarial claims to objectivity and institutional supports for those claims. In the case of the media, the ascendency of […] sources of (mis)information has created a parallel universe to the "mainstream media" […] Charges of "fake news" echo across the gulf between these parallel media universes. (Lynch 2020: 50)

This, according to Lynch, is the basis allowing «alternative scientists» to create «manufactured controversies», that is to say, announcing that there is a debate within the scientific and technical sphere about an issue for which there is actually an overwhelming scientific consensus (manufactured controversies have been discussed by Oreskes and Erik M. Conway 2010 and Ceccarelli 2011, among others; see also Chapter 4 in this volume). Indeed, the concept of artificially maintained controversies is crucial for anti-vaccination discourses and the MMR vaccine in particular because the issue was debated and disputed in the media, because the hypothesis of a link was genuinely believed by many

parents and patients, and because claims of vaccine harm were often couched as though they were backed by scientific data and expert authorities, despite the fact that the scientific consensus has always been decidedly in favour of the MMR vaccine. In Lynch's words: «all sides in such debates tend to invoke scientific authority, though in some cases the authority invoked is widely discredited, such as in the case of the thesis by Andrew Wakefield that the Mumps, Measles, and Rubella (MMR) vaccine was linked to autism» (Lynch 2020: 54). He thus concludes by questioning the value of post-truth as an interpretive category for such manufactured scientific controversies:

> I suggested that it may be less helpful to speak of an anti-science campaign or "post-truth" era, than to treat it as a more selective opposition to or denial of modes of inquiry and specific facts (whether associated with scientific investigations or more widely available understandings and observations) that threaten (or are believed to threaten) entrenched economic interests, religious beliefs and political doctrines, and collective habits. Such opposition is often expressed through the rhetoric of science, voiced by credentialed experts who present counter-narratives and "alternative facts." Far from being an opposition to "science," it makes selective use of emblems and idioms of scientific authority. Perhaps the problem is not anti-science per se, but the collapse of more nuanced debate into over-generalized "scientific" claims in the public airing of disagreements. (55)

This insight is indeed confirmed by scholars examining anti-vaccination claims and arguing that these are often couched in seemingly rational terms, striving for acceptance in the media and scientific circles (Offit 2011). The present volume strives to reconcile these views by acknowledging that, despite these tendencies, fringe scientists heavily exploit personal, anecdotal narratives to foster their arguments; moreover, they often claim to be listening to the people's (the patients' and the parents') voices, at the same time depicting "mainstream" experts as separate from the general population and their legitimate concerns. Andrew Wakefield himself, for example, does not hesitate to depict his research as grounded in the patients' and parents' narratives, which is what makes it evidenced, authoritative, and credible. This reliance on stories is precisely what allows him to accuse his colleagues of being "unscientific" when they refuse to pay attention to these data, and is the topic of Chapter 5 in this volume.

In this sense it can be said that emotion and personal beliefs tend to trump hard facts, to become themselves the supreme form of evidence; therefore, it seems possible, legitimate, and ultimately useful to adopt "post-truth" as a category to understand both scientific denialism and alternative science. Thus, the aim of the analysis presented in the following chapters is that of understanding the post-truth features of the MMR vaccine-autism newspaper and social media coverage, with a special focus on readers' engagement and responses to the news. Hopefully, it will also become possible to show that these insights can

be applied to contemporary anti-vaccination discourses, also in the light of the advent of the Covid-19 pandemic.

1.2.4.2. Fake news, misinformation, disinformation, and vaccine hesitancy

Vaccine hesitancy has been described by the WHO as the reluctance or refusal to vaccinate despite the availability of vaccines; among its possible causes it has listed complacency, inconvenience, and lack of confidence. This lack of confidence, in turn, may be attributed to the spreading of fake news and disinformation about immunisation, including how vaccines work, what their side effects are, and conspiracy theories (CTs) claiming that pharmaceutical companies are colluded with governments and profit from purposefully harmful inoculations. Most importantly, fake news and disinformation are sometimes shared and thus legitimised by prominent, authoritative, and powerful figures: former USA President Donald Trump himself, prior to his election, posted various Tweets where he endorsed the theory that vaccines cause autism. For example, on 22nd October 2012 he wrote: «Autism rates through the roof – why doesn't the Obama administration do something about doctor-inflicted autism. We lose nothing to try»; and again, on 28th March 2014: «Healthy young child goes to doctor, gets pumped with massive shot of many vaccines, doesn't feel good and changes – AUTISM. Many such cases!» (on the relevance of X – formerly called Twitter – for Donald Trump's political campaign and career see, among others, Demata 2018). During his presidency he tried to soften his views, couching his anti-vaccination stance in more rational and consequently seemingly reasonable terms: «I am in favour of vaccines, but I want smaller doses over a longer period of time» (quoted in Najera 2016). However, as the dosage and interval at which vaccines are administered are assessed following strict scientific procedures and approved by major health and medicine organisations, his claim can in fact be considered anti-vaccinationist, and chiefly anti-scientific and anti-establishment. Moreover, Donald Trump always maintained close ties with prominent members of the anti-vaccination movement, such as Andrew Wakefield himself (who moved to the United States, where he is now working, after he was struck off the British medical register for misconduct) and Robert F. Kennedy Jr., an attorney and environmental activist with no scientific or public health training who is a vocal proponent of fringe ideas about vaccines[2]. Donald Trump never abandoned these anti-establishment and anti-intellectualist positions, even in the face of the Covid-19 pandemic crisis, when he repeatedly contravened state health rules (Tollefson 2020). However, although the election of Donald Trump as the President of the United States in 2016 is generally considered a

2 Note that in April 2023 Robert F. Kennedy Jr. announced he would be running as the main challenger to current USA President Joe Biden in the Democratic Party primary election; in October 2023 he said he would withdraw from the Democratic party primaries and run in the 2024 American elections as an independent candidate.

turning point, definitively setting off the so-called post-truth era, it was probably the most overt expression of cultural tendencies which had been spreading for some years. Most importantly, it is probably naïve to interpret Donald Trump's failure to secure re-election in 2020 as an unequivocal sign of changing times, as further evidenced by his candidacy for US president in the 2024 election. As journalist Matthew D'Ancona had foreseen in the preface to his previously quoted book *Post-Truth: The New War on Truth and How to Fight Back*,

> Trump [is] a consequence rather than a cause. His departure from political office – whenever the day comes – will not mark the end of the Post-Truth era, and it is a grave error of analysis to think otherwise. This is not a battle between liberals and conservatives. It is a battle between two ways of perceiving the world, two fundamentally different approaches to reality.

Therefore, the (political) significance that anti-vaccination movements have gained in recent times must be understood as the consequence of a social, cultural, and ultimately epistemological process whereby emotions and idiosyncratic beliefs have acquired an ever-greater salience, concretely influencing public opinion, and consequently, political events. This process has deep roots and continues to find fertile ground to grow upon, as the advent of the Covid-19 pandemic has shown.

Similarly, anti-vaccination discourses cannot be easily reduced to instances of fake news, as is sometimes done by commenters and science communicators alike. Indeed, there is still considerable variation in the intended meanings and usage of labels like misinformation, disinformation, and fake news, as these terms appear to be used interchangeably in common language while scholars and legislators have identified important differences between the three (Cummings and Kong 2019, Iynegar and Massey 2019). According to the definitions provided by the OED:

- The phrase "fake news" refers to «news that conveys or incorporates false, fabricated, or deliberately misleading information, or that is characterised as or accused of doing so» (fake, n2 and adj., OED).
- The noun "disinformation" identifies «the dissemination of deliberately false information, especially when supplied by a government or its agent to a foreign power or to the media, with the intention of influencing the policies or opinions of those who receive it» (disinformation, n., OED).
- The noun "misinformation" denotes «the action of misinforming someone; the condition of being misinformed; wrong or misleading information» (misinformation, n., OED).

According to these definitions, the main difference between fake news and mis- or disinformation lies in their intentionality: while people or organisations spreading disinformation and fake news do so willingly and deliberately, usually for a financial and/or political gain, people who have been exposed to

misinformation may sincerely believe in what they are sharing and spreading. And indeed, most people taking part in anti-vaccination discourses honestly believe that vaccines are harmful, and that doctors, governments, and pharmaceutical companies are corrupted and willing to cover up health scandals for their own gain. These discourses tap into a deep-seated mistrust of the "elites" and the "establishment". Consequently, an ethical communication with vaccine-hesitant patients cannot completely overlook their genuine fears and anxiety, as illogical and unfounded as these may be:

> Post-Truth is, first and foremost, an emotional phenomenon. It concerns our attitude to truth, rather than truth itself. From this, it should be clear that the counter-attack has to be emotionally intelligent as well as rigorously rational. (D'Ancona 2017: 85)

Consequently, the main aim of the present monograph is to study the language of vaccine hesitancy, and more precisely, of the MMR vaccine-autism controversy, with a focus on the way the lucid exposition of objective facts interacts with the emotional recounting of personal storytelling and beliefs, especially in the mainstream and social media.

1.2.4.3. A changing media landscape

The MMR vaccine controversy arose and spread at a time when the media landscape was being enormously changed by the advent of the Internet. Both Web 1.0 and especially Web 2.0 have influenced the way readers experience a text, allowing them to simultaneously consume and produce contents, communicating interactively with a potentially global audience (Herring 2013). Social media such as Facebook, Twitter, or Instagram have considerably enlarged the possibilities for participation and exchange, so that new patterns of interaction have been created both horizontally, among social peers, and vertically, between users and established institutional hierarchies (Demata, Heany and Herring 2018). Clearly, traditional mass media also offer ways for interaction and exchange between readers and the newspapers' editorial board as well as among readers: letters to the editor, for example, are one way through which the public can comment directly on a news topic, and they predate the advent of the internet. However, the Internet and social media have undoubtedly offered an unprecedented opportunity for a massive and freer audience participation, through readers' comments on newspapers' websites and social media pages.

Thus, as virtually unlimited amounts of information of any kind can be accessed faster and easier than ever before, the dynamics of scientific and health communication have been changing, too, with both positive and negative results. If, on the one hand, it has become potentially easier for scientists and doctors to reach out to their patients, and for patients to find doctors and supporting communities with whom to share their concerns, on the other hand,

misinformation and disinformation have found fertile ground to thrive online, also thanks to the allowances of the Internet enabling users not only to consume, but also to actively produce their own contents (Ratzan 2011, Prestin and Chou 2014). It is indeed rather easy to post unverified, misleading, or false contents on the Internet. Additionally, users who engage in conversation with one another on social media like Facebook are at an increased risk of being trapped into so-called echo-chambers and confirmation niches, that is, «polarised [communities] formed of users who select information in accordance with their system of beliefs […] a sort of echo-system in which the truth value of information is not salient, and what matters is whether the information fits in one's narrative» (Zummo 2018: 231).

Again, this process is not new nor unique to the internet: a printed newspaper's readership is often defined by its editorial stance and agenda, made explicit and legitimised through editorials and opinion pieces where the newspaper's values are openly discussed. However, the advent of the internet and of social media seems to have exacerbated this process: in analysing the construction of these confirmation niches in online comments on vaccination, Zummo (2017) confirms that the online (Facebook) environment tends to strengthen participants' confirmation biases, configuring a discursive space where people engage in a kind of thrust-and-parry conversation, opposing each other on principle.

Betsch et al. (2012) discuss these insights in relation to vaccination, concluding that the Web 2.0 has indeed the potential of influencing vaccination decisions, but that social media has given anti-vaccinators numerous opportunities to virally spread their ideas. Therefore, they suggest creating health communication websites which are attractive, easy to find, and readily provide the accurate information needed, especially by «less knowledgeable individuals» (Betsch et al. 2012: 1). Other authors discussing health and vaccine communication on the Web environment express similar ideas: for example, Iynegar and Massey (2019: 7660) concentrate on «campaign[s] of rebuttal based on accurate information through Facebook, Twitter, and other forms of social media»; and similarly, Arede et al. (2019) propose to exploit mass media and social media channels to both foster scientifically accurate, pro-vaccination messages and to educate younger generations in critical thinking.

These approaches, however, seem to rely heavily on what has been called the «deficit model» of science communication, conceptualising the audience as a passive receiver of information which simply has to be couched in convincing and appealing terms. Implicit in this reasoning is the belief that mis-, disinformation and fake news can effectively be countered by factual debunking. This view appears limited, though, especially in a post-truth era where emotive appeals appear as more effective persuasive and argumentative strategies even in science and health matters, and it does not fully exploit the interactive and cooperative potentials of technologies allowing users to also

become producers of their own content. Arguably, a more complex, layered, and ultimately "emotionally intelligent" approach is needed to truly understand the persuasive and argumentative power of anti-vaccination discourses in the post-truth era.

In addition, it has often been noted that in the journalism of the digital age, a separation has developed between the main function of news websites and social media on the one hand, and of traditional news media on the other hand. Indeed, websites and social media pages are increasingly used to break the latest news; this allows journalists to inform their readers in real time and keep the news up-to-date. The printed newspaper, which is published the next day, is then used to elaborate or comment on such news; this results in a proliferation of editorials and opinion pieces. A more thorough discussion of the choice to include editorials and readers' letters in the corpus is provided in Chapter 2, which focuses on the construction of the corpus and the criteria used for inclusion and exclusion of relevant texts.

On a different note, as was mentioned in the previous section, authors who have explored the way autistic people use the internet and social media have argued that CMC considerably helps many of them acquire the means to construe and communicate their identity, to build communities and to advocate for their rights. CMC appears to suit the communicative needs of many autistic people because it allows for interactions that are delayed in time and space, thus freeing them from the need to decode body language, to engage in eye contact, and to keep up with neurotypicals' hectic conversation rhythm. As Davidson (2008: 796) writes: «Computer-generated communication is clear, satisfyingly straightforward and accurate, and can go a long way towards alleviating AS anxieties around social interaction»; «The Internet has been shown to be an appropriate and unusually accommodating medium for those on the spectrum, given characteristic preferences for communication at a socio-spatial (and minimal *temporal*) distance» (*ibidem*: 802, emphasis in the original), thus confirming what Singer (1999: 64) had written almost ten years previously, namely that «[t]he democratization of information flow which is the Internet has promoted the emergence of new ways of self-identification for autistics». Gillespie-Lynch et al. (2014: 1) further confirmed these insights by interviewing a larger sample of autistic people and concluding that «[p]articipants with autism spectrum disorder (ASD) perceived benefits of computer-mediated communication in terms of increased comprehension and control over communication, access to similar others, and the opportunity to express their true selves». Thus, it seems possible to suggest that the advent of the Internet has facilitated the building of online communities for autistic people who can connect with one other, and sometimes also to find their own new dimension for advocacy against stigmatisation: hereto, Davidson (2008: 797) states that «the Internet enables those with AS to participate in shared "language games", and so to have a *voice*, a collective

voice that is often confrontational in the sense of contesting and attempting to supplant predominant belittling constructions of autism» (emphasis in the original).

Although it must be pointed out that Van Driel et al. (2023) have also conducted semi-structured interviews with autistic individuals and discovered that current social media design is not sufficient for truly creating an inclusive environment and fully enabling participation, the results of the present analysis seem to be in line with Davidson's insights as to autistic people's advocacy against discrimination and stigmatisation, as will be argued in Section 5.4.1. in Chapter 5.

1.3. Discourses of and about the MMR vaccine: a literature review

This section is devoted to a brief exploration of some notable scholarly studies which have explored the MMR vaccine controversy from the point of view of linguistics and/or communication studies. It is not exhaustive, but it is rather aimed at presenting those works which have most informed the analysis expounded in the next chapters.

One of the first scholarly examinations of the newspaper coverage of the controversy about alleged links between MMR and autism was Speers and Lewis (2004). They examined both media content and public opinion and knowledge to explore how this controversy was presented, and, in turn, how this coverage influenced public perceptions. Their study spans the time period from 28th January to 15th September 2002, and included two national surveys based on over 1000 face to face interviews, with the purpose of exploring what the public learned from the coverage, and how this information may have influenced attitudes towards the vaccine. They concluded that the media's critical scrutiny of those supporting MMR was not matched by a rigorous examination of the case against it, and that the public was often misinformed about the level of risk involved.

One of the first lengthy and comprehensive accounts of the press coverage received specifically by the MMR vaccine-autism controversy in the UK was Tammy Boyce's 2007 volume *Health, Risk, and News: The MMR Vaccine and the Media*. Boyce conducted a content analysis on news programmes on the British television and radio, and on news articles published in the quality and popular press, focussing on the period between 1st February to 15th September 2002. Her sample includes the weekday BBC 6:00 evening news and ITV 6:30 evening news, the BBC Radio 4 morning news programme *Today*, and a text corpus of five dailies (*The Guardian, Daily Telegraph, Daily Mail*, *The Sun, Daily Mirror*) and four Sunday newspapers (*Mail on Sunday, Sunday Times, News of the World and*

The Observer). Her corpus was compiled by including all items containing the word *MMR*. Additionally, she carried out interviews with journalists and health specialists to explore the production of health news, and she also carried out focus groups and national audience surveys to examine public responses to such news. Her analysis focuses on the way sources are selected to cover a health and science story, on the way evidence is expressed and balanced in the articles and news programmes, and on this coverage's impact on the audience's perception of authority, expertise, and facts. She discovered that most stories covering the MMR vaccine also mentioned its supposed link with autism, and that one of the main forces driving journalists to talk and write about Wakefield's study was the possibility of framing a science and health issue as controversial, thus enhancing its newsworthiness, and capturing the readers' attention. The strict adherence to evidence-based scientific facts was considered less important than the journalistic ideal of balance, giving voice to all sides of a debate; however, this often translated into false balance, whereby unscientific opinions were given undue prominence, effectively misrepresenting scientific consensus. Boyce's study is seminal, and many of her insights remain valuable. However, her focus on the content of news items comes to the detriment of a more refined linguistic analysis; moreover, the limited period selected for the analysis and the fact that important events in the controversy followed (most importantly, the GMC's decision to strike Wakefield off the British medical register in 2010) means that the study is worth updating.

Christopher Clarke's 2008 article *A Question of Balance* shares certain features with Boyce's study, as it analyses the false balance created by the British and American elite press while covering the autism-vaccine controversy: he discovered that journalists chose to place the views shared by most of the scientific community alongside those of a lone, discredited doctor and of some worried parents, thus creating the misleading impression that their ideas were backed by similar amounts of evidence. Clarke's study clearly identifies and defines the question of false balance in science and health coverage (based on Boykoff and Boykoff's 2004 work on climate change). However, he excludes editorials, commentaries, and letters to the editor from his corpus, despite recognising that «these pieces can serve as barometers for community sentiments about controversial issues» (Clarke 2008: 102). The present analysis seeks instead to give analytical prominence precisely to these items.

Vicentini and Grego (2016) focus on argumentation, exploring the specific argumentative strategies employed in institutional healthcare websites to promote childhood immunisation, their main linguistic realisations, and their rhetorical relationship with anti-vaccination discourses in non-institutional sources. The study testifies to the importance of effective and ethical persuasive strategies to counter anti-vaccine disinformation, although it focuses on institutional

discourse, and is therefore different in scope from the present analysis which is devoted to the mainstream press and social media.

Focussing on mainstream media, but also incorporating institutional and political discourse is Stöckl and Smajdor's 2017 essay, published in a volume about the global history of vaccination politics and policies. The authors explore the complex interactions between the political and the scientific in the way the MMR debate – and particularly the refusal of the then UK Prime Minister Tony Blair to disclose his son's Leo vaccination status – was covered in the national press and television, with a focus on the BBC and the *Daily Mail*. Their research has the merit of highlighting how public health campaigns «are often linked to political debates that are not directly relevant to the clinical impact of a drug» (Stöckl and Smajdor 2017: 255), and the way «the behaviour of politicians influenced the private decision making of parents because of what politicians stand for: trust in medicine, trust in the state to look after its people and trust in their moral judgements» (*ibidem*). Thus, they further endorse Durbach's insights as to how «vaccination is a particularly polysemic medical technology, and its enforcement is always a political act» (Durbach 2005: 5) and the way these political instances fuel anti-vaccination debates.

Finally, Plastina and Maglie's 2019 analysis uncovered the great potential for vague language to construct scientific uncertainty, not only as an ethical practice adopted by the scientific community to advance new knowledge claims, but also and most importantly as a covert persuasive technique to undermine public confidence in vaccination. They carried out a corpus-assisted discourse analysis of various text types in order to explore diachronically the usage of approximators, vague quantifiers, epistemic stance markers, subjective stance markers and general extenders/placeholders employed to assert or dispute the legitimacy of a knowledge claim. The present monograph shares this interest for fine-grained quantitative and qualitative linguistic research, but is also interested in the exploration of polyphonic markers and the structure of storytelling used to present personal experience as valuable evidence.

The next section concludes Chapter 1 with an overview of the Covid-19 pandemic's main characteristics and a brief literature review.

1.4. Characteristics of the Covid-19 pandemic

In his seminal work *Epidemics and Society*, significantly published in 2019, Snowden analyses the history and impact of infectious diseases such as the plague, smallpox, typhus, cholera, tuberculosis, malaria, polio, and HIV/AIDS by paying particular attention to their characteristics, modes of transmission, risk factors, and heavily impacted social categories. According to these criteria, the new coronavirus could be described as follows: the virus is highly infectious, contagion is airborne, and the illness it causes is deadly especially for

individuals who are already considered vulnerable, i.e., the elderly. Interestingly though, the new coronavirus does not seem to be particularly risky for children, unlike other contagious illnesses like polio and measles. According to Snowden, the most fearful epidemics are those hitting the strongest and more economically active parts of the population, like the plague which killed adults in their prime; diseases affecting children may be equally fearful; but epidemics spreading among the elderly have the least potential to instil fear and despair. Nevertheless, the new coronavirus pandemic has shaped the collective imagination, mainly because of the isolation suffered by the patients and their families, especially in the first phases of the pandemic. Indeed, severe patients were considered potentially contagious until their death, and therefore they had to remain isolated, a condition which deprived people of the possibility to die peacefully, surrounded by their loved ones. Moreover, the virus first appeared in countries that are generally regarded as industrialised (China and Europe – more specifically, Italy – were hit first) and it seemed to affect all strata of society rather equally (more than infectious diseases like cholera, which used to spread chiefly in the poorer suburbs).

Interestingly, though, the different strata of society were not affected equally by the initial measures taken to contain contagion, like lockdown and quarantine. Indeed, their economic repercussions were harsher on the most vulnerable, confining people in a situation that highlighted the importance of living in adequate, spacious, and not overcrowded premises (and that also underscored how culture-bound the concepts of "house" and "home" are). These "factual", extralinguistic characteristics of the new coronavirus may have affected the way its newsworthiness was discursively constructed.

By way of comparison, measles is a highly contagious infectious disease affecting primarily children, but extremely dangerous also for adults who catch it. Infection is airborne and seems to affect all strata of society equally – although of course, the possibility to live in spacious and not overcrowded environments may reduce the risk. However, what significantly affects the perception of this illness compared to others is the fact that severe cases have become rarer in industrialised countries, probably due to mass vaccination. Therefore, its potential ravages are not vivid in the collective memory, and people may be tempted to underestimate its potential risks. These factors arguably facilitated the spread of anti-vaccination sentiments seeing measles as being less dangerous than autism – which is not an infectious disease but a genetic condition, whose exact causes are still hard to pinpoint precisely.

There is a bulging and ever-growing academic literature on the language and communication of the new coronavirus, which cannot be effectively summarised here: it suffices to say that a search performed on the search engine Google Scholar in July 2023 using the keywords "Covid-19 discourse analysis" in the time window 2020-2023 returned more than 31,000 results. I will limit

myself to mentioning a few research projects which were launched during the first months of the pandemic by prestigious academic institutions, which provide large databases of research which could be said to have set the tone for subsequent academic enquiries:

- The *Covid19 Pandemic Series*, edited by J. M. Ryan for Routledge.
- The *Archive Covid-19 Collection* and the *Covid-19 microsite* by Taylor & Francis Online.
- The *Covid-19: Humanities and Social Science Perspectives Collection* and the *Coronavirus microsite* by Sage Publishing.
- The *Covid-19 Language Hub* and the *Coronavirus Research Hub*, initiatives organized by Oxford University Press.
- *The Quo VaDis (Questioning Vaccination Discourse) Project* initiated by the University of Lancaster, applying corpus-based discourse analysis to discussions about vaccinations in the press, parliamentary debates and social media, with the aim of informing public health campaigns through a better understanding of vaccine hesitancy.

As stated in the foreword, Chapters 3-5 in the present volume close with an exploration of the possible connections between the MMR vaccine debate and the Covid-19 pandemic, and the ways in which these findings can inform the way we analyse and understand the pandemic. Chapter 2 is instead devoted to an exploration of the criteria used for corpus collection and analysis in this study.

Chapter 2
Corpus building and corpus description

2.1. The newspaper corpus

The corpus was collected looking for newspaper articles using the strings "MMR vaccin* AND autism" and "MMR vaccin* AND autistic" on the database NexisUni, an academic research database providing access to many sources in digital format, including newspaper archives. The wildcard was used to retrieve texts containing both "vaccine" and "vaccination" in their singular as well as their plural forms, while the connector AND served to retrieve texts where both issues were discussed. No time span was set, but all articles published after December 2019 were excluded from the present study, because texts dealing with vaccination appeared during the coronavirus pandemic would warrant a separate discussion. The analysis then focused on articles published in English in national British newspapers, both broadsheets and tabloids. Following is a list of the newspapers included in the corpus, their format, and their political leanings:

- the *Guardian* and its sister Sunday paper the *Observer*: one of the most successful British broadsheets, traditionally of a centre-left orientation.
- the *Telegraph* and its sister Sunday paper the *Sunday Telegraph*: one of the most authoritative British broadsheets, traditionally conservative.
- the *Times* and the *Sunday Times*: a traditionally conservative British newspaper of record published in broadsheet format.
- the *Daily Mail* and its sister Sunday paper the *Mail on Sunday*: a middle-market, traditionally conservative tabloid.
- the *Daily Mirror* and its sister Sunday paper the *Sunday Mirror*: a tabloid, traditionally aligned with the Labour party.
- the *Daily Express* and its sister Sunday paper the *Sunday Express*: a middle-market, conservative tabloid, often associated with royalist, national populist, and Eurosceptic views.
- the *Sun*: a right-wing tabloid usually associated with conservative and Eurosceptic views.
- the *Independent*: established in 1986, it began as a broadsheet and changed its format to tabloid-size in 2003 (although this edition was rather termed "compact", to distance itself from the sensationalist reporting style which is typically associated with the tabloid press). Since 2016 it has become an online-only newspaper. As its name suggests, it purports to avoid political party allegiance.

Wherever possible, the weekly and Sunday editions of the papers were kept separate in different sub-corpora, as previous studies have shown that articles dealing with health, science, and medical issues in Sunday editions may differ considerably from their daily counterparts. For example, Harding (1985: 97), who analysed the depiction of immunisation in the British national press in a corpus comprising both daily and Sunday newspapers, found that:

> Whilst the Sunday papers carried the same number of articles per issue as the daily papers, their articles tended to give more extensive coverage and to have more attention drawn to them. The source of articles in the Sunday papers was less likely to be an event and, although more sensationalized, the articles had more information in them. […] The superiority of the Sunday papers in reporting these issues (although only minor) may be a function of their planning criteria. These papers obviously require longer term planning than daily papers. This, apparently, has a moderating effect on the criteria for "newsworthiness" resulting in the improved coverage observed in this study.

However, NexisUni did not allow for a separate search of the two sister newspapers in the case of the *Mail* and the *Mirror*; consequently, their daily and Sunday editions were grouped together in the same sub-corpora. Duplicates were removed, both through the filtering function allowed by the NexisUni platform and through a manual scanning of the original corpus. Table 2 shows the final composition of the dataset.

Newspaper	**N. of articles**
Broadsheets	
The Guardian	313
The Observer	79
The Daily Telegraph	215
The Sunday Telegraph	60
The Times	381
The Sunday Times	109
Total	*1,157*
Word types[3]	*25,741*
Word tokens	*866,511*
Tabloids	
The Daily Mail and Mail on Sunday	417
The Daily Mirror and Sunday Mirror	217

3 Word types refer to the number of distinct words in the corpus, as opposed to word tokens, which refer to the total number of words in the corpus, regardless of how many times they are repeated.

The Daily Express	149
The Sunday Express	62
The Sun	104
The Independent	413
Total	*1,362*
Word types	*22,521*
Word tokens	*880,874*
Total	2,520
Word types	32,927
Word tokens	1,747,385

Table 2. Corpus composition

Before proceeding with an analysis of the composition of the corpus, however, some clarifications as to the criteria used for the collection of these texts are needed.

Firstly, the strings used to retrieve the relevant articles ("MMR vaccin* AND autism" and "MMR vaccin* AND autistic") aimed to obtain a congruous number of texts as closely related as possible to the controversy at the centre of the present study. The terms "vaccine/s" and "vaccination/s" were preferred over synonyms like "inoculation" or "immunisation" because previous studies have shown that the former search terms yield more results than the latter (Wolfe and Sharpe 2005). Other expressions that are frequently used to refer to vaccination, such as "jab/s", were avoided because they possibly convey a marked (negative) attitude towards the procedure, as they are metaphorical in nature; note, for example, Eula Biss's remark that «[t]he British call it a "jab", and Americans, favoring guns, call it a "shot". Either way, vaccination is a violence.» (Biss 2014: 139). Similarly, the acronym MMR (measles, mumps, and rubella) was deemed sufficient to retrieve a suitable number of articles given its frequency of use compared to the full form. Nevertheless, the fact must be acknowledged that these choices possibly limited the number and scope of the articles that were available for the analysis.

Secondly, the collection process was heavily affected by the fact that the link between the MMR vaccine and autism was stated in the string search: thus, articles discussing the triple vaccine without mentioning autism were overlooked, possibly biasing the analysis towards texts critical of vaccination or dubious as to its safety. Indeed, this is the reason why previous studies, among which Boyce's (2007) which is quoted extensively in the present volume, have preferred to examine all published articles discussing the MMR vaccination in a limited period of time (from 1st February to 15th September 2002). The undeniable advantage is the possibility of counting how many times the vaccine is

discussed in relation to autism vis-à-vis how many times the link is not mentioned, thus effectively measuring the incidence of this disproved theory in vaccination discourses – and Boyce discovered that as many as three quarters of the articles containing the word "MMR" published in that period in the UK and the US discussed the possible link between the vaccine and autism (Boyce 2007: 20). However, the present study aims to trace and follow the discursive history of this specific controversy, from the first time the link was suggested to the time the theory was discarded to the ways it is still discussed nowadays, thus constructing a possible trajectory from medical debate to misinformation. For this reason, the search focuses on articles explicitly discussing the link between the measles, mumps, and rubella vaccine and autism, without setting a time span, aware that the resulting corpus is not representative of all discourses about MMR vaccination.

Thirdly, the analysis considers solely newspaper articles, thus excluding not only other related genres that are representative of scientific discourse, such as the academic paper and the press release, but also different popularising genres such as the TV show or the radio broadcast, upon which Boyce's 2007 study instead focussed. The choice to exclude radio and television news is partially justified by the desire to keep the number of texts manageable for a more detailed linguistic analysis, at the same time including as many published platforms as possible without temporal limits. The exclusion of genres belonging to the scientific medical discourse, such as the academic paper, or bordering on scientific and popularizing discourse, such as the press release, was instead based on the belief that the general public does not possess the specialised knowledge that is necessary to thoroughly understand scientific papers. For them, newspaper articles describing or commenting on the latest research constitute the sole, or at least the main, sources of scientific information (see for example Mohammadi et al. 2015 for an altimetric analysis of the research papers' audiences showing that they are mainly read by journal editors, PhD students, and post-doc researchers). Comparing the general press with academic publications and press releases is certainly useful to understand the process transforming scientific research into news, and indeed, it is the object of many studies on scientific popularisation (see, for instance, Woloshin and Schwartz 2002 on the relationship between press releases and journalism; Catenaccio 2008 on the press release as a text genre; Brechman, Lee and Cappella 2011 on cancer research; Lee and Basnyat 2013 on the 2009 H1N1 influenza pandemic). However, the main objective of the present monograph is to explore the newspaper coverage of the vaccine-autism issue. Moreover, vaccination, being a public health measure, is not purely a scientific and medical procedure but also a political enterprise affecting society as a whole, and an analysis of the newspaper coverage of the MMR vaccine-autism controversy has the potential to uncover all these aspects.

This is also why particular attention is paid to dialogic, argumentative genres like the editorial and the letter to the editor, that is to say, texts where journalists and readers alike make the scientific or political news their own, and discuss it in relation to their personal beliefs and priorities. Indeed, this attention for editorials and letters to the editor possibly constitutes the main difference between the present analysis and former studies, which, on the other hand, tended to exclude these argumentative genres in order to focus on the way scientific discourse was presented in the press: for example, in studying scientific press coverage, Hijmans, Pleijter and Wester (2003: 157) clearly state that letters to the editor, columns, and editorials are «genres usually not considered news reports» and therefore exclude them from their study; similarly, Clarke's 2008 analysis of the MMR vaccine coverage in the British quality press disregards editorials, commentaries, and advertisements. The choice of including these texts in the present study is motivated by the fact that the peculiar interaction between scientific, technical, and political notions with the individuals' personal convictions and life experiences, allowed by their argumentative and dialogic nature, can be worthy of intellectual scrutiny, especially in the light of a post-truth society where the relationship between truth, lies, facts, and emotions is being continually questioned and redefined. Additionally, the kind of audience participation allowed by letters to the editor can be considered to some extent a precursor of the commenting function allowed by the Internet and social media: as Nielsen anticipated in his 2010 study on letters to the editor, «their participatory character foreshadows the newer and potentially more interactive technologies that journalists and news organizations may have to get used to» (Nielsen 2010: 22). This topic is explored in more detail in Section 3.4.3. in Chapter 3.

Lastly, a clarification is needed concerning the type of newspapers chosen for the analysis. In the present corpus, national newspapers were preferred over regional, local ones. This choice was motivated primarily by the desire to explore mainstream, ideologically powerful and dominant discourses which may easily propagate abroad, this time in accordance with Clarke (2008: 90), whose sample was also limited to periodicals with major circulations, because:

> While this sampling approach may overlook more nuanced coverage on the state/local level, the aforementioned newspapers are often considered "elite or agenda-setting media" (Boykoff and Boykoff, 2004). Specifically, they often serve for news sources for political elites and more local, secondary newspapers.

