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# Giving health news a shot in the arm:

An audience study of journalistic techniques  
used in vaccination stories

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Wendy Elaine Shailer-Knight  
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## ABSTRACT

The risks of infant vaccination have sometimes been overstated in vaccination news stories through construction techniques that emphasise controversy and conflict, or put an undue focus on the opinions of non-experts. This “false balance” may have contributed to the growth in vaccine hesitancy or refusal around the world. Some scholars have suggested adding interpretative elements to vaccination stories, balancing quotes in line with the known evidence on an issue, or using more photographs of vaccine-preventable disease.

In this qualitative research, these approaches were explored in an audience study with individuals who read three versions of a news story about vaccination risks that exhibited varying degrees of balance and evidence. The first version exposed an audience to a falsely balanced story about the risk of the MMR (measles, mumps, and rubella) vaccine, featuring prominent opinions about the risk. The second version used evidentiary balance, where a greater space was taken up by experts quoted on MMR vaccine safety, mirroring the scientific consensus. The third version featured a balanced story with the addition of photographs of children showing symptoms of vaccine-preventable diseases. The mixed-methods study primarily used individual semi-structured interviews with 17 parent/caregiver participants, with support from two questionnaires. The goal of the research was to determine the audience responses to the stories, and if the three variations affected feelings of safety about the vaccine, or the reported vaccine intentions of participants.

The research found that even vaccine-confident individuals responded to a story alleging vaccine risks with a degree of anxiety or unsettled feelings about the vaccine. Future vaccination intentions were not impacted, but some participants expressed a desire to look further into vaccine safety in the future. When exposed to the story constructed with a balance of vaccine safety content that better reflected the scientific evidence, anxieties were reversed and participants expressed relief. In contrast, the vaccine-hesitant and -refusing participants responded to the first story by agreeing with the allegations, and considered the second story biased. The third version, with photographs alongside the story, drew mixed responses: some participants were interested in the images and these reinforced their vaccination intent; others disliked them or thought they were manipulative.

The results of the study suggest interpretative and evidentiary balanced approaches to vaccination stories, as well as careful use of photographs, do represent useful strategies for journalists to use in more accurately conveying risk in contested science or health stories, and could play a limited role in increasing the vaccination intentions of readers. The study findings highlight the potential falsely balanced stories have for sowing doubts about vaccine safety in news consumers or reinforcing vaccine-refusing attitudes. This research has added significance in light of the global Covid-19 pandemic and vaccine rollouts, and could inform news media’s use of balance in contested health or science stories in the future.

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## **Audience study visual material credits**

Two audience study images, the baby wearing a yellow spotted garment, and the teen with mumps, are from the Centers for Disease Control and Prevention in the United States. These were free for publication use and available from the Public Health Image Library at <https://phil.cdc.gov>. The third image, from Shutterstock [image 467190389], of an ill baby being carried by a nurse in blue, was purchased for use in this research.

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## Chapter one: Introduction

This study focuses on health communication and news media, looking especially at vaccination news and presentations of risk. Health and science news are important sources of information for consumers, but public misconceptions persist on many health and science topics (Dixon et al., 2015). In the last two decades, vaccine hesitancy has been on the rise, with some parents deciding the risks of vaccinating outweigh the risks of rarely seen diseases vaccines are designed to prevent, resulting in outbreaks of preventable disease (Brunson & Sobo, 2017; World Health Organization, 2019a). Many theorists have implicated the news media in the growth of vaccine hesitancy, citing inaccurate news stories and elevated presentations of risk in some news coverage (Boyce, 2007). But explorations of how readers make sense of news story presentations about vaccine safety are rare, and this question forms the backdrop to the research detailed in this thesis.

### 1.1 Theoretical background

The news media's traditional role in democratic societies has been threefold: to investigate official information and check it for accuracy, hold those in positions of power to account, and publicise what news organisations think the public needs to know (Maras, 2013; McQuail, 2010). Two of these fundamentals, checking information for accuracy and publicising essential information, have historically been the main reasons readers, listeners, or viewers wanted to consume news (McQuail, 2010). This informational role includes providing people with the latest health and science news, together with possible risks (Maggio et al., 2020).

But some authors have asked if news media are fulfilling their role as a trusted information provider. As news media have embraced society's ideals of diversity of expression and equality, journalists have attempted to interview a wider range of people (Christians et al., 2009). However, giving equal space to opposing views in the name of fairness or balance, or prominence to quotes from unqualified people or persons with academic or financial conflicts of interest, is believed to have contributed to misinformation in science and health stories (Ashwell, 2016; Boyce, 2006; Corbett & Durfee, 2004; Dixon & Clarke, 2012, 2013; Holton et al., 2012; Wang et al., 2017).

Scholars have also noted the portrayal of health and science news stories often leads to risk narratives that overstate controversies in an effort to make news more compelling (Dixon et al., 2015). Health stories, like other hot-button topics, can be ripe for controversy and sensationalism, and are often used by news media to lift readership or audience levels (Myllylahti, 2013), particularly by a sometimes manufactured conflict between two points of view. Sometimes adherence to the objectivity norm has led to the presentation of two opposing opinions in a strategy to appear unbiased or neutral (Maras, 2013).

Accuracy in news stories about health is important in a democratic society as providing the wrong information, or the public not learning health-preserving information, can have consequences for public health. In the case of vaccination news, several researchers have highlighted the role of inaccurate and incomplete news coverage in fuelling anxieties about vaccination risk (Faasse et al., 2017). Vaccination news can be both complex and polarising for readers, and like climate change science, some of the principles behind immunisation are not well understood, and misinformation online is rife (D’Ancona, 2017).

Some researchers have claimed modifications are needed to the objectivity norm to reduce the construction of misleading narratives, and have suggested using weight-of-evidence balance in scientific or health news stories to show the weight of scientific consensus is in one direction (Clarke et al., 2014). The role of images of vaccine-preventable disease in news reports has also been considered by scholars, with many assuming images would encourage uptake of vaccination (Clarke et al., 2015). Few studies have been done on the impact of photographs, and the sparse results have been mixed (Pluviano et al., 2017). In the context of these findings, the research presented in this thesis looks at the relationship between feelings of safety about vaccination and news coverage, and whether modifying some elements of news story presentation might affect reader vaccination intentions.

## 1.2 Research questions

The specific Research Questions guiding this research are:

*RQ1: In news stories depicting controversy about possible vaccine adverse effects featuring quotes from non-experts, how do readers respond to amplified presentations of risk? What are the implications for readers’ perceptions of vaccine safety and intent to vaccinate?*

*RQ2: In news stories featuring people quoted about possible vaccine adverse effects, how do readers respond to the inclusion of quotes about the safety of the vaccine from scientists or*

*medical experts? What are the implications for readers' perceptions of vaccine safety and intent to vaccinate?*

*RQ3: In news stories about vaccinations, how do readers respond to the inclusion of photographs of people with symptoms of preventable diseases? Is there any connection to reported views on the importance of vaccination/or reader intention to vaccinate?*

The present research explores audience responses to different degrees of balance and evidence in a vaccination news story in a qualitative study conducted in 2020 with 17 volunteer parents. It is a uniquely New Zealand study, with the research taking place in a provincial city, Palmerston North. The audience study features three variations of a news story about the MMR (measles, mumps, and rubella) vaccine in a qualitative design focusing on semi-structured interviews, with support from questionnaires on vaccine confidence and media consumption.

The present research explores the research questions by:

1. Exposing participants to a falsely balanced story about the risk of the MMR vaccine, featuring prominent opinions about the risk.
2. Exposing an audience to a story using evidentiary balance, where a greater space was taken up by expert evidence and opinion that the MMR vaccine was safe.
3. Exposing an audience to a balanced story featuring the addition of photographs of children with vaccine-preventable diseases.

The research coincidentally unfolded at the same time as the global Covid-19 pandemic, a phenomenon that itself produced untold numbers of urgent health and vaccination news stories. The pandemic gives the research heightened relevance and confirms the importance of the topic.

The next chapter, the Literature Review, provides a deeper background on the power of news media and vaccination news, with a consideration of the news media's role as an information provider in an age of information "disorder" (D'Ancona, 2017). It presents research about whether journalistic norms in news story construction have a part to play in misrepresentations of health risks and vaccine hesitancy, and showcases alternative approaches to covering scientific controversies. The role of photographs in accurately portraying disease risk is also discussed. Chapter three, the Methodology, explains the

research design and methods used in the current study, including the nature of audience studies and the theoretical basis for using mixed methods for deeper information gathering (Creswell & Plano Clark, 2018). It details the processes underpinning the semi-structured interviews as the primary method, and the journalistic techniques used in preparing the news stories for the study. Chapter four, Results, provides the audience's responses to the three story variations and the questionnaire answers, leading to the Discussion in Chapter five, where the results are connected to theory, and the implications of the findings delivered. The Conclusion discusses the significance of the research and presents limitations and suggestions for future research that would extend the current study.

## Chapter two: Literature review

This review presents current scholarship about the role of the news media, vaccination, and the intersection of the two, traversing the most relevant literature on news media treatments of vaccination and the reporting of risk. It places coverage of vaccination stories within wider theories about the power of the press in forming public understanding of issues and the informational role of the news media in a healthy democracy. It presents studies about news media treatments of childhood immunisation, poor levels of vaccination, and theories about the contribution of journalism's reliance on the objectivity norm in story construction. The chapter closes by introducing theories about the impact of photographs in health news stories and alternative approaches to reporting science controversies, signalling the research interests of the present study.

### 2.1 News and democracy

From the beginnings of the modern democracy, news media have been seen as pivotal to the concept of Habermas's "public sphere", the place where the freshly minted egalitarian society contributed to and participated in bourgeois daily life (Butsch, 2011, p. 152; McQuail, 2010). The new democracy meant equal access to information was important, with collective discussion considered necessary to the public decision-making process that democracy was predicated upon (Butsch, 2011). But as populations grew ever larger in eighteenth and nineteenth century England and Europe, the difficulty of accessing information equally led to reforms that freed the print press from political control and partisan interests. Reformers said a free press was needed to protect the liberties of the public (Ward, 2010), resulting in dependence upon circulation and advertising instead.

Fast forward to today and journalism is a key ingredient in the social cement of modern society, according to McNair (2009). McQuail (2010) argued there is a public interest in the way the media operates, with the industry founded on its role as a trustworthy information provider. Ethical standards and professionalism have been developed to support that role (Butsch, 2011). Although journalist ideals are still debated, most contemporary theorists and press associations would agree with Christians et al.'s (2009, p. 119) six-part description of the journalists' role in a democracy:

- Acting as a "watchdog" to sniff out corruption in power and politics
- Informing the public

- Forming opinion
- Setting the agenda for public discussion
- Providing surveillance on the social environment
- Participating in social life

The first four are particularly relevant to public health when vaccination stories are in the news, and later in this chapter we will see there can be conflicts between them.

Other scholars have argued journalists' social responsibility to be accurate and truthful is perpetually at tension with the entertaining and money-making necessities of news as a business (Butsch, 2011; McQuail, 2010), especially since the regulatory changes that allowed mega media mergers to occur from the late 1990s. Over the last two decades, the established commercial media have been further challenged by technological convergence, and the subsequent loss of advertising revenue has led to dramatic reductions in media power and reach, as well as decimating journalist workforce numbers (McKinnon et al., 2018; Myllylahti, 2013).

Ellis (2014) argued that a healthy democracy relies on a healthy news media. Writing about the importance of governance and ownership, he said the news media needs to reach enough of us and be willing and able to provide the public with information they need to know. News media are still influential and do reach significant numbers of us, according to journalism fact tank the Pew Research Center's regular reports in the United States (Mitchell et al., 2016; Shearer, 2018). The latest reports confirmed more than seven out of 10 Americans follow national or local news *somewhat* or *very closely*. Although there have been drops in consumption in traditional or legacy print newspaper outlets in the United States over a longer time frame, many people are turning to their digital online permutation in large numbers instead (Mitchell et al., 2016; Shearer, 2018). The greatest proportion of adults preferred to "watch" news on television (46%), rather than read it (35%) or listen to it (17%). Internet-based news sites and television broadcasting are therefore pulling in the consumers of traditional print news platforms. For the parenting-aged demographic that infant vaccination information is most relevant for, the Pew Centre readership changes found 50% of participants aged between 18-29, and 49% of participants aged 30-49, preferred online news (Mitchell et al., 2016; Shearer, 2018).

In New Zealand, there were big variations between mastheads when readership figures were taken across all platforms, but most newspapers were holding steady or seeing only insignificant changes two years ago (Nielsen Media, 2019; Roy Morgan, 2019). During the emergence of a global Covid-19 pandemic and nation-wide lockdown in 2020, television and print news consumption surged in New Zealand, as news consumers returned to trusted sources to keep up with Covid-19 developments related to their personal safety (Dillane, 2020; Myllylahti & Hope, 2020; “New Zealand Herald”, 2020).

### **2.1.1 Information disorder**

However, the news media’s role as a trustworthy information filter and provider, and watchdog on others, is increasingly coming under scrutiny (Reed et al., 2020). Complicating information delivery from the traditional news outlets is the onslaught of unreliable news from all sources. Our current time in history has been labelled the “post-truth” era. Post-truth was the Oxford English Dictionary word of the year for 2016, defined as when facts and objectivity are replaced by emotion and personal opinion (Oxford Languages, 2016).

D’Ancona (2017) said the public was inundated with information from online and social media sources that, if not maliciously false, was at least of poor or dubious quality. The result was a relentless flood that Steffens et al. (2017) evocatively called “a fire hose of unfiltered health information” the public faced daily (Steffens et al., 2017, p. 122).

Misinformation activists Wardle and Derakhshan (2017) have coined a new term, “information disorder”, to describe the creation and distribution of deliberately false, harmful information designed to disrupt, manipulate or mislead. Just a few months after the declaration of the global Covid-19 pandemic, the World Health Organization had to declare an “infodemic” as well, because of the huge outpouring of false information on social media about the virus (Nguyen & Catalan-Matamoros, 2020). Social media and the internet have often been singled out in the literature as the primary proponents of misinformation and disinformation (Brilli et al., 2020), but the news media are not immune (Peters et al., 2018). Reed et al. (2020) said examples of information disorder in the world of journalism include such things as intentionally using false news, exaggeration, or unnecessarily explicit content to capture attention. In the case of media stories about health and science, this has implications for the portrayal of risk, covered later in this chapter at section 2.4.2.

### 2.1.2 Agenda setting theory

Forming opinion and setting the agenda for public discussion are two of Christians et al.'s (2009) six descriptions of the journalist's role, listed earlier. Academics agree that instead of just reporting events and providing the public with the information needed to make informed choices, news media actually have considerable power in constructing the agenda of public debate (Phelan, 2012). The agenda setting theory established by McCombs and Shaw (1972) noted the propensity of the public to take media coverage as a signal of what important issues they should attend to. Broersma (2010) asserted the public were often unaware a debate even existed until the news media highlighted it. He argued media have considerable power in influencing "what people think about and how they act" (p. 29), a sentiment that echoes Aufderheide (2008) who said media's powerful shaping role could either help or hinder a functioning public.

Aufderheide (2008) said the most valuable "real estate" in the world was that inside our heads and news media reports affect how news consumers thought about and understood the world. Getting through the "media smog" of information overload and checking the veracity of information could be a challenge:

Being an informed citizen is an exhausting and unrewarding full-time job, and most of us already has one of those (Aufderheide, 2008, p. 56).

Steffens et al. (2017) found mainstream news was still setting the agenda for conversations around public health, despite the pressure from social media and internet platforms, but the traditional top-down communication from elites to the public was being eroded by technological convergence. Social media were also capable of pushing stories back the other way, and setting the agenda of news media reports (Jang et al., 2019). An updated agenda setting theory describes how new media such as social media could orient users toward legacy news media coverage that fit their interests, and make certain issues more salient to news consumers (McCombs et al., 2014).

By communicating information about health in general, and vaccines in particular, the news media is an important instigator of public debate about vaccination. The public relies on news media for health advice (Maggio et al., 2020) and for warnings about risks, with news media consumers expecting health and science information to be accurate (Ashwell, 2016; Corbett & Durfee, 2004; Dixon & Clarke, 2012, 2013).



### 2.1.3 The objectivity norm

Alongside the academic debate about the role of news media in a democracy, and the problems of influence, accuracy, and misinformation, there is concern about the place of journalistic objectivity. Objectivity is a much-debated concept in journalism where reporters try to remain neutral about a topic and to not allow their personal views to influence news reports (Christians et al., 2009; McQuail, 2010). McQuail (2010) said journalists had both a responsibility to endorse public health initiatives for the greater good as well as keep an eye on things like risks to the individual. This could be quite a balancing act; the two may be in opposition, such as when news reports about science or health challenged established science. Objectivity, and its pursuit of balance, accuracy, and neutrality, has traditionally been the way journalists maintain a middle ground.

The objectivity norm is practised differently in different countries and in different media outlets (Maras, 2013; McQuail, 2010; Skovsgaard, 2012), but one of the fundamental principles behind objectivity, that most journalists would agree upon (McQuail, 2010), is the attempt at impartiality and the pursuit of truth. Closely related to balance, with the terms sometimes interchangeable, McQuail (2010) said objectivity was usually distinguished by an emphasis on getting both sides of a story and balancing quotes from two sides in a controversy. This was an attempt, in appearance at least (Broersma, 2010; Maras, 2013), to be unbiased.

Reporters have to write in a detached tone and balance stories by presenting various points of view. The objectivity norm is an important way to distinguish journalism from propaganda and PR (Broersma, 2010, p. 28).

The end goal of objectivity is truth and “factualness” (Thomas et al., 2017). Various commentators have described objectivity as an impossible dream because of human beings’ inherent biases; or even a dangerous myth or cult used as a cover for the white, male, point-of-view (Maras, 2013). Maras (2013) said the concept of objectivity is “inherently ambiguous” (p. 7), but could be reshaped into something meaningful. He joined Bell (1998) and Ward (2010) in arguing that objectivity was a norm that needed updating for the current age.

However, the “objective” style of balancing discourse has become dominant in news story construction as it was seen as a way to avoid accusations of bias, and to maintain neutrality (McQuail, 2010), and is often defaulted to when the respective validity of conflicting

statements cannot be personally verified due to journalistic knowledge or time impediments (Brüggemann & Engesser, 2017). It emerged as a dominant ethical ideal for print news media early last century, and remains a basic journalistic tenet (McQuail, 2010; Ward, 2010). According to Boyce (2007), the objectivity norm was historically important to news media attaining its place in society as a neutral and independent observer that upheld the public interest, essential to democracy. Various press freedoms and privileges have been acquired because of this special status (McQuail, 2010). Objectivity was even expected by the news consumer. People complain of bias if news reports appear to favour one side over another (Maras, 2013), and the objective reporting style has been found to increase trust in media (McQuail, 2010). But, as we will see, the orthodox fashion of balancing two sides to a story has limitations when it is used in cases where evidence overwhelmingly supports one side over another, such as in vaccination reports about safety.

## 2.2 Vaccination and the public good

Vaccination rates have slowed and hesitancy or refusal is on the rise (Turner, 2019; World Health Organization, 2019a). This has not always been the case. United States sociology professor Jennifer Reich (2016) provides a useful reminder of the now mostly forgotten pre-vaccine world, when high death rates from now-preventable diseases were a normal part of life, and surviving childhood was far from assured. Her book asserted the development of vaccine is one of the most important medical advancements in modern history, saving millions of lives worldwide by eliminating or reducing the transmission of deadly diseases. Before vaccinations were developed, one in four infected people died from smallpox, half of those infected by diphtheria died, half of all infected babies with whooping cough were hospitalised and around 4% died, 1% of polio cases led to permanent paralysis, and there was 1 death per 1000 cases of measles and much higher rates in immunity-compromised individuals. Even when victims survived, many infections had lasting, life-altering effects, like deafness, brain damage, or deformity (Measles, 2020; Reich, 2016).

However, vaccines have occasionally attracted controversy, too. Early forays into developing vaccinations delivered both incredible successes and some shocking tragedies. Reich (2016) records that orphans were used for experiments, parents ordered to vaccinate children at gunpoint, and successive United States governments in turns championed or ignored the need for poor communities to be immunised.

Otago University public health researchers Nick Wilson and Michael Baker wrote in 2012 that:

Infectious diseases are one of the few human health threats that have the potential to be entirely eradicated (p. 68).

That same year, Nikki Turner, from the University of Auckland's Immunisation Advisory Centre, was convinced measles and pertussis (whooping cough) could be easily eliminated in New Zealand if immunisation uptake continued what was then an upward trajectory (Turner, 2012). But vaccine-preventable diseases like measles, earmarked for eradication in New Zealand in 2012 (Wilson & Baker, 2012), are still here. Measles is highly infectious and lower vaccination rates have had the inevitable result: worldwide measles deaths jumped nearly 50% between 2016 and 2019 (Patel et al., 2020). New Zealand's significant immunisation gaps were made apparent in a measles outbreak in 2019 (discussed below in section 2.4.4).

### **2.2.1 Not a shot: Vaccine hesitancy and refusal**

In many parts of New Zealand, and around the world, vaccination rates are currently lower than that required to protect the community at large against preventable disease outbreaks (Ashwell & Murray, 2020; World Health Organization, 2019b). According to research, reasons for this include small but vocal communities spreading misinformation; apathy from the success of vaccines making preventable diseases appear to be eradicated or milder than reality; and post-modern societies that seek information for themselves instead of relying on experts or traditional authorities, such as news media or conventional science (Comrie et al., 2012; Getman et al., 2018; Kata, 2012; Mueller et al., 2012; Reich, 2016; Rossen et al., 2019; Tilley et al., 2014). In addition, Russia has reportedly used internet trolls to plant anti-vaccination information to try and destabilise target countries (Broniatowski et al., 2020; Mau, 2019).

To understand the limits of news media's influence, some understanding of reluctance to vaccinate is needed. Vaccine refusers have been studied by researchers for many years: efforts have been made to get inside the thinking of what is to most people a perplexing point of view. McKinnon and Orthia (2017) analysed archival *Sydney Gazette* issues for government material on smallpox vaccination and discovered some of the same anti-vaccination rhetoric existed 200 years ago as today. This broadly came under three categories: ignorance of how vaccines work; belief in the pre-eminence of individual liberty

or mistrust in authority compelling them to act; and objections based on religion, sex, or class.

Another Australian study, by Rossen et al. (2019), also identified three main psychological vaccination attitude profiles, succinctly named accepters, fence-sitters, and rejecters. Like McKinnon and Orthia (2017) above, “rejecters” were more concerned for personal liberty and the rights of the individual. Rossen et al.’s rejecters also elevated purity of the body, and considered vaccines impure or unnecessary. According to Reich (2016), common “rejecter” beliefs were that the body’s immune system worked better without outside interference from vaccinations, and vaccinations could overwhelm it. Rossen et al.’s fence-sitters aligned to the confidence hesitancy group in Getman et al.’s 2018 study, a subset that wanted more information to inform their own decision making and research about vaccines. Tilley et al.’s (2014) New Zealand research was similarly themed, finding the main barriers to immunisation for the group of 107 New Zealand parents and expectant mothers surveyed were concerns about safety, confusion about the benefits of vaccination versus the risk of not vaccinating, and systemic impediments such as time and money to get to doctor appointments or general practitioner shortages. Verger and Dubé (2020) condensed similar patterns into: confidence, complacency, and convenience. At the start of 2019’s measles outbreak in New Zealand, Turner (2019) offered a further reason, saying our modern lives were busy and vaccinations just got forgotten when there were no outbreaks of disease.

Comrie et al. (2012) concluded society had moved away from authoritative models in the “survival” societies of past generations and toward freedom of choice/libertarian models, including a waning trust in the health profession as a whole. Kata (2012) called this the post-modern medical paradigm: where everybody was an “expert” and fringe elements found like-minded individuals to build false consensus with. Smith and Graham’s (2017) study of Facebook anti-vaccination sites also found the concept of structural oppression from institutional government and the media proliferated. Conspiracy theories were given air and thrived in highly feminised communities. Fifteen years ago, Leask et al.’s (2006) audience study with parents about vaccination decision making found similar broad themes:

Anti vaccination arguments appeal on a broad level by alluding to deep anxieties and social issues that concern many 21st century citizens, such as cover ups by medical professionals (who protect each other, or close rank when confronted); faceless bureaucrats regulating parenting and finally, a profit-driven pharmaceutical industry. Anti-vaccination lobbyists align themselves with broad, socially acceptable structures,

framing non-vaccination as an informed choice made by parents who are dissatisfied with official assurances, venerate freedom of choice and are suspicious of government intervention (p. 7238).

The literature on vaccine hesitancy shows the most intractable anti-vaccination populations are unlikely to be shifted from their views due to a tendency to stay within small communities or internet “echo chambers” and avoid mainstream messaging sources (Getman et al., 2018; Kata, 2012). This group represents a very small percentage of the total population, but Helps et al. (2019) said this core also represented an immovable community that became more entrenched with the imposition of penalties for not vaccinating.

Leask (2011) estimated between 3 and 7% of children in Australia were unvaccinated or under-vaccinated because of the hard-core anti-vaccination beliefs of parents. In New Zealand it was about 8-9% of infants, and higher levels in older age groups (Turner, 2019). Turner (2019) said true vaccine refusal is rare in New Zealand and the drop in vaccination was primarily about complacency and accessibility, as well as fear of vaccines. However, populations that were complacent about vaccinations were considered the most at risk of being influenced by anti-vaccination messaging (Comrie et al., 2012). The under-vaccinated group was considered large enough to achieve vaccination levels that protected the community if more members were vaccinated (Turner, 2019).

In contrast, Brunson and Sobo (2017) found views were diverse and “jagged” (p. 38), with complex layers and different thoughts on different vaccines, depending on the child, location, and environment. Parents would weigh up the risks between a particular child having or not having a particular vaccine at a particular time, with decisions not fixed, but having “plasticity” (p. 45) and subject to change if the environment or perception of risk changed (Brunson & Sobo, 2017). Stephenson et al. (2018) agreed there was a large middle ground of parents, who often moved through the different arguments before coming to a vaccination decision, with strict all-or-nothing views only a feature of a small minority of vaccine-hesitant parents.

Finally, Stephenson et al. (2018) suggested contemporary news media reporting on vaccination viewpoints in polarised pro- and anti-vaccination fashion has actually undermined public health efforts to lift vaccination rates by alienating parents in the vast in-between land. Stephenson et al.’s findings coincided with the Australian Government

introducing more punitive schemes for non-vaccination, which both intensified negative reporting about vaccine refusal and generated stories about people feeling victimised or oppressed by the regime taking away their choice; Ashwell and Murray (2020) suggest this negativity could be more persuasive than positive vaccination news stories.

Next, we look at how news media's penchant for stirring controversies over scientific certainty and vaccination facts unwittingly taps into a deep vein of mistrust in parents.

## **2.3 Journalists and jabs: Vaccination in the news**

We have seen the priority the news media puts on objectivity earlier. How the norm plays out in science and health stories, where the facts are contested, is the focus of this section. Journalist-media critic Davies (2008) argued that journalists do attempt to report “the truth” for the greater public good, but media structures and news gathering systems tended to distort it. New Zealand media commentators and journalists Manning (2012) and Hope (2012) have documented the priority that circulation and ratings now hold in the New Zealand media environment, while Myllylahti's (2013) media ownership report showed cut-backs and media mergers have led to more sensationalism, reactionary journalism, and content about celebrities in an effort to lift ratings or readership. This meant bad news, or even the mere possibility of risk, was pushed to the top of the news agenda.

### **2.3.1 Science journalists under pressure**

In their respective studies into science reporting, Ashwell (2016) and McKinnon et al. (2018) found subject areas that involved complex issues were notoriously difficult to report well. This was partly because the simplification and brevity that news media requires means there was not enough time or space to cover the topic adequately. News needs to be simple, quick to write, objective, and attention-seeking. But this meant story context and meaningful explanation could be left out, with lost opportunities for refuting misunderstanding or inaccuracies (Ashwell, 2016; McKinnon et al., 2018), such as claims that vaccines are harmful or do not work.

Jang et al. (2019), Perez et al. (2016), and Catalan-Matamoros and Penafiel-Saiz (2019) represent three content analysis studies that found inaccurate news reports or stories repeating unsubstantiated claims or myths of possible harm from vaccination. Perez et al. (2016) investigated a correlation between human papilloma virus (HPV) vaccination in news reports in Canada and a low rate of vaccination uptake when boys were added to the

immunisation schedule, finding many news reports were incomplete or incorrect. Although Perez et al.'s study period of 2012-2014 coincided with HPV vaccinations being extended to adolescent boys, many news reports did not mention the eligibility of boys. Inaccuracies were found in the news stories about the range of cancers and conditions protected from by the vaccine, and misleading information about its effectiveness and safety. HPV vaccination news coverage also frequently focused on the controversy from morality debates, as HPV is sexually transmitted and young adolescents are given the vaccine (Casciotti et al., 2014; Faasse et al., 2017; Perez et al., 2016; Robbins et al., 2012). Catalan-Matamoros and Penafiel-Saiz's (2019) systematic review also found negative and inaccurate messages proliferated among the vaccine stories sampled: 75% of the mass media articles picked up in the authors' review were found to be negative about vaccines and 83% were inaccurate, with many stories quoting sources that said a vaccine was not well understood by science, that it did not work, or that it may harm people.

Other researchers have found vaccination risks amplified in news reports through news framing and the use of imprecise, qualitative terminology (Pan & Meng, 2015), or reactions attributed to vaccines that were later found to be coincidental. Pan and Meng (2015) concluded the news framing used by United States television networks in reports of swine flu pandemics had the power to change public opinion on controversial issues:

By selecting certain aspects of news events and excluding other information, news reporters can direct public opinion and influence audience interpretation of news events (p. 132).

