

**News Media Framing and Risk Communication:
A Content Analysis of British Columbia's 2014 Measles Outbreak**

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Abstract

Given their agenda setting function, the news media can play an important role in framing our understanding of health issues. Immunization in particular is considered a public health success story. Nonetheless, growing hesitancy towards immunization for a variety of reasons has resulted in outbreaks of vaccine preventable diseases (VPD) across North America. Using British Columbia's 400-case measles outbreak in 2014, the present research employs a mixed method content analysis to examine news media framing of the outbreak in the *Vancouver Sun* and *The Vancouver Province* between March 1st-May 24th 2014. Key quantitative findings from the present study suggest that the dominant attribution of blame for the measles outbreak was religion (41%), medical/science sources were overwhelmingly relied upon in the coverage (80%), a greater degree of diligence was taken to avoid false balance, and finally there was a general lack of mobilizing information provided in the coverage. Key findings from the qualitative analysis suggest that while mandatory vaccination policies were seen as a positive solution to outbreaks, they could have polarizing implications. Thus, this study supports prior research calling for a national immunization registry. The present research concludes by presenting risk communication suggestions for public health authorities and the media.

Keywords: immunization, vaccine preventable disease outbreaks, content analysis, measles, religion, health communication

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1. Introduction

Measles, also known as rubeola or red measles, is an incredibly contagious disease that is caused by a Paramyxoviridae virus (McFee, 2013). Measles is easily spread through respiration, and is considered one of the most contagious of all infections (Lassen, Schuster, Stemmler 2013). The disease causes a red, blotchy rash that starts on the face and spreads down the body. Symptoms include fever, cough, runny nose, and red and watery eyes (McFee, 2013). While most people recover from measles within 2 to 3 weeks, the disease can cause dangerous problems such as swelling of the brain (encephalitis), pneumonia, seizures, deafness, brain damage, or death (Public Health Agency of Canada, 2014). Centers for Disease Control and Prevention (2014) notes that 1 out of 20 children with measles will get pneumonia, and for every 1,000 children infected by measles, one to two will die from the disease.

The Public Health Agency of Canada (the Agency) (2014) cautions that since there is no cure for measles, *prevention is crucial*. According to the Agency (2014), “anyone who has not been immunized can get measles, but children are especially at risk” (para. 1). Canada has been free of endemic measles since 1998, with the introduction of the publicly funded measles, mumps, and rubella (MMR) vaccine (Public Health Agency of Canada, 2013). Thus, vaccination is considered a public health ‘success story,’ given that it has sharply reduced the prevalence of—and deaths from—diseases such as measles, pertussis, and polio (World Health Organization, 2013). Scott Halperin argues that, “vaccination is one of the greatest public health achievements of the 20th Century and most vaccines in use are cost saving or have favorable cost-effectiveness profiles” (quoted in Langley & Naus, 2011, p. 429). Nonetheless, there have recently been declines in vaccination up-take rates in Canada, and according to the World Health Organization (WHO) (2013), cases of vaccine-preventable diseases (VPD), such

as measles, are increasingly being confirmed across Canada. The Agency (2013) explains that, “As the incidence of a vaccine-preventable disease decreases following successful immunization programs, there is a potential for Canadians to become complacent and question the role of vaccines in preventive healthcare” (para. 9).

A variety of reasons have been cited for the complacency and/or opposition to vaccination such as the MMR-autism controversy (Boyce, 2006; Clarke, 2008; Clarke 2010; Holton, Weberling, Clarke, Smith, 2012; Leask & Chapman, 2002), the anti-vaccination movement (Nicholson & Leask, 2012; Poland & Jacobson, 2012), alternative medicine (Opel et al., 2013), celebrity influence (Kata, 2012), and religious beliefs (Aspinwall, 1997; Rodgers, Gindler, Atkinson, Markowitz, 1993). Some of these reasons will be further expanded upon in the literature review. Overall, the growing complacency and/or opposition to vaccination has meant that uptake rates are beginning to fall, which becomes problematic when you consider that the success of vaccination programs depends largely upon herd immunity.

Herd immunity, describes a type of immunity that occurs when a significant portion of a population (or a herd) provides a measure of protection for individuals who have not developed immunity (John & Samuel, 2000). In other words, the larger the proportion of individuals who are resistant to a disease, the smaller the probability that a susceptible individual will come into contact with an infectious individual (Fine, Eames & Heymann, 2011). Susceptible individuals include children too young to receive their vaccination, pregnant women, and other populations that cannot vaccinate for medical reasons. As public confidence begins to shift and vaccination uptake rates begin to decline, once VPD like measles are rapidly returning, infecting susceptible populations and posing a major public health risk (Dixon & Clarke, 2013).

With the return of VPD in Canada and the United States, the issue of vaccination is increasingly becoming a topic of interest amongst the mainstream media. Research shows that health news can have “a greater influence on public health-related expectations and behaviour than high-budget, government-sponsored public health campaigns” (Jordens, Lipworth, Kerridge, 2013, p. 448). Further, several studies have revealed that people are more often exposed to health information through the mass media than through traditional sources of information, like physicians or health facilities (Cho 2006; Montgomery, 1990; Wyn, 1994). Ultimately, news media “have a critical role in shaping public opinion about who is responsible for causing or solving key social problems” (An & Gower, 2008, p. 108).

While there is a vast amount of health information available through the media, such information is not necessarily adequate for the audience to be fully informed or to make educated decisions regarding their health (Hoffman-Goetz and Friedman, 2005; Rothblum, 1999; Vargas and de Pyssler, 1999). In a study of news framing and immunization, Goodyear-Smith et al. (2007) found that, “the media have a significant effect on public perception of disease and vaccination, ultimately leading to changes in vaccine coverage” (p. 765). News coverage thus has the potential to “create false perceptions and mislead the public about many health topics” (Arroyave, 2012, p.194). Therefore, what gets said in the news media about a health issue, like an outbreak, has consequence.

Wallack, Woodruff, Dorfman, and Diaz (1999) urge that health communicators must monitor the media “in order to understand how health issues are portrayed and/or ignored, what aspects are emphasized, and what solutions are offered” (p. 197). Thus, the framing of VPD outbreaks warrants further scholarship, as the way in which outbreaks are discussed has the ability to influence the perceptions of the public on the effectiveness and importance of

vaccination. This research will use the theoretical lens of framing and agenda setting, as well as risk communication to analyze print news coverage of the 2014 British Columbia measles outbreak to unpack how the outbreak is being framed in the media.

1.1. Purpose of the Study

The purpose of this study is to explore the framing of measles outbreaks¹ in British Columbia, specifically examining BC local daily newspaper coverage in the *Vancouver Sun* and *The (Vancouver) Province*. These two BC newspapers have been selected as they have a combined weekly readership of almost 1.8 million people (Newspapers Canada, 2012). The BC outbreak took place primarily in the Fraser Valley health district, just east of Vancouver. According to Fraser Health—the provincial health care service provider for the more than 1.6million people living in communities stretching from Burnaby to Hope—the outbreak officially began on March 8th and was declared over on April 28th 2014. In order to ensure a more fruitful study of the topic and to provide a contextual understanding, the time frame in which articles will be collected from the Factiva database will be a week prior to the outbreak, March 1st 2014 until 3 weeks following the outbreak on May 24th 2014 (85days).

The recent outbreak in BC has been selected, as with over 400 confirmed cases of measles in a seven-week time span, it is the largest outbreak to occur in the province in over thirty years (Fraser Health, 2014a). While there has been an increase in confirmed cases of measles in BC since 2009, the 2014 outbreak saw more cases of measles than the entire province had seen in 15 years (Fraser Health, 2014a). As well, it is the largest measles outbreak

¹ According to the Canadian Communicable Diseases Report published in October 2013, “as measles is eliminated in Canada, a single case would be considered unusual or unexpected. However, while measles activity remains high in other WHO regions, importations are expected to continue” (Public Health Agency Canada, 2013, p. 4). The following is a working definition of a measles outbreak: “Two or more confirmed cases linked, either epidemiologically or virologically or both” (Public Health Agency Canada, 2013, p.4).

to occur in Canada since the 2011 outbreak in Quebec. Initially, the measles outbreak in BC appeared to be contained within a Christian school in the community of Chilliwack where the vast majority of cases were being reported (Fraser Health, 2014b). However, on March 13th 2014, Fraser Health issued a public service announcement warning that measles had been spread to the general population in both Chilliwack and Agassiz, and extended the warning to other communities within Fraser Valley East (Fraser Health, 2014b). By the time the outbreak had been declared officially over on April 28th 2014, there had been over 400 confirmed cases of measles reported in the province (Fraser Health, 2014c).

Employing a content analysis of the newspaper coverage during the outbreak period, this research takes both a quantitative and qualitative approach. Quantitative in that it seeks to understand the following: 1) who is being blamed for the outbreak (blame attribution); 2) who is being sourced in discussions of the outbreak (source); 3) if any mobilizing information (MI) is provided in the article. Similarly, Leask and Chapman (2002) reviewed positive coverage of immunization in over four and half years of Australian newsprint media, specifically examining the framing of blame attribution for low immunization rates in the country. Their framework then went on to inform Holton, Webering, Clarke, and Smith (2012), who examined blame attribution, sourcing, and mobilizing information in a study of newspaper coverage of the MMR-autism controversy. The framework of these two studies was employed to inform the coding scheme and protocol for the present research. Additionally, the present study takes a qualitative approach, in that it seeks to understand the general tone in which the outbreaks are discussed in the news coverage. By employing both a quantitative and qualitative approach, this study provides a more in-depth analysis of VPD outbreak coverage.

2. Literature Review

2.1. Legal Framework of Vaccination in Canada

In Canada, immunization is the shared responsibility among federal, provincial, and territorial governments. Approval of vaccine products and the recommendations on the use of vaccines are made by the federal government, while the provinces and territories “are responsible for planning, funding, and delivering immunization programs in their jurisdiction” (Public Health Agency of Canada, 2013, p. 23). Publicly funded immunization programs are an important cornerstone of Canadian medical history, being directly linked to lowering disease outbreaks (Public Health Agency of Canada, 2013). By 1983, all provinces and territories across Canada had implemented a routine MMR combined vaccine for children at 12 months. In British Columbia specifically, the first dose of MMR is recommended for children at 12 months and the second between 4-6 years (HealthLink BC, 2014).

In Canada, only two provinces have enacted legislation governing the vaccination of school children: Ontario (1990) and New Brunswick (1997). This legislation gives the authority to send children home or suspend them from school for not being up-to-date on their childhood immunizations. However, parents in these provinces have the ability to legally exempt their children from an immunization citing conscience, religious, or medical grounds (Public Health Agency of Canada, 2012). The debate to introduce such mandatory vaccination legislation across Canada often hinges on the competing interest of public safety versus personal liberty (Walsh, 2014). In the United States, all American states require children to be vaccinated before entering school, with exemptions varying depending upon the state (Walsh, 2014). Countries like Australia provide financial compensation to parents for vaccinating their children. In countries with strict vaccination policies, such as Slovenia, exemptions are only

available for medical reasons. Some vaccine opponents “view the mandatory injection of a foreign substance into their bodies as an unacceptable infringement on their personal liberty by the state” (Walsh, 2014). While others cling to the discredited Wakefield study, claiming that vaccines cause autism and are unsafe risk for their children. Erin Walkinshaw (2011) argues that there is little interest in Canada to implement a strict mandatory vaccination policy as it could further isolate opponents and move skeptics towards opposition. However, Walkinshaw (2011) does suggest that vaccination legislation like that in Ontario and NB could be an important step for provinces to manage potential public health risks. While BC does not require vaccination for school entry like other provinces in Canada, it is possible this discourse could emerge following the 2014 measles outbreak.

2.2. Contextual Overview of Vaccination: Examining the Influences

2.2.1. MMR-Autism Controversy. Despite the proven effectiveness of vaccination (Public Health Agency of Canada, 2013), and the countless lives medical professionals argue that have been saved, a debate now exists regarding vaccination safety and effectiveness. Research shows that this debate has in part stemmed from a 1998 article published by Dr. Andrew Wakefield and associates in medical journal the *Lancet*, which claimed a link between autism and the MMR vaccine (Nicholson & Leask, 2012). Although the Wakefield study has been discredited, retracted from *the Lancet*, and Wakefield was barred from practicing medicine in the UK (Poland & Jacobson, 2011), the discourse on vaccination has shifted with more and more people questioning the need for it (Hopper, 2013). Several studies (Clarke 2008; Holton et al., 2012) have examined the prevalence of discussions regarding the Wakefield study in the news media, and the fuel it gave to the anti-vaccination movement (Poland & Jacobson, 2011;

Kata, 2012). While the Wakefield controversy will not be the central focus of the following research, this study will take note of references to Wakefield in the sample.

2.2.2. Anti-Vaccination Movement. The anti-vaccination movement, is “an amorphous group holding diverse views that nevertheless shares one core commonality: an opposition to vaccines” (Kata, 2012, p. 3778). One of the key anti-vaccination groups in Canada is *Vaccination Risk Awareness Network (VRAN)*, based in BC. The VRAN portray themselves as a neutral watchdog organization, however in reality they are a bias organization that dispenses anti-vaccination information (Kata, 2012). For example, in a June 2012 article published on their website, VRAN claims that, “Vaccination may cause significantly more injuries and deaths than they prevent” (para. 4). One major avenue that has enabled the proliferation of this movement is Web 2.0 (Reyna, 2011), as the online world provide the anti-vaccination movement with an effective platform to disseminate their message.

2.2.3. Religious and Cultural Influence. Broadly speaking, certain religions and belief systems promote alternative perspectives toward vaccination as well. Religious objections to vaccines are based generally on “(1) the ethical dilemmas associated with using human tissue cells to create vaccines, and (2) beliefs that the body is sacred, should not receive certain chemicals or blood or tissues from animals, and should be healed by God or natural means” (College of Physicians of Philadelphia, 2014, para. 7). In the US, there have been a number of outbreaks associated with religious communities in Philadelphia (Rodgers, Gindler, Atkinson, Markowitz, 1993), Missouri and Illinois (CDC, 1994). These outbreaks are problematic as infections can “spread quickly through small unvaccinated social and/or geographic church communities” (Aspinwall, 1997, p.11). Overall, divergent cultural perspectives toward vaccination demonstrate “the need for continued communication and

collaboration between medical and public health officials and the public regarding acceptable and effective immunization policies” (College of Physicians of Philadelphia, 2014, para. 15).

The BC measles outbreak began amongst a religious community in Chilliwack, and thus understanding the relationship between immunization and religion is crucial.

2.3. Mediation of Health

Understandings about health are not from one’s own direct experience; instead, understandings are mediated, and discourses regarding health and illness are “amplified through not only Web 2.0, but also print media, television, cinema” (Ahmed & Bates, 2013, p. 3). Health issues like immunization are now mediated in the 21st century with the Internet, traditional media and celebrities contributing to the discourse. In the media-rich environment of today, it is easy to be overwhelmed by the variety of different sources and forms of health information (Hoffman-Goetz et al., 2014). Yet, in spite of the popularity of new media, “the traditional media are here to stay to a surprising extent” (Moordige, 2008, p.5 quoted in Hoffman-Goetz et al., 2014, p.124). While the news media is an important source of health information and a channel to promote the benefits of immunizations, the media are more than mere message channels (Boykhoff, 2007; Clarke 2008). For example, in Wales there was extensive coverage of the MMR vaccine controversy in one local paper between June-September 1997. Following this, there was a 13.6% decline in vaccine uptake in the distribution area of the publication, compared with a 2.4% decline elsewhere (Good-year Smith et al., 2007). As the research in Wales demonstrates, the mass media can be a “double-edged sword, influencing health behaviour in both positive (health-enhancing) and negative (health-compromising) ways” (Hoffman-Goetz et al., 2014, p. 124). As the issue of immunization continues to become highly mediated, it is imperative to understand how health

issues like disease outbreak are being discussed, as well as the conditions under which stories are being generated. Journalists cannot just be broadly blamed for their influence on shaping health perceptions and behaviours; instead we must look more broadly towards the current media-producing environment.

