FLU NEWS YOU CAN USE? AN ANALYSIS OF FLU NEWS QUALITY 2008-2010

by

Patricia Kehn
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Biodefense

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Date: ____________________________ Spring Semester 2016
George Mason University
Fairfax, VA
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Doctor of Philosophy at George Mason University

by

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Spring Semester 2016
George Mason University
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DEDICATION

This major accomplishment is dedicated to my late parents “TNE” whom suffered with me though my academic training and professional careers, yet were delighted by my latest academic pursuit. They continued to be proud and wanted the best for their children and grandchildren. I greatly miss their wise advice and devoted spirit. My father was even more deserving of a doctorate for which he was discouraged from pursuing during his dedicated career. I hope to continue to honor him.
FOREMOST, I am grateful for the project concept generation during discussions with my chair and the former Director of the Biodefense Program, Trevor Thrall; our evolving visions nicely supported this momentous process. I’m also grateful for Cara Frankenfeld who has been a long standing member on my dissertation committee; her strengths have ensured that I was aware of the health sciences literature and her dissertation proposal guidance aided in the direction of a more robust research investigation. I’ve had the pleasure of the tutelage of Sonia Ben Ouaghram-Gormley and she was very helpful in providing background references to get me started in a new research field and in how to skillfully address research arguments. Much appreciation goes out to Bonnie Stabile who stepped in for Sonia due to a family emergency prior to the oral defense. I also benefitted greatly from the thorough feedback from Xiaomei Cai who gave my first draft a critical read and instructed me that I still had a lot to learn. Not to be forgotten is the late Fran Harbour who became a supportive fan after the graduate studies oral examination phase and often expressed excitement for my initial research topic on hygiene, which was also instrumental in this current research. I also learned from the knowledgeable professors in the Biodefense sciences including Ken Alibeck and Robert Baker. On the technical side, I’m appreciative of the library support services for their well-designed template and Sally’s superb assistance to ease last minute headaches. Last but not least, the administrative staff including Peg, Amanda, and Shannon have been most helpful in the latter years and throughout the Program transitions. To the friends at my late father’s elder care facility, I appreciate your encouragement and family-like support. And best of success to the Kehn graduation trifecta, my niece who is earning her Bachelor degree and nephew who is graduating from high school besides myself with a long earned PhD degree.
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<tr>
<td>ABC</td>
<td>American Broadcasting Companies, Incorporated (television network)</td>
</tr>
<tr>
<td>CA</td>
<td>Content analysis</td>
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<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention (U.S. government agency)</td>
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<tr>
<td>GBS</td>
<td>Guillain-Barré syndrome (neurological or paralytic complication associated rarely with a flu vaccine, but more commonly with natural bacterial or viral infection)</td>
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<tr>
<td>HBM</td>
<td>Health Belief Model (research framework)</td>
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<tr>
<td>HCW</td>
<td>Healthcare worker(s) or personnel</td>
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<tr>
<td>HPV</td>
<td>Human papillomavirus (sexually transmitted disease related to one of the newer (2006) vaccines in the U.S.)</td>
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ABSTRACT

FLU NEWS YOU CAN USE? AN ANALYSIS OF FLU NEWS QUALITY 2008-2010
Patricia Kehn, Ph.D.
George Mason University, 2016
Dissertation Director: Dr. A. Trevor Thrall

Rationale: Public health behaviors can be influenced by the public’s perceptions of health news content. Public persuasion about being more vigilant with vaccination compliance is important in preventing the spread of flu and diminishing the severity of infection. In theory, moderate to poor flu vaccination rates among Americans could reflect subpar flu news quality. The news quality factors in this study are categorized in terms of main or general persuasiveness based on common or infrequent reference in the communications literature.

Context and Objective: The premise of this research is that in order for the public to have strong knowledge and decision power of whether or not to comply with the annual flu shot, eligible persons or guardians need to be fully informed and reminded about the importance of disease complications and health authority recommendations regarding prevention. The breadth of health information constitutes an evaluative communications quality factor referred to as information completeness. In total, six persuasiveness
factors are applied to evaluate the quality to news stories on flu. The primary goal of this research is to assess the overall quality of flu-related communications provided through the mass media in national newspapers and televised news that were distributed during May 2008-October 2010 (including the 2009 H1N1 pandemic).