This choice also accounts for the fact that Wakefield's 1998 paper has been widely influential, so much so that it is oftentimes considered the starting point for the modern-day wave of anti-vaccination sentiments and conspiracy theories not only in the UK, but also in Europe and even in the United States (Numerato et al. 2019: 84). Additionally, the focus on both broadsheets and

tabloids is widely considered best practice in discourse analyses of the British press (see for example the key studies by Van Djik 1991 and Baker et al. 2008). Strictly speaking, the two terms refer to the newspapers' printed formats, with broadsheets being bigger and tabloids being more compact. However, the two also have different histories and connotations: broadsheets are more commonly linked to longer, in-depth news stories written with a sombre style, striving for objectivity and accuracy, while tabloids tend to opt for flashier headlines and shorter articles dealing with sensationalistic pieces of news. Moreover, broadsheets tend to be associated with the higher, better-off classes, whereas the tabloids' readership of choice tends to belong to the lower and working classes (see, for example, Rogers 2020), although the advent of the Internet and of the online version of these papers seems to have changed these tendences, levelling out the newspapers' audiences (*ibidem*). Finally, the political alignment and, more broadly, the editorial stance of each newspaper was taken into consideration because it influences the way editors and journalists follow news values, selecting the news and the angle with which to present them; this is true also for science, health, and medicine, and especially for vaccination, which is, as stated previously, a public health measure and as such touches upon political as well as social issues.

Thus, the final corpus comprises six broadsheets and six tabloids, one of which is an online newspaper; four of these newspapers can be considered of centre-left orientation (the *Guardian,* the *Observer,* the *Daily Mirror* and *Sunday Mirror*), while the remainder are variously positioned on the conservative, right-winged political spectrum, with the exception of *the Independent*. The texts were uploaded onto the corpus analysers SketchEngine (Kilgarriff et al. 2014) and AntConc (Anthony 2021) and examined using a corpus-assisted discourse analysis approach, described in Section 2.3. in the present Chapter.

2.2.1. Corpus composition and preliminary observations

Some preliminary observations can be made concerning the size and composition of the sub-corpora, shown in Table 2 in Section 2.1., as well as the distribution of articles in time, which can be seen in Figure 1. The corpus is small (1,747,385 words), but specialised, with both the broadsheet and the tabloid sets containing roughly the same number of articles (N broadsheets = 1,157, N tabloids = 1,362) and of word tokens (N broadsheets = 866,511, N tabloids = 880,874). However, some newspapers have published more articles than others: for example, the *Times* and the *Guardian* are particularly prolific broadsheets, while among the tabloids the *Daily Mail* stands out alongside the *Independent*. The temporal distribution of the articles shows that the interest for this controversy peaked in correspondence with significant events: for instance, in 2001 and 2002 when the first scientific studies trying to test Wakefield's hypothesis were being published, and when the then Prime Minister Tony Blair was at

the centre of a public debate over his son Leo's vaccination status (Stöckl and Smajdor 2017). It never completely faded, and indeed gained new momentum in 2019 following major measles outbreaks in Europe and the United States. This datum also suggests that these controversies may linger in the public debate, irrespective of their debunking in scientific environments, thus possibly contributing to the framing of subsequent discourses about medicine and public health. Interestingly, comparatively fewer articles were published in 2004, when the *Lancet* paper was firstly retracted by most of its authors, and 2010, when it was fully retracted by the journal and Wakefield was stripped of his medical license (see also the timeline in Section 1.2.2. in Chapter 1), despite the fact that events that are considered pivotal for the definitive settling of this controversy in the medical, scientific field.

It is also interesting to note that fourteen articles in the corpus appeared in the years before the publication of Wakefield's 1998 *Lancet* paper (more precisely, in 1994, 1996, and 1997); these are analysed in Section 3.4.1. in Chapter 3.

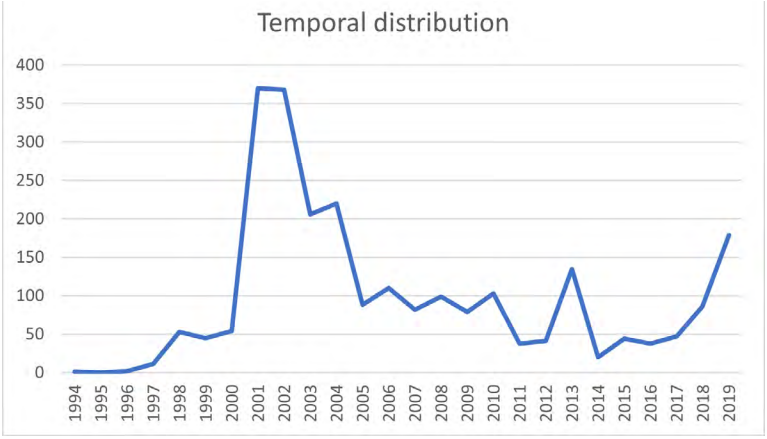

Figure 1. Temporal distribution of articles in the corpus.

2.2.1.1. Editorials and letters to the editor

As previously stated, one of the main aspects differentiating the present analysis from preceding studies is the inclusion in the corpus of editorials – «taken as an instance of interaction through written text» (Bolivar 1994: 276) – and letters to the editor – a primarily argumentative genre «designed to convince readers of the acceptability of a point of view and to provoke them into an immediate or future course of action» (Richardson 2007: 150). These argumentative and dialogic genres allow journalists and readers to explore and discuss science and politics, re-interpreting medical facts through their personal beliefs and life experiences.

The number and percentage of editorials and readers' letters were assessed thanks to the function, present on the NexisUni platform, allowing the researcher to retain information regarding the section of the newspaper where an article appeared originally. Thus, it was possible to manually scan the corpus to understand which articles had been classified as editorials, leaders, comments, and readers' letters (a methodology that proved more reliable than the automatic flagging of the option on the platform, which tended to disregard some relevant articles or to include unrelated ones).

A quantitative analysis of the composition of the corpus, shown in Table 3, reveals that editorials and readers' letters indeed constitute a small, but non-negligible part of the total, with some differences depending on the newspaper under consideration. Note that each letter was counted separately, even when it was published in a single collection, because each letter was considered as an independent, complete text. The juxtaposition of letters expressing different points of view and stances towards vaccinations in one single collection was then analysed as a textual and argumentative feature of such collections.

	Editorials, leaders, comments		**Readers' letters**	
Newspaper	Number	Percentage	Number	Percentage
Guardian	37	11.82	7	2.23
Observer	23	29.11	26	32.91
Daily Telegraph	13	6.04	7	3.25
Sunday Telegraph	2	3.33	5	8.33
Times	17	4.45	42	10.99
Sunday Times	12	11	7	6.42
Daily Mail and Mail on Sunday	8	1.91	26	6.23
Daily Mirror and Sunday Mirror	17	7.83	7	3.22
Daily Express	2	1.34	2	1.34
Sunday Express	5	8	4	6.45
Sun	8	7.69	16	15.38
Independent	65	15.73	30	7.26
Broadsheets	*104*	*8.98*	*94*	*8.12*
Tabloids	*105*	*7.70*	*85*	*6.24*
Total	*209*	*8.29*	*179*	*7.10*

Table 3. Number and percentage of editorials and readers' letters compared to the whole corpus.

It is evident from Table 3 that broadsheets have published comparatively more editorials and readers' letters than tabloids, although the differences are small, and therefore it can be said that the four sub-corpora are comparable.

In particular, the *Observer* (a Sunday paper) stands out for having published the highest percentage of editorials and readers' letters alike. The sub-corpus of readers' letters is smaller in number, but still worth investigating. The newspapers which published the highest percentage of readers' letters were the *Observer,* the *Times*, and the *Sun*.

2.2.1.2. Science, health, and medicine featured articles

One further sub-corpus is made up of articles belonging to the science, health, and medicine section of the newspaper, together with articles appearing in other sections but which were written by the newspaper's science, health, or medicine correspondents. Again, this classification was carried out manually by scanning the articles' sections and authors, retrievable thanks to NexisUni. Table 4 shows the number and percentage of these articles compared to the whole corpus.

	Science, health, medicine articles	
Newspaper	Number	Percentage
Guardian	130	41.53
Observer	5	6.32
Daily Telegraph	68	31.62
Sunday Telegraph	21	35
Times	81	21.20
Sunday Times	7	6.42
Daily Mail and Mail on Sunday	24	5.75
Daily Mirror and Sunday Mirror	27	12.44
Daily Express	27	18.12
Sunday Express	29	46.77
Sun	21	20.19
Independent	162	39.22
Broadsheets	*312*	*29.96*
Tabloids	*290*	*21.29*
Total	*602*	*23.88*

Table 4. Number and percentage of science, health, and medicine articles compared to the whole corpus.

In none of the newspapers under scrutiny do most of the published articles belong to the science, health, or medicine section; only in the *Guardian* and the *Sunday Express* does the percentage come close to fifty, and in many other instances it remains well below thirty percent (plummeting to 5.75% in the case of the *Daily Mail*).

These percentages could be considered a further testimony of the nature of vaccination coverage, which often incorporates medico-scientific, public health, and political issues. However, they also might be evidence of an even grimmer picture where news pieces dealing with delicate health matters and complex scientific issues are entrusted to journalists who are not science, health, or medicine correspondents, and therefore may lack the competences and the training to cover them adequately and accurately.

Further concerning the authors of the articles in the corpus, and the authority with which they write, it is worth noting that five texts in the dataset were written by Andrew Wakefield himself and were published in four different newspapers. They are the following:

– "The case against MMR: wary parents have proved the experts wrong before. They will do so again"; *Independent*, 22nd January 2001
– "My stand on MMR cost me my job … but I'll fight to tell the truth"; *Daily Mail*, 6th January 2002
– "MMR remains under scrutiny"; *Sunday Times*; 11th April 2004
– "Ministers have only themselves to blame for the latest furore"; *Sunday Telegraph*, 15th August 2004
– "The government has tried to cover up putting price before children's health"; *Independent*, 13th April 2013

This finding is noteworthy because it proves that Andrew Wakefield repeatedly found space on national and authoritative UK newspapers even after his theories had been refuted by the scientific community.

2.2. The Facebook corpus

Facebook was established in 2004 by Mark Zuckerberg, together with fellow Harvard College students and roommates Eduardo Saverin, Andrew McCollum, Dustin Moskovitz, and Chris Hughes. Access was originally limited to Harvard students; it then opened to other North American universities, and in 2006 membership became available to anyone over 13 years old. Since then, Facebook has gradually become one of the most widely used and popular social media in the world: it experienced a particularly rapid growth in the years 2006-2012, and as of 2020 it claimed 2.8 billion monthly active users (Statista 2021). Its popularity has been declining in recent years due to competition from other platforms (such as Instagram and TikTok). However, Facebook remains particularly useful for the present analysis because its expansion largely overlaps with the chronology of the MMR vaccine-autism controversy (by way of comparison, Instagram was founded in 2010, while TikTok was first released in 2016).

Facebook allows its members to register (by providing their email address and a password) and to create a personal profile, including a profile picture

and some general personal information. Users can then create content by uploading pictures, videos, status updates, or sharing content generated by other users; they can connect with other members by becoming friends on the platform; and they can comment and react to the contents posted by their friends which they can see on their newsfeed, which is constantly updated by an algorithm based on their preferences. These characteristics largely correspond to the four key allowances of social media listed by Boyd (2008: 121), namely: profiles, which enable members to display their identity; friend lists, indicating their intended audience; stream-based updates, which re-display user-generated content (including status updates and photos) in the members' newsfeed; and – most importantly for the present analysis – public commenting tools supporting members in posting texts on member friends' profiles and posts. Posting texts is actually not the only commenting function allowed by Facebook: others include clicking the "like" button, which has recently been flanked by other reactions such as "love", "laugh", "hug", and "sad". According to these features, Facebook is classified by Eisenlauer (2017: 232-233) as an egocentric social networking site, facilitating member's portrayal and sharing of the different facets of their personalities; enabling its users to create, display, and manage their connections with a community, formed around general (rather than specific) interests; with a high offline anchorage, whereby users are more likely to construct ties with people they already know in the offline environment; and exploiting auxiliary mobile networking apps. Users can become friends with other people on Facebook, but they can also "like" public pages – such as newspaper Facebook pages – so as to start receiving regular updates concerning the content posted by such pages on their newsfeed. Then, they can comment on these contents, too, together with other users who have "liked" the page; and in doing so, they can come to interact with strangers who are not included in their friend lists.

Indeed, Facebook and social media platforms in general have become pivotal for many newspapers and news sites, which use referrals on social networking sites to increase and improve their website traffic and article views (both leading to economic success). As stated by Kümpel, Karnowski and Keyling (2015: 1): «social media recently have become a constitutive part of online news distribution and consumption». More specifically, newspapers can publish posts on social media linking to their news articles; Facebook users therefore see the post – usually showing the headline of the article, a picture, and a short text functioning as a lead – and decide whether to click on it, in order to continue reading on the newspaper's website. Users can then publish their reaction to the article on Facebook, they can share it, and they can comment on it. Many authors regard this novel aspect of news sharing and consumption as a process of democratisation, with much potential for political participation and civic engagement and for facilitating discussions. According to Hille and Bakker

(2014: 1), the commenting function on Facebook has become «one of the most common formats of audience participation in journalism», superseding readers' letters to the editor, of which they can be considered the natural descendants (see also Section 3.4.3.2. in Chapter 3). The authors also note that commenters are rarely anonymous, because Facebook is a site that people use to maintain social connections, often anchored in offline relationships, and where they display their desired identities through the creation of a personal profile. This can influence their attitude towards commenting and can discourage extreme abusive behaviour. However, the near absence of formal gatekeeping to moderate discussions can also mean that these escalate rapidly and frequently. Bearing in mind these potential contradictions, the language of Facebook comments can provide insights into the quantity and the nature of users' engagement with (anti)vaccination debates (see also: Faasse, Chatman and Martin 2016).

For the analysis of newspapers' Facebook pages, it was decided to focus on just two publications, the *Guardian* and the *Daily Mail*. This choice was determined by the fact that it is more challenging, from a methodological point of view, to gather comments posted by users online, not least because of the necessity to thoroughly anonymise data and to convert a digital text into a .txt, machine-readable format. Despite the existing rules of conduct for researchers studying online, publicly available data (e.g., the guidelines provided by the Association of Internet Researchers), their use still involves ethical challenges; and although there is a generally low expectation of privacy for Facebook comments, the data for the present study were thoroughly anonymised, deleting both users' names and profile pictures. Moreover, online threads tend to encompass a large number of comments (although the average length of the comments themselves may be rather short), which provide the researcher with much data even by looking at one single newspaper.

When choosing which newspapers to focus on, it was decided to retain a distinction between a broadsheet and a tabloid publication, respectively with a left-leaning and a conservative political stance. More specifically, the *Guardian* and the *Daily Mail* were chosen because of the important role they played in the press coverage of the MMR debate (uncovered through the analysis of the newspaper corpus) and because they both have a lively Facebook profile with a considerable number of followers (at the time of writing, in March 2024, the *Guardian* Facebook page has got 8.9 million followers, while 16 million people "like" the *Daily Mail* Facebook page). Note that the *Guardian* Facebook page has not published any guidelines for commenters and does not explicitly state whether discussions on the social media are moderated; whereas the *Daily Mail*

Facebook page links to house rules for discerning unacceptable from acceptable comments,[4] and explicitly asks its users to read them before posting a comment.

Relevant articles were retrieved using the search function allowed by Facebook, inserting the keywords "MMR vaccine and autism" (the reasons behind this choice of keywords were illustrated in Section 2.1 for the offline corpus). This search gave a significant number of articles, some of which did not appear to be directly relevant to the issue at hand; therefore, a manual scanning of all the results was carried out to exclude unrelated texts. Once this process was completed, the comments posted underneath the selected articles were copied and pasted onto a .txt file (thus eliminating the profile pictures) and anonymised (that is to say, the names of both authors of comments and of the people tagged in the comments were deleted). Note that all comments were selected, except when there were more than 1000 comments under one single post: in these cases, "more relevant comments" were retrieved through the appropriate filter allowed by the Facebook site. The researcher chose to remain a passive observer and never to interact with the commenters.

A separate file was then created for each post and uploaded to the corpus analysers SketchEngine (Kilgarriff et al. 2014) and AntConc (Anthony 2021). Unfortunately, it was not possible to keep extra-linguistic data such as hyperlinks and images (including emojis), therefore the analysis focused on the strictly linguistic aspect of the comments, aware that much of their meaning can be nonetheless conveyed through these graphic, multimodal signs (see, for example: Mazzali-Lurati 2007 on hyperlinks and Danesi 2017 on emojis). Still, a record was kept of how many interactions the post provoked, both in terms of comments and in terms of number of likes or reactions, and number of shares.

One larger corpus was thus created encompassing all retrieved texts, including two smaller sub-corpora focussing on the two publications under study. Tables 5 and 6 show the composition of the *Guardian* and the *Daily Mail* sub-corpora.

Guardian				
Headline	**Date**	**Nr. of comments**	**Nr. of reactions**	**Nr. of shares**
Measles outbreak worsens in US after unvaccinated woman visits Disneyland	15th January 2015	1026	2012	2783
To the anti-vaxxers: please don't give measles to my tiny, helpless future baby | Lindy West	04th February 2015	906	2166	459
We should listen to Roald Dahl, not Jenny McCarthy, on vaccinating our children	10th February 2015	1127	5702	2265

4 The rules are available at the link: https://www.dailymail.co.uk/home/house_rules.html?fbclid=IwAR1-kCgX6v6a6IVlpwxrVdCtFTg0S6caFtntLMI5z1zSvQ0SMyECizwOEm8, last accessed 10th March 2024.

Melanie's Marvelous Measles: the detrimental power of anti-vaccination rhetoric	12th February 2015	462	719	314
I'm finally getting vaccinated. But not because of your shaming	1st March 2015	742	801	169
Autism doesn't have to be viewed as a disability or disorder	16th July 2015	343	2879	1582
What if giving the meningitis B vaccine to every child did more harm than good?	6th March 2016	234	260	72
Robert De Niro steps into autism vaccination row by screening film	26th March 2016	1064	1444	796
Robert de Niro pulls anti-vaccination film from Tribeca film festival	27th March 2016	1082	4935	529
Worst case of chickenpox sparks call for vaccination rethink	1st August 2016	1016	3245	1385
Trump appears to abandon vaccine sceptic group denounced by scientists	21st February 2018	256	366	43
More than 120 homeopaths trying to "cure" autism in the UK	27th April 2018	823	2509	544
Take-up of MMR vaccine falls for fourth year in a row in England	18th September 2018	750	1614	615
Rightwing populists ride wave of mistrust of vaccine science	22nd December 2018	896	1956	620
Half of new parents shown anti-vaccine misinformation on social media - report	24th January 2019	762	1943	825
Measles is on the rise - but telling anti-vaxxers they're stupid won't fix it | Ellie Mae O'Hagan	15th February 2019	1205	1072	333
High risk: anti-vaxxers in the delivery ward	27th February 2019	836	1982	538
Trapped in a hoax: survivors of conspiracy theories speak out	3rd March 2019	601	1504	868
Anti-vaxx propaganda is flooding the internet. Will tech companies act? | Lucky Tran, Rachel Alter and Tonay Flattum-Riemers	5th March 2019	375	484	163
Revealed: AmazonSmile helps fund anti-vaccine groups	5th March 2019	342	2187	379
Treatment of unvaccinated Oregon boy with tetanus cost nearly $1m, CDC says	9th March 2019	983	3857	1497
New York City declares emergency over measles as cases double in two months	9th April 2019	857	2791	652
Measles is on the march again - but scare tactics won't improve vaccination rates | Andre Spicer	26th April 2019	658	394	76
Revealed: populists far more likely to believe in conspiracy theories	1st May 2019	539	893	391
German parents may face fine for refusing measles vaccination	6th May 2019	794	4912	294
Sharp rise in measles in England amid fears over "anti-vaxxers"	30th August 2019	452	591	150

Facebook to redirect anti-vaccine searches to public health pages	4th September 2019	425	2633	247
Experience: I nearly died of measles	14th September 2019	664	1044	504
Drop in vaccination rates in England alarming, experts warn	26th September 2019	680	1106	465
Two unborn babies die in New Zealand after mothers contracted measles	1st October 2019	600	1959	725
Flu vaccine offered to every primary school child in England	4th October 2019	752	1302	98
Totnes parents defiant over vaccines	22nd October 2019	1398	1114	320
There are no words: Samoa buries its children as measles outbreak worsens	1st December 2019	634	7144	3502
Vaccines that saved millions - and where the next breakthroughs will be found	Promotional content – undated	252	611	139
Tokens[5]	*549,234*			
Types	*22,044*			

Table 5. Composition of the corpus of comments from the Guardian Facebook page.

Daily Mail				
Headline	**Date**	**Nr. of comments**	**Nr. of reactions**	**Nr. of shares**
Mom of 7 ditched anti-vaxxer stance after kids get whooping cough	11th April 2015	226	410	55
Unvaccinated children could be banned from preschools across Australia	12th March 2017	616	342	306
Robert de Niro says autistic son changed "overnight" after MMR vaccine	13th April 2016	535	1966	1114
Anti-vaccine mothers blamed for diseases returning to Britain	19th September 2017	413	603	124
Controversial new study claims aluminium in vaccines may cause autism	3rd December 2017	5402	9192	9865
Parents are urged to vaccinate their children against measles / Deadly measles outbreak warning issued ahead of Easter weekend	29th March 2018	547	1022	2896
Selfish "anti-vax" mums have given me mumps	9th November 2018	668	363	148
Woman whose child has cancer urges parents to vaccinate their children	27th November 2018	490	581	308
Anti-vaxxers are among the top "threats to global health" in 2019	18th January 2019	3296	9743	7818
Anti-vaxxer asked Facebook group how to protect child from measles	2nd February 2019	132	187	37

5 In both Table 5 and Table 6, The numbers of tokens and types refer to the total corpus of comments.

Measles outbreak in Washington fueled by anti-vaxxers soars	5th February 2019	626	709	634
Facebook may start removing anti-vaxx posts	15th February 2019	666	966	241
UN warns of "complacency" as measles cases soar worldwide	2nd March 2019	1979	3246	2987
The MMR jab does NOT lead to autism	5th March 2019	1326	5010	3970
Facebook cracks down on anti-vaxxers	7th March 2019	1710	4509	1783
Unvaccinated children are banned from going to school in Italy	12th March 2019	1626	13803	4042
NYC orders mandatory vaccines for some amid measles outbreak	9th April 2019	242	202	106
New York parents are holding "measles parties" to infect their kids	10th April 2019	1733	2452	1000
DR MICHAEL FITZPATRICK on his campaign against vaccine misinformation / My son's autism led me to take on the anti-vaxxers	14th October 2019	421	304	68
Germany to fine parents £2,000 if they fail to vaccinate children	15th November 2019	1486	7572	22577
Tokens	*340,810*			
Types	*16,056*			

Table 6. Composition of the corpus of comments from the Daily Mail Facebook page.

Some preliminary observations as to the composition of the corpus can be made before proceeding with the linguistic analysis.

First, it must be noted that the *Guardian* sub-corpus is slightly bigger than the *Daily Mail* sub-corpus, in terms of the number of texts (articles and comments) collected, their tokens, and their types. The two sub-corpora are nevertheless comparable; still, normalised frequencies are used together with raw frequencies throughout the analysis. Interestingly, though, the *Daily Mail* sub-corpus presents a higher average number of comments per post (1,207 comments in the *Daily Mail*, 757 in the *Guardian*). This possibly indicates that readers of the *Daily Mail* tend to engage more on Facebook, or that the tabloid's Facebook page is more successful in involving the readership than the broadsheet's.

In both sub-corpora, the number of reactions is consistently higher than the number of comments, the only exceptions to this trend being three posts in the *Guardian* sub-corpus and five posts in the *Daily Mail* sub-corpus: this datum could suggest that the commenting function is subordinate to the easier and quicker possibility of leaving a (graphic) reaction, which carries its own semantic and semiotic meaning. As already stated, these reactions will not be explored in the present study , but it must be recognised that they have the potential to communicate users' emotive responses to, as well as agreement or disagreement with, a piece of news.

It is less easy to identify a pattern for the number of shares, which fluctuates the most; it must be noted that this is also the most pragmatically fuzzy action, because the act of sharing content does not necessarily imply agreement, as the shared post can be accompanied by lines of texts (which may possibly be considered a sort of paratext) further commenting on it, either endorsing or challenging it (see, for example, Kümpel, Karnowski and Keyling 2015 on news sharing in social media sites).

2.3. Corpus-assisted discourse analysis

As said, the corpus-assisted quantitative analysis was carried out by uploading the texts in .txt format in the corpus analysers SketchEngine (Kilgariff et al. 2014) and AntConc (Anthony 2020) which were used to extract wordlists, keyword lists, collocations, and concordances.

Wordlists include the most frequently used lexical items in the corpus, sorted by frequency. These lexical items may be extracted in word form or in their lemmatised form, that is to say, the basic form of a word including all its possible forms in the result (for example, the lemmatised form of the reporting verb "say" includes all instances where its word forms "say", "says", "saying", and "said" appear in the corpus). Note that, in order to use the lemma list function on AntConc, it is necessary to first import a lemma list file: the AntBNC lemma list (ver. 004) was used here (i.e., an automatically generated English lemma list based on all words in the BNC corpus with a frequency greater than 2, created by Laurence Anthony). Furthermore, words and lemmas in a wordlist may be listed according to their raw frequency or their normalised frequency: raw frequencies account for how many times a word, word-form, lemma, or phrase occurs in the corpus, while normalised frequencies account for how many times it occurs in a given subset and are used to compare corpora of different sizes. The standardised (or normalised) frequency was here calculated manually, using the formula:

$$\text{standardised frequency} = \frac{\text{raw frequency count}}{\text{total number of words in the text}} * 1{,}000$$

following Douglas, et al. (1999). Note that it was chosen to multiply by one thousand, as the whole corpus contains 1,747,385 word tokens, and each sub-corpus contains less than one million words (in contrast with the default setting of many corpus analysis software packages, which automatically provide a normalised frequency per one million words).

Keywords are the most frequent words in a corpus compared with a reference corpus; therefore, they are useful to understand the peculiarities of one specific discourse compared to another. Before obtaining a keyword list it is thus necessary to first choose an adequate reference corpus as benchmark; SketchEngine provides the researcher with in-build reference corpora, whereas

in order to obtain keyword lists on AntConc, it is necessary to first upload a reference corpus. For the present analysis, keyword lists were obtained: (i) by considering the whole specialised corpus under study compared with a corpus of general English; and (ii) by comparing the different sections of the corpus under study. The first analysis was conducted using SketchEngine and using the British National Corpus (BNC) as reference; the second analysis was conducted through AntConc by uploading the sub-corpora as reference corpora using the Settings function.

Collocations are defined as words that recur more frequently than could be expected by chance alone in the node word's surroundings, and they contribute to the definition of the node word's general semantic preference and prosody (Stubbs 2001), namely the negative or positive meanings with which it is generally associated. Both SketchEngine and AntConc provide the researcher with specific functions to extract collocations; in the present study, relevant collocations were selected using Mutual Information (MI) statistics, three positions to the left and three positions to the right of the node word, and were sorted by frequency.

Finally, concordances are the occurrences of a node word in context, which are displayed in the corpus as a list, whereby it is also possible to highlight the terms occurring in the word's immediate right and left surroundings using different colours. This option allows the researcher to formulate hypotheses as to the word's connotative meaning in context, thus expanding the insights gained through the analysis of collocations.

This quantitative analysis was useful as an exploration of the main discourses and most exploited linguistic features, which were then investigated more thoroughly through close reading of concordances and a selection of texts. The full wordlists and keyword lists detailing the results of the quantitative analysis are reported in the Appendix at the end of the volume; the next chapters instead present the results and discussion of the discourse analysis with a focus on discursive construction of medico-scientific controversies and debates (Chapter 3), of medico-scientific evidence and expert actors in the news (Chapter 4), and on the role of argumentative narratives and narrative evidence in such debates (Chapter 5). Each chapter then closes with a discussion of the similarities and differences between the aspects discussed in the chapter and discourse(s) of the Covid-19 pandemic.

Chapter 3.
Staging medico-scientific controversies and debates in the news

The Oxford English Dictionary (OED) defines the noun "controversy" as an «argument or contention on a matter of opinion; (typically heated) discussion or debate in which opposite views are advanced and maintained by opponents, esp. when conducted publicly (as in the press) and at length» (controversy, n., 2b, OED). According to this definition, controversies are discursive in nature (they are «arguments», «contentions», and «discussions») and more specifically, they are typically media discourses conducted «in the press». Moreover, controversies concern «matters of opinion» and thus may seem difficult to reconcile with an idea of science and medicine centred on facts and evidence.

Science is actually a process of discovery and is falsifiable by definition. This evolution takes place through the rigorous and methodologically sound accumulation of new evidence, discussion, and redefinition of previous knowledge, but can be also influenced by society and culture. Journalists may decide to discuss these novel findings before they have been accepted by the medico-scientific community, thus documenting this process of discovery, but at the risk of unduly confusing (and possibly scaring) the public. However, the press may also fabricate controversies because controversial issues have an intrinsic news value, allowing to stage heated debates involving various members of society, politicians, and the medical and scientific community alike.

3.1. Discourse and science as socially situated processes

3.1.1. Discourse

Discourses have been defined as «practices which systematically form the objects of which they speak» (Foucault 1972: 49); «a system of statements which constructs an object» (Parker 1992: 5); «language-in-action» (Blommaert 2005: 2); and as

> A set of meanings, metaphors, representations, images, stories, statements and so on that in some way together produce a particular version of events […] surrounding any one object, event, person etc., there may be a variety of different discourses, each with a different story to tell about the world, a different way of representing it to the world. (Burr 1995: 48)

Discourses, in this sense, are invariably connected to social practices and social structures. Discourse analysis (DA) is a method of examining the structure of texts which takes into account both their linguistic content and their socio-cultural context; as summarised by Paltridge (2012: 2):

> Discourse analysis examines patterns of language across texts and considers the relationship between language and the social and cultural contexts in which it is used. Discourse analysis also considers the ways that the use of language presents different views of the world and different understandings. It examines how the use of language is influenced by relationships between participants as well as the effects the use of language has upon social identities and relations. It also considers how views of the world, and identities, are constructed through the use of discourse.

Discourse analysis, and especially corpus-assisted DA, is characterised by: (1) a focus on the interconnections between language and its socio-cultural context; and (2), the way speakers authentically use language to shape and re-present their identities and their worldviews. Language and discourse are thus inseparable from the socio-cultural environment in which they are produced, which they describe, and which they actively contribute to construct. The structure and characteristics of texts, as well as their meaning and interpretations, are similarly socially and culturally situated: hence, meaning is acquired in context. Likewise, participants create and display their identities through language and discourse, which are also interconnected with other (previous and subsequent) texts and discourses. In this sense, discourses are always in an intertextual relationship with other texts, a relationship which may be analysed both synchronically and diachronically.

Debates (and controversies) can also be interpreted through these lenses. For example, Blommaert (1999: 10) specifically defines debates as

> moments of textual formation and transformation, […] in which group-specific discourses can be incorporated into a master text, in which a variety of discursive means are mobilized and deployed (styles, genres, arguments, claims to authority), and in which socio-political alliances are shaped or altered in discourse.

This definition can be applied to medico-scientific debates happening within specific groups and then incorporated in the general news, where different genres and styles (e.g., news pieces, editorials, letters, expository, argumentative …), arguments (e.g., anti- or pro-vaccination claims), and claims to authority (e.g., scientists and experts vs. parents and guardians) are expounded. Building a bigger corpus encompassing a number of articles from different periods allows to gain a more precise view of this master text and is the goal of the analysis presented in this volume.

3.1.2. Science

Any account of the language used to produce and circulate medico-scientific knowledge cannot overlook the fact that this knowledge in itself is a socially situated process, and as such has been extensively studied by sociologists of science. Two fundamental works about the sociology of science first brought to the attention of scholars the more contingent aspects of scientific practice, challenging the notions of absolute objectivity of scientific data and facts and of unequivocal linearity of scientific inquiry: Fleck's *Genesis and Development of a Scientific Fact* (Fleck 1935 [2012]) and Kuhn's *The Structure of Scientific Revolutions* (Kuhn 1962). Fleck's work describes the process through which scientific knowledge becomes a scientific fact while it moves from specialised circles to non-expert groups, and also reveals how research agendas are often determined by the interests of extra-scientific communities. Kuhn's work was seminal in highlighting how science is really a socially and culturally embedded activity. It showed that scientific change is a disruptive, revolutionary event, bringing about new paradigms and cyclically interrupting stable periods, whose acceptance often rests on conflicts and debates among experts. Thanks to these works, sociologists of science also began to reflect on the impact that scientific controversies and revolutions have on society at large, as well as on the changes undergone by scientific notions once they spill over from inner scientific and academic circles to wider contexts.

Latour's 2005 actor-network theory (ANT) in particular was developed to distinguish between «science in the making», as created in laboratories, and «public science», as it is presented in the public domain. This theory also underlines the polyphonic nature of scientific activities, which are not to be thought of as separate from society at large, but shape and are actively shaped by cultural and social factors. These can even help determine whether a hypothesis/theory can finally turn into a scientific fact. Building on ANT, Venturini (2010) proposed a model to explore the «cartography» of scientific controversies, dedicated to the exploration of all factors leading to the emergence, development, and settling of a scientific debate, both within and outside the laboratories.

Problems arise when scientific discovery progresses directly under the public's eye, especially if the public has not been educated to think about science as a socially-situated process. In this case, people may expect to receive definite answers from scientists, and react negatively to notions of uncertainty. Examining the process of diffusion of Einstein's theory of relativity, Biezunski (1985: 183) explained:

> The novelty of a scientific revolution is marked by the absence of consensus among the scientific community. A new perspective is not accepted immediately: there is the time of debate. It can last from several months to several decades. The question of the exposition of the theory during that period is not a trivial

> one. When there is no consensus, the usual scheme of popularization cannot be applied: it is no longer a neutral means of transmission of knowledge: popularization becomes a part of the struggle to make the new ideas accepted. In most cases this process is limited to scientific circles. Nevertheless, it sometimes happens that the debates also take place among the public at large. In such a context, what is at stake in popularization is revealed with more evidence.

Arguably, the advent of the Internet has made these insights ever timelier. Possibly because of this inevitable outcome of scientific communication in a globalised, inter(net)-connected world, many have advocated for better education to uncertainty and doubt, and for a more careful description of science as a progressing rather than fixed entity. For example, Keohane, Lane and Oppenheimer (2014) list honesty, precision, audience relevance, transparency, and most importantly, specification of uncertainty about conclusions as the key principles for scientific communication. This could ultimately result in better risk-benefit assessments on the part of the general public.