McKinnon et al. (2018) noted that specialist health and science journalist numbers have plummeted along with the rest of the media workforce over the last two decades; according to Rogener and Wormer (2017), science sections were one of the first to be pruned in newsrooms. Ashwell's (2016) study found time-poor journalists were under pressure to always find a readership-boosting quirky or "sexy" angle to science topics and rapid newsroom staff turnover meant inexperienced reporters were often covering science subjects. Yet at the same time, McKinnon et al. (2018) found public interest in science was very high, but access to raw research was limited so readers relied on the news media to keep them updated.

In the next section we turn to the part played by news story construction techniques that, when combined with a steady reduction in media resources, have been found to exacerbate

the problems of communicating risk and complex science accurately (Ashwell & Murray, 2020; Pan & Meng, 2015). Earlier research has focused on climate change news coverage and reader perceptions that the issue was less serious than scientists believed it to be (Corbet & Durfee, 2004; Getman et al., 2018; Rogener & Wormer, 2017). Boyce (2007) found the same problem to an opposite extreme with vaccination stories creating panic by overplaying the risks.

### **2.3.2 Constructing a false sense of risk**

Against this background of journalists under pressure and inaccurate reporting, we now focus on the literature exploring the tension between the need to balance possible risk with established facts in health news. As discussed earlier, as part of their watchdog role, the media do have a responsibility to disseminate risk when it is present. Modern vaccines are safe, but some vaccinations do cause adverse reactions in some people. Early vaccines occasionally killed people or accidentally infected them with the diseases they were designed to protect against (Reich, 2016), so there are historic precedents for caution. The actual known risks of modern vaccinations range from superficial soreness at the site of an injection, to seizures (rare), temporary platelet number drops (very rare), to serious allergic reactions and possible brain damage (extremely rare – 1:1,000,000) (Brunson & Sobo, 2017).

In health news, the audience's understanding of the relative risk of having the vaccination, as opposed to not having it, is pivotal to vaccination intention and uptake, according to Boyce (2007). In 2011 Leask noted that media framing shifted from the perceived risk of disease to vaccination itself whenever the vaccine-preventable diseases become so uncommon they seem to no longer be a risk. But a fixation on risk mirrors the obsession some people have with vaccination safety when the diseases vaccines protect against no longer seem a threat. Several studies have found as community protection from vaccination rises, and the risk of acquiring a vaccine-preventable disease drops, parents then switched to focusing on the risk of the possible side effects of the vaccination itself (Brunson & Sobo, 2017; Comrie et al., 2010; Goodyear-Smith et al., 2007; Verger & Dubé, 2020). This phenomenon was common in nations where vaccine-preventable diseases are rarely seen first-hand:

These parents believed that while being exposed to a [vaccine-preventable-disease] was perhaps a slim possibility, accepting vaccination entailed a definite exposure to a possible harm (Brunson & Sobo, 2017, p. 43).



Among others, risk communication experts Dixon and Clarke (2012) have highlighted the construction of news reports as important in shaping public perception of vaccination risk. A similar argument was posited by Brüggemann and Engesser (2017), and earlier by Corbett and Durfee (2004), about climate change, showing news stories could increase uncertainty about scientific certainties by implying scientists were in disagreement on an issue when the majority were not.

As shown earlier, balanced reporting is a journalistic tenet designed to convey objectivity in news reports, by showing “both sides” of an argument, so journalists can avoid accusations of bias. Scholars like Boyce (2007) and Dixon and Clarke (2012, 2013) argued that showing views for and against vaccination when alleged risks were raised, in an effort to appear objective or neutral, could easily produce a misleading picture about the extent of the risk. They called this “false balance” (2013, p. 352). Information that was almost universally accepted by experts as factual scientific principles suddenly appeared contested or questionable. Using quotes from sources with alternate views has been identified as an important problem in science and health news generally, as is using quotes from unqualified people, or persons with academic or financial conflicts of interest (Ashwell, 2016; Holton et al., 2012; Wang et al., 2017). An associated idea has been labelled amplification theory. Some theorists have identified that even repeating an unsubstantiated idea, such as in a news report, will give it air and “amplify”, or megaphone the faulty information (Brüggemann & Engesser, 2017, p. 59).

Applying the norm of balance amplifies the views of contrarians (which may attract audience attention) and distorts coverage of the issue (p. 59).

McQuail (2010) said news media were known for pursuing dramatic stories about risk instead of more mundane ones, which can make the world seem more dangerous than it really is. The social amplification of risk framework (Jaques, 2014) is a label given to this phenomenon, establishing that social forces like news media are particularly adept at amplifying risk, and in shaping the public’s understanding and response to risk. Jaques (2014) said the news media are a “primary amplifier” (p. 242) because they repeat risk information, dramatise risks in news stories, and have credibility with news consumers.

In 2018, McKinnon et al. interviewed scientists who singled out false balance and fabricated controversy in science news coverage for misrepresenting facts in news stories: “Media reporting often feels like two sides to the story needs to be reported and that’s not the case,”

(p. 568) said one participant. The scientists believed this journalistic convention contributed to misunderstanding about climate change science.

Balance is the central tenet of journalism but at some point it becomes ridiculous ... [there is a] low level of understanding that an opinion about something is very different to an expert opinion (p. 568).

Brookman-Byrne (2019) argued that journalists should not be using balance at all in news reports about science. Instead accuracy should be the main emphasis, leaving balance to subjects like politics where there was clearly more than one side to the argument.

### **2.3.3 Effects: Studies of news coverage and vaccination uptake**

So when controversies and risks of vaccination have been amplified by falsely balanced news coverage, what is the effect on the audience? Do positive reports produce an increase in vaccination uptake, and negative ones lower it? O'Neill (2011) says mass communication theorists have debated media effects on audiences for decades: whether they are minimal or powerful, and how they could even be identified or measured. Much of the more recent literature investigating news media and vaccination uptake assumes negative coverage will lead to negative health outcomes (Faasse et al., 2017). By negative coverage, the authors mean any news content that questions the safety or necessity of vaccination.

Many of the studies and systematic reviews in this area are predicated upon the contention that news media reports did influence reader activities (Catalan-Matamoros & Penafiel-Saiz, 2019). Historical scholarship has also made this link (Largent, 2012; Reich, 2016).

Establishing a definitive causation and a direct link between news coverage and vaccination rates is difficult, however. No meta-analysis was included to establish causation between negative media coverage and vaccination uptake levels in Catalan-Matamoros and Penafiel-Saiz's review, although the study date range (2007-2017) did coincide with a period of falling vaccination uptake around the world.

However some researchers have established news media can indeed either help or harm vaccination uptake rates, such as in the case of Nigeria and polio vaccination. Research by Warigon et al. (2016) documented a significant improvement in immunisation rates after journalists partnered with the World Health Organization in news media campaigns supporting polio eradication from 2007 onwards. Chen and Stoecker (2020) matched patterns in positive news coverage to vaccine uptake records, for adults at least. Their study found that every additional 100 news stories published about the importance of influenza

vaccination for the elderly in each month under scrutiny coincided with an uptake increase of 0.3 percentage points for people aged 65+ during the flu season months.

In the New Zealand environment, researchers Goodyear-Smith et al. (2007) mapped a changing narrative from news media, establishing there was a reduction in alarmist anti-immunisation messages between the study period of 2001 and 2003, with information-correcting strategies by the Immunisation Advisory Centre thought to have contributed to the change. The following year, the New Zealand Immunisation Register was established, in response to a meningococcal disease outbreak, to find where immunisation gaps were. Whether in tandem, or each element alone, the result was a dramatic increase in actual rates of immunisation in New Zealand (Turner, 2012). The authors concluded that the news media had “a significant effect on public perception of disease and vaccination” (Goodyear-Smith et al., 2007, p. 764).

On the reverse side of the ledger, medical and psychology researchers Faasse et al., (2017) found misinformation was itself contagious, with news media reports of adverse reactions to HPV vaccinations leading to more adverse reactions, escalating rates of public concern and worry, and poor levels of vaccination uptake. HPV vaccines are safe and effective but uptake around the world has been lower than expected (Robbins et al., 2012). Faasse et al. (2017) argued this was due to the erroneous news reporting of alleged reactions, with news reports about alleged reactions leading to more people succumbing to alleged reactions, and more news reports. The New Zealand-situated study (Faasse et al., 2017) collated negative news reports and Google search entries, and researchers were able to predict the levels of adverse event reporting that would occur the next month. Bahri et al. (2017) used similar media monitoring of news items about HPV vaccination, but this time using computer software to track live news reports, with the result that the authors could accurately anticipate the kind of questions journalists would ask medicine regulators about risks and reactions, thereby repeating the cycle. Australia’s HPV programme withstood the media attention in the long run, with vaccination rates later recovering (Leask, 2016).

Fake news and misinformation are powerfully affective, according to Hansen and Schmidtblaicher (2021), who found news coverage and, in particular, a television documentary, undermined the Danish HPV programme when it featured false content about vaccine side effects. The authors documented a sharp decline in HPV vaccine uptake after

the broadcast and media articles, dropping from 90% compliance to 30%. Back to influenza, and another systematic review by Brilli et al. (2020), focusing on the 2014 influenza vaccine campaign season in Italy, found a 2.5% drop in the daily influenza vaccine uptake numbers (78 fewer vaccinations) on each occasion news media published stories alleging adverse effects of the flu vaccine. The rates recovered within 10 days of the news appearing, by which time authorities had completed investigations and confirmed the vaccine's safety.

Another recent study by Thaker (2021) looked at New Zealand participants' feelings about Covid-19 vaccinations soon to become available. It found nearly one in four survey participants felt less inclined to be vaccinated with a Covid-19 vaccine after exposure to a mocked-up social media post with misinformation about the vaccine's safety.

Further, Li et al. (2015) said the news media were experts at raising awareness of trouble, but not so effective at providing enough context to avert consumer fears. Hansen and Schmidtblaicher (2021) admitted they could not prove the connection between the Danish documentary mentioned above and HPV vaccine rates falling, but they asserted misinformation on mainstream news media was more damaging than other media sources because consumers trusted it to be accurate:

Although our results cannot establish causality, the coincidence between the TV documentary and the drop in uptake represents a smoking gun in the absence of any good alternative explanation (p. 266).

Finally, Robbins et al.'s (2012) content analysis of Australian media reports of HPV vaccination also found news stories failed to educate the public about the vaccine and what it protected against, but the authors questioned if education and accuracy was really the news media's job:

It is naive to expect that the media's primary role is centered on communicating scientifically accurate information. Rather, the media operate to report, to critique, and to attract and retain audiences. Representing conflict and stirring emotions will often serve such agendas (p. 157).

Indeed, social scientist Leask (2011) said knowledge was inconsequential in vaccination uptake; instead, she brought vaccination uptake back to risk discourse and argued vaccination decisions were about emotion and perceptions of risk.

### 2.3.4 Correcting myths can backfire

However, even correcting misinformation about vaccination risk is not as straightforward as it may seem. The effects of misinformation and risk narratives become even more acute when the nature of attitude formation and memory is considered. Nyhan and Reifler (2014) conceded efforts to “correct” views actually led to a solidification of anti-vaccination viewpoints. Similar studies by Peter and Koch (2015), and Pluviano et al. (2017), have established a “backfire effect” to presenting corrective information (Pluviano et al., 2017, p. 3). These studies found raising the possibility of a risk could embed it in a memory, even if the risk was described as untrue; people forgot the discourse about it being untrue and remembered the risk instead. Just repeating a myth could also make it more familiar and familiarity was related to believability in memory. Attitudes were easier to remember than facts, so attitude formation at the point of learning about an issue was considered key to remembering correct information. These studies advocated for careful use of facts and scientific accuracy in news reports on vaccination.

Accuracy was journalism’s central value, argued Maras (2013). It is not the news media’s job to persuade people to get vaccinated; but it is the news media’s job to be factual. Research by Getman et al. (2018) showed news reporting of alternative views in vaccination debates was becoming less common, with the most recent news reports mostly pro-vaccination and fact-focused. But false information and opinion should not be used to fan the flames of consumer fears in news reports. In the next section, we see how reporting unproven science helped do just that.

### 2.3.5 The measles minefield: The MMR controversy and false balance

The most compelling argument for news media influencing vaccination uptake comes from research examining the measles controversy. Measles and MMR is the case du jour in the world of vaccination hesitancy and refusal (Largent, 2012), and is used as the basis for my audience study (see Chapter Three). The MMR (measles, mumps, and rubella) vaccine has garnered particular attention from vaccine safety skeptics because of doubts sown by British academic gastroenterologist Andrew Wakefield. In the 1990s Wakefield hypothesised that exposure to the measles virus could precipitate intestinal problems that caused, triggered, or worsened autism symptoms. His research involving 12 patients was questioned by most scientists and doctors at the time (Jang et al., 2019).

Wakefield and a team of scientists published their theory in the prestigious *The*

*Lancet* medical journal in 1998 (Wakefield, 1998). At a news conference publicising the research, Wakefield suddenly expanded the hypothesis to suggest even exposure to a vaccine for the virus, particularly the combination of measles, mumps, and rubella in one vaccine, could interfere with the digestive system in this way to cause autism in susceptible populations. He suggested giving the MMR in three separate vaccines would be safer (Boyce, 2006). MMR vaccines were typically administered to children at around 18 months, an age that coincided with the onset of behavioral and neurological symptoms of autism (Largent, 2012). A large outcry among other scientists ensued, and by 2002 the research had been judged as poorly designed or fake. Wakefield was later found to have had considerable conflicts of interests and was accused of professional misconduct.

*The Lancet* retracted the article in 2010 and said Wakefield's research was fraudulent, but meanwhile Wakefield moved to the United States and continued to find support for his theories (Largent, 2012). Significantly, this research was widely reported in the news media (Boyce, 2007). Even after the continuing publication of it as debunked, the myth travelled far and wide and the MMR-autism link mantra was taken up by vaccine-hesitant communities around the world (Jang et al., 2019; Peters et al., 2018). Vaccination rates dropped and the effects of the 1998 research are still reverberating today in increased vaccine hesitancy:

Ultimately, it did not matter that the paper by Wakefield et al. was retracted; the damage was done, and we are still experiencing the impact 20 years on (Peters et al., 2018, p. 367).

The measles disease, once close to elimination, was now on the rise, along with mumps and rubella. In 2019, the World Health Organization (WHO) named vaccine hesitancy (reluctance or refusal to vaccinate) one of its top ten threats to global health for that year (World Health Organization, 2019b). In using just measles as an example, WHO reported an estimated 110,000 people were killed by the disease worldwide in 2017 (WHO, 2019b). The most severe measles outbreak to hit New Zealand in 20 years struck in 2019, with 2194 confirmed cases by the outbreak's end in February 2020, two unborn babies dying and a 40% hospitalisation rate for sufferers (Ministry of Health, 2020). Worse, the disease spread from New Zealand to Samoa where 72 people died. New Zealand's measles outbreak in 2019 highlighted the significant immunisation gaps in the teen and early 20s age groups that were not vaccinated due to the 1998 MMR scare.

For communication and journalism scholars, the news media treatment of the 1998 *The Lancet* article and Wakefield's research has become an example of what can go wrong when journalism norms coincide with a powder keg example of contested science (Boyce, 2007; Largent, 2012). In the autism-vaccine controversy, new research suggesting MMR vaccine risks, unproven and later retracted, was given equal weight to the greater volume of dissenting medical findings in news reports (Speers & Lewis, 2004). Earlier studies presented in this chapter show *false balance* in health and science stories could lead to news consumers believing there was equal evidence for and against a scientific theory.

Hansen et al.'s 2019 retrospective Danish study of media coverage and MMR vaccination rates connected news reports with actual vaccination rates using computational techniques to assess 1622 news articles from a Danish news archive and collate two million vaccination registrations between the years 1997-2014. Echoing the same conclusions as Leask (2016), a major finding was when strong elements of vaccination risk or disagreement among "experts" was introduced to news articles, readers were affected enough to refuse or delay vaccination. When the MMR controversy was at its height in the late 1990s, and when media reports featured contested opinions, MMR vaccination rates fell. Leask (2016) calls these "sticky" (p. 535) stories in that they were more memorable in the media and minds of readers, and able to affect vaccination behaviours for years. Leask found, although media coverage about risks was only one of many sources parents attended to, it was a significant one:

Even with the UK's autism and vaccination scare, MMR coverage for children took 4 years to decline from the 91% prior to publication of the original article to 2003–04 when coverage hit a trough of 80%. A range of factors amplified its effect with the media's role being one, albeit important one (Leask, 2016, p. 534).

In a study about MMR-autism reporting, a retrospective content analysis of 281 worldwide newspaper articles from 1998-2011 was conducted by Holton et al. (2012). The study was located within a lens of risk communication and sought to understand how the erroneous research obtained such high publicity in the period. It echoed the findings of Boyce (2007) that opinion rather than fact dominated quotes from sources, which Catalan-Matamoros and Penafiel-Saiz (2019) considered was key to understanding the influence of news reporting in this era.

Boyce (2007) traced the MMR news coverage in the United Kingdom in great detail and showed that high rates of sensational quotes from anxious and emotional anti-MMR parents were often positioned opposite much smaller comments from pro-MMR medical and scientific sources who offered bland safety statements, echoing Dixon and Clarke's definition of false balance. In their research, Dixon and Clarke (2013) found that readers became unsure about vaccines when proven facts about safety were presented alongside unsupported views that they were unsafe; this uncertainty also led to lower intentions to vaccinate future children. Boyce (2007) called it *over-balancing* when new evidence challenged established science, providing an opportunity for "maverick scientists to use the media to secure coverage" (p. 74), and *under-balancing* when attention was given to only one side, without acknowledging other views.

Boyce's (2006, 2007) research confirmed journalists chose non-experts to interview about the MMR risks with the result that unsubstantiated claims became prominent in the news:

Journalists selected almost equal numbers of scientists for and against the MMR vaccine, suggesting that scientists were evenly split on this issue, when in reality, the vast majority of scientists and health professionals supported the MMR vaccine. Journalists used parents to *question* the vaccine's safety but very rarely used them to *support* the vaccine (Boyce, 2007, p. 77, emphasis in the original).

Boyce (2007) argued the journalistic objectivity norm was flawed when balance was used to provide unproven scientific research equal space and quotes in an article as opposing established scientific arguments. In the MMR controversy she said this made both sides appear equally plausible, even though the established science side had many more proponents and vital evidence. In her book on the topic, Boyce (2007) likened the news media coverage to a Greek chorus. Although the link between the MMR vaccine and intestinal problems that lead to neurological conditions was never proven, only postulated, the rumours of a possible link and anxieties of parents became the prevailing news discourse. She documented British news media consistently falsely balancing coverage and choosing sources that would amplify the alleged risks, while discarding the far greater evidence on the side of MMR safety.

The evidence continues in a recent study by Jang et al. (2019), who found both user-generated social media and online mainstream news postings in the United Kingdom, the United States, and Canada were powerful misinformation conduits, spreading inaccurate health information about a false link between childhood MMR vaccination and autism even today.



## 2.4 Alternative approaches to reporting contested science

This chapter has presented literature which has established a clash of ideas was often sought for its compelling news value in journalism, which sometimes meant complex subjects were reduced to conflicts between opposing views, or risks amplified to sensational levels. The journalistic norm of objectivity is used to maintain neutrality on issues and avoid accusations of bias. Without objectivity and balance, news reports would become public relations instead, as Broersma (2010) and Maras (2013) have argued. However, the reviewed research on vaccination stories and uptake figures suggests these traditional construction techniques may be misrepresenting the actual risk presented in contested health and science stories.

Much of the literature reviewed (Catalan-Matamoros & Penafiel-Saiz, 2019; Hansen et al., 2019; Perez et al., 2016; and Wilson & Baker, 2012), concurs that more accuracy is needed in news reports about vaccines. Scholars were also clear that objectivity could not be abandoned altogether, or news media would lose their ability to report scientific or medical research that they had little first-hand knowledge about (Maras, 2013; McQuail, 2010). Indeed, Kohl et al. (2016) found experienced science journalists could wait for as long as 15 years to ensure a scientific consensus stuck before reporting it as a fact.

Signalling potential trouble is an important democratic function of journalism and scholars such as Bell (1998) and Ward (2010) contended that balance must remain, but in a different form. Using the lens of ethical practice, Ward (2010) argued for rebuilding concepts of objectivity so it worked towards what was good, just, and right, as opposed to what was convenient or in someone's interest. He said the form of objectivity that emerged as a journalistic tenet last century was a "spent force", arguing instead for *pragmatic objectivity* (p. 204), defined as being active instead of passive, where the journalist did not pre-judge stories, was fair, and followed where facts led.

A similar theory was *interpretative objectivity* from Maras (2013), an alternative to the "artificial commitment to balance" that led to false balance, or pseudo-objectivity, by a careful arrangement of facts (Maras, 2013, p. 64). With interpretative objectivity the journalist uses judgement, and verifies or challenges information and, where appropriate, includes a narrative to news stories to clarify that most scientists believe the evidence points in a certain direction.

Brüggemann and Engesser (2017) also advocated for the mainstream use of interpretative objectivity, or *contextualized reporting* (p. 66) in science stories. In analysing the news media's role in the climate debate, the pair argued that by continuing to report contrarian views the media perpetuated falsehoods. However, in their study the authors found interpretation is now overtaking the balance norm, in climate journalism at least. Maras, too, said journalists sometimes suffered from "frame blindness" (p. 66) with news routines encouraging ideological distance from the story. Again pointing to the interpretive role, he noted that reporters could not treat both sides equally in a war report if one side was the aggressor, or it gave "moral blessing to evil" (p. 72).

As we have seen, treating both sides equally in an uneven scientific debate can also be a problem. Interpretative objectivity joins other theories about weighting evidence that have emerged in the last two decades. Boyce (2007) showed that news stories about MMR at the height of the controversy erroneously suggested uncertainty about vaccine safety. She found stories were often equally balanced for and against the possibilities of the vaccine causing autism, or overbalanced toward the risk of autism, and the opinions of non-experts given priority to scientific sources. This was despite 99% of scientists believing the vaccine to be safe (Boyce, 2007).

Weighting or balancing stories to show where the consensus lies is an approach that has featured in several audience studies by Dixon and Clarke (2012, 2013), Clarke et al. (2014, 2015) and Dixon et al. (2015). The theorists saw *evidentiary balance* in news reporting as a possible solution to false balance, particularly on topics with elements of risk-related uncertainty (Clarke et al., 2014, p. 461). This is where views from different sides of a debate are still included, but the content or construction of articles reflects the level of certainty in a scientific argument, making it clear most experts agreed on the issue, if that was the case. Using the autism-vaccine controversy as a starting point again, the authors tested how news reports constructed with different levels of evidentiary balance would shape reader certainty about risks associated with the MMR vaccination with an audience study via an online questionnaire. An important finding was when evidentiary balance was used in news reports about vaccination, even when controversial and opposing views were included, readers were able to understand the weight of evidence pointed in one direction (Clarke et al., 2014).

Kohl et al. (2016) contended that weight-of-evidence reporting could also be represented by the physical space taken up by opposing arguments in a story, finding readers assumed equal veracity to arguments that were provided equal column centimetres or “space”, despite the inclusion of statements about scientific consensus. The writers believed weight-of-evidence techniques were not the only way to convey relative validity of oppositional claims, but advocated their use. Key to their argument was news consumers were likely to encounter the outlier opinions elsewhere anyway, so helping the audience understand the debate would best serve their interests. Cushion and Lewis (2017) said the idea was gaining ground in the news industry:

In recent years, there has been greater recognition among broadcasters that impartiality should not be translated into simply balancing the competing sides of a debate or issue. It is now widely acknowledged that a binary notion of balance can distort coverage when the weight of evidence clearly falls on one side – most famously in the coverage of climate change or the reporting of the Measles, Mumps and Rubella (MMR) vaccine (p. 220).

## **2.5 The picture of health: The role of visuals in vaccination stories**

Researchers have also turned their attention to the potential for visual elements in news reports to better portray the real dangers of vaccine-preventable diseases rather than just text. The literature on the effect of photographs and graphics on audiences has shown visuals in news reports and advertising are powerful conduits of emotion. In 2008 Helene Joffe wrote of her findings that images aroused “basic” emotions such as fear, disgust, or horror in news reports, whereas textual and verbal elements moved down more intellectual pathways.

Images also had power to attract attention that text alone could not, often being used to lure readers into engaging with a text. Gibbs (2011) argued that the power of a picture was in its “speed of reach,” (p. 252) and humans reacted physiologically to images faster than they can comprehend. Writing at a time before the development of the high-tech photo tampering of today, Joffe contended that photographs also provided authenticity and verification to a story by providing a form of pure proof that text and written arguments, with their associations of taking sides, could not (Joffe, 2008).

A key concept in the literature is the ability of images to tell a different story than the accompanying text. Brennen and Gutsche (2019) argued the eye always won when news reports featured competing information for the eye (photographs) and ear (words). The authors believed journalists frequently overlook the power of images in news reports and do

not realise pictures or footage could either underline or circumvent the reported text. Mendelson and Darling-Wolf (2009) found text and photographs interacted to produce meaning for readers. The researchers manipulated a *National Geographic* feature story about Saudi Arabia into three variations with pictures only, with text only, or with pictures and text, and found the three audiences had very different interpretations of the country. Participants with the photographs and no textual narrative, and participants with photographs and text, had more stereotypical views of the nation and its inhabitants than the groups with text only.

Researchers have suggested news media use more photographs of preventable disease in news reports to bring greater impact to the vaccination message due to their emotional power (Clarke et al., 2015). Catalan-Matamoros and Penafiel-Saiz (2019) also considered the role of photographs, graphics, and infographics important in putting people off or clearly showing facts, considering it an important area for further study, as many people only read headlines and looked at photographs. They joined many scholars who argued for more overt use of disease facts and pictures of vaccine-preventable disease symptoms in written materials about vaccines (Clarke et al., 2015; Tilley et al., 2014) to communicate that not vaccinating was seriously risky.

One news story content analysis about vaccination images acknowledged the emotional power of photographs, and found clear cases where they produced the opposite effect than intended. Wu et al. (2018) found the typical images of screaming children or needles were classified as negative by readers, with potential to provoke emotional reactions such as fear, disgust or reinforce mistrust of the health system. This is despite the content of the accompanying news reports clearly intending to reinforce positive messages or maintain a neutral stance on vaccination. In the Wu et al. (2018) study, photographs appearing with online news coverage of vaccination stories in June 2016 were analysed and nearly one in eight of the images in the sample could be classified as negative using this criteria. In New Zealand, Comrie et al. (2012), too, found disease images aided recall by enhancing emotional impact. The study's participants also said they were interested in seeing photographs of parts of the body with disease symptoms, but did not want to see pictures of children getting injections.

Dixon et al. (2015) experimented with using images as exemplars for their weight-of-evidence theory in audience studies using a photo of a single scientist versus a photo of

several scientists to illustrate that 97% of scientists believed vaccines did not cause autism. Along with other strategies, the authors found this was a useful tool in modifying the effects of falsely balanced news stories, but only for those participants that trusted science and scientists. Another failure of photographs to produce the expected response came from Pluviano et al. (2017) and their attempts to debunk scientific myths. They experimented with showing audiences photographs of children with measles in a “fear correction” technique (p. 5) to try and alter misinformation that vaccination was unnecessary as the preventable diseases were mild. Instead, after a time delay, respondents only remembered the fear response to the pictures and connected it to the vaccine instead of preventable diseases, a phenomenon known as “danger-priming” (Nyhan et al., 2014, p. 6).

## 2.6 Conclusion

This chapter has reviewed the literature on vaccinations in the news media, first establishing the role and responsibilities of news media to the audience and society when reporting on science and health subjects. It has highlighted ongoing criticisms of journalism where theorists believe the objectivity norm and balance conventions have produced false balance and misrepresented risk in stories about contested science. The background to vaccination has been briefly touched upon, as has the research on why some people reject vaccinations. Research on how vaccination has been presented in the news has followed, with the various theories of audience effects from news coverage about risk detailed. The chapter returned to balance and objectivity in the closing sections, considering how the norms could be modified to enable more accurate reporting about health risks. Finally, studies considering the impact of photographs of vaccine-preventable disease, and images in general, have been surveyed, continuing the theme of increased accuracy in news reports. The next chapter will detail the methodology and methods used in the research described in this thesis, when some of these theories are put under scrutiny.

## Chapter three: Methodology

This chapter introduces the audience study at the core of this thesis, with detail about the theoretical background that underpinned the methods and procedures used in the research. It presents the mixed-methods approach and gives an overview of its aims. The methods used to tackle the research questions are described, as well as procedures employed in participant selection and recruitment, data collection, and analysis. The Covid-19 pandemic had an impact on the study, which is explained. In addition, the ethical considerations that informed the preparation for the study are discussed, including special acknowledgment of the Treaty of Waitangi partnership with Māori. Finally, three limitations of the research are noted, and a suggestion for further study.

### 3.1 Background of the project

This research aims to add to current knowledge about how information is perceived by consumers of news media, particularly when exposed to complex or controversial stories about health or science, or when health risks are portrayed. It investigated two elements considered important in conveying scientifically accurate vaccination messages in news articles in current scholarship: the use of quotes in a controversy, and the use of images. In the present study, these elements are explored in an audience study using qualitative interviews and hypothetical news media article examples as prompts in those interviews.

The use of quotes from experts and non-experts in stories about risk, the prominence given to competing arguments, and the use of images of vaccine-preventable disease in news stories about vaccination are all aspects of news reporting that warrant scrutiny. Conventional balance and objectivity models in journalism that pitch opposing quoted sources against each other in health and science stories about risk have been questioned in the past by New Zealand immunisation expert Turner (2012), and shown to overstate the true extent of risks in quantitative studies focusing on balance and evidence by risk communication researchers Dixon and Clarke (2012, 2013). In particular, the unhelpful use of “contrarian voices” by journalists in a debate has been found by Brüggemann and Engesser (2017, p. 58) to add bias, not the envisaged neutrality or objectivity.