2.4. News Production Under Economic Constraint

Given that this study explores news media coverage of the 2014 measles outbreaks in BC, it is important to have an understanding of what takes place behind the scenes, namely news production routines. Advertisement revenue—where news organizations get the majority of their funding—has come under a great deal of pressure (Forde & Johnson, 2013). Consequently, there have been massive employment cutbacks in the newsroom (McChesney 2013; PEW 2013; Rottwilm 2014; Siles & Boczkowski 2012; Örnebring 2009). In July 2012, Sun Media, Canada's largest newspaper chain, closed eight newspapers and three free dailies (Wong, 2013). Further the corporation also got rid of 360 jobs, on top of 550 positions cut earlier that year (Wong, 2013). According to the Canadian Media Guild (2013), in the past five years, media jobs losses nationally have reached roughly 10,000. These job cuts are problematic as research suggest that the print news coverage tends to guide a great deal of the coverage in the broadcast sector (Lewis, Williams, Franklin, Thomas & Mosdell, 2008). Further, Fenton (2012) maintains that now, “they [journalists] talk less to their sources, and find themselves captured in desk-bound, cut and paste, administrative journalism” (p. 122).

News managers value staff versatility, which tends to undermine incentive to develop specialized expertise (Lowrey, Claussen & Anderson, 2000; Kees & Becker 2002). Given that reporting on health issues often requires specialized knowledge, cutbacks can serve as a further barrier to producing quality health news (Dixon & Clarke 2013; Schwitzer 2010; Seale, 2003;

Picard & Yeo 2011). Several studies demonstrate that media coverage of health issues is of poor quality (Arroyave 2012; Dentzer 2009; Gray 2011; Radford, 1996; Wilson, Bonevski, Jones & Henry 2009). Ultimately, when these topics are not critically analyzed, this can result in misinformation being easily relayed to the masses. Thus, it is imperative to recognize that journalists are under several economically rooted constraints that have the ability to impact the quality of news coverage they produce. Although journalists may follow certain routines and procedures due to the nature of the newsroom, “it is important to remember that media are a source of public information and have a social responsibility” (Arroyave, 2012, p.209). While one can empathize that journalism is facing constraint, empathy should not be replaced with complacency. It is thus important that scholarship, such as this paper, continues to challenge and push for extensive investigations of health issues covered in the media.

2.5. Vancouver Media Environment

British Columbia has two major English language daily newspapers: the *Vancouver Sun* and *The Province*. Traditionally considered rivals (Fralic, 2012), the two newspapers joined in 1958 through the creation of Pacific Newspaper Group Inc. (which is now owned by Postmedia Network Canada). Collectively, the newspapers reach over 1.8million people each week (Newspapers Canada, 2012). *The Province* has been a daily newspaper since 1898 and attracts 987,040 weekly readers (Newspapers Canada, 2012). The *Vancouver Sun* since 1912 and attracts 853,800 weekly readers (Newspapers Canada, 2012). The *Vancouver Sun* is considered a broadsheet and publishes daily with the exception of Sundays and selected holidays. Although named the *Vancouver Sun*, it is important to note that this newspaper has no affiliation to the Sun Media chain that operates tabloid papers across Canada. Despite recent cutbacks (CBC, 2013), the *Vancouver Sun* continues to have the largest newsroom in

Vancouver. The *Vancouver Province* is considered a tabloid and is published on a daily bases with the exception of Saturday and selected holidays.

Along with these two daily newspapers, there are also two national newspapers distributed in Vancouver, *The Globe and Mail* and the *National Post*. *The Globe* has a three-page BC news insert to attract more local readership, while the *National Post* has very little BC specific content. Given that this study seeks to provide an in-depth study of measles outbreaks in BC, these two papers were not selected, as they were more likely to discuss VPD from a broader national perspective. There are also a variety of local weekly papers distributed throughout the various communities in Vancouver and surrounding areas. While there are local weekly newspapers in Fraser Valley, these papers are not published on a regular basis and articles are not accessible on major databases such as Factiva or LexisNexis. Thus the small local weeklies have not been selected for analysis. As well, given the large Chinese-speaking population in the city of Vancouver, there are currently four Chinese-language daily newspapers. The two free newspapers in the city, *24hours* and *Metro*, contain a small number of BC specific stories and tend to run more celebrity news and gossip. Overall, Vancouver has a variety of newspapers that make up the media environment in the city and province as a whole. Nonetheless, the *Vancouver Sun* and *The Province* continue to be the two newspapers that dominant in the province and receive wide readership, thus warranting further study.

2.6. Related Previous Research

2.6.1. Blame Attribution: Who is responsible? Semetko and Valkenburg (2000) define the attribution of responsibility frame as “a way of attributing responsibility for [a] cause or solution to either the government or to an individual or group” (p. 96). The most influential work on framing attributions was conducted by Shanto Iyengar (1990; 1991). Iyengar (1990)

argued that news framing of responsibility can influence individuals' decisions about whether, and how, to act to solve social problems, such as poverty and unemployment. Attributing blame appears to be a commonplace practice amongst journalists (Arroyave, 2012). When a health issue occurs, they often describe said problem and then identify actors responsible or involved in the problem. Iyengar (1991) identified two distinct news frames for dealing with issues: the episodic news frame (focusing on certain individuals or specific events) and the thematic news frame (placing issues and events in general context at the societal or governmental level). The media can thus present problems and their solutions as either an individual or societal responsibility (An & Gower, 2008).

2.6.2. Sourcing and Balance. The idea of balance is generally assumed to be a cornerstone of the journalism profession (Clarke, 2008). Traditionally it is conceptualized that a journalist should give two sides to every story as a means of providing the public with impartial analysis (Harcup, 2009; Rottwilm, 2014). However, the digital communications revolution of the 21st century has had an impact on both producers and consumers of media and thus the conceptualization of balance.

The BBC (2007) defines impartiality as giving the public “a fair and informed view of events and issues, in order to let the audience make up their own mind” (p.19). While the idea of a “fair and informed view” seems like a plausible way to conceptualize balance, this can be problematic when you consider the idea of false balance. When reporters give equal weight to both sides of an argument, even when one is factually incorrect, this is considered false balance (Cohen-Almagor, 2008; Ward, 2009). This phenomenon of false balance has been expanded upon by Kovach and Rosenstiel (2007), who argue that, the formulaic approach to balance that tends to measure it by “how many words or minutes are devoted to each side” (p. 77) has in

fact distorted its purpose. While there are often more than two sides to every story, Kovach and Rosentiel (2007) caution that, “sometimes balancing them equally is not a true reflection of reality” (p. 77). Ultimately when defining balance, especially in light of controversial health risks such as VPD outbreaks, the journalistic norm of balance must be approached cautiously.

Research supporting this approach stems from Clarke (2008), who used British and American newspaper coverage of the autism-vaccine controversy (AVC) as a case study to explore the topic of balanced reporting. Clarke (2008) concluded, by covering the perspectives of both supporters and skeptics of a link to autism in the interest of balance, “media discourse gave the impression that the epidemiological evidence was uncertain and a potential relationship was plausible” (p. 79). While balance may be a championed traditional journalistic norm, in some health situations it can have dire effects.

The types of sources that get used by journalists are explicitly linked to the concept of balance. Using the UK as a backdrop to understand sourcing and expertise, Boyce (2006) explored the use of expert-sources and sources in the AVC. Following her media analysis, Boyce (2006) uncovered that, “sources were not necessarily selected for their expertise or knowledge in the area of vaccinations or autism” (p. 895). For example, “anti-MMR parents were not presented as ‘ordinary voices’ but were often juxtaposed with scientific experts who were put into the position of answering parents’ claims that the MMR vaccine had caused their child’s autism” (Boyce, 2006, p.896). Boyce (2006) urges that both journalists and academics need to question how expertise gets used in reporting, as journalist’s selection and presentation of experts has the ability to skew and further distort the sensitive issue.

New conceptualizations of balance are constantly being debated in the journalism industry, as balance or impartiality influences how content is perceived by readers. Overall, the

essence of the findings from the 2007 BBC report was that no longer can we simply present one view on a topic and then find a concise alternative to that view. Instead, the current media environment means that there is a 360-degree range of opinions. However, when discussing health issues, Clarke (2008; 2013) cautions that there is the potential that in striving to achieve balance we may jeopardize accuracy. Boykoff and Boykoff (2004) argue that balanced reporting on an issue as a means of ensuring quality reporting can in fact produce a disconnect between media and scientific discourse. Journalists can end up giving an impression of uncertainty when in reality there is none—such as in the case of AVC—and thus “elevate a fringe group to a high-profile status, or suggest that opposing perspectives are equally well-supported by evidence” (Clarke, 2008, p.80).

The works of Boyce (2006) and Clarke (2008) demonstrate that understanding who is being sourced—whether that be the everyday citizen or a medical professional—is crucial. Given that the reporting failures of the AVC have been well researched and documented (Boyce, 2006; Clarke, 2008; Clarke, 2013; Larson et al., 2011), whether there has been a greater consciousness of the effects of false balance in health risk situations, such as the BC measles outbreak, warrants further exploration.

2.6.3. Mobilizing Information

Mobilizing information can be defined as messages that, in theory, allow readers to act on existing attitudes and adopt health-protective or enhancing behaviors (DeSilva, Muskavitch and Roche, 2004; Lemert, Mitzman, Seither, Cook, Hackett, 1977). Mass communication scholars have explored this concept on both the individual level and societal level, with much of this research centering upon on political participation (McLeod, Scheufele and Moy, 1999; Scheufele and Shah, 2000). However, more recently the concept of MI has been extended to

the field of health communication (Clarke, 2010; Cohen, Caburnay, Luke, 2008; Holton et al., 2012; Hoffman-Goetz and Friedman 2005; Kensicki, 2004).

According to Lemert (1984), there are three types of MI at the individual level:

1) *locational* information, which provides details about the time/place of an event, 2) *identificational* information, which provides names/descriptions of individuals involved, 3) *tactical* information which is the “closest analog to risk information, as it emphasizes a ‘what to do’ approach to providing guidance” (Lemert, 1984, p. 255). The presence of MI at the individual level will be the focus for this study, as from a health perspective, “such information can empower people to adopt risk-reducing and/or health-promoting behaviors through higher levels of self-efficacy (i.e., the perceived ability to change behavior)” (Clarke, 2010, p. 614).

In the context of vaccination, Clarke (2010) argues that, “media can provide similar types of mobilizing information analogous to political participation, even though the outcomes (vaccine decision-making versus voting, for example) are different” (p. 613). Ultimately, when MI is not provided by the news media and controversies are merely reported on there can be dire effects. In the case of the AVC for example, health officials have argued that because the news media failed to provide MI, parents and other concerned individuals were unable to make informed decisions regarding vaccination, such as assessing risk and benefit and deciding whether or not to immunize themselves or others (i.e. children) (Clarke, 2010; Reyna, 2011). Thus, understanding the presence and frequency of MI is an important objective of this study.

2.7. Theoretical Framework

2.7.1. Agenda Setting. While there has been an emergence of new media in the past decade, traditional print news media continues to play a dominant role in setting the agenda of what is ‘newsworthy’. Agenda setting describes the “ability [of the news media] to influence the

salience of topics on the public agenda” (McCombs & Reynolds, 2002, p.2). In other words, if an issue like VPD outbreaks are covered frequently and dominantly in the news media, the audience will likely regard the issue as more important. As Arroyave (2012) asserts, “media can promote the discussion of certain health topics by placing them on the public agenda over others” (p.195). Further, given that the general public considers news media to be a major source of medical and health information (Parrot, 1996), understanding how the BC outbreak is framed in the news article sample—i.e. who gets blamed—is of great importance.

While perceptions will not be tested in this research, it is vital to comprehend that what gets deemed newsworthy can be potentially influential in shaping perceptions. This understanding of agenda setting supports the importance of further understanding the framing of VPD outbreaks as the following study seeks to do. As Payne and Schulte (2003) argue, “mass media agendas and health communication objectives can be authoritative allies or forceful foes when it comes to supplying the public with accurate and timely health information” (p.124). Therefore given the established agenda-setting function of the news media, it is important to unpack the framing techniques employed within the coverage of the BC measles outbreak.

2.7.2. Framing Theory. Framing theory suggests that how something is presented—the frame—can influence the choices people make (Entman, 2007). Framing, as Entman (1993) observed “is to select some aspects of a perceived reality and make them more salient in a communicating text” (p.52). A frame can affect an individual “by stressing certain aspects of reality and pushing others into the background—it has a selective function” (Lecheler, de Vreese & Slothuus, 2009, p.186). As a result of framing, certain issues, attributes, judgments, and decisions are suggested over others (Sheufele & Shah, 2000).

Framing theory is frequently employed in communication research (Arroyave, 2012; Bryant & Miron, 2004), and will be employed in this research to explore how certain individuals are being ‘blamed’ for the outbreaks, what types of sources are being used in discussions of outbreaks, and what types of MI, if any, are present in the news articles, as well as the general tone of the news articles. Thus, this analysis will focus on the selective function of framing which suggests certain issues over others.

Ultimately, in the context of VPD outbreaks, understanding how the outbreaks are framed in the media is vital as news framing of health issues has also become a source of misrepresentation (Hayes et al., 2007). Misrepresentation of health issues like vaccination, has the potential to skew perceptions of the public and shift attitudes towards complacency or opposition. As Arroyave (2012) notes, “how health issues are portrayed or approached in the media may either facilitate the development of favorable public opinions or incite negative sentiments regarding related public health policies” (p.195).

Recently, scholarship has begun to distinguish between frames in thought and frames in communication (Berinsky & Kinder, 2006; Borah, 2011; Chong & Druckman, 2007; Dorfman, Wallack, Woodruff, 2005). While “both are concerned with variations in emphasis and salience” (Druckman, 2001, p. 228) surrounding a topic, “the former refers to an individual’s cognitive processes around understanding and making decisions on an issue, while the latter reflects how media content is shaped and presented” (Berger, 2012, p. 18). For the purpose of this study, the focus will be upon frames in communication. Thus, in a similar vein to previous research (Holton et al., 2012), this research focuses on the structural or descriptive element i.e. the way frames appeared in news coverage as opposed to their level of influence on readers. Identifying what frames exist is the first step in understanding the issue at-large.

2.7.3. Risk Communication. Risk communication is “an approach to communicating with the public about issues that are a real, suspected, or potential threat to their health and safety, or to the environment” (Hoffman-Goetz et al., 2014, p. 150). Risk communication encompasses a two-way process, with active participation from both the sender and the audience (Aakko, 2004). A prominent scholar in the field, Sandman (1987), suggests that risk is made up of two factors: hazard (how much harm the risk is likely to do) and its outrage (how upset the risk is likely to make people). Depending on the distribution between hazard and outrage, different approaches to risk communication should be taken. In terms of disease outbreak risk communication, Sandman (2007) suggests communicating often requires immediate action given the potential for disease to rapidly spread. However, vaccination-related issues present many risk communication challenges (Ball, Evans, Bostrom, 1998).

Although the news media are a significant channel through which vaccine communication takes place (Leask & Chapman, 2002), they can also be a misleading and fear inducing resource. As Hoffman-Goetz et al. (2014) argue, “Media headlines identifying threats can be confusing, anxiety producing, and frightening” (p.149). For example, officials have argued that in the context of the AVC, “media coverage further compounded an already worrisome situation” (Clarke, 2010, p. 621). As the AVC demonstrates, media are not always a reliable source for providing risk information. Yet, given that many people obtain health risk information pertaining to public health issues from newspapers (Hoffman-Goetz et al., 2014), understanding how these issues are framed is crucial to risk communication research.