Modern communication of science to non-experts started to develop between the end of the 19th and the beginning of the 20th century, following the institutionalisation and professionalisation of research, coupled with the emergence of mass media and mass communication. At that time, scientific communication followed the so-called traditional, dominant, or canonical view (Hilgartner 1990; Grundmann and Cavaillé 2000). As can be seen by the following quotation from Bucchi (2008: 58), according to this diffusionist view of science popularisation, there exists a clear-cut division between professionals, mediators, and the public:

> Cornerstones of the conception […] are the need for mediation between scientists and the general public, made necessary by the complexity of scientific notions; the singling out of a category of professionals and institutions to perform this mediation (science journalists and, more generally, popularisers of science, museums and science centres); and use of the metaphor of translation to describe this mediation.

The public is seen as a passive recipient of the mediated (translated) scientific knowledge, and this mediation is not entrusted to scientists but to journalists. This view is frequently at the root of criticisms towards the general mainstream media, who are seen as responsible for scientific misinformation or inaccuracies that are thus conveyed to the public; unfounded concerns over the safety of vaccines are a case in point. One of the main tenets of this conception is the belief in the existence of a clear boundary between the community of specialists and the audience. The audience is seen as a passive and ignorant recipient of true knowledge which is mediated in a linear process of translation, from a specialist text full of difficult and opaque terms and syntax to a simpler and

more linear text written in everyday, more comprehensible language. This is why this model is also known as the «deficit» model.

However, this view has come under considerable criticism in recent years, with scholars pointing out that the process of transformation from a strictly scientific to a popularised text is not linear and does not involve a mere simplification of terms and grammar. They have also noted that the public, far from being passive, does in fact contribute to the active creation of a new scientific discourse that enters a cycle of production and reception, thus potentially influencing the creation of subsequent scientific and popular texts (see, for example: Daniele and Garzone 2016). Arguably, this becomes even more relevant for health and medicine issues such as vaccination, which operate at the intersection between the scientific and the personal.

Scholars, both sociologists of science and linguists, have thus proposed a new, alternative model of understanding science popularisation. In this model, «popular science does not just report scientific facts to a less specialist audience but represents phenomena in different ways to achieve different purposes» (Hyland 2010: 19). Thus, «popularization involves not only a reformulation, but in particular also a recontextualization of scientific knowledge and discourse that is originally produced in specialized contexts» (Calsamiglia and Van Dijk 2004: 371). The authors also identify a continuum, joining:

- The intra-specialist level: communication among specialists researching the same discipline. This is typically discursively realised in scientific journals.
- The inter-specialist level: communication involving specialists from different fields.
- The pedagogic level: science presented in textbooks.
- The popular level: public communication of science in the press or on television (see also Cloître and Shinn 1985).

The analysis presented in this volume examines the fourth level, involving the mainstream press; moreover, it also highlights dialogism and audience participation in knowledge co-construction through the analysis of social media (Facebook).

3.2. Controversy as a news value

Authors who have studied the media coverage of health and science issues, such as Boyce (2007), have argued that health, science, and medicine stories are often reported in a way that highlights (and sometimes even fabricates) their most controversial and contentious aspects, and that therein lies these stories' intrinsic or perceived news value.

News values can be conceptualised as the driving forces behind the selection of events to be covered in the news. The scholarly investigation of news values

has a long history. One of the earliest and most influential works on news values was Galtung and Ruge's 1965 exploration of the way events become news. They listed twelve «news factors» which determine whether events are considered worthy of reporting as news and divided them between «culture-free» and «culture-bound» values. «Culture-free» values include: frequency, threshold (absolute and/or increasing intensity), unambiguity, meaningfulness (cultural proximity and relevance), consonance (predictability, demand), unexpectedness (unpredictability, scarcity), continuity, composition. Culture-bound values include: reference to elite nations, reference to elite people, reference to persons, reference to something negative. The authors (Galtung and Ruge 1965: 65) hypothesised that the more news factors an event possesses, the likelier it is that it will be covered in the press. Although they focused on the intrinsic properties or qualities of an event determining whether it will make it into the news, they also hypothesised that these characteristics can be variously selected, accentuated, distorted, and replicated in news coverage by journalists and readers.

Since the publication of this seminal work, many authors have referred to it, sometimes trying to modify or update their list. For example, Richardson (2007) defined news values as «the criteria employed by journalists to measure and therefore to judge the "newsworthiness" of events […] to select, order and prioritise the collection and production of news» (Richardson 2007: 91), but also as «the (*imagined*) preferences of the expected audience» (*ibidem:* 94, emphasis in the original).

One of the more refined and comprehensive approaches to news values to date, however, seems to be Bednarek and Caple's discursive approach, whereby

> [n]ews values can be seen as discursively constructed, and newsworthiness becomes a quality of *texts*. News values are thus defined as the "newsworthy" aspects of actors, happenings and issues ***as existing in and constructed through discourse***. (Bednarek and Caple 2013: 13) (emphases in the original)

Their own list of news values and their definitions (Bednarek and Caple 2017: 55) includes (though it is not limited to) the following:

- Consonance: the event is discursively constructed as (stereo)typical.
- Impact: the event is discursively constructed as having significant effects or consequences (not necessarily limited to impact on the target audience).
- Negativity: the event is discursively constructed as negative, for example, as a disaster, conflict, controversy, or criminal act.
- Personalisation: the event is discursively constructed as having a personal or "human" face.
- Positivity: the event is discursively constructed as positive, for example, as a scientific breakthrough or heroic act.

– Proximity: the event is discursively constructed as geographically or culturally near (in relation to the publication location/target audience).
– Superlativeness: the event is discursively constructed as being of high intensity or large scope/scale.
– Timeliness: the event is discursively constructed as timely in relation to the publication date, as new, recent, ongoing, about to happen, or otherwise relevant to the immediate situation/time (current or seasonal).
– Unexpectedness: the event is discursively constructed as unexpected, for example, as unusual, strange, rare.

Interestingly, Bednarek and Caple (2017: 171-223) also carried out a study on the news values in Facebook posts and in most shared news on Facebook, stating that their interest for investigating social media news feeds laid in their usage as «social referrals», that is, in their potential to bring people on the news website via link on the social media page. They discovered that the news posted on Facebook mainly construct the news values of personalisation and proximity. These may arguably also be the news values which mostly attract users who read and comment on the news posts.

The issue of newsworthiness is tackled by Boyce (2007) in her study on the UK newspaper coverage of the MMR vaccine-autism controversy, which precedes the publication of Bednarek and Caple's overview. Boyce starts with a discussion of the news values identified by Galtung and Ruge, alongside with those listed by Harcup and O'Neill (2001), but reckons that these are not completely adequate to capture the newsworthiness of a health, science and risk story. Therefore, she identifies four specific news values that can explain why certain health and science stories receive coverage while others do not, namely:

– Controversy: if a health/science/risk story can be reported and framed as a controversy it is more likely to be covered.
– Editorial campaigns and pack journalism: if a science or health story is attached to an editorial stance or a campaign, then its news values are increased.
– Framing health and science as political, not scientific: if journalists are able to report without scientific detail or evidence, then the story is more attractive.
– Risk, trust, and blame: if a health and science story is about risk, trust, or blame, or can be framed as such, then it has more news value.

Boyce's analysis starts from the assumption that news values are what causes a story to be covered, therefore they are part of journalistic practice (her approach is widely ethnographic in that she collects interviews with editors and journalists) and also, to some extent, a pre-existing cognitive construct. In her own words: «the more relevant question is to understand why some stories are deemed "fascinating" enough to receive media coverage» (Boyce 2007: 46). She also quotes Hansen (1994: 114) stating that «the most pronounced criterion of

newsworthiness is whether science can be made recognisable to the reader in terms of human interest or in terms of something readers can relate to». She proceeds to argue that the debate surrounding the MMR vaccine possesses all of the four news values listed above, both intrinsically and because journalists deliberately decided to focus on such aspects, especially controversy.

3.3. False balance, or balance-as-bias

Section 1.3. in Chapter 1 introduced the topic of false balance by mentioning Clarke's 2008 study on the news coverage of the MMR controversy in the British and American elite press. Quoting Boykoff and Boykoff's 2004 seminal study on the coverage of climate change, Clarke explains that balance is a well-established journalistic norm. It can be understood both in terms of quantity, meaning that journalists strive to present all sides of an issue, and in terms of quality, meaning that the most influential perspectives are juxtaposed in a point-counterpoint format receiving equal attention. The norm is aimed at guiding journalists towards objectivity and accuracy. However, when reporting medico-scientific issues where the bulk of scientific evidence clearly favours one perspective over another, these two ideals can come into conflict. In line with Boykoff and Boykoff, who had talked about «balance as bias», Clarke suggests that in these cases the choice of giving equal space to both sides can be interpreted as a form of bias, actively introducing dissent in an area where scientists and experts largely agree. This coverage can also produce wrong beliefs in the audience, who is led to think that the scientific and/or medical community is split about the safety of the MMR vaccine.

Clarke's analysis spanned the period between 1998 and 2007 and classified newspaper articles into four main categories: texts mentioning "anti-link" studies only; texts mentioning both pro- and "anti-link" studies; texts mentioning only pro-link studies; and texts mentioning neither pro- nor "anti-link" studies. He discovered that the British press devoted considerable attention to pro-link studies and claims, especially during periods of increased coverage in 2001-2002 and 2004. This is particularly telling because, while this attention might have been justified in the period immediately following the publication of Andrew Wakefield's study (and was certainly encouraged by Wakefield's own statements), during this time the scientific consensus disproving an autism-vaccine link strengthened, rather that weakened.

The remainder of the present chapter is devoted to an examination of the MMR corpus under study with a focus on the discursive construction of debates and controversies.

3.4. Controversies in the MMR vaccine-autism corpus

3.4.1. Case study 1: what happened before 1998

As stated, perhaps one of the most sensitive times to write about the controversy over the link between the MMR vaccine and autism were the months immediately before and after the publication of Wakefield's article, i.e., the period when the possibility of a debate loomed.

Fourteen articles in the corpus precede the publication of Wakefield's *Lancet* paper in 1998; they are listed in Table 7.

	Year	Headline	Newspaper
1	1994	A jab in the dark	*Daily Mail*
2	1996	A jab in the dark; a new pre-school booster for measles, mumps and rubella is worrying parents	*Independent*
3	1996	A shot in the dark; the complications from vaccine damage seem to multiply in the courtroom	*Independent*
4	1997	Alarm over measles jab; parents pressure health chiefs for ban on children's vaccine	*Daily Mail*
5	1997	Both of my little boys are autistic and my wonderful marriage is in tatters. Our lives have been ruined by a vaccine; should we ban the vaccine?	*Daily Mail*
6	1997	How safe are the vaccines we inject into our children?	*Daily Mail*
7	1997	The truth about the MMR jab; childhood illnesses may be on the wane, but are vaccines damaging our children's immune systems?	*Independent*
8	1997	Jabs are fine, but not for my baby	*Observer*
9	1997	The boy lost in a foreign country	*Times*
10	1997	Crying shame on the vaccination victims	*Sunday Times*
11	1997	Your health special; DR Mark Porter, TV's top GP, answers your health problems	*Daily Mirror*
12	1997	Kill or cure? The Sunday talking point: hundreds of children are believed to have suffered serious side-effects as a result of MMR	*Sunday Mirror*
13	1997	Jab wrecked our family; interview	*Sun*
14	1997	Needled by worry; Letter	*Sun*
Word tokens: 20,853			

Table 7. Articles discussing the link between the MMR vaccine and autism published before 1998.

These fourteen articles were issued in the period from 1994 to 1997; most of them were published in tabloids. The analysis of the topics of these articles, the news values that they adhere to, and their argumentative structure already foreshadow the characteristics that the debate would assume in the following months and years.

3.4.1.1. News values

According to the headlines reported in Table 7, the two main reasons for discussing the MMR vaccine were the introduction of a pre-school booster (in 1994), and court litigations following parents' claims that their children had been vaccine-damaged (in 1996 and 1997). Court litigations were assisted by research carried out by Andrew Wakefield and colleagues at the Royal Free Hospital of London (and commissioned by Norfolk solicitors Dawbarns; see also the timeline in Section 1.2.2. in Chapter 1). Their research group is mentioned in seven of these articles, as is an interview given by Wakefield to the magazine *Pulse* in 1997 in which he claimed to be on the verge of a discovery that would revolutionise the British vaccination programme. For example, article 4 (*Daily Mail*, 1997) reports:

> An author of one of the studies claims the research could lead to a revolution in the way immunisation is carried out. Dr Andrew Wakefield, of the Royal Free Hospital in Hampstead, North London, told *Pulse*: "The papers are the results of collaboration between other countries and centres in the UK. The results clearly confirm our suspicions and take them further. We have not enough published evidence to change policy at the moment, but we have accumulated enough evidence for Tessa Jowell[1] to conduct an independent review. It could lead to a profound rethink of vaccination policy."

Predictably, Wakefield's statements led various journalists to cover a supposed budding controversy over the safety of the MMR vaccine. These news items and the way they were presented to the public arguably satisfy six news values as identified by Bednarek and Caple (2013; 2017), namely:

- Negativity: the damage suffered by children, allegedly caused by the MMR vaccine, coupled with possible future vaccination harms expressed through noun phrases like «complications from vaccine damage» (article 3), «vaccination victims» (article 10), and «serious side-effects as a result of MMR» (article 12).
- Proximity, defined as the geographical or cultural nearness of an event, linguistically built using first-person plural pronouns and possessives to create a sense of community («we inject» in article 6, «our children» in articles 6 and 7).
- Impact: strictly linked to negativity, it is evident in all news pieces focussing on the possible consequences of vaccination. At this early stage of the controversy, these may often be expressed through questions like «are vaccines damaging our children's immune systems?» (article 7) and «Kill or cure?» (article 12).

1 Then Minister of State in the Department of Health.

– Unexpectedness: hinted at by the numerous questions raising doubts over the safety and effectiveness of vaccines previously considered to be safe. For example, the abovementioned question «childhood illnesses may be on the wane, but are vaccines damaging our children's immune systems?» (article 7) also expresses a contrast between a previously accepted premise (now hedged through the epistemic modal verb "may") and a new disturbing hypothesis.
– Superlativeness: mainly expressed through quantifiers referring to the great number of children allegedly damaged by the vaccine («multiply» in article 3, «hundreds of children» in article 12).
– Personalisation: voiced through storytelling, interviews, and first-person pronouns in headlines such as «our lives have been ruined by the vaccine» (article 5) and «Jab wrecked our family» (article 13).

There are also lexical correspondences and explicit or implied references to previous vaccine scares which may contribute to create consonance. For example, the expression «a shot/jab in the dark», used in the headlines of articles 1, 2, and 3, is probably a reference to a very well-known anti-vaccination book, published in 1985, written by Harris Livermore Coulter and Barbara Loe Fisher, and entitled *DPT, A Shot in the Dark*. As the title suggests, the book is very critical of the vaccine against diphtheria, pertussis, and tetanus, which was accused by the authors of endangering the lives of children. Barbara Loe Fisher is a very vocal American anti-vaccination author and founder of the association *Dissatisfied Parents Together*, which later changed its name into *National Vaccine Information Center*, an organisation focussed on anti-vaccination advocacy (see also Section 1.1.2.4. in Chapter 1).

Finally, the news value of controversy as described by Boyce (2007: 46) is also evidently present. The "controversial" nature of the vaccine under scrutiny is not only conveyed by the high number of questions, but also suggested through polyphony, the contemporaneous presence of various explicit or implicit voices shaping the discourse.

Table 8 lists the abovementioned news values together with the frequencies of the lexical items signalling them, chosen among the most frequent 150 words in the sub-corpus.

News value	**Lemma**	**Raw frequency**	**Normalised frequency**
Negativity	Damage	67	3.21
	Risk	50	2.39
	Suffer	34	1.63
	Problem	33	1.58
	Serious	27	1.29
Proximity	We	93	4.45
	Our	38	1.82

Impact	Develop Result Side-effect	35 33 21	1.67 1.58 1.00
Unexpectedness / Controversy	? Now New	47 47 24	2.25 2.25 1.15
Superlativeness	[number]	333	15.96
Personalization	I My Family Robert Matthew Son Mother	159 47 47 32 28 24 21	7.62 2.25 2.25 1.53 1.34 1.15 1.00

Table 8. News values and lexical items in the 1994-1997 sub-corpus.

Nouns, verbs, and adjectives with a markedly negative connotation signal negativity, while impact can be expressed through nouns and verbs signifying (negative) change. Unexpectedness can be conveyed by the adjective "new" and the adverb "now", but also by asking questions, which also mark the beginning of a possible controversy. Proximity is highlighted through first-person plural nouns and possessives expressing a sense of community. First person singular pronouns and possessives, on the other hand, serve to achieve personalisation, together with proper nouns (evidence of the fact that people are quoted and their stories recounted in the texts) and kinship terms (like "son" and "mother", which may also have an affective connotation when used in storytelling). Finally, superlativeness can be communicated through numbers used to quantify allegedly vaccine-damaged children and their families. This strategy seems to be particularly important in this sub-corpus, where lawyers and journalists alike are eager to legitimate their claims and their stories by appealing to the sheer number of people supporting them. Moreover, this may also be considered a strategy to imply polyphony, as each stated claim appears to be shared by a multitude of other, similar voices. Indeed, these numbers frequently occur together with reporting verbs and hedges, as in the following:

1. We've heard from over 400 families reporting severe problems after the injection. (*Daily Mail* 1997)
2. Richard Barr, a Norfolk solicitor […] has been approached by more than 800 families claiming adverse reactions from MMR. (*Sunday Times* 1997)

3.4.1.2. Polyphony

Polyphony can be studied by focussing on morphological, lexical, syntactical, and textual elements such as reporting verbs, mental verbs, modal verbs, hedging, and conjunctions (see for instance Fløttum 2013; Dahl and Fløttum 2014). It is signalled in all the present articles predominantly by direct and indirect quotations introduced by a variety of reporting and mental verbs, as well as

by linking words and conjunctions structuring discourse. Table 9 lists some of these elements, chosen from the 150 most frequent lemmas, and the frequencies with which they are found in the sub-corpus.

Lemma	**Category**	**Raw frequency**	**Normalised frequency**
Not	Adverb	126	6.04
But	Conjunction	122	5.85
Say	Reporting verb	113	5.41
Can	Modal verb	52	2.49
If	Conjunction	50	2.39
Would	Modal verb	50	2.39
No	Adverb	42	2.01
Could	Modal verb	37	1.77
Tell	Reporting verb	34	1.63
Because	Conjunction	34	1.63
Claim	Reporting verb	32	1.53
Should	Modal verb	29	1.39
Believe	Mental verb	27	1.29
May	Modal verb	24	1.15
Know	Mental verb	24	1.15

Table 9. Polyphony and lexical items in the 1994-1997 sub-corpus.

For example, the coordinating conjunction "but" is used, in its adversative meaning, to juxtapose two conflicting points of view, whereas the negation "not" implies and repeats a different point of view before refuting it. Three instances from the corpus where "not/no" and "but" are used simultaneously are particularly revealing in terms of polyphony:

3. I'm not saying that vaccination is wrong but there is intense pressure on parents to allow their children to be vaccinated. (*Daily Mail* 1994)
4. We are not anti-vaccine but when something goes wrong, it should be investigated. (*Times* 1997)
5. No one wants to ban vaccines but we have to recognise the possibility that healthy children are destroyed in the national interest. (*Sunday Times* 1997)

All are direct quotations. Example 3 quotes solicitor Richard Barr, who is representing families convinced that their children were vaccine-damaged, while example 4 and example 5 quote one such father and mother, respectively. They all open their statements with the negation "not/no" which is aimed at justifying their subsequent claim introduced by the conjunction "but". In particular, in example 4 this syntactic structure is exploited in order to shift the pragmatic value of the label "anti-vaccine". More precisely, the claim that «we are not anti-vaccine» implicitly anticipates a possible criticism towards the ideas

expressed by the parents in the interview, which could be phrased as "proposition (p) = you are anti-vaccine" and which remains unsourced. This criticism is then tackled in the following adversative clause, where the moral obligation to investigate possible vaccine-adverse events is conveyed through the deontic modal verb "should". Similarly, the first clause in example 5 anticipates the possible inference "p = you want to ban vaccines", which is then faced in the adversative clause. This is in turn strengthened by the use of the deontic verbal phrase "we have to", again suggesting a shared moral obligation to consider the possibility that vaccines are harmful to children (expressed through the markedly negative verb "destroy").

This complex polyphonic interaction between different points of view, which can be explicit or implicit, is strategically exploited by journalists to create a debate and to underline elements of uncertainty and confusion. This is also done through pronouns and possessives juxtaposing in-groups and out-groups (example 6), or through a combination of hedging, conjunctions, modal and reporting verbs (example 7)

6. They [the Department of Health] did send through 14 pages of charts and statistics on the safety of vaccines; but for every chart of theirs it seems there is always another study in another journal showing a different picture. (*Independent* 1996)
7. The department says research linking the MMR jab with autism […] has been dismissed by international experts […] and that the vaccine has an excellent safety record. However, Dr Wakefield says the longest period of research into the combined vaccine is just three weeks after it has been given. (*Daily Mail* 1997)

Reporting verbs, such as "say", "tell", and "claim", which are all among the most frequent verbs in this sub-corpus, are the most straightforward means to signal polyphony, and they are examples of sourced attributed propositions. Following the classification proposed by Caldas-Coulthard (1994: 305-306) (see also Section 4.3.1. in Chapter 4), "say" and "tell" are neutral structuring verbs, defined as «the ones that introduce a "saying" without explicitly evaluating it». The reporting verb "claim", on the other hand, is an illocutionary glossing verb that conveys the presence of the author in a text, and which is subjected to a certain degree of interpretation. More specifically, it contributes to the expression of a hypothetical element (Winter 1994: 62) and is classified as a non-factive reporting verb whereby the writer is not committed to the truth of the proposition they report (Tadros 1994: 75-76). In the present sub-corpus, the abovementioned attorney Richard Barr, the Department of Health, and Doctor Wakefield tend to be associated with neutral structuring verbs, while families and parents are often the subject of the non-factive verb "claim." Mental verbs expressing hypothetical elements and personal convictions like "think" and "believe" are also frequently used to introduce parents' claims of vaccine damage. Conversely, the level of

certainty conveyed by the mental verb "know" often appears as the desired outcome of more research, as in «Parents need to know exactly what the risks are» (*Daily Mail* 1997) and «We believe three-in-one vaccinations should be suspended until more is known about MMR» (*Sunday Mirror* 1997).

This usage of the reporting verb "claim" (instead of "say" or "tell"), coupled with the framing of parents' anti-vaccination statements as mental states (rather than verifiable hypotheses) could be interpreted as an attempt, on the part of the writer, to distance themselves from and to delegitimise the positions expressed by the parents. However, the force of their claims is actually strengthened in these articles through storytelling, which is here used as a polyphonic argumentative strategy configuring a discourse where individual stories constitute valid pieces of evidence (this topic is central in Chapter 5 of the present volume).

The last published text in this small dataset, a letter by a reader of the *Sun* (14), arguably summarises the audience's response to this early coverage of the alleged link between the MMR vaccine and autism:

> I was very concerned by your article about six-year-old M. P.[2], whose parents believe his autism was caused by the MMR vaccine. My daughter is due for her jabs soon, and I worry about what to do for the best. More research is urgently needed into this subject.

The predominant emotions expressed in this letter are fear («very concerned», «worry») and uncertainty («more research is urgently needed»). First-person pronouns and the reference to the fellow reader's daughter also testify to the personalisation of the news, which is subsumed under the writer's personal experience. These emotional responses would end up framing much of the ensuing coverage of this issue.

3.4.2. Case study 2: Dr Simon Murch's "unequivocal evidence" reported

On 1st November 2003, the scientific journal the *Lancet* published a letter written by Dr Simon Murch, a physician working for the Centre for Paediatric Gastroenterology at the Royal Free Hospital in London who was a former colleague of Wakefield's and one of the co-authors of the original paper on «autistic enterocolitis». The letter was entitled «Separating inflammation from speculation in autism». With it, Dr Murch publicly distanced himself from Andrew Wakefield's claims, stating that the evidence that the MMR vaccine is not linked to autism is «unequivocal»:

> There is now unequivocal evidence that MMR is not a risk factor for autism – this statement is not spin or medical conspiracy, but reflects an unprecedented volume

2 The full name is provided in the original text, but is here omitted for privacy issues.

> of medical study on a worldwide basis. […] Unless vaccine uptake improves rapidly, major measles epidemics are likely in the UK this winter. (Murch 2003: 1499)

Many UK newspapers subsequently covered the news of the publication of this letter. Table 7 lists the articles in the corpus which mention it, their headline, newspaper, date of publication, and text genre. The table includes articles covering the letter extensively as well as articles only briefly mentioning it. These were retrieved by searching for the phrase *"*unequivocal evidence*"* as well as the node words "Murch" and "Lancet" within the whole corpus.

	Headline	**Newspaper**	**Date**	**Genre**
1	Measles epidemic to strike Britain	*Daily Express*	31.10.2003	News article
2	MMR jab safe after all, says "scare" doctor	*Daily Mail*	31.10.2003	News article
3	MMR is safe, says expert who helped make autism link	*Independent*	31.10.2003	News article
4	Epidemic fear in MMR boycott: Doctor warns of measles outbreaks this winter	*Guardian*	31.10.2003	News article
5	Doctor in MMR alert now says jab is not dangerous	*Times*	31.10.2003	News article
6	MMR scare scientist warns of impending measles epidemic	*Daily Telegraph*	31.10.2003	News article
7	Agony for parents	*Daily Telegraph*	1.112003	Reader's letter
8	Experts clash over safety of MMR vaccination	*Daily Mirror*	1.11.2003	News article
9	MMR wars: scientists row over triple jab's safety evidence	*Daily Mirror*	1.11.2003	News
10	Tide begins to turn against opponents of MMR	*Times*	1.11.2003	News article
11	MMR – new bid to ease worries	*Daily Express*	3.11.2003	News article
12	The MMR vaccine	*Times*	11.11.2003	Reader's letter
13	Why our children are in greater danger than ever before	*Sunday Express*	16.11.2003	Review
14	A travesty of truth: This week's "drama" about MMR and autism does nothing but reinforce already held prejudices	*Observer*	14.12.2003	Comment
15	Tv coverage of MMR	*Times*	20.12.2003	Review
16	Doctor who linked triple jab with autism to be charged with serious professional misconduct	*Independent*	12.06.2006	News
17	Is this doctor a hero or a health risk?	*Daily Telegraph*	13.06.2006	Comment
18	Q&A: MMR vaccine row	*Guardian*	16.07.2007	Q&A
19	The doctor at the centre of the MMR vaccination row	*Guardian*	16.07.2007	News article

Table 10. Articles quoting or mentioning Dr Simon Murch's 2003 Lancet letter.

By looking at the articles' headlines and by scanning the body of the text, it can be gathered that different journalists chose to focus on different aspects of Dr Murch's letter. Authors of articles 1, 4, and 6 highlighted Dr Murch's warning of an impending measles epidemic, while authors of articles 2, 3, and 5 emphasised his claims about the safety of the vaccine. However, authors of articles 8 and 9 chose a different angle, depicting the letter as a sign of an ongoing controversy and debate among experts with different opinions. Parents' worries and uncertainties are foregrounded in article 11 and echoed also in the «agony» expressed in article 7.

Each of these articles quotes Dr Murch's letter extensively, but also includes other sources variably aligned with his views or challenging them. For example, article 1 reports a statement by a Department of Health (DoH) spokesperson endorsing Dr Murch's comments, which «are a clear reminder of the importance of immunisation with MMR and we hope they will reassure anxious parents». However, anti-vaccination advocate Jackie Fletcher is also quoted contending that «Millions of parents will see his words as yet another attempt by vaccine chiefs to frighten parents into using the MMR jab». The same sources are also mentioned in article 2, while articles 4 and 5 only include the DoH spokesperson's statement. Conversely, articles 8 and 9 construe a debate among experts by juxtaposing Dr Murch's voice with that of Andrew Wakefield. More specifically, article 8 begins by announcing that «Two scientists at the centre of the MMR controversy clashed in public yesterday – creating even more confusion for parents», while article 9 declares: «Two experts who first raised fears about the MMR vaccine and autism were at war yesterday after one claimed the jab was now safe» (both exploiting the conventionalised metaphor ARGUMENT IS WAR). It is particularly significant that the media stages this debate despite the fact that Dr Murch speaks explicitly of «unequivocal evidence», and that this is not delved into in any newspaper article in the corpus.

It is also interesting to point out that Dr Murch, in his original letter, had already identified one likely accusation that could be moved towards him due to his new pro-vaccine position, namely that he had become part of the establishment's "conspiracy" to protect pharmaceutical profits. He had tried to anticipate these accusations by tackling them polyphonically through negation and concession: «this statement is not spin or medical conspiracy, but reflects an unprecedented volume of medical study». Nevertheless, this is exactly what Andrew Wakefield accuses him of in his rebuttal: as reported in article 8, «Dr Wakefield […] suggested that Dr Murch had succumbed to establishment and peer pressure».

Richest in polyphony is article 10, where as many as nine voices are sourced. It, too, opens by framing the debate as a «row» which has «intensified» after the publication of the letter. The text then continues by reporting the views by:

- Andrew Wakefield, who «claimed that Simon Murch […] had been pressed into defending MMR by threats of research grants being withdrawn».
- The DoH, who «denied claims by Dr Wakefield […] that he had sent unpublished data to the Joint Committee on Vaccines and Immunisation (JCVI) to back his claims».
- Liz Miller, then head of immunisation at the Health Protection Agency, who «said that a recent court case in which parents had sued vaccine manufacturers for compensation had collapsed for lack of evidence».
- Liam Fox, then Shadow Health Secretary, who «said that it was understandable that parents had been confused by some of the coverage of MMR», but who is also quoted praising Dr Murch's letter, defined as «gratifying».
- Paul Burstow, then Liberal Democrat health spokesman, who is quoted endorsing the NHS vaccination programme, saying that: «Switching to the option of individual vaccines for each disease on the NHS is exactly the wrong thing to do».
- Isabella Thomas: «a representative for Justice Awareness and Basic Support, a lobby group that aims to promote awareness of the issues surrounding the MMR vaccine, said that she was saddened by what Dr Murch had said and felt that the Department of Health had placed immense pressure on him».
- Bill Welsh: «chairman of the Glasgow-based charity Action Against Autism, believes that Dr Murch has decided to "toe the party line" to protect his career».
- Pat Troop: «chief executive of the Government's Health Protection Agency, said last night: "We are concerned because we have had about 350 cases this year of measles […] Last year we had about 300." However, she added that the rate of increase was not as high as had been expected».

The article is very rich in reporting verbs and quotations, both direct and indirect. Many sources (Andrew Wakefield, Liam Fox, Paul Burstow, Isabella Thomas, and Bill Welsh) are quoted expressing their own opinions about the issue. Only the DoH, Liz Miller, and Pat Troop reportedly provide some kind of evidence to support their claims. However, the "evidence" that Dr Murch is talking about does not seem to be examined nor covered.

Given the intensely polyphonic nature of these articles, it is perhaps unsurprising that one reader, writing a letter to the editor (article 7), laments the «puzzling and apparently conflicting statements from doctors and the medical profession». The natural reaction to what is perceived as a racket of contradictory voices is thus a desire for peace and quiet: «As for Dr Murch, a period of silence from him would be appreciated».

More recent articles do not cover Dr Murch's *Lancet* letter as news, but use it to frame the latest issues, proving that discourses about the MMR vaccine over time become part of a wider master text. For example, texts 14 and 15 review

a TV show portraying a dramatized account of Andrew Wakefield's work and a mother's quest for the "true" causes of her child's autism. The articles quote Dr Murch's letter as an example of the scientific consensus that vaccines are not linked to autism, in order to criticise what they deem an inaccurate, biased, and potentially dangerous TV drama. The author of article 14 specifically writes: «Six weeks ago, Dr Wakefield's real-life former colleague Dr Simon Murch added to the scientific neo-consensus, when he warned of the possibility of low MMR take-up leading to a measles epidemic». Similarly, articles 16-19, published three to four years later, remind the public of Dr Murch's letter while covering the accusations of professional misconduct with which Andrew Wakefield was being charged, and which will finally lead to his removal from the British medical register.

This episode shows that the same quotation can be exploited in different and sometimes opposing ways: either to portray a debate among scientists, or as an expression of scientific consensus. This may depend on how many other voices are quoted supporting it, or on which news values the author intends to highlight. Clearly, the choice is also influenced by the period in which the article was written and the relative stability of the scientific consensus at the time of writing. However, an initial sensationalised reporting of a medico-scientific hypothesis as a debate or a controversy may subsequently trigger conspiratorial thinking, because it can indirectly legitimise those who suggest that the settling has been influenced by academic and economic interests rather than by newly found evidence. This also happens because science is perceived by the general population (and the media) as a fixed set of rules, rather than as a process whereby knowledge is continuously built, tested, confirmed or falsified.

3.4.3. Case study 3: readers' letters and Facebook comments

3.4.3.1. Readers' letters and fabricated debates

In his 2008 study described in Section 3.3. in this Chapter, Clarke chose to disregard editorials, commentaries, and advertisements. However, he conceded that these «can serve as barometers for community sentiments about controversial issues» (Clarke 2008: 102). Indeed, various authors have underlined the relevance of readers' letters when discussing controversy in the news: firstly because «letters editors [sic] emphasize the importance of the surprising, extraordinary, and sometimes controversial, angle. […] The letters institution is thus firmly positioned against the zone of consensus […] and in the domain of controversy» (Nielsen 2010: 27). Secondly, because «[i]n the selection and placement of letters, newspapers construct debates (or arguments) within and between letters, simultaneously signalling the pertinence of the included letters to the subject being debated and thereby acknowledging and (depending on how the letter is presented) legitimating their contents» (Richardson and Franklin 2004: 184-185).

It is often the juxtaposition of letters performing different functions that shapes the debate and reveals the assumptions about authority, expertise and scientific knowledge underlying editorial choices. For example, a collection of letters that was published on 11th February 2002 in the *Times* – tellingly under the headline «The MMR controversy» – juxtaposed four letters supporting vaccination with two letters contrary to the procedure and one letter advocating for single vaccines. Similarly, another collection was published on 14th February of the same year under the headline «MMR dilemma», featuring four letters supporting vaccination, one letter criticising it, and one letter asking for single vaccines. Significantly, both collections are introduced by the newspaper's request to «Debate the issues of the day, as they happen, and join in the discussion with other *Times* readers». This caption testifies to the participatory ideal driving letters to the editor, whereby discussion is encouraged not only between readers and editorial boards, but also among readers, in accordance with Nielsen's (2010: 22) remarks:

> Historical research has substantiated Tocqueville's observation that 19th-century newspapers were not only for information, entertainment, and keeping an eye on the government, but also allowed citizens to communicate with one another, and even to act together. Despite the changing orientation of journalism and the attempt to differentiate more clearly between news and opinion, both popular and professional opinions continue to be printed by papers, and the participatory aspiration remains a "real ideal" […] for instance, when readers are invited to take part through captions like "join the debate!" and "send us a letter".