When it comes to using images of vaccine-preventable diseases in news reports, researchers have suggested publication of such images should be increased to emphasise the importance

of vaccination, in the light of falling vaccination rates (Catalan-Matamoros & Penafiel-Saiz, 2019; Clarke et al., 2015). Communication academics Comrie et al. (2012) also found focus groups understood more about the role of infant vaccination when shown images than by reading informational texts without any pictures. Other studies have found photographs could have unexpected effects, reinforcing or subverting the message of a printed text that accompanied them (Brennen & Gutsche, 2019; Pluviano et al., 2017; Joffe, 2008).

The specific research questions guiding this study are:

*RQ1: In news stories depicting controversy about possible vaccine adverse effects featuring quotes from non-experts, how do readers respond to amplified presentations of risk? What are the implications for readers' perceptions about vaccine safety and intent to vaccinate?*

*RQ2: In news stories featuring people quoted about possible vaccine adverse effects, how do readers respond to the inclusion of quotes about the safety of the vaccine from scientists or medical experts? What are the implications for readers' perceptions about vaccine safety and intent to vaccinate?*

*RQ3: In news stories about vaccinations, how do readers respond to the inclusion of photographs of people with symptoms of preventable diseases? Is there any connection to reported views on the importance of vaccination/or reader intention to vaccinate?*

### **3.2 Audience research**

The concept we know of as an “audience” can be traced back to the ancient Greek and Roman societies where “the audience” were the spectators of public displays of theatre, music or sports events in the arenas of the time. According to McQuail (2010), the word has been used since the middle of the 20<sup>th</sup> century as a collective term for the “receivers” of a media activity, usually in a public setting. From the 1920s to our current age, audience studies were usually precipitated by each new technological or media advance and concerns about the corrupting influence to society each new medium wrought (Griswold et al., 2011). Comic books, radio broadcasts, motion pictures, magazines, and television have all been blamed for causing social harm or delinquent behaviour (see, for example, O'Neill, 2011, on theories about links between cinema attendance and social ills, and violent television programmes normalising violence in society). Early theorists conceived of audiences as a

kind of mass organism; as passive receivers they were collectively vulnerable to the effects of the medium (McQuail, 2010).

According to O'Neill (2011), the entire history of communication theory oscillates between finding active or passive audiences, and minimal or powerful effects from media. Most early studies, from 1920-1950, actually found only limited effects from media, and researchers began to see audiences as made up of individuals who were able to operate under personal autonomy, not as mass collectives. O'Neill said concerns of the 1930s and 1940s about one-sided propaganda methods used by totalitarian regimes also proved illusory because of this limited effect. Ideas about audiences seeking gratification and reward from consuming media started to emerge at this point, setting the agenda for post-war scholarship (O'Neill, 2011).

With the arrival of television in the 1960s, worries about violent content, especially in children's television programming, precipitated another round of audience studies, according to O'Neill (2011). Although later studies into prolonged exposure to extreme violence did find negative audience affects (O'Neill, 2011), by the 1980s audiences were beginning to be viewed as more active, diverse, and self-motivated than originally thought (Griswold et al., 2011). New developments in psychology and anthropology meant researchers were realising other pre-existing social and psychological elements came into play when media effects were to be considered (Couldry, 2011; Nightingale, 2011).

In audience research cited in the news media during the 1960s and 1970s, attention turned again to media power, with mass communication studies focusing on political broadcasts and communication, investigating fairness and bias in political debates (Butsch, 2011).

McCombs and Shaw's (1972) work in the era cemented the idea that news media could set the agenda that the public thereafter attended to. However, McQuail (2010) said theorists expected to find significant influence on public opinion and attitudes, but did not. According to Bird (2011), this was because of the difficulty in capturing a true audience response to news; this difficulty is also why most audience studies have been conducted with entertainment media rather than news.

However, traditional news media are still ripe for research. As described in the literature review in Chapter Two, McQuail (2010) confirmed one of the functions of mass media is providing the public with warnings about potential dangers and risks. This speciality of the



news media is the backdrop to the audience study described in this thesis. However, audience studies that have addressed how audiences respond to complex or confronting stories are rare, according to Bird (2011). Many studies are conducted via manipulated online news variations presented to randomly sampled groups, followed by questionnaires. Few follow the design of this present study and use qualitative interviews to investigate the topic of interest.

### 3.2.1 Relevant audience study examples

- **News habits and fan forums**

Bird's (2011) news media audience studies included one showing participants pre-recorded television news programmes, and then interviewing participants directly after; others involved participants keeping diaries of their responses to news and news habits during the day or week. Bird (2011) said innovations in converging technologies and constant news feeds have led some theorists to speculate feedback forums on internet news sites would be suitable for examining news audiences. However, her investigations found anonymous online audiences operated very differently to real-life ones discussing the news, with news fan forums notable for quickly polarising into two vitriolic or abusive camps over controversial stories.

- **Health communication**

A study involving health news by Maggio et al. (2020), part of a larger cancer communication project, looked at the heuristics behind how parents of adolescents judged the credibility of relevant health news stories. In it, 64 participants read and then were interviewed about their judgements about two stories, one about the HPV vaccine protecting against cancer, the other the health dangers of e-cigarettes. This study found the parents used nine recurring strategies to decide if the stories were to be believed.

- **Photographs and text response**

In this study by Mendelson and Darling-Wolf (2009), three versions of a *National Geographic* story on Saudi Arabia were shown to three groups of participants, one version with story and pictures, one with just the story, and one with just the pictures. The researchers found text and images each have power to tell contradictory stories, with participant perceptions varying wildly depending on which story variation they were exposed to, particularly in relation to cultural stereotypes about the Saudi culture.

- **Television news and vaccination**

Closer to home and an Australian study by Leask et al. (2006) explored parent participant responses to pro- and anti-vaccination arguments in television news, finding that when vaccine-accepting mothers were first confronted with anti-vaccination arguments their initial response was shock and surprise, before returning to the confidence already established by existing familial and social networks, and trusted medical sources.

- **Dixon and Clarke and vaccination risk**

Dixon and Clarke, together and in combination with others, produced five relevant journal articles between 2012 and 2015. Dixon and Clarke are United States risk communication researchers who have performed several audience studies in which more than 300 university journalism or communication student participants were exposed to news stories constructed with different degrees of balance and expert evidence about the danger or safety of vaccinations. The students were then asked to complete questionnaires on their responses to the stories. The studies typically involved random assignment of two versions of a story to two sets of participants and investigated responses to news articles constructed with a higher proportion of quotes about the potential harm from vaccines, or balanced with experts providing quotes on the side of safety, or with the addition of interpretative elements where the journalist added narrative to say where the consensus of opinion was in the debate. Typically the unbalanced reports and stories without interpretative narrative resulted in participants becoming uncertain or alarmed about the vaccine featured (Dixon & Clarke 2012, 2013). These experiments built on earlier work by Corbet and Durfee (2004) whose audience studies featured news stories about climate change manipulated with different elements of contextual analysis about the certainty and uncertainty of climate science. In Corbet and Durfee's study, participants filled in short questionnaires about whether global warming was a fact and if the readers thought scientists were certain about it, after reading different versions of a news article on the topic.

### 3.3 Research design

The present research is similar to Dixon and Clarke's audience studies (2012, 2013) described above, but a qualitative design is used and face-to-face interviews are the primary study method. The audience study centred upon a vaccination news story about the MMR

(measles, mumps, and rubella) vaccine, with elements of story construction varied in three successive versions of the story. Each version was designed to address each research question and the stories were presented one after another to the same participant, with interview questions asked after each story. Readers were asked about their responses, vaccination intentions and feelings of safety about the vaccine after each story permutation. This design required a much smaller number of participants than in comparable studies by Dixon and Clarke, but a deeper examination of audience responses from the different variations of the vaccination messages was possible because of the interview component (Creswell & Plano Clark, 2018; Minichiello et al., 2008).

The news story readings and interviews were juxtaposed by two questionnaires, before and after, to provide more robust and wide-ranging data. The first asked for participants' broad views on vaccine safety and whether they supported vaccination; the second, longer, questionnaire repeated some of the vaccine confidence and vaccination intent questions to see if any modification to views could be captured, and also canvassed the media consumption and demographic backgrounds of the participants.

### **3.4 Mixed methods research**

In the last three decades mixed methods research has emerged as the third methodological movement in academic research after the quantitative and qualitative paradigms. A once controversial method, according to Creswell and Plano Clark (2018), mixed methods research has quickly become a popular and exciting way to investigate a topic as it is an accessible approach to inquiry. It replicates the natural way we approach issues in everyday life: looking at clinical facts in combination with talking to people about their experience or feelings about a topic.

According to Frey et al. (2000), questionnaires have been used for thousands of years and are commonly used in communication research, such as public opinion research. Questionnaires are considered a useful way to find out what participants think about particular topics, but only the questions that the researcher thinks to include can be addressed. Another weakness scholars found with questionnaires was their potential to be quickly filled out without much consideration (Frey et al., 2000).

Conversely, interviewing is more intuitive: questioning could lead in new directions depending on the informant's answers. Theorists like Minichiello et al. (2008), believed

research designed around qualitative interviews could open up opportunities for a greater understanding of why people think and behave the way they do. Creswell and Plano Clark (2018) also equated interviewing with a richer data set than questionnaires, with questionnaires more concerned about quantitative measurements of things, and interviews the qualitative motivations and deeper realities of people's lives.

However, interviewing also has limitations. Critics say researchers can easily misinterpret the informant's intended meaning or influence answers by using poor questioning technique; some debate whether the interview process itself can construct a form of reality that did not exist before (Minichiello et al., 2008). Minichiello et al. (2008) said interviewers must also avoid "bracketing" (p. 79) interview subjects into agreeing with them and should set aside personal feelings and assumptions about the topic to do so.

In mixed-methods research, Creswell and Plano Clark (2018) argued the limitations and strengths of both qualitative and quantitative research paradigms could be offset by combining the two, resulting in a potentially deeper understanding, with more "breadth and depth" (p. 4) than what would arise from employing either method individually. Importantly, as Schoonenboom and Johnson (2017) asserted, the overall goal of combining both quantitative and qualitative aspects in a project was to find the best way to answer the research questions of the study, and they too believed using the two styles of research together could be stronger than either separately, with the potential to solidify and further advance any conclusions that arose. Mixed methods are also ideally suited to applied communication research rooted in pragmatism (Creswell & Plano Clark, 2018), where solutions to real world problems are sought, as in this research. This philosophical position allows the research to inform professional practice, in this case the real world practice of journalism and health communication.

In the research presented here, the semi-structured interviews form the qualitative heart of the audience study. Participants were asked to read a news story and then interviewed about their responses to it, on three successive occasions in the one sitting. Their responses to the different versions of the stories formed the core of this research. However, the inclusion of the questionnaires before and after the interviews added a quantitative element, surveying participants on vaccine confidence and vaccination intent concepts before and after the story reading and interviews. According to Schoonenboom and Johnson (2017), this design can be

labelled quan+QUAL+quan, indicating most weight was on the qualitative component of the study, with support from the two questionnaires.

The core qualitative aspect of this project is rigorous enough to garner useful information on its own, a prerequisite of a quan+QUAL combination according to Schoonenboom and Johnson (2017), while the supplemental quantitative questionnaires add additional data. It was also a fundamental feature of mixed-method research that the two methods were combined at some stage. In this study, the two strands were integrated twice: at the reporting of results and in analysing the data.

### **3.5 Interviewing procedures**

#### **3.5.1 Interviewing as a method**

The researcher is considered the instrument in qualitative interviews and Frey et al. (2000) cautioned that the quality of data collected is directly related to the skill of the researcher. My job was to quickly gain rapport with subjects, remain neutral but encouraging, and to tease out responses and inner experience from reluctant and verbose informants alike (Seidman, 2013). This can be a difficult balance to maintain. Gaining the trust of participants is crucial, according to Minichiello et al. (2008). In describing interview techniques they said rapport could be achieved by matching the language style, speech patterns, tone, posture, and even breathing rhythms of the subject. Analytical listening skills and timing are all important; techniques that reduce bias and interviewer influence even more so.

Most potential participants would broadly expect an interview to entail giving verbal answers to another person in response to questions, thanks to our culture replete with television journalist interviews, fictional police dramas, and personal experiences like job interviews. However, the kind of questioning used in research interviews differs in some significant ways from the typical televised journalistic interview. The research interview as used in this study was less of an interrogation, and more of a two-way conversation, where information about the participant's motivation and understanding was as important as the words they said. Instead of having a fixed direction or topic, there may be no expectations of where the informant's information may lead (Minichiello et al., 2008; Seidman, 2013). According to Minichiello et al. (2008), in using semi-structured interviews the researcher is interested in people's interpretation of their experience of social reality, rather than just the facts.

Individual interviews are the most commonly used data-collection means in qualitative research and considered the “gold standard” by many (Lambert & Loisel, 2008). In qualitative research, interviews are conducted somewhere along the continuum of completely structured to loosely structured (Firmin, 2008; Minichiello et al., 2008). A structured interview may be a clinical history of a patient or a police interview at a crime scene; a loosely structured interview could be a lengthy and open-ended discussion about someone’s life story.

This study used a semi-structured interview as its primary method, with a defined list of questions in a set order, but some flexibility, with a mix of open and closed questions. Minichiello et al. (2008) suggested a more nuanced study is attainable in semi-structured interviews, and, in this case, the potential for a deeper understanding of how people perceived information in news stories about controversial issues:

Face-to-face interaction and careful observation enable the researcher to discover contradictions and ambivalences within what ‘on the surface’ may seem to be a simple reality (p. 11).

Open questions allow the interviewee to provide wide interpretations and views on the subject under discussion; closed questions were used to confirm a specific fact or opinion (Saunders et al., 2012). Roulston (2008) said closed questions can be useful additions to the semi-structured interview schedule in qualitative studies when they contribute useful data in relation to the research question. Using a few closed questions can also have the additional benefit of making later analysis easier by reducing the possible answers (Roulston, 2008), with the data also simplified by having many answers fit into a set of ready-made themes aligned with the systematic question order. This would not be possible in looser, unstructured interviews

### **3.5.2 Interview questions**

This study used semi-structured interviews, with an interview schedule comprising a mixture of open and closed questions. The questions were carefully chosen to evaluate the participants’ responses to the news stories, in line with the literature that formed a theoretical basis for the study. I was seeking spontaneous responses, so I ordered the questions in a way that captured immediate feelings first, asking similar questions after each story variation. Safety and intentions to vaccinate were key responses I wanted to capture, so earlier questions asked how the story made participants feel about MMR vaccine safety, and what they noticed about the stories. Later ones concerned intentions to vaccinate. In the middle, I

chose broad questions to help form an understanding of why they felt that way. The balance of quotes in the news stories is a key component of the research, so I also included questions that asked participants what they thought of the quotes in the first two stories. Then, I included specific questions to determine if the readers had noticed the manipulations I made to the stories and the particular components of interest, such as opinion or fact portrayals in the stories, to determine if the variations were working the way I intended. Some questions replicating certainty scales were borrowed from interview schedules and questionnaires from similar studies. The interview question schedule can be found in Appendix A.

### 3.5.3 Performing the interviews

The research interview was the primary method of answering the three research questions of this study. I interviewed each participant after reading each version of the story and, importantly, did not disclose the goal of each story variation, whether this was to amplify risk, balance the evidence, or explore the impact of adding photographs to vaccination stories. The interviews were face-to-face, directly after each reading, and in the same sitting as that in which the participants filled out the two questionnaires.

This research aimed to replicate as closely as possible the response of a typical audience in a casual, real-life news-reading setting, therefore no interview questions were provided in advance. For the same reason, no transcripts were offered to participants to read over, add to or amend after the sessions.

In the audience study described in this thesis, I aimed for semi-structured interviews, using a pre-prepared list of questions asked in a set order, in line with a tentative approach to the phenomena under investigation. Some deviation from the schedule occurred, as determined by the participant's responses and, as Ayres (2008) and Seidman (2013) confirmed, it was important that semi-structured interviews possessed this flexibility. Many of my interviews veered off the story under discussion as participants spoke about their views on vaccinations, health, or news media in general. With a semi-structured process, I had the flexibility to gently prompt participants for more detail when their answers were unclear or there seemed to be more they wanted to say about the stories.

In the interviews described here, respondents were asked exploratory open questions such as, *"What, if anything, did you notice about the people that were interviewed and quoted by the journalist in the news story you have just read?"* and probing questions, *"What did you think about what they said?"*, in combination with more structured passages of questioning.

Further probing questions or follow-up promptings to continue were then used to seek more explanation where the interviewee's response seemed incomplete (Saunders et al., 2012).

Other devices like silence and rephrasing were also helpful to tease out responses.

Explicitly closed questions were asked, too, such as: *“Based on what’s in this story, do you think the vaccine is safe? Why or why not?”*, and particularly, *“On a scale of 1-5, where 1 is no and 5 is yes, would you say you would vaccinate yourself or a child in your care with the MMR vaccine discussed in the story? What made you answer (1,2,3,4,5)?”* These partly closed questions helped provide immediate responses to the story scenarios and a means of comparing the responses of different participants on key points. For story scenario A and B, I also asked participants if they thought the people quoted in the two stories were speaking from their own opinions or quoting facts. This was so I could assess if the editing of the stories matched the goals of the audience study. In most cases the participants responded in the expected fashion, but occasionally a participant would consider news story “facts” to be opinions, and vice versa. The story scenarios are described in more detail below, at section 3.7.2.

In this project, some participants who were ambivalent about or against vaccinations had strong objections to the content presented, or expressed their dislike of being pressured by society to change their minds about vaccination. I needed to be neutral but encouraging to support them in their right to hold any view, as well as verbally prompting them to respond fully. Some techniques I used were nodding to encourage them to keep talking, using statements like, “Many people would agree with you” or, “Lots of people would be concerned by that”. Other expressions of empathy, and the offers of a cup of tea or coffee and refreshments, also helped in this process. I also knew some of the participants personally from playgroup or school connections, and needed to exercise discipline to stick to the schedule and maintain neutrality, and not let an encouraging persona become overt agreement.

In this project, my prior journalism experience provided a good basis for research interviewing. The challenge of accurate note taking at the same time as maintaining a conversation was a transferrable journalistic skill, with the written notes providing a useful record of the interviews and the audio recordings serving as a back-up.

When working as a newspaper journalist, my roles spanned news stories to feature writing. The interview styles used in these genres vary considerably in the level of interrogation and



rapport needed, depending on whether the story being prepared fits a “hard” or “soft” news category. Emotional distance is maintained in most journalistic interviewing situations, with a neutral approach to a topic usually needed, with the exception of lighter stories, interviews with personalities, or discussions with those affected by tragedy. In these interviews a journalist must cultivate a more supportive, encouraging style to allow the subject to open up and provide insights about themselves. I tried to use this warmer interviewing style in my qualitative interviewing to encourage informants to be open about their feelings about the vaccination news stories.

As well as prior reading in qualitative interviewing theory, useful preparation was rehearsing the interview question schedule with family and friends, and practice training sessions with an academic supervisor. By sticking mainly to the set questions in the interviews, the later data processing and transcribing were streamlined, as possible responses were reduced.

### **3.5.4 Interview data collection procedures**

According to Frey et al. (2000), treating all participants as similarly as possible is fundamental to reliable results from data collection. Hence, interview procedures were kept as uniform as practicable for each respondent. Potential bias was minimised by all participants being asked the same set of questions (Frey et al., 2000), and by encouraging the expression of a range of views, from those that completely supported the full schedule of vaccinations to those that agonised over each shot or refused vaccination altogether.

All of the 17 interviews took place in a single interview session with each individual, either at a private residence, in a Massey University communication department meeting room, at the participant's work place or, on one occasion, at a quiet cafe in Feilding. Audio was recorded on an iPad, because of its unobtrusiveness, ease of use and clear audio quality. I took full research notes during interviews, as a mixture of verbatim quotes, non-verbal observations, and paraphrased comments. The interviews were then transcribed from these notes, using the audio files to check for accuracy.

Interview analysis occurred after the interviews were complete and comprised organising participant responses into themes under the three research question categories. Participant comments were arranged in tables under these headings and all responses were accounted for. In the same way, tables for the responses to each of the three news stories were developed so patterns of responses could be observed. More detail about data analysis can be found in Chapter Four.

## 3.6 Questionnaire procedures

### 3.6.1 Creating the questionnaires

In addition to the semi-structured interviews, this study used two questionnaires which serve several functions. The initial questionnaire asked for views on vaccine safety and intentions, identifying initial differences and similarities between participants before the audience study; a procedure used in previous studies (Pluviano et al., 2017). A second questionnaire after the audience study not only explored any changes to these views, but included media consumption and demographic questions enabling the researcher to capture all the elements of interest at one time. Frey et al. (2000) endorsed such an approach for broad information gathering that could both help more fully describe the sample under observation, and also be used in other studies (Creswell & Plano Clark, 2018).

In designing questionnaires for this study, the wording and layout was seen as a part of the toolkit for gathering insights into the participants. Frey et al. (2000) suggested working from questions already presented in other studies when designing questionnaire content, as they believed phrasing and format could significantly affect answers. The questions arrayed in my questionnaires were derived from multiple sources. The vaccine behavioural intentions questions were developed from Rossen et al.'s (2019) study into moral profiles of what the authors termed vaccine accepters, fence-sitters and rejecters. This was a long questionnaire concerned with various moral traits of the participants, but I only used the questions relating to whether participants intended to vaccinate or not. The vaccine confidence questions, about whether participants thought vaccines were safe or believed scientists thought they were safe, came directly from New Zealand personality researchers Lee et al.'s (2017) study on vaccine confidence profiles. The general demographic questions were lifted from the New Zealand Attitudes and Values Survey (Sibley, 2013/14), as used by Lee et al. (2017). Media consumption questions were a combination of those from Rubin et al.'s (1994) communication measures sourcebook and a Pew Research Center report into the modern news consumer (Mitchell, 2016). See Appendix B for the specific questions used in the questionnaires and details of the source material.

### 3.6.2 Questionnaire layout considerations

Questionnaire design academics Robinson and Leonard (2019) emphasised question order, saying questions needed to be organised to maintain reader interest, but not introduce order effects, where the earlier questions influenced respondent thinking and impacted their answers to later questions. The theorists said it was sometimes better to group questions in

themes and sometimes better to randomise them, depending on the study's purpose. In this study, I placed questions in themes to make meaning clear, and aid navigation of the questionnaires. Robinson and Leonard (2019) also flagged the importance of typographical formatting and visual layout design, noting that even the placement of tick boxes could impact responses. The "no response" tick box in particular should be visually separate from other scale options so that the mid-point in a scale was not obscured. In my questionnaire design, I aimed for a form that was plain, easy-to-read, and appeared contemporary and appealing. It used the New Zealand Blind Foundation (2018) guidelines of 12-point font and a good contrast between colours. Response scales were varied from right to left and left to right so respondents ticking boxes in a formulaic fashion was noticeable. The second questionnaire followed the guidance from Robinson and Leonard (2019), as well as Frey et al. (2000), leaving demographic questions to the end, to lessen fatigue or risks of abandonment in cases where participants become irritated by questions about ethnicity or age.

Although Frey et al. (2000) argued against sensitising participants to the subject of the research prior to a study, in this research, Ethics Committee advice meant the Information Sheet and recruitment notice openly presented the broad topic as vaccination news in the media, as the committee considered vaccination a controversial topic that could upset some participants. The first questionnaire used in this study was also carefully constructed so a question about measles vaccination was embedded among other touchstone vaccine questions to scatter attention away from the MMR vaccine that was to feature in the audience study's news stories. The full questionnaires can be found in Appendix B.

### **3.6.3 Using the questionnaires**

Participants were asked to fill out the first questionnaire prior to the exposure to the news stories, and the second one after the stories and interviews had been completed. Although much thought had gone into the design and content of the questions, some participants were confused by the intentional change in direction of the certainty scales. Some had to amend answers after realising the scale had changed direction. No participants expressed any qualms about the demographic or ethnicity questions.

## 3.7 News story procedures

### 3.7.1 News story selection decisions

The audience study had three goals aligned with the research questions detailed earlier: to explore responses to amplified risk in a falsely balanced story, to see how audiences discerned between facts and opinion in quotes, and to assess any connection between photographs of vaccine-preventable diseases and an audience's vaccine confidence and intentions. To target these three goals and the three research questions, three versions of a news story were prepared for the study. These stories were three variations on an actual story published in the *Bay of Plenty Times* in March 2019 (Wiggins, 2019) announcing the results of a new longitudinal Danish study that found no connection between the MMR vaccine and cases of childhood autism in a large population. The reported study revisited earlier now-debunked research that had suggested a link in 1998, discussed in detail in the previous chapter.

This present audience study used an MMR-autism themed news story because the MMR case is an exemplar commonly used in communication research, due to the continuing effects of the 1998 research and high rates of transmission for measles in unvaccinated populations (Hansen et al., 2019; Holton et al., 2012), discussed in detail in Chapter Two. Researchers find health news stories about measles useful to study because measles was one of the most infectious airborne diseases in the world and it was considered safe and simple to prevent, if enough people were immunised (Turner, 2012; Wilson & Baker, 2012).

For years vaccination experts have said New Zealand was vulnerable to a measles outbreak because vaccination levels remain lower than the 95% coverage rate considered crucial to stop the disease spreading, in addition to small pockets of very low immunity. Health communication organisations were constantly working to increase rates of measles vaccination as outbreaks could be swift and severe. Even in 2021 with Covid-19 vaccine roll-outs in New Zealand, Health Ministry officials were attempting to fill gaps in measles vaccination coverage during the same mass vaccination effort due to these concerns (Warhurst, 2021). The MMR-autism case has also garnered significant news media attention over the years and the news media's reporting of the original study results are still being scrutinised (Hansen et al., 2019).

### 3.7.2 Story A: Controversy story

For the first story, labelled Story A, I edited the story to over-balance the alleged risks from the MMR vaccine and downplay its safety, as described by Boyce (2007), via quotes alleging vaccine risk and structuring that gave the comments visibility. To achieve this, I rewrote the introduction to signal the controversy, added in comments from a woman called Alison Singleton (an actual Nelson anti-vaccination activist), and removed expert quotes from medical professors endorsing the new research and confirming vaccine safety. This construction was falsely balanced by making it appear both arguments had equal evidence (Dixon & Clarke, 2012, 2013). I took Alison Singleton's quoted comments from her actual wording in a letter to the editor published in *The Nelson Mail* (Singleton, 2013). I gave her comments prominence, and constructed the story so that her quotes were arranged to directly contest the findings of the reported research, as the letter writer alleged she had evidence for a link between the MMR vaccine and autism in children. I also rewrote the story's headline to flag the conflict inherent in the story: *New vaccine, autism study irks*. I structured the story and new headline to follow typical journalism conventions on how controversial stories are prepared for publication to make them appear more newsworthy, skills learned during my work as a journalist and sub-editor.

I did not provide Alison Singleton any background in the story, only a name, that she lived in Nelson, and that she had written a letter to the editor. No details of her activism were included, no evidence was given. The masthead and date were also removed from the articles, so readers could only look to the content for information without the context and credibility of publishing details, a strategy Maggio et al. (2020) and Dixon and Clark (2013) also used in audience studies involving the news media.

Sandwiched in the middle of the story, the letter writer's comments came after some contextual information about the new Danish research, the source of the original scare in the 1998 retracted academic paper, and the existence of a 2016 film, *Vaxxed*, which also disputed the safety of the MMR vaccination. Alison Singleton's reasonable-sounding reported speech and direct quotes are compelling and emotive:

Writing in a letter to the editor, she said it was simply not true that there is no scientific evidence supporting a link between autism and the MMR vaccine.

"There have been a large number of scientific studies around the world that confirm a link between autism and the MMR shot. However, despite their publication in respected

peer reviewed journals, we never hear of these studies in the media or through the medical system.

“Many scientific journals primarily publish studies funded by the pharmaceutical companies which promote that vaccines are safe, effective and necessary.”

She says studies which show otherwise are shelved or suppressed.

“People need to open their eyes and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals.”

I ended the story with World Health Organization news of increased measles cases worldwide, growing vaccine hesitancy related to the 1998 retracted study and *Vaxxed*, and statistics about the large New Zealand measles outbreak between January 2019 and January 2020, which was updated beyond the March 2019 Wiggins story which predated the end of the outbreak.

### 3.7.3 Story B: Balancing content story

In the second version (Story B), I reduced the letter writer’s quotes to a much smaller portion of the story and put back in the reassuring content of the original *Bay of Plenty Times* article. The story repeated the same initial information as the first about the new Danish research findings that quelled autism-MMR link fears; the original discredited *The Lancet* study was still mentioned, and so was the *Vaxxed* film. New to this version were quotes from two expert medical and academic sources, one a University of Auckland senior lecturer in vaccinology, who provided specific brain scan evidence in her quotes about autism being unrelated to vaccination, and the other a University of Otago professor, with no background or specialty given, who gave his opinion in quotes that the new research should be “very reassuring” to anyone concerned about a link.

I had now structured Story B so the portion devoted to MMR vaccine safety took up more space (paragraphs) than the alleged risks, aiming for *evidentiary balance* (Clarke et al., 2014, p. 461). Evidentiary balance can mean using a balance of quotes that mirror the evidence-based consensus on the issue with less content from the smaller population who disagree, as used by Kohl et al. (2016), or a narrative that states overtly that most scientists think a certain way (or that scientists are undecided, if the findings are truly contentious), as used by Clarke et al. (2014). Scholars like Brüggemann and Engesser (2017) suggest journalists use this more interpretative approach when reporting a scientific controversy where an element of doubt remains, to maintain a necessary component of balance so as to remain objective.

### 3.7.4 Story C: Balancing story with photographs



Photographs used by permission: Left and right, from Centers for Disease Control and Prevention, centre, from Shutterstock.