In risk communication, the perception of risk also plays a major role. As cultural anthropologist Mary Douglas (1992) argues, issues of morality and blame are central to the understanding of risk. Douglas (1992) describes notions of risk in modern societies as being

part of a politicized ‘blaming system’. In this system, ‘whose fault?’ is the first question. Further, Abraham (2009) suggests that attributing blame is salient in disease outbreak, and “this has consequences for the kind of risk and outbreak communication that will succeed in reaching and convincing the public” (p. 605). A major component of this study is to examine blame attribution and the potential consequences. Thus risk communication is an effective lens to unpack attribution in the context of disease outbreak, as how the news media frames the measles outbreak in BC has the potential to impact how citizens perceive the risk of VPD outbreaks i.e. whether citizens see it as something important to pay attention to and vaccinate against, or a controversial and unsupported claim. Aakko (2004) notes that the “ability to communicate effectively about risk is emerging as a high property for public health officials” (p. 25). Thus this study seeks to further understand how the news media convey health risk, making risk communication a vital element to guide the discussion section of the present study as well as providing suggestions for public health practitioners.

2.8. Research Questions After reviewing the relevant literature, the research questions for the content analysis of the 2014 BC measles outbreak are as follows:

- 1) How are vaccine-preventable disease outbreaks being framed by the news media?
- 2) A) Who is blame being attributed to for the measles outbreaks? (i.e. parents, doctors, public health, travel)
B) What attribution of blame is dominant?
- 3) A) Who are the sources used in discussions of the measles outbreaks?
B) Who are the sources used to assign the blame? (I.e. are ‘blamers’ experts or ordinary opinions)
- C) Do sources used in coverage present factual information or opinion?
- 4) A) Does the news article provide any mobilizing information on the outbreak?
B) If so what type? (identificational, locational, tactical)

3. Methodology

3.1. Research Design

A mixed method content analysis has been implemented in this research to explore the framing of the BC measles outbreak in the news media. Content analysis has been selected as it is a popular method for analyzing data in communication studies and is an unobtrusive technique, thus minimizing ethical considerations (Berger, 2014). Holsti (1968) broadly defines content analysis as “any technique for making inferences by systematically and objectively identifying special characteristics of messages” (p.608). It is important to note that content analysis “tells us what is in the material being studied, not how it affects people exposed to this material” (Berger, 2014, p.233). While historically content analysis was conducted from a quantitative approach, in recent years, content analysis has been argued to have the potential for both a qualitative and quantitative approach (Creswell, 2013). Thus employing a content analysis has been selected, as it enables the researcher to analyze the data from both a quantitative and qualitative perspective.

Specifically, an explanatory sequential mixed methods design has been selected as it allows the researcher to collect quantitative data in the first phase, analyze the results and then use those results to help inform the qualitative phase (Ivankova, Creswell, Stick, 2006). The overall intent of this design “is to have the qualitative data help explain in more detail the initial quantitative results” (Creswell, 2013, p. 224). For the purpose of this study, both manifest and latent content have been examined, a more preferable way of conducting a content analysis (Berelson, 1952; Berger, 2014). Manifest content was counted looking for blame attribution, sourcing, and MI. Latent content was examined in the open coding phase where the researcher explored themes and patterns that emerged in the tone of the articles.

3.2. Role of Researcher

As the researcher, I do not have any insider knowledge of newsroom routines in the two newspapers being examined. Nor am I overly familiar with the Fraser Valley and the socio-political dynamics. Thus, the research will provide an outside view of the situation and not a backyard view. However, as someone who believes vaccination is an important public health development, I have some bias in seeing anti-vaccination efforts as harmful and misleading. Following a strict data collection analysis procedure and validation strategies in line with the content analysis methodology minimizes this bias to provide a fruitful study of the topic.

3.3. Data Collection

The data collection for an explanatory sequential mixed methods design occurs in two distinct phases, with rigorous quantitative sampling in the first phase and purposeful sampling in the second qualitative phase (Creswell, 2013). The explanatory sequential approach allows for the creation of two data sets, with one building upon the other (Ivankova, Creswell, Stick, 2006). According to Berg (2009), in order to ensure objective analysis of messages conveyed in the data being analyzed, one must create and strictly follow a criterion of selection. The criterion of selection must be formally established before the actual analysis of data occurs (Berger, 2014), in doing so it helps to ensure reliability and validity of the findings, two crucial elements of a content analysis. The criterion of selection for the present study is below.

- Must be an English newspaper article or editorial published in the *Vancouver Sun* or *The Province* between March 1st-May 24th 2014 (85 days).
- Must be retrieved using the reputable database Factiva using the keyword “measles”.
- The article must have specifically referenced the 2014 measles outbreak in British Columbia.
- In discussions of blame attribution, attribution must have been contained within at least one paragraph or a minimum of two sentences.

- In discussions of mobilizing information, the MI must have pertained to the individual level. A decision was made by the researcher in consultation with her supervisor not to code basic information such as the symptoms of measles or a call to vaccinate as MI. While this information is important, unless the article explicitly states what to do and/or where to go it was not coded as having MI present.

Due to the limited scope and focus of this research, news briefs under 100 words (4) have been excluded from the sample. This decision was made after reviewing the articles and concluding that, news briefs under 100 words presented primarily factual information and little analysis on the topic. Letters to the editor (8) have been excluded from the sample, as they were citizens, not journalists, writing into the newspaper to comment on the topic and provide a personal response. Any duplicate articles or articles not pertaining to the BC measles outbreak were also excluded. As a result, the final sample for the study is 31 articles (n=31). Of the sample, 18 articles were published by the *Vancouver Sun*, and 13 articles were published by *The Province*.

3.4. Data Analysis Procedure

In using Krippendorff's (2004) five different types of coding units to guide the study, both thematic and referential units were selected for analysis. The referential quantitative units focused on understanding blame attribution, source, and MI utilized in the data set and were counted and recorded in the coding checklist found in Appendix B. The thematic units emerged throughout the second qualitative phase of the analysis as data was continuously re-read, namely looking to uncover any patterns in the tone of the news articles. The debate surrounding mandatory vaccination policy emerged as a major thematic unit following the qualitatively analysis. Related to this theme were provincial policy comparisons and the state of immunization record keeping in BC. The data analysis steps taken in the present explanatory sequential mixed methods content analysis are outlined below.

1) After using the Factiva database to collect the news articles based upon the above criterion of selection, data was organized in chronological order in preparation for analysis (a complete list can be found in Appendix C). During this time, open coding was conducted. As part of the open coding phase, any articles not meeting the selection of criteria were removed leaving a final sample of 31 news articles (n=31).

2A) According to the guidelines for conducting a content analysis (Berger, 2014; Krippendorff, 2004), general categories for the quantitative analysis were established in advance. The categories of analysis are based upon the codebook from Holton et al. (2012). Throughout the quantitative coding process, categories were modified as necessary and the sample was re-read using the updated guidebook (Appendix A) and checklist (Appendix B).

2B) The finalized coding checklist (Appendix B) was consulted when reading each article in the sample and required information—i.e. date of the article—was recorded on the checklist.

2C) All articles were then re-read and cross referenced to the completed checklist to ensure the checklist accurately portrayed the information present in each article.

2D) The results from the quantitative inquiry were then analyzed with the number of entries in each category being counted for descriptive statistics to allow for the demonstration of magnitude (Berg, 2009). This information was then used to guide the qualitative analysis.

3) In the second phase of open coding, the news articles were then read from a qualitative perspective looking for themes in tone that emerged from the data. Codes that emerged pertaining to the tone of the articles were then organized into precise categories. These categories were then re-read to see if any categories were too broad or too narrow,(Berg, 2009).

4) Following this protocol, the researcher conducted an analysis of the qualitative materials, as sorted into various categories seeking patterns. A common protocol is that “a minimum of three

occurrences of something can be considered a pattern” however “no apparent pattern is a pattern” (Berg, 2009, p. 225). The qualitative findings respond to RQ1. After reading through the sample, three inter-related themes emerged from the data in discussion of the outbreaks.

5A) In order to determine the tone of a news articles in the first theme (mandatory vaccination policies), the language employed was coded as either being positive and for creating such policies, negative and against or skeptical of such policies, or neutral and providing no opinion on the policies, other than basic factual information.

5B) News media references to other provinces, namely Ontario and NB, with mandatory vaccination policies were then coded. Ultimately, these comparisons were a framing tool used by the news media to as further suggesting that mandatory vaccination policies were a positive development for BC to consider.

5C) Finally, a general observation was made that the news media framed the state of the immunization record keeping system in BC as inefficient and in some cases, ineffective.

6) Once the coding process was complete and the results were analyzed for the quantitative and then the qualitative phase, interpretation follows the form of “first reporting the quantitative, first-phase results and then the qualitative, second phase results” (Creswell, 2013, p.225).

3. 5. Delimitations

The scope of the research has been limited to exploring the news coverage of the measles outbreak in BC from March 1st-May 24th 2014. While there have been other measles outbreaks in Canada in the past five years, none have been as large as the BC outbreak with the exception of the 2011 measles outbreak in Quebec. Quebec has not been selected for analysis as the majority of news coverage is in the French and thus presents language limitations for the researcher. As outlined in the literature review, extensive literature exists exploring the AVC

controversy and subsequent news framing. While the MMR-controversy will not be the principal focus of this study, measles has been selected, as the disease is often associated with the controversy and thus has the potential to influence framing of the outbreaks. For the purpose of this study, two local daily newspapers the *Vancouver Sun* and *The Province* were selected due to their 1.8million readers per week (Newspapers Canada, 2012).

3.6. Validation Strategies

It is important to identify the procedures that were taken in this study to validate the findings and ensure trustworthiness. Krippendorff (2004) stresses that, one must be able to validate content analysis *in principle*. According to Berg (2009), in order to ensure objective analysis of messages conveyed in the data being analyzed, one must create and strictly follow a criterion of selection. The criterion of selection has been formally established above in the data collection section. In doing so, this research technique ensures findings that are replicable, and thus valid. As well, the coding scheme for the research is based upon the work of Holton et al. (2012) and was revised independently by two professors at the University of Ottawa, thus determining inter-coder reliability. It is also important to note that the quantitative portion of the coding was conducted first to provide a more objective overview of the topic. Secondly, the qualitative portion of the coding was conducted. This way, the objective quantitative approach is complimented by in-depth study provided by the qualitative approach. By using a combination of predetermined and emerging codes, this study provides a balanced approach to the topic and enables the researcher to minimize bias (Ivankova, Creswell, Stick, 2006). Overall collection of the data using both a quantitative and qualitative approach allows for more concrete and in-depth findings.

4. Findings

The 31 news articles coded in this research originated from the *Vancouver Sun* (58%) and *The Province* (42%). Of the sample, 15 articles were published in March 2014, 11 articles in April 2014, and 5 articles in May 2014. The coverage peaked at the beginning of the outbreak (March 9th-March 16th, 9 articles) and the end of the outbreak (April 27th-April 30th, 6 articles). It is important to note that there was no reporting on the issue until the Fraser Health Authority officially declared the measles outbreak on March 8th 2014. Following May 6th 2014 the coverage of the outbreak in the *Sun* and *The Province* sharply declined. For the purpose of the finding section and the discussion section, each news article will be referred to by their chronological number, a full list can be found in Appendix C. In the following section, quantitative results will be discussed first in relation to corresponding research questions. Following the quantitative results, the qualitative results from the study will then be analyzed.

4.1. Blame Attribution

When searching for who blame was attributed to for the BC measles outbreak, the researcher coded first for peripheral categories of blame (RQ2A), and subsequently coded for the dominant attribution of blame (RQ2B) found in each news article. For the peripheral blame, several categories could be chosen for a single news article, however for dominant attribution (RQ2B) only one category of blame could be selected.

4.1.1. RQ2A: *Who is blame being attributed to for the outbreak?*

The results of the study demonstrate that there were 8 different categories of peripheral blame attribution (Graph 1, Appendix D): religion (20.78%), low immunization rates (19.48%), parents (14.28%), travel (12.99%), Chilliwack school (11.68%), anti-vaccination movement (7.79%), immunization safety (7.79%) and other individuals (5.17%). The news

media framed religion and low immunization most frequently as to blame for the measles outbreak, followed by parents and travel. When travel was blamed, it was in relational to the Netherlands/Holland where there was a relationship between the church at the focal point of the Fraser Valley measles outbreak and churches in the Netherlands. The Netherlands has undergone several measles outbreaks, as some religious leaders believe in the same ‘natural immunity’ to diseases as religious leaders in Fraser Valley.

4.1.2. RQ2B: *What attribution of blame is dominant?*

Similarly to RQ2A, coding for the dominant attribution of blame demonstrated that the news media overwhelmingly framed religion (40.93%) as to blame for the BC measles outbreak. A choice was made by the researcher to merge Chilliwack school (12.9%) and religion (29%) together under the broad category of religion. This decision was made as whenever blame was placed on the Chilliwack school, it was either indirectly or directly referenced as a religious school where religion was the primary factor for opposition to vaccination and the subsequent measles outbreak. For example, in article #11: “The outbreak began to pick up speed in early March, as the number of people infected jumped from two students at a religious school in Chilliwack to dozens of suspected cases among fellow students.” However, religion was also generically blamed, “In BC’s outbreak, one spokesperson for the unvaccinated advanced the theological proposition that having ones children immunized would be interfering with God’s purpose” (#20). This spokesperson was Reverend Adriaan Gueze of Chilliwack’s Reformed Congregation of North America church that “sees vaccines as an interference with God’s providential care” (#7). Given that Fraser Valley is considered British Columbia’s bible belt, it is thus not unsurprising that religion

played a role in opposition to vaccination and was framed as the dominant attribution of blame in almost half the news articles.

Following religion, the second most likely dominant attribution was to blame parents (22.58%), suggesting “The number of parents willing to decline vaccinations for their children is good evidence of how effective those vaccines are: We have forgotten how serious infections can be” (#27). Another article claimed, “Suddenly we’ve got apparently rational people convinced that vaccinating their kids is dangerous” (#20). Low immunization rates (16.13%) also received blame for their role in the outbreak. Graph 2 details all the dominant attributions of blame and can be found in Appendix E.

4.2. Source and Expertise

The sources employed in the coverage, as well as the type of information they provided when attributing blame, were also explored in this study. This research used the BC measles outbreak as a case study, thus different sources were broken down in to as exact categories as possible.

4.2.1. RQ3A: *Who are the sources used in discussions of the measles outbreak?*

In the study sample, there were 11 different categories of sources that became apparent in discussions of the measles outbreak (Graph 3, Appendix F). Operationalized definitions for these sources can be found in Appendix A. The categories were as follows: Fraser Health Authority (39.52%), Health officials (17.8%), Medical/Science researchers (9.5%), Medical/Science organizations (8.3%), parents (7.5%), government (4.74%), Reverend Abel Pol of Chilliwack’s Canadian Reformed Church (pro-vaccine) (4.34%), Reverend Adriaan Geuze of Chilliwack’s Reformed Congregation of North America (anti-vaccine) (3.55%), the Public Health Agency of Canada (2.4%), US Health Officers (1.18%), and the media (1.18%).

Overwhelming Fraser Health Authority was sourced by the news media (39.52%), followed by

other Health officials (17.8%). Other important sources were Medical/Science researchers (9.5%) and organizations (8.3%). It is important to note that while these sources have been segregated, they all fall under the broad category of medical and science sources.

Interestingly, only two news articles (#29, #30) interviewed parents for their perspective on the outbreak: “We were so scared. I just couldn’t believe this was happening to him because someone at his school wasn’t vaccinated” (#30). The remainder of the articles overwhelmingly relied on Fraser Health Authority (39.52%) or other health officials (17.8%) to provide information on the measles outbreak. Potential consequences of this reliance will be expanded upon in the discussion section.