Most importantly, the juxtaposition of letters expressing opposing views of vaccination highlights, stages, and to a certain extent, fabricates disagreement and controversy.

Sometimes the debate happens not only among readers, but also among journalists themselves, who, however, are called forth as parents rather than experts. For example, another collection published in the *Observer* in February 2002 assembles the opinions of various contributors, including science writers, sports writers, feature writers, and sub-editors; the total of 18 comments are printed under the headline «The MMR debate: parents weigh up the odds». Moreover, each text is preceded by a short headline summarising its main point. To provide an overview of the wide variety of points of view included in this collection, the headlines are listed here:

- The Government has a patronising attitude.
- Parents who don't vaccinate are selfish.
- We are becoming far too risk-averse as a country.
- Our children lapsed into unconsciousness.
- Memories of the BSE denials are too recent.
- Was I leading my little lambs to the slaughter?

– Blair's hypocrisy has led to heartache.
– It is wrong for Blair to stay silent about Leo.
– Cost is clearly a factor in the debate.
– We should worry about a measles epidemic.
– Nanny state insists it knows best.
– I wish our child hadn't had any vaccinations.
– The tabloids have been irresponsible.
– I'd have preferred the single jab if available.
– A German mate called it British scaremongering.
– MMR may have made our son's autism worse.
– Blanket immunisation is a nice (huge) earner.
– Measles is a killer, autism is not.

These 18 texts are thus divided into seven pro-vaccination, three anti-vaccination, and eight pro-single vaccination texts – which, as said, can in some way be assimilated to anti-vaccination texts because they are in open opposition to the scientific and public health consensus. This collection is an instance of a publicly staged, and possibly fabricated, internal debate within the newspaper's editorial office, published for the use of readers who may thus identify and empathise with the journalists. It taps into many characteristics of the debate, such as reference to the then Prime Minister Tony Blair's choice not to disclose his son Leo's vaccination status (see also Section 4.3.2.3. in the next Chapter), to the Government's decision not to provide single injections through the NHS, and to the BSE scare (see also Section 1.1.2.6 in Chapter 1 and Section 4.3.2.3. in the next Chapter). It also testifies to the tendency of entrusting parents with the task of evaluating evidence in order to assess the risk-benefit ratio of vaccination for their children, often on the basis of their own previous knowledge or previous experience.

3.4.3.2. Debates in Facebook comments

Facebook comments constitute a means for audience participation and engagement which could be considered a descendant of readers' letters to the editor, with some similarities and some differences. For example, McCluskey and Hmielowski (2012) argue that online readers' posts bypass the filter of editorial gatekeeping and are thus freer than traditional readers' letters to the editor (which, on the contrary, were considered by some scholars as biased and not necessarily representative of the opinions of the public at large; see also Wahl-Jorgensen 2001; Wahl-Jorgensen 2002a; Wahl-Jorgensen 2002b; Wahl-Jorgensen 2002c). They write:

> [N]o media gatekeepers decided which online reader posts to publish, in contrast to letters to the editor, in which just some of the letters are published. Although online posts may be removed for violating terms of participation (such as poor taste, inappropriate language or libelous comments), most are published unedited.

> By contrast, limited space means that not all letters to the editor are published […], with factors such as length, quality of writing, topic […] and ideas […] all determining what gets published. In addition, letters are commonly edited for language and/or length. (McCluskey and Hmielowski 2012: 314)

They also comment on the identity of letter writers vis-à-vis Facebook commenters, their lifestyle, and the way they feel about the news topics they are commenting on, stating that

> posting makes it easier to participate in public discourse, but it may also represent a different audience than letter writers. Posting comments on a news site is simple for those with a basic level of technological expertise, allowing users to quickly access the electronic version of an article and post remarks. Readers can post numerous comments within a short period of time and sometimes engage in a virtual dialogue with others […]. By contrast, submitting a letter to the editor typically requires time to write, edit, print, find the proper address and mail the letter. Those submitting letters perhaps had more available time and the extra effort to participate suggests they have been more passionate about the topic. (*ibidem*: 314-35)

Similarly, Landert and Jucker (2011: 1423), analysing the blending of the private and the public on the Internet, highlight the speed and ease with which users can comment on Facebook as opposed to sending a letter to the editor, which results in more immediate and less rigorous reactions, as well as in an enhanced dialogism among readers themselves:

> The newspaper section "letters to the editor" has always provided an opportunity for private individuals to make their own voices heard, to make their private opinions public as it were. Today this kind of "talking back" to the mass media has become more immediate. It is easier and quicker to respond online to a newspaper article published on the Internet, and presumably the selection and editing of such reactions is less rigorous than it used to be. […] As a result of the very short time span between the publication of an article and the possible publication of reactions to it, further readers can then react both to the newspaper article itself and to the reactions already published.

Finally, they also comment on the editing and editorial process of Facebook comments and readers' letters to the editor, which is deemed responsible for the difference in formality and style between readers' letters and Facebook comments (as well as among Facebook comments themselves):

> One factor responsible for the difference in formality between letters to the editor and online comments is the difference in the editorial process of their publication. The letters were selected and edited by the letters' editor prior to publication, sometimes involving cuts in size […]. Online comments, on the other hand, appear exactly as typed by their authors. The only editorial intervention

> consists in the deletion of comments that violate the editorial guidelines, for instance by being offensive. This difference in the editorial process also accounts for the larger variability of style among the online comments. (*ibidem*: 1432)

Note that each of these authors seems to take for granted the presence of an editorial gatekeeping process whereby the more offensive and abusive comments are deleted. Nevertheless, abusive comments often do appear on Facebook, thus testifying to the fact that the gatekeeping process, when present, is not entirely successful (although this may predominantly be due to a lack of sufficient resources rather than will, as argued by Goujard in 2017).

The main differences between readers' letters to the editor printed in traditional news media and comments posted by users on Facebook are summarised in Table 11.

Readers' letters to the editor	Facebook comments
The publishing process is managed by the newspaper's editorial board.	The user has got complete autonomy when posting their comment.
The publishing process is always subjected to editorial editing. Possible consequences: • Letters may be abridged. • Discussions may be toned down. • Letters may appear to adhere closely to editorial lines. • Letters generally maintain a strong link with the original articles they are responding to.	There may or may not be a gatekeeping process. Possible consequences: • If there is a gatekeeping process, comments may be deleted. • If discussions are not moderated, they may escalate. • Comments are free. • Comments unrelated to the issue at hand often appear.
Writers may refer to previously published articles and letters by providing details about headlines and dates of publication, or may address the editor using formulae such as "Sir".	Writers can "tag" other users, or they may use the "reply" function to engage directly with one another.
Interactions in the same issue are fabricated by the editor; interactions among issues are delayed in time.	Interactions can happen almost simultaneously as in face-to-face encounters, and cannot be fabricated by the editorial board.
Writers usually buy the newspaper they write to; therefore: • they belong to that newspaper's readership, meaning that they probably share the newspaper's line, agenda, and preferred ideology. • they know the contents of the article they are responding to.	Anyone can freely access the newspaper's social media page to comment; therefore: • many commenters may actually dissent with the newspaper's editorial stance. • they may be commenting without having read the article.

Table 11. Main identifiable differences between readers' letters to the editor and users' comments on Facebook.

Boyd (2018) also notes that these Internet commenting practices change the traditional flow of media discourse, enabling users to react and to recontextualise institutional discourse. Consequently, the expression of ideology and evaluation, of argumentation and persuasion is not exclusive to journalists

writing editorials anymore, but is also open for negotiation to readers and users. However, the effectiveness of debates on Facebook is undermined by social media users' tendency to descend into verbal abuse and name-calling, and by the formation of the so-called echo-chambers and confirmation niches (Zummo 2018). This essentially means that the Facebook environment tends to reinforce participants' confirmation biases, configuring a discursive space in which people tend to seek information from sources that are already aligned with their thinking and tend to oppose users who have different opinions on principle. These discussions thus tend to escalate; they rarely reach the concluding stage and often result in the participants' further entrenchment in their pre-existing positions.

Indeed, the quantitative analysis of the sub-corpus of Facebook comments showed that dysphemisms are used very frequently, and much more frequently than in the newspaper sub-corpus, as can be seen in Table 12.

	Newspaper corpus		**Facebook comments corpus**	
Lemma	Raw frequency	Normalised frequency	Raw frequency	Normalised frequency
Stupid	37	0.02	595	0.64
Idiot	22	0.01	517	0.56
Ignorant	33	0.01	260	0.28
	Guardian Facebook subcorpus		**Daily Mail Facebook subcorpus**	
Lemma	Raw frequency	Normalised frequency	Raw frequency	Normalised frequency
Stupid	336	0.61	257	0.75
Idiot	295	0.53	222	0.65
Ignorant	146	0.26	112	0.42

Table 12. Raw and normalised frequencies of the lemmas "stupid", "idiot", and "ignorant" in the newspaper and Facebook sub-corpora.

In the newspaper corpus, "idiot" is least frequent, with "ignorant" being only slightly less frequent than "stupid". In the Facebook corpus, on the other hand, "ignorant" is significantly less frequent than "stupid" and "idiot" (in both sub-corpora). This may be explained by the fact that the semantic meaning of the latter adjectives refers not so much on what people do not know, but on what people are, their perceived intelligence. The condition of being "ignorant" about something is reversible through exposure to new information, whereas one's own (perceived) intelligence is an intrinsic quality which cannot be altered. This issue can be linked to one insight about the post-truth mindset and its consequent death of expertise, namely that the lack of knowledge about one specific issue is equated to a lack of education, general knowledge, and even a

lack of intelligence, thus increasingly overlapping the meanings of the adjectives "ignorant" and "stupid". This in turn destabilises the idea of experts and expertise because it delegitimates attempts to educate laypeople by providing them with new information. This idea has been exposed by Nichols in his 2017 book, significantly titled *The Death of Expertise*, which is explicitly focussed on the American social and cultural landscape, but whose insights may be extended to the European and UK environment, too. He notes that «Americans no longer distinguish the phrase "you're wrong" from the phrase "you're stupid". To disagree is to disrespect. To correct another is to insult» (Nichols 2017: 34). More specifically, when talking about anti-vaccination claims, this could mean that doctors and science popularisers lose their power to correct anti-vaxxers' mistaken beliefs, when this attempt is interpreted (or meant) as an insult.

Moreover, "ignorance" and "stupidity" are central concepts when examining (anti-vaccination) conspiracy theories, because one typical discursive strategy for such conspiracy theorists is the emphasis on intelligence and knowledgeability: «proponents of vaccination [are] perceived as naïve targets of the pharmaceutical lobby» (Numerato et al. 2019: 91), while conspiratorial beliefs «may help to uphold the image of the self and the in-group as competent» (Douglas, Sutton and Cichocka 2017: 540) and can be used to strengthen conspiracists' self-description as superior thinkers who resist manipulation: «The conspiracist raises herself to the position of an alternative knowledge authority, a true expert instead of "false experts leading us astray"» (Ylä-Anttila 2018: 362).

All these insights emerge from the analysis of concordances and are supported by the following examples, showing how both sides of the debate are prone to this type of name calling:[3]

8. My only problem is ignorant people claiming that others must get vaccinated. If you are so scared of a handful of pathogens that you are willing to inject those pathogens directly into your connective tissue, I believe that is your right. But don't tell others that they need to do the same, especially if you are ignorant on the subject, which I have found that most people who support medical tyranny are. (*Guardian* 2018)
9. User 1: Babies & children are dying .. After being vaccinated ..
   User 2: No. They are not. But there is no point telling you that because you are stupid.
   User 1: yes they are.. Do you think it strengthens your argument to insult my intelligence.. Just rude.. (*Guardian* 2019)
10. User 1: measles is a normal virus that boosts our immune system! Maybe vaccinated people are spreading it!
    User 2 (responding to User 1): maybe you are an idiot?

3 Facebook comments are here reproduced in their original form, maintaining the occasional spelling and grammar mistakes.

User 3: Unfortunately you cannot be vaccinated against stupidity.
User 4: what? Are you genuinely this stupid?
User 5: […] No one can be this stupid! (*Daily Mail* 2019)

Example 10 is particularly indicative of the type of argument developing online, with accumulating insults and the creative metaphorical use of the term "vaccination" in user 3's comment. In this case, pro-vaccinators are insulting an anti-vaccinator who claimed that vaccinated people are spreading the measles virus; in example 8 it is an anti-vaccinator who accuses pro-vaccinators of being ignorant. Example 9 is another instance of a pro-vaccinator insulting an anti-vaccinator; the latter also comments on this behaviour by judging it «rude» and not a good argumentative strategy. Indeed, it does not seem that anti- and pro-vaccinators in these threads ever come to an agreement, nor find solutions to their arguments. Typically, they implicitly agree to disagree by abandoning the conversation, a move which is allowed and facilitated by the fact that these interactions happen in an online environment, usually among strangers. However, they also tend to define opponents, people disagreeing with them, as «trolls»; this move arguably stops the debate at the opening stage, with participants refusing to start the discussion (Van Eemeren 2010: 11) on the basis of negative assumptions about their opponents' identities and willingness to debate. Moreover, this seems to be a rather frequent move, with the lemma "troll" appearing 110 times (0.11) in the corpus of Facebook comments, in contexts like the following:

11. User 1: You've got to be a complete moron to believe that government want to extend or help human lives by vaccinate them, you obviously hate your kids if you have any! People like you don't realize how precious is live of a child. Gamble with your kids not mine! Government are the real terrorists!
    User 2: Dont feed the trolls, this is clearly one.
    User 3: troll.
    User 1: When you lack of brain to explain something, the easiest way to avoid conversation is to call someone "troll". (*Daily Mail* 2017)
12. User 1: I'm in dispare with all these folk who are employed by a medical system and are complicit in this junk science!
    User 2: You're a troll, you answered nothing. Have fun teasing everyone, I'm out. Just don't forget that this very medical system will be helping to keep you alive one day pal.
    User 1: it's fascinating that everyone becomes a "troll" when they have an opposing view! Clown! (*Guardian* 2019)

The definition for the noun "troll" in computing slang is «a person who posts deliberately erroneous or antagonistic messages to a newsgroup or similar forum with the intention of eliciting a hostile or correcting response» (troll, n.1, *OED*). As in the case of fake news and disinformation, the dictionary definition includes the adverb «deliberately» to highlight the troll's intention to deceive or

inflame the debate. However, the corpus data seem to suggest that these discussion forums are populated by people who genuinely hold anti-vaccination and anti-scientific beliefs. Although it is true that there are users who defend these beliefs using deliberately aggressive language, the same can often happen among pro-vaccination participants, too. Thus, the usage of the label "troll" in context seems to rather point to the ineffectiveness of this type of debate which easily descends into name calling, without ever reaching the argumentation, let alone the concluding stage.

Moreover, accusations of being a troll seem to be regularly anchored in requests for evidence or in judgments about their reliability and legitimacy, once again testifying to the interest users have for sourcing, discussing what they deem as an authoritative and acceptable source. This is the topic of the next Chapter.

3.5. Characteristics of the medico-scientific and vaccine debate during the Covid-19 pandemic

3.5.1. Uncertainty and scientific development during the Covid-19 pandemic

The Covid-19 pandemic happened at a time of unprecedented globalisation, in an interconnected world with a frenetic movement of both people and ideas. The former arguably allowed the virus to spread fast and wide, but the latter meant that knowledge and information could also be shared easily and immediately, and the media were extremely keen to cover any event linked to the pandemic. Consequently, probably for the first time in history science was developing directly under the public's eye, with "controversies" hitting the headlines worldwide before the scientific community even had the chance to examine theories and hypotheses. There was also unprecedented media attention towards experts, such as epidemiologists and virologists (although their actual presence in the media appeared to vary significantly among countries). This could have arguably been an opportunity to heal the fracture between experts and their public, which many lamented had been happening for some years and was at the basis of the so-called post-truth mindset. However, the massive amount of information and interviews gathered by the media gave rise to an "infodemic", that is to say, an excessive amount of information – including false and misleading information – which considerably confused the general public. Moreover, seeing science in progress, exposing occasional inadequacies and contradictions among reliable experts, caused the public to doubt their authority and their expertise, precisely because laypeople are used to being exposed to scientific theories and statements *after* these have been discussed and negotiated within the scientific community. This aspect of the current situation

presents some similarities with the MMR vaccine-autism controversy, because at the time many people believing Wakefield's claim thought to be witnessing a scientific and medical revolution. Moreover, many studies were indeed being carried out to test Wakefield's hypotheses while the public was eagerly waiting for their results, feeling the uncertainty despite the fact that the triple MMR vaccine was never withdrawn.

Another factor enhancing uncertainty and anxiety in the general public has been the speed with which vaccines against the new coronavirus were developed, which frightened many people into thinking that they were really "experimental" vaccines which had not been properly tested before being approved. Indeed, this speed was unprecedented, and was mainly due to the extraordinary collaboration among scientists all over the world, fostered by massive funding, and helped by the fact that the scientific community already possessed some knowledge of the coronavirus family, because of the Sars-Cov-1 2002-2003 epidemic (Krammer 2020; Li et al. 2020; Padron-Regalado 2020). This, too, could have been a great opportunity to highlight a remarkable result achieved by the international scientific community, but was in fact often inserted in an overarching discourse of suspicion and anxiety, whose origins can certainly be identified in the health, science, and medicine scares that preceded the pandemic (including the MMR vaccine-autism controversy).

Additionally, the contemporaneous existence of three or more approved vaccines against the same virus triggered a "patient-as-consumer" mindset whereby people wanted to have a choice on which vaccine they should receive. In particular, there was increased suspicion towards the AstraZeneca vaccine (lately renamed Vaxzevria) in Italy and in continental Europe in general about a very rare link between the vaccine and clotting disorders (these suspicions appeared less prominent among the UK population, probably because the vaccine was developed precisely in the UK by the Oxford University and British-Swedish company AstraZeneca). This situation was somehow reminiscent of the debate on single versus multiple vaccination, whereby people wanted to have the freedom to choose between the triple MMR or separate injections. In both cases, patients considered it their right to have various possibilities available to them, among which to choose freely. Parents who opted for single vaccines against measles, mumps, and rubella for their children but could not afford to pay for them in private clinics often decided to avoid vaccination altogether; during the new coronavirus pandemic, a considerable number of people refused to be vaccinated with the vaccine developed by AstraZeneca and, in the absence of a suitable alternative, refused to be vaccinated (see, for example, McEvoy 2021). The main difference between the two situations is the fact that MMR is a childhood vaccine, and the decision to administer it to children lies with their parents, while the vaccine against the new coronavirus is given to adult patients

who are responsible for their own health (only in the last months of 2021 were these vaccines approved for use on young children).

However, it must be noted that the problematic uptake of the AstraZeneca vaccine was not the result of popular risk perception alone: many governments were quick to suspend vaccination campaigns with that vaccine, or to restrict their usage to particular age categories, although many experts felt that these decisions were not adequately supported by available scientific data and served a mainly political purpose. These measures, coupled with the often frenzied communication strategies adopted to explain them, severely undermined faith in mass immunisation campaigns (Kennedy 2021).

3.5.2. Anti-vaccination claims during the Covid-19 pandemic

As already stated at various points in the present monograph, anti-vaccination claims are often recurring and there are many similarities between anti-vaccination instances past and present. Among the recurring motifs identified by Offit (2011: 107), the following are recognisable in both the MMR vaccine-autism controversy and present-day discourses about the new coronavirus:

- The belief that doctors are evil: during the MMR vaccine-autism controversy, this largely translated into the idea that Andrew Wakefield and his colleagues were victims of a witch-hunt mounted against them by the rest of the scientific community. Nowadays, the notion that doctors are evil betrays widespread distrust of the medical profession seen as part of the corrupted elite and the evil establishment.
- The organisation of public rallies, which translated into large, organised protests both during the MMR vaccine-autism controversy and during the new coronavirus pandemic. Especially in the latter case, these rallies were highly controversial and hit the headlines worldwide because they flouted the rules imposed by governments to contain the spreading of the virus, including keeping social distancing and wearing masks (Philipose 2020).
- A diffuse feeling of paranoia, which is actually typical not only of anti-vaccination movements, but also of epidemics, when people's fear of contagion translates into suspicion and mistrust towards others. These fears are nowadays compounded by suspicions of the elites and the political/medical establishment, which also form the basis of conspiratorial thinking. During the earliest months of the pandemic, this feeling of paranoia was enhanced by the uncertainty as to the new virus's modes of transmission and risk factors; moreover, the "infodemic" meant that people were constantly exposed to massive amounts of information, which was often false or contradictory, and had profound repercussions on their feelings of wellbeing and mental health (Malathesh, Chatterjee and Das 2020)

– False claims of vaccine harm: one of the most noticeable characteristics of the MMR vaccine-autism controversy was the lingering of the false claim of a link, even after this had been debunked by several major and authoritative scientific studies. During the new coronavirus pandemic, false claims of vaccine harm were given new momentum and legitimacy by the uncertainty of having to deal with a new virus and consequently with new vaccines, despite the approval these received by national and international organisations (such as the European Medicine Agency and the *Agenzia Italiana del Farmaco* in Italy).
– The belief that vaccines are unnatural and the lure of alternative medicine, endorsed by a perceived irreconcilable difference between science and nature. This motif was repeated and maintained during the MMR vaccine-autism controversy, too; it seems that it has become increasingly difficult for humans to accept the idea of malevolent, rather than benevolent, natural forces able to create illnesses and unable to provide a cure for such ailments.
– The mass marketing of anti-vaccination ideas and beliefs, which has been made easier and more accessible by the advent of the internet and of social media.

Tellingly, writing at the height of the COVID pandemic, Erica Eisen stated:

> Two hundred years [after Jenner], attempts to discredit the safety and reliability of vaccination — whether against measles or against COVID — persist. The arguments made by today's anti-vaxxers often echo those put forth by their nineteenth-century antecedents: claims of inefficacy, allegations of ghastly side effects, appeals to religion. Jenner seems likely to have assumed that the benefits of vaccination would be so self-evident that they would shut down all debate. That many continue to assail the safety and reliability of the method he pioneered, not only decades but centuries later, is something that, in all likelihood, the doctor never could have imagined. (Eisen 2020)

Interestingly, during the Covid-19 pandemic new movements emerged, fostering anti-scientific ideas which are similar, in many cases complementary, to anti-vaccination claims, but which nonetheless should be analysed separately, namely the "Anti-Mask" and "Anti-Covid Certificate" movements (known as "No Mask" and "No Green Pass" in Italy). These rather transparent labels refer to organised groups of people who oppose the mandatory wearing of masks and the institution of Covid certificates to testify one's vaccination status in order to obtain access to workplaces, public places, and public events. The latter is strictly connected with the theme of compulsory vaccination, which has been opposed since the beginning of mass vaccination campaigns in Victorian England and continental Europe (see also Section 1.1.2.2. in Chapter 1 of the present volume). The former, however, can be considered the expression of

more general anti-scientific feelings. Furthermore, the initial hesitation on the part of the WHO to recommend the widespread use of masks might have been a mistake which substantially contributed to compound the debate. Indeed, the fact that the scientific community has subsequently been unanimous in recommending the universal wearing of masks to protect against contagion was not enough to erase that initial recommendation which was later proved wrong. Members of the anti-mask movement continued to contend that masks themselves are a health hazard, and strenuously defended the freedom of the individual body against external impositions – but, some argued, also against the wellbeing of the community (Grunawalt 2021).

Chapter 4
Medico-scientific evidence and expert actors in the news

4.1. Alternative sources of knowledge

As stated in Section 3.2. in the previous Chapter, in her 2007 analysis Boyce argued that health, science, and medicine issues such as the MMR vaccine debate are more likely to be considered newsworthy (that is to say, more likely to be covered by the media) if they can be framed as political, not scientific. According to the author, the health or science story is more attractive to journalists and their public if they are able to report *without* scientific detail or evidence. Arguably, this framing also fits well within a post-truth society, where (following the Oxford English Dictionary's definition) appeals to emotion and personal belief have a greater potential to shape public opinion than evidenced-based propositions.

However, as mentioned in Section 1.2.4.1. in Chapter 1, a 2020 essay by scientist Michael Lynch titled *We have never been anti-science* criticised this definition, arguing that people in a post-truth world actually value sources and expertise, but they disregard official authority and believe in their own alternative sources of knowledge. Indeed, there are various instances in the corpus where authors discuss the nature and value of evidence and their sources. The newspaper coverage of the letter written by Dr Simon Murch mentioning «unequivocal evidence» supporting the safety of the MMR vaccine, which was analysed in Section 3.4.2. in the previous Chapter, is a case in point: although evidence was explicitly mentioned and qualified as «unequivocal» in the original text, it still sparked a debate which was portrayed by the media, and where the focus was rather on what the participants in the discussion believed of that evidence, as well as on the credibility of Dr Murch himself. The episode was also frequently framed as political: many opponents accused the doctor of colluding with the government and other powerful forces of the establishment, and countered his claims by providing their own evidence. This evidence could either stem from alternative sources of knowledge (such as Andrew Wakefield himself, who was keen to describe his actions and claims as acts of resistance in a hostile medico-scientific environment) or from one's own personal experience with the vaccine.

Again, Boyce tackles the issue of knowledge and sources in her MMR corpus by referring to the Contributory-Interactional-None (CIN) theory of expertise developed by Collins and Evans (2007), according to which:

- Contributory expertise is the ability to contribute actively to the core set of knowledge in a specialism; it can be acquired only through learning, practice, and total immersion in a subject, and it corresponds to the highest level of expertise.
- Interactional expertise is acquired through linguistic engagement with contributory experts, and it requires an extensive immersion into the culture of a particular specialism.

The direct consequences of this theory are the refusal of the concept of "lay expertise" and a clear-cut separation between expertise and experience, the latter being insufficient to build legitimate expertise. This is particularly relevant because it undermines the importance of the experience of parents with the upbringing of their children. As Boyce explains:

> Raising a child and observing their health does not make one an expert in child health. Yes, parents have the *experience* of numerous childhood diseases (and they may contribute to the core set of knowledge if they develop sufficient knowledge) but this does not mean that their statements are expert statements or that importantly in this case study, their views are not equivalent to expert statements. (2007: 142) (emphasis in the original)

This view is in direct opposition to Wakefield's core argument that «parents have proved the experts wrong before. They will do so again» (*Independent* 2001). Boyce concludes her analysis by stating that journalists in the MMR vaccine debate seem to have chosen their sources based on the newsworthiness of their claims, rather than on the kind of expertise they possess. Speers and Lewis' 2004 study also discovered that the media made wide use of the so-called "expert parent", whereby parents' views about MMR were pitted against those of orthodox science. The authors interpret this insistence on the "expert parent" or "expert patient" as an example of false balance, or balance-as-bias, when staging health and medicine debates (see Section 3.3. in Chapter 3).

4.2. Personal experience and anecdotal evidence

The importance of personal accounts of individual experiences with health and medicine issues is widely explored by the discipline of the Medical Humanities, which seeks to bring human experiences of illnesses and diseases to the heart of health and medicine discussions (in contrast with the purely biomedical approach widely dominating Western medicine). In this sense, various authors talk of a «narrative-based medicine» (see, for example: Hunter 1991,

Charon 2006, Shapiro 2008). The tools for empathic listening offered by the Medical Humanities can be valuable for a medical doctor facing patients' – or parents' – fears towards vaccinations, in order to also tackle their requests to participate more actively in this decision-making process which is likely to affect their children's futures. However, it is important to note that these narratives are not seen as sources of evidence for scientific and medical claims; on the other hand, they constitute one possible means to build a better relationship between doctors and patients, to enhance communication and empathy, with the aim of improving therapeutic adherence, vaccine uptake, diagnoses, and cures. In this sense, narratives do not substitute rigorous clinical procedures, but are part and parcel of an integrated medical model – Engel's biopsychosocial model, for example (Engel 1977).

On the other hand, Wakefield's approach, mirrored by many proponents of alternative medicine and pseudoscience, tends to value anecdotal evidence above all else, even when this is in direct opposition with the results of rigorous scientific (epidemiological, clinical) studies. These narratives are appealing and often succeed in earning the patients' and the parents' trust; however, in fostering scientifically unsound diagnoses and treatments they actively endanger their health and safety. In this sense, these narratives can find a prominent place in a post-truth mindset where people's medical behaviours are influenced by appeals to emotion and personal belief, which trump scientific and medical facts.

Notably, Andrew Wakefield himself authored some articles in the corpus where he expounded his views on the topic. For example, in a comment published in *The Independent* in January 2001 he stated: «One of the fundamental rules of medicine is to listen to your patients because the clues to their disease lie in their story. If you forget that rule, it is time to leave the ward». In another comment appearing in the *Daily Mail* in January 2002, he wrote:

> Parents have, in good faith, reported their children's symptoms linking bowel symptoms to developmental and behavioural regression. Their concerns have been almost universally dismissed by health care professionals. Some had to wait many years before getting their child investigated. As doctors we must first listen and then act upon what we have heard. This is one of the tenets of conventional clinical medicine.

Finally, in the *Sunday Telegraph* in August 2004, he wrote:

> Those of us involved in directly addressing parental concerns and researching possible vaccine adverse reactions are affirmed in our resolve by the often dogmatic, high-handed and alarmingly unscientific response of those in public health, to genuine issues of safety.

The value of personal experience as evidence, and consequently of argumentative storytelling, is discussed more extensively in Chapter 5. The present chapter is instead devoted to an analysis of the social actors populating the corpus, and to the strategies used by writers to legitimise or de-legitimise them as authoritative sources of medico-scientific knowledge and information. The exploration of their contexts of occurrence also provides insight into the discursive realisation of such evidence within newspaper discourse.

4.3. Re-presenting and legitimising alternative sources of knowledge in the MMR vaccine-autism corpus

4.3.1. Mental verbs and reporting verbs

4.3.1.1. Mental verbs and reporting verbs in the newspaper corpus

The preliminary quantitative analysis of both the newspaper and the Facebook corpus shows an abundance of verbs signalling mental activities, sensory activities, and feelings, coupled with an abundance of reporting verbs (see also the Appendix).

Drawing from Biber, Johansson, et al.'s (1999) list of the most common mental verbs in the English language, Table 13 records their raw and standardised frequencies in the newspaper corpus.

Mental verb	Raw frequency	Normalised frequency
Find	2556	1.50
Know	2154	1.26
Believe	1920	1.13
Think	1914	1.12
Need	1720	1.01
Want	1402	0.82
Feel	995	0.58
Hear	882	0.51
Mean	741	0.43
Understand	572	0.33
Read	535	0.31
Hope	519	0.30
Consider	422	0.24
Expect	398	0.23
Love	297	0.17
Remember	217	0.12
Listen	180	0.10
Wonder	171	0.10
Determine	162	0.09

Suppose	157	0.09
Assume	104	0.06
TOTAL	*18018*	*10.61*

Table 13. Frequencies of mental verbs in the newspaper corpus.

Some of the verbs in Table 13 relate to the semantic sphere of knowledge (such as "find", "know", "understand"), others refer to the semantic sphere of thought (such as "believe", "think", "consider", "wonder", "suppose"), others still refer to feelings (such as "want", "feel", "hope", "love"). By looking at the concordances and therefore at the contexts in which these verbs occur, interesting patterns of usage emerge.

For example, the verb "know" is often expressed in a negative context (in structures like SUBJECT + DO/DOES + NOT + KNOW; NOBODY/NO ONE KNOWS; SUBJECT + WILL/WOULD + NEVER + KNOW; SUBJECT + KNOW + NOTHING) or coupled with verbs such as "need", "want", and "should", which implicitly underscore the present lack of knowledge. Similarly, "understand" is also often negated or hedged (through adverbs such as "fully" or "completely", in structures like SUBJECT + DO NOT + FULLY/COMPLETELY + UNDERSTAND).

Conversely, "believe" is more often used in its affirmative form (being negated only 133 times out of 1920 occurrences) and often strengthened by adverbs such as "fully" or "strongly". The same is true for the verb "think" (which is negated a mere 145 times out of 1914 occurrences); moreover, the preferred subject of the verb "think" is the first-person singular pronoun "I", which testifies to its strictly personal, individual dimension. These verbs are distinctively preferred when introducing statements about the nature of autism and the effects of vaccines than factual reporting verbs, both when supporting (examples 1 and 3) and when opposing (examples 2 and 4) the idea of a link between vaccines and autism:

1. I believe that vaccinations were involved in the change in my daughter from a cheerful, content personality to a tense, explosive, nervous character who finds life very challenging. (*Times* 1999)
2. I don't think the MMR poses a threat of autism at any age. (*Daily Mirror* health article, 2002)
3. The day R.[1] got the injection was the day her life changed. I don't want other children to go through what my daughter has been through. I don't think MMR is fair or right. (*Daily Mail* 2003)
4. I think Wakefield is wrong about the MMR. (*Observer* 2007)

Taking into account the context and co-text of occurrence of such examples, however, it can be noted that example 2 expresses the opinion of a *Mirror*

1 Full names are given in the original texts but are here omitted for privacy purposes.

columnist who is also a GP with a regular health column on the tabloid, and who is responding to a reader's letter asking for advice on the MMR vaccine. She (probably correctly) assumes that her audience is interested in what she personally thinks, both as a GP and as a parent. Accordingly, her statement continues: «I understand your anxiety – I went through it with my own children and the whooping cough vaccination, but after a lot of soul-searching, I vaccinated my sons». Her answer does not entirely downplay the importance of evidence-based claims, though, because her column continues by providing relevant statistics and reviewing the latest studies. Still, by framing her initial response as an emotive appeal relying on mutual understanding, she establishes an important personal connection with her readers, thus partly recreating in the text the relationship of trust and the dialogue that is usually established in the doctor's office. Despite the potential of participatory genres such as readers' letters and columns to create a dialogue, to provide information, and to give advice, there are very few instances in the corpus where letters are used to ask questions and fewer still receive a direct answer (only 6 letters, making up 3.35% of the sub-corpus). The fact that so few letters are conceived as genuine inquiries is in line with previous studies showing that it is not the norm for British readers to write to newspapers asking for advice (while in other countries such as Italy, for example, this seems far more common; see, for example, Pounds 2006). However, this also means that letters to the editor are not regularly exploited to their full potential, in order to foster dialogue between readers and professionals – a dialogue which may sometimes be difficult to establish, and which may otherwise never become public, remaining confined to the doctor's office.