This current study explored the audience response to photographs of vaccine-preventable diseases, so a third version (Story C) presented Story B a second time to readers, but this time I included three coloured photographs of individuals with symptoms of MMR vaccine-preventable diseases alongside the story. Three large images of children were used to illustrate two of the diseases MMR protects against. Two photographs were of sick babies with measles, and one was of a teenaged boy suffering from mumps, with the typical neck swelling apparent. The photographs used a mixture of children appearing to be of Māori or Polynesian ethnicity and of Pakeha-European ethnicity, as research indicated people were more responsive to health pictures showing their own ethnicities (Comrie et al., 2010), and these are the primary ethnicities of New Zealanders.

In a real newspaper article, the photographs would have been presented in a side bar or in a second story to illustrate the importance of MMR as they were not related to the main story angle about the Danish research, but to do so would have meant introducing a second story to the presentation, making it more difficult to determine responses to the photographs. Both Story B and C have the original *Bay of Plenty Times* headline: *Vaccine, autism not linked: study*.

### 3.7.5 Story layout and design decisions

Using my sub-editing knowledge and experience, I produced the three story scenarios in the design and formatting style of traditional newspaper layout, using columns to break up text, and the serif font Times New Roman commonly used in newspapers. Headlines were in 30pt bold and story content in 11pt. Captions and bylines were in sans serif font.



In Story C, I used newspaper layout design principles to ensure the photographs did not interrupt the flow of text by positioning two photographs above the headline and one in the width of two columns to the top right of the story. Photographs with a left or right aspect were arranged so as to look inward instead of out of the page. I also designed the page so that the story and headline were not separated if the page was folded in half horizontally, like a newspaper would be. Story A and Story B were printed on white high-quality A4 paper. Story C was printed on to a larger A3 page.

I traced two photographs from the New Zealand Immunisation Advisory

Story A

## New vaccine, autism study irks

By Amy Wiggins

A new study of more than half a million children has found no link between the measles, mumps and rubella vaccination and autism, but some anti-vaccination proponents remain unconvinced.

The Danish study, published in the *Annals of Internal Medicine* journal, looked at all children born in the country between 1999 and 2010. The children were followed through to the end of August 2013. It found the MMR vaccine did not increase the risk of autism, even in children with other autism risk factors or in children whose siblings

had autism. There was also no clustering of autism cases following vaccination.

Researchers from Statens Serum Institut in Copenhagen found that of the 657,461 children included in the study, only 6517 were diagnosed with autism.

Of the children followed, 95 per cent received the first vaccination, which is offered at 15 months, but there was no difference in the number of vaccinated children with the disorder compared to the number of unvaccinated children.

A 1998 paper in the *Lancet* which first implied a link between the MMR vaccine and autism was

retracted in 2010 but turned thousands of parents around the world against the vaccinations.

The film *Vaxxed: From cover-up to catastrophe*, which was released in 2016 and also claims there is a link between autism and the MMR vaccine, has also led to an increase in parental reluctance to have their children vaccinated against the diseases despite wide criticism of faulty evidence.

Nelson woman Alison Singleton shares this reluctance to vaccinate.

Writing in a letter to the editor, she said it was simply not true that there is no scientific evidence sup-

porting a link between autism and the MMR vaccine.

"There have been a large number of scientific studies around the world that confirm a link between autism and the MMR shot. However, despite their publication in respected peer reviewed journals, we never hear of these studies in the media or through the medical system."

"Many scientific journals primarily publish studies funded by the pharmaceutical companies which promote that vaccines are safe, effective and necessary."

She says studies which show otherwise are shelved or suppressed. "People need to open their eyes

and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals."

There has been an increase in measles cases in Europe and the United States and the World Health Organisation has declared vaccine hesitancy as one of the top 10 threats to global health.

In New Zealand there have been a number of measles cases in recent years, including a large outbreak last year.

From 1 January 2019 to 29 January 2020 there were 2193 confirmed cases of measles across New Zealand.

Story B

## Vaccine, autism not linked: study

By Amy Wiggins

A new study of more than half a million children has found no link between the measles, mumps and rubella vaccination and autism.

The Danish study, published in the *Annals of Internal Medicine* journal, looked at all children born in the country between 1999 and 2010. The children were followed through to the end of August 2013.

It found the MMR vaccine did not increase the risk of autism, even in children with other autism risk factors or in children whose siblings had autism.

There was also no clustering of autism cases following vaccination.

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The film *Vaxxed: From cover-up to catastrophe*, which was released in 2016 and also claims there is a link between autism and the MMR vaccine, has also led to an increase in parental reluctance to have their children vaccinated against the diseases despite wide criticism of faulty evidence.

Nelson woman Alison Singleton shares this reluctance to vaccinate.

Writing in a letter to the editor, she said it was simply not true that there is no scientific evidence sup-

porting a link between autism and the MMR vaccine.

"People need to open their eyes and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals."

However, University of Auckland senior lecturer in vaccinology Dr Helen Petousis-Harris said the latest study was a "loud and clear" message that MMR could not trigger autism in susceptible children.

"We know through modern technologies such as brain imaging and genomics that autism begins long before birth."

University of Otago Professor

Michael Baker agreed the study was "very reassuring for anyone concerned about the possible link".

There has been an increase in measles cases in Europe and the United States and the World Health Organisation has declared vaccine hesitancy as one of the top 10 threats to global health.

In New Zealand there have been a number of measles cases in recent years, including a large outbreak last year.

From 1 January 2019 to 29 January 2020 there were 2193 confirmed cases of measles across New Zealand.



Children with measles.

## Vaccine, autism not linked: study

By Amy Wiggins

A new study of more than half a million children has found no link between the measles, mumps and rubella vaccination and autism.

The Danish study, published in the *Annals of Internal Medicine* journal, looked at all children born in the country between 1999 and 2010. The children were followed through to the end of August 2013.

It found the MMR vaccine did not increase the risk of autism, even in children with other autism risk factors or in children whose siblings had autism.

There was also no clustering of autism cases following vaccination. Researchers from Statens Serum Institut in Copenhagen found that of the 657,461 children included in the study, only 6517 were diagnosed with autism. Of the children followed, 95 per cent received the first vac-

cination, which is offered at 15 months, but there was no difference in the number of vaccinated children with the disorder compared to the number of unvaccinated children.

A 1998 paper in the *Lancet* which first implied a link between the MMR vaccine and autism was retracted in 2010 but turned thousands of parents around the world against the vaccinations.

The film *Vaxxed: From cover-up to catastrophe*, which was released in 2016 and also claims there is a link between autism and the MMR vaccine, has also led to an increase in parental reluctance to have their children vaccinated against the diseases despite wide criticism of faulty evidence.

Nelson woman Alison Singleton shares this reluctance to vaccinate. Writing in a letter to the editor, she said it was simply not true that there is no scientific

evidence supporting a link between autism and the MMR vaccine.

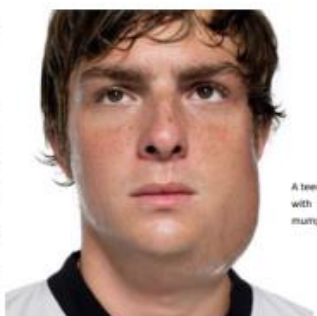
"People need to open their eyes and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals."

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University of Otago Professor Michael Baker agreed the study was "very reassuring for anyone concerned about the possible link".

There has been an increase in measles cases in Europe and the United States and the World Health Organisation has declared



A teen with mumps.

vaccine hesitancy as one of the top 10 threats to global health. In New Zealand there have been a number of measles cases in recent years, including a large

outbreak last year. From 1 January 2019 to 29 January 2020 there were 2193 confirmed cases of measles across New Zealand.



Centre website to their source, the Centers for Disease Control and Prevention, where they were provided free of cost for publication use.

A third photograph (a small baby, carried by a nurse in blue) was found via a Google image search to be used in several online newspaper sites illustrating articles on vaccination. I traced this image to Shutterstock and purchased it for use in this research.

All three story scenarios can also be found in full in Appendix C.

### **3.7.6 Order effects considerations**

This study presented three versions of a story to participants in this order: Controversy story, balancing story, and balancing story with photographs. Audience studies that have examined order effects in research justify this approach, particularly early persuasion formation studies that showed more attention was paid to the first of two messages, and those that tested negativity theory. Some early theorists, like Hovland and Mandell (1957), have found the first message presented in a sequence sometimes made a more powerful impression than the subsequent one, especially if the message involved new or novel information. Robinson and Leonard (2019) speak of order effects of earlier questions influencing later ones and the care needed in questionnaire layouts. Similar studies into marketing communication, looking at the role of presentation order in judgement formation, showed initial impressions tend to last through subsequent presentations (Kümpel & Unkel, 2020).

Further studies, focusing on the effect of disturbing or exciting news in broadcast media, have found not only lingering effects of negative or positive news stories to the news consumer's mood, but thinking disrupted by as much as a two-minute processing delay (Mundorf et al., 1990, as cited in Mundorf & Zillmann, 1991). In the Mundorf et al. study, participants were unable to remember further incoming news reports consumed immediately after the exciting or disturbing story. Particularly arousing hedonic valence (positive or negative) has also been found to spread over to the next story, intensifying its effect on the audience, with negative stories appearing more negative and positive stories appearing more positive (Mundorf & Zillmann, 1991). Negativity theory also has an application here, as studies have found negative information to be many times more memorable (Guskind & Hagstrom, 1988, as cited in Choi & Lee, 2007) than positive information, regardless of the order in which information was presented.

In the present study, I wanted to explore the audience response to the more alarming story, without the possible interaction effects from the second and third stories. Having the balancing stories second and third, however, cannot rule out the affective reaction effect described above, of readers experiencing heightened positive affects after the more negative story. However, Mundorf and Zillmann's (1991) theory involved audience exposure to extremely negative or violent broadcast news stories immediately followed by a positive story, or vice versa. The research described in this thesis features less extreme stories and participants were interviewed after each story. The persuasiveness and credibility aspect of the more negative story would also be expected to be a factor, and some participants might also view the disease photographs in the third story as negative and be affected accordingly.

### **3.8 Participant recruitment and a pandemic**

The research procedures described here unfolded according to a research plan, with some Massey University Human Ethics Committee revisions, described below, as well as some significant complications brought on by the 2020 Covid-19 pandemic. This research required participants who were parents or caregivers of preschool or school-aged children with decision-making responsibility about vaccinations, as the MMR vaccine is given to babies and young children. This included grandparents and wider whanau members. After obtaining Ethics Committee approval to proceed with the research, I contacted Manawatu and Palmerston North kindergartens, day cares, and schools for permission to target suitable participants by posting either an electronic recruitment notice inviting participation in the schools' newsletters, or a physical notice on a noticeboard located at pick-up points where parents collected children. Some snowballing of contacts also occurred with participants passing on the recruitment request to their associates in the target population, and a notice also went up at the Palmerston North Toy Library (garnering one participant).

#### **3.8.1 Impact of a pandemic**

The topic of this research was decided upon in 2019, prior to the full impact of a New Zealand outbreak of measles in 2019, and well ahead of the Covid-19 pandemic in 2020. Both of these outbreaks confirmed the relevance of the research, but the Covid-19 virus, in particular, has also considerably raised the profile of vaccines in news media and conversations. Individuals who may have given no thought to vaccinations for many years would have suddenly seen a deadly new virus take hold. No-one in New Zealand would have been oblivious to a national lockdown precipitated by a global coronavirus pandemic on 25 March 2020 that remained for nearly five weeks. The lockdown closed schools, day cares,

and many workplaces, apart from those deemed “essential” by the Government. Myllylahti and Hope (2020) have documented that news consumption, particularly health news, rose sharply during the 2020 New Zealand Covid-19 nation-wide lockdown. It is therefore probable that these events, as well as the publicity about worldwide efforts to produce a Covid-19 vaccine, increased participant knowledge about the role of vaccination in preventing disease.

Particularly important to this research though, Covid-19 fears and the New Zealand lockdown in March 2020 presented many practical research challenges, from the complete shutdown of the researcher’s university and cessation of Ethics Committee meetings, to the closure of schools and kindergartens, complicating participant recruitment. Some schools and day care centres declined publicising the recruitment notice when the researcher's approach coincided with a second partial lockdown and a tightening of parent and visitor management protocols. Efforts to include Well Child provider Plunket in the recruitment window also failed due to the suspension of playgroups, where a direct appeal and distribution of notices was hoped for, and difficulty contacting staff to provide the necessary permissions to access any alternative database.

With a restriction on gatherings in New Zealand, it looked for a time that face-to-face interviews were also going to be impossible. Fortunately near-normal life resumed in time and, over a two-month period from late July 2020 to late September 2020, 18 participants volunteered and 17 audience studies were completed.

### **3.8.2 Saturation point**

At least 20 participants were initially sought for this research, and recruitment efforts continued while the interviews were taking place. However, the acquisition of participants stopped when the researcher deemed a “saturation” point had been reached. Cobern and Adams (2020) and Seidman (2013) described saturation as when a repetition of opinions started occurring in interviews. When this became apparent in my interviews it suggested that most, if not all, probable parental or caregiver responses to the news story variations had been found. According to Cobern and Adams (2020), saturation increases the external validity of a study, suggesting the results were indicative of a true effect that might be found in similar situations.

### 3.9 Ethical considerations and amendments

Vaccination is an emotive subject, and the images of sick children displayed in the third story scenario had the potential to upset some people. For these two reasons, the research was deemed high risk and a full ethics application to the Massey University Human Ethics Committee was required before the research commenced. A full ethics application meant providing the committee with all documentation, such as the recruitment notice, questionnaires, and interview question schedule, as well as details of the scope of the study, expected recruitment procedures, organisations that would be approached for participants, interview methods, and an expression of the experience of the researcher and her reliability to act ethically.

All interviews were preceded by obtaining written consent to interview and digitally record interviews, which was granted in all cases.

Four key areas of possible harm from the research were indicated to the committee:

- **Exposing participants to incorrect information about vaccines**

As the story scenarios in this research included real news stories edited to highlight inaccurate or incomplete information, there was a risk research participants could be misled by this information. This was mitigated against by telling each research participant at the end of the interview that the information presented was manipulated, and the medical consensus was that vaccines were safe and reliable, replicating the techniques used by Dixon and Clarke (2012).

- **Emotional upset or panic**

It was possible that some participants could be sensitive to the information and photographs showing the symptoms and effects of vaccine-preventable diseases. The mitigation against this was a verbal reminder that doctors and medical professionals believe that vaccinations were a safe and reliable method to protect against the preventable diseases displayed. The contact details for a free counselling service was included in the Information Sheet, as well as the statement: If any questions cause you distress, then we will pause the interview, and you can ask that the interview stop or continue after a break if you are comfortable with that. The participant Information Sheet said participants would see some confronting messages about vaccination and could opt out of the study at any time. In practice, no-one was this upset, but

as Chapter Four will explain, a theme of participants being disturbed by the content was noted.

- **Participants feeling manipulated to accept views contrary to their own and developing negative views about vaccination discussions**

Interviewees who opposed vaccination may have felt uncomfortable with the exposure to photographs and data presenting the dangers of not vaccinating children. The mitigation for this possibility was the use of respectful interviewing techniques designed to capture a range of views and responses, and practising de-escalation techniques, such as using statements like, “Many people share those views” or “That’s a valid point”, should people become defensive or upset about the nature of the stories. Provision was made to stop the interview at any time. This did not happen, but some relevant comments from participants are further explored in Chapter Four.

- **Identification of participants**

Privacy concerns and worries about potential misuse of data collected were addressed in the Consent Form. This stated the questionnaire participant responses were confidential, and the participant’s name and information would not be freely available but restricted to authorised persons only, as per Massey University’s ethical research data protocols (Massey University, 2017). I also minimised the personal information collected, and de-identified informants by using anonymised names in the written document.

As the ethics application was sent just prior to the 2020 Covid-19 lockdown, and assessed afterwards, to approve the application, the Ethics Committee sought extra information about procedures for advertising, recruitment, and other strategies if no face-to-face interviews were to be possible due to the pandemic. The committee also wanted justification for a plan to use semi-fictional news story mock-ups because the element of deception would need to be disclosed, so the decision was made to use actual news stories instead. The audience study’s news stories and vaccination images were also provided to the committee.

The Ethics Committee also required further additions to recognise the special relationship with Māori afforded by the Treaty of Waitangi in New Zealand. Culturally meaningful elements that recognised the principles of the Treaty, such as partnership, process, and protection, were added to the audience study procedures, with the researcher consulting with

Massey University MBS Associate Dean, Māori, Dr Farah Palmer, and MidCentral Health Pae Ora Tracy Haddon for guidance. Vaccination uptake and health messages in the media are important to all New Zealanders but may have special relevance to Māori as indigenous populations have a lower vaccination uptake in New Zealand. Of the 17 participants, one identified as Māori.

The full ethics application was assessed, and approved by the Massey University Northern Human Ethics Committee (application number NOR 20/13).

### **3.10 Limitations of method**

My study design has some limitations. It uses participants from the researcher's home region to make it possible to conduct face-to-face interviews on limited resources. In this case, perhaps due to the researcher living in a university city, and in the region of the city where many academics live, the participant sample was skewed toward highly educated individuals with more experience of academic research than would occur in a random sample (see Chapter Four for more detail about the participants). Six of the 17 participants were also foreign-born, bringing experiences from other countries with different vaccination schedules, and immunisation information programmes. However, Frey et al. (2000) asserted people who volunteer for academic research tended to have a higher intellect, interest, and motivation, among other attributes, and were more outgoing than the general population. In addition, although the research included one vaccine refuser, and two vaccine-hesitant parents, anecdotal feedback (from participants talking about their friends), suggested many vaccine refusers were reluctant to be questioned on their views, and also were not typically interested in mainstream news media. The study recruitment notice openly advertised the vaccination theme. These factors will have resulted in an atypical profile of a general parent being studied.

A second limitation of this study was the deeper reading the questioning may have artificially prompted in the audience. By asking subjects whether they thought the MMR vaccine was safe after Story A, and why, a level of thought was applied to the issue that may not accurately describe how people would consume a news story in real life. The researcher found some participants commenced interviews very supportive of vaccinations, but after reading the story more closely after interview prompts, talking about occasions where they might look into vaccination further.

Story scenario order is a third limiting factor of this research. It is difficult to determine the cumulative impact and interaction of the three stories shown one after another, such as the unsettling content of Story A affecting the response to the photographs in Story C. As noted above, some theorists have found presentation order effects to be a factor in their studies, and the possibility of the positive story appearing more positive because of its contrast to the negative story being presented first (Mundorf & Zillmann, 1991). Negative stories have sometimes been seen as more memorable and credible than positive ones, too (Ashwell & Murray, 2020; Choi & Lee, 2007), and in my audience study the more controversial and negative story comes first. However, if Story A was shown last, persuasion formation studies (Hovland & Mandell, 1957; Kümpel & Unkel, 2020), and order effects theories (Robinson & Leonard, 2019), suggest the reassuring and confronting nature of the content of the other two story scenarios could linger for readers, and make it difficult to fully assess the response to the “risk” story. Certainly, more “pure” data would have been possible if different, but broadly equivalent, participants were used for three separate audience studies. This would be an ideal prospect for future research.

### 3.11 Conclusion

This chapter outlined the research methods used to answer the study’s three research questions. The study’s theoretical foundations and influential audience studies have been described, as well as the reasoning behind selection decisions, which led to the design of a unique study. Some strengths and weaknesses of using interviewing or questionnaires in research have been discussed, as well as the benefits of using both in a mixed-methods study. Participant recruitment and data treatment procedures have also been detailed in the chapter, as has the impact of a global pandemic on the practical realities of recruitment and, almost certainly, on participant knowledge. In its closing sections, the chapter has demonstrated the project’s commitment to ethical inquiry, and it concludes with some possible limitations. The next chapter presents the results from the interviews and questionnaires.

## Chapter four: Results

This chapter presents the findings from qualitative interviews with audience study participants as well as data from questionnaires delivered before and after the interviews. The study results are presented in three sections: first, a description of the participant sample is provided to show its unique characteristics; second, the responses to the audience study are documented, broken into three main headings reflecting the different variations on the stories and three research questions; and finally, the questionnaire data is detailed, including future intentions around measles vaccination and the participants' particular news media consumption patterns.

### 4.1 The interview sample

Seventeen participants accepted an invitation to join the researcher's audience study. This invitation was via notices put up on physical notice boards or posted in online newsletters in schools, kindergartens, day care centres, and playgroups in Palmerston North, New Zealand, and surrounding districts. Palmerston North is a university city and many families associated with the city's educational facilities reside in its Hoko-whitu suburb. Hoko-whitu is also the researcher's home suburb and, for convenience and easier facilitation of face-to-face interviews, many volunteers were sought from this area. As the appeal notice included information about the study being sited in news media and with a vaccination theme, the sample perhaps unsurprisingly included a high proportion of well-educated individuals with an interest in media and health. As per the requirements of participation, all were, or were soon to be, caregivers of babies, preschoolers, or primary school-aged children and the main decision-maker about vaccination in their households.

Of the 17 individuals in the study, 16 were women, and ages ranged from 26 to 47. Seven out of the 17 were not born in New Zealand: two were from the United Kingdom, and one each from South America, the United States, Ukraine, France, and Malaysia. Ethnically, 11 identified as New Zealand European, two "other" European, two Hispanic or South American, one Māori/New Zealand European, and one Chinese. The participants were predominantly positive about vaccination in the initial questionnaire, with 14 indicating their full support of the New Zealand vaccination schedule. Two participants were vaccine-hesitant and one participant refused all vaccines for her children.



The participant sample was well educated, well above the national average, with almost all having at least the equivalent of a university degree, and three with master's degrees. Three out of the 17, or 18%, had PhDs or medical degrees and one was a PhD candidate. To put this into perspective, according to the Ministry of Education (2018), in 2016 only 1% of New Zealanders aged between 25 and 64 had a doctorate or equivalent education in 2016, and only 5% of 25-64 year olds held a master's degree or equivalent education. Participant names have been changed to preserve anonymity.

## **4.2 The audience study**

The interviews with the participants described above were carried out in 2020, over the course of two months. The interview findings presented in this chapter identified the thematic responses to print media presentations of news stories manipulated by adding or subtracting certain elements of construction. The responses that are presented here were collated from the interview transcripts and are linked to the three research questions of this study. The study is sited in a wider analysis of risk communication in health or science news stories.

The 17 participants read three versions of a news story, and were presented with a questionnaire before reading the news story variations, and another questionnaire afterward, to determine baseline views on vaccination and news media consumption levels.

The results are presented next, under three headings that align with the three research questions of this study: responses to non-expert quotes in unbalanced news stories; responses to quotes from experts about vaccine safety in balanced stories; and responses to photographs of preventable diseases. As detailed below, there were distinct responses to the three versions of the stories, as well as some solidification of previous views on the importance of vaccinating. The interview schedule, questionnaires, and news stories can be found in Appendices A, B and C.

## **4.3 Story A: Response to non-expert quotes in unbalanced news story**

The first story presented to participants, Story A, was designed to engage with Research Question One, and looked at the audience response to a news story featuring quotes about MMR (measles, mumps, and rubella) vaccine safety from someone who was not a scientist, doctor, or vaccine expert. Story A was constructed to highlight safety concerns about the MMR vaccine and the vaccine industry. As noted earlier, initial questionnaires showed 14 of the 17 participants were confident in the safety of the measles vaccine, two members were

hesitant but did vaccinate their children, and one participant refused this and other vaccines for her family. However, most participants were unsettled by the story.

Four prominent audience responses to Story A were verbalised and recorded:

- Unsettled or disturbed by claims of vaccine risk
- Criticism of letter writer
- Confidence that vaccine less risky than acquiring disease naturally
- Suspicion of media agenda

#### 4.3.1 Story unsettles participants

Although many participants also challenged the credibility of the letter writer, a common response to the news story was communicating a feeling of being unsettled or prompted to rethink the safety or background of the MMR vaccination. Most participants commented on one or more elements of Story A's quotes from the letter writer, Alison Singleton, and were concerned by them. Some wondered about the safety of the vaccine; others picked up on the quote about pharmaceutical companies funding research and the possibility of bias in published results. Three participants, Julie, Nicola, and Kim, had not heard of the discredited link between the MMR vaccine and autism before and they were worried by it. Julie, a PhD science candidate, was one of these, "Wow, this is surprising, really surprising," she said, appearing slightly shocked. She also wanted to check if the Danish research was done correctly, saying there are sometimes mistakes in academic research:

*Sometimes you find inconsistencies, or things that have been missed. So now I always read the methodology ... you have to pay attention.*

Nicola, a farm worker with a science degree, who described her perspective as "a fan of the science", said the story's quoted comments made her think twice:

*It did make me think, when they say there's more studies that have been published about it, or that there's been studies confirming the link...maybe, if I was concerned about it, I'd have to look it up...I mean, if I had autism risk factors in my family, then I'd probably look into it.*

Data analyst Kim felt unsettled by comments about the autism link. She had vaccinated two older children and had a three-month-old baby:

*I think I can relate a story like this to other medicines as well – it could be luck. It would be one in a million...*

Eight participants were also prompted by the story content to comment on the possibility of a cover-up or interference from pharmaceutical companies, suggesting scientific research funding was problematic. Camera operator Rob was one of these, “You never know who is paying for it, do you?”

Business owner Tamsin also had her suspicions about the role of pharmaceutical companies raised by the story’s suggestions of suppressed results:

*It’s interesting. It definitely makes you think with the whole pharmaceutical backing. That’s the bit that makes you go, ‘Mmmm, yeah’.*

Two others wanted to see these suppressed studies that the letter writer alleged showed a link between MMR and autism.

*My reaction to the article was, I wish I could see that list of publications that she’s talking about. I don’t want to dismiss her view, maybe that’s true, it’s certainly true we haven’t heard about those – I wish there was a further reference list of those articles she talks about. She said they were publications in peer reviewed journals, so I wish I could have a look at them. Because she’s certainly right - nobody talks about them! – Claire*

The responses from vaccine-hesitant and -refusing participants were particularly striking; these three participants tended to align themselves with the views of the letter writer. The letter writer’s assertion that pharmaceutical companies were paying for vaccine-positive research particularly resonated with these three:

*I don’t necessarily believe what pharmaceutical company ‘advertising’ says, because they are paying their own scientists to find findings for them to create money so they can give the vaccine out. – Suzanne*

*But then, the pharmaceuticals – where there’s money involved...that’s another problem. – Belinda*

*And I feel like this Nelson woman has done a bit more research – as have I. So... I do actually agree with her findings... or her comments here about ‘the studies which show otherwise are shelved or suppressed’. – Jane*

For the three vaccine-hesitant and -refusing participants, the letter writer’s views on MMR vaccine safety also sparked more discussion about the safety of vaccines in general. Unlike Julia, Nicola, and Kim quoted earlier, who had encountered the autism scare for the first time in the presented news story, Jane, Suzanne, and Belinda were more concerned about other possible effects. Former teacher Suzanne wanted more information about the new Danish research, such as how they tracked children and if the autism tests were routine or not:

*How did they arrive at that? Who was involved with it?...I still have the same questions: There are no answers about the type of [side effect] reporting being done. How many children are actually being reported to the doctors, and how much with or without the autism?*

Belinda kept returning to a fear of a possible, as-yet-unknown, long-term side effect from the vaccine. As could be expected, all three hesitant or refusing participants had strong views about the risks of vaccination and the two that had vaccinated their children, Belinda and Suzanne, had struggled with the decision; Belinda admitting she would be tearful with worry when vaccinations were due:

*It's as safe as probably it can be. But it would be nice to have more transparency about the vaccine and how it's put together. It may protect for one disease, but the carrier agents may cause problems further down the track. How much research has been done on that? We all understand the concept of herd immunity, but are you vaccinating 100 people to just save a few [that would die]?*

Suzanne was also worried about the ingredients used in vaccines to keep them viable:

*It's the additives. It's not so much the actual vaccine itself; it's the additives to keep it active. It's like having colourings and additives in our food... It was also a risk taking it, you know, because, would [her daughter] have a reaction to these additives or the measles thing?*

Other possible side effects of the vaccine were problematic for Suzanne, too:

*...I felt like there were bigger concerns with things like the brain swelling. It would have been taken into account that there were side effects – but only in a few children – but you've still got to think, what if my child is the 1%? Because [she] hadn't had many vaccinations, so how is she going to react with this?*

However, for most of the vaccine-confident participants the “unsettled” feeling appeared to be prompted by the news story; they wanted to know more about the letter writer and see if her claims had any substance. In total, 13 out of 17 participants professed worries about vaccine safety or wanted to see evidence of the mooted link between the MMR vaccine and autism after reading the manipulated story with amplified content about vaccine adverse effects. These stated reservations did not change intentions to vaccinate when asked, but induced feelings of unease, surprise, and a necessity to look further into the reported risks showcased in the story. Some said they wanted to do more research about vaccine safety in the future.

#### 4.3.2 Letter writer's credibility questioned

Another almost equally prominent response to the first news story was criticism of the letter writer's claims. For 12 of the 17 participants, this disapproval came from noticing the letter writer had no evidence or hard data for her opinions. Several were verbally critical of her point of view. Some participants honed in on the lack of evidence immediately; three noted the unsubstantiated claims yet were still unsettled by Story A.