Approach: A systematic content analysis was performed under the structured framework of the Health Belief Model to assess televised and newsprint flu news for information completeness and balance, which are two common communications quality features. The level of overall news quality was evaluated for not only information completeness, balance and accuracy collectively referred to as main persuasiveness, but also news salience, informant source credibility, and presence of alleviatory or clarifying content collectively referred to as general persuasiveness. To determine which of these factors reflect better determinants of higher news quality, secondary quality factor analyses were performed to determine potential contribution of each news quality factor.

Findings: The quality of flu news between television and newsprint sources was determined to be of a comparable moderate quality level. Information completeness was the prominent quality factor contributing to higher news quality. The reassurance provided through messages of novel concern clarifications and comforting concepts that address common public fears and misconceptions also contributed to higher news quality, thus suggesting that this type of content needs to be more frequently applied by the media. The overall mediocre quality of flu news reflected a balanced disease risk frame and relatively high accuracy in conjunction with an imbalanced prevention approaches frame and lack of vaccine safety discussions. Perpetuated, yet unnecessary
mention of unrepeated adverse events from decades ago, myths, or other exaggerations about the flu vaccine did not appear to undermine news quality. Consultation with credible informants such as government or medical authorities contributed to news quality, although not to the same level as the main persuasiveness factors. Broadcast news in the morning and evening was of a similar quality; however, the news quality of the east coast newspapers was slightly higher than that of newspapers from the western regions.

**Conclusion:** Salient flu news occurs at a low baseline level in the print and broadcast media and may slightly increase during a fall to spring season, or more certainly during an escalating global epidemic or pandemic. Lessons learned from content analysis of flu news enlighten us on the media agenda, while identification of information gaps points to areas in vaccine safety and other flu prevention news communications that can be improved upon.
I. FLU NEWS QUALITY RESEARCH SCOPE

This research concentrates on investigation of the quality of flu news based on a pool of literature that suggests health information is incomplete and inaccurate, especially if obtained from an online source or associated with press releases or medical journal communications. Here, the traditional media of television and newsprint are analyzed through an inductive content analysis; data findings point to a mix of quality strengths and weaknesses that together coalesce to a moderate level of overall news quality during a 20-month span from October 2008 to May 2010. Chapter One provides an introduction into the role of the mass media in providing health information to the public and the research inquisition into the quality of flu news. Flu is a respiratory disease that affects millions of Americans each year. A brief background on disease burden is followed by an introduction to the overarching research study goals, significance and roadmap of the flu news research direction.

1.1 Overview: Flu News Quality and Disease Burden

1.1.1 News Media and Research Introduction —

Health information is often communicated through the mass media, which is a critical means of providing general guidance or the official recommendations of public health authorities to the common public. As such, United States (U.S.) newspapers may
have a daily or weekly “health section”. Many in the public may rely on mass media for current health information as their contact with physicians and other health care providers may be infrequent or limited. Having access to up-to-date health information can affect health behavior [Jardine et al., 2015; Bonevski et al., 2008]. Health news can be influential at a range of public health levels from opinions of the common citizen and circle of friends or coworkers to public health authorities and policymakers; on a broad spectrum, the media agenda can influence the policy agenda and vice versa [Dearing and Rogers, 1996]. In contrast, not having access to current health information, or lack of knowledge about disease and appropriate and available prevention measures can leave the public to their own or ill-conceived devices and repress public health gains [Habel et al., 2009; Kennedy & Bero, 1999].

Content analysis (CA) is a common analysis technique used among communication, and social and political science scholars; this methodical approach is a scholarly means to analyze news articles for issue salience and identify weaknesses such as missing, inaccurate or exaggerated information. Upon a review of the literature, the raised issue of incomplete health information provided through the mass media precipitated this research on the quality of news on the topic of flu, which is a highly contagious disease that spreads across the U.S. annually. Missing and inaccurate messages are two key factors that may reduce news quality. These problems of missing and/or misleading health information can undermine public health programs. Prior studies of vaccine and other public health news have noted missing or incomplete disease prevention or treatment information pertaining to duration of protection, consequential side effects, or description of a newly available prevention measure
[Habel et al., 2009; Madden et al., 2012; Moynihan et al., 2000]. Conceivably, misinformation (and/or hype) can be just as detrimental to public health programs similar to missing information [Frost et al., 1997; Pineda & Myers, 2011; Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012; Danovaro-Holliday et al., 2002]. Thus, accuracy is another contributor towards better news quality. When it comes to a common disease such as flu, also known as influenza, which has been around before the invention of the printing press, it is expected that the mass communications are highly accurate and not exaggerated. Maintenance of quality might be achieved if public health information is less associated with press releases on new treatment products (pharmaceuticals) or clinical trials, as these types of complex health information tend to be abbreviated, and sometimes inaccurate, biased (financial gain), or exaggerated through the media [Woloshin & Schwartz, 2002; Caulfield & Condit, 2012]. Similarly, the newness of a prevention product (or an emerging disease) can bring about news content inaccuracies especially during early news reporting periods; for example, some disease and associated vaccine news inaccuracies were found in online content following the licensure (2006) of a new vaccine against human papillomavirus (HPV) [Madden et al., 2012; Habel et al., 2009]. If flu news suffers from incompleteness and/or inaccuracies, then the news quality may be suboptimal.