The frequency of reporting verbs was also extracted from the newspaper corpus. These verbs were then classified following Caldas-Coulthard (1994). Their percentages are visually represented in Figure 2, together with examples from the corpus.

The pie chart shows that neutral structuring verbs are most frequent; this result is unsurprising, given that they are widely used in general language as well as in the news (see also: Biber and Quirk 2012). The second highest percentage is represented by metapropositional expressives like "claim", "report", and "accuse"; and another considerable segment is made up of metapropositional directives like "suggest", "warn", and "urge". The descriptive verbs in this dataset are likely to signal storytelling embedded in news texts, while transcript verbs are likely to be used when quoting extensively from external sources.

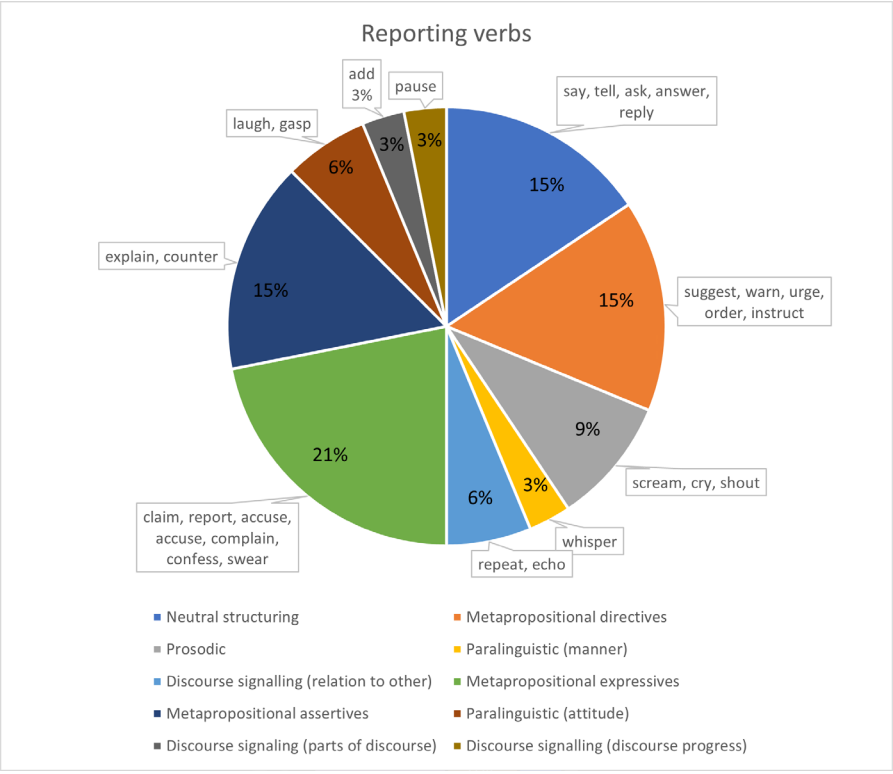

Figure 2. Percentages, classification, and examples of the reporting verbs included in the newspaper corpus.

The more refined classification of these reporting verbs' types reveals two major trends: the non-factive reporting of claims, and a deontic attitude focussed on directions and suggestions concerning a desired course of action. Surprising is the comparatively lower percentage of metapropositional assertives like "explain" (371 occurrences) and "clarify" (25 occurrences), which would be expected to play a more important role in scientific news discourse (incidentally, these occurred rather infrequently even within the sub-corpus of science, health, and medicine articles, where "explain" occurs 80 times with a normalised frequency of 0.21, and "clarify" appears only thrice).

Only 2% of the whole newspaper corpus is made up of interviews and Q&As. Such genres can be used to voice the opinions of experts and/or prominent personalities and are a more interactive, personalised way to provide the public with relevant information on a specific issue. However, newspapers in the corpus preferably use them to portray the life experiences of parents; in most cases (40%, mostly published between 1998 and 2005), the interviewees are parents of autistic children who blame the vaccine for their autism.

4.3.1.2. Mental verbs and reporting verbs in the Facebook corpus

The quantitative analysis of the Facebook corpus also shows that the mental verbs "think" and "believe" are particularly frequent, together with the activity verb "read". Similarly, the most frequent collocates of the verb "know" are the conjunction "if" and the adverb "how", showing that this mental verb is preferably used when discussing concepts, negotiating and debating their truth value, while certainty of knowledge is preferably expressed with epistemic certainty. From the analysis of their most frequent collocates and contexts of use, it can be gauged that the dialogic nature of Facebook comments is exploited by users to discuss the value of one's beliefs, thoughts, and the research that individuals carried out in order to reach such conclusions. This is what happens in the following exchange, where user 1's unhedged statement is challenged by user 2 demanding the source of their professed absolute knowledge[2]:

5. User 1: Vaccinations don't cause autism.
   User 2: How do you know that? I'm not confirming either way, I'd just like to know where you got your statement from? (*Daily Mail* 2016)

This insight is also confirmed by the numerous instances where the verbs "think" and "know" are used simultaneously in the structure SUBJECT + THINK + SUBJECT + KNOW, in recurring phrases such as "you think you know better than scientists", "pro/anti-vaxxers think they know better than anyone else", and "pro/anti-vaxxers think they know everything". Anti-vaxxers also often use the verb "believe" coupled with "everything" and "anything", in phrases like DON'T BELIEVE EVERYTHING + SUBJECT + TELLS YOU or YOU BELIEVE ANYTHING + SUBJECT + TELLS YOU, in an attempt to underscore their supposed independence from mainstream thinking. Moreover, "vaccines" and "vaccinations" are very frequent objects of the verb "believe", in phrases like "believe in vaccines" or "believe in vaccinations". This usage arguably betrays a conceptualisation of vaccines as something people must have faith in, which may adumbrate the importance of evidence and rigorous scientific testing as the basis for "believing" or "trusting" science.

Finally, the collocates of the verb "read" reveal the main sources of information mentioned by the commenters, namely: "article", "research", and "study", pointing to scientific publications; "insert", which is part of a discourse about patient information leaflets accompanying drugs and vaccines; and "comment/s", testifying to the common cross-references to other users' comments posted in the same thread, which co-exist with external sources. Most importantly, these occurrences express the importance attributed to evidence and sourced statements by participants in the discourse.

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2 Facebook comments are here reproduced in their original form, maintaining the occasional spelling and grammar mistakes.

Indeed, both anti- and pro-vaccination commenters insist that their opposers provide sources for their claims, or appear anxious to back up their own assertions through evidence. Thanks to the affordances of computer-mediated-communication (CMC), this evidence is often referenced to in the form of hyperlinks pointing to content existing outside of the social media platform. This is arguably another aspect of polyphony, as hyperlinks can be used to display sources and to quote (see for example Myers 2010: 114-128; De Maeyer 2014).

Oftentimes, the discussion focuses on the perceived reliability and authoritativeness of such research. However, it can also be argued that the perceived reliability of these alternative sources of knowledge is actually based on and expressed through emotive appeals. See, for example, the following exchange:

6. User 1: Have you watched either of the two VAXXED films. Are you better qualified than the leading edge doctors and scientists that support its sentiments? Can you disprove their safety issues around vaccine. You haven't watched them So Who is crazy? Who's a crazy brain? Are you one That does everything the government tells you to do? […] You know more than Professor Chris Exely's 25 years of research on aluminium's autoimmune destruction ability?
   User 2: oh wow, you think the crackpots in Vaxxed are "leading edge doctors and scientists"? And that they have "irrefutable evidence"?
   User 1: Your research? Your evidence? Please post your evidence? […] Now spend time reading. Professor Chris Exely's works.
   User 2: I will post some of the thousands of studies proving the safety and efficacy of vaccines tomorrow. Why you can't find them yourself is beyond me.
   User 1: I cant because there isn't any safety studies on vaccine I look forward to it There is just pharmaceutical dogma I have no agenda, I am just interested in truth.
   User 3: You lose all credibility (if any existed) if you are A) basing anything on Wakefield and B) basing anything on this joke movie. (*Guardian* 2019)

In this example, users are not discussing the actual available evidence on vaccine safety, but rather the reliability of their sources and the nature of their evidence. The discussion escalates very quickly, with accumulation of questions and lexical choices (such as «crazy» and «crackpot») clearly modelling a heated and sometimes aggressive debate.

The authoritativeness and reliability of specific organizations is also questioned in some texts in the corpus. Such examples are often indicative of conspiratorial thinking whereby official sources of knowledge and public health policies are suspected of corruption and cover-ups, as in the following comment from the Facebook corpus:

7. The CDC engaged in a cover up and this has been proven in public documents, brave doctors like Wakefield step up and speak the truth, and people that have not done their own research regurgitate the Western medical establishment's doctrine and call him and those like him quacks and call people like me "anti-vaxxers" and "whack jobs" because we dare to question bogus science bought and paid for by Big Pharma. (*Guardian* 2016)

In this example, the CDC (Center for Disease Control and Prevention) is accused of covering up adverse vaccine effects, and this accusation is expressed with a high degree of certainty mentioning alleged proofs published in public documents (not otherwise specified or linked to). Consequently, Andrew Wakefield is presented as a brave whistleblower challenging the «medical establishment's doctrine». The same framing applies to people believing him, who «dare» to question official science, which is considered «bogus» because funded by «Big Pharma». However, other instances in the corpus point to the fact that the CDC itself is used as a source by commenters to back up their claims. See, for example, the following exchange:

8. User 1: you might want to look into Dr. Chris Exley's research with Aluminum and levels in dementia and Autism. […] How much Aluminum is being injected into healthy babies in the pursuit of the infamous "herd immunity" which is a proven myth […] Good luck with your vaccines.
   User 2: Dr. Chris Exley? Too bad the CDC doesn't agree with your or his conclusions. He is positively looney in his conclusions. Maybe that's why he gets laughed out of serious scientific circles?
   User 1: Yawn. Trite ad hominem. (*Guardian* 2018)

Examples 7 and 8 testify to the fact that the same sources can be mentioned by anti- and pro-vaccinators alike, but with a different perceived authority and truth value. In example 8, the CDC is portrayed by user 2 as an authoritative source representing scientific consensus to discredit anti-vaccine views, and more specifically Dr. Exley's research; however, this does not produce any effect on the other participant, who in turn dismisses this argumentation as an «ad-hominem» accusation. In this rhetorical strategy, the speaker attacks the character, motive, or some other attribute of the person making an argument rather than attacking the substance of the argument itself. For this reason, it is often considered a logical fallacy. It could be argued that user 2 was not in fact trying to attack Chris Exley's character or motives, but was rather highlighting the fact that his research is not supported and has been discredited by authoritative organizations in the medico-scientific field. However, communication fails, probably because he employs disparaging language and judgements, including the adjective «looney».

This inefficiency in communication style is also noted by other authors in the corpus, who also point out that in fact many people who oppose vaccination

have done research, read a lot, and sincerely believe that they are informed. The problem is, again, the reliability of their sources of information:

9. These people are not irrational: they operate within their own internal rationality. They are not ignorant: […] they typically make their decision based upon a mound of books and source material. (*Times* editorial 2013)
10. It's so much easier to be snarky, or to immediately shut detractors down. But most anti-vaxxers do not start out as outright science deniers. They become more polarized and fall into the trap of profiteers when they seek confirmation from echo chambers after their fears are dismissed and ridiculed. (*Guardian* opinion article, 2019)
11. A number of the anti-vaxxer vanguard may have started life as concerned parents, but have gradually sunk into increasingly extreme positions because the only communication they're getting from the other side is that they're foolish and irresponsible. […] we call them idiots and chancers, we denounce their beliefs – and then we wonder why they're not coming around to our way of thinking. (*Guardian* opinion article, 2019)

This reasoning is closely connected to the topic of identity labels in the anti-vaccination debate, which is dealt with in Section 4.3.3. in this Chapter.

4.3.2. Representational strategies

The ways in which individuals and/or groups of people are represented in language can be explored through a realm of semiotic choices that are referred to as «representational strategies» (see, for example: Fowler 1991, Van Djik 1991, Fairclough 2001). Such strategies may reveal the way identities are constructed, people are classified, and sets of ideas are represented, in this case allowing to unpack the strategies of de-legitimisation of sources of knowledge or actors in the debate. An inventory of categories and strategies which can be used by writers to characterise social actors was developed by Van Leeuwen (1996), including:

- Personalisation vs. impersonalisation: refer to the ways a participant can be personalised (e.g., "Dr Simon Murch") or impersonalised (e.g., "researchers from the Royal Free Hospital").
- Individualisation vs. collectivisation: analyse the ways people can be characterised as individuals or as parts of a community (e.g., "family doctors" vs. "Dr Mark Porter, father of two daughters").
- Specification vs. genericisation: the former refers to participants described as specific individuals, while the latter refers to participants characterised as belonging to a generic type (e.g., "Jackie Fletcher, a mother of an autistic boy", vs. "an anti-vaccination activist").
- Nominalisation vs. functionalisation: the former includes all instances when participants are nominated in terms of who they are, while the latter

describes the instances when they are depicted in terms of what they do (e.g., "Tony Blair" vs. "the Prime Minister").
- Functional honorifics, such as "Professor", "Doctor", "Minister", i.e., terms that reflect a person's role coupled with their social status.
- Objectivation: occurs when participants are represented through a feature, for example, "a ball of fun" for a baby.
- Anonymisation: describes instances where participants are obscured, for example using phrases such as "according to a source". Arguably, this also occurs when research, studies, and evidence are personalised and their authors obscured, in phrases like "according to research" or "a recent study says".
- Aggregation: occurs when participants are quantified and/or discursively reproduced as statistics, as in "many thousands of children".

Social actors can also be profiled according to the actions that they carry out in a corpus of texts, including mental verbs (such as "think" or "believe") and reporting verbs (such as "say" and "claim").

4.3.2.1. Andrew Wakefield

In the early articles in the corpus, the noun phrase "Andrew Wakefield" is frequently preceded by functional honorifics; among these, "Dr/doctor" and "gastroenterologist" are prominent. However, after he was stripped of his medical license, these were modified by the adjectives "former", "discredited", and "disgraced", or substituted by "Mr", which avoids functionalisation. Honorifics are an important way of describing – framing – social actors because they can be used to enhance a person's level of authority; conversely, their removal strategically diminishes it. More specifically, Andrew Wakefield's authority as a medical professional can be linguistically lessened by substituting the honorific "Doctor" with "Mr", with reference to his removal from the British medical register. His statements can be thus newly framed as views held by a nominalised individual, rather than by a collectivised profession.

Indeed, Wakefield's studies are frequently described as "controversial" and accompanied by reporting verbs such as "claim" and "suggest", which highlight the debate they generated. Both are non-factive glossing verbs that can be used by writers to distance themselves from the reported propositions, thus further undermining Wakefield's credibility.

Although the main discourses about Andrew Wakefield in the whole corpus point to this negative semantic prosody, it is true that some readers' letters as well as some early editorials exploit individualisation and personalisation to describe him as a hero, a lone voice braving the censorship of the scientific and political establishment, who deliberately hamper his studies and undermine his credibility by silencing him and stripping him of his licence. His distance from the rest of the medical community is thus portrayed as a sign of bravery and

excellence, used to further discredit other doctors' practices and messages, and to endorse conspiratorial beliefs about powerful forces (governments colluded with pharmaceutical companies) protecting their interests regardless of children's health. See the following examples:

12. The complaints against Wakefield are parts of an attempt to discredit this body of research, and so place beyond question the Government's vaccination policy, and undermine the children's claim for legal aid. (*Daily Telegraph* letter, 2004)
13. The case has the whiff about it of a medieval inquisition, called to defend the orthodoxy of the establishment against the heresy of an independent mind. Dr Wakefield's "crime" was to open an important debate that remains unresolved. (*Daily Mail* comment, 2006)

Andrew Wakefield himself reinforced this framing in the articles he authored:

14. The clinical issue autism, bowel disease, and possible links with MMR is a relatively simple story that has become obscured by layers of a personal, political, financial and other imperatives that threaten to subvert the issue of how to help these children. (*Daily Mail* 2002)

4.3.2.2. Experts, scientists, and researchers

The quantitative analysis of the texts in the corpus showed that the lemmas "expert" (frequency: 1508, standardised frequency 0.88), "scientist" (frequency: 1036, standardised frequency: 0.61), and "researcher" (frequency: 734, standardised frequency: 0.43) frequently collocate with nouns, adjectives, and quantifiers such as "group", "set", "panel", "some", "other", "many", "most", "no". They are the subjects of reporting and mental verbs, coupled with other lexical items belonging to the same semantic areas, such as "say", "evidence", "opinion", "view", "warn", "believe", "fear" (verb), "parents" (the objects of experts' speech acts), "find", "claim". Additionally, nouns and adjectives specifying the experts', scientists', and researchers' areas of expertise are also frequently used in their vicinity, such as "health", "medical", "autism", "vaccine/s", "immunisation", "childhood", "child/ren", "measles", "MMR". Other common collocates include nouns and adjectives further qualifying them: "leading", "public", "independent", "government", "university".

The first group of collocates, including nouns, adjectives, and quantifiers, is frequently used to signal collectivisation, whereby writers try to enhance the credibility of the stance expressed by highlighting the fact that it is maintained by a large number of professionals ("a group", "a panel", "by many", "by most"). "No" is also similarly used to isolate Andrew Wakefield and thus discredit his studies:

15. No researchers have been able to replicate Wakefield's results in the Lancet study. (*Sunday Times*, 2009)

However, some of these collocates are used to imply discrepancies among the profession by representing an ongoing debate, especially when coupled with glossing and mental verbs, as in the following:

16. The researchers at Guy's and St Thomas' hospitals in London believe some of the increase they found is due to better awareness of autism disorders and improved diagnosis. Other experts claim, however, that the rise is linked with other possible factors including diet, vaccines, and the exposure to pesticides. (*Daily Mail* 2006)
17. Wakefield had argued that giving the vaccines separately, at intervals of at least a few weeks, would lessen the impact on the immune system. Other scientists disputed the claim, pointing out that children are frequently infected with more than one virus at a time, without suffering permanent damage. (*Independent* health article, 2010)

Once again it must be noted how the positions held by scientists and researchers are framed as speech acts or mental activities, without expanding or sourcing the evidence on which they are based. The audience is therefore often asked to take sides on the basis of these social actors' perceived authority and the public's trust towards the profession.

4.3.2.3. The Government

The noun "government" can be used in the corpus either to refer to the State or to pre-modify the nouns "experts" and "scientists". Examples 18-20 testify to this second usage:

18. Government scientists and the Department of Health dismissed his [Wakefield's] findings as flawed and insisted the MMR jab was safe. […] But now experts at New York University School of Medicine have reported the first independent corroboration of the findings that first sparked concern. (*Daily Mail* 2002)
19. How can we trust the Government experts? […] It was the experts who were wrong about the BSE, and who were wrong about foot-and-mouth. How can we believe what they say about MMR and our children? (*Daily Mirror* 2002)
20. Government experts insist that there is no link between MMR and autism. But many parents have refused to let their children have the triple vaccination. (*Daily Mirror* 2003)

In example 18, scientists working for the government are pitted against «independent» experts whose results are deemed more reliable, while example 20 further fuels the opposition between experts and parents. In both examples the reporting verb «insist» is used; following Caldas-Coulthard (1994), this is a metapropositional expressive conveying urgency, persistence, and possibly peremptoriness. Example 19 highlights how the BSE health scare, that was

managed poorly by the British government (as discussed in Section 1.1.2.6. in Chapter 1), now negatively primes the audience's responses, making them more likely to distrust official authorities. See also the following:

21. In a post-BSE society, […] the public are bound to be suspicious of Government reassurances […]. (*Independent* leading article, 1999)
22. While most of us cannot remember the last measles outbreak, we can remember the last time a government repeatedly reassured us that there was no evidence of a link between a frightening disease and a suspect agent. That was during the BSE crisis when there was no link between eating beef and new variant CJD. Until suddenly there was. (*Sunday Times* comment, 2001)
23. Many, perhaps mindful of the fact that government scientific assurances had proved wanting over BSE and CJD, chose to believe Dr Wakefield. (*Sunday Times* leading article, 2004)

Of note are, in this case: the expression «chose to believe» in example 23, where an anti-vaccination claim is framed as a mental activity, as a conscious choice justified by a feeling of distrust of the government rather than on scientific data; and the fact that the expressivity of the reporting verb «reassure» and its corresponding noun «assurances» is consistently undermined and negated in context.

A second episode involving issues of evidence and trust in the government is the debate surrounding Leo Blair's vaccination status. In early 2001, while the level of MMR immunisation in the UK was dropping sharply, the then Prime Minister Tony Blair and his wife Cherie were asked to disclose whether their son Leo had received it. According to many, such a disclosure would have boosted the public's confidence in the triple vaccine, providing further evidence of the vaccine's safety. Tony and Cherie Blair refused, advocating for their right to privacy. This refusal exacerbated the debate and was widely covered in UK newspapers, both in news articles and opinion pieces. Many people believed that the then Prime Minister was trying to hide the fact that his son Leo had not been immunised (also given Cherie Blair's notorious penchant for alternative medicine and natural remedies). Moreover, many people felt that if they really had decided not to have their child vaccinated, they must have done so because they had had access to scientific evidence that had not been disclosed (Stöckl and Smajdor 2017). These people started to distrust both the Government and its recommended vaccination policy:

24. The fact is that the Government and medical establishment themselves have exacerbated this crisis. And it certainly doesn't help when Tony Blair won't give a straight answer over whether baby Leo has had the jab […] And what of the politicians, with their reputation for dissimulation and deceit? Not surprisingly, the public has little faith in them either. Yet these are the same politicians who are now trying to demonise the media for

articulating the quite legitimate concerns felt by millions of Britons. (*Daily Mail* leading article, 2002)

25. Tony Blair must urgently square up to his responsibilities. His mulish refusal to disclose his own decision over baby Leo has compounded public doubt. (*Observer* comment, 2002)

During one of his public speeches, Tony Blair addressed these criticisms by trying to defend the government's vaccination programme and his decision not to disclose his son Leo's vaccination status at the same time. His statement, reported verbatim by thirteen different articles in the corpus, was the following:

26. It is not true that we believe the MMR vaccine to be dangerous or believe that it is better to have separate injections, as has been maliciously suggested in the press.

In this sentence, the then Prime Minister defends himself from the attacks of an otherwise unspecified «press» by listing the «malicious suggestions» that have been made against him and claiming that they are «not true». What makes these occurrences particularly interesting is the fact that they effectively repeat anti-vaccination claims by denying them. This type of implicit polyphony may explain, at least partially, why debunking scientifically incorrect information by countering it with facts often backfires, making the original misinformation more memorable by repetition (as was found by numerous studies in psychology, see for example: Lewandowsky et al. 2012; Ecker, Hogan and Lewandowsky 2017). Indeed, from a strictly linguistic point of view, correcting or disproving a claim through negation is an operation of implicit polyphony which effectively repeats the refuted point of view, thus (inadvertently) making it more familiar for the audience. This effect may however be reduced if the initial refuted claim is sourced, thus ascribing it to one identifiable voice, and if the reasons for the refuting are made known, because these operations reduce the effect of implicit polyphony and enhance that of overt argumentation. None of these, however, are present in Mr Blair's speech as was reported in the general press.

In December 2001, Tony Blair eventually admitted to the newspapers that his son Leo had, in fact, been vaccinated – but according to many commentators, this statement was long overdue (Stöckl and Smajdor 2017). Surely, this controversy within the controversy once again testified to the ease with which the issue of the MMR vaccine was personalised in the press, as well as to the audience's keen interest in these personal stories.

4.3.2.4. Representational strategies: concluding remarks

Two conflicting tendencies emerge when analysing the representational strategies of social actors in the present corpus: one pointing towards impersonalisation, collectivisation, functionalisation and aggregation arguably used to confer official authority, to the detriment of emotive participation; the other, opposing tendency points towards personalisation, individualisation, and nominalisation

used to highlight emotional involvement. It can be argued that, when talking about diseases and medical procedures affecting the body (especially of young and vulnerable patients), emotional involvement confers a certain degree of credibility and authority in itself: parents' stories are credible and authoritative because they are based on experience; lone doctors who listen to them are credible and authoritative because they care. Therefore, it is not always easy to ascertain whether impersonalisation is used to legitimise or to undermine a claim, and what is more, a superficial endorsement may effectively disguise an implicit undermining.

It could be hypothesised that these strategies are often left open for the reader to interpret according to their pre-existing frames and ideological squaring: if they trust scientists, experts, doctors and the professional categories they represent, then functionalisation and aggregation strategies will have the effect of endorsing their statements; however, if they suspect their motives and are inclined to conspiratorial thinking, they may interpret these as "de-humanising" strategies.

The use of reporting verbs to accompany the participants' statements does not help, either, because they appear involved in the same communication activities, framed using largely the same glossing verbs, thus effectively constructing a debate where each view is equally legitimate, irrespective of the amount of scientific evidence available to support it. Indeed, argumentation relying on personal involvement with the issue and pre-existing (ideological) frames appears to be rarely problematised in the present corpus.

4.3.3. Negotiating "Anti-vaxxer" and "Pro-vaxxer" as identity labels

4.3.3.1. The newspaper corpus

Many authors in the corpus discuss anti-vaccinators as a homogenous category, trying to identify and predict its features. Most do so by connecting them with their social class. More specifically, commentators in the corpus identify them with the middle classes, as in:

27. [A] growing number of middle-class families disbelieve government and collective medical advice that the MMR vaccine is safe. (*Observer* comment, 2004)
28. Theoretically, it should be harder to persuade parents from lower socio-economic groups to bring their children for vaccination. This is not the case. The bad parents come from the over-educated middle classes with access to the internet. (*Sunday Times* opinion, 2005)

These examples capitalise on the parameter of expectedness to reveal a set of assumptions about the middle classes, including their level of education and their attitude towards healthcare, medicine, and parenting. Most importantly, though, they also reveal a set of assumptions about anti-vaccinators: for instance, it is evident from example 28 that the educated middle-classes do not fit the pre-existing stereotype of uneducated people entertaining anti-vaccine ideas.

Further stereotypes, or expectations, concern the political affiliations of the people refusing the vaccine. Some authors seem convinced that they typically belong to the (far) right (example 30); on the contrary, other authors blame the political left (example 31); and others still describe a more nuanced picture including people from the left as well as from the right political spectrum (examples 29, 32, 33):

29. Zero-dosers are sceptical and anti-authoritarian, either from a right-wing small-state perspective ("The Government can keep its needles out of my kids") or a leftist anti-capitalist one ("Big Pharma likes to profit from people's panic"). They invoke Nature as an idyllic self-regulating state perverted by modern medicine. (*Times* editorial, 2013)
30. Right-wing Americans have finally exposed the true extent of their scientifically and socially illiterate barminess. (*Times* editorial, 2015)
31. Left-wing anti-vaxxers subscribe to breastfeed-until-three, homeopathic, gluten-free elevation of the pure and "natural" over the chemical and manufactured. They believe polio was cured not by mass vaccination but better sanitation. (*Times* editorial, 2018)
32. Vaccine hesitancy does not map neatly on to party affiliation. Alongside the Trump-following populists and the rightwing anti-establishment individualists are the left-leaning Mother Earth-lovers. These are people who worry about injecting their children with chemical compounds in the same way that they worry about pesticides in their food. (*Guardian* opinion, 2018)
33. It is curious how this movement takes in both left and right. (*Times* editorial, 2018)

Further comments on the anti-vaxxers' identity concern not only their level of education, but also their intelligence and their attitude towards (scientific) information. Some of them even resort to name calling and dysphemisms like «stupid» (example 34) and «idiots» (example 35; see also Section 3.4.3.2. in Chapter 3) to comment on the (perceived) cognitive capabilities of antivaxxers, who are here discussed as a homogenous category:

34. The fault lies with their remarkably stupid parents who believe that vaccination is a personal choice. (*Sunday Times* opinion, 2005)
35. One only has to stray into anti-vaxxer internet forums for a few minutes to see that they're stuffed with conspiracy theorists, opportunists, reactionaries, and – worst of all – hubristic idiots. This is the vanguard of the anti-vaxxer movement. (*Guardian* comment, 2019)

Unsurprisingly, other comments react to this negative description, exploiting polyphony, and negation in particular, to recall these statements and to refute them:

36. These mums are not reacting out of irrational ignorance. They are intelligent people who read about health issues. (*Sun* commentary, 2002)

Identifying the anti-vaxxers' typical profile seems important for the authors of the texts, especially in the sub-corpus of editorials and commentaries, for two main reasons. First, to describe a category which has acquired political

relevance throughout the years (one *Times* columnist wrote in 2018 that «now "anti-vaxxer" has become a powerful political identity»). Second, to devise adequate communication strategies to convince them to vaccinate, couching messages which appeal to their pre-existing ideologies and which are consonant and coherent with their mindsets. However, these identity labels are also subject to a high degree of negotiation, especially in dialogic and participatory genres like Facebook comments.

4.3.3.2. The Facebook corpus

One prominent result from the quantitative analysis of the Facebook corpus compared to the newspaper corpus is the higher frequency of the noun "anti-vaxxer", especially in its plural form. Conversely, its corresponding adjectives "anti-vaccination" or "anti-vaccine" are used equally or slightly more frequently in the newspaper corpus. The noun "pro-vaxxer" is never used in the newspaper corpus, while it occurs sporadically in the Facebook corpus. Its corresponding adjectives "pro-vaccine" and "pro-vaccination" are used slightly more frequently in the Facebook than in the newspaper corpus. These results are potentially significant because nouns can be used as identity labels to categorise sets of people sharing similar values and positions towards vaccination, whereas adjectives qualify these claims and not the people who adopt them; and studies have shown how social media can provide unique fora for the performances of identity (Koteyko and Hunt 2016).

Raw and normalised frequencies are reported in Table 14; Tables 15 and 16 show a selection of the most frequent collocates of "anti-vaxxer/s", "anti-vax", "anti-vaccine" and "anti-vaccination" both in the newspaper and the Facebook comments corpus.

	Newspaper corpus		**Facebook comments corpus**	
Phrase	**Raw frequency**	**Normalised frequency**	**Raw frequency**	**Normalised frequency**
Anti-vaxxer	107	0.06	152	0.16
Anti-vaxxers	119	0.07	567	0.61
Anti-vaccine	288	0.16	148	0.16
Anti-vaccination	195	0.11	67	0.07
Pro-vaxxer	0	0	5	0.005
Pro-vaxxers	0	0	29	0.03
Pro-vaccine	22	0.01	52	0.05
Pro-vaccination	6	0.003	24	0.02

Table 14. Raw and normalised frequencies of the phrases: anti-vaxxer/s, anti-vaccine, anti-vaccination; pro-vaxxer/s, pro-vaccine, pro-vaccination.

Most frequent collocates of *anti-vaxxer*	
Newspaper corpus	**Facebook comments corpus**
Disgraced	Not
Wakefield	But
Andrew	No
Movement	Disgraced
Spread	Wakefield
Prominent	Andrew
Warning	Propaganda
Said	Movement
Myths	Would
Medical	Found
Media	YouTube
May	Vaccines
Leader	Vaccination
Expert	Trump
Doctor	Surge
Curse	Spread
Challenge	Parents
Most frequent collocates of *anti-vaxxers*	
Newspaper corpus	**Facebook comments corpus**
Called	You
Parents	All
Committed	Because
Known	They
Spread	Like
Movement	Can
Children	Will
Can	Think
Believed	Stupid
Backed	Most
Want	Should
Wakefield	Children
Threat	Want
Tells	Problem
Social	Believe
Selfish	Thanks
Read	Stop
Myths	Risk
Media	Kids

Andrew	Claim
	Rise
	Flat
	Dangerous
Most frequent collocates of *anti-vax*	
Newspaper corpus	**Facebook comments corpus**
Movement	Movement
Parents	Mother
Campaign	Warns
Campaigners	Not
Propaganda	Parents
Father	People
Conspiracy	Nightmare
Called	Propaganda
Stupidity	But
Selfish	Whooping
Position	Memes
Mums	Cough
Measles	Conspiracy
Content	Comments
Conspiracies	Typical
Consequences	Stupid
Blamed	Nonsense

Table 15. Most frequent collocates of: anti-vaxxer/s, anti-vax in the newspaper corpus and in the corpus of Facebook comments.

Most frequent collocates of antivaccine	
Newspaper corpus	**Facebook comments corpus**
Movement	People
Campaigners	Movement
Groups	Pro
Activists	Because
Propaganda	Doctor
Sentiment	All
Rise	Another
Movements	Paper
Film	Messages
Content	Foul
Want	Fall

Spark	Effects
Theories	Crowd
Said	Theories
Lobby	
Dangerous	
Most frequent collocates of antivaccination	
Newspaper corpus	**Facebook comments corpus**
Movement	Movement
Documentary	People
Campaigners	Needless
Film	Pro
Campaigns	Documentary
Parents	Many
Myth	Controversial
Groups	Web
Spread	Sites
++Propaganda	Parents
Controversial	Morons
Spreading	Idiots
Myths	
Health	
Russian	
Group	
Condemned	

Table 16. Most frequent collocates of: anti-vaccine and anti-vaccination in the newspaper corpus and in the corpus of Facebook comments.

The dialogic nature of Facebook comments enables users to discuss and negotiate the pragmatic meaning of these identity labels. This is why polyphonic markers such as "not" and "but" are to be found in recurring phrases such as «I'm not an anti-vaxxer» and «I'm not an anti-vaxxer, but …», as in the following examples:

37. For the record […], I am not an Anti-Vaxxer … I am Pro-Choice, I believe in Vaccinations, but, believe in giving the right types of vaccinations … the current vaccinations given are not only controversial but immoral. (*Guardian* 2018)
38. I'm not an anti-vaxxer, but vaccines can be harmful (hence the "Vaccine Damage Payments" people can claim from the govt). (*Guardian* 2019)
39. I'm not an anti-vaxxer but a mother of a beautiful daughter who is still suffering from an adverse reaction receiving the HPV Gardasil vaccine in high school. My families situation is also terrible and sad. Two sides to

the vaccine situation, just depends whether you've been affected. (*Daily Mail* 2019)

In examples 37-39, users try to shift the pragmatic value of their claims by couching them in seemingly more rational terms. Significantly, though, user in example 37 does so using the mental verb «believe» to profess their faith in «the right types of vaccination», without further specifying. Furthermore, they say that current vaccines are «immoral», thus anchoring their argumentation in a mixture of religious and cultural values, rather than in scientific facts. Example 39 reveals the argumentative salience of personal experience with vaccination and/or illness.