Many participants were experienced academic researchers and quick to notice the lack of citations for letter writer Alison Singleton's claims. The difference between opinion and expert opinion was quite clear for these respondents, indicating a high level of media literacy. Some, like Meghan, were quite scathing of the letter writer's content:

*It is not fact if you [just] say there are scientific studies. She hasn't quoted any peer reviewed journals, she hasn't quoted any scientists directly – and there's a difference between reading a peer-reviewed journal that ... you have scholarly and non-scholarly articles and scholarly articles have to be checked through and go through a process. It's not just opinion. You have to have fact. And the fact that they had to pull an article back in – the 1998 paper – to retract that there was a link: The evidence wasn't substantiated enough for them to make that claim.*

Similarly, yoga teacher Amy, on to her second master's degree, said any evidence needed to be stated:

*It's not enough to me just to say 'many' and blah blah, all this stuff she's saying, 'studies that show...', well, which ones? Until that's a fact and I can see it with my own eyes, it still seems to be an opinion. I'm open to seeing the evidence. I haven't yet. It sounds very factual, but it doesn't have the evidence to back it up. Fact for me is: these statistics over here [indicating the Danish study in the story], black and white facts that I can see.*

And medical doctor Rowena also noted the vague terminology:

*The fact that you never hear of the studies, she says there is a large number, but she isn't able to give any examples.*

Many participants who were critical of the letter writer's claims took the correspondent's language into consideration when scrutinising her quotes. In addition to the lack of cited evidence, mother-of-three Brooke said the use of "emotive" words like "people need to open their eyes and look deeper" was enough for her to question the letter writer's credibility:

*It's like she's trying to convince other people. That quote there is trying to draw on people's emotions, and accusing the media of lying.*

Jessica also picked up on this passage of quotes. She thought the colloquial phrasing was a rhetorical device often used by “less reliable people” trying to convince others. She also did not believe the suggestion that some studies were shelved and suppressed and was instead confident that if there was an actual problem with the vaccine it would have been made public.

Speech therapist Monique thought the letter writer had contradicted herself:

*She said there'd 'been a large number of studies published in scientific journals' and then later on says 'studies that show otherwise were shelved and suppressed'.*

Others were mildly critical of the lack of evidence, but Nicola was more open to the idea that it may have been edited out, and Kim thought the letter writer may have just been a novice:

*The lady may have gone into self-study, getting these publications from somewhere. I think it's a bit one-sided, as well, against the vaccine. It looks so convincing, but what is the source?*

Those that did not believe the claims of a cover-up of evidence were confident any studies that did exist would have been made known to the public by now. They communicated that they could not take the letter writer's views seriously without hard data.

#### **4.3.3 Belief that disease poses greater risk than vaccine**

Another frequent response was full confidence in the MMR vaccine featured in Story A, and nearly all other vaccines, while accepting there was a degree of risk in vaccination. Six acknowledged there could be some risk with the MMR, but more risk from acquiring the diseases naturally.

Stephanie acknowledged there may be minor side effects when the MMR vaccination was administered, but the alternative was a greater risk. She was a fan of reading history and an old Nigerian saying, “Don't count your children until the measles has passed”, had stuck with her:

*Maybe the vaccine can trigger something, but if you get the actual disease it may kill you. So, if vaccination affects you this way ... but if you are not vaccinated and you get it, you may die.*

Some of the participants knew they did not completely understand the science involved, but determined vaccination to be the safer option than not vaccinating, like mother of a newborn and preschooler, Jessica:

*There are sometimes issues that happen; there are possible side effects. But I still would vaccinate. I don't believe [the MMR vaccine] would cause autism but maybe some side effects from the body's immune response.*

Julie, too, was confident the risk was worth taking for her two children:

*I would still get them vaccinated. I guess that we have more benefits than problems with the vaccine.*

Belinda, one of the vaccine-hesitant participants, said her evaluation of the greater risk was the deciding factor in vaccination uptake for her: “But only because...what’s the alternative? I’d never forgive myself if [her daughter] picked it up and got complications.”

However, for Belinda, Story A did not help with the ambivalence she struggled with, and she worried if even doctors knew what was safe and what was not. She said she would just hope her child did not react badly and have her vaccinated:

*I think it just confirms that both camps seem to have compelling evidence and are both convinced of their findings, which leaves parents in an invidious situation...I’m still no further convinced in my mind!*

For Brooke, and many others, confidence in vaccination extended to stating their trust in the medical system, scientists, and doctors. To these participants, the manipulations of Story A were interesting, but not of great impact:

*I guess we have to put our trust in researchers that the results they find from research are accurate and factual, regardless of who’s sponsored it. Pharmaceutical companies obviously fund some of these things, so you do put a lot of trust in that. And there are no guarantees that they’re not swayed, but you hope that scientists are credible enough to report fact...I feel that in New Zealand we are quite good at keeping an eye on things. I wouldn’t like to think that we are corrupt. – Brooke*

Many participants said the details in the story about the Danish study and the World Health Organization statistics confirmed their views that vaccinating was “better” than not vaccinating, and were more convinced by the Danish study because of the detail and scale of the study:

*The newspaper article says there was more than half a million children, which is a huge sample, and it’s been published in the Annals of Internal Medicine Journal... So that seems pretty convincing... – Claire*

Mother-to-be Monique also said the research findings in the story would help convince her about the importance of vaccination: “Because the Danish study...was reconfirming that there’s no link to increasing the risk to autism.”

#### 4.3.4 Bias and sensationalism puts off participants

The news media was another topic that provoked a strong response during these interviews. A recurring theme of the interviews was suspicion or negativity toward news outlets and journalists. One was perplexed by the “unbalanced” reporting style represented in Story A. Six were critical of the news media, suspected bias in Story A, and indeed all news reporting, or believed in the existence of a hidden agenda behind news stories. Another three, like lecturer Ruth, hated the sensationalism:

*My husband and I, we can't listen to the news anymore...because they don't provide enough information to develop an informed opinion or provide a good understanding. They're often skewed. They're very light, I think, the reporting ... Not just about vaccination, but I think the media tends to ... I think of the word provocative, but they don't necessarily provoke people to dig deeper. They often take an idea that's almost sensationalised and it can create this hype, or anxiety. There is almost a frenzy to believe a particular view point but it's not necessarily presenting impartial information to help people make an informed decision.*

Some of those in the hidden agenda camp, such as vaccine-hesitant Suzanne, believed there were alliances or underlying motives behind the production of news stories:

*What are the connections with people that are asking for the information? Because there's a whole network behind what is just printed on the paper.*

Vaccine-refusing participant Jane was certain there was more to the letter writer's contribution than was published. She thought the journalist had used Singleton's comments as a kind of token balance to show the opposite argument when writing the story:

*It [covers the] facts straight away: here's the pros. And then the cons are kind of ... I don't know if it's intentionally left as... and this is just somebody's opinion.*

Some participants, like business owner and mum-of-three Tamsin, said journalists were “always biased”. Others took a more proactive approach and spoke of the need to check sources and mastheads for credibility, reading news from a few publications to compare for consistency. Despite the above observations that Story A did unsettle audience study participants, many were adamant they would never take any single news report at face value or let it affect their decision-making:

*The media will always filter the news. So it's so important what media you use. They can have the same story and it's presented quite differently, which can affect what you think. – Julie*

Three participants focused their attention on the construction of Story A and were put off or perplexed by it because they saw it as unbalanced or sensationalised. Suzanne said she did



not like it when journalists put their own “value judgements” on the news, and she saw this in Story A.

*It turns me off. Even though it's more engaging ... I turn it off. I find it not as sincere. It's not presenting the news; it's attention-grabbing.*

Lecturer Claire was disconcerted that so much of the story had been given to the “faulty” information. She said if she was the editor she would ask why the journalist was even including *The Lancet* study and *Vaxxed*, as it justifies people’s fears at the same time as saying people’s fears were unfounded:

*On the one side of me, I think it's fair to say that some people don't agree with this, but on the other hand, it's unfair that you are giving so much space to this counter argument. It's almost too much space, even though the journalist says these are retracted or have faulty evidence; it's still too much space. People who are less discerning might give those two arguments equal weight, and that's wrong. It makes me perplexed rather than upset. I like to have both points of view, but maybe this is slightly on the wrong side. I wish there had been less space.*

These participants’ responses to Story A reflect aspects of the research design that will be discussed further in Chapter Five. The story was deliberately edited to highlight the attention-grabbing risk elements of the MMR vaccine by giving the controversial letter writer substantial quotes and prominence.

#### **4.4 Story B: Response to quotes from experts about vaccine safety in balanced story**

The second story presented to participants as an interview prompt covered much of the same information about the new Danish research findings to quell autism-MMR link fears as the first, but presented fewer quotes from the letter writer and introduced two new sources. Story B’s new quotes were from two New Zealand academics who endorsed the work of the Danish study. One of them provided detail about genomics and brain scan research from Auckland University that showed autism was unrelated to vaccination. This time the story was constructed with a *weight-of-evidence* balance of information, showing that most of the credible scientific and medical consensus was on the side of the MMR vaccine being safe by including more content from that side of the argument, but also still demonstrating a small percentage of people believed it to be dangerous (Clarke et al., 2014; Kohl et al., 2016). Key again to the story was the use of quotes from sources, this time with experts on vaccine safety having prominence.

Now explored in more detail, the primary responses to Story B were:

- Relief and reassurance
- Confidence in research and doctors
- More confidence in MMR vaccine safety
- Mistrust of media/cover-up suspicions

#### 4.4.1 Story B brings palpable relief

The most prominent responses to Story B communicated a dramatic reversal of the anxiety brought on by Story A. Even participants who had shown no sign of being worried by the first story were perceptibly relieved by the second, stating their relief in words and appearing much more relaxed about the story, saying it was “good” or “better” than the first one, or “felt a bit more factual”. Thirteen participants expressed relief after reading Story B and felt vindicated in their support of the vaccine. For example, from Amy:

*This one for me, I feel more comforted that I have done the right thing. If I was looking at Alison’s argument and there was evidence to it, then I would be deeply disconcerted [with the first story].*

Julie, the PhD candidate, was relieved the autism link was only a scare:

*I like this one more....I didn’t feel [the vaccine was] unsafe in the first one, but it gave me a second thought. I had to go back and look through the information just to be sure what is going on, what is the relationship. But here [in Story B], I don’t feel that necessity. I still want to look for the studies, but now it is because it’s exciting to know about the studies!*

The structuring of the second article was referred to as a key feature of the shift. Some participants said in the first story some reassuring points were missed as they were drawn to the “more interesting” controversial elements; this time they were more able to absorb the detail about the Danish study:

*It provided more evidence in favour of vaccination than the previous story. The more evidence you’re given, the more reassured you feel....The Danish study is the main topic, but this story has effectively got another expert that has agreed with that research and included some more research to back that up. – Jessica*

#### 4.4.2 Facts, research, and doctors increase confidence

Indeed, it was the quotes from the experts that were explicitly referred to as making the difference to nine of the participants. These participants were reassured by the expert commentary because they felt the senior lecturer in vaccinology and Otago University professor were both credible and trustworthy:

*Well, [Dr Helen Petousis-Harris] is of a neutral stance. She’s not from a pharmaceutical company, she works at a university. Her opinion should be neutral.*

*They're not paying her wages, so to speak. And I guess the Otago professor is backing that up, too. – Brooke*

*Obviously [a lecturer in vaccinology] would have an understanding of the bell curve of where vaccination would work and where it wouldn't work. Their opinion has a bit more weight to it rather than the Nelson woman that you don't know anything about. – Nicola*

*Again it's mostly looking at the data from the research company, but the opinions from the people who have qualifications do add to that. – Monique*

For some participants it was not just about the credibility of the academic sources that were quoted; it was the starkness of the contrast between quotes from a person with credentials, and what appeared to be facts within those quotes, with the letter writer who seemed to present no firm evidence for her views. For Meghan, and others, this left the Nelson woman with no authority to comment and just her feelings on the issue, “It was just purely emotional.” Emotions were not a bad thing, Meghan said, but she believed vaccination was a topic where science had to come first:

*I would listen to a doctor's opinion over a mother's opinion, because that person has had training. I think that there's a time and place for trusting your emotions – for instance, do I buy that car or not? ... I think there's definitely a difference between making a decision with emotion and professional opinion.*

Similarly, Julie said it was suddenly obvious the letter writer was basing her view on her opinion alone and “not related [to] the scientific work”:

*It's more clear ... The researchers, they did really good research, they have an opinion with a different perspective. So for me, it is more convincing. In the first story, they just asked someone and, 'Okay, let's just write it down' ...*

Of the two quoted experts, one was given credentials as a University of Auckland senior lecturer in vaccinology and one was described as simply a University of Otago professor, without his area of expertise provided. The first expert gave specific details about brain scanning and genomics research into autism; the second, just his opinion that the new Danish study should reassure worried parents. This difference was not lost on some close readers of the story. Jessica noted the lecturer in vaccinology “would obviously be pro-vaccine but also aware of all the science behind it”. As Otago University is a New Zealand medical school, she, and some others, assumed the University of Otago professor was involved in medicine or at least “a very intelligent person and worth listening to”:

*I wouldn't necessarily be putting as much weight on the University of Otago professor as the Auckland one because [the Auckland one] used specific examples of research that's been done that could be looked up and verified. But I'd probably give more*

*credibility to a University of Otago professor than just a random woman from Nelson!*  
(laughs) – Monique

*If I don't believe this [lecturer in vaccinology Helen Petousis-Harris], I can look it up. I know where to search for the information and I can go to the university.* – Kim

Others said they did not have “100% trust” in scientists either, but the details given in the story appeared to be reliable and factual, and the doctors had high levels of authority, so were more believable for them.

#### 4.4.3 Vaccine intentions boosted

Seven of the participants said the second story did make them feel more convinced about the safety of the MMR vaccine, even though they already supported its use. This confidence was firmly rooted in the quotes that provided facts and reassurance from people who were presumed to be experts in the field. For these participants the confidence reinforced their intention to vaccinate children with the vaccine in the future:

*If I had a lower opinion about it being safe in the first one, I'd have a better opinion of it being safe in the second one.* – Nicola

*I'm not 100% blindly believing science and pharmaceuticals, but at some point we need to trust them that they are doing the right thing. And vaccines are not new; they have been tested.* – Claire

*I am probably a bit more confident to take the vaccine after this story.* – Kim

For the science enthusiasts in the audience study, like Julie, the quoted detail about modern technology showing differences in autistic children's brains before vaccination was a confidence booster:

*It's a real tool that provides you with important information, and if you use it for finding if there is a link between vaccination and autism you can really know if it exists or not.*

Nicola, too, thought this aspect was interesting:

*I don't think it provides any more facts than the other one; it just provides an extra perspective. I think that part about modern technologies and genomics showing it all before, gets your brain thinking on a different aspect. It's a very convincing statement.*

The reassurance and expert quotes combined to produce feelings of safety and vaccine confidence, with some participants saying if it was possible to choose a higher point on the 1 - 5 scale of intentions to vaccinate they were asked during the interviews, they would have chosen it this time.

#### 4.4.4 Untrusting, unwavering, and unconvinced

It is worth noting that the boost in confidence in the safety of the MMR vaccine from the new quoted information in Story B was only a response shared by the vaccine-confident individuals. The three vaccine-hesitant and -refusing participants held these experts in low regard, and were suspicious of the medical profession and society's established science hierarchies. These three had also shown they did not trust the media much, either. For example, from Suzanne:

*My perspective is that by reading this sort of thing ... I wouldn't be using just that as my main... [information] Even if you ran many stories in this area, as a research journalist, I wouldn't just be going with your opinion. ...[I would be asking] who ordered that particular study to be done? That's quite important journalism – the stories behind the stories.*

Belinda said it all came down to whether you trusted where the information was coming from, regardless of how “official” it sounded. She was suspicious that “all the weight” was now on the doctors' comments:

*It comes back to the old thing: put someone in a doctor's uniform and anyone will believe them.*

Jane, the vaccine-refusing participant, was skeptical of the Otago professor's remarks:

*Well I'm not reassured. Thank you, Michael, but actually, I'm not reassured! (laughs). I do know someone who now has an autistic son and he wasn't prior to his MMR.*

She felt the vaccinology lecturer's quote about brain imaging and genomics was “interesting”, but she wanted more information and to see the research up close for herself:

*When and where has it taken place, along with this latest study? There is a little bit here, but I'd actually like to see both sides presented. It would be interesting to see a brain image beforehand and a brain image after. It says 'we know that autism begins long before' but it doesn't say, we've looked at pre- and post-vaccinated images.*

Residual distrust of the news media remained in other participants, too, with a small number responding that journalists were “always biased” or there was always “an agenda” or “smokescreen” in news stories, but this was less prominent in the responses to Story B. Tamsin, who is supportive of vaccines, was still wary of media in general:

*You don't have to [try hard to] see the agendas that are all over the [TV news] screen. ...they are not going to shape my thinking.*

However, vaccine-hesitant Suzanne and vaccine-refuser Jane were deeply suspicious:

*I would be looking to see a bit more about it. Even if you've got a number of journalists all saying the same thing – how are they connected? Sometimes there is a hidden connection, some collaboration – maybe – for a purpose...Therefore you might have an agenda. – Suzanne*

Jane thought Story B was weighted too far toward vaccine promotion this time, “I know where they are coming from, but I don’t feel the stories are balanced.”

French-born Claire, who had critiqued what she saw as the unbalanced approach to Story A, thought Story B was more accurate, but saw the contrast as exemplifying a common problem with media coverage. She compared the vaccination debate to the climate change one, saying news media unwittingly created bias when they tried to give equal treatment to two sides of the argument:

*For so long, journalists have tried to be unbiased in a way that made them biased. You can't give equal weight to the climate change deniers, because of a handful of politicians and people with money who control certain industries, who are threatened by environmentally friendly companies...So if you give them equal chance to speak, that is bias, because you are not listening to the 99% of scientists and the International Panel on Climate Change.*

Story B and Research Question Two about the response to expert commentary in a debate is about exactly this point and how best to communicate scientific or medical information, and will be explored further in the Discussion, Chapter Five.

#### **4.5 Story C: Response to photographs of vaccine-preventable diseases**

In the third and final variation of the audience study, participants were presented with Story B again, but this time with three coloured photographs of vaccine-preventable diseases positioned alongside the text. Story C showed two small babies with measles and a teen boy with symptoms of mumps, two of the diseases MMR vaccination is designed to prevent. This arrangement in Story C addresses Research Question Three, about the impact of photographs and their connection, if any, to reported views on the importance of vaccination or reader intention to vaccinate.

The primary responses to Story C were:

- Emotions stirred
- Upset or annoyance
- Fascination and interest
- A reminder of disease experience

#### 4.5.1 Images provoke visceral response

The attention-grabbing lure of photographs of sick children was immediate when Story C was presented to participants, all of whom were parents or soon-to-be-parents. Eight out of the sample of 17 found the images stirred emotions but they were not put off vaccinating by the pictures. The responses varied from mild “pull at heart strings” comments to a consideration of the seriousness of the diseases.

Meghan said the pictures confirmed the whole point of vaccination:

*I wouldn't want to see my kids like this. I wouldn't want to risk putting my kids in any of these situations.*

For Julie the pictures were a bit frightening:

*I can't even think about my kids looking like that. It is not just the look [the outside]. You know that behind any of these viruses all the problems can appear. Because you see the skin and you know that is not going to last forever, but you know that some viruses have other consequences. Even just a fever; if you have a really high fever it can cause brain damage.*

Jessica had a newborn of her own and said the picture of the small baby evoked the most emotions for her. She could put herself in the place of that child's parents. Kim was upset that the children in the photographs had been put in danger, “This doesn't have to happen.” Ruth, an academic, worried about society's indifference to the danger of the diseases, “I worry about the complacency.”

#### 4.5.2 Images upsetting or unnecessary for some

However, some participants did think the pictures were a bit too much to have with the newspaper story. These participants thought them upsetting or unnecessary because they did not add to the story or were unpleasant to look at. Vaccine-refusing Jane felt they were manipulative, and Belinda wondered if she was being manipulated.

For Jane, the pictures reminded her of the pressure Emergency Department doctors had once exerted in trying to persuade her to vaccinate:

*Oh, yes. I've seen these. Of course you'd choose little people... I had to take my son in [to hospital] as he had croup in the early hours of the morning, and the house surgeon then called a paediatrician to come and talk to me about vaccinations. And he called me selfish.*

Vaccine-hesitant Belinda's response was also immediate:

*It hits emotionally. I have an emotional reaction straight away...Is it fear? Is it manipulation? But it's working; that's why I vaccinated [pointing to the pictures].*

Two others thought the photographs of sick children were too upsetting to look at:

*It just makes me feel sad. I don't want to think about it... – Stephanie*

*Yes, it's a little bit hard to see... the little babies. – Monique*

Media lecturer Claire thought having three big photographs was too much for the story. She thought just one was enough to highlight the reality of the diseases, but found it thought-provoking that there were three, connecting this to her earlier media commentary. She thought it demonstrated the power of journalists to pick and choose what information to include or not.

#### **4.5.3 Fascination and mump memories return**

Some participants found the photographs of disease symptoms fascinating and educational. These participants, who said they were not emotionally affected by the pictures of the diseases, found them compelling in a different way. Three participants dramatically remembered their own experiences with mumps and measles:

*Oh, look at those mumps...I had mumps as a child. It was terrible! – Brooke*

*Ooh, I had a mump! I was about 11 and this reminds me. That [the photographs] doesn't disturb me at all, I guess that's because I've grown up with lots of... I used to read dad's [medical] textbooks for fun (laughs). Strange child! So I am just, like, well, that's what measles looks like. – Amy*

Rowena was a doctor who had seen the diseases first-hand as well as knowing people living with the after effects:

*I suppose seeing kids with measles, especially, always reminds me of seeing kids with measles in real life, and it's pretty awful. And also, one of our best friends had mumps as a child, which made him partially deaf. It kind of reminds you a bit more than just the words.*

Others spoke of their fascination with seeing the now rare disease symptoms and of knowing what to look for if children ever acquired the diseases.

*Oh, wow! I've never seen a picture of mumps before!...The mumps looks unbelievable! It looks painful, let alone uncomfortable. That doesn't look nice for the kids to go through. It looks quite awful, to be honest. Unsightly... I like weird things so I would probably find it fascinating. But I dare say, for the poor kid, it is just not nice. – Nicola*



The photographs were attention grabbing to all participants, but garnered a diversity of responses. This will be discussed further in Chapter Five.

#### 4.5.4 Reader intention to vaccinate

In this study, Research Question Three looked at how readers responded to photographs of people with the symptoms of disease alongside the story. It is interesting to now consider the reported differences in feelings from participants about the importance of vaccinating and future intentions.

- **Reinforced:** Ten participants said having the photographs with the story reinforced their intentions to vaccinate. For example:

*You get so lost in all the info and this [the photos] just reminds you of the whole point of vaccines, because we get removed from it because it's not around. Like Covid, it's not that big a deal, because it's everywhere else. But if you put it in front of you, it reminds you that actually it is kind of a big deal... – Tamsin*

*The pictures pull on your heart strings and make you feel sorry for the children in the pictures, and make you think, I don't want that to happen to my children... to suffer through that unnecessarily, if there's a solution or preventative. – Brooke*

*It just makes it more obvious that vaccination's a good idea, if you want to avoid this [pointing to photographs]. I think it's really important that the concerns that people have, that are not based on facts, are addressed. The more kids that can get vaccinated the better. – Jessica*

- **No difference:** Seven participants said the photographs made no difference to their intentions. Most of the seven were already on the side of vaccination and the photographs were nothing new. Mother-to-be Monique said although the photographs stirred her emotions, she would make sure her decision-making about vaccination was based on common-sense not an emotional reaction. Vaccine-hesitant Suzanne said the photographs were interesting but would not affect her decision because, "I have such a strong voice internally". Vaccine-refusing Jane said the photographs did not make any difference, only reinforcing her previously stated objections to vaccination.

#### 4.7 Questionnaire results

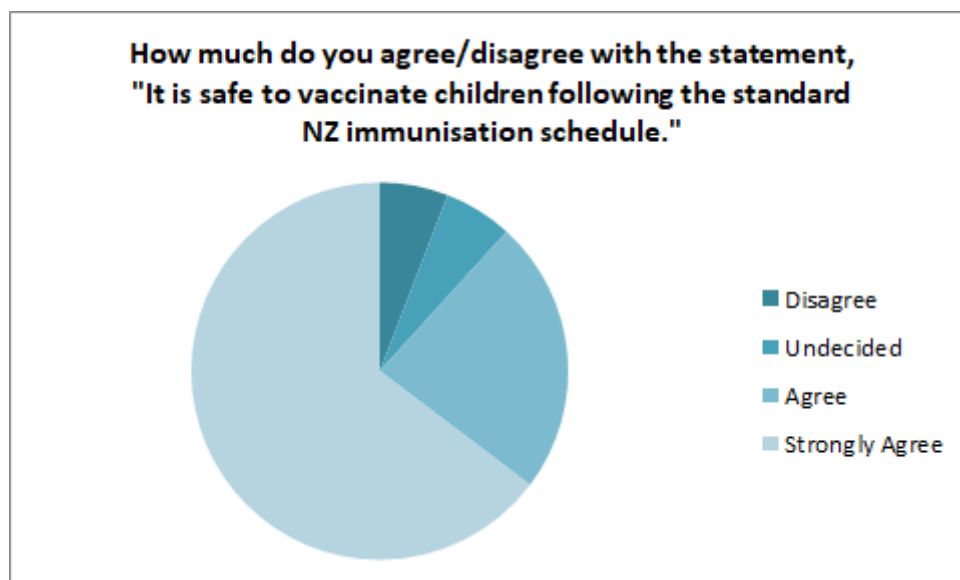
This section now turns to the questionnaire data. Two questionnaires were given to participants, one with seven certainty scale questions about vaccination presented at the start of the interviews, before the exposure to the news stories. Two questions were repeated in the second questionnaire, which was given at the end of the interviews. The second questionnaire also asked about future vaccination intentions and several news consumption and general

demographic questions. The questionnaires can be found in Appendix B.

#### 4.7.1 Vaccine confidence, safety, and intentions

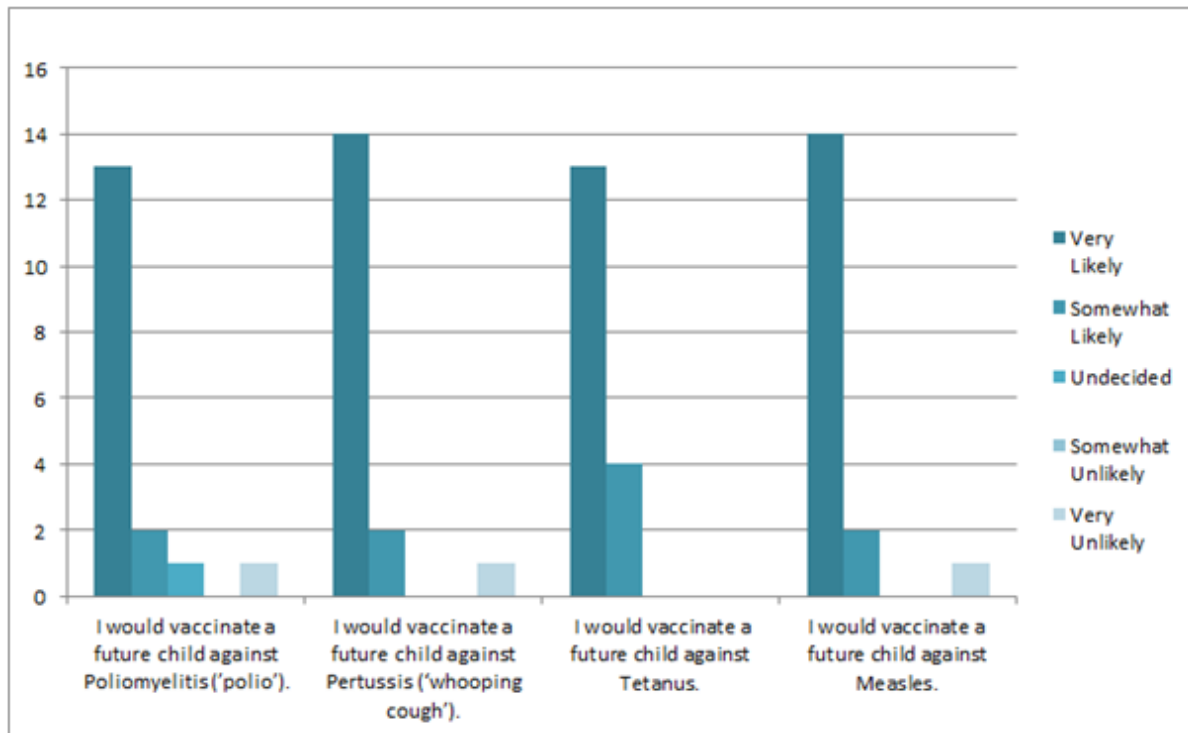
The first questionnaire sought to establish participant views on vaccine confidence and intentions before the interviews. The questions were also useful to provide more insight into the characteristics of the participant sample. The first question was a general one about vaccine safety (Figure 1). The majority of participants (11) strongly agreed it was safe to vaccinate children according to New Zealand's immunisation schedule. Four agreed with this question, one was undecided, and one disagreed.

**Figure 1.** Agreement scale question on vaccine safety.



The second question asked about specific vaccines (Figure 2). Along with three other vaccines, participants were asked in the first questionnaire how likely they would be to vaccinate a future child against the measles disease. This question is of particular relevance because the news stories presented in the interviews concern measles, mumps and, rubella (MMR) vaccination. As shown in Figure 2, in the initial questionnaire, 14 of the 17 participants said they would be *very likely* to vaccinate children against measles. Two said they were *somewhat likely* and one was *very unlikely*.