4.2.2. RQ3B: *Who are the sources used to assign the blame?*

After coding to see the general sources used in discussion of outbreaks, news articles were then coded for sources that were quoted or cited *and* linked to the attribution of blame. The findings demonstrate that Fraser Health Authority (36%) was the most frequent source used to assign blame, “A Fraser Health official said it’s suspected that the current measles outbreak was brought to BC by a family who travelled to Holland earlier this year” (#3); “Lee [Fraser Health Authority Doctor] blamed misconceptions about immunization safety as well as philosophical and religious resources” (#4). Medical and science researchers (13%) such as epidemiologists were the next most likely sources to be linked to attributions of blame. Although a variety of science/medical sources have been individually divided in Graph 4 (Appendix G), when we couple together the five categories pertaining broadly to science/medicine we see these sources were dominantly (71%) used in blame attribution.

Further, it is interesting to note that parents (2%) were sourced minimally and thus rarely linked to attributing of blame, despite being generally blamed 14% (RQ2A). No child or

adult with measles was ever cited or quoted in the sample. As RQ2B revealed, religion was the dominant attribution of blame (40%) in the sample. Thus it is also significant to note that pro-vaccination Reverend Pol and anti-vaccination Reverend Geuze were only sourced and linked to the attribution of blame in a total of 10% of the sample.

4.2.3. RQ3C: *Do blaming sources used in coverage present factual information or opinion?*

This study was interested in whether sources linked to attribution of blame presented factual information or opinion when blaming. It appears that medical/science researchers, organizations and other medical bodies like Fraser Health Authority overwhelmingly used factual information when attributing blame (Table 1, Appendix H). Notably, the government equally used fact and opinion when attributing blame, as did other health officials.

Those sources that mainly utilized opinion when attributing blame were the Reverends and parents, in the few articles they were sourced. Overall, in the research questions pertaining to sourcing we see that medical/science sources were pre-dominantly relied upon and thus were also pre-dominantly linked to attributions of blame. Given that these sources, such as the Fraser Health Authority, are turned to provide answers in disease outbreak situations, placing blame is part of that function.

4.3. Mobilizing Information

4.3.1. RQ4A: *Does the news article provide any mobilizing information on the outbreak?*

The final quantitative stage in this research was to code the data for the presence of mobilizing information (MI). Graph 5 in Appendix I displays that MI was present in 39% of the news articles, and was not present in 61% of the news articles. While the presence of MI was not found in the vast majority of news articles, present in 26 of the news articles was some form of informational MI. Broadly speaking the researcher considers informational MI a

description of the disease or a call to vaccinate without providing any actual information of how to do so. A description of the disease was provided in 61% of the news articles (“Measles is a highly contagious disease and potentially fatal viral infection characterized by a rash, high fever, runny nose, coughing and tiny spots inside the mouth” #4) and a general call to vaccinate was also remarked in 61% of the news articles (“Don’t mess with measles or other preventable disease-immunize you kids” #18). Of the sample, 16% had no informational MI present. Notably, 10% of the news articles had no MI and no informational MI present. Asking the readers to vaccinate or giving a description of measles without providing a location to vaccinate or a contact name or number to find out further information, demonstrates that informational MI is lacking in its mobilizing capabilities, having a mainly descriptive function.

4.3.2. RQ4B: *If so what type? (identificational, locational, tactical)*

Of the news articles with MI present (39%), locational MI was the most frequently used at 47%. An example of locational MI was found in article #6, “The health authority will set up vaccination clinics in Chilliwack and Agassiz early next week and distribute more measles vaccine to doctors and pharmacies in the Fraser East region”. Identificational MI such as “To find a clinic or check on recommended vaccination schedules, go to ImmunizeBC.ca” (#30) was present in 29% of the news articles with MI. The least frequent type of MI to appear in the sample was tactical information (24%). An example of tactical MI was given in article #9 which remarked, “If students who attended NE1 are unvaccinated, then we are asking them to stay home and not to return to campus before the 29th of March, when that will be the end of the likely period that they will develop measles” (Fraser Health chief medical officer Dr. Paul Van Buynder). Graph 6 (Appendix J) demonstrates the distribution of MI types amongst the 39% of the sample that had MI present.

4.4. Qualitative Findings: *How are VPD outbreaks being framed by the news media?*

Overall, the qualitative findings respond to RQ1. In keeping with the methodological protocol outlined above, the quantitative results from this study guided the qualitative inquiry. For the purpose of the qualitative analysis, three related themes appeared to be dominant: 1) mandatory vaccination policy debate, 2) provincial policy comparisons and 3) ineffective immunization record keeping. The themes were reoccurring in almost half (45%) of the sample. The quantitative analysis did not allow for this important pattern to be examined, thus it was of qualitative interest. As the quantitative analysis demonstrated, science/medical sources were the most frequently sourced (80%). As a result of this source dominance, it is not unsurprising that the discussion of vaccine policy would be a frame of interest. Given the reemergence of measles in Canada and the large outbreak in BC, discussions of how to regulate vaccination to prevent future outbreaks in Canada is an important topic to address.

4.4.1. Mandatory Vaccination Policy Debate

Other than blaming certain actors for the outbreak or explaining what to do if infected with measles, the quantitative results demonstrate that on the whole the sample lacked any MI at the individual level. Thus, discussions of mandatory vaccination seemed to be the only apparent solution to preventing future outbreaks, which would have to occur at the societal level. As mentioned in the methods section, the news articles that explored the mandatory vaccination debate were qualitatively coded as either having a positive, negative, or neutral tone. The coding revealed a positive tone towards implementing mandatory vaccination policies in 60% of the articles, a negative tone in 30%, and a neutral tone in 10% (Graph 7, Appendix K).

Over half (60%) of the news articles portrayed mandatory vaccination policies as a positive development to combatting outbreaks. Examples of this were seen with headlines remarking “Parents urging mandatory vaccinations in public schools” (#26). In this article it describes an online petition launched by parents asking Premier Christy Clark “to amend the public schools law to ensure parents provide proof they’ve vaccinated their kids before they attend public schools, except where exempted for medical, religious, or philosophical reasons” (#26). Further, in an editorial published in the *Sun*, the author remarked “British Columbia should make immunization mandatory for children attending public schools” (#5). Another article maintained, “The spread of measles through Western Canada...should be a call to arms. Schools and universities should require vaccination records before admitting students” (#27). While sentiments in favor of a mandatory vaccination policy were found in the majority of the sample (60%), there was an underlying tone in 30% of the articles suggesting mandatory vaccination policies may have a detrimental and polarizing effect.

A negative tone towards mandatory vaccination policies occurred in 30% of the articles. This negative tone came predominantly from authoritative figures. One article remarked, “B.C.’s health minister says the government won’t be forcing people to get a measles vaccination despite an outbreak in the Fraser Valley. Instead Terry Lake says the government hopes most people heed the advice of health officials and have their children vaccinated to protect the population” (#3). In another article, Lake remarked “That’s a very big step, when you’re forcing people to take treatments” (#4). Echoing these sentiments was BC’s chief public health officer Dr. Perry Kendall, who commented “Forcing parents to provide proof of vaccinations could backfire by causing some parents to ask for exemptions where previously they hadn’t” (#26). While the negative tone was apparent from medical authorities

in BC, these were normally followed up by the news media framing them in relation to provinces *with* mandatory vaccination policies.

4.4.2. Provincial Comparisons

Provincial comparisons were a framing tool employed by the news media to suggest mandatory policies could have a potential in BC. In the news articles pertaining to the qualitative analysis, 57% made references to other provinces in Canada where there are mandatory vaccination policies. After counting the articles in which provincial comparisons occurred (57%), the researcher then examined these references in depth. All comparisons made in the sample were inherently seen as further suggesting a positive tone towards mandatory vaccination policies. The researcher determined that the news media employed comparisons to Ontario and New Brunswick, as well as Manitoba as a means to demonstrate that mandatory policies are something BC should consider.

Provinces with mandatory vaccination laws such as Ontario, were framed as a good example of how to approach the vaccination issue: “Unlike BC, where there have been 400 cases of measles this season, there were 17 cases in Ontario this year, which Ontario health officials said proves mandatory vaccination is effective” (#26). Another article remarked, “While BC makes vaccination readily available for infants and school-age children, the province should follow the example of Ontario and New Brunswick, which require immunization for children entering school” (#5). The choice to frame mandatory vaccination policies in comparison to other provinces, suggests these policies are effective.

4.4.3. Ineffective Immunization Record Keeping

In the framing of blame attribution, the quantitative results from this study demonstrate that low immunization rates were blamed for the measles outbreak in 19% of the news articles

(RQ2A). While qualitatively reading the sample, a general observation was made that the low immunization rates could in part be attributed to the immunization tracking system. For example, Fraser Health Authority's Dr. Michelle Murti, remarked, "the low vaccination rates may partly be a function of poor record keeping. In BC, family doctors don't have the ability to enter public health data, so there is sometimes a delay before immunizations given by GPs are entered into the system" (#28). Further Dr. Meena Dawar, of the Vancouver Coastal Health Authority "attributes the relatively higher [immunization] rates in Richmond and Vancouver to better access to clinics and a strong working relationship between family doctors and public health units in tracing and recording immunizations" (#31). Nonetheless, there was a defensive tone amongst some authoritative figures when consulted on the issue. Fraser Health Authority defended its vaccination program claiming, "We know our vaccine program is working because if it were not, we would be seeing measles cases multiplying outside of this specific population" (#12). However, as the outbreak developed, it spread outside of Chilliwack and began to infect the general population.

Overall, the implicit and explicit tone regarding the current system of tracking immunizations in BC appears to be negative. Ineffective tracking has public health and risk communication implications, especially in an outbreak situation. When parents do not track immunizations it is difficult to determine if a child has had an important vaccination. Instead the current solution appears to be to just get another vaccine; "there's no harm in getting an extra dose of measles, mumps, and rubella vaccine if you're not completely sure" (#6- Monica Naus of the BC CDC). This is a somewhat problematic solution that presents potential implications to the health care system and perceptions of immunizations, which will be explored in the discussion below.

5. Discussion

In short, the findings from the present study demonstrate that immunization continues to be a contentious topic covered by the news media. This section will now explore the findings in light of current literature and risk communication theory.

5.1. The Dominant Blame Frame: Religion and Immunization

Religious resistance to immunization clearly demonstrates a need for public health officials to work closely with religious communities and monitor any potential outbreaks situations. As the quantitative findings from the current study suggest, religion was overwhelmingly (41%) the dominant frame of blame for the BC measles outbreak. The findings from this study are in line with previous literature that suggests religion has been influential in shaping vaccine decisions (Etkind, Leh, MacDonald, Silva, Pepper, 1992; Kennedy & Gust, 2008; Kulig, Meyer, Hill, Handley, Lichtenberger, 2002; Salmon et al., 1999; Shelton, Snavely, De Jesus, Othus, Allen, 2013). Before exploring potential implications of this frame, a contextual overview of the religious communities in Fraser Valley will be provided.

Fraser Valley East, where the measles outbreak occurred, is made up of the following communities: Abbotsford, Agassiz, Chilliwack, Mission, Hope and Harrison Hot Springs. Fraser Valley is considered BC's Bible belt, with Abbotsford alone having roughly 90 churches (MacQueen, 2012, para. 5). Chilliwack, which was the community where the outbreak originated, is home to the Reformed Congregation in North America (RCNA). This is a church with official ties to the Reformed Congregations in the Netherlands, also known as the Dutch Reformed Church. Travel between the Netherlands and BC, was confirmed by Fraser Health Authority as the reason why measles was first brought to the area. Following this, measles then began spreading rapidly amongst Fraser Valley East religious communities (Fraser Health

Authority, 2013b). Ultimately, the concentration of religion in Fraser Valley has resulted in the rise of some fundamentalist beliefs regarding vaccination.

Chilliwack's RCNA has the largest congregation in North America at 1,200 members, and is under the guidance of Reverend Adriaan Geuze. Geuze believes that, "We leave it in (God's) hands. If it is in his will somehow we get a contagious disease, like in this case the measles, there are ways, of course, to avoid this. If (we get sick), he can also heal us from it" (#7). It appears that these beliefs led to religion being blamed dominantly for the measles outbreak in Fraser Valley East, and the subsequent spread of 400 cases of measles through the region in less than 2 months. As was noted in the literature review, a vaccination rate of at least 95% is required to maintain herd immunity (John & Samuel, 2000). Chilliwack's Mount Cheam Christian school—which is governed by the RCNA and where the first cases of measles were reported—has a vaccination rate "of less than 10 per cent" (#31) and the general East Fraser region has rate between 60 and 70 percent (#2). Thus, it appears a great deal of blame was placed on these communities, in some cases vilifying them or making them appear foolish: "People who refuse to immunize their children against measles and other disease, either due to misguided views...or that God's will should prevail, are playing a dangerous game" (#18).

News frames function as the simplified versions of reality, "guiding audiences to recognize, locate, label, perceive, evaluate, and attribute intentional human actions and events" (Zheng, 2012, p. 8). In doing so, mass media does not only inform people of an issue, but it also has the potential to influence the way people think about these issues by constantly suggesting meanings and explanations of issues (Clarke, 1992; Gamson & Modigliani, 1989; Ma, 2005). While religion may have been at the forefront of the Fraser Valley measles outbreak, it appears that there are a plethora of issues that contribute to outbreaks that were not

as readily explored.

Simply blaming religion does not help us circumvent the public health issues it presents. Arroyave (2012) notes that journalists may emphasize certain aspects that make a story more attractive as a means to grab the attention of the reader. However, “this does not mean that such an approach will help the audience to understand the health issue and provide a clear orientation on that particular health topic” (Arroyave, 2012, p. 200). Religion—especially fringe or extremist views—is a controversial topic. As framing theory suggests, journalists use framing as a way to reduce the complexity of the story (Scheufele & Tewksbury, 2007). The present study exemplifies this understanding of framing, as it appears religion was a simplified and easy target to blame for the outbreak. While Reverend Geuze’s beliefs are based upon biblical interpretation, he nonetheless represents a religious sect that’s beliefs can have serious consequences for public health. As the findings from the present study suggest, there is a gap in fully understanding religious objection to vaccination. Blaming the individuals who subscribe to a certain religion without looking at what can be done to work with these communities can in some regards be seen as a public health failure. Thus, in moving forward, it is crucial to explore ways in which to work with these communities. As such some potential suggestions will now be outlined.

5.1.1. Suggestions for Public Health Practitioners and Communicators

1) Religiously Sensitive Vaccination Literature. A suggestion for public health practitioners whose authority covers religious communities with an opposition to vaccination is to create immunization materials that are religiously sensitive. Previous literature that studied members of the RCNA church in Southern Alberta concluded that “For the Dutch participants, their religious viewpoints do not allow them to accept immunization indicating a need for tolerance

for adherence to faith-based decisions” (Kulig et al., 2002, p. 111). While members of the RCNA are unlikely to start vaccinating, in the case of measles, a solution is to disseminate practical immunization materials to these communities. For example, pointing out the importance of isolating yourself or your children from the general population, monitoring the disease as it develops, as well as contact information should individuals in religious communities chose to vaccinate.

Furthermore, Shelton et al. (2013) who conducted a study of religion and the HPV vaccine, found that it is important to identify differences between religious groups, so that health messages could address the specific groups concern. While BC has a specific document for health authorities² for communicating about immunization hesitancy with parents, religious opposition to vaccination is only identified twice in the entire document. When religious opposition is discussed, it is in relation to vaccine ingredients like gelatin as some groups such as Jews and Muslims follow dietary rules that prohibit pork products found in gelatin. Nonetheless, there are no specific strategies outlined for practitioners when confronted with religious opposition. Expanding such documents to include more comprehensive coverage of religious opposition to vaccination and differences amongst religious communities could provide practitioners with necessary tools to communicate about vaccination.