Many instances of occurrence of the labels "pro-vaccine", "pro-vaccination", and "pro-vaxxer" actually convey a similar meaning and are accompanied by polyphonic markers such as "but" and "however". See, for example, the following:

40. User 1: I'm pro-vaccination, but in a world in which we don't know everything, surely "unsure" is a perfectly acceptable answer? (*Guardian* 2018)
41. Dr. Wakefield […] is not ANTI-vaccine. Not at all. He is pro-vaccine. However, there are some serious limitations of safety studies on vaccines in the USA. He is one of many, pro-Science, highly educated people that feel that there needs to be more research done in this area, especially on generic factors that make one susceptible to immune system overreaction. (*Guardian* 2019)

These examples are reminiscent of one characteristic that was identified by Offit (2011) as being typical of contemporary anti-vaccination movements, namely the reluctance of being labelled as such. While comparing past and present anti-vaccination movements, he writes:

> Protesters in nineteenth-century England had no trouble labeling themselves anti-vaccine. Indeed, most organized anti-vaccine groups included the word *anti-vaccination* in their names. Today, however, anti-vaccine activists go out of their way to claim that they are not anti-vaccine; they're pro-vaccine. They just want vaccines to be safer. This is a much softer, less radical, more tolerable message, allowing them greater access to the media. However, because anti-vaccine activists today define *safe* as free from side effects such as autism, learning disabilities, attention deficit disorder, multiple sclerosis, diabetes, strokes, heart attacks, and blood clots – conditions that aren't caused by vaccines – safer vaccines, using their definition, can never be made. (Offit 2011: 122)

The plural noun "pro-vaxxers", on the other hand, seems to be used chiefly by anti-vaxxers to talk about what they perceive as an antagonistic group, as in:

42. According to my experience pro-vaxxers don't like to think or do research. It's much easier for them to blindly trust doctors (as if doctors are gods who never make mistakes). This conversation is useless. (*Daily Mail* 2019)

43. It's upsetting to see how pro-vaxxers think they're so much smarter than the anti-vaxxers. (*Guardian* 2019)
44. hey pro-vaxxers … you are brainwashed morons … lead to the slaughter. (*Daily Mail* 2019)

Each of these comments exploits the contrast between US and THEM; in this case, the in-group is made of anti-vaxxers and the out-group is constituted by pro-vaxxers. This opposition is functional to attack the interlocutors' intelligence. However, the same strategy is adopted by supporters of vaccination, too:

45. User 1: Babies & children are dying .. After being vaccinated ..
    User 2: No. They are not. But there is no point telling you that because you are stupid.

Indeed, it seems legit to say that the discourse of Facebook comments differs from the discourse of newspaper articles – and letters in particular – precisely because of the higher degree of interaction and connection allowed by the social media, which enables users to negotiate meanings, to argue their points and to interact with one another. Nevertheless, it also seems that most of the exchanges do not reach the conclusion stage and easily descend into name-calling (this is probably what prompted user in example 42 to write that the conversation was «useless»). This could be explained by noting that in recent times, the nouns "pro-vaxxer(s)" and "anti-vaxxer(s)" have become identity labels applied to numerous, organised, homogenous groups with cultural, social, and political relevance. People recognise themselves as belonging to one or the other, have expectations regarding the personal, cultural, and social profiles of the people they identify as anti- or pro-vaxxers. Therefore, they openly and publicly discuss their identity, rather than vaccination research (on the other hand, Section 5.4.1. in Chapter 5 describes how autistic people may exploit Facebook comments in order to re-define and re-negotiate their own identity in the face of discriminatory comments by neurotypical users).

4.4. Public health authorities and policies during the Covid-19 pandemic

4.4.1. Conspiracy theories

Conspiracy theories (CTs) include claims that pharmaceutical companies, governments, and the medical community willingly implement dangerous vaccinations, thus consciously risking the life of their patients, exclusively for financial and/or political gain. These accusations bring vaccine hesitancy one step further, as they are not only concerned with scepticism towards the science of vaccines, but also, and most importantly, with mistrust of the scientific and political establishment. These conspiratorial beliefs have a long history and are not strictly a twenty-first century phenomenon: suggestions of wilful

cover-ups and mistrust of the elites were already expressed by anti-vaccinators in Victorian England and have accompanied scientific/medical controversies through the centuries. At the height of the MMR vaccine debate, too, were journalists and readers often sceptical of big pharmaceutical companies and especially of the Government. Many suspected that official authorities were suppressing Wakefield's research into the connection between the MMR vaccine and autism in order to safeguard their mass vaccination programme. Traditional newspapers sometimes blamed the Internet and social media for the spreading of CTs, but in fact "mainstream media" also contributed to the creation of a discourse of suspicion and mistrust of the establishment. They did so by couching these allegations in seemingly more rational, and therefore acceptable, terms: for example, by preferring the phrase "cover up" over "conspiracy" and by generally framing it as legitimate, even intelligent and independent, questioning (Fiammenghi 2022). However, it is true that vocal conspiracy theorists have found ample space online, where to freely share their views in more overt and extreme terms.

CTs during the new coronavirus pandemic found fertile ground to grow and spread, both offline and online, and they mainly concerned the origin of the virus: scientists were accused of having manufactured it in the laboratory, and then of having wilfully spread it all over the world. Many CTs also accused China of having created and spread the virus in order to destroy European and American economies (Hartman et al. 2021). Alternatively, suspicions were raised over the pharmaceutical industry developing vaccines and medical treatments, once again seen as a source of profit for them. What is striking is the increasing importance these theories have gained in public discourse and the legitimation they have received from central public and political figures, such as the former USA President Donald Trump, who consistently referred to the new coronavirus as the "Chinese virus" in his tweets. For example, on 28th May 2020 he tweeted: «All over the World the CoronaVirus, a very bad "gift" from China, marches on. Not good!». He thus fomented anti-Asian sentiments throughout his country and legitimated beliefs in CTs about the origins of the virus (Hswen et al. 2021).

4.4.2. Vaccination mandates

Compulsory vaccination is a central concept which, however, is often unrelated – or only loosely related – to the science of vaccines and to beliefs in their safety and effectiveness: more often it is entrenched in political positions and concepts such as state regulation and self-determination. For this reason, it is also a deeply cultural concept whose analysis varies from country to country. The MMR vaccine-autism controversy showed that many UK citizens were contrary to top-down immunisation campaigns imposed by the state, often betraying a more general mistrust of the Government itself.

During the Covid-19 pandemic, the matter has become even more pressing due to the introduction of "Covid vaccination certificates" used to testify one's own vaccination status in order to be able to continue working, and to gain the right to access certain places (like restaurants, theatres, and cinemas) and events (such as concerts and exhibitions). These certificates were welcomed favourably by some parts of the population, who agreed on their usefulness, mainly in order to avoid lockdowns and quarantines which are very damaging for both the economy, education, and people's mental health. However, their introduction and implementation were also heavily criticised, with protests sparking across Europe. In many cases, populist and nationalist tendencies were aggregated with such protests, once again rallying against an alleged tyranny of the State (see for example: Bieber 2020, Vieten 2020, Williams, Kestenbaum and Meier 2020). Andrew Wakefield himself publicly took a stand against Covid-19 vaccination mandates during the early days of the Covid-19 pandemic, from the USA, where he attended a tele-conference. He stated: «One of the main tenets of the marketing of mandatory vaccination has been fear. And never have we seen fear exploited in the way that we do now with the coronavirus infection […] We are seeing a destruction of the economy, a destruction of people and families … and unprecedented violations of health freedom […] And it's all based upon a fallacy» (Jamison 2020).

The emergence of these movements possibly testifies to the increased political importance that this kind of anti-scientific and anti-establishment claims have acquired, especially because these are not fringe movements, but have the attention of the media and of politicians alike, who interpret them as the direct expression of the sentiments of a non-negligible part of the electorate.

Chapter 5
Argumentative storytelling in vaccination debates

5.1. Literature review

The nouns "narrative" and "story" are often used interchangeably and can be considered synonyms in everyday language. However, some dictionary definitions highlight the significance of narratives as sense-making as well as argumentative devices; for example, the Oxford English Dictionary (OED) defines the noun "narrative" as «an account of a series of events, facts, etc., given in order and with the establishing of connections between them» ("narrative", n., OED).

The study of storytelling in sociolinguistics has a long tradition, going back to the work of Labov (1972). Labov defined narratives as «methods of recapitulating past experience by matching a verbal sequence of clauses to the sequence of events which actually occurred» (Labov 1972: 359-360). This definition is taken up by Greenhalgh, who explicitly discusses the relevance of narratives for public health and talks about «accounts with a beginning, a series of unfolding events and an ending [putting] characters, events, actions, and context together so as to make sense of them, and generally [following] a recognizable form and pattern» (Greenhalgh 2016: 3). According to Labov, this recognizable form consists essentially of a series of temporally related clauses. He distinguishes between minimal narratives, which contain a single temporal juncture, and fully-formed narratives, for which he identifies six main components. These are: abstract, orientation, complicating action, evaluation, result or resolution, and coda (Labov 1972: 363).

Going one step further, it can also be said that narratives become meaningful often because this process of structuring events and actions in a sequence suggests causality. Quoting Greenhalgh again (2016: 7), they «enable people to look back and make their lives (and illnesses) meaningful by retrospectively structuring events and actions in a way that conveys perceived causality (X happened because of Y)». Moreover, narratives appeal to feelings and emotions, therefore they are evocative and memorable. Because of all these characteristics, storytelling has been said to play a role in both scientific communication and in public health (Bury 2001; Olson 2015; Zanola 2023).

However, when incorporating narratives into scientific communication it is arguably necessary to also assess their truth value. Denzin (1989: 25),

discussing biographies and autobiographies, contends that they are «fictional statements with varying degrees of "truth" about "real" lives». Expanding on this, Greenhalgh (2016: 3) states that even when they are based on real events, narratives «cannot be considered true nor objective in any simple sense», and prefers to talk about subjective or intersubjective narratives. She means that they may convey one person's version of events or they can connect and respond to the subjectivities of their public, thus being embodied in institutional and social practices. In any case, it seems safe to say that stories and narratives are generally perspectival, that is, they convey a particular perspective, rather than biased, that is, they are not often systematically nor intentionally distorted.

Moreover, storytelling can be employed as a tool for argumentation, designed to persuade the listener of the legitimacy of the narrator's perspective. Narratives can convince; however, they do so not thanks to their objective truth, but rather thanks to their likeness to real life and their emotional impact. This impact can also have an ethical dimension, so that those who hear or read such narratives incur in a duty to act (Greenhalgh 2016: 3-8).

Moreover, in argumentative storytelling, it is often the case that stories provide the relevant support, that is, the evidence, to back a claim. As Carranza put it, «among the main ways in which narrating and arguing combine are those in which the expression of an argumentative position calls for some evidence to back it up and make it acceptable» (Carranza 2015: 66). Argumentative narratives and their instantiation in the corpus under study are the focus of the present chapter.

5.1.2. Argumentative storytelling

Personal experiences where the first symptoms of autism occurred shortly after immunisation can be used to foster the hypothesis of a link between vaccines and autism. These may be countered by personal stories describing cases of children and patients affected by vaccine-preventable illnesses. What makes the first narratives unreliable is the fact that numerous scientific studies have proved that the link between vaccines and the onset of autism is coincidental. Similarly, what makes pro-vaccine narratives reliable is the fact that numerous scientific studies have proved that vaccines effectively prevent infectious diseases. Nevertheless, these elements are external to the narratives themselves, which maintain an internal coherence establishing temporal and causal connections between the retold events. This internal coherence is what makes them convincing and compelling.

The pragma-dialectical approach to argumentation (see, for example: Van Eemeren 2010) focusses on the notion of "reasonableness" to assess whether an argumentative procedure is valid and instrumental in resolving a difference of opinion. It thus belongs to the field of normative pragmatics, as it aims at understanding how various linguistic and non-linguistic factors play a part in the

process of accepting or rejecting a point of view in a rational way. Consequently, this approach sees argumentative narratives as fallacies; more precisely, it interprets them as instances of symptomatic argumentation leading to hasty generalisation. For example, Van Eemeren and Grootendorst (1987: 289) understand the following statement as fallacious: «The American medical system doesn't care what happens to the patient. I know of a man who was turned away by a hospital and then died», because it «[justifies] a general conclusion on the basis of an insufficient number of (nonrepresentative) observations».

Although this interpretation certainly holds true from a purely rational approach to argumentation, it fails to acknowledge the role played by individual knowledge and personal beliefs, which affect the participants' construal and assessment of events. Noting this, Carranza (1996: 4) states that «it is necessary to adopt a rhetorical and anthropological approach which links reasonableness to the knowledge and beliefs of particular people at a certain time and place», recognising how «it is relevant to examine argumentative-narrative texts with a view not only to describe the textual patterns but also reveal the speakers' attitudes, beliefs and values» (*ibidem*: 7-8) because «[p]ersonal stories with a high degree of argumentativeness […] can provide access to the storyteller's point of view on an aspect of the social order» (*ibidem*: 37).

To our knowledge, Carranza's approach is one of the few explicitly focussing on argumentative storytelling from a linguistic point of view. Her studies try to analyse the structure of narratives displaying a high degree of argumentativeness, often drawing on the classic works by Labov and Waletzky (1967) and Labov (1972; 1981). They also shed light on the way personal accounts are used to re-present ideologies as well as the individual, social, and cultural identities of storytellers (see, for example: Carranza 1999; 2010; 2015). The present analysis is directed at the structure of argumentative narratives as they emerge in the corpus – especially in readers' letters to the editor and Facebook comments – together with their significance in shaping public debate about vaccination.

5.2. Structure and characteristics of anti-vaccination and pro-vaccination narratives

5.2.1. Narrative structure

A closer linguistic analysis of the texts in which writers recount their personal experiences – either with vaccination or with the illnesses it protects against – reveals that most of them exploit a coherent and recurring structure. This structure largely adheres to that of a typical plot as identified by Labov (1972, see above) and it is similar for both anti-vaccination and pro-vaccination narratives (Fiammenghi 2021). Table 17 presents the main components of a conventional plot, with its corresponding typical anti-vaccine and pro-vaccine

realisations as they emerge from the analysis of the corpus, which will be illustrated in more detail in the following sections.

Typical plot	**Anti-vaccination narratives**	**Pro-vaccination narratives**
Initial situation, or orientation	A happy family with a healthy, typically developing child	A happy family with a healthy child
Complication: an event or action that creates difficulties	A vaccine injection, following which the child falls ill and their development is compromised	A vaccine-preventable disease, following which the patient is severely ill
Reaction	Parents become convinced that the vaccine caused their child's illness. They decide to bring their case to court and/or to set up anti-vaccine organisations in order to warn other families against vaccinations	Medical treatments are given to the patient. Parents try to warn other people against vaccine-preventable diseases and in favour of vaccinations
Resolution		A resolution is provided when the patient fully recovers. A partial resolution is provided when the patient recovers from the illness, but suffers permanent damage
Final situation, which may also include a moral evaluation of the story	A negative moral evaluation of the practice of vaccination and of the role played by doctors, pharmaceutical companies, and governments enforcing it	A positive moral evaluation of the practice of vaccination and/or a negative judgment of the people who decide not to vaccinate

Table 17. Typical story plot and its realisations in anti-vaccine and pro-vaccine stories.

The analysis of the texts in the corpus shows that there are important similarities and largely overlapping structural characteristics between anti- and pro-vaccination narratives, and both tend to follow conventional plot structures. However, there is one major difference between the former and the latter: anti-vaccination narratives tendentially do not reach the resolution stage. Indeed, a typical and full resolution of the complication allegedly originated by the vaccine is deemed impossible by anti-vaccination storytellers who blame the vaccine for having caused their child's autism, because autism is described as a life-long, incurable condition. The only possible, but partial reaction is presented in the form of legal action, aimed at obtaining financial compensation, and of anti-vaccination propaganda, aimed at "saving" other children from the damages of vaccination. Consequently, anti-vaccination stories can have a strong emotional impact, and the urgency with which they advocate for immediate action (vaccine-damage compensations programmes, the abolition of compulsory vaccination) appears very compelling.

Conversely, pro-vaccination narratives may present three different endings: they may relate painful episodes of diseases from which the patient nonetheless

recovered; they may recount cases of patients who suffered long-lasting damage following their illness; or they may narrate tragic cases where the patient died of a vaccine-preventable disease. Each of these endings has a different level of desirability but also a different level of emotional impact.

5.2.2. Causality and characters

Another important factor impacting the effectiveness of pro- and anti-vaccination narratives is the possibility of implying a firm cause-effect nexus. Indeed, the fact that a causal relationship between vaccines and autism is refuted by the scientific community is not directly relevant for the discursive construction of anti-vaccination narratives; rather, authors establish a temporal relationship between the two events which also suffices to imply causation. This is a formal logical fallacy, known as *post hoc ergo propter hoc*. It is easily embedded in narratives because episodes in a story typically unfold as a temporal sequence, connections between them being made by the readership based on common sense and on shared assumptions about the world. Indeed, according to Carranza (2015: 58), personal narratives build their argumentative reasoning based on a «chain of causality» seen as a key narrative element. This chain is built on «logical-rhetorical operations that, if evaluated from the point of view of a logician's syntax, would appear to be fallacies […] but are relevant argumentative moves serving the goals and constraints in the production context» (*ibidem:* 62). In turn, these logical operations are used to build «narrative plausibility» based on common sense (*ibidem:* 63).

A story also has different characters allowing the plot to unfold, generally corresponding to the protagonist(s) or positive hero(es), the villain(s), and the victim(s), who may be aided by one or more allies. Polyphony, or multi-voicedness, is usually the means through which these various characters contribute to the developing of the story and through which the audience gains access to their thoughts and points of view. In anti-vaccination stories it is often easy to identify precise characters in the story fulfilling specific roles: children are typically the main characters and the victims, while parents are usually co-protagonists and may be both victims and heroes. Their allies may be sympathetic doctors "fighting" against the establishment, who in turn is the evil antagonist, embodied either by members of the medical staff insisting on wanting children vaccinated, or the Government and politicians allegedly protecting the interests of pharmaceutical companies.

On the other hand, it is more difficult for pro-vaccination writers to conceive similar stories with such clear-cut, prototypical characters, and to stage an unequivocal, undeniable, unambiguous sequence of cause-effect. This is because of various factors having to do with both the reality of vaccination and the perception of illness and risk in (Western) societies. Indeed, infectious illnesses such as measles have become uncommon in Europe, their incidence having

been significantly reduced in the latest decades. Many scientists agree that this improvement was probably due to a combination of factors, including better life conditions and hygiene and widespread vaccination. As a result, there are fewer examples of such cases available to storytellers, and the illnesses themselves are less vivid in the collective memory. This is also why many talk about vaccines as being «victims of their own success» (see, among others, Offit 2011: 174).

Moreover, while vaccination is a physical act occurring at a precise point in time and space, it is almost always very difficult to pinpoint exactly when and where contagion happens. Although it is true that babies who are too young to be vaccinated (or are immunocompromised) may plausibly catch the disease from an unvaccinated child, for example while at the doctor's or at nursery school, the exact cause-effect chain is difficult to reconstruct precisely. Likewise, the process of infection is invisible to the naked eye and therefore more easily perceived as an abstract phenomenon, less easy to describe at length; the same cannot be said of the gesture of vaccination, of the needle piercing the skin, which can be painstakingly retold in a story. The analysis of the texts in the corpus suggests that all these factors arguably contribute to enhancing the argumentative potency of anti-vaccination narratives, at the same time lessening the persuasive effect of pro-vaccination ones.

5.3. Storytelling in the MMR vaccine-autism newspaper corpus

5.3.1. Storytelling in the 1994-1997 sub-corpus

Section 3.4.1. in Chapter 3 illustrated the sub-corpus of newspaper articles published before 1998 hinting at a possible future controversy surrounding the MMR vaccine. These articles also contained instances of argumentative storytelling. The following is an example of an anti-vaccination narrative published in the *Daily Mail* in 1997.

Summary containing:
- Initial situation
- Complication
- Reaction

When A.[1] was 10 months old I remember lifting him out of the bath, wrapping him in a big fluffy towel and trying to stop him jumping up and down from the excitement of bathtime. My husband, S., 33, a fighter pilot in the RAF, was on business abroad and I said to our chuckling son: "Daddy has gone flying." To my amazement he repeated the whole sentence back to me. It was the first time he'd done anything like that and I was delighted. It confirmed to me what a bright and bubbly little boy he was. The MMR vaccine was to change all that. Not only has it wrecked my marriage, it's taken away my sons and made my life hell. It's why I'm on a mission to warn other parents before their children end up like mine.

1 Full names are given in the original articles but here omitted for privacy issues.

Story proper: Orientation	[…] Like many mothers I thought vaccination was the right thing to do for your child. All the leaflets I'd read, and advice I'd been given by health workers and doctors, told how serious illnesses like rubella, measles, and mumps could be. The only side-effect they mentioned was a slight risk of the vaccinated child feeling groggy the next day. S. and I believed what we were told and decided A. should have his MMR jab as soon as he was a year old. We took him to a health clinic in W. […]
Complication	The day after the jab, A. developed a temperature and was a little woozy but after giving him some Calpol – a form of paracetamol which the doctor said "would work like a treat" – he was fine. A week later he came down with what I can only describe as a meningitis-like illness. I found him lying motionless in his bed, his face as white as a sheet, and he was unable to eat. He was sick over and over again and there was nothing I could do to stop him crying. The doctor came out and dismissed it as just a viral infection. In fact, it only lasted four days and then he was fine again. […] It was only after [our second son] N. was vaccinated, and developed identical meningitis-like symptoms a week after the jab, like his brother, that we realised something wasn't right. […] I think a mother instinctively knows when there is something wrong with her child and I was convinced all was not right. But when you're just one mother against the knowledge of the medical establishment, it can be hard to prove.
Reaction (Resolution)	It was only two years ago that the boys were diagnosed as autistic […]. There's no cure for autism, but since the boys visited Dr Andrew Wakefield at London's Royal Free Hospital last summer, their condition has improved. He is studying possible links between MMR vaccines and autism, Chron's disease and inflammatory bowel disease. […]
Evaluation (Reaction)	[I]t disturbs me to think how different their lives would have been if I hadn't said yes to vaccination. […] I feel my boys have been robbed of their chance in life. I've often crumpled into tears but recently I've been so determined to fight to get the potential dangers of MMR vaccination publicised that I've got to be strong to survive. I don't want anyone else to be in the same predicament as me.

In this story, various events taking place at different points in time are recounted. The causal link between them is never stated explicitly (and the author clarifies that Andrew Wakefield is still studying the possible causal connection between the MMR vaccine and autism); however, it is forcefully implied using temporal conjunctions and adverbs, as in «N. developed identical meningitis-like symptoms a week after the jab», used to build «narrative plausibility» (Carranza 2015: 63). Additionally, this apparently common-sense explanation is strengthened through the reference to motherly, natural instincts («I think a mother instinctively knows when there is something wrong with her child»), which are pitted against references from external, authoritative sources: «All the leaflets I'd read, and advice I'd been given by health workers and doctors». The fact that in 1997, when this specific story appeared in the *Daily Mail*, this hypothesis had still not been studied extensively, and therefore had not yet been scientifically refuted, makes the story appear even more plausible.

The following examples illustrate the case of two articles where anti- and pro-vaccination stories are juxtaposed. Both are featured articles discussing the plausibility and possible public health implications of the alleged link between the MMR vaccine and autism.

***Sunday Times*, 1997, Crying shame on the vaccination victims**

Pro-vaccination narrative	**Anti-vaccination narrative**
The dangers of failing to vaccinate against measles were starkly illustrated last week by the case of E. T., 15, from F., Surrey, who contracted the disease after her doctor advised against inoculation and was left with severe brain damage. […] But the helplessness of MMR's apparent victims may contribute to some parents' reluctance to agree to vaccination.	ORIENTATION: When W. was born, he was "perfect, bright as a button". COMPLICATION: Within a couple of weeks of his vaccination, at 15 months, he began head-banging and developed swollen glands. He spent whole nights shrieking. "The worst thing was, we started losing him", says his mother. "His speech and understanding diminished and as time went on it disappeared. We could see him leaving us and there was nothing we could do to bring him back." Her son is now classed as severely autistic and has Chron's disease, a chronic inflammation of the intestine. His illness has had a devastating effect on the family. For four years his mother was up every 90 minutes in the night. She eventually gave up her career as a business analyst. W., who attends a special school, cannot be let outside the house alone for fear he will be run over, nor left in a room or he will start gnawing through electric wires. His parents' "total focus" on their disabled child has been to the detriment of their other two children. […] EVALUATION: "It's only because I'm extremely strong that I've come through," says K., whose compensation claim is under review by an independent tribunal. "What comforts me is that for years when I mentioned MMR, people would brush it under the carpet. Now they're starting to say, "My God, maybe you were right."

Sunday Mirror, 1997, Kill or cure? The Sunday talking point: hundreds of children are believed to have suffered serious side-effects as a result of MMR

Pro-vaccination narrative	**Anti-vaccination narrative**
SUMMARY: Dr Mark Porter is a GP and Sunday Mirror columnist. He has two daughters C., eight, and S., seven. His mother was exposed to rubella while pregnant with M.'s sister C., in the days before a vaccine. C. is profoundly deaf as a result.	SUMMARY: Why play Russian roulette with your child's life? Anne Coote, 40, is co-founder of the pressure group JABS (Justice, Awareness, Basic Support) which represents 800 families who say their children are vaccine-damaged. Anne's 10-year-old daughter R. suffers severe epilepsy as a result of MMR.
ORIENTATION: Before the introduction of a vaccine against rubella up to 70 children a year were born severely handicapped because their mothers had caught the disease during early pregnancy. And they were just the tip of the iceberg. Most pregnant women coming into contact with it were advised to have abortions, and as many as 700 a year did. COMPLICATION: My mother came into contact with the disease, but decided to carry on with her pregnancy, and my youngest sister C. was born profoundly deaf. EVALUATION: If rubella vaccines had been available then she would be able to hear like you and I – sadly they weren't, they were introduced the year after she was born.	ORIENTATION: When I took R. to the clinic in February 1989, I was told by the nurses that MMR had been used in America and there were no possible side-effects. […] COMPLICATION: The following day R. was very irritable – not her usual loveable self. My GP advised plenty of fluids and paracetamol to bring the temperature down. But she didn't get better. Her temperature was 104. She was going off her food. Her face started to swell up and she gave out frightening, high-pitched screams. On the ninth day I took her back to the GP, who said she had all the symptoms of meningitis without the stiff neck. He gave me antibiotics and told me to keep a close eye on her. I took her home, gave her the pills and she fell asleep on my knee. Then she stopped breathing. I was terrified. The diagnosis was that she had had a convulsion, probably related to MMR. By the next day she was covered from head to toe in a measles-like rash. […] I was told it was the vaccination coming through. It got worse. […] She went from being a happy-go-lucky girl to a child who cried all night, was silent in the day, and confused about who her parents and brothers were. […] She wasn't R. anymore. She couldn't talk. She'd gone back into nappies. She would fall over for no reason. We found out that these were epileptic seizures. She started having 20-30 a day. Her whole life was turned around. […] When she was younger you couldn't take her to a supermarket because she would run amok, pulling things off the shelves. Now she is 10, but she has the mind of a four-and-a-half-year-old. […] REACTION: As if all this wasn't sapping enough, we have had a dreadfully difficult time fighting for compensation. […] EVALUATION: We believe three-in-one vaccinations should be suspended until more is known about MMR. Parents should be able to make an informed decision. […] Unless there are more tests then we will end up with lots more Rs.

The anti-vaccination narrative published by the *Sunday Times* is much lengthier than its pro-vaccination counterpart, emotionally more appealing, with a more refined plot which is structured more clearly, and characters who are better profiled. In the article from the *Sunday Mirror*, the argumentative value of the stories is made explicit in the lead stating that «here, two parents argue their cases for and against the jab». However, the link between the MMR vaccine and epilepsy is presented as fact in the summary to the anti-vaccination narrative: «Anne's 10-year-old daughter R. suffers severe epilepsy as a result of MMR».

5.3.2. Storytelling in editorials and readers' letters

The preliminary close reading of the texts included in the sub-corpus of editorials and in the sub-corpus of readers' letters revealed that storytelling plays a role both as an argumentative device and as a topic for open discussion. Considering all instances where storytelling appears in the editorials and readers' letters included in the corpus (passages where authors retell their personal experiences with vaccinations and/or illnesses as well as cases where they discuss these narratives' argumentative value and relevance), storytelling is present in 45 texts in the corpus of editorials (21.53% of the whole corpus), and in 39 letters (21.78% of the whole corpus). Of these, 60 stories (27 in editorials and 33 in letters) convey an anti-vaccination message, while 24 (18 in editorials, six in letters) are written from a pro-vaccination stance. These results are shown in Figure 3.

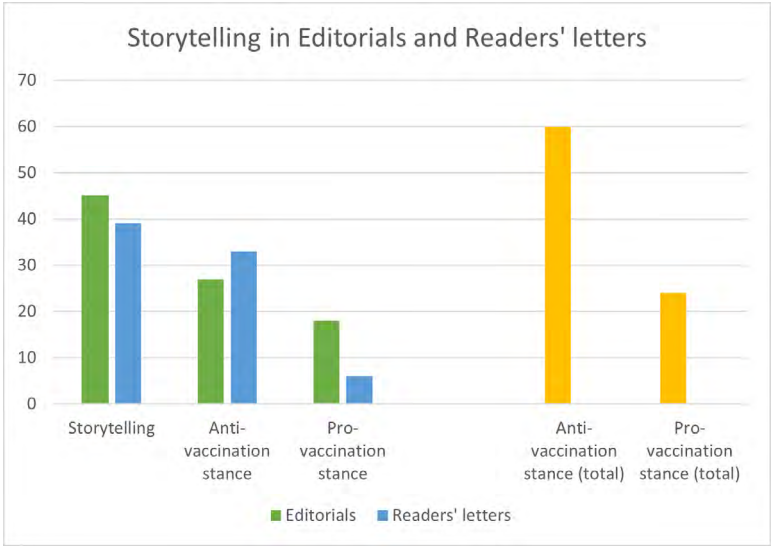

Figure 3. Frequency and stance of editorials and readers' letters where storytelling appears.

Following are examples of anti-vaccination accounts from the corpus:

Daily Mirror reader letter, 1998

Initial situation	My son T. was developing normally until he had his MMR jab. He was a happy little lad, very outgoing and hitting every developmental signpost with ease and doing very well. In fact I would say he was developing quite quickly compared to a lot of youngsters his age.
Complication	Then he had his MMR jab as a matter of course. Things were fine for a few weeks but then we started to notice that he had become very withdrawn. His walking and talking was slowing down and he wanted to be on his own all the time. It seemed like he was withdrawing from everything around him. He was not happy and had tantrums. T. was given the MMR vaccination at 15 months, at 16 months he was diagnosed with being autistic.
Moral evaluation Reaction	We believed we were doing the best for T., and now we have to live with what has happened. T. has a 10-month-old sister, C., and there is no way she will be having the MMR inoculation. I just wouldn't risk it. Having one child suffer the way T. does is enough.

Independent reader letter, 2002

Orientation Initial situation	J. is now 13 and he is a classic example of children whose autism has been linked to MMR vaccination. He seemed to be a normal child until around the time he had the MMR vaccination; he was quiet and easy, he had learned a few words and was into most things.
Complication	After vaccination his development slowed, words learnt were lost, moods changed and he developed a rash when he was ill.
Reaction	From an early stage we were convinced that J.'s autism was linked to chemicals. At first we thought it might be diet but it gradually dawned on us that the biggest chemical input to the human body at that early age is MMR.
Moral evaluation	Up until a couple of years ago we were still unsure as to what advice we should give to parents who asked for our advice on MMR but now we are convinced that MMR was the cause of J.'s autism so our answer is to say, "If we had to make the decision again then we would opt for a single rather than a triple vaccination."

Both stories present an initial situation where children were developing "normally", were happy and outgoing, and received the MMR vaccine. Then, the children's development appeared to slow down or to regress, and finally they were diagnosed autistic. The 1998 letter merges reaction and moral evaluation by first expressing guilt («we believed we were doing what was best for T.») and underscoring the impossibility of a resolution («and now we have to live with what has happened»), then illustrating their future course of action as a reaction to their first experience («there is no way she will be receiving the MMR inoculation […] Having one child suffer the way T. does is enough»).

The 2002 letter, on the other hand, presents a reaction in the form of the parents' realisation that their son had been vaccine damaged; interestingly, this realisation is phrased as an "epiphany", without presenting any kind of evidence or source to back up their statement («it gradually dawned on us»). The moral evaluation of their story is then presented in the form of advice given

to other parents in favour of separate vaccines (which, it is worth reminding here, were never available on the NHS because they were deemed unsafe by the scientific community).

Not every letter in the corpus displays a fully formed narrative; some of them only contain «minimal stories» (in Labov's 1972 terms), apparently relying on the consonance and familiarity of this structure to trigger the whole narrative, which is then left to other readers to reconstruct. This consonance was already expressed in the above 2002 letter defining the retold story as a «classic example» of the link between vaccines and autism. The following letter illustrates the way in which such narratives may be only succinctly evoked without losing their argumentative value:

1. I, with many other parents, will welcome an investigation by the Department of Health into the link between the MMR vaccination and autism (News, June 18). I am convinced that my child was vaccine damaged. At 17 months my child was perfectly happy and progressing well. Within 10 days of an MMR jab, he was brain damaged and thoroughly miserable. (*Sunday Telegraph* 2006)

Here, the personal account serves to support the claim that the writer's child was vaccine damaged, which in turns serves to request an official investigation into this link. This request is phrased as being shared by «many other parents», supposedly with similar individual experiences. The logical reasoning is the following; the propositions in square brackets are left implicit and can only be inferred from the text:

a. My child was developing normally before the MMR vaccine.
b. Within 10 days of an MMR vaccine, he appeared brain damaged and miserable.
c. [Temporal proximity suggests that the MMR vaccine must have damaged my child.]
d. [This situation is undesirable and should be investigated.]
e. [The MMR vaccine is offered by the Department of Health.]
f. Therefore, the Department of Health should investigate into this link.

This letter was prompted by a preceding news article, which the author explicitly refers to. In such cases, it seems possible to talk of «second stories» (Sacks 1992), namely stories elicited by those that were published before, sometimes as an endorsement, sometimes in a polemical perspective. See also the following example, published in the *Sunday Express* in 2002:

2. In response to B. M.'s letter regarding the idea that autism is purely genetic, I can only say that I am totally stunned by what she said. My daughter was progressing as normal until she had the MMR vaccine at 15 months, after which she lost her speech and began to withdraw into her "own world". She has now been diagnosed with autism.