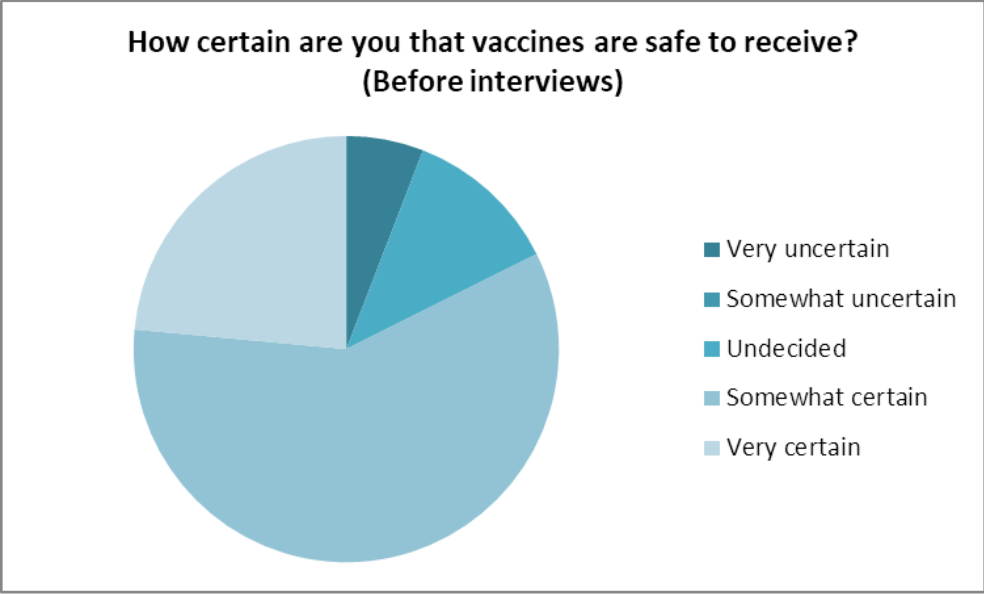
**Figure 2.** Vaccine intentions from first questionnaire.



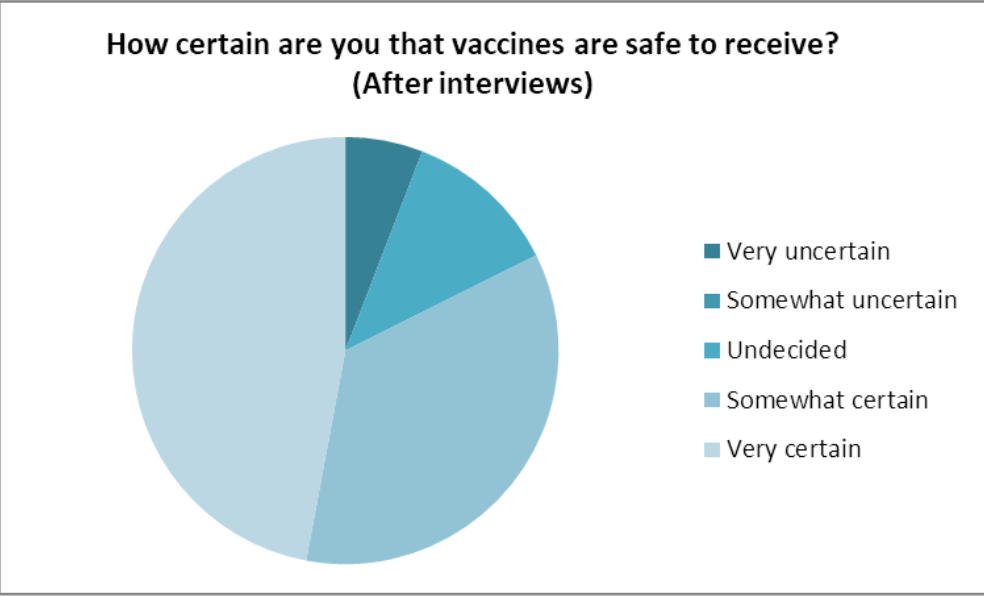
Two questions were repeated in the before and after questionnaires on the subject of vaccine safety. One was, “How certain are you that vaccines are safe to receive?” The second was, “How certain do you believe scientists and the medical community are that vaccines are safe to receive?”

As can be seen in Figures 3-6, there was no change among vaccine-refusing and vaccine-hesitant participants, but an increase in feelings of safety in some accepting participants from *somewhat certain* to *very certain* was captured. Between Figures 3 and 4, the certainty doubles from four to eight participants. Between Figures 5 and 6, certainty about scientist and medic beliefs about vaccine safety also increases, shifting from eight to 11 participants selecting *very certain*.

**Figure 3.** Vaccine safety certainty from questionnaire before interviews.



**Figure 4.** Vaccine safety certainty from questionnaire after interviews.

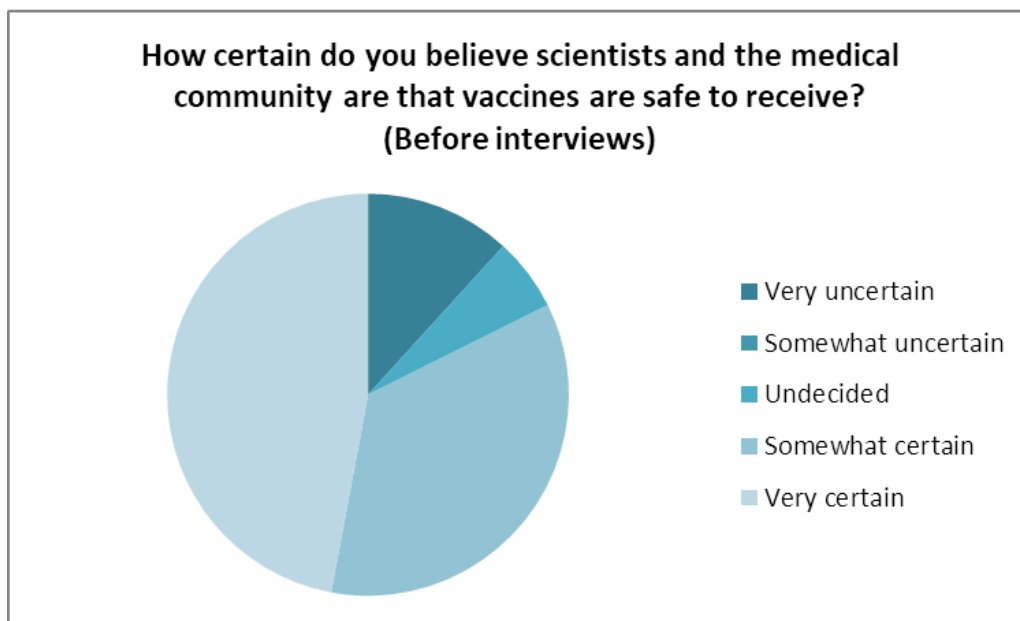


As seen earlier, the first questionnaire asked about theoretical intentions to vaccinate a child in the future with four specific vaccines. The second questionnaire surveyed vaccine intentions in a more general way, asking if the participant would receive any vaccinations themselves if recommended by their health care provider, and if they intended to “make sure” their child or children received any vaccinations similarly recommended. Again (see Figure 7), we see the clear split between accepting and reluctant or refusing participants.

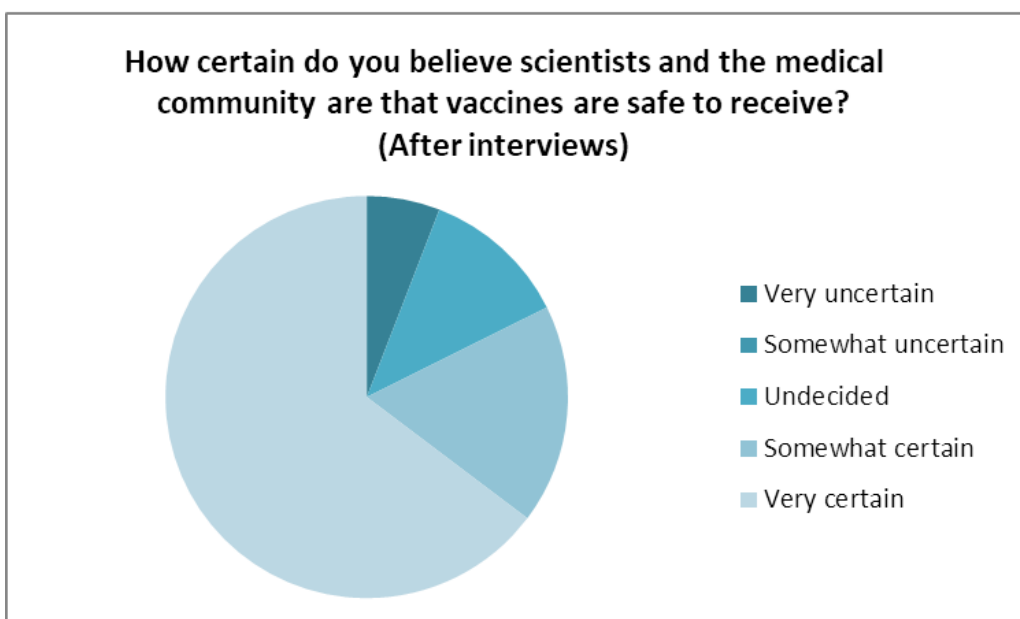
Six out of the 17 chose *strongly agree* and six chose *agree* to the first question, three were *undecided* and one each chose *disagree* or *strongly disagree* to the prospect of following a doctor's recommendations on their own vaccinations.

Seven out of 17 chose *strongly agree* and seven chose *agree* to the second question about vaccinating children along the lines of healthcare advice, while one each chose *undecided*, *disagree*, and *strongly disagree*.

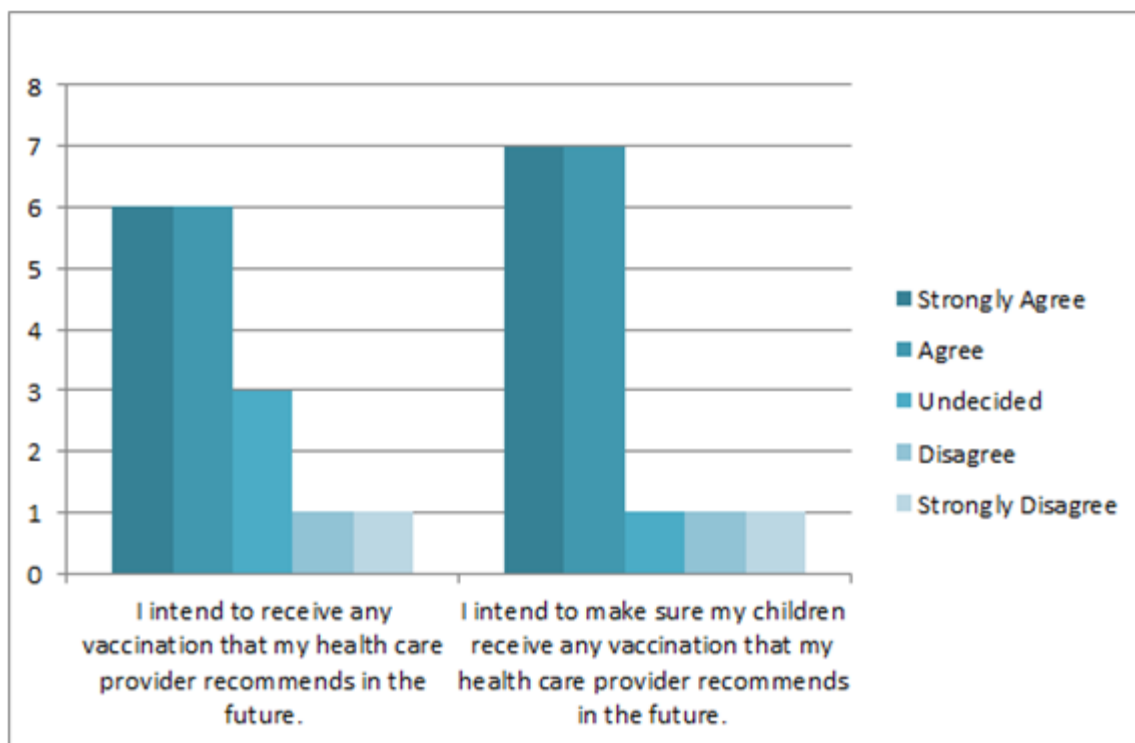
**Figure 5.** *Certainty in scientist/medic belief in vaccine safety before interviews.*



**Figure 6.** *Certainty in scientist/medic belief in vaccine safety after interviews.*



**Figure 7.** Vaccine intentions agreement scale from second questionnaire.

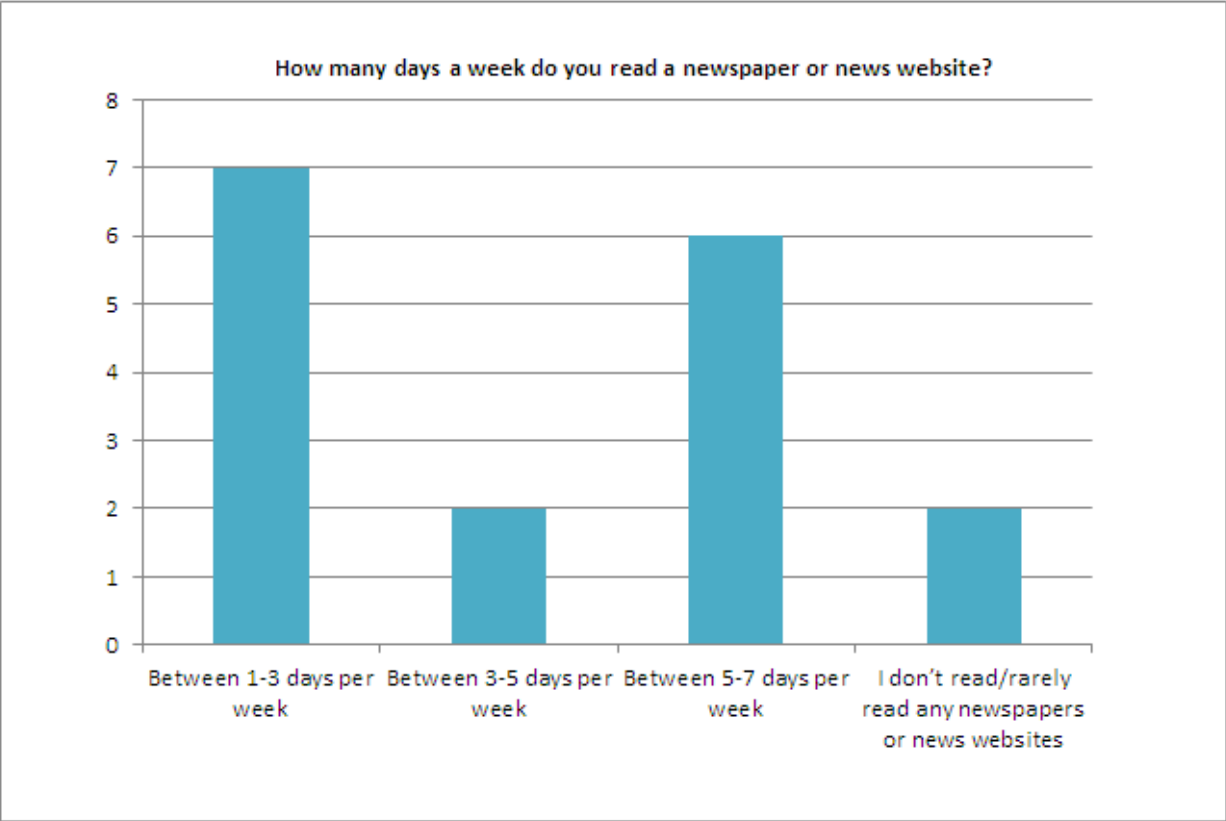


#### 4.7.2 News media consumption

In the second questionnaire, participants were also asked about their news consumption. “News” was defined as information about events and issues that involved more than just friends and family. The result (Figure 8) shows the sample members were quite high news consumers, with nine participants being medium/low news consumers and eight categorised as medium/high.

The preferred news type and subject categories were also canvassed (see Figures 9-10) and showed this sample of participants had high interests in world news, national news and information about their communities and neighbourhoods. When specific subject categories were considered, wide preferences for a range of subjects were demonstrated. Sports and entertainment were less preferred fields, but crime news, health news, and science/technology news were popular subjects. Health and science news have particular relevance to this research project.

**Figure 8.** *News consumption frequency.*



**Figure 9.** *News consumption preferences by type.*

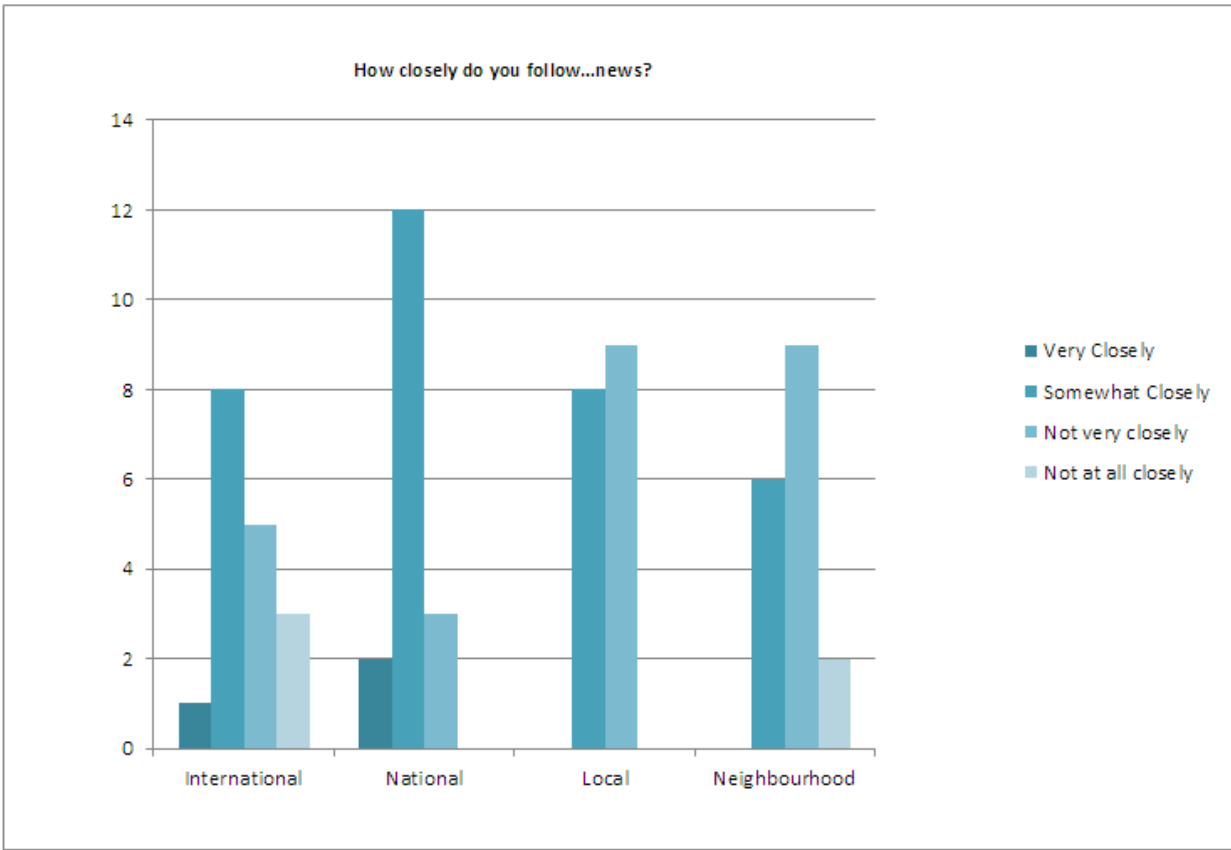
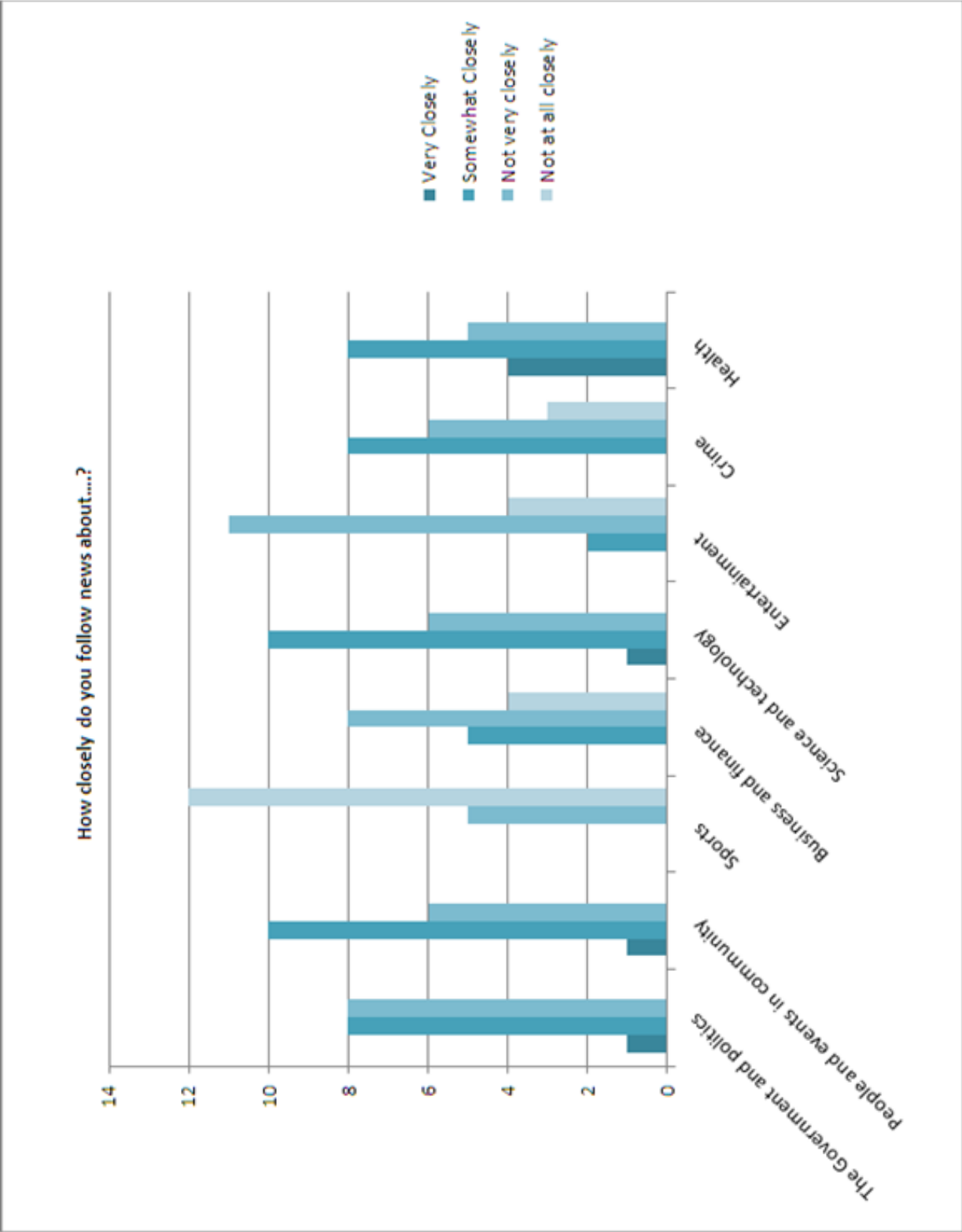


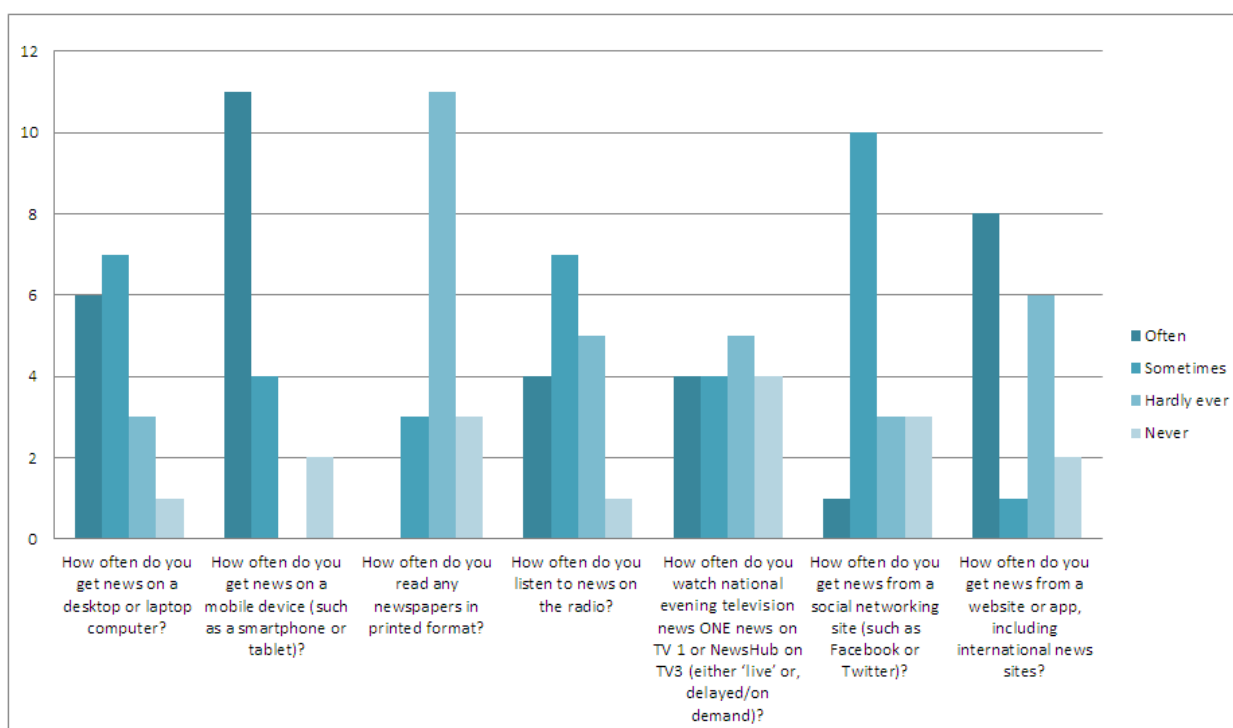
Figure 10. News consumption preferences by subject category.





Turning to preferences for the delivery or format of news, from digital to paper-based, Figure 11 shows the way this cohort accessed news was highly digital, with smartphone, tablet or other computer use dramatically outstripping traditional or legacy formats like printed newspapers and evening television news, and slightly ahead of radio.

**Figure 11.** *News format and platform preferences and frequency.*



## 4.8 Summary

After first describing the characteristics and baseline vaccination views of the audience study participants, their responses to the three news story versions have been recorded in this chapter. These were presented under the headings: responses to non-expert quotes in unbalanced news stories; responses to quotes from experts about vaccine safety in balanced stories; and responses to photographs of preventable disease, mirroring the ordering of the audience study news story variations. The questionnaire answers have also been displayed in this chapter. Chapter five, the Discussion, will connect these findings to the research questions of this study and the wider themes of the literature that forms the basis of this research.

## Chapter five: Discussion

The research presented in this thesis explores reader responses to differing vaccination news stories to learn more about how audiences perceive information about alleged health risks. It has considered risk communication theories about news story construction techniques, and whether these techniques mislead audiences about the risks of vaccination, as some theorists suspect. This is important as consumer anxieties about vaccination risks have negatively affected vaccination uptake around the world, according to theorists like Speers and Lewis (2004).

The literature reviewed in Chapter Two documented the established view that the role of the news media in a democracy is to both provide factual information and signal possible risks, including health risks (Maras, 2013; McQuail, 2010), and that people rely upon news media to fulfil these roles. Concerns about rising vaccine hesitancy and refusal have prompted considerable scholarship about the news media's power in shaping consumer knowledge about health.

Scholars believe journalistic conventions used to maintain objectivity and balance in news stories about contested science could lead to inaccurate depictions of risk (Brüggemann & Engesser, 2017). The key construction techniques of equally balancing two sides in an argument, and quoting non-experts in scientific or health stories, are especially thought to be factors in misleading readers about risk in vaccination news stories (Boyce, 2007). Feelings of risk and intention to vaccinate are linked to vaccination uptake, according to Dixon and Clarke (2013).

There is consensus that a range of arguments do need to be included in reporting a scientific debate, otherwise news stories could easily be reduced to public relations pieces or advertising (Broersma, 2010; Maras, 2013). But commentators, such as Ward (2010) and Bell (1998) have long suggested a need to rework objectivity. More recently, communication researchers have theorised a more interpretative or evidence-based model, where commentary or quotes are balanced according to the “weight” of established evidence or scientific consensus, thereby modifying the objectivity norm to more accurately convey contested science (Brüggemann & Engesser, 2017; Dixon & Clarke, 2012). Studies that point to the power of photographs of disease to show the risks of not vaccinating have also been considered (Clarke et al., 2015).

This chapter will integrate the questionnaire results and news story responses to consider the role false balance, evidentiary balance, and photographs have in presenting risk in news stories about vaccination to address the research questions underpinning this study. How the study adds to current research about vaccination in the news is also outlined. Finally, the chapter will discuss the implications this research has for journalism practice and the construction of health news stories featuring contested or controversial science.

### 5.1 How readers respond to amplified presentations of risk

The literature from risk communication scholars, from both retrospective content analyses such as Faasse et al. (2017), as well as audience study experiments like those conducted by Dixon and Clarke (2012, 2013), has suggested news consumers are affected by news reports that allege harm from particular vaccinations. Reported effects have ranged from contagions of psychologically induced illness in the case of HPV vaccinations after news reports of girls becoming sick, to immediate drops in uptake of influenza vaccination after unrelated deaths were attributed to the vaccine in the cases documented by Brilli et al. (2020). There has also been extensive literature on the MMR controversy and how news reports alleging an unproven link with autism in infants led to a drop in MMR vaccination that is still occurring today (Hansen et al., 2019; Peters et al., 2018). Previous studies have found news story presentations that amplified risk, especially by featuring opinions, and emotional comments from people convinced of the risk, have led to news audiences perceiving vaccination risks to be higher than scientists believed them to be (Brüggemann & Engesser, 2017).

In the audience study presented in this thesis, participants filled out a preliminary questionnaire about their beliefs about safety regarding vaccines in general, and with the measles vaccine in particular (among others). As reported in Chapter Four, 14 out of 17 participants were confident about vaccine safety and happy to have their children vaccinated. One participant refused all vaccines and two were hesitant about them. This established most of the participants were comfortable with vaccination and had made up their minds that infant immunisation was safe.