2) Communication Skills Training. Research indicates that discussing vaccination, especially amongst religious groups, requires proper communication skills training (Langley & Naus, 2011). Leask (2002) argues that risk communication is more than a top-down supply of information, thus public health practitioners and communicators must be prepared to engage in dialogue with hesitant parents. Although some clinicians have decided to discontinue or have

² <http://www.immunizebc.ca/healthcare-professionals/immunization-communication>

considered discontinuing their provider relationship with patients who refuse vaccines, the American Academy of Pediatrics Committee on Bioethics “advises against this and recommends that clinicians address vaccine refusal by respectfully listening to parental concerns and discussing the risks of non-vaccination” (Omer, Salmon, Orenstein, deHart, Halsey, 2010, p. 1982). Thus, proper communication skills training for health authorities on religious opposition to vaccination, as well as general vaccination hesitancy is an ongoing and necessary public health initiative.

3) Harness Opinion Leadership Opportunities. Another suggestion for public health authorities is to encourage a dialogue amongst religious leaders. In their research, communication scholars Katz and Lazarsfeld (1957) studied the flow of personal influence, concluding that influences stemming from the mass media first reach opinion leaders, who in turn pass on that information to their every-day associates for whom they are influential. This theory is known as the two-step flow and its conceptualization of opinion leaders has been effective in previous health communication efforts dealing with religious influences. For example, efforts in India and Pakistan to increase polio vaccinations relied upon “systematic and sustained mobilization of community and religious leaders and influencers (e.g. local doctors, Imams)” (Orbregon, 2009). Efforts to engage influencers, such as religious leaders, were made in an aim to build public confidence and credibility in the Polio Eradication Initiative (PEI). In 2004, Muslim religious leaders in India were asked to participate in the polio campaign to convince resistant caregivers. These religious leaders succeeded in doing so in 87% of the cases in their coverage area (Orbregon et al., 2009). Similarly, involvement of religious leaders in in Pakistan’s North-West frontier province led to coverage of children in families refusing due to religious reasons to increase from 13% in August 2007, to 17% in

October 2007 (Orbregon et al., 2009). The work by Orbregon et al. (2009) demonstrates that involving religious leaders as spokespersons and using faith-based folk media—for example church announcements—is an incredibly effective way to reach community members.

Ultimately, managing stakeholder relations is an important principle of risk communication as it helps ensure “Coordinated, consistent messages and communication approaches that meet the needs of the stakeholders” as well as, “afford[ing] the opportunity to leverage the valuable resources and information that stakeholders can offer” (Public Health Agency of Canada, 2013, p. 27). The suggestion stemming from the present research to encourage the use of opinion leaders, is in line with a key risk communication principle that values stake holder relationships (Bostrom, Johnson, Fisher, Stoto, 1997; Leask, 2002).

While traditional views of risk communication have been focused on a need to better inform the public to reduce what is seen as ‘irrational’ thinking, modern risk communication theory suggests the importance of a more inclusive process (Leask, 2002; Sandman, 2007). This process is achieved through consultations with stakeholders, such as religious leaders, to ensure discussion of concerns about risk in an atmosphere where emphasis is placed on negotiation (Leask, 2002). Ultimately, opinion leadership has the potential to bridge the gap between religious-resistance to immunization, as opinion leaders can play a crucial role in the gaining trust of the community and potential acceptance. Thus, public health authorities should work to identify these opinion leaders in religious communities as a means to develop a mutually beneficial relationship and assist in the prevention of future VPD outbreaks.

5.2. Overcoming ‘False Balance’

The findings from this study suggest that news media have learned from previous misguided attempts at balancing articles with pro-vaccine and anti-vaccine sources. When

attempts to equally balance both sides of an argument—regardless of if one side is factually incorrect—the phenomenon of false balance transpires (Cohen-Almagor, 2008; Ward, 2009). In terms of vaccine media coverage, false balance previously occurred when a factually inaccurate study claimed a link between the MMR vaccine and autism, known amongst communication scholars as the AVC. Research supports (Boyce, 2006) that instead of accurately assessing the situation, the news media covered the link in lengths, creating a discourse in which anti-vaccine parents were not presented as ordinary voices, but instead juxtaposed with medical and scientific experts (Boyce, 2006). By consulting all sides of the story and giving the AVC a ‘balanced’ frame, the news media assisted in creating a discourse of doubt surrounding vaccine safety (Boyce, 2006; Burgess, Burgess, Leask, 2006). This discourse of doubt had real life implications. In England for example, as a consequence of media coverage “MMR-immunization rates fell from 94% to 75% and cases of measles increased” (Offit & Coffin, 2003, p.1).

The findings from the present study on the BC measles outbreak seem to demonstrate that a greater degree of accuracy has been taken when covering vaccination. For example, in response to RQ3A which looks at the different sources employed in coverage of the outbreak, when combining all medical and health sources we see that they were quoted or cited 80% of the time (Graph 3). In the case of the BC measles outbreak, it appears the news media took a greater degree of vigilance to ensure anti-vaccination sentiments were minimized and public health experts were primarily consulted for information on the outbreak. For example, actors espousing anti-vaccination sentiments, primarily Reverend Geuze, were sourced in only 4% of the sample. The findings from this study thus demonstrate an important advancement in immunization news media coverage.

It is also important to note that Andrew Wakefield was never explicitly referred to in the sample, and only implicitly referred to in three articles (#19, #27, #31). For example, one news article called it a “widely discredited study linking the MMR vaccine to autism” (#31), while another remarked “The British doctor who made the first, fraudulent claim linking vaccination with autism has been forbidden to practice medicine in the U.K” (#27). While it was suggested Wakefield’s study played a role in contributing to parental hesitancy on immunization, he was interestingly never linked with blame attribution for the outbreak. The minimal referencing to Wakefield, and the decision of the media to call it a ‘discredited study’ appears to further demonstrates a positive step forward for the framing of immunization in the news media.

Although the findings from the present study seem to demonstrate that medical/science sources used predominantly factual information when sourced (RQ3c), it is possible that complete reliance on these sources could be isolating for some readers. While being pre-cautious of framing a news article as supporting anti-vaccination beliefs, it is also important to ensure that there is some diversity in sources used. As Kata (2012) maintains, “only parents of fully vaccinated children trusted their physicians, pharmaceutical companies, or the government; others were distrustful and felt data provided to them was one-sided” (p. 3780).

Further, the findings from this study appear to demonstrate that parents were framed as dominantly to blame for the measles outbreak in 23% of the sample. Yet they were rarely sourced or cited, with only 2 articles (#29 & #30) from the entire sample interviewing a parent for their perspective on VPD outbreaks. These articles used the same parent, BC dad Jason Lawson, who made a plea for parents to vaccinate to prevent outbreak after his 10 year-old son contracted the disease while receiving chemotherapy. The inclusion of parental narratives

could be a highly effective approach for persuading audiences on the importance of vaccination, which will now be explored in further depth.

5.2.1. Suggestions for Further Improving Balance

1) Inclusion of Parental Narratives. A potential method in which to address the medical/science sourcing bias could be to consider including the narratives of pro-vaccine parents in news media coverage. Research suggests, simply providing information about immunizations may no longer be sufficient to convince hesitant parents (MacDonald & Finlay, 2013). Instead what is needed is “the dissemination of vital information by individuals with social influence, since these individuals have the natural ability to connect population members to each other and to influence social norms regarding immunization” (Goldberg, 2013, p.1399). Empathy and narrative, which parental narratives could highlight, are proven as two effective communication tactics for addressing immunization hesitancy (Larson et al., 2011). Similar to religious leaders, public health authorities could use pro-vaccination parents as opinion leaders with the potential to influence immunization decision making amongst their social circles.

A great example of parent narrative is found in a *Slate* news article written by journalist and mother Amy Parker (2014, January 6th) which details her experience with vaccination. Although Parker echoes sentiments similar to medical professionals, she does so in a way that is more accessible to readers by providing her perspective as a patient and a worried parent. Providing such narratives in a pre-packaged form for the news media could help address the economic and time constraints journalists are under, while ensuring important communication goals are met.

However, news media and public health authorities must be cautious when including parental narratives. While parent’s views can humanize a story, a diligent effort must be made

to ensure they do not spread false information, which could derail public health initiatives.

While it is not within the capacity of the present research to test the impact of these narratives, future research could examine the effects of the inclusion of parental narratives in health news coverage, as well as, the effects of heavily relying upon health and medial sources upon immunization perceptions.

5.3. Lacking Mobilizing Information

Mobilizing information (MI) is an important aspect of health news coverage, as it “enables people to act on existing ideas and motivations” (Holton et al., 2012, p. 696).

Nonetheless, the findings from this study seem to demonstrate that it continues to be overlooked, with MI available in only 39% of the news articles in the sample. This finding is in line with previous research that demonstrates there is a general lack of MI in health news (Arroyave, 2012; Holton et al., 2012). The most common form of MI in the current study was locational, while the least common MI in the sample was tactical. These finding appear to support previous research, which finds that tactical MI is the least likely to appear in health news coverage (Holton et al., 2012).

In present study, it appears medical and science experts were overwhelmingly quoted or cited in news articles (80%- Graph 3). Nonetheless, MI was sparse in the coverage of outbreak. As well, it seems there were gaps in sourcing throughout the news articles in the present study. Information pertaining to measles such as symptoms, how many people it kills etc. were not directly cited. As research suggests, source credibility in discussions of vaccination is important to new parents (Ekos Research Associates, 2011; Logan et al., 2010). Thus, saying what a disease is or how it kills without providing support could leave some readers skeptical.

To maintain public confidence, Goodyear et al. (2007) argues that, “health planners constantly need to develop and review their health promotional messages and relationships with the media” (p.768). Using the case of the BC measles outbreak, suggestions to both combat the lack of MI and improve the quality of MI in health news coverage will now be explored.

5.3.1. Suggestions for Improving Mobilizing Information

1) Public Health-Media Partnership. In light of current literature, the present study “does not suggest that journalists should, in effect, become public health practitioners tasked with persuading people to be vaccinated” (Clarke, 2010, p.622). While media most certainly have an agenda setting function, Clarke (2010) argues that the media should be seen as a resource through which people become aware of an issue, strategies to address this issue, and potentially be motivated to take action. Thus, a suggestion to combat the lack of MI in news media coverage could be a partnership between media outlets like the *Vancouver Sun* and *The Province* and public health authorities. It is not the sole responsibility of one side or the other to ensure MI is provided. Instead a partnership between these institutions could enable public health authorities to provide accurate health information to the news media, which the news media could in turn effectively frame into their news coverage. MI was lacking from the sample and therefore a few mobilizing message examples will now be outlined.

2) Mobilizing Messages. Mobilizing messages could come in the form of including links to websites with further immunization information such as immunizebc.ca. [Immunizebc.ca](http://immunizebc.ca) is an incredibly helpful website that provides BC specific information on immunizations, and allows parents to track their child’s immunizations. Other mobile health devices that could be included in coverage could be the free immunization app offered by the federal government

called ImmunizeCA. As well, coverage on how to subscribe to free text reminders of vaccine appointments from BC health authorities could be an important addition. Finally, National Immunization Awareness Week occurred from April 26th to May 3rd 2014, just as the measles outbreak in BC was being declared over. Interestingly, only one article in the entire sample mentioned the important week. In future, this week could be a great opportunity for a media and public health partnership to launch important coverage on immunization and disease prevention through a series of events, speakers etc.

In sum, these are just a few suggestions that could enhance the quality of MI provided in news coverage and ways in which a future media and public health partnership could tap into existing opportunities. If these opportunities are not seized, there is the potential of serious risk for public health and the spread of disease.

5.4. Mandatory Vaccination Policies & Risk Communication Implications

5.4.1. Vaccination in the Canadian Context. Compulsory immunization laws of any kind are quite rare in Canada (Mah, Guttman, McGeer, Krahn, & Deber, 2010). In an overview of the legal framework of vaccination in Canada, the literature review in the present study outlined that two provinces have mandatory vaccination policies: Ontario (1990) and New Brunswick (1997). For these two provinces, vaccination legislation applies specifically to school age children. In Ontario and New Brunswick, this legislation gives authority to send children home or suspend them from school for not being up-to-date on their childhood immunizations determined by each province. Nonetheless, parents in these provinces have the ability to legally exempt their children from an immunization citing conscience, religious, or medical grounds (Public Health Agency of Canada, 2012). Manitoba has a vaccination policy that

legislates that children without measles vaccination can be sent home from school but only during outbreak situations.

The major qualitative finding from the present study was the uncovering of what appeared to be a positive tone (60%) when discussing such mandatory vaccination policies in the Canadian context. While there are no such policies in BC, the news media framing of policy discussions seemed to suggest they are something warranting consideration. Further, comparisons to other provinces with mandatory school-age vaccination policies were also a prominent qualitative finding in the present study. These comparisons were often framed to suggest that BC was missing out on important policy developments. Interestingly, only authoritative figures such as the BC Health Minister and a Fraser Health Authority doctor were openly against such policies. Ultimately, such policies present a number of issues in relational to rights and risks which will now be outlined.

5.4.2. Balancing Individual Versus Community Risk. Mandatory vaccination policies often hinge on an ethical debate regarding risk. As Clarke (2010) maintains, “there is the sometimes-uneasy relationship between the ‘public good’ they [immunizations] provide and an individual’s right to decline a medical intervention” (p. 611) Thus, the question often centers on the individual risk versus community risk when making vaccination decisions. Feikin, Lezotte, Hamman, Salmon, Chen, Richard (2000) assert that the decision to forgo vaccination must balance individual rights with social responsibility for the community. In exemplifying this argument, Feikin et al. (2000) remark, “If all vaccine-preventable diseases were confined to the individual (eg, tetanus), the consequences of forgoing vaccination would fall only on the child whose parents make the decision” (p. 3150). However, most VPD are spread from person to person. Thus, “the health of any individual in the community is intricately dependent on the

health of the rest of that community (Feikin et al., 2002, p. 3150). Unlike tetanus, measles is an infectious disease that can spread rapidly throughout the community. As we saw in the case of BC, measles moved from the religious community in Chilliwack to the general population.

Previous research suggests that the policy of childhood immunization relies on the concept of herd immunity (Feikin et al., 2000; Hobson-West, 2010). As Hobson-West (2010) maintains, “Central to this [herd immunity] is the notion of community good or community benefit” (p. 280). While several arguments have been advanced for the preservation of individual rights and freedoms, when it comes to the decision to vaccinate, some critique that focusing on the individual is dangerous. It is understandable that the individual perspective is debated in discussions of vaccination policies given the current importance often placed on individual choice and responsibility in healthcare. Nonetheless, Hobson-West (2010) warns that, “if individuals do indeed behave as autonomous rational agents, as the rational actor model implies, it may make sense to ‘free ride’ and refuse vaccination” (p. 280). ‘Free-riding’ can be seen as problematic as it has the potential to under-mind vaccination programs entirely.

Omer et al. (2010) maintain that high vaccine coverage, “particularly at the community level, is extremely important for children who cannot be vaccinated, including children who have medical contraindications to vaccinations and those who are too young to be vaccinated” (p. 1984). Thus, high rates are important as these groups are often more susceptible to complications of infectious diseases such as measles and depend on the protection provided by the vaccination of children in their surroundings (Omer et al., 2010). Choosing to ‘free ride’ and not vaccinate, can thus compromise the safety of individuals who cannot be vaccinated due to medical reasons. Ultimately, balancing individual and community risk when discussing mandatory vaccination policies continues to be an area of debate amongst

parents, healthcare providers, and the government. While the findings from the present study seem to demonstrate that the news media framed mandatory vaccination policies as a solution for preventing VPD outbreaks, health communication research tends to demonstrate otherwise.

5.4.3. Shortcomings of Mandatory Vaccination Policies. From ethical and policy standpoints, mandatory vaccination policies require that the state make provisions for those who do not consent to immunization (Gosti, 2000). Exemptions can be based upon medical or non-medical reasoning. Recently, exemptions from Ontario's mandatory childhood vaccination program were studied by Mah et al. (2010). Mah et al. (2010) found two major issues with mandatory vaccination legislation in Ontario. The first was the presence of exemptions themselves and the second was that there is limited and out of date regulation in place. These issues will now be explored in further depth.