In this example, the author's emphasis on an initial, regular situation that changed after the vaccine serves to refute the theory of a genetic basis of autism. Once again, the temporal adverbial "after" is deemed sufficient by the author to suggest causation and to demonstrate that the vaccine was responsible for her daughter's diagnosis. The same belief is shared by the authors of the following two letters, who write:

3. I have read too many stories of children who have developed autism or bowel disorders after having it [the MMR jab]. Many parents are refusing to put their children at risk and the Government have no right to condemn them without providing an acceptable alternative. (*Sun* reader letter, 2002)
4. My son had a reaction to MMR within eight days and was very ill with a measles-like rash and fever. He now has autism. I think the media owes it to parents to give all the facts. (*Independent* reader letter, 2002)

In example 3, stories linking the MMR vaccine with autism are used to explain both why parents are refusing the vaccine and why the Government should provide an alternative (the author is presumably referring to separate injections). This request relies on the premise, which is nonetheless left implicit, that parents are right in establishing a link between the vaccine and autism. Consequently, giving the vaccine to a child equates putting that child at risk. The logical reasoning is as follows:

a. I have read many stories of children who have developed autism after the jab.
b. [This temporal link demonstrates that the jab caused autism]
c. [Consequently] Many parents are refusing to put their children at risk [by vaccinating them].
d. The government should provide an alternative.

Proposition *d*, which is the main argumentative claim of the letter, only derives logically from propositions *a* and *c* if these are completed with the implicit propositions in square brackets. These propositions, however, rely on the so called *post hoc ergo propter hoc* logical fallacy. By leaving this fallacy implicit, the author avoids the task of defending their argumentation from closer scientific and logical scrutiny.

Furthermore, in example 4, stories are equated with facts that should (according to the author) be reported in the media. Interestingly, this equivalence is not only implied, but also evidently treated as unproblematic by the writer, who does not seem to feel the need to justify such a view: here as in the previously discussed letter, the explicit expression of temporal sequences («within eight days», «now») is deemed sufficient to imply causation. The same power of personal experience in changing people's opinion about vaccination is also expressed in the excerpt in example 5, where an initial statement in favour of vaccination is then refuted through the conjunction "but" and the reference to

the writer's individual experience. Of note is also the unproblematised use of the mental verb "believe":

5. I was always pro-vaccination, but having watched my son slip away into a world of his own after MMR my attitudes have changed. It may well be that my son, who has been diagnosed with autistic spectrum disorder, had some genetic predisposition, but I believe that the MMR jab caused damage to his immune system. (*Times* reader letter, 2002)

5.3.2.1. "Alternative medicine" as a Resolution

Examples from these sub-corpora also show that in some (less frequent) cases, anti-vaccination narratives do provide a possible (if only partial) resolution. This takes the form of "alternative cures" for autism. See, for example, the following:

Daily Mail reader letter, 2000	
Orientation Initial situation	I believe my daughter L. was damaged by this treatment. Before the injection she was a bright, inquiring child ahead of all her development milestones.
Complication	Shortly after, she changed and appeared to regress. Now nearly nine, she is at a special school for severe learning difficulties.
Reaction (partial) Resolution	We have embarked on a series of expensive secretin injections and believe we are beginning to see positive results.
Moral evaluation	Sadly there is no rush to complete clinical trials of secretin so it can be licensed and available on the NHS.
Daily Mail reader letter, 2000	
Initial situation Complication	My wonderful little boy, C., became autistic three weeks after he received his MMR at 13 months. We had no help from the NHS,
Reaction	but thankfully we found out how to help our son. We sold our house to finance the start of specialist behavioural and medical treatment.
(partial) Resolution	Our son is now nearly three and has made incredible progress. But he is still autistic.
Daily Mail reader letter, 2007	
Initial situation	J. is nine, and like his sister, A. is a joy. […]
Complication	At 19 months, he had a terrible reaction to the MMR jab. His leg swelled and he slept fitfully with fevers for days. He developed a raging thirst and temperatures. Ten days after the jab he developed a measles-like rash and was very ill. Within weeks, he lost all eye-contact, descended into full-blown autism and lost all his skills and language. He also developed severe bowel problems, would scream for hours and lost all desire to communicate. It was a nightmare for all of us.
Reaction Resolution	By searching on the internet, we brought him back from severe autism to a child who still has difficulties but not so as you'd know, apart from a speech delay and being a slow learner at school. He still has horrendous bowel and stomach pain, can't digest food and has allergies.

Despite the emotional appeal that these accounts may have, there is no scientific evidence supporting the effectiveness and safety of many of these alternative treatments, which in some cases may be damaging and almost always are a heavy burden for the families' finances (although it is not easy to understand exactly which treatment the author of the 2007 letter is referring to when mentioning «the Internet»). Dr Paul Offit debunks many of these alternative practices in his 2008 book, tellingly entitled *Autism's false prophets: bad science, risky medicine, and the search for a cure*. Nevertheless, it is easy to understand the force of a proposed resolution inserted in a narrative that is typically presented as unsolvable.

It is also worth noting that such narratives often exploit lexicalised metaphors to describe autism as a «descent», a «regression», a «retreat», with reference to an UP-DOWN opposition whereby UP IS GOOD and DOWN IS BAD. Similarly, such narratives may use metaphors referring to LIGHT VS. DARKNESS (for example, a collection of readers' letters appeared in the *Daily Mail* in 2000 and which contained many anti-vaccination stories was published under the headline: «A bright light dimmed by vaccination»). These metaphors describe a situation "before" and a situation "after" the vaccine, which is instrumental for upholding the idea of a link between the vaccine and the onset of autism. However, they also clearly betray a deeply ingrained form of ableism and reinforce the stigma associated with autism (see for example: Grinker 2020; Nario-Redmond 2019). Not surprisingly, these representations are often forcefully refuted by people in the autism community, who, however, are not featured in the letters in the present corpus.

5.3.2.2. Pro-vaccination narratives

As was argued at the beginning of this chapter, the structure of pro-vaccination narratives is largely similar to that of anti-vaccination stories; however, these stories more often present some form of resolution, and the causal relationship between insufficient immunisation and contagion is expressed in a more nuanced way. See, for example, the following:

Guardian comment, 2009

SUMMARY	My baby daughter is desperately ill and her life has been put at risk by the selfishness of a sizable minority of north London parents and their wrong-headed beliefs about the MMR vaccine.
INITIAL SITUATION COMPLICATION	Earlier this week my normally vigorous and feisty 11-month-old was reduced to drowsy, snot-filled lethargy. She refused food, became uncharacteristically listless and developed a hacking cough. Then that evening the measles rash appeared over most of her body – great timing for trying to get an appointment with the doctor.

Daily Express comment, 2013

INITIAL SITUATION	Both my son J. and his sister C. were immunised against measles, mumps, and rubella. […]

Complication	Neither J. nor C. has had measles but J. certainly got mumps in his first year at university. He was 19 and came home to recuperate, feeling very sorry for himself. He looked horrendous, his handsome face swollen like a gargoyle's.
Resolution	He recovered
Moral evaluation	but I always wondered why he got mumps when he'd had the jab. Now I know. As so often when large numbers of young people from all over the UK come into close physical contact, that year at J.'s university there was an epidemic of mumps. (This phenomenon is also associated with outbreaks of meningitis, far more serious.) Even though many of his fellow students must have had the MMR, others had not. And the real effectiveness of vaccinations depends on universality, because they don't necessarily guarantee protection to everyone. The theory of mass immunisation is to eradicate the diseases over time. So unless everyone has the MMR jab, even those who do are not entirely safe.

Notably, the causal relationship between unvaccinated people and the baby's illness is stated in the orientation by the author of the 2009 *Guardian* letter but is not staged in the text: on the contrary, it is expressed in passive voice shadowing agency («was reduced»), thus diminishing its emotive and persuasive effect. Additionally, the 2013 *Daily Express* letter contains a full resolution and ends with a lengthy (moral) evaluation and scientific explanation of the effectiveness of vaccination and universal immunity, which are certainly informative, but arguably tone down the emotional impact of the retold episode.

5.3.2.3. Negotiating the value of argumentative narratives

Finally, some texts in the corpus, especially comments and editorials, openly discuss the argumentative value of storytelling. Many writers tend to criticise the use of storytelling as evidence, admitting its emotional impact but highlighting its anecdotal, and statistically non-significant, value. One lengthy article authored by Steve Connor from the *Independent*, published in 2002, tries to answer the question asked in the headline: «Why parents are ignoring the rational experts» by discussing compelling storytelling and its relationship with scientific data:

6. Harrowing accounts of individual families affected by autism fly in the face of the anonymous welter of data presented in the studiously turgid prose of the medical journals. It doesn't matter that study after study has found no link between MMR and autism, a single, disturbing account of how one child became ill following an injection is enough to sow the seeds of doubt in the minds of many parents. This is not to say that anecdotal experiences are invalid from a scientific point of view. Far from it. Medical journals are full of case reports involving individual patients who have come to a doctor with an unusual or mysterious condition. But in trying to prove cause and effect within the population at large, it is numbers that count, not

> anecdotes. It is an indisputable fact that 500 million doses of the MMR vaccine have been distributed in 90 countries over the past 30 years and no one has been able to establish a link with autism. Such numbers, however, can seem pretty meaningless to a mother or father of an autistic child who, they are convinced, has developed the disorder after an MMR jab. Why, they may ask, should we believe such figures when we know what happened to our own child? […] What we perhaps should be aware of is our own deep-seated inclination to concentrate on individual horror stories at the expense of the bigger picture. The mass media know the power of the anecdotal case history, they know that a medical issue is not really a story until there is a name, a photograph and a set of quotes from the victim or their family to go with it. We are, in short, vulnerable to seeing potential tragedy in our own lives by following the story through the experiences of someone who has suffered the same fate.

Essentially similar insights are expressed by commenters in the *Observer* and the *Guardian*. Interestingly, a 2002 article published by the *Observer*, written by columnist David Aaronovitch, attributes the success of anti-vaccination argumentative narratives to the lack of a scientific consensus, while in a more recent *Guardian* article Sarah Boseley (then health editor) is more inclined to blame the press. Both, however, agree on the power of stories to convince parents of the risk of vaccinating their children:

7. [I]n the absence of even a rough consensus about the facts, the narrative increasingly belongs to those who have an emotionally compelling story to tell. (*Observer* comment, 2003)
8. The press ran lurid stories featuring children whose autism became evident at around the time they had their MMR jab and sent shivers through the hearts of many parents. (*Guardian* comment, 2018)

It seems legitimate to say that this reliance on individual stories as evidence, although probably deeply seated in the human psyche, may also be interpreted in a post-truth perspective. This seems to apply especially when talking about health, science, and medicine issues, also betraying a profound distrust in the medical and scientific profession. Indeed, what makes this heavy reliance on idiosyncratic beliefs and personal accounts possible seems to be lack of trust in scientific and medical information, which is openly disregarded whenever it appears at odds with personal experience. Additionally, it also seems possible to hypothesise that the media consciously exploit the implicatures allowed by storytelling (which relies on common sense assumptions and culturally shared beliefs) to maintain a fundamental ambiguity, in order to avoid explicitly endorsing the alleged link between vaccines and autism and claiming to be merely giving voice to the parents' legitimate worries.

Pro-vaccination accounts of single cases of contagion following a missed vaccination also risk diminishing the argumentative power of rational and

evidence-based facts, because they rely on a legitimisation of anecdotal experiences which effectively equates the value of these stories with anti-vaccination ones. Nevertheless, the desire to personalise pro-vaccination messages to try and counter the emotional power of anti-vaccination campaigns seems understandable, and to a certain extent, also advisable. One possible way to do that, without losing sight of reliable and comprehensive data could be developing and expanding the (moral) evaluation section. This section could become the site where individual stories are complemented by statistical data and their message anchored in scientific consensus, as did the author of the *Daily Express* 2013 comment reproduced in Section 5.3.2. above.

5.4. Storytelling in the Facebook corpus

The qualitative analysis of readers' letters has shown how storytelling was consistently used by writers as a powerful argumentative device. They used personal, real-life, individual experiences as legitimate and convincing evidence to foster anti- and pro-vaccination claims. Comments in the Facebook corpus similarly exploit argumentative storytelling. However, as Facebook is a social media platform, these become «shared stories» (Page 2018) which may also elicit a number of «second stories» (Sacks 1992). Second stories expressing alignment also have an argumentative value, because they create an effect of accumulating evidence, thus strengthening the force of the claim. Moreover, the fact that users can interact means that they can negotiate the value of their experiences – discussing the nature of "evidence" and of "facts" – and their respective «telling rights» (Shuman 2010).

All these tendencies are apparent in the comments posted by users underneath a *Guardian* post, entitled «We should listen to Roald Dahl, not Jenny McCarthy, on vaccinating our children». This article was posted on 10th February 2010, received 5704 likes, 1130 comments, and was shared 2265 times. The headline contains a reference to the personal life experiences of the writer Roald Dahl and the actress Jenny McCarthy. The former lost his daughter Olivia to measles when she was seven years old and wrote the following moving words in favour of vaccination:

> The measles had turned into a terrible thing called measles encephalitis and there was nothing the doctors could do to save her. That was twenty-four years ago in 1962, but even now, if a child with measles happens to develop the same deadly reaction from measles as Olivia did, there would still be nothing the doctors could do to help her. On the other hand, there is today something that parents can do to make sure that this sort of tragedy does not happen to a child of theirs. They can insist that their child is immunised against measles. (Dahl 1986)

Jenny McCarthy, on the other hand, is the mother of an autistic child and she is convinced that he was vaccine-damaged. Consequently, she is a staunch anti-vaccination advocate, claiming that vaccines are "toxins" which should not be injected into children's bodies. In stating that «we should listen to Roald Dahl», the author of the *Guardian* headline thus implicitly expresses a pro-vaccination claim. However, the decoding of such claim relies on the audience's shared knowledge about Roald Dahl's and Jenny McCarthy's personal backstories. The article itself opens with the author's own individual experience, whose structure can be identified as follows:

Initial situation/Orientation	In 1998, the *Lancet* published a paper on a putative link between the MMR vaccine and autism. That summer I was a medical student rotating though a hospital elective in Dublin.
Complicating action	The first patient I saw was a nine-year-old girl with measles encephalitis. She was paralysed, mute, and blind. She lay in a side room at the end of corridor with mustard yellow walls and stencilled butterflies. The curtains were drawn shut.
Final situation	She would die by the end of the month.

In the text, the writer then actively encourages readers to share their own personal stories, because they are deemed more persuasive than appeals to scientific data:

> Doctors and our patients have thousands of stories to tell about the implications of infectious diseases that should have been eradicated by now. The memory of that nine-year-old girl speaks more to me than dry statistics. The latter, although obviously imperative to dispel vaccination myths, do little to inform apprehensive parents during a media storm.

It is often impossible to assess with certainty whether users commenting on Facebook have actually read the news article. However, it is possible to say that the sheer number of comments suggests that patients have indeed thousands of personal stories to share.

One of the first comments to be found under this post is a pro-vaccination narrative. Its structure is more fragmented than that of the narratives analysed in the previous sections, and it lacks the original post's richness in descriptive details. Still, some key elements can be identified:[2]

2 The Facebook posts are here transcribed in their original form, thus maintaining spelling and/or grammar mistakes.

Complicating action (1)	My dad caught polio when he was a kid.
Present situation	He was left with life long problems. He suffered pain every day of his life.
Complicating action (2)	My mum had whooping cough the distress when you can't catch your breath.
Evaluation	These diseases don't just kill they main cause life long disabilities.
Argumentative claim	My parents didnt hesitate getting us vaccinated because they suffered from the disease. I wouldn't hesitate getting mine done either.

This story demonstrates the importance of the memory of infectious diseases, such as polio and whooping cough, to create frames with which to understand and conceptualise measles epidemics. Indeed, polio is a highly contagious disease which can kill children or leave them permanently disabled, and it was very common in Europe until a vaccine became available in 1955. Therefore, its ravages are still vivid in many people's memories, and pictures of children in iron lungs still have the power to instil fear in the population. A number of similar comments follow the first one recalling past experiences with measles, such as:

9. User 1: I don't have too many memories of being ill in the 1950s but I do remember having measles. I was lying in a darkened room and felt so bad that I didn't even want my Mum to read to me. There was no MMR vaccine in those days but you can be sure I had my own children vaccinated.
10. User 2: Well said I remember measles, glad my kids were vaccinated and never had to suffer that illness. It pretty horrid.
11. User 3: I also had measles in the 1950s. I can still remember how I'll I felt. My GP visited daily for a week. I feel lucky not to have suffered any long term effects. Also a girl in my class at school had a calliper on her leg because she had suffered from polio.

Authors in examples 9 and 10 reminisce about their experiences with measles, while author in example 11 talks both about measles and polio. The first two examples overtly state their pro-vaccination claim, while the third comment overtly states that these preventable contagious illnesses are dangerous, thus implying that vaccines are necessary. All these comments also present a high degree of interaction and polyphony, through linguistic cues expressing alignment such as «well said» (example 10) and «I also» (example 11).

However, comments expressing disagreement are also present in the thread, relating both to the statement in the original post and to the preceding comments. See, for example, the following:

12. User 4: I have never had a vac. Never will. I have never had any serious illness yet people I know who have had their vacs are always ill. Those that dont, don't seem to get ill. How do you explain this. Ok this is just my personal experience and what i have seen. But evidence is evidence.

The same author then further endorses their statement in a follow-up comment:

13. User 4: I have passed my immune system on to my kids. My eldest is not mine, her "real" dad had vacs and so did my wife, so did she, and she was hospitalised for henock and has had chicken pox. My other daughter has had no vacs and has never suffered from measles, chicken pox or anything for that matter. My son, also no vacs, had chicken pox and was fully over it in less than a week. I as a parent want not only the best for my children but my grandkids as well. If that means no vacs so they build up their immune systems and pass it on is that not better than constantly pumping these drugs into them and weakening their natural defence.

The reasoning in example 12 could be summarised as follows:

a. I have never had vaccines and I have never suffered from serious illnesses.
b. I know of other people who were not vaccinated and are perfectly healthy.
c. I know of people who were vaccinated and are always ill.
d. [This is evidence that the vaccine causes people to fall ill.]

In the follow-up comment (example 13), user 4 personalises this reasoning by substituting the generic «people» in both proposition *b* and proposition *c* with their son and daughters. Note that they always refer generically to «vaccines», without ever specifying which vaccines and which illnesses they are talking about. Only when recounting their children's experience do they mention specifically «henock» (presumably Henoch-Schönlein purpura, a disease of the skin which mostly affects children) and chickenpox. In example 12 they also comment on the evidential value of their story, although they do so in a rather ambiguous and contradictory way: «this is just my personal experience, but evidence is evidence».

Another comment in this thread explicitly equates «stories» with «facts», in a way that is highly reminiscent of a reader letter, published in the *Independent* in 2002, that has already been commented on in Section 5.3. (and is here reproduced for easier readability):

> My son had a reaction to MMR within eight days and was very ill with a measles-like rash and fever. He now has autism. I think the media owes it to parents to give all the facts. (*Independent* reader letter, 2002)

> What about the parents that have horror stories to tell because of vaccinations! Offer all facts and allow people to question! (*Guardian* Facebook comment, 2015, my emphasis)

However, this equation is not always taken for granted. Another exchange in the same thread reveals how users may negotiate the argumentative value of storytelling:

14. User 5: I had mumps, measles and rubella in the 1970s as well. As with the Vast majority of people I didn't experience any issues or side effects from

these normal childhood illnesses and my lifetime immunity adds to true herd immunity. Most vaccinated adults cannot say the same.

15. User 6: I usually try to refrain from being rude in posts, but on this occasion I have to say it: you are an idiot. Congratulations! You didn't suffer any lasting effects from these diseases, ergo no one does. Brilliant logic there. […] How stupid can you be? I've had proper flu twice in my life and I was horribly ill for about 10 days, but I lived to tell the tale. Yet, that doesn't change the fact that the influenza virus still kills many young, old and immune-compromised people to this day. I also had mumps, which was grim to say the least, and fortunately I don't have any lasting effects from it. Yet it can and does cause infertility in people.

User 5 in example 14 expresses an anti-vaccination claim, very similar to that voiced by author of examples 12 and 13 discussed above, their reasoning being that because they, and many other people, contracted measles, mumps, and rubella and did not suffer any side effect, these are normal childhood illnesses. They also state that contracting such illnesses is a way of building a strong immunity, thus also benefitting the herd. Consequently, vaccines are not only useless, but also harmful, because they do not allow people to build "their own" immunity. Notably, both authors repeat the distinction between "natural" and "artificial" immunity which is recurrent in anti-vaccination discourses. User 6 in example 15, on the other hand, harshly criticises this reasoning by explaining that individual experiences cannot be generalised indiscriminately. They do so by recounting their own story, stressing the similarities with the tale retold in the preceding comment (as they also suffered from infectious illnesses and then recovered without suffering any lasting damage), but emphatically refusing this experience's evidential value. This is done through the anaphoric repetition of the adversative conjunction "yet", which rhetorically emphasises the second proposition over the first.

Other users not only criticise the evidential value of storytelling, but also the authority of storytellers in the matter at hand. In this way, they polemicise directly with the *Guardian* headline:

16. User 7: I'll just take my health advice from doctors etc. Not authors or starlets. It's dumb either way.
17. User 8: Or we could listen the people who have trained for years on end on how to keep people alive – the doctors – rather than some celebrities to advise us on our health care! Crazy idea I know..
18. User 9: Might we rather listen to scientists? The people that dedicate their entire lives toward improving our lot?
19. User 10: Maybe we should do our own research and not rely on celebrities to do our thinking for us at all.

According to the users in examples 16-18, neither writers nor actresses are experts in science and medicine, therefore they should not be entitled to give

health advice. Incidentally, these comments could be taken as evidence of the fact that their authors did not read the whole article before posting, but are merely reacting to the headline, because the *Guardian* article was actually written by a medical doctor. User 10 in example 19, on the other hand, delegitimises «celebrities» and experts alike, encouraging people to «do [their] own research».

Very similar tendencies can be found across the whole Facebook corpus, as in the following:

20. User 1: Of course he [Wakefield] was banned! His study and documentary described EXACTLY what happened to my son post-vaccine. People whose kids were never injured by vaccines should really not comment!
    User 2: sorry to hear that. I am also sorry to tell you that your personal experience is not strong enough to counterbalance dozen of studies showing that vaccine does not cause autism.
    User 1: but they DO cause autism! Why would I need studies to "prove" they don't if my personal experience says the opposite? (*Guardian* 2018)
21. User 1: My first child is autistic and was normal until he was given the MMR. When I was challenged on this by so called experts I produced the videos to show the changes he went through. I can't help believe that there is a truth no one wants to find out.
    User 2: what a load of made up bollocks.
    User 1: do have a child you went through an adverse reaction to such a vaccine? What an idiot you are. We had to nurse him through the reaction and our son stopped talking, never to speak again.
    User 3: Having a sick child does not make you a scientist. The experts are experts because they have studied this extensively. Vaccines do not cause autism.
    User 4: My son also has ASD and ADHD, he had all of his vaccines. His elder sister had her vaccines too and doesn't have ASD and ADHD. We also know unvaccinated children with autism. It's a neurological condition that your son was born with as it's highly likely to be genetic.
    User 5: the stats show that the chance if getting autism doesn't change with respect to vaccination. There are certain odds, by pure chance, that some kid's onset of autism will occur around the same time as their mmr vaccination. Your experience is wirhin that statistical probability. It looks like it's connected but it isn't. Nothing invalidates the pain of your experience. But it's not proof of a connection between the two. (*Guardian* 2019)

User 1 in example 20 refuses to acknowledge the evidence provided by scientific studies if this is at odds with their personal experience, thus revealing a profound lack of trust in and recognition of the authority of science and medical professionals. The comment posted by user 1 in example 21 triggers a lengthy exchange, where people take various stances: user 2 immediately resorts to insults and accusations (to which user 1 responds with an equally inflamed

comment). User 3 delegitimises parents' experience as expertise, stating that real expertise derives instead from years of research and study on a topic, and similarly, user 5 uncovers user's 1 logical fallacy, acknowledging however the painfulness of their experience. Finally, user 4 references to their own experience with two vaccinated children, one autistic and the other neurotypical, which is used to debunk the theory of a connection between vaccines and autism. Each of these writers expounds their personal theory and point of view without managing to convince the others, and without showing any signs of changing their mind at any point.

Overall, it can be said that many comments in these threads retell lengthy accounts of personal experiences with vaccines or vaccine-preventable illnesses, which are used to foster anti- or pro-vaccination claims. Many other comments function as second stories, or may just briefly mention personal experience to back up their claims. They may also rely on consonance to evoke stories, to enable other users to reconstruct the complete argumentative process without displaying a fully-structured narrative. However, many threads are also used to critically discuss the evidential value of personal experience and individual stories, either by highlighting its anecdotal nature or by stressing the fact that medical advice should be given by scientists and doctors, not by storytellers. It is impossible to reproduce and analyse every such comment here, but it can be concluded that this is indeed one central feature of vaccination discourse, both in traditional and in social media. Facebook in particular widens the circle of "prosumers" actively shaping the discourse and allows these shared stories an enhanced visibility. Moreover, it also allows storytellers to conduct lengthy exchanges in which to negotiate the argumentative value of their stories. This is arguably very valuable to the researcher studying post-truth society, because it verbalises the process whereby emotions and idiosyncratic beliefs are argumentatively pitted against hard facts and scientific evidence. However, it also emphasises how Internet users are often trapped in their own confirmation niches, or echo chambers, with online conversations being reduced to a sterile defence of one's own pre-existing convictions and beliefs.

Looking more closely at the way arguments proceed in these posts, following the pragma-dialectical approach to argumentation (Van Eemeren 2017), it can be noted that they are often non-linear, because many users intervene and create different argumentative threads which often proceed in parallel. Writers may tag other users they are responding to, with multiple and different conversations going on simultaneously. It is not difficult to identify these arguments' confrontation stages, where users define their disagreement with the original post or with each other. Equally identifiable is the opening stage, establishing the point of departure. The argumentation stage is very often characterised by argumentative storytelling, presenting personal experience as evidence, but interactivity gives participants the opportunity to criticise this standpoint. However,

arguments on Facebook consistently lack a conclusion, as results are almost never stated by participants, either because they abandon the conversation or because they remain entrenched in their own original positions. Moreover, the flow of the argumentation can be interrupted at any point by users attacking other participants' identities and telling rights, often through dysphemisms and hate speech.

5.4.1. Countering ableism: the voice of autistic people

As previously noted, many of the anti-vaccination readers' letters reproduced in this chapter display an underlying, more or less overt ableism, because they perpetuate stereotypes against autistic people which could be summarised as "autism is an extremely undesirable negative side-effect of vaccination". This is also true for many of the anti-vaccination users' comments in the Facebook corpus. These forms of ableism can be said to be a discursive "by-product" of such anti-vaccination argumentative narratives, which itself could engender resistant discourses by autistic people themselves, reacting to these negative stereotypes and/or positioning themselves within the vaccination debate.

No printed letters included in the corpus were written by autistic people nor by autism experts, with the result that autistic people had very few chances to create and display resistant discourses in traditional media. Conversely, as was stated in Section 1.2.4.3. in Chapter 1, computer-mediated-communication (CMC) suits the communicative needs of many autistic people, some of whom have taken advantage of the Internet to advocate against stigmatisation. Indeed, autistic people in the corpus of Facebook comments confront anti-vaccinators who express discriminating views towards them, as clearly testified to by the following examples:

22. Well, I'm autistic – it's in my family's genes – and it makes me furious to read people asserting that their children have "suddenly become autistic due to mercury [sic] in vaccines", as if we autistics were just the living dead who stumble around living numb, useless lives. As if we were not equal to anyone who is not autistic and a damn sight more intelligent than many. It's hate speech. (*Guardian* 2015)
23. I AM a person with autism, and someone who fails to grasp the difference between correlation and causation could say that I "changed" after the supertyphoon when I was a toddler: does that mean that big storms cause autism through some kind of PTSD? Slightly less stupid a theory, but only just. (*Guardian* 2016)
24. I have a MAJOR issue with Wakefield. if I could sue him, Jenny McC and Del Bigtree[3] I would. I AM autistic, and the amount of hatred, fear, lies

3 Del Matthew Bigtree is an American television and film producer; he is also CEO of the anti-vaccination group *Informed Consent Action Network* and has produced the film *Vaxxed: From*

and abuse we are receiving from the antivaxx community is growing every month. […] They need to be stopped. A gastroenterologist attending seminars to sell his films attended by "autism mums" speaking about cures with not a single autistic person in sight. It's evil. (*Guardian* 2019)

25. I am autistic. I can assure you that people like me have existed forever. We are not converted into autistics in some kind of Jekyll and Hyde chemical transformation. (*Guardian* 2019)
26. User 1: I'm autistic, and […] I was never vaccinated as a baby. As an adult, I received measles vaccines when an epidemic broke out. Guess what?? It didn't make the autism worse!!!

    User 2: I've got Autism and I don't really care where it came from, whether I was born with it or it came from the shots, I've got it, I can't change that so I just keep moving forward and learn to overcome it. If your child does get autism, then what's the point spending hours of your time trying to find where it came from when you could be finding ways to help the child in the future as that's the only way forward.

    User 3: Well lots of kids with autism aren't like you. You obviously have a mild case. My autistic sil can't use a computer, much less get on fb. She can't talk at all and she can't walk anymore. She bangs her head on anything she can find while wearing diapers at 25. Those parents need to know where it came from so they can undo the damage. (*Daily Mail* 2019)

These examples show several aspects of the discourse about vaccines and autism emerging directly through autistic voices on Facebook. First, most autistic people in the corpus refuse the theory of a link between vaccines and autism (the only exception in the present corpus is user 2 in example 26, who states not to be interested in the theory at all). In refusing this theory they debunk several of the claims perpetuated by anti-vaxxers, mainly the idea that autism is caused by «mercury» and «chemical» ingredients in vaccines (examples 22 and 25). Second, they find the ableist rhetoric of many anti-vaccinators to be deeply offensive. However, in many cases their comments either go unnoticed, because they do not elicit any response from other users or are not successful in making anti-vaccinators change their perspective. Indeed, user 3 in example 26 overtly challenges the comments written by user 1 and user 2, going as far as to question their own self-representation as autistic people («you obviously have a mild case»).

The initial statement, that the means for participation and communication allowed by the Internet would empower autistic people and guarantee them access to more suitable forms of expression, is strictly linked to initial, enthusiastic, and optimistic views of the Web 2.0 as an alternative source of media

Cover-Up to Catastrophe, based on Wakefield's theory of a link between the MMR vaccine and autism.

power, as an instrument of democratisation (Demata, Heany and Herring 2018). And indeed, this goal has been reached, at least partially, as there is convincing evidence that the Internet and social media do allow autistic users to build a discursive space from where to counter hegemonic (in this case, neurotypical) discourses. However, this hegemony is persistent and is deconstructed with much difficulty, also because discussions – about vaccination – on Facebook tend to be heated, convoluted, and lacking a concluding stage.

5.5. (Argumentative) storytelling during the Covid-19 pandemic

Argumentative storytelling has been widely exploited during the Covid-19 pandemic by journalists and anti-vaccinators alike. For example, in March 2021 the AstraZeneca Covid-19 vaccine (later renamed Vaxzevria) came under considerable criticism because of some episodes of blood clots following injections, which in some cases caused the death of the patient. Some European governments (among which the Italian one) even decided to suspend vaccination campaigns for a few days to allow investigations into this possible connection. In the end, administrations resumed following clarifications provided by the European Medicines Agency (EMA), which had found 25 suspected cases of disseminated intravascular coagulation and cerebral venous thrombosis out of 20 million vaccinations carried out and had not deemed this number sufficient to declare the drug unsafe for European citizens (European Medicines Agency 2021). In the UK, however, administration of the vaccine has never been suspended. The newspaper coverage of this incident did not choose to focus on the mechanisms of surveillance put in place by both political and scientific organizations; instead, they extensively covered the heart-wrenching narratives of patients who died in the days and weeks following the administration of the vaccine, presenting their stories as possible evidence of the danger of the AstraZeneca vaccine. It is safe to say that full confidence in the vaccine was never restored among the general population following this incident (Smith 2021).

However, besides being a sign of the appeal that argumentative narratives have, especially in a post-truth era, during the Covid-19 pandemic storytelling has also become a way for people to make sense of their dramatically changing world. Projects have been created to allow people – and especially the healthcare staff – a platform where to create and share their personal life stories during the pandemic. These stories have arguably had a great therapeutic power helping them to navigate their feelings and mental health, elaborating deaths and losses, giving meaning to their strain and fatigue. One early article in this sense was Wakam et al.'s (2020), where they shared heart-breaking stories of

patients dying alone in their hospital beds, forbidden to see their loved ones, thus powerfully advocating for a better and more humane management of the coronavirus crisis.

Projects whose initiators created a platform where users could post and share their personal stories during the Covid-19 pandemic were the following:

– *A Journal of the Plague Year*, an archive established on 13th March 2020 by Arizona State University historians in collaboration with a global network of scholars. Their mission is to document, curate, and preserve experiences of the Covid-19 pandemic, and therefore they invite people to share their stories about how the pandemic has affected their lives, «from the mundane to the extraordinary». Available at the link: https://covid-19archive.org/s/archive/page/welcome (last accessed: 17th July 2023).
– The collection of diaries and interviews on Covid-19 from around the globe compiled by Luck-It, available at the link: https://luck-it.net/category/2019-nCoV/ (last accessed: 17th July 2023).
– Based in Italy, the project *Scriviamo La Storia* established by the *Società Italiana di Anestesia, Analgesia, Rianimazione e Terapia Intensiva*, aiming to collect accounts of personal experiences with the pandemic, to enable medical staff to share their feelings, thus also protecting and improving their own mental health and wellbeing. Available at the link: https://vissuto.intensiva.it/ (last accessed: 17th July 2023).

Therefore, despite criticisms of using argumentative stories – anecdotal and polarising – to express and support one's position within the vaccine debate, some experiences and projects implemented during the pandemic seem to point to the therapeutic power of language to create empathy, and consequently to the real possibility to create an effective synergy between storytelling and truth.