Part one of this study's first Research Question asks, *In news stories depicting controversy about possible vaccine adverse effects featuring quotes from non-experts, how do readers respond to amplified presentations of risk?* The first story shown to participants was falsely balanced by presenting news of new research confirming the MMR vaccine was not linked to autism and then providing prominence and space in the story for a woman to claim the MMR

vaccine was in fact unsafe, allege a cover-up, and suggest pharmaceutical company interference. The introduction and headline also signalled the conflict.

One of the main responses to the first story variation was discomfort about the vaccine featured. The story unsettled vaccine-confident and vaccine-hesitant participants, with some feeling disturbed by the possible link to autism. Others challenged the credibility of the woman alleging the risks, noticing the story did not include any evidence for her claims. Some of these participants were experienced researchers and, despite the lack of evidence, were still affected by the story. Several participants picked up on the references to cover-ups and pharmaceutical company dishonesty, finding these were legitimate causes for concern. Others wanted to do more research on the vaccine to check the evidence and safety claims for themselves. One participant noticed the falsely balanced nature of the news story, but two others instead reported feeling uncomfortable with the approach to the story, saying it was sensationalised or biased. Some were dismissive of news media and considered them untrustworthy.

The vaccine-hesitant and -refusing participants found the claims about vaccine risks confirmed their suspicions, backing up their established beliefs and anxieties about vaccination in general. They considered a part of the story presenting new Danish research showing no link to autism was false or one-sided, and agreed with the quoted woman's claim that pharmaceutical companies paid for positive vaccine research and suppressed other studies that showed harm.

The second part of the research question asks, *What are the implications for readers' perceptions about vaccine safety and intent to vaccinate?* It was clear from the responses to the story, summarised above and detailed in Chapter Four, that most participants were unsettled by the claims about the MMR vaccine's safety. However, when asked about vaccine safety and intentions to vaccinate, there was no change from the participants' initial positions on the vaccine. Those that were vaccine-confident, still felt the MMR vaccine was safe and still intended to vaccinate their children with it. Along with one vaccine-hesitant participant, many strongly expressed it was far more risky to not have the vaccine than it was to have the vaccine.

As the study did not include an immediate invitation to accept a MMR vaccination, changes to vaccination uptake that were mooted by some of the literature reviewed in Chapter Two

cannot be directly addressed. Crucially, the expressed anxiety did not affect the stated vaccination intentions of any participants. Feelings of safety about vaccines and vaccine intentions can predict future vaccine uptake, according to Dixon and Clarke (2013).

The literature on false balance, such as those studies performed by Dixon and Clarke (2012, 2013), and Clarke et al. (2014, 2015) showed that in similar research, or when parents were interviewed about their response to actual stories in the news (Speers & Lewis, 2004), participants registered a change in vaccination intentions after exposure to stories alleging risks. The present study found interviewing participants about their feelings of vaccine confidence at the point of exposure to the news story had a different result. Participants who started out intending to vaccinate current or future children remained determined to do so, but some voiced their concerns and indicated they wanted to do more research into vaccine safety. This finding therefore does not support the predominant theory that false balance leads to a lowering of vaccine intentions.

The difference could be linked to the research design which captured how participants make sense of news stories. The data on the ability of qualitative interviews to capture a deeper understanding of participant responses is also recalled here (Minichiello et al., 2008). In my semi-structured interviews, the participants were able to detail an increase in anxiety about the vaccine in their responses, even though their future intentions to vaccinate did not change in principle. Leask (2006) found vaccine-accepting mothers talked through concerns with established networks of family and doctors to maintain confidence in vaccination when it was challenged. It was also notable in the literature on vaccine hesitancy from Hansen et al.'s (2019) retrospective study on MMR uptake, and Leask's public health experience, that this confidence could be fragile. These studies have established that worries about vaccinations could lead to delayed or missed vaccinations, with the possibility of vaccines being forgotten altogether in the future (Leask, 2016). The misgivings about safety raised by the participants in my study suggest these individuals could have their confidence in vaccine eroded by repeated exposure to stories alleging risks, especially at times of heightened sensitivity when children have vaccinations coming due. Even delays in attending vaccination schedules could provide a window for diseases to spread.

Some researchers have also theorised about the impact of repeated exposure to unsettling stories about a particular vaccine, and whether mild anxieties could lead to latent or outright

hesitancy at a later date (Dixon & Clarke, 2013). Brunson and Sobo (2017) have established that parental vaccination views are “plastic” and ready to change to suit changing perceptions. In the classic media agenda setting theory of McCombs and Shaw (1972) the news media’s power is not in telling people what to think, but what to think about; in the effects theory of Katz and Lazerfield (1955, as cited in Couldry, 2011) the power is in the reinforcement of opinions, not coming up with the opinions in the first place.

An unexpected finding from my research was insight into vaccine-confident parents’ decision-making. Whereas many studies have focused on communication strategies aimed at changing the minds of hesitant or refusing parents, this one gathered detailed responses of vaccine-accepting parents as part of the study. The response to the falsely balanced story about vaccine risks was primarily an unsettled feeling and need to research the vaccine further for these participants. In researching the vaccine further, the possibility of encountering more unsubstantiated information or overtly anti-vaccination material is high (D’Ancona, 2017). Established studies have found vaccine-refusing populations were unlikely to be shifted from their views and have suggested focusing on hesitancy instead; this study suggests accepting populations should not be overlooked, either.

In the responses we can also see questions being raised about cover-ups and corrupt pharmaceutical companies by participants in the interviews, akin to misinformation that Wardle and Derakhshan (2017) and Nettlefold (2018) argued could be later exploited by merchants of malicious disinformation. Other participants expressed their view that the news media were untrustworthy in the way they handled the unproven claims.

In the case of the hesitant and refusing participants, the falsely balanced story was read as confirmation of their suspicions about vaccine risk and the suppression of evidence of side effects. For one of these participants this story endorsed their decision not to vaccinate; for others it spurred more discussion on the risk-benefit analysis involved in a thorny decision. This supports Stephenson et al.’s (2018) finding that polarised stories could further alienate unsure or hesitant parents, and points to the many studies that found elevated risk narratives in news stories led hesitant parents to question vaccination (Speers & Lewis, 2004; van Bekkum & Hilton, 2013).

The responses to the risk story show there were widely different readings of news stories from vaccine accepting, hesitant, and refusing participants. Leask contextualised audience response as not, “‘What do messages do to people?’ but ‘What do people do to messages?’” (2016, p. 535). She said the basis for responses to vaccination messages depended on complex underlying beliefs and social or cultural factors, as well as familial support systems. In the present study the participants did three things to the risk claim message: some believed it; others, after recovering from the surprise or alarm, qualified the message against what else they knew about vaccines; the rest rejected the claims. This emphasises the power that individual background, preferences, and pre-existing beliefs have on news story responses (O’Neill, 2011).

But some participants did believe the message. This poses a problem for journalism as the amplified risk presentation also produced anxiety in vaccine-confident individuals and reinforced an anti-vaccination position for vaccine-hesitant or -refusing individuals. The social amplification of risk framework (Jaques, 2014) is demonstrated, with readers’ perception of vaccination risk impacted by the story construction that dramatises the potential for harmful side effects from the MMR. We know that the link between MMR vaccination and autism has never been proven and the vast majority of scientists believe the vaccination to be safe (Boyce, 2007). But emphasising the conflict in the story has amplified the risk. Some participants (such as “Kim”) stated afterward that the parts of the story alleging the risks drew their attention immediately as they were “more interesting”, and some said they did not notice the elements of the story about vaccine safety until reading the second story. This shows how compelling conflict is as a news value and why it is so valuable to journalists in constructing stories that attract readers.

The incompatibility between providing factual health news and producing stories that draw in readers is unambiguous; responsibilities to be both accurate and promote readership are at odds with each other. In section 5.7, I discuss this further and consider how journalists may address this tension.

## **5.2 How readers respond to quotes balancing safety of MMR vaccine**

It was clear from the first story variation that amplifying risks in news reports about vaccination did make parents worry about vaccinations, even if this study’s findings did not support the theory that these worries then led to changes in vaccine intentions. But some researchers have suggested a solution to falsely balanced news stories misrepresenting true

risks in health controversies is to include a narrative sentence or balance of quotes to show scientific evidence was weighted more toward one side of the debate. These stories still provide news consumers with the different viewpoints in a story, but allow the journalist a more interpretative role in cases of contested science. The literature called this evidentiary balance, weight-of-evidence reporting, pragmatic objectivity, or interpretive objectivity.

*Weight of evidence* and *evidentiary balance* are basically interchangeable terms, used by Dixon and Clarke (2012, 2013), Clarke et al. (2014), and Kohl et al. (2016) to describe stories constructed so the volume of information or quotes in a story is matched in scale to the known scientific evidence on an issue. If only a small number of experts about an issue had outlier views, only a small percentage of a story would cover their comments. *Interpretive objectivity* is used by Brüggemann and Engesser (2017) and Maras (2013) to describe a narrative statement in a story written by a journalist to show most scientists thought a certain way. *Pragmatic objectivity*, as promoted by Ward (2010), pulls objectivity out of its passivity and allows journalists to actively interpret the facts and put them together using logical investigation, also broadly similar to the other terms.

Studies that have used some of these techniques have found audiences could understand there were differing views on a vaccine's safety, but that most scientists believed certain facts to be true (Dixon & Clarke, 2013; Kohl et al, 2016). This way of constructing stories is a departure from more orthodox approaches to the journalistic objectivity norm, where conflicting arguments are pitted against each other to make a story more compelling or controversial, maintain neutrality, or to avoid accusations of bias (McQuail, 2010). These aspects of the literature were explored in Chapter Two, section 2.4.

The second news story variation sought to answer Research Question Two, *In news stories featuring people quoted about possible vaccine adverse effects, how do readers respond to the inclusion of quotes about the safety of the vaccine from scientists or medical experts?* To address this question, the second variation presented in my audience study featured weight-of-evidence balance by including fewer quotes from the woman claiming alleged risks of autism connected to the MMR vaccine and replacing them with quotes from two vaccine experts on vaccine safety. One of the new sources included evidence that autism could be detected in the brain at infancy (prior to vaccination). The medical consensus for MMR safety was visually represented by a larger portion of the story being devoted to scientific comment than before.



As seen in Chapter Four, the responses to this story were dramatically different to the responses to the first story version. Participants expressed their relief and said they felt reassured about the vaccine. Even participants that had not communicated their worries about the vaccine's link to autism or other side effects after the first story variation now responded that they felt a lot better about the vaccine. Some said they felt vindicated that they had made the right decision in vaccinating current children. The primary responses were relief and reassurance, and confidence in research and doctors. The participants all said it was the commentary about vaccine safety from the quoted experts that made the difference. They found the medical experts and scientific facts trustworthy and credible. This also made the contrast with the woman alleging risks more stark to participants who said it highlighted further her lack of evidence for the claims. The keen scientists in the participant sample were particularly interested in quotes about infant brain research and enjoyed reading them.

The overwhelming response to the second story was relief, reassurance, and restored confidence in the vaccine, especially if it had been shaken by the first story. A skepticism or anxiety response followed by one of relief has been seen before in the literature. This pattern was also found in Leask et al.'s 2006 audience study using television clips of an anti-vaccination story followed by a positive story:

It seemed that when their formerly unquestioned beliefs about the overall value of vaccination were challenged, participants were relieved to grasp at something which reassured them (p. 7242).

Mundorf and Zillmann's (1991) affective reaction theory, where participants sometimes respond with an exaggerated opposite emotion to a second presentation after an exciting or disturbing first presentation, could also have an application here. If the first story was unsettling, the theory suggests the relief from the second more reassuring story could be intensified as a result. But in the present study the reaction appeared to be deeper than a fleeting response: the comments from individuals indicated balancing the news story with a volume of quotes that matched the medical consensus on safety meant they could see the level of agreement on the issue. Participants said including detail and data in the second story increased confidence and made them feel they were making the right decision on vaccination.

Identical to the first research question, the second part of Research Question Two was, *What are the implications for readers' perceptions about vaccine safety and intent to vaccinate?*

The participant responses in the verbal interviews showed there was little change in vaccine intentions, with those intending to vaccinate children still intending to do so. However, seven participants said their vaccine intentions were made stronger by the story. They felt more confident of the MMR vaccine's safety and that scientists had researched it in detail and were also confident it was safe. As mentioned above, vaccine intentions and feelings of safety have been linked to actual uptake, so this could be a meaningful change.

The boost in confidence clearly shown by the vaccine accepters was not shared by the vaccine-refusing and two vaccine-hesitant participants, however. Those that were hesitant were still unsure and the one participant that refused vaccines was unchanged in her views. These three were not convinced by the medical experts quoted, and were deeply suspicious of research and of the news media. Two of these participants were unsatisfied with the level of detail about the research alleging no link between MMR and autism and not reassured; one suggested a hidden agenda or collaboration could be in play, responding in ways that suggested the story hardened her resolve against being persuaded by the evidence for vaccine safety.

The responses expressed by the hesitant and refusing participants revealed deeper anxieties about vaccines than those presented in the news stories and high levels of emotion about the issue. This was not unexpected; the research on vaccine refusers has shown entrenchment of views is deep. The participants' resistance to accepting any alternative narrative about vaccines by describing their concerns about vaccination, and dislike of repeated assurances they were safe, support the contentions of Tilley et al. (2014) that vaccine-hesitant parents did not like being told what to think, and the pre-eminence of personal liberty expressed by vaccine-refusing parents found by Kata (2012), Rossen et al. (2019), and Smith and Graham (2017). Many studies have indicated emotion and feelings frequently form the basis for vaccination decisions (Leask, 2011).

Leask et al. (2006) concludes that trust in health professionals was one of the fundamentals when parents were deciding to vaccinate or not. However, the hesitant and refusing participants in this study were suspicious of doctors, backing up the findings of Rossen et al. (2019), and McKinnon and Orthia (2017), that vaccine-hesitant and -refusing people had a waning trust in the health profession. The response also echoed the scientific denialism characterised by D'Ancona (2017) as a belief that scientists, government, and pharmaceutical

companies were working together in society for harmful goals. Researchers have suggested engagement with health news in mainstream media was also rare among vaccine-refusers, with many preferring to consume publications or websites that confirmed their beliefs (Getman et al., 2018; Kata, 2012).

The response to this story is an important indicator of the validity of the claims of researchers about the value of using evidentiary balance or interpretative elements in news stories. As discussed in Chapter Two, one of the traditional roles of news media in a democracy has been to impart information that the public need to know, as well as signal possible risks. Presenting facts accurately in these communications is key to gaining and maintaining trust in news media (Dixon & Clarke, 2013; McQuail, 2010), and, in the case of vaccination, could have ramifications for public health.

The findings from my second story variation did support the argument for amending objectivity conventions to better represent the status of scientific belief on an issue, particularly in health stories about risk. As mentioned in Chapter Two, Kohl et al. (2016) found some journalists have shifted to using more interpretative techniques already in reporting climate change science. Health news could be another area that benefits from this approach. Whether the current resourcing constraints and time pressures of journalists allow for these techniques is a question that will be considered in section 5.7 below.

### **5.3 How readers respond to inclusion of photographs of diseases**

Researchers such as Clarke et al. (2015) have argued for the use of photographs of vaccine-preventable diseases in news reports to visually represent the risks of not vaccinating. Studies on imagery in media, such as those by Wu et al. (2018) on the use of pictures of needles or injections in vaccination reports, and Joffe (2008) about the vivid impact of news story images on identification and memory, have shown photographs are capable of producing powerful emotional reactions in viewers, both positive and negative.

The first part of Research Question Three asks, *In a news story about vaccinations, how do readers respond to the inclusion of photos of people with symptoms of preventable diseases?* To address this question, the second story variation was shown to participants again, but three large, coloured photographs of babies and children with symptoms of measles or mumps were included in the story. Although the photographs of preventable diseases were palatable

and interesting to most of the participants, three did become annoyed or upset. The emotional reactions were immediate. The pictures were compelling or repelling, depending on the participant. Eight out of 17 were positively stirred by the pictures, others felt they were too upsetting, and the sole vaccine-refusing participant thought it was manipulative to use them. Several others were fascinated by the pictures because they reminded them of having the illnesses as children or liked seeing symptoms they had never seen before.

The second part of Research Question Three asks of the use of photographs, *Is there any connection to reported views on the importance of vaccination/or reader intention to vaccinate?* Most participants said the photographs did reinforce their pro-vaccination views, with 10 out of 17 expressing the pictures helped put the debate in perspective and showed the risks of not vaccinating. The other seven, though, said the pictures made no difference, and some reported they would work hard to ignore the emotional effects and think rationally when weighing up vaccination.

The response to the photographs was mixed. Most participants were interested in them and thought they demonstrated the importance of vaccinating, but a significant number found them upsetting or annoying. This ambivalence has often been found in the literature on photographs. Joffe (2008) argues images are powerful and could lure the reader, but also provoke disgust or fear. This could put readers off engaging with the message, like Wu et al. (2018) found with their study about images of vaccination injections and needles. The third story variation in my study suggests that images of disease may have a role as another layer of evidence in news reports to highlight the danger of vaccine-preventable diseases, but could just as easily turn people away or appear excessive. The respondents in this study questioned the motives of news media behind the more sensationalised news presentation in the first story, so the unnecessary use of unpleasant pictures would do little to ease this skepticism.

Importantly, the vaccine intentions of readers were not automatically increased by seeing the reality of the vaccine-preventable diseases. This aligns the audience study with research by Pluviano et al. (2017) that found direct correction of faulty knowledge and the provision of more evidence of the dangers of vaccine-preventable diseases did not convince vaccine refusers to accept vaccinations, but instead backfired and fortified vaccine-refusing resolve. The case for using photographs of disease in vaccination news stories is unsettled. Photographs of vaccine-preventable diseases may be interesting and educational for some,

but manipulative or contrived for others, putting them off reading a news story or fuelling misgivings about news media.

#### 5.4 Questionnaires capture increased certainty

The questionnaire results show the participants' feelings of safety about vaccinations or vaccination intentions remained unchanged or more certain. The questionnaires presented to participants before and after the three stories and interviews had value as a benchmark of the overall response to the three story manipulations and in providing a snapshot of the participant sample's news diet and preferences. Two certainty scale questions appeared in the initial questionnaire and were repeated in the questionnaire presented at the end of the study, *How certain are you that vaccines are safe to receive?*, and *How certain do you believe scientists and the medical community are that vaccines are safe to receive?* In both cases the vaccine-accepting individuals increased their certainty about vaccine safety, shifting from four out of 17 being *very certain* about vaccine safety initially, to eight out of 17 selecting *very certain* after the three stories. They also demonstrated increased certainty about whether the scientific and medical community believed that vaccines were safe, from eight out of 17 being *very certain* at the beginning, to 11 out of 17 at the end. Hesitant and refusing participants were unmoved with *very uncertain* or *undecided* answers almost identical on both occasions.

Vaccine intentions were measured by the initial certainty scale questions on the likelihood of participants vaccinating a child against four named diseases, which showed the clear split between accepting and hesitant or refusing individuals; in the final questionnaire a wider question was used about general vaccine intentions and their level of agreement with two questions: *I intend to receive any vaccination that my health care provider recommends in the future*, and *I intend to make sure my children receive any vaccination that my health care provider recommends in the future*. Most participants answered *strongly agree* or *agree* to these propositions, with some participants stating verbally their only reservation was to the Covid-19 vaccine, which had only just emerged at that time, feeling it was too new and untested to make a decision on.

The questionnaire results added a second means to explore the research questions. These results showed a clear majority (14) of participants were confident in measles vaccination before the audience study. The results also revealed a corresponding solidification of views,

as observed in the interviews, with general vaccine confidence rising slightly among the vaccine supporting individuals after the audience study.

The results reveal feelings of safety were notably strengthened in the vaccine-accepting individuals, and intentions held firm between the two questionnaires. These results can not be presumed to indicate the impact of the photographs, or the combination of talking about vaccine safety and seeing the photographs during the audience study. But they do demonstrate the power of the news media, showing the three variations did have an influence on many participants.

In turning to news consumption preferences, the news frequency, type, preferred subject category, and device/format questions shone further light on the participants' news habits, with medium to high levels of news consumption, wide interests in health, science, technology, and community, as well as strong preferences for digital delivery methods.

## **5.5 Contribution of the research**

This thesis extends existing research on false balance and weight-of-evidence approaches to increasing factual accuracy in news reports in three ways. First, whereas most similar studies have used online questionnaires to gather participant feedback, this study is one of a rare few studies to use semi-structured interviews at the point of exposure to capture in-depth, individualised concerns about vaccination news stories. This has allowed a detailed examination of responses from participants and showed complex relationships between feelings of safety about a vaccine and stated intentions to use it. The study also evaluates the impact on readers of including photographs of vaccine-preventable diseases in news reports about vaccination, compared to the same story without the photographs, which is also rare in audience study literature. The participant responses update assumptions from some authors that photographs would strengthen intentions to vaccinate, and corroborates studies that show potential for backfire affects (e.g. Pluviano et al., 2017). Finally, the study introduced before and after questionnaires to assess pre-existing vaccine safety perceptions and vaccine intentions, allowing for any change to these two components to be documented after reading the news stories, as well as a full understanding of the participant media consumption and news habits. The repetition of questions in before and after questionnaires did show some real increase in confidence in vaccinations in some participants after the final variation with the photographs of disease. Further research could build on this study to look at

contemporary health and science stories and assess the prevalence of unbalanced risk narratives in New Zealand media.

### **5.6 Implications for journalism: A vaccine for misinformation**

In addition to the research contributions, the study presented here also has possible implications for journalism; it clearly shows feelings of safety about vaccines are impacted by false controversy, boosting the argument for journalists to use approaches that better represent the true known risks in stories about science or health. The modified objectivity approach in the evidentiary balanced story in this study reassured most readers and enabled them to see where the scientific consensus was in the controversy. We know that journalism conventions tend to distort risk (McQuail, 2010), and easily become part of an amplification process that can thereafter be difficult to defuse (Jaques, 2014). Exciting stories also attract more readers, viewers, and listeners, and therefore more revenue in a commercial news media environment.

Consideration of what is the most ethical and socially responsible thing for journalists to do is relevant here. Ward (2010) put this conundrum in the lens of ethical practice, saying what was right and good was what journalists should aim for; truth telling or accuracy should be the goal, and was journalism's central value (D'Ancona, 2017; Ward, 2010). The watchdog role of the news media described in Chapter Two means journalists must be able to criticise, and be on the watch for risks to the individual and society. Including divergent views and hearing from a variety of sources helps journalism mirror a diverse society, and McQuail (2010) argued some form of objectivity was crucial to the maintenance of information sources, as well as to avoid bias.

Ward (2010) argued that journalism has developed its ethical framework because the industry has the power to “do substantial public harm and substantial public good” (p. 44). If journalism's job is to serve the public good, the general welfare of citizens is one of its many facets. It was not the journalist's job to persuade people to get vaccinated, but to accurately convey information about vaccination. We know that readers' pre-existing beliefs about the topic will impact the way they will receive it (Leask, 2006), but Speers and Lewis (2004) argued that journalists must realise there were consequences for public health from news reports about vaccination because of the news media's power in forming and reinforcing attitudes.

According to Reed et al. (2019), the world is more awash with “alternative facts” than ever and Nettlefold (2018) noted digital platforms for news media have led to innovative new ways for orthodox news distribution, but also more misinformation, malicious falsehoods, and advertising pretending to be news. Vaccines are common targets. Any decline in traditional news media influence, along with its important gatekeeping and fact-checking function in society, means more windows open for information, and misinformation, from alternative sources (Nettlefold, 2018). The kind of coverage that results in a gridlock of opposing points of view, such as the amplified risk story in my first variation, is fertile ground for conspiracy theories (D’Ancona, 2017), tarnishes the trustworthiness of media, and impacts understanding of important issues by turning people to alternative sources of information instead (Catalan-Matamoros & Penafiel-Saiz, 2019).

Against this backdrop, my research suggests every news story that presented new research in science or health needs a different approach, depending on the known facts of the issue. New scientific and health discoveries are always emerging but journalists cannot be expected to know the complete facts all of the time. In cases where the evidence clearly points in one direction, using evidentiary construction methods to balance quotes in two sides of the argument, or an interpretative sentence providing context to the debate, will be the more factual depiction of current knowledge. I believe this still allows a journalist to maintain some distance and signal risks when there was not much known about the true facts of issues, but it avoids the problem of providing equal prominence to unconfirmed risks as to established evidence.

However, my research underlined the tensions between boosting readership with an exciting news angle, and providing the public with accurate information. Research participants made comments that highlighted this incompatibility, and how presentations that sensationalised vaccination debates were unhelpful in promoting understanding. Another difficulty in the New Zealand journalism industry, and elsewhere, is cutbacks to the media workforce over many years have led to practical challenges of doing more with less in shrinking newsrooms (Ashwell, 2016; Davies, 2008). In addition, Ashwell (2016), and McKinnon et al. (2018), have established that reporters with science or health reporting expertise are particularly thin on the ground. Delivering an analysis of the current scientific consensus in an interpretative or evidence-based narrative could be a difficult prospect, particularly with time constraints and pressure on journalists to churn out news stories.



Investment in quality journalism would capitalise on the news business being deemed “essential” at the height of Covid-19 lockdowns in New Zealand, and an increase in news consumers during the crisis. But, even without this, the technique of providing general opinions and expert information with equal space in specialised health or science news stories is easily avoided. The second story variation in this study did not say either argument was right or wrong, but it gave the established scientific and medical arguments more prominence, which I believe was pivotal to participants understanding the true nature of the risks of the MMR vaccination.

Logic and commonsense are easily applied to attribution to see if the quoted person is qualified to speak on a topic or not. In the MMR controversy, Andrew Wakefield was well qualified and was quoted about erroneous health research, to little immediate effect on vaccine uptake (Boyce, 2007; Leask, 2016). It was the subsequent coverage of the views of emotional and anxious parents, and omission of contextual content about the scientific consensus, that had the far greater impact on people’s fears (Boyce, 2007; Catalan-Matamoros & Penafiel-Saiz, 2019; Speers & Lewis, 2004). In the same way, it is the post-truth fashion for putting opinions ahead of facts that journalists must avoid.

Similarly, the hard-hitting emotional power of photographs are journalistic gold for capturing attention, but this study shows that if they accompany a news story urging people to get vaccinated because of the dangers of disease, their use is not so clear cut. The photographs in this study had power to engage or put off readers, and potential to crystallise the vaccination intentions of readers by tapping into deeper fears or emotions, or just as easily turn people off the news altogether. News consumers are already skeptical of media motives behind “sensationalism”, as seen in my sample, and using stirring photographs could be seen as another attempt to manipulate readers. This study provides no argument to change current routines and increase the use of photographs of disease in news reports.

In the 2020 Covid-19 lockdown crisis, audiences did turn to legacy news media in big numbers for health information (Myllylahti & Hope, 2020). Trust in news media did rebound in the second story responses in this study, but not in all participants. Dixon and Clarke (2013) argued increasing the evidence-based distribution of quotes and interpretative elements of a story would increase the faith readers had in journalists. This would thereby enhance the role of news media in a democracy to provide dependable information and

reassert their position as trusted information providers. That is surely the best way to boost readership and maintain audiences, as well as work for the public good.

## 5.7 Summary

This study has shown the importance of news story construction in health and science stories about possible health risks. It has demonstrated a more interpretative or evidence-based balance of quotes could help portray risks more accurately. Importantly, the research did not find amplified risk portrayals in news stories affected vaccination intent, unlike other research examined in this thesis. But although the reported concerns after the “risk” story may not have been strong enough to change participant vaccination intent after the one reading, in cases of repeated exposure to similar risk stories, the possibility remains that such misgivings may have the potential to impact intentions over time. In comparison, the subsequent evidentiary balanced news story did notably raise intentions, supporting the expansion of this approach to the reporting of vaccination news. The research also found that images have the power to produce positive and negative responses in readers, solidification of vaccination intentions, as well as disengagement with the story. This updates scholarship that assumes photographs will enhance vaccination intentions for all.

Any technique that improves accuracy in news reports has wider implications for democratic engagement. In the small audience study represented in this thesis, the more alarmist risk-focused stories not only dented participants’ trust in vaccinations, they heightened existing misgivings about the trustworthiness of news media, too. This has important implications for New Zealand journalism in maintaining audiences and the news media’s position as a trusted information provider.

In the face of the ongoing global Covid-19 pandemic, public confidence in vaccines is considered crucial to defeating the virus and saving lives in the future. Even with Covid-19 risks clearly apparent, many people have indicated a reluctance to be vaccinated against the virus (Thaker, 2021; Verger & Dubé, 2020). Acknowledging that news media represent only one part of the picture of why people accept or refuse vaccinations, they are nonetheless powerful vectors of health messages (Speers & Lewis, 2004). More than ever, the news media need to be regarded as trustworthy sources of dependable information on vaccine safety and health. Balanced stories that depict the true state of scientific knowledge on issues, instead of contrived controversy, would go a long way toward restoring that trust.

## Chapter six: Conclusion

My research has explored the responses of 17 participants to different presentations of risk and evidence in a vaccination news story, and considered the impact of the three different story variations on each individual's feelings of safety about the vaccine and intentions to vaccinate themselves or children in the future. This audience study forms the core of a wider examination of health and science news.

The study's particular concerns have been how health risks are communicated to and perceived by news media audiences. To provide a theoretical basis for the present inquiry, Chapter Two established news media's importance in a democracy to provide accurate information, keep a check on society's power structures, and signal risks to the individual (Christians et al., 2009; McQuail, 2010), while at the same time noting its ability to fulfil these roles have diminished over the last two decades due to commercial, societal and technological pressures (Butsch, 2011; Myllylahti, 2013). Ironically, the necessity of news media to provide accurate information was shown to have become more pressing in the face of consumer bombardment from multiplied sources of information, misinformation, and disinformation (D'Ancona, 2017; Steffens et al., 2017).