It appears that while mandatory vaccination policies in Ontario have been championed as the appropriate model to control VPD spread, this may not always be the case. In Ontario, the vast majority of exemptions that occur are for *non-medical* reasons such as religious or contentious. Further, Mah et al. (2010) found that in Ontario younger children are more frequently exempted. The frequent exemption of young children is problematic given what we know about the susceptibility of young children to VPD. Research demonstrates that children exempted for religious and philosophical reasons are 35 times more likely than vaccinated children to contract measles, as well as increasing community risk by upwards of 30% (Mah et al., 2010). As Salmon et al. (1999) argue, "unlike medical exemptions, which are due to an intrinsic medical condition, religious and philosophical exemptions are voluntary choices" (p. 48). While the presence of exemptions themselves are seen as problematic by some so too is the administrative process for regulating the exemptions.

In Canada, “medical exemptions require a physician’s statement attesting to prior immunity or contraindication; nonmedical exemptions may be obtained simply with a parental affidavit, signed before a commissioner” (Mah et al., 2010, p. 41). The ease of obtaining nonmedical exemptions to vaccination is especially concerning given that in Ontario non-medical exemption rates are higher than medical exemptions. Although state-level compulsory vaccination laws have been demonstrated to be highly effective towards achieving high childhood immunization coverage rates (Hodge and Gostin 2001), Salmon et al. (2005) found that in the US higher non-medical exemption rates have been documented in jurisdictions where administrative procedures are comparatively easy. With the availability of exemptions to mandatory policies, it appears that the spread of VPD is still possible, especially amongst religious communities (Feiken et al., 2000). While mandatory vaccination may be a well-intentioned policy to prevent the spread of disease—as it was championed by the news media in the present study—it has shortcomings. Ultimately, the research from Canada and the United States on mandatory vaccination policies leaves researchers with more questions than answers, as balancing individual and community risk continues to present a number of difficulties.

Although well intentioned to have policies protecting community wellbeing, when religious factors come into play as they did in the case of BC, the ethical debate becomes contentious. Schwartz (2013) suggests that, “time spent defending vaccines and vaccine policies, including mandatory vaccination requirements, is time not spent making the positive case for the clear benefits of vaccination for individuals and communities” (p. 48). While a topic of media attention, it is clear that those choosing to refuse vaccination should instead be the area of focus for public health practitioners and communicators. The present research is not suggesting to get rid of exemptions for those provinces that have mandatory school-age

policies, but instead makes suggestions for other ways to combat vaccination skepticism. The following section will now suggest some possible risk communication tactics to consider when faced with vaccine skepticism.

5.4.4. Risk Communication Suggestions

1) Community Risk Focused Literature on Immunization. In an analysis of immunization promotional leaflets in the US, it was revealed that the community risk dimension of immunization was not prioritized (Hobson-West, 2010). Further, Mah et al. (2010) note that Canadian parents may be increasingly weighing perceived personal risk, over the personal and population benefit when making decisions about immunizing their children. Based upon relevant literature, a major risk communication suggestion moving forward is to emphasize the community risk of not immunizing in health literature. Not only should leaflets reflect the community aspect of immunizing, but public health officials should emphasize this element when communicating about VPD outbreak risks. Shifting the discourse surrounding immunization from individual risk to community risk, could have a potential impact in generating a better appreciation for herd immunity and the need to preserve it through mass immunization. Ultimately, “effective risk communication is essential to limiting morbidity and mortality caused by communicable diseases, in addition to minimizing the damage that they can cause to national economies and public health infrastructure” (Infanti et al., 2013, p.1). This shift in dialogue should be considered a critical tactic for communicating risk in disease outbreaks situations.

2) Fight Complacency. Risk communication scholar Sandman (2007) argues that the public’s perception of risk has just as much influence over their behaviour, as the actual risk. For example, “if people who are at high risk for measles infection do not feel that they are at risk,

they are unlikely to take any action to protect themselves against it” (Public Health Agency of Canada, 2013). Research on vaccination hesitancy has argued that VPD, like measles, have faded from the memory of parents, resulting in complacency. Such complacency means that parents no longer fear these diseases and thus do not see vaccination as a necessity. Risks from measles and polio are becoming less ‘available’ to parents, “whereas media reports on diseases linked to vaccines...are becoming more available” (Leask, 2002, p. 125).

One way to fight such complacency is to train physicians and other public health practitioners on how to field concerns regarding not only vaccination, but vaccination policies in Canada. For example, scoffing off questions regarding mandatory policies with responses such as, “That’s a very big step, when you’re forcing people to take treatments” (BC Health Minister Terry Lake, #4), could potentially create a discourse of doubt, which could in turn undermine vaccination efforts. Without explaining why mandatory policies are not being considering by the BC government, this could leave potential parents skeptical of vaccination all together. Ultimately, in order to effectively fight complacency, an open dialogue must be maintained and the risk of disease outbreak must be perceived as real and harmful. An effective example of advertisements combatting such vaccine-preventable disease complacency created by the Alberta Health Services can be found in Appendix L.

5. 5. Conclusion

In conclusion, as the present study suggests, framing mandatory vaccination policies as the response to VPD outbreaks could have polarizing implications. Although news media tends to try and provide a solution to health problems (Arroyave, 2012), the solution given in the case of the BC measles outbreak has many complexities that need to be considered further before such claims can come to fruition. Out of news media discussions surrounding

mandatory vaccination policies in the present study, the state of immunization record keeping systems in Canada appeared to become an apparent sub-theme.

BC does not have a central registry of immunizations, and without this system it is incredibly difficult to track who has had what immunizations. A child can have one immunization with a family doctor and another with a public health nurse. Given that there is no electronic health record system of immunizations in place in BC, often times it falls on parents to keep track of immunization records. Surveys conducted across Canada have shown that “as many as 30% of parents have misplaced their child’s immunisation record by the time their child is seven years old, 15% of immunisation records are incomplete, and 24% contain data entry errors” (Laroche & Diniz, 2012, para. 2). Thus the reliance on parents to track immunizations in place of an effective tracking system is problematic.

While BC does not have a mandatory vaccination policy for school-age children, the lack of a centralized registry also makes monitoring immunization uptake and the potential of outbreaks incredibly challenging. Access to such information “is critical in the event of a vaccine recall, vaccine failure or of suspected adverse event following an immunization” (Laroche & Diniz, 2012, para. 2). Additionally, such information is essential to ensure immunizations are provided according to the recommended schedule such that there is optimal protection against VPD (Laroche & Diniz, 2012, para. 3). Thus, the lack of a centralized registry has the potential to burden the healthcare system.

The findings from the present research seem to suggest that the frequent the response from health authorities was: “If you don’t have a record, it didn’t happen...there’s no harm in getting an extra dose of measles, mumps, and rubella vaccine if you’re not completely sure” (#6- Monica Naus BC CDC). This response does not exactly leave one feeling confident

in the current immunization system. Further, getting an extra vaccine because there is no record can result in vaccine supply issues which increase costs to the health system and may result in adverse health outcomes for vaccine recipients (Laroche & Diniz, 2012, para. 3).

There have been efforts at the national level to create a Canada-wide electronic immunization registry, known as the Canadian Immunization Registry Network (CIRN). National registries successfully exist in Australia. Such a registry has the capacity “to capture data on the administration of vaccine doses at the individual level within the population and represent an important tool in assessing immunisation coverage and vaccine uptake” (Laroche & Diniz, 2012, para. 1). However, the last meeting of CIRN was in 2002. It appears that efforts in Canada to create such a registry have dissipated, despite being greatly in need. Mah et al. (2010) suggests that in Ontario where there are mandatory vaccination policies, the ability to link data on vaccination exemptions in the province to individual-level characteristics is not yet possible either, reflecting continuing gaps in public health reporting. Thus it appears that with or without mandatory policies if the administrative authority to track immunizations is not effective or does not exist, the important task of monitoring the potential of outbreaks is futile.

Overall, what the findings from this study in relational to relevant literature have demonstrated is that without or without mandatory policies there are going to be people that object to vaccination for non-medical reasons such as religion in the case of BC’s Fraser Valley. As a result, instead of debating mandatory policies, future research needs to explore further how we could learn from these communities opposition to vaccination. One way to do so is to have an effective national immunization tracking database that can help determine where outbreaks have the potential to occur.

6. Conclusion

The issue of vaccine-preventable disease outbreaks tends to be examined from an epidemiologic perspective and not from a communication perspective. Of those examining vaccination from a communication perspective, the studies have focused primarily on the framing of the autism vaccine controversy (AVC) (Boyce, 2006; Clarke, 2008; Holton et al., 2012; Leask & Chapman, 2002). None have been specific to Canada, nor have they focused on the recent resurgence of measles occurring in the country. Given that the majority of people get their health information from the mainstream media (Jordens et al., 2013), news coverage of VPD outbreaks has been focus of the present study. Since VPD outbreaks have only begun to occur in Canada in the past of five years and are likely to progress, continually studying how they are being framed in the news media is critical.

The present research sought to examine the framing of the 2014 measles outbreak in British Columbia by conducting a mixed method content analysis of news articles published in the *Vancouver Sun* and *The Vancouver Province* between March 1st-May 24th 2014 (n=31). The coding scheme guiding the content analysis was derived from previous scholarship by Holton et al. (2012), as well as Leask and Chapman (2002). Agenda setting, framing, and risk communication formed the theoretical lens to explore the BC measles outbreak. As Picard and Yeo (2011) maintain, “News coverage raises concerns...because of its effects on choices and behaviours that have implications for personal health, family health, and community health” (p. 5). Thus, given the agenda setting function of news media (Arroyave, 2012; McCombs & Reynolds, 2002) and the public health ramifications of disease outbreak, the present study sought to give insight on risk communication implications of how the BC measles outbreak was framed and provide suggestions for public health authorities.

The findings from this content analysis appear to suggest that the dominant attribution of blame for the outbreak was religion (Graph 2). Given that the outbreak took place in Fraser Valley—which is home to British Columbia’s bible belt—the framing of religion as to blame for the outbreak was likely. Nonetheless, this study has outlined suggestions for working with and further understanding religious opposition to vaccination. Some of examples of this are the creation of religiously sensitive vaccination literature, communication skills training, and the use of key religious stakeholders as opinion leaders. If implemented, these efforts have the potential to increase immunization acceptance and minimize risk of future outbreaks.

Additionally, the findings from this study suggest that the phenomenon of false balance—an issue for previous immunization news media coverage—was more cautiously approached by journalists. It appears, science and medical sources were heavily relied upon in the sample (80%-Graph 3), and fear mongering anti-vaccination sentiments were minimized. The findings suggest more diligence was taken when covering the BC measles outbreak. While not the sole responsibility of journalists or public health to ensure news coverage is accurate and mobilizing, in future a partnership between these two industries surrounding the discourse on immunization could foster more inclusive and beneficial news coverage.

Further, in line with previous research (Holton et al., 2012), the findings from the present study also suggest that MI continues to be an area in need for improvement in news media coverage of health issues. In understanding that the media have an agenda setting function (McCombs & Shaw, 1972), it is crucial that public health authorities work with the news media to ensure coverage of health risk situations, such as VPD outbreaks, provide accurate and effective MI. Such a partnership highlights the agenda setting power of the media, whilst providing framing techniques that are conducive to public health initiatives in risk

situations. Finally, the present study raised important questions in regards to the implementation of mandatory vaccination policies in Canada, and the public health consequences of communicating individual risk over community risk. If BC had an effective immunization tracking system, potentially the measles outbreak in Fraser Valley could have been avoided or more highly anticipated to hinder the spread of 400 cases of a preventable disease. Overall, this study indicates a need for more research to be conducted on religious influences on decisions to vaccinate and further explore how public health authorities can accommodate religious freedoms while ensuring the health of the community at large.

6.1. Limitations

Given the time restraints of the researcher, this study employs a content analysis of news coverage and does not engage in primary research. As a result, the study cannot account for the different perceptions readers of the news articles will have. Understanding how different populations will internalize the news media framing of outbreaks is beyond the scope of this research and is thus an area future research could expand upon. In terms of generalization, the present content analysis focuses upon news coverage in the province of BC and thus the results cannot be fully generalized to other provinces within Canada as each province has diverse socio-political backgrounds. It is also important to note that technological limitations restrained the sample size for the content analysis to 31 news articles. In future, including a larger range of new sources or online sources should be considered.

6.2. Future Research

The present research has sought to explore and give insight into the framing of the 2014 BC measles outbreak. However, it is important to note that outbreaks are now emerging across Canada and the United States. In Santa Monica, California for example, vaccination refusal has

led to immunization rates as low as that of Chad and South Sudan (Khazan, 2014). Deriving from the quantitative results of the present study, an important area for future research to explore is ways in which to work with religious communities opposing vaccination. These communities pose a risk not only to themselves but the general public. Thus, understanding the opposition more fully and testing some of the suggestions given in the present research could provide future tactics for coping with outbreak situations in religious communities.

The qualitative results from this study appear to suggest that the current immunization tracking system in Canada is flawed. It appears upon further research that this finding is valid in provinces with and without mandatory policies (Laroche & Diniz, 2012; Mah et al., 2010). While it is not within the scope of the present research to explore the effects of a deficient immunization tracking system on VPD outbreaks, it is an important area for future research to consider.

The media play a pivotal role in our culture, meaning that in order for scientists and medical authorities to communicate effectively with the public, they must first communicate effectively with the media (Picard & Yeo, 2011). Thus it is vital that scholarship continues to study effective communication strategies for disease outbreak situations, comprehending the media's role and the pressure journalists face. Ultimately, understanding how the mainstream media are framing outbreaks can provide essential information for health professionals as to how to intervene and help promote positive frames of immunization in the future, which could in turn encourage uptake and prevent future outbreaks and/or epidemics. As Clarke (2010) remarks, "Vaccine safety crises are teachable moments, both for the public and for health officials" (p.622). It is crucial these teachable moments be ceased to minimize future risk, and maintain a sensitive yet practical approach to disease outbreaks.

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APPENDIX A: Coding Guidebook

Research Questions

- 1) How are vaccine-preventable disease outbreaks being framed by the news media?
- 2) A) Who is blame being attributed to for the outbreaks? (i.e. parents, doctors, public health, alternative medicine, newcomers) [D]
B) What attribution of blame is dominant? [E]
- 3) A) Who are the sources used in discussions of the measles outbreaks? [F]
B) Who are the sources used to assign the blame? (I.e. are 'blamers' experts or ordinary opinions) [G]
C) Do sources used in coverage present factual information or opinion? [H] (combined)
- 4) A) Does the news article provide any mobilizing information on the outbreak? [I]
B) If so what type? (identificational, locational, tactical) [J]

Coding Protocol: Operationalized Definitions

A. **Article ID** - Each article will have an assigned number. The coder should write the number as it appears on the article. A sample of 31 articles will be coded. Each article will have an assigned number of 1-31 located at the top of the article above the headline. Coders should write the number as it appears on the article.

B. **Article Source** – Each article will either be from the following:

- Vancouver Sun _____
- The Province _____

C. **Date** - The date of the article should be coded with a two-digit month, two-digit date and four-digit year. For example, January 3, 2014 should be coded as 01/03/2014.

D. **Attribution** – Attributions help guide the public's perception of whom or what is connected to or responsible for an event. Attributions can "frame the blame" by emphasizing certain actors. For the purpose of this study, attribution must be contained within at least one paragraph or a minimum of two sentences. The attribution should directly or indirectly place blame for the measles outbreak on one of the following. Please mark "1" for present and "0" for not present. At least one anecdotal example would be noted (by writing out separate from code sheet) as the coding proceeds.