Afterword

One of the most prominent characteristics of this volume is possibly the high, and sometimes intrusive, number of cross-references across Chapters and Sections. Indeed, although the structure of the volume tries to isolate several aspects of the discourses of and about vaccines – variably focusing on the staging of debates, the representation of expert social actors, and storytelling – the truth is that all of them together contribute to shape the discourse. No one aspect of the discourse seems to be completely understandable without the other, because no one can be convincingly separated from the other. Vaccination is a complex medico-scientific issue whose development is entrusted to scientists and physicians, but whose regulation and enforcement is entrusted to politicians and public health organizations. It collocates at the intersection between science and politics, between the personal and the public. This complexity is perfectly reflected in the discourses surrounding vaccination, its regulation, and its enforcement, where all these characteristics mix, merge, stir the public debate and produce dense texts. It is therefore difficult to effectively analyse such dense texts by focusing on one single aspect, or adopting one single theoretical framework, one single method of enquiry. This is why the analysis in this volume exploits both quantitative and qualitative methodologies and a variety of theoretical frameworks. Despite the possible limitations of such an approach (including the risk of merely scratching the surface by superficially adopting theoretical and methodological suggestions) it is believed that such an analysis can be of some value for a heterogeneous audience of actors who have different interests and are involved in different ways and to different degrees in the debate.

The main results of the analysis carried out in this volume point to a marked polyphony in both offline and online texts, with many different voices creating or participating in the discourse. This polyphony is realised through different linguistic means which are used to assess or describe the social actors' varying levels of authority and expertise. Indeed, the various social actors in the discourse (among which Andrew Wakefield, medical doctors, scientists, and the Government) appear involved in similar communication activities, framed using largely the same glossing verbs: most commonly non-factive reporting verbs like "claim", or metapropositional directives such as "warn", "suggest", "urge", highlighting the socio-political aspects of public health policies like mass immunisation. Conversely, metapropositional assertives like "explain" are less frequent, which is surprising, given that the discourse revolves around and popularises a medico-scientific issue. This effectively constructs a debate where each view is presented as equally legitimate, irrespective of the amount

of scientific evidence available to support it. Furthermore, argumentation relying on emotions and personal belief appears to be rarely problematised in the present corpus, with mental and sensory verbs (like "believe" and "feel") being used very frequently to introduce one's own positions towards vaccination, even in the case of medical doctors and scientists.

The identities of the various social actors in the discourse are also often presented and described through a variety of strategies with the effect of legitimising or delegitimising one's views and telling rights. More precisely, two conflicting tendencies emerge: one points towards impersonalisation, collectivisation, functionalisation and aggregation which are arguably used to confer official authority to the detriment of emotive participation. The other points towards personalisation, individualisation, and nominalisation used to highlight emotional involvement. It can be argued that, when talking about diseases and medical procedures affecting the body (especially of young and vulnerable patients), emotional involvement confers a certain degree of credibility and authority in itself (for example, parents' stories are considered credible and authoritative because they are based on real-life experiences). Therefore, it is not always easy to ascertain whether impersonalisation and personalisation are used to legitimise or to undermine a claim. It seems that these strategies are often left open for the reader to interpret according to their pre-existing frames and ideological squaring: if they trust scientists, experts, doctors and the professional categories they represent, then functionalisation and aggregation strategies have the effect of endorsing their statements; however, if they suspect their motives and are prone to conspiratorial thinking, they may interpret these as "de-humanising" strategies, giving more credence instead to personalised and individualised accounts.

When actively participating in the creation of the discourse and engaging with the news through letters to the editor or Facebook comments, readers also personally defend their telling rights and use a variety of argumentative strategies to foster their views and opinions, at the same time attacking their opponents: the most distinctive of these is argumentative storytelling. Argumentative stories can promote either an anti- or a pro-vaccination claim, which is sustained by using retellings of individual experiences as evidence. Consequently, they are also rich in emotive language and passionate appeals. The analysis uncovered the fact that anti- and pro-vaccination stories share a similar structure, usually introducing a situation where the patient (the child) is healthy, then recounting a complication (a vaccine injection in the first case, a vaccine-preventable illness in the second) and a moral evaluation (condemning vaccination and the people who enforce it in the first case, denouncing people who refuse the vaccines in the second case). However, anti-vaccination stories are often emotionally more compelling than pro-vaccination ones, because:

- They manage to painstakingly describe and dramatically stage the moment of vaccination (whereas it is more difficult, for pro-vaccination authors, to accurately pinpoint and represent the moment when the patient catches the measles virus).
- They benefit from narrative conventions, where temporal sequencies are commonly used to suggest causal relationships. They are thus able to effectively disguise the *post hoc ergo propter hoc* fallacy (on which claims of a link between vaccines and autism are based) as common sense, anchoring it in the audience's pre-existing beliefs.
- They do not offer a resolution, depicting autism as an undesirable, lifelong, and incurable condition; this is why these stories can be accused of perpetuating an ableist and discriminating view of autism and autistic people.

Moreover, anti-vaccination stories often present recognisable characters: for example, the parents (and possibly the fringe doctors supporting them, plus the lawyers representing them in court) personify both the positive heroes, fighting against a hostile medico-scientific and political establishment, and the victims, together with their vaccine-damaged children. On the other hand, the villains in pro-vaccination stories are usually anti-vaccination parents; in this sense, they may be effective in convincing hesitant patients, but often exclude anti-vaccinators themselves. Additionally, as many readers (especially Facebook commenters) notice, indiscriminately using personal stories as evidence to sustain pro-vaccination claims risks legitimising the use of anecdotal experiences as evidence to support medico-scientific theories in general. A minority of pro-vaccination advocates and medical doctors try to complement accurate scientific explanations and scientific data with their personal stories – which are undeniably more captivating, emotionally compelling, and relatable.

Finally, the comparison between offline means for reader participation and engagement like letters to the editor with the online commenting function on Facebook demonstrates that online conversations about vaccines often escalate and assume a decidedly antagonistic, aggressive quality: identity labels like "anti-vax" and "pro-vax" – which are infrequent in the newspaper corpus but common in Facebook comments – are often used to summarise users' identities and systems of beliefs; hostile judgments like "ignorant", "stupid", and "idiot" also regularly occur in the corpus of Facebook comments and are equally used by anti- and pro-vaccinators alike, not only to define their opponents, but also to evade the debate (many times directly in the opening stage). Both groups seem to value evidence and are keen to provide sources for their statements; however, they consistently disagree on what makes a source authoritative and often discuss the legitimacy and telling rights of different voices, rather than the plausibility and verifiability of the links between

vaccines and certain negative side-effects. Debates therefore rarely reach the concluding stage, transforming trust in vaccines into an essentially ideological and partisan issue. Nevertheless, one important advantage of the freer and more democratic participation allowed by social media (as opposed to readers' letters to the editor) is that of giving voice to autistic people and autism experts, who are marginalised in the traditional press – and stigmatised by anti-vaccination claims stating that autism is an extremely negative outcome of vaccination that must be avoided – but who can find new channels of expression and aggregation online.

These results can be interpreted in the light of the so-called post-truth era: the focus on polyphony and evidentiality underscores the complex interaction between appeals to hard facts, emotions, and personal beliefs, and their differing argumentative values; the analysis of argumentative stories highlights how personal experiences can be used as evidence and be considered legitimate and authoritative, even in medico-scientific debates; the analysis of dialogism and argumentation in Facebook comments shows the relevance of "alternative" sources of knowledge as well as the tendencies of online communication to descend into name calling and partisan entrenchments. These insights can therefore be applied to present-day (anti)vaccination discourses, to highlight similarities and differences, with the aim of understanding the scientific, political, social, and historical reasons behind recurring and/or changing aspects. Figure 4 tries to visually summarise them, without sacrificing complexity.

Indeed, this complexity appears inescapable, as texts discussing vaccination merge various medico-scientific, political, and social instances which all essentially contribute to the shaping of the discourse. It also seems evident in the face of the Covid-19 pandemic and the multitude of (anti)vaccination discourses it has produced. It is thus paramount to embrace this complexity and to avoid misleading simplifications both when analysing (anti)vaccination discourses and when devising new ways to address (anti)vaccination concerns, in order to make sense of the multitude of voices compounding the discourse, effectively appealing both to emotions and hard facts in order to simultaneously satisfy the public's interest in authoritative voices and to re-create a relationship of trust between the patients and the medico-scientific establishment.

	Objective facts	**Emotion and personal belief**	
Anti-vax (pro vaccine-autism link)	Reference to sources of knowledge: - (hyper)links - Quotations, citations - Reported speech (*credibility, legitimacy, authority explicitly discussed*)	Mental & sensory verbs (*think, believe, feel*) Non-factive glossing verbs (*claim*) Individualisation, personalisation Argumentative storytelling Re-presenting & addressing opponents: - Identity labels (*pro-vax*) - Dysphemisms (*stupid, idiot*)	*Discourses about* *Discourses by*
Pro-vax (against vaccine-autism link)	Reference to sources of knowledge: - (hyper)links - Quotations, citations - Reported speech (*credibility, legitimacy, authority explicitly discussed*) Collectivisation, aggregation, anonymisation, impersonalisation	Mental & sensory verbs (*think, believe, feel*) Non-factive glossing verbs (*claim*) (Argumentative storytelling) Re-presenting & addressing opponents: - Identity labels (*anti-vax*) - Dysphemisms (*stupid, idiot*)	*Discourses about* *Discourses by*

Figure 4. A summary of the main linguistic strategies used to re-present and to sustain anti-vaccine and pro-vaccine claims in a post-truth perspective.

Appendix

I. Wordlists

The ensuing tables show the most frequent lexical items in the whole corpus as well as in each sub-corpus, including content and function words, both in their raw and normalised frequencies. It is worth reminding here that content words are defined as words that possess a semantic meaning, such as nouns, adjectives, adverbs, and verbs; function words are defined primarily as words denoting grammatical relationships, typically prepositions, pronouns, and conjunctions. The lemmas are colour-coded to divide them into:

- Lemmas defining the thematic foci of the controversy (including the words appearing in the string search used to retrieve the relevant articles), which are coded in red.
- Lemmas referring to the main social actors included in the discourse; these are coded in yellow.
- Lemmas possibly signalling polyphony, including personal pronouns and possessives, reporting verbs, mental verbs, modal verbs, and adverbs and conjunctions structuring text and discourse; these are coded in green.
- Lemmas denoting or connoting emotions; these are coded in blue.
- In bold are other potentially revealing lemmas that are semantically connected with scientific and medical research.

I.I. Wordlist of the whole corpus

Whole corpus (1,747,385 word tokens)					
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw frequency**	**Normalised frequency**
The	103533	59.25	Disease	4390	2.51
Be	79323	45.39	Dr	4243	2.42
Of	51390	29.40	Can	4237	2.42
To	48155	27.55	Will	4019	2.30
A	44191	25.28	If	3923	2.24
And	40451	23.14	Give	3915	2.24
In	35098	20.08	All	3890	2.22
Have	31104	17.80	**Research**	3769	2.15
That	23573	13.49	Would	3709	2.12
He	18343	10.49	After	3576	2.04
It	18105	10.36	Up	3530	2.02

They	16987	9.72	When	3493	1.99
Child	15480	8.85	**Medical**	3469	1.98
For	15104	8.64	People	3406	1.94
MMR	15022	8.59	So	3303	1.89
Vaccine	13483	7.71	Make	3300	1.88
I	12952	7.41	Find	3269	1.87
Say	11912	6.81	Mumps	3238	1.85
With	10888	6.23	Between	3223	1.84
We	10654	6.09	**Study**	3206	1.83
As	10301	5.89	Doctor	3151	1.80
On	10029	5.73	Than	3141	1.79
Not	9590	5.48	Time	3129	1.79
By	9504	5.43	Government	3073	1.75
Autism	8872	5.07	**Cause**	3047	1.74
At	8734	4.99	Over	3039	1.73
But	8535	4.88	What	3006	1.72
She	8502	4.86	Now	2996	1.71
Measles	8379	4.79	Out	2961	1.69
This	7486	4.28	Take	2915	1.66
Parent	7349	4.20	Some	2890	1.65
From	7324	4.19	Could	2884	1.65
Who	7251	4.14	Other	2877	1.64
Been	7129	4.07	Per	2832	1.62
There	6556	3.75	Two	2787	1.59
Year	6332	3.62	**Single**	2763	1.58
Jab	6331	3.62	Last	2741	1.56
Health	6250	3.57	Against	2736	1.56
Do	5391	3.08	Get	2736	1.56
Which	5283	3.02	Cent	2682	1.53
About	5237	2.99	Public	2647	1.51
One	4993	2.85	Because	2634	1.50
Vaccination	4927	2.81	Risk	2589	1.48
You	4893	2.80	Claim	2536	1.45
Or	4720	2.70	Rubella	2469	1.41
Link	4661	2.66	Should	2379	1.36
Wakefield	4627	2.64	Go	2314	1.32
No	4626	2.64	Also	2303	1.31
Case	4553	2.60	**Evidence**	2293	1.31
More	4402	2.51	First	2253	1.28

I.II. Wordlist of the sub-corpus Headlines

Headlines (4,466 word tokens)					
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw frequency**	**Normalised frequency**
MMR	1212	271.38	**Study**	91	20.37
Be	1204	269.59	After	90	20.15
The	1151	257.72	Expert	90	20.15
To	842	188.53	Give	90	20.15
Of	664	148.67	Rise	85	19.03
Jab	642	143.75	Wakefield	84	18.80
In	528	118.22	How	83	18.58
A	516	115.53	Life	75	16.79
Vaccine	468	104.79	**Single**	75	16.79
Measles	443	99.19	Can	74	16.56
And	379	84.86	**Why**	74	16.56
For	361	80.83	Blair	73	16.34
Autism	353	79.04	She	73	16.34
Child	323	72.32	Science	72	16.12
Have	303	67.84	Letter	71	15.89
On	293	65.60	Up	71	15.89
As	268	60.00	**Research**	69	15.45
Doctor	267	59.78	Year	69	15.45
Parent	265	59.33	Baby	66	14.77
We	243	54.41	Disease	66	14.77
Over	233	52.17	More	65	14.55
Health	210	47.02	News	63	14.10
Fear	207	46.35	This	63	14.10
Link	198	44.33	**Triple**	63	14.10
I	178	39.85	All	61	13.65
Say	167	37.39	Good	60	13.43
It	165	36.94	Out	60	13.43
Case	155	34.70	Safe	60	13.43
New	149	33.36	Claim	58	12.98
By	138	30.90	Do	58	12.98
Vaccination	133	29.78	Get	58	12.98
Who	133	29.78	Tell	58	12.98
Anti	129	28.88	One	57	12.76
That	128	28.66	**Cause**	56	12.53
At	126	28.21	Put	56	12.53
Scared	126	28.21	Report	56	12.53

They	126	28.21	Debate	55	12.31
With	124	27.76	Take	55	12.31
You	116	25.97	Row	54	12.09
He	112	25.07	Scientist	54	12.09
But	108	24.18	If	53	11.86
From	108	24.18	Autistic	52	11.64
Not	108	24.18	Back	52	11.64
Epidemic	106	23.73	Face	52	11.64
Outbreak	105	23.51	Mother	52	11.64
Risk	104	23.28	Andrew	51	11.41
About	103	23.06	Should	51	11.41
No	96	21.49	Family	50	11.19
Warn	95	21.27	Must	50	11.19
Mumps	92	20.60	Call	49	10.97

I.III. Wordlist of the sub-corpus Editorials

Editorials (131,672 word tokens)					
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw frequency**	**Normalised frequency**
The	8103	61.53	Say	305	2.31
Be	5292	40.19	When	299	2.27
Of	4099	31.13	She	298	2.26
To	3665	27.83	Will	298	2.26
A	3261	24.76	People	292	2.21
And	3004	22.81	Jab	290	2.20
In	2472	18.77	Link	277	2.10
Have	2208	16.76	Would	277	2.10
That	2156	16.37	Make	271	2.05
It	1676	12.72	Case	268	2.03
They	1377	10.45	Than	261	1.98
For	1118	8.49	Government	258	1.95
We	1051	7.98	Now	257	1.95
He	1024	7.77	Public	255	1.93
MMR	972	7.38	Other	238	1.80
I	924	7.01	Find	237	1.79
Child	912	6.92	Should	236	1.79
As	860	6.53	**Medical**	235	1.78
Not	839	6.37	Some	234	1.77

On	809	6.14	Out	232	1.76
With	780	5.92	Disease	231	1.75
Vaccine	755	5.73	Risk	231	1.75
By	732	5.55	Between	227	1.72
This	731	5.55	Take	225	1.70
But	728	5.52	Up	225	1.70
Autism	559	4.24	**Evidence**	221	1.67
At	548	4.16	Over	221	1.67
Been	547	4.15	Good	220	1,67
Parent	547	4.15	Many	218	1.65
Who	525	3.97	**Study**	217	1.64
There	512	3.88	**Cause**	213	1.61
From	506	3.84	Give	213	1.61
Measles	495	3.75	**Research**	213	1.61
Do	485	3.68	Know	210	1.59
Or	423	3.21	Science	209	1.58
About	414	3.14	Against	208	1.57
Which	397	3.01	Only	205	1.55
You	396	3.00	Even	201	1.52
All	394	2.99	Get	199	1.51
One	392	2.97	Life	199	1.51
Vaccination	388	2.94	Dr	198	1.50
No	364	2.76	Time	194	1.47
Wakefield	358	2.71	Report	190	1.44
So	357	2.71	Because	188	1.42
Can	350	2.65	Such	181	1.37
More	341	2.58	How	180	1.36
If	334	2.53	Any	179	1.35
Year	332	2.52	After	178	1.35
Health	314	2.38	Could	173	1.31
What	306	2.32	Those	173	1.31

I.IV. Wordlist of the sub-corpus Readers' letters

Readers' letters (38,543 word tokens)					
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw f requency**	**Normalised frequency**
The	2181	56.58	When	101	2.62
Be	1803	46.77	Year	98	2.54

Of	1089	28.25	Or	97	2.51
To	1045	27.11	Which	94	2.43
A	905	23.48	**Cause**	91	2.36
And	894	23.19	Dr	90	2.33
Have	697	18.08	Than	86	2.23
I	640	16.60	More	84	2.17
In	627	16.26	Link	83	2.15
That	521	13.51	**Research**	83	2.15
MMR	431	11.18	People	78	2.02
It	403	10.45	Health	75	1.94
For	363	9.41	Many	75	1.94
Child	349	9.05	Risk	74	1.91
He	342	8.87	Make	72	1.86
We	342	8.87	Now	72	1.86
They	319	8.27	Wakefield	70	1.81
Vaccine	302	7.83	After	69	1.79
With	271	7.03	Other	69	1.79
Not	267	6.92	**Single**	68	1.76
As	266	6.90	Take	66	1.71
Autism	235	6.09	Any	65	1.68
This	223	5.78	Autistic	65	1.68
On	209	5.42	Case	65	1.68
By	179	4.64	Disease	65	1.68
Do	176	4.56	Good	65	1.68
No	170	4.41	Time	65	1.68
There	159	4.12	Up	65	1.68
At	157	4.07	Between	64	1.66
But	154	3.99	Say	64	1.66
Parent	153	3.96	Some	64	1.66
Measles	148	3.83	Government	62	1.60
Been	147	3.81	**Medical**	62	1.60
From	136	3.52	Out	62	1.60
Jab	127	3.29	Son	62	1.60
Can	126	3.26	Three	62	1.60
Who	125	3.24	Only	60	1.55
You	120	3.11	Such	60	1.55
Would	119	3.08	Find	58	1.50
One	117	3.03	**Evidence**	55	1.42
All	115	2.98	These	55	1.42
Give	113	2.93	Get	54	1.40

Should	112	2.90	Week	53	1.37
Vaccination	112	2.90	Into	52	1.34
She	111	2.87	Know	52	1.34
About	107	2.77	Could	51	1.32
Letter	107	2.77	Life	51	1.32
If	105	2.72	London	51	1.32
Will	105	2.72	Believe	50	1.29
So	102	2.64	Go	49	1.27

I.V. Wordlist of the sub-corpus Science, health, and medicine articles

Science, health, medicine (376,716 word tokens)					
Lemma	Raw frequency	Normalised frequency	Lemma	**Raw frequency**	**Normalised frequency**
The	24135	64.06	She	987	2.62
Be	16601	44.06	More	985	2.61
Of	11830	31.40	No	960	2.54
To	9939	26.38	Give	918	2.43
A	9227	24.49	**Medical**	910	2.41
And	9118	24.20	Find	907	2.40
In	8771	23.28	Mumps	892	2.36
Have	7106	18.86	Can	884	2.34
That	5193	13.78	Between	864	2.29
Child	4078	10.82	You	854	2.26
MMR	3768	10.00	**Cause**	851	2.25
It	3691	9.79	Will	839	2.22
They	3666	9.73	After	838	2.22
Vaccine	3552	9.42	If	805	2.13
He	3491	9.26	Per	798	2.11
For	3087	8.19	Would	785	2.08
Say	3012	7.99	All	756	2.00
With	2464	6.54	Cent	752	1.99
Measles	2360	6.26	Up	751	1.99
Autism	2324	6.16	Doctor	738	1.95
By	2154	5.71	Than	735	1.95
Not	2114	5.61	People	733	1.94
At	2027	5.38	Two	708	1.87
As	1990	5.28	Could	703	1.86
We	1923	5.10	Risk	695	1.84

On	1881	4.99	**Single**	677	1.79
But	1758	4.66	Some	674	1.78
Been	1712	4.54	Against	672	1.78
I	1702	4.51	**Evidence**	666	1.76
Health	1687	4.47	Other	665	1.76
From	1608	4.26	Rubella	665	1.76
Parent	1597	4.23	Public	654	1.73
Who	1595	4.23	Over	645	1.71
This	1585	4.20	When	645	1.71
Year	1563	4.14	Make	642	1.70
There	1507	4.00	Because	633	1.68
Jab	1345	3.57	Last	630	1.67
Dr	1329	3.52	Government	625	1.65
Vaccination	1290	3.42	First	610	1.61
Which	1285	3.41	Take	608	1.61
Case	1257	3.33	Now	607	1.61
Disease	1257	3.33	**Bowel**	603	1.60
Wakefield	1256	3.33	**Publish**	583	1.54
Link	1245	3.30	Time	583	1.54
Do	1116	2.96	London	580	1.53
Research	1116	2.96	Three	579	1.53
One	1074	2.85	So	575	1.52
Study	1072	2.84	Month	571	1.51
Or	1041	2.76	Out	560	1.48
About	1030	2.73	**Paper**	554	1.47

I.VI. Wordlist of the sub-corpus Broadsheets

Broadsheets (866,511 word tokens)					
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw frequency**	**Normalised frequency**
The	51902	59.89	Disease	1942	2.24
Be	38311	44.21	Can	1924	2.22
Of	26366	30.42	Will	1919	2.21
To	23584	27.21	**Research**	1917	2.21
A	22351	25.79	All	1869	2.15
And	19810	22.86	Would	1866	2.15
In	17887	20.64	People	1823	2.10
Have	14486	16.71	If	1807	2.08
That	12895	14.88	Time	1781	2.05

He	9171	10.58	**Medical**	1761	2.03
It	8821	10.17	Dr	1758	2.02
They	8173	9.43	Up	1745	2.01
For	7670	8.85	Give	1712	1.97
Child	7043	8.12	When	1683	1.94
MMR	6558	7.56	**Study**	1671	1.92
Vaccine	5903	6.81	Find	1643	1.89
Say	5680	6.55	Make	1627	1.87
I	5606	6.46	After	1623	1.87
As	5509	6.35	Between	1609	1.85
With	5389	6.21	Doctor	1595	1.84
On	5265	6.07	So	1542	1.77
Not	5010	5.78	Than	1525	1.75
We	4954	5.71	What	1523	1.75
By	4912	5.66	Some	1497	1.72
At	4341	5.00	Other	1454	1.67
Autism	4288	4.94	Out	1454	1.67
But	3948	4.55	Take	1417	1.63
She	3829	4.41	Over	1415	1.63
This	3744	4.32	Public	1401	1.61
Measles	3736	4.31	Now	1372	1.58
From	3662	4.22	Could	1350	1.55
Who	3567	4.11	Against	1341	1.54
Been	3410	3.93	**Cause**	1337	1.54
Parent	3130	3.61	Last	1335	1.54
There	3066	3.53	Mumps	1331	1.53
Year	3002	3.46	Government	1295	1.49
Health	2771	3.19	Two	1295	1.49
Do	2764	3.18	Get	1260	1.45
About	2722	3.14	Claim	1238	1.42
Wakefield	2688	3.10	Because	1209	1.39
Which	2528	2.91	Report	1201	1.38
You	2505	2.89	Risk	1165	1.34
One	2449	2.82	**Evidence**	1148	1.32
Vaccination	2427	2.80	Should	1137	1.31
Or	2420	2.79	Also	1130	1.30
No	2315	2.67	First	1128	1.30
Case	2184	2.52	Many	1087	1.25
Link	2138	2.46	Go	1085	1.25
More	2135	2.46	Only	1083	1.24
Jab	2060	2.37	**New**	1076	1.24

I.VII. Wordlist of the sub-corpus Tabloids

Tabloids (880,874 word tokens)					
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw frequency**	**Normalised frequency**
The	51631	58.61	Or	2300	2.61
Be	40398	45.86	More	2267	2.57
Of	25024	28.40	Give	2203	2.50
To	24571	27.89	If	2116	2.40
A	23608	26.80	Will	2100	2.38
And	20641	23.43	All	2021	2.29
In	17215	19.54	After	1953	2.21
Have	16691	18.94	Wakefield	1939	2.20
That	10679	12.12	Mumps	1907	2.16
It	9284	10.53	**Research**	1852	2.10
He	9172	10.41	Would	1843	2.09
They	8814	10.00	When	1810	2.05
MMR	8464	9.60	**Single**	1800	2.04
Child	8437	9.57	Per	1794	2.03
Vaccine	7580	8.60	Up	1785	2.02
For	7434	8.43	Government	1778	2.01
I	7353	8.34	So	1761	1.99
Say	6232	7.07	Cent	1712	1.94
We	5700	6.47	**Cause**	1710	1.94
With	5499	6.24	**Medical**	1708	1.93
As	4792	5.44	Make	1673	1.85
On	4764	5.40	Find	1626	1.84
She	4673	5.30	Now	1624	1.84
Measles	4643	5.27	Over	1624	1.84
By	4592	5.21	Than	1616	1.83
But	4587	5.20	Between	1614	1.83
Autism	4584	5.20	People	1583	1.79
Not	4580	5.19	Doctor	1556	1.76
At	4393	4.98	**Study**	1535	1.74
Jab	4271	4.84	Could	1534	1.74
Parent	4219	4.78	Out	1507	1.71
This	3742	4.24	Take	1498	1.70
Been	3719	4.22	Two	1492	1.69
Who	3684	4.18	What	1483	1.68
From	3662	4.15	Get	1476	1.67
There	3490	3.96	Rubella	1475	1.98

Health	3479	3.94	Because	1425	1.61
Year	3330	3.78	Risk	1424	1.61
Which	2755	3.12	Other	1423	1.61
Do	2627	2.98	Last	1406	1.59
One	2544	2.88	Against	1395	1.58
Link	2523	2.86	Some	1393	1.58
About	2515	2.85	Time	1348	1.53
Vaccination	2500	2.83	Claim	1298	1.47
Dr	2485	2.82	Three	1297	1.47
Disease	2448	2.77	Month	1288	1.46
You	2388	2.71	Public	1246	1.41
Case	2369	2.68	Should	1242	1.40
Can	2318	2.63	Go	1229	1.39
No	2311	2.62	Vaccinate	1218	1.38

I.VIII. Wordlist of the sub-corpus Facebook comments

Facebook comments corpus		
Lemma	**Raw frequency**	**Normalised frequency**
You	19819	22.26
I	18601	20.89
They	11943	13.41
Vaccine	9766	10.97
Not	7954	8.93
We	5748	6.45
Child	5728	6.43
People	4933	5.54
Vaccinate	4359	4.89
Get	4279	4.80
But	4162	4.67
If	3971	4.46
Can	3968	4.45
All	3851	4.32
No	3472	3.90
Measles	3214	3.61
He	3132	3.51
Autism	2672	3.00
Know	2588	2.90

Vaccination	2531	2.84
Because	2454	2.75
Disease	2337	2.62
Say	2291	2.57
Kid	2239	2.51
Make	2168	2.43
Think	2135	2.39
Would	2129	2.39
She	2061	2.31
More	2032	2.28
Like	2023	2.27
Cause	2003	2.25
Will	1975	2.21
Life	1948	2.18
Good	1813	2.03
Some	1756	1.97
Thing	1642	1.84
Should	1575	1.76
Anti	1569	1.76
Die	1538	1.72
Parent	1437	1.61
Study	1433	1.61
Research	1425	1.60
Many	1416	1.59
Need	1321	1.48
See	1306	1.46
Take	1304	1.46
Now	1294	1.45
Risk	1274	1.43

I.IX. Wordlist of the sub-corpora Guardian and Daily Mail Facebook comments

Guardian			**Daily Mail**		
Lemma	**Raw frequency**	**Normalised frequency**	**Lemma**	**Raw frequency**	**Normalised frequency**
You	11331	20.63	You	8488	24.90
I	10820	19.70	I	7781	22.83
They	6869	12.50	They	5074	14.88

Vaccine	5844	10.64	Vaccine	3922	11.50
Not	4725	8.60	Not	3229	9.47
We	3426	6.23	Child	2491	7.30
Child	3237	5.89	We	2322	6.81
People	2919	5.31	Vaccinate	2169	6.36
But	2473	4.50	Get	2095	6.14
If	2295	4.17	People	2014	5.90
Can	2265	4.12	Can	1703	4.99
All	2196	3.99	But	1689	4.95
Vaccinate	2190	3.98	If	1676	4.91
Get	2184	3.97	All	1655	4.85
No	2109	3.83	No	1363	3.99
He	2058	3.74	Autism	1259	3.69
Measles	2007	3.65	Measles	1207	3.54
Vaccination	1646	2.99	Know	1162	3.40
Because	1444	2.62	Kid	1141	3.34
Know	1426	2.59	He	1074	3.15
Autism	1413	2.57	Disease	1053	3.08
Make	1400	2.54	Because	1010	2.96
Say	1340	2.43	Cause	990	2.90
Think	1328	2.41	Say	951	2.79
Disease	1284	2.33	She	891	2.61
Like	1172	2.13	Vaccination	885	2.59
She	1170	2.13	Like	851	2.49
Will	1146	2.08	Will	829	2.43
Life	1137	2.07	Go	818	2.40
Good	1110	2.02	Would	813	2.38
Kid	1098	1.99	Life	811	2.37
Anti	1078	1.96	Think	807	2.36
Some	1067	1.94	Make	768	2.25
Com	1032	1.87	Die	710	2.08
Cause	1013	1.84	Good	703	2.06
Go	995	1.81	Some	689	2.02
Thing	986	1.79	Thing	656	1.92
Should	937	1.70	Should	638	1.87
Parent	899	1.63	Many	614	1.80
Study	892	1.62	**Research**	558	1.63
Research	867	1.57	Now	553	1.62
Risk	859	1.56	**Study**	541	1.58
Die	828	1.50	Parent	538	1.57

Many	802	1.46	Need	519	1.52
Need	802	1.46	Take	514	1.50
See	799	1.45	See	507	1.48
Take	790	1.43	Believe	495	1.45
Read	775	1.41	Anti	491	1.44

II. Keyword lists

II.I. A selection of the first 100 most frequent keywords in the Facebook corpus compared to the Newspaper corpus

Facebook corpus vs. Newspaper corpus	
Word	**Keyness**
You	+ 17189.52
I	+ 5600.82
Your	+ 5142.08
Kids	+ 2365.13
Vaccines	+ 2304.74
My	+ 2243.2
People	+ 2221.63
Com	+ 1816,74
Vaccinated	+ 1738
https	+ 1608.48
Get	+ 1265.72
Know	+ 1138.05
They	+ 1051.98
Not	+ 1020.05
Stupid	+ 1015.78
Pharma	+ 996.25
If	+ 920.22
Pox	+ 909.38
Vaccinate	+ 908.68
Please	+ 805.15
Read	+ 786.41
Vaxxers	+ 770.71
Like	+ 748.17
Lol	+ 747.25
www	+ 732.67

Think	+ 721.09
CDC	+ 710.54
Gov	+ 697.54
Chicken	+ 669.9
Immunity	+ 665.92
Flu	+ 625.92
Anti	+ 614.95
Big	+ 609.59
Sick	+ 608.3
Kid	+ 585.08
Polio	+ 573.89
Org	+ 558.17
Immune	+ 554.03
Maybe	+ 513.92
Yourself	+ 489.28
Idiots	+ 479.11
Everyone	+ 467.81
Idiot	+ 459.44
Vax	+ 452.06
Because	+ 441.81
Them	+ 437.26
Youtube	+ 432.11
Aluminum	+ 408.34
Someone	+ 403.42
Die	+ 396.95
Herd	+ 395.18
Ignorance	+ 373.14
Ignorant	+ 372.85
Unvaccinated	+ 358.46

II.II. A selection of the first 100 most frequent keywords in the Facebook corpus compared to the Editorials and Readers' letters sub-corpus

Facebook corpus vs. Editorials and Readers' letters sub-corpus	
Word	**Keyness**
You	+ 2173.23
Your	+ 567.27
Vaccines	+ 392.99
I	+ 382.38

People	+ 296.37
Vaccinated	+ 232.32
Kids	+ 232.08
Get	+ 208.07
They	+ 205.75
https	+ 186.31
Com	+ 171.64
Vaccinate	+ 130.67
Anti	+ 124.49
www	+ 116.21
Pharma	+ 115.21
Stupid	+ 114.8
CDC	+ 105.57
My	+ 96.94
Vaxxers	+ 95.63
Know	+ 95.51
If	+ 93.32
org	+ 93.13
Polio	+ 93.11
Pox	+ 92.64
Think	+ 90.9
http	+ 80.7
Flu	+ 79.57
Yourself	+ 78.59
Got	+ 77.15
Like	+ 75.59
Lol	+ 73.75
Please	+ 73.13
Immune	+ 72
Me	+ 71.12
Chicken	+ 70.9
Sick	+ 70.9
Because	+ 69.77
Gov	+ 69.15
Actually	+ 66.62
Read	+ 61.68
Youtube	+ 61.31
Big	+ 61.02
Die	+ 58.37
Diseases	+ 56.81

Not	+ 56.2
Immunity	+ 53.15
Them	+ 53.06
Idiot	+ 52.88
Kid	+ 52.5
Mean	+ 52.27
Can	+ 49.77
Facebook	+ 49.72
Preventable	+ 49.31
Unvaccinated	+ 48.84
Idiots	+ 47.48
Aluminium	+ 47.19
Google	+ 47.07
Vax	+ 45.99
Cancer	+ 45.88
Shots	+ 43.44

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The MMR vaccine debate and its relevance to the Covid-19 pandemic

Carlotta Fiammenghi

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