Also in Chapter Two, a background to vaccination was given, and the prevailing academic analysis of vaccination news included, in the context of considering the problems of factually conveying health risks via news media. Here, the objectivity norm used in journalism to balance conflicting views in a news story was introduced as one of the foundations of this study, with the construction technique of equally balancing opposing arguments implicated by academics in wrongly amplifying risk narratives (Boyce, 2007; Dixon & Clarke, 2012, 2013). In the case of vaccination news, this has conveyed the risks associated with vaccination as much higher than established science or medicine would attribute, or wrongly suggested science was unsettled on an issue (McKinnon et al., 2018). Literature was included of the view that such *false balance* may have contributed to vaccine hesitancy around the world (Boyce, 2007; Largent, 2012). I then presented arguments for more interpretative ways to report contested science or health stories, and thereby set up the thesis for subsequent exploration of these approaches in the audience study. The role of photographs of vaccine-preventable diseases in news stories was also raised in the literature, and this, too, was looked at in the audience study.

Chapter Three described how the research questions would be answered, providing the details of the audience study and the methods used. Here we saw the audience study mapped out with its focus on semi-structured interviews to capture responses to the three story versions. In Chapter Four the results of the audience study were arrayed, showing that falsely balanced risk narratives did lead audiences to worry about the vaccine portrayed in news stories. This contrasted with responses to a subsequent balanced story, which most participants found more reassuring and reversed their anxieties about the vaccine. The responses to photographs were mixed. Chapter Five discussed these findings in relation to the three research questions that underpinned the study presented in this thesis.

## **6.1 Significance of research findings**

My focus has been on the role of journalistic techniques used in vaccination stories, with a research objective to explore the viability of strategies thought to increase the veracity of science and health news. We saw in Chapter Four the elevated vaccination risk presentation in the audience study's first story variation did produce anxiety and an unsettled response in many participants, addressing the first part of Research Question One. Reader perception of vaccine safety was found to be diminished in most vaccine-confident participants in this scenario and activated people's concerns about news media trustworthiness. Vaccine-hesitant and vaccine-refusing participants used the risk presentations to confirm their beliefs and ambivalence about vaccination safety. Although feelings of safety about the vaccine were impacted, no measurable change in intention to vaccinate was observed. This addressed the second part of Research Question One.

Research Question Two was approached in this study by means of a second news story constructed with evidence balanced to match the weight of scientific understanding of vaccine safety. This interpretative approach to a news story appears to allay worries and provide reassurance to those who have decided to vaccinate children. Reported responses from participants indicated the inclusion of quotes about vaccine safety from experts in this story did reverse worries and boost feelings of reassurance in the vaccine-accepting participants. The story variation produced scepticism and mistrust in vaccine-hesitant and -refusing participants, who responded they were unmoved or suspicious about the contents. To address the question of safety perceptions and intentions to vaccinate, we saw reported feelings of safety considerably heightened among the vaccine-accepting participants, and one

of the vaccine-hesitant participants, after exposure to the story, but again no impact on future intentions was observed, answering Research Question Two.

The findings of this thesis do support the use of a more interpretative or evidence-based approach to news story construction about unsettled science topics, as proposed by Kohl et al. (2016), because of a clear impact to feelings about risk and safety that was captured in the first two variations. Notably, the study did not replicate the finding of Dixon and Clarke (2012) that concerns raised about vaccine safety would directly change readers' intentions to vaccinate.

However, constructing stories in a more balanced way could also increase trust in the news industry. Previous research has established trust and accuracy are fundamental to news media fulfilling their role as dependable information providers in a democracy (Butsch, 2011; McQuail, 2010), adding another argument toward modifying the objectivity norm to increase factuality. The current convergent media environment, with multiple information sources, means it is almost inevitable consumers will hear conspiracies and counter claims about vaccines (Kohl et al., 2016). More than ever, the traditional news media need to be regarded as channels for truthful statements of scientific consensus.

Research Question Three was concerned with how readers respond to photographs of disease symptoms. The third presentation of a news media story that added photographs of vaccine-preventable disease to the evidentiary balanced story variation produced strong feelings in participants, both appreciating and objecting to the photographs. Turning to implications for perceptions of safety and intention to vaccinate, the study found most participants reported photographs did significantly crystallise their intention to vaccinate, by showing the true risk of not vaccinating. But other participants were put off by the pictures and disliked them. The vaccine-refusing participant found the photographs unwelcome and manipulative. Vaccine intentions were therefore increased in some participants, but not others, answering Research Question Three of this study. Therefore, the current study does not support the routine use of photographs of vaccine-preventable diseases in news stories as evidence of disease risk, as the emotional response to such images was diverse and could either harm or help a vaccine safety message, depending on the participants.

Although small and regionally based, the audience study presented in this thesis does add to current research about the construction of vaccination news stories, and makes a contribution to understanding how news consumers perceive health and science stories in general. There is already a diversity of views in journalism about how the objectivity norm should be implemented in news stories, and to what degree a journalist should put their own beliefs of the facts into the story (Skovsgaard et al., 2013). This can range from a passive presentation of opposing opinions in the one extreme, to a mobilising interpretation of facts in the other. Some climate change science reporting has already changed to the latter (Kohl et al., 2016). It is hoped the responses to news media risk presentations detailed in this thesis will add some insight into which approach journalists and news media organisations should use in stories about science or health controversies in the future. There are already some indications that New Zealand journalists are turning to a more fact-based presentation of stories precipitated by the Stuff media company returning to New Zealand ownership (Hartvelt, 2021). Further content analysis of the current approach to vaccination news, and Covid-19 presentations, would provide a useful indication of how prevalent unbalanced risk constructions now are in the current media landscape.

## 6.2 Limitations of the study

This audience study was small, exploratory and used a qualitative method with a regionally based sample of participants, so it is important to not overstate the findings.

Limitations of this design are the possible introduction of the order effects from the sequence of the three stories, discussed in Chapter Three, and the more contrived presentation of the photograph variation, with photographs becoming an “add-on” to the existing story. In a more realistic news scenario the photographs would have had more relevance to the actual news story than they did here, which may have resulted in a different outcome to the one presented in this thesis where some participants were put off by the photographs and thought they were not necessary to the story.

The research adds to a small number of studies to feature participant interviews at the point of exposure to vaccination news. However, qualitative interviews cannot fully replicate news consumer responses to news stories in a natural setting. The limited nature of audience studies to capture true effects from media exposure has been highlighted (Bird, 2011; Leask, 2016; O’Neill, 2011), necessitating a limited assessment of any findings and no definitive cause and effect.

The study was also limited by looking primarily at responses to print news media story styles, whereas legacy media is now competing heavily with social media and internet-based sites when people weigh up vaccination decisions, particularly the parenting-aged demographic (Catalan-Matamoros & Penafiel-Saiz, 2019). A future study could widen this focus.

### **6.3 Suggestions for future research**

Future research using a larger audience study that involves two separate groups of participants exposed to the risk and balance stories could deepen understanding of the responses to each variable of interest here, without the complication of introducing possible order effects and using the same participants for each variation. Future research could also extend this exploration into social media and online news sites.

A limitation identified in this research was using photographs artificially placed with a news story only tenuously linked to them. A future study using a story featuring a child with a vaccine-preventable disease, with and without photographs, would be a useful extension of this study.

This study, along with the existing literature on vaccination news stories, has established the presentation of risk narratives in news stories do affect readers. There are many opportunities to study the construction of news reports about Covid-19 at the present time to analyse how risk is being portrayed by news media during a pandemic. These could include audience studies designed around Covid-19 coverage, a content analysis on the use of interpretative elements and balance in vaccination stories, or interviews with journalists on how they have approached stories alleging Covid-19 vaccine risks or side effects. Pandemics are rare and this is a novel disease being combated with a new vaccine, so audiences are likely to respond differently to reports than they do to those about established vaccines and more familiar disease outbreaks.

### **6.4 Conclusion**

The research presented in this thesis is particularly relevant to the current Covid-19 pandemic and communication about Covid-19 vaccination. Hesitancy toward Covid-19 vaccines has been encountered in my casual discussions with participants during this study as well as in official questionnaire data (Thaker, 2021). The unprecedented speed of progress towards a vaccine and subsequent rollout in New Zealand has alarmed some people and accelerated anti-vaccination, alternate science, and conspiracy discourse (Mitchell, 2021). Media

coverage that portrays risk factually, and presents scientific commentary in keeping with the weight of evidence, could help allay any fears about the Covid-19 vaccine. The disease's clear danger and easy transmission should help galvanise the news media to reflect on their role to do so. The public depends on them.



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## Appendix A

### Interview questions

*After reading Story A (controversy version)*

1. Did you learn anything new about vaccinations in story (A)?
2. How does the story (A) make you feel about the Measles-Mumps-Rubella vaccine?
3. Based on what's in this story, do you think the vaccine is safe? Why or why not?
4. How sure are you about this answer? What makes you say that?
5. On a scale of 1-5, where 1 is no and 5 is yes, would you say you would vaccinate yourself or a child in your care with the MMR vaccine discussed in the story? What made you answer (1,2,3,4,5)?
6. Would you say you agree or disagree the news story presents facts about the MMR vaccine?
7. What, if anything, did you notice about the people that were interviewed and quoted by the journalist in the news story you have just read?
8. What did you think about what they said?
9. Would you say they were quoting facts or opinions? What words or language in the story makes you think that way?
10. Is there anything about the first story that might affect your intention to vaccinate your child, or a child in your care, in the future?

*After reading Story B (with balancing content added)*

11. Did you learn anything new about vaccinations in story (B)?
12. How does the story (B) make you feel about the Measles-Mumps-Rubella vaccine?
13. Do you think the vaccine is safe? Why or why not?
14. How sure are you about this answer? What makes you say that?
15. Based on this story, on a scale of 1-5, where 1 is no and 5 is yes, would you say you would vaccinate yourself or a child in your care with the MMR vaccine discussed in the story? What made you answer (1,2,3,4,5)?
16. Would you say you agree or disagree the news story presents facts about the MMR vaccine?

17. What, if anything, did you notice about the people that were interviewed and quoted by the journalist in the news story you have just read?
18. What did you think about what they said?
19. Would you say they were quoting facts or opinions?
20. Did you notice any other differences between the first two stories?
21. Is there anything about the second story's content that might affect your intention to vaccinate your child, or a child in your care, in the future?
22. Which version (the first or second story) did you find more persuasive for or against vaccination? Why?

*After reading Story C (balanced version with pictures of people with disease added)*

23. After looking at the story now, would you say vaccination is important/necessary/a good idea? Why or why not?
24. What, if anything, did you notice about the photos and images used in the news story you just read?
25. On a scale of 1-5, where 1 is no and 5 is yes, would you say you would vaccinate yourself or a child in your care with the MMR vaccine discussed in the story? What made you answer (1,2,3,4,5)?
26. Is there anything about story (C) that makes you feel less inclined to vaccinate your children or children in your care?
27. Is there anything about story (C) that makes you feel more inclined to vaccinate your children or children in your care?
28. Would you say your risk of getting the measles is high or low? Why do you feel that way?
29. Do you think vaccines are safe and necessary? Why or why not?
30. Have your feelings about this changed from when you answered the questionnaire at the beginning? Why or why not?
31. Where would you say you get most of your information about health risks from?
32. Did anything else stand out to you today when you read the stories? Can you tell me a little more about why this stood out for you?

## Appendix B

### Questionnaire one: News media coverage and vaccination messages

**Participant Number**

**Circle** or mark the dot underneath the scale number that best reflects the extent to which you **agree** or **disagree** with each statement.

5  
Strongly  
Disagree

4  
Disagree

3  
Undecided

2  
Agree

1  
Strongly  
Agree

**Q1** How much do you agree/disagree with the statement, “It is safe to vaccinate children following the standard NZ immunisation schedule?” (Adapted from Lee et al. (2017))



**Circle** or mark the dot underneath the scale number that best reflects your viewpoint.

1  
Very  
Likely

2  
Somewhat  
Likely

3  
Undecided

4  
Somewhat  
Unlikely

5  
Very  
Unlikely

**Q2** I would vaccinate a future child against Poliomyelitis ('polio').



**Q3** I would vaccinate a future child against Pertussis ('whooping cough').



**Q4** I would vaccinate a future child against Tetanus.



**Q5** I would vaccinate a future child against Measles. (All four adapted from Rossen et al. (2019))



**Circle** or mark the dot underneath the scale number that best reflects your level of certainty about each statement.

1  
Very  
Uncertain

2  
Somewhat  
Uncertain

3  
Undecided

5  
Somewhat  
Certain

6  
Very  
Certain

**Q6** How certain are you that vaccines are safe to receive? (Adapted from Dixon & Clarke (2012))



**Q7** How certain do you believe scientists and the medical community are that vaccines are safe to receive? (Adapted from Dixon & Clarke (2012))



## Questionnaire two: News media coverage and vaccination messages

### Participant Number

\_\_\_\_\_

**Circle** or mark the dot underneath the scale number that best reflects your level of certainty about each statement.

1	2	3	4	5
Very Uncertain	Somewhat Uncertain	Undecided	Somewhat Certain	Very Certain

**Q1** How certain are you that vaccines are safe to receive? (Adapted from Dixon & Clarke (2012))



**Q2** How certain do you believe scientists and the medical community are that vaccines are safe to receive? (Adapted from Dixon & Clarke (2012))



**Circle** or mark the dot underneath the scale number that best reflects the extent to which you **agree** or **disagree** with each statement.

5	4	3	2	1
Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

**Q3** I intend to receive any vaccination that my health care provider recommends in the future. (Adapted from Dixon & Clarke (2012))

**Q4** I intend to make sure my children receive any vaccination that my health care provider recommends in the future. (Adapted from Dixon & Clarke (2012))



The next series of questions present statements about the news articles you have just viewed. **Circle** or mark the dot underneath the scale number that best reflects the extent to which you **agree** or **disagree** with each statement about the news articles. (Questions 5-14 were adapted from Dixon & Clarke (2012))

5 Strongly Agree      4 Agree      3 Don't Know      2 Disagree      1 Strongly Disagree

**Q5** *Story A* presents the perspective that vaccines are safe and necessary.



**Q6** *Story A* presents the perspective that vaccines may cause adverse reactions.



**Q7** *Story A* presents both perspectives: vaccines may cause adverse reactions, *and* vaccines are safe.



**Q8** *Story A* presents facts from medical experts about vaccinations.



**Q9** *Story A* presents opinions from ordinary people about vaccinations.



**Q10** *Story B* presents only the perspective that vaccines may cause adverse reactions.



**Q11** *Story B* presents both perspectives: vaccines may cause adverse reactions, *and* vaccines are safe.



**Q12** *Story B* presents the perspective that vaccines are safe.



**Q13** *Story B* presents facts from medical experts about vaccinations.



**Q14** *Story B* presents opinions from ordinary people about vaccinations.



These next questions are about your news consumption. By ‘news’ we mean information about events and issues that involve more than just your friends and family.

**Q15** How many days a week do you read a newspaper or news website? (Circle or tick ONE) (From Rubin et al. (1994))

- ☐ Between 1-3 days per week
- ☐ Between 3-5 days per week
- ☐ Between 5-7 days per week
- ☐ I don't read/rarely read any newspapers or news websites

**Circle** or mark the dot underneath the scale number that best reflects the extent to which you follow or do not follow each type of news. (Questions 16-34 were adapted from Mitchell (2016), with some modifications to change United States television news programmes to New Zealand ones)

5	4	3	2	1
Very	Somewhat	Not very	Not at all	No
Closely	Closely	Closely	Closely	Answer

**Q16** How closely do you follow international news?



**Q17** How closely do you follow national news?



**Q18** How closely do you follow local news?



**Q19** How closely do you follow news about your neighbourhood?





The next questions are about the subject category of news that interests you. **Circle** or mark the dot underneath the scale number that best reflects the extent to which you follow or do not follow each type of news, either in a newspaper, on television, radio, or the internet.

5	4	3	2	1
Very	Somewhat	Not very	Not at all	No
Closely	Closely	Closely	Closely	Answer

**Q20** How closely do you follow news about the Government and politics?



**Q21** How closely do you follow news about people and events in your community?



5	4	3	2	1
Very	Somewhat	Not very	Not at all	No
Closely	Closely	Closely	Closely	Answer

**Q22** How closely do you follow news about sports?



**Q23** How closely do you follow news about business and finance?



**Q24** How closely do you follow news about science and technology?



**Q25** How closely do you follow news about entertainment?



**Q26** How closely do you follow news about crime?



**Q27** How closely do you follow news about health?



5  
Often

4  
Sometimes

3  
Hardly  
Ever

2  
Never

1  
No  
Answer

**Q28** How often do you get news on a desktop or laptop computer?



**Q29** How often do you get news on a mobile device (such as a smartphone or tablet)?



5  
Often

4  
Sometimes

3  
Hardly  
Ever

2  
Never

1  
No  
Answer

**Q30** And how often do you read any newspapers in printed format?



**Q31** How often do you listen to news on the radio?



**Q32** How often do you watch national evening television news ONE news on TV 1 or NewsHub on TV3 (either 'live' or, delayed/on demand)?



**Q33** How often do you get news from a social networking site (such as Facebook or Twitter)?



**Q34** How often do you get news from a website or app, including international news sites?



(The final group of questions are adapted from Lee et al., 2017 and the New Zealand Attitudes and Values Study (Sibley, 2013/14))

**Q35** What ethnic group/s do you most identify with? Tick or circle all those that apply.

- ☐ New Zealand European
- ☐ Māori
- ☐ Samoan
- ☐ Cook Islands Māori
- ☐ Tongan
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Other

**Q36** What is your gender? M F N (non-binary gender)

**Q37** What is your occupation?

.....

**Q38** What is your age?

.....

**Q39** How many children do you care for?

.....

**Q40** What is your annual household income? Tick or circle ONE.

- ☐ Less than \$60,000
- ☐ Between \$60,000-\$80,000
- ☐ Between \$80,000-\$100,000
- ☐ More than \$100,000

Story A

# New vaccine, autism study irks

By Amy Wiggins

A new study of more than half a million children has found no link between the measles, mumps and rubella vaccination and autism, but some anti-vaccination proponents remain unconvinced.

The Danish study, published in the *Annals of Internal Medicine* journal, looked at all children born in the country between 1999 and 2010. The children were followed through to the end of August 2013.

It found the MMR vaccine did not increase the risk of autism, even in children with other autism risk factors or in children whose siblings

had autism. There was also no clustering of autism cases following vaccination.

Researchers from Statens Serum Institut in Copenhagen found that of the 657,461 children included in the study, only 6517 were diagnosed with autism.

Of the children followed, 95 per cent received the first vaccination, which is offered at 15 months, but there was no difference in the number of vaccinated children with the disorder compared to the number of unvaccinated children.

A 1998 paper in the *Lancet* which first implied a link between the MMR vaccine and autism was

retracted in 2010 but turned thousands of parents around the world against the vaccinations.

The film *Vaxxed*: From cover-up to catastrophe, which was released in 2016 and also claims there is a link between autism and the MMR vaccine, has also led to an increase in parental reluctance to have their children vaccinated against the diseases despite wide criticism of faulty evidence.

Nelson woman Alison Singleton shares this reluctance to vaccinate.

Writing in a letter to the editor, she said it was simply not true that there is no scientific evidence supporting a link between autism and

the MMR vaccine.

"There have been a large number of scientific studies around the world that confirm a link between autism and the MMR shot. However, despite their publication in respected peer reviewed journals, we never hear of these studies in the media or through the medical system.

"Many scientific journals primarily publish studies funded by the pharmaceutical companies which promote that vaccines are safe, effective and necessary."

She says studies which show otherwise are shelved or suppressed. "People need to open their eyes

and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals."

There has been an increase in measles cases in Europe and the United States and the World Health Organisation has declared vaccine hesitancy as one of the top 10 threats to global health.

In New Zealand there have been a number of measles cases in recent years, including a large outbreak last year.

From 1 January 2019 to 29 January 2020 there were 2193 confirmed cases of measles across New Zealand.

Story B

# Vaccine, autism not linked: study

By Amy Wiggins

A new study of more than half a million children has found no link between the measles, mumps and rubella vaccination and autism.

The Danish study, published in the *Annals of Internal Medicine* journal, looked at all children born in the country between 1999 and 2010. The children were followed through to the end of August 2013.

It found the MMR vaccine did not increase the risk of autism, even in children with other autism risk factors or in children whose siblings had autism.

There was also no clustering of autism cases following vaccination.

Researchers from Statens Serum Institut in Copenhagen found that of the 657,461 children included in the study, only 6517 were diagnosed with autism.

Of the children followed, 95 per cent received the first vaccination, which is offered at 15 months, but there was no difference in the number of vaccinated children with the disorder compared to the number of unvaccinated children.

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retracted in 2010 but turned thousands of parents around the world against the vaccinations.

The film *Vaxxed*: From cover-up to catastrophe, which was released in 2016 and also claims there is a link between autism and the MMR vaccine, has also led to an increase in parental reluctance to have their children vaccinated against the diseases despite wide criticism of faulty evidence.

Nelson woman Alison Singleton shares this reluctance to vaccinate.

Writing in a letter to the editor, she said it was simply not true that there is no scientific evidence sup-

porting a link between autism and the MMR vaccine.

"People need to open their eyes and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals."

However, University of Auckland senior lecturer in vaccinology Dr Helen Petousis-Harris said the latest study was a "loud and clear" message that MMR could not trigger autism in susceptible children.

"We know through modern technologies such as brain imaging and genomics that autism begins long before birth."

University of Otago Professor

Michael Baker agreed the study was "very reassuring for anyone concerned about the possible link".

There has been an increase in measles cases in Europe and the United States and the World Health Organisation has declared vaccine hesitancy as one of the top 10 threats to global health.

In New Zealand there have been a number of measles cases in recent years, including a large outbreak last year.

From 1 January 2019 to 29 January 2020 there were 2193 confirmed cases of measles across New Zealand.



## Story scenario C

### Story C



Children with measles.

# Vaccine, autism not linked: study

By Amy Wiggins

A new study of more than half a million children has found no link between the measles, mumps and rubella vaccination and autism.

The Danish study, published in the *Annals of Internal Medicine* journal, looked at all children born in the country between 1999 and 2010. The children were followed through to the end of August 2013.

It found the MMR vaccine did not increase the risk of autism, even in children with other autism risk factors or in children whose siblings had autism. There was also no clustering of autism cases following vaccination.

Researchers from Statens Serum Institut in Copenhagen found that of the 657,461 children included in the study, only 6517 were diagnosed with autism. Of the children followed, 95 per cent received the first vac-

cination, which is offered at 15 months, but there was no difference in the number of vaccinated children with the disorder compared to the number of unvaccinated children.

A 1998 paper in the *Lancet* which first implied a link between the MMR vaccine and autism was retracted in 2010 but turned thousands of parents around the world against the vaccinations.

The film *Vaxxed: From cover-up to catastrophe*, which was released in 2016 and also claims there is a link between autism and the MMR vaccine, has also led to an increase in parental reluctance to have their children vaccinated against the diseases despite wide criticism of faulty evidence.

Nelson woman Alison Singleton shares this reluctance to vaccinate. Writing in a letter to the editor, she said it was simply not true that there is no scientific

evidence supporting a link between autism and the MMR vaccine.

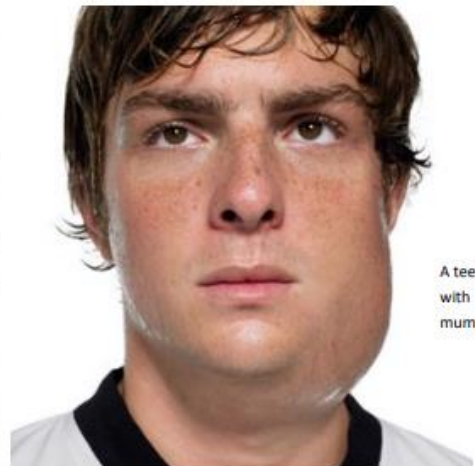
"People need to open their eyes and look deeper and not simply believe everything you are told by the media or well-meaning medical professionals."

However, University of Auckland senior lecturer in vaccinology Dr Helen Petousis-Harris said the latest study was a "loud and clear" message that MMR could not trigger autism in susceptible children.

"We know through modern technologies such as brain imaging and genomics that autism begins long before birth."

University of Otago Professor Michael Baker agreed the study was "very reassuring for anyone concerned about the possible link".

There has been an increase in measles cases in Europe and the United States and the World Health Organisation has declared



A teen with mumps.

vaccine hesitancy as one of the top 10 threats to global health. In New Zealand there have been a number of measles cases in recent years, including a large

outbreak last year.

From 1 January 2019 to 29 January 2020 there were 2193 confirmed cases of measles across New Zealand.

## Appendix D

### Information Sheet

#### Introduction to My Research

My name is Wendy Shailer-Knight. I am currently working toward a Master of Business, endorsed in Communication. I am interested in health and science stories in the news media and how audiences perceive messages. The focus of my current research is news about vaccination.

#### Project Description, and Invitation

I am conducting an audience study where participants will read some news stories and then be interviewed about their responses to, and perceptions of, different types of vaccination news stories. I am interested in a range of views and invite you to participate in this study whatever your personal feelings about vaccination may be.

#### Participant Identification, and Recruitment

You have been approached to participate in this study after responding to an invitation to register your interest in the project at your child's kindergarten, school, or through Plunket. You may have been given this information sheet by someone you know or seen it on a noticeboard.

I am aiming to recruit between 20 and 30 individuals. Anyone who is involved in the decision-making around vaccination for a child is invited to participate, including parents, caregivers, grandparents/tipuna, or extended family and whanau members.

#### Project Procedures

- If you agree to take part, you will be asked to read some vaccination-themed news stories and interviewed in person. You will also be asked questions about your news media consumption and asked to fill in some survey questions about your general views on a range of health issues.
- You will need to allow one hour. The research is expected to take place between July and September 2020 at a public location suiting the participant, such as at your child's school or kindergarten.
- The information I receive from the interviews will form part of my thesis into news media techniques and vaccination messaging. If accepted, this thesis will be published and held in the university library as a hard copy and as an academic file digitally. This thesis is expected to be completed in 2021.
- Research and interview data may also be published in an academic journal or presented at an academic or industry conference. Relevant findings may be distributed to journalism training organisations or sent to news media.

#### Possible Harms of Participation

- During the course of this research, you may be exposed to some confronting messaging about vaccination.
- If any questions cause you distress, I will pause the interview, and you can ask that the interview stop or continue after a break if you are comfortable with that. We will discuss ways you may like to gather support. I would also encourage you to call Lifeline if you feel distressed. It is a free counselling service available 24 hours, 7 days a week. The phone number is 0800 543 354 or you can text HELP (4357).



## Data Management

- The interview will be audio-recorded in a digital file and transcribed into a word document, as well as in note taking. All transcribing of the recordings will be made by the researcher, Wendy Shailer-Knight, and stored for five years. The original written note recording and transcripts will be held securely in a locked cabinet at Massey University that is only accessible to the research team. All digital files and transcripts will be securely kept on a password-protected computer and then deleted when the project is complete. Hard copies of participant consent forms will be stored in a separate locked cabinet from the data files.
- Participants will not be identified in the research findings and no names or identifying information will be used in the thesis or any subsequent published documents, although I may differentiate participants via anonymised names.
- You may request a summary of findings by contacting me at the email address noted below, or through my academic supervisors (named below).

## Participant's Rights

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question in either a verbal interview or on any written survey that may form part of the interview;
- withdraw from the study before the findings are written up in September 2020;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- ask for the recorder to be turned off at any time during the interview.
- bring a whanau member or support person to the research interview.

**If you are interested in taking part**, I would love to hear from you. Please email me (Wendy) at [Wendy.Shailer.1@uni.Massey.ac.nz](mailto:Wendy.Shailer.1@uni.Massey.ac.nz) or text or phone 021 107 4738 to register your interest.

## Project Contacts

The researcher, Wendy Shailer-Knight, can be contacted by email at [Wendy.Shailer.1@uni.Massey.ac.nz](mailto:Wendy.Shailer.1@uni.Massey.ac.nz) or via my supervisors, listed below. Prospective participants are invited to contact me or one of my supervisors if you have any questions about the project.

### Project Supervisors:

Dr Susan Fountaine  
Senior Lecturer School of Communication, Journalism and Marketing  
Telephone: (06) 356 9099 extn. 83964  
Email: [S.L.Fountaine@massey.ac.nz](mailto:S.L.Fountaine@massey.ac.nz)

Dr Niki Murray  
Senior Lecturer School of Communication, Journalism and Marketing  
Telephone: (06) 356 9099 extn. 83977  
Email: [N.S.Murray@massey.ac.nz](mailto:N.S.Murray@massey.ac.nz)

*This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application NOR 20/13. If you have any concerns about the conduct of this research, please contact Dr Fiona Te Momo, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 43347, email [humanethicsnorth@massey.ac.nz](mailto:humanethicsnorth@massey.ac.nz).*

## Appendix E

### ***News media coverage and vaccination messages***

#### **Participant Consent Form - Individual**

I have read, or have had read to me in my first language, and I understand the Information Sheet. I have had the details of the study explained to me, any questions I had have been answered to my satisfaction, and I understand that I may ask further questions at any time. I have been given sufficient time to consider whether to participate in this study and I understand participation is voluntary and that I may withdraw from the study at any time.

1. I agree/do not agree to the interview being sound recorded.
2. I wish/do not wish to have my recordings returned to me.
3. I agree to participate in this study under the conditions set out in the Information Sheet.
4. I wish/do not wish to receive a summary of findings about this research when it is completed.

Please provide your email address if you would like this summary:

\_\_\_\_\_

#### **Declaration by Participant:**

I \_\_\_\_\_ [print full name] \_\_\_\_\_ hereby consent to take part in this study.

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_