- 1) **Chilliwack School**- A private Christian school (Mount Cheam Christian School) with traditionally low immunization rates due to religious opposition, where the outbreak first began.
- 2) **Religious community**: Individuals who subscribe to a particular religious belief which can, depending upon the belief, influence their views on vaccination and enable them to object to vaccination for religious reasoning.
- 3) **Low immunization rates**: Immunization uptake rates below 90% are considered low and threaten herd immunity, thus leaving a community or region susceptible to a VPD outbreak.
- 4) **The anti-vaccination movement**: The amorphous movement that has organized in opposition to vaccination.

- 5) **Public Health (generic):** Includes public health officials such as nurses or other medical officials who may have been consulted during the outbreak.
- 6) **Parents:** Individuals who have children and thus vaccination is a topic of discussion.
- 7) **Travel:** Individuals visiting different places with low immunization rates, such as the Netherlands, where they contract measles and then bring it back to Canada.
- 8) **Society:** Society can be considered the population at large; those individuals who were not directly involved with the media, the government, or the medical community.
- 9) **Immunization safety:** Fears that vaccines are not safe and cause harm to children such as autism or other side effects.
- 10) **Other individual:** Any other individual who does not fit into one of the above categories or does not represent one of the above categories.

E. Dominant Attribution

Noting that an article may feature more than one attribution of blame (as in Variable D), should select the overarching attribution that the article emphasized. For the dominant attribution, need to choose the attribution most frequently mentioned in the article. The dominant attribution may be evident in the headline or early in the story, but must read the entire article before determining the dominant attribution. If the dominant attribution is unclear, should select the attribution that received the most attention. So if an article blamed “Media” and “Parents” and if it not clear which was dominant based on first reading, then would look to see which one was discussed more. If the “Media” or references to the media appeared in five sentences and “Parents” appeared in eight, then you would choose “Parents.” If the attribution appears in the same number of paragraphs, then count the number of times the attribution appeared in sentences. If the dominant attribution is still unclear, then use other context clues such as the headline to determine dominant attribution. The categories and definitions are the same as they were for Variable F. Should choose only one dominant attribution.

- 1) **Chilliwack School**
- 2) **Religious community**
- 3) **Low immunization rates**
- 4) **Travel**
- 5) **Immunization safety**
- 6) **Parents**
- 7) **The anti-vaccination movement**
- 8) **Society**
- 9) **Public Health**
- 10) **Other Individual**

F. Sources – Sources include any individual or organization who is quoted or cited as a source in the article in discussions of the measles outbreak in BC. This might include a direct source quote, such as “Dr. Smith said...” or an indirect source, such as “According to the CDC....”. For the purpose of this section, a tally will be made in the code sheet to count what type of sources are used in each news article and how many times that source gets quoted or cited in the article. Listed below are the potential types of sources that could be quoted or cited in the news articles.

- 1) **Fraser Health Authority:** The public health authority responsible for governing Fraser Valley where the outbreak took place and communicating about the outbreak.
- 2) **Health Officials:** Medical professions such as public health nurses or doctors, generically referred to as a source.
- 3) **Government:** Government sources include any individual employed by the federal government or provincial government. This might include the Prime Minister of Canada, Members of Parliament, Senators, or other government-affiliated organization.
- 4) **Medical/Science Organizations:** Organizations concerned with the treatment or research of measles or vaccinations such as the Centers for Disease Control (CDC).
- 5) **US Health Officer:** American medical officers such as those from Whatcom County Health Department where an American contracted measles from BC.
- 6) **Science/Medical researcher:** Individuals involved in research of measles or vaccinations, who provide expertise from the medical and/or science community such as epidemiologists.
- 7) **Reverend Adriaan Geuze:** Leader of Chilliwack's Reformed Congregation of North America (RCNA), who opposes vaccination for religious reasons and instructs his congregation of 1,200 to do the same.
- 8) **Reverend Abel Pol:** Leader of Chilliwack's Canadian Reformed Church (CRC), who takes a pro-vaccination stance.
- 9) **Public Health Agency of Canada:** National agency of the Government of Canada responsible for public health, emergency preparedness, and responses to infectious and chronic disease control and prevention.
- 10) **Parents:** Individuals who have children and thus vaccination is a topic of discussion.
- 11) **Media:** Any source of media, including newspapers, TV, radio, blogs, magazines, reporters, journalists, etc.
- 12) **Other:** If sources do not seem to fit into any of the categories listed above, should count the number of "other" sources and write them in the blank provided on the code sheet.

G. Blamer Source/Count- Sources include any individual or organization who is quoted or cited as a source in the article AND linked to the attribution of blame. This might include a direct source quote, such as "Dr. Smith said..." or an indirect source, such as "According to the CDC..." However, *for this section* if an individual or organization is listed or noted because they are part of the story, but not necessarily because they provided information for the story, they should not be counted as a source. For example, in an article that says the CDC is involved in a research study, but does not provide information directly from the CDC or quote someone from the CDC, the CDC should not be considered a source. If the attributing source is not present, code "0". If the attributing source is present, code "1". (Definitions are the same as the above)

*Need to separately note the number of different attributing sources that appear under the same category. For example, if the Prime Minister is quoted as attributing blame, then would code "1" under elected official and "1" in the counting column. If the US president and a state senator were quoted as attributing blame, then would need to code "1" under elected official and "2" in the counting column.

- 1) **Fraser Health Authority**
- 2) **Health Officials**
- 3) **Government**
- 4) **Medical/Science Organizations**
- 5) **US Health Officer**
- 6) **Science/Medical researcher**
- 7) **Reverend Adriaan Geuze**
- 8) **Reverend Abel Pol**
- 9) **Public Health Agency of Canada**
- 10) **Parents**
- 11) **Media**
- 12) **Other**

H. When they attributed blame, did they use fact or opinion... Because sources may be used to convey factual information as well as point of view/opinion, please indicate what each source conveyed using the following. Again, code “0” for not present and “1” for present. Please note that a source can give both factual information and point of view/opinion, therefore may code for the presence of both for one source:

1. **Factual information** – Information that is known to be true or can be verified, such as “The Lancet published an article by Andrew Wakefield”; information such as names, locations, web sites, numbers and figures that can be verified or are known to be true.
2. **Point of view/opinion** – Information that conveys a personal opinion or point of view that may not be shared by everyone, such as “Scientists should really be doing a better job to find a cure for autism”; information that may not be verified or supported by previous research or available figures, such as “My child was diagnosed with autism and I’m pretty sure it was caused by the MMR vaccination.

I. The media may provide solutions to problematic issues, such as mobilizing information or calls to action. Mobilizing information (MI) or "calls to action" are defined as any information appearing in an article that enables readers to act or facilitate personal action. For the purposes of this study, MI may include: names of individuals, organizations, documents or legislation, or it may include even more specific information such as phone numbers, web addresses or instructions on how to get involved with funding or advocacy efforts. Please note if the article included a MI of any form, should code “0” for not present and “1” for present. Information pertaining to the disease of measles describing the symptoms or the side effects of the disease and/or a call to vaccinate against the disease should be coded as ‘informational.’ Reasons for coding this as informational have been expanded upon in the methodology of the research paper. In order to be considered informational, the discussion of the disease must be purely descriptive, and the call to vaccinate must be generic and not provide a location or contact number to do so (otherwise it could be considered MI). Please note if informational MI is present and if so, which type (disease description or call to vaccinate).

J. If MI is present, need to write in the number of "Names," "Locations" or "Tactics" provided in the article according to the definitions below. Articles may contain one, two, or all three types of MI. If there is no MI, may leave these fields blank.

- 1. Names** - Names include the specific names of individuals or organizations provided in MI. This might include statements such as "Contact Fraser Health for more information." If a person is quoted as a source, but there is no other specific information or "call to action" to contact the individual, that should be counted as a source, but not as MI. Should write in the number of "names" provided as part of MI.
- 2. Locations** - Locations include specific contact information, such as a phone number, web site or address where people can go for more information measles outbreak or to somehow get involved in related efforts. Should write in the number of "locations" provided as part of MI.
- 3. Tactics** - Tactics include specific directions or tactical information about how to get involved in outbreak prevention or assist with the outbreak. For example, "contact your representative and urge them to pass a mandatory vaccination law" should be considered "tactics" information. Should write in the number of "tactics" provided as part of MI.

APPENDIX B: Coding Checklist**A) Article ID:** _____**B) Source:** 1. The Vancouver Sun
2. The Province**C) Publication date:** _____**D) Attribution:** Code 1= present; Code 0 = not present

- 1) Chilliwack School
- 2) Religious community
- 3) Low immunization rates
- 4) Travel
- 5) Immunization safety
- 6) Parents
- 7) The anti-vaccination movement
- 8) Society
- 9) Public Health (generic)
- 10) Other Individual
- 11) Other: _____

E. Dominant Attribution: Code 1= present; Code 0 = not present

- 1) Chilliwack School
- 2) Religious community
- 3) Low immunization rates
- 4) Travel
- 5) Immunization safety
- 6) Parents
- 7) The anti-vaccination movement
- 8) Society
- 9) Public Health (generic)
- 10) Other Individual
- 11) Other: _____

F. Sources: Code 1 or more=present; Code 0=not present (meaning could who gets quoted and then keep adding on to the categories depending, so in one article PM quoted one and then quoted again later one should mark 2 under elected official)

- | | |
|----------------------------------|-----------------------------------|
| 1) Fraser Health Authority | 6) Science/Medical researcher |
| 2) Health Officials | 7) Reverend Adriaan Geuze |
| 3) Government | 8) Reverend Abel Pol |
| 4) Medical/Science Organizations | 9) Public Health Agency of Canada |
| 5) US Health Officer | 10) Parents |

11) Media

12) Other

G. Blamer Source/Count: Code 1 or more= present; Code 0 = not present

1) Fraser Health Authority

8) Reverend Abel Pol

2) Health Officials

9) Public Health Agency of Canada

3) Government

10) Parents

4) Medical/Science Organizations

11) Media

5) US Health Officer

12) Other

6) Science/Medical researcher

7) Reverend Adriaan Geuze

H. Convey: Code 1= present; Code 0 = not present

1. Factual information

2. Point of view/opinion

I. MI/Calls to Action: Code 1= present; Code 0 = not present; Code 2= informational MI [give explanation]

MI Present: _____

Informational Present: _____

J. MI/Calls to Action Type: Code the number of occurrences for each (list example separate sheet)

- Names:
- Locations:
- Tactic:

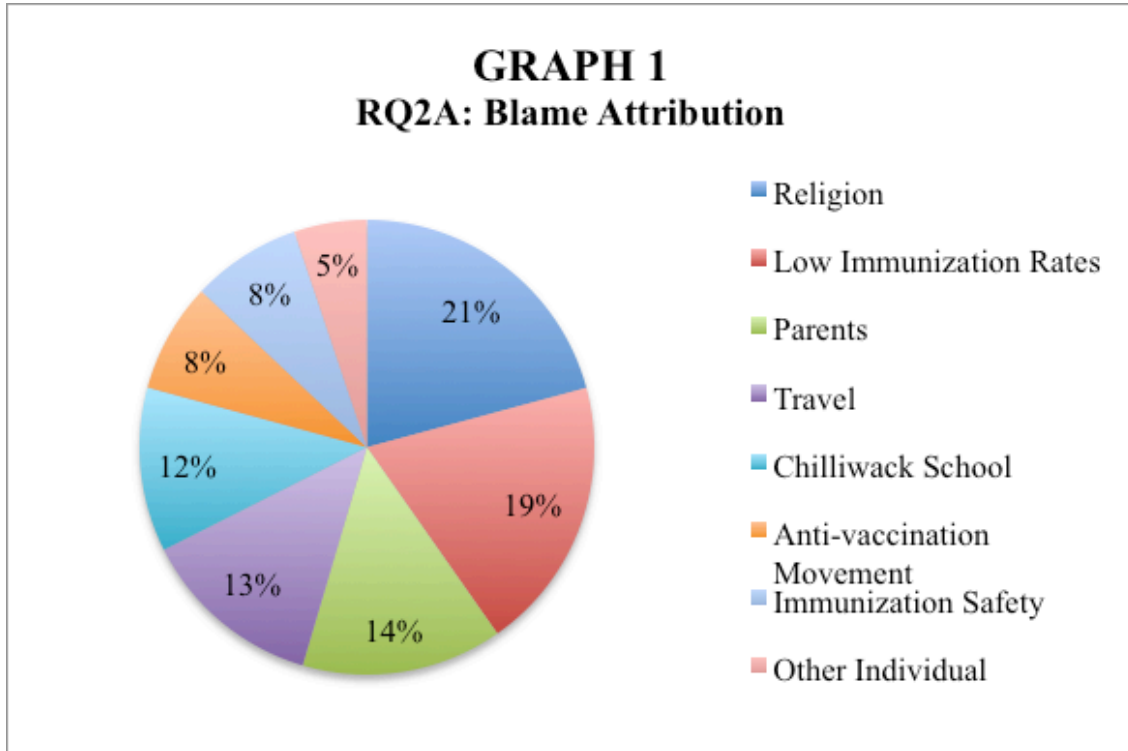
APPENDIX C: Chronological Sample List

NUMBER	TITLE	PUBLISHER	DATE	TYPE
#1	“Measles alert sounded for Fraser Valley”	The Province	March 9 th 2014	News
#2	“Measles outbreak hits Chilliwack; Immunization rates as low as zero in some east Fraser Valley schools; health official”	The Sun	March 10 th 2014	News
#3	“Forced measles vaccination not in plans”	The Province	March 11 th 2014	News
#4	“Measles outbreak originated in Netherlands: officials”	The Sun	March 11 th 2014	News
#5	“Make vaccination a must”	The Sun	March 13 th 2014	Editorial
#6	“Measles outbreak spreads; Disease affects general population in Chilliwack and Agassiz”	The Sun	March 14 th 201	News
#7	“Vaccines interfere with God’s care: pastor, Immunization rates ‘very low’ in Chilliwack- the centre of a measles outbreak”	The Sun	March 15 th 2014	News
#8	“Measles outbreak spreads to Burnaby’s BCIT campus”	The Province	March 16 th 2014	News
#9	“Measles care spurs call for vaccination checks; One student at Burnaby campus infected in incident linked to Chilliwack outbreak”	The Sun	March 17 th 2014	News
#10	“Measles spread as some ignore advice”	The Sun	March 21 st 2014	In Brief
#11	“The Fraser Valley’s measles problem”	The Province	March 23 rd 2014	News
#12	“Measles cases double in the Valley”	The Province	March 25 th 2014	News
#13	“Measles cases double in the past week”	The Sun	March 25 th 2014	News

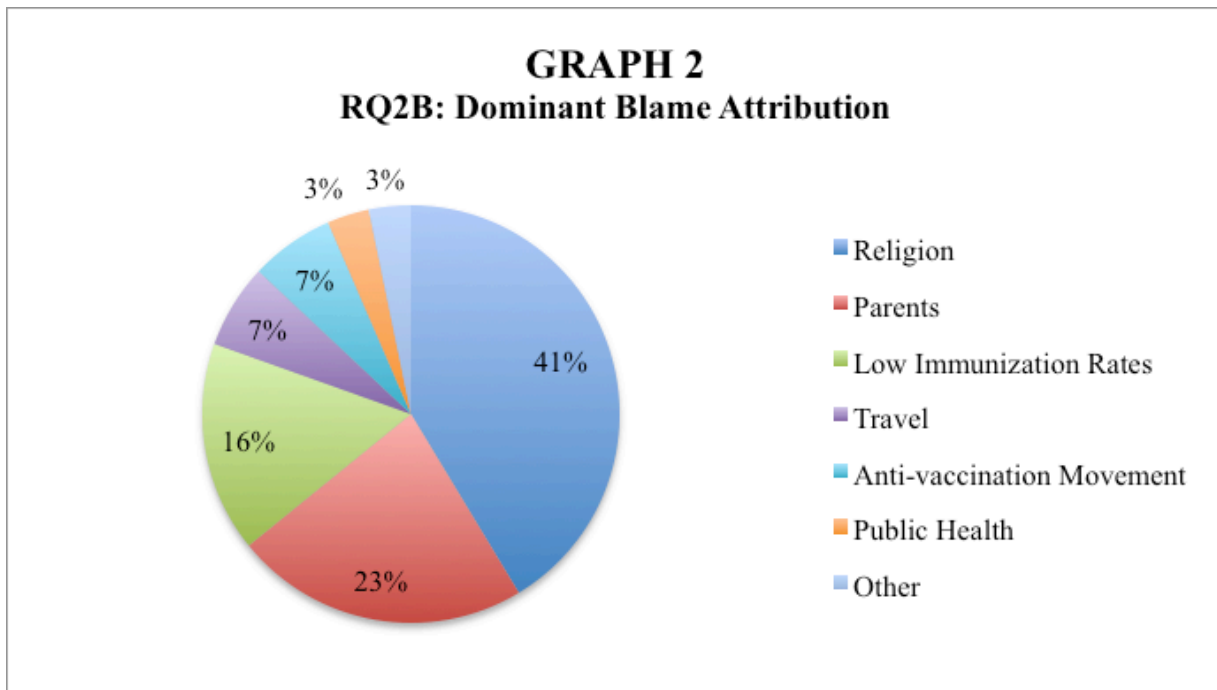
#14	“Health official confirms U.S. resident got measles in B.C.”	The Province	March 31 st 2014	News
#15	“Fraser Valley measles outbreak crosses into Washington state”	The Sun	March 31 st 2014	News
#16	“Measles outbreak contained”	The Sun	April 1 st 2014	News
#17	“Most cases ever in B.C.”	The Province	April 1 st 2014	News
#18	“Foolishness behind record measles cases”	The Province	April 2 nd 2014	Editorial
#19	“Measles may be ‘ticking time bomb’; Even people who have been immunized may be at risk; doctor says”	The Sun	April 5 th 2014	News
#20	“Measles is back and there are lots of people to share the blame”	The Sun	April 11 th 2014	News
#21	“Young parents don’t recall that viruses killed many”	The Province	April 27 th 2014	News
#22	“Vaccine benefits far outweigh the risks”	The Province	April 28 th 2014	News
#23	“Measles outbreak over, chief medical officer declares”	The Sun	April 29 th 2014	News
#24	“Lessons from Quebec’s 2011 outbreak; Measles: with number of cases on the rise in B.C. and much of Canada, province has avoided latest surge”	The Province	April 29 th 2014	News
#25	“Focus switches to Quebec in battle to contain measles; Province has avoided cases after huge vaccination blitz in 2011”	The Sun	April 29 th 2014	News
#26	“Parents urging mandatory vaccinations in public schools”	The Province	April 30 th 2014	News
#27	“Vaccines work; remember that fact”	The Sun	May 6 th 2014	Editorial

#28	“Half of Lower Mainland elementary school vaccination rates too low to contain measles; So many schools falling short of the 90-per-cent inoculation rate is a concern, officials say”	The Sun	May 17 th	News
#29	“Dad urges al to vaccinate after his son nearly died; Illness was spread from another child who had not been inoculated”	The Sun	May 17 th 2014	News
#30	“You vaccinate your children to protect the community”	The Province	May 18 th 2014	News
#31	“Link between vaccination, ethnic neighborhoods: Schools in area with high numbers of students with a Chinese background boast high rates”	The Sun	May 21 st 2014	News

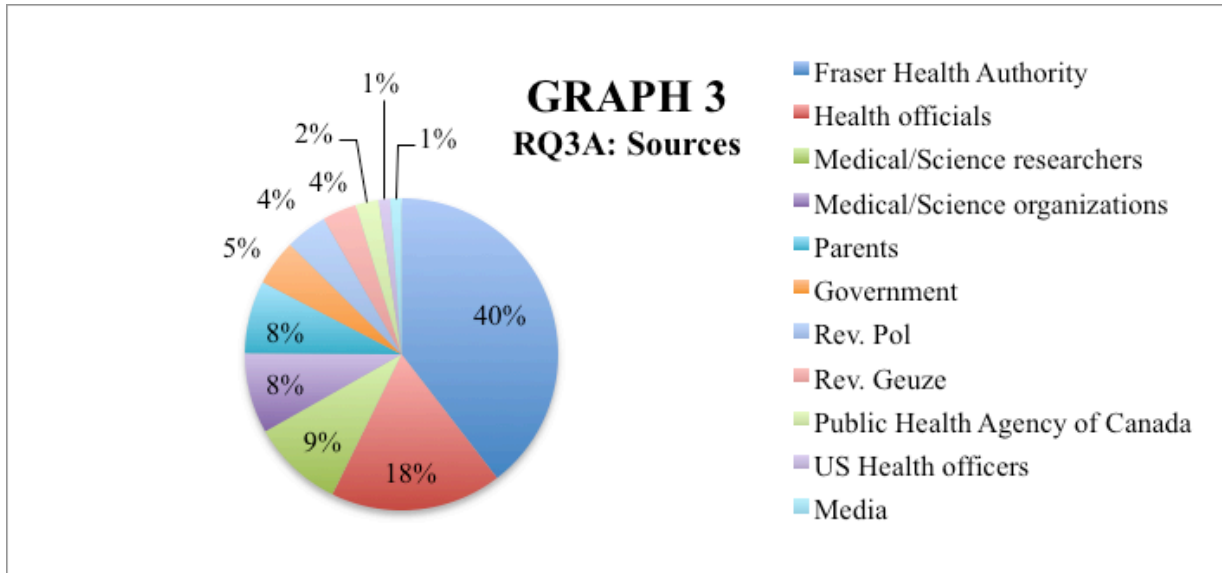
APPENDIX D



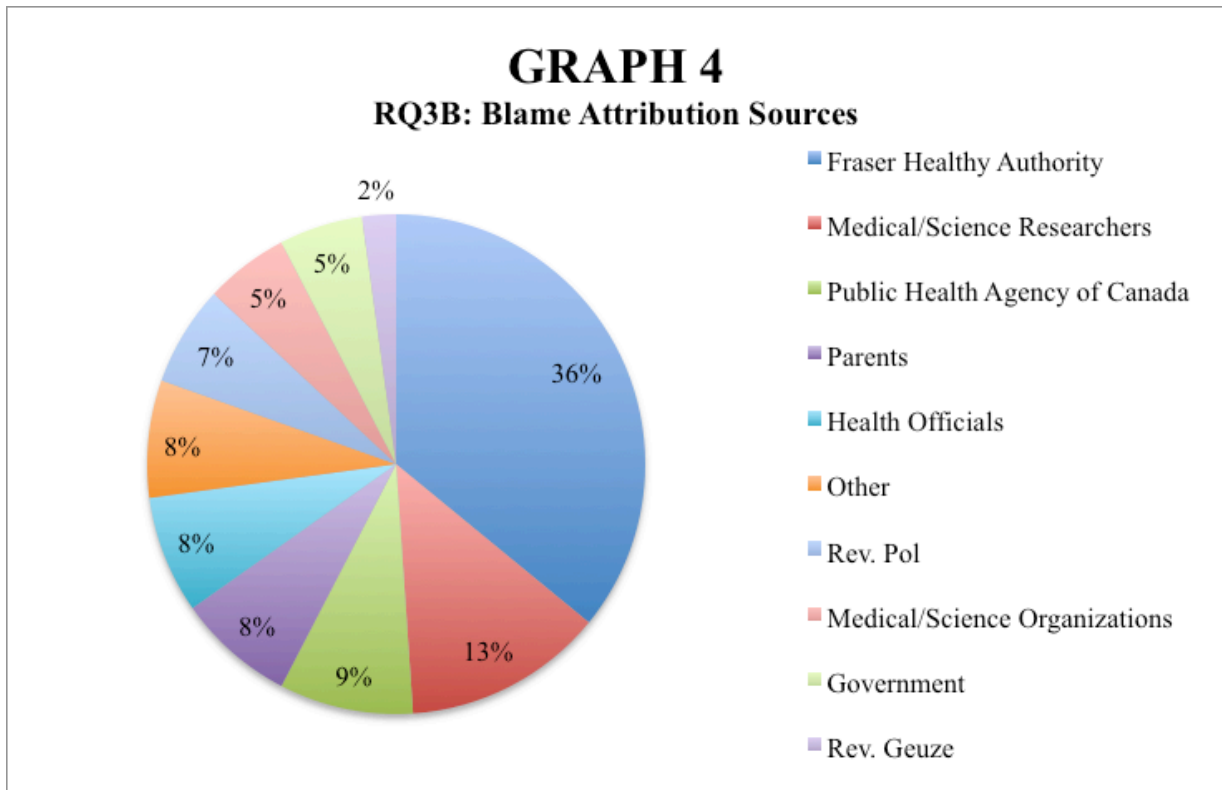
APPENDIX E



APPENDIX F



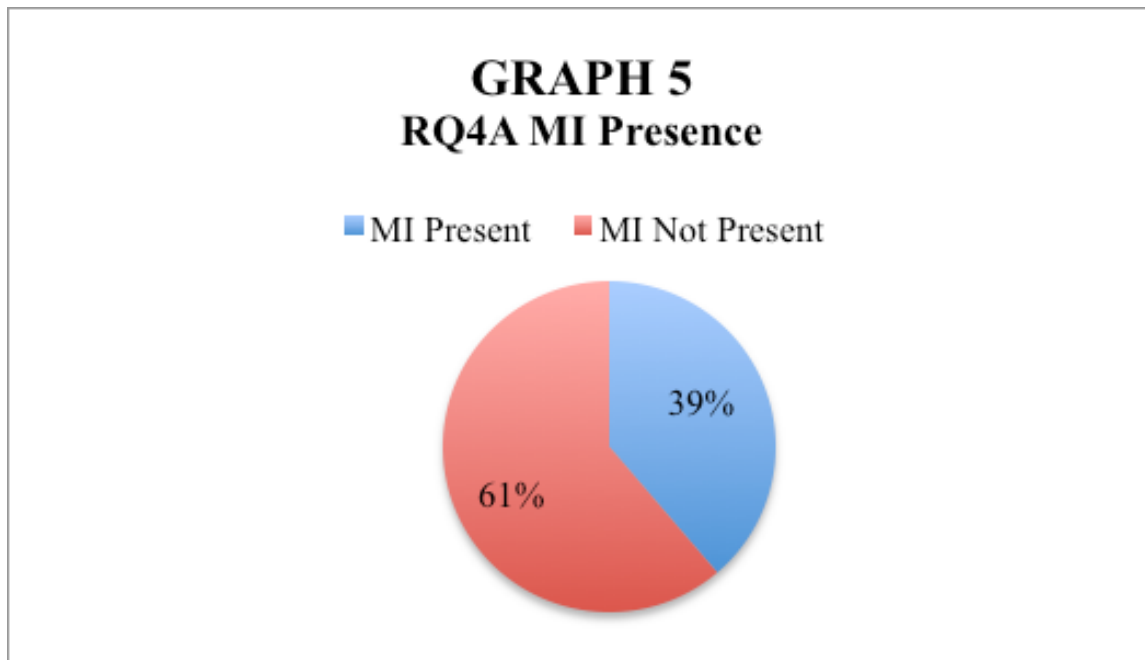
APPENDIX G



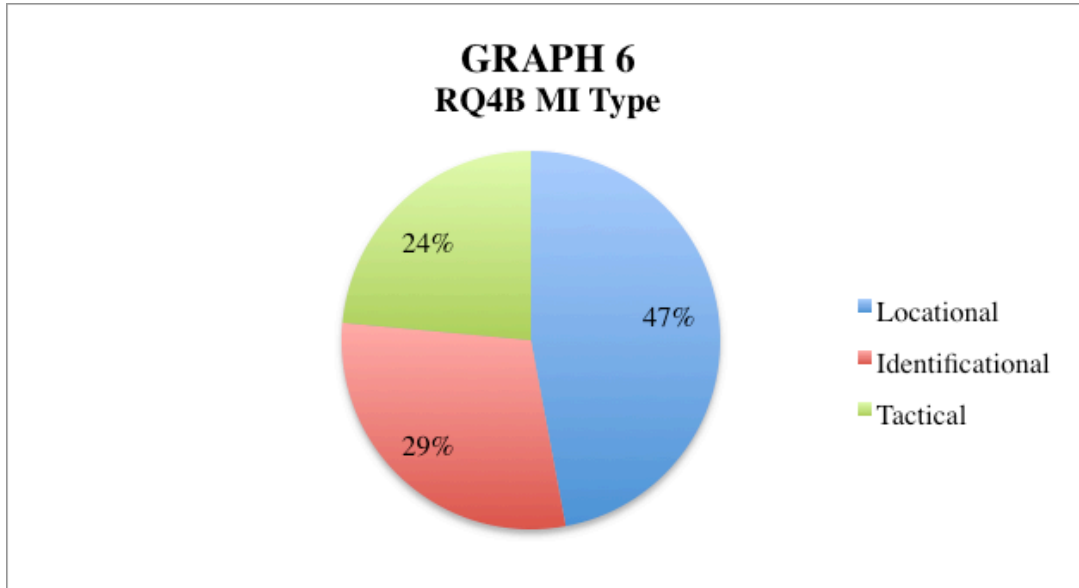
APPENDIX H

Table 1
RQ3C Source use of Fact versus Opinion

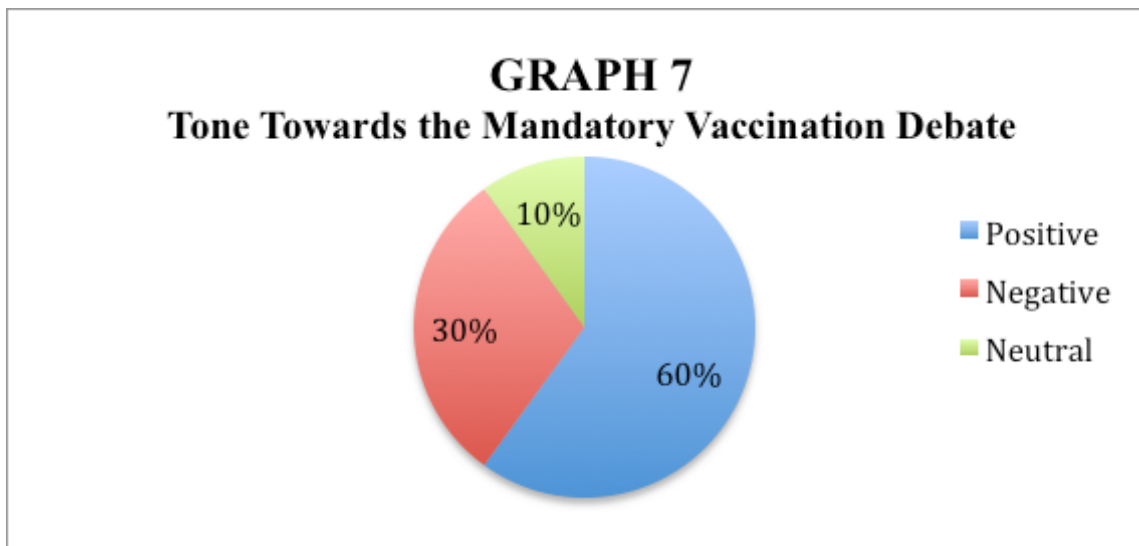
Source	Fact	Opinion
Fraser Health Authority	28	9
Public Health Agency of Canada	6	4
Government	3	3
Medical/Science Organizations	5	0
Reverend Geuze (anti)	0	2
Reverend Pol (pro)	1	5
Health officials	5	5
Medical/Science Researchers	11	2
Parents	1	7
Other	2	7

APPENDIX I

APPENDIX J



APPENDIX K



| **APPENDIX L:** Alberta Health Services Advertisements Addressing Complacency