Since flu vaccination rates are below 50%, it is easily questioned whether the media have frequently left out information that could guide more of us into making a decision to comply with annual flu vaccination. This potential fault is important since health information can influence health behavior. The design of this research study takes advantage of a behavioral model framework to guide the structure of this content
analysis research. If research findings suggest gaps in common flu information, then this study could aid health beat reporters and other gatekeepers (editors, producers) in media journalism.

The goal of this research project in assessing the uncertain quality of flu news is mediated through enhanced optimization of the structural framework for content analysis application and enhanced quality evaluation designs. Flu news materials studied through this research approach include newspapers and television, both popular U.S. news sources. The applied breadth of factors contributing to quality news includes completeness, balance (within media frames), and accuracy in addition to other general persuasiveness factors. Information completeness is a core quality parameter. An additional assessment besides specific issue salience and/or agenda setting, which relate to content completeness, is media framing (secondary agenda) as a means to evaluate for presentation of balanced content. Accuracy is important from the standpoint of not only factual correctness, but also lack of misrepresentation through myths and misleading statements, bias or exaggeration. The general persuasiveness component in this research design incorporates flu story salience (newsworthiness), credibility, and the unique attribute of comforting statements through current (non-outdated) statements and myth-busting clarifications that serve as a form of public concern alleviation. Credible information refers to information provided from trusted sources such as experts within the U.S. government public health institutions (Centers for Disease Control and Prevention (CDC) or National Institutes of Health of the Department of Health and Human Services), or other medical professionals. The combination of common and
general persuasiveness factors allows for a more optimal assessment of overall news quality.

1.1.2 Broadened Research Designs to address Prior Shortcomings —

This research focus on flu news and importance to the public health mission is justified based not only on low vaccination rates, but also since only a few CA studies have examined the content and/or quality of flu news, and the need to improve upon former research design weaknesses. While CA is a scholarly and common analysis technique to analyze news articles, former study designs may be overly narrow, evasive or have other shortcomings. Two design weaknesses are identified through this research entailing a review of the published literature in spite of an evident lack of transparency in how coding, media frame or other CA processes are operationalized in many studies [Matthes, 2009]. One shortcoming is that the majority of CA-like studies, regardless of whether on prevention, treatment, or diagnosis, seem to focus on only two aspects (risk and benefit), while a few may study four or five parameters [Quick, 2010; Bonevski et al., 2008; Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012; Larson et al., 1982; Mattson, 1999; Goodall et al., 2012; McRee et al., 2012]. Second, the lack of transparency and/or breadth also holds true for assessments of news quality; this flu news research also entails an expansive inquisition of news quality.

Although content analysis has been applied for decades, there appears to be variability in application, often with a limited analytical scope, in addition to a lack of transparency in methodology [Matthes, 2009]. The first glaring drawback in past
analyses of public health information is a lack of a golden standard by which to structure key parameters of value to assess for content discussion or presence. In an examination of published CA studies that apply to a variety of public health issues such as medication (treatment), screening test, or preventive care (dental, vaccine) compliance, or biotechnology, research scholars assess only a few parameters [Moynihan et al., 2000; Schwartz & Woloshin, 2002; Bubela & Caulfield, 2004; Danovaro-Holliday et al., 2002; Marks et al., 2007]. The most common points that are analyzed among these public health matters are risks and/or benefits. Thus, upon identification of gaps in the analytical approaches of previous studies, forthcoming content analyses merit stronger approaches as utilized in this research design and framework application. This flu news research is partially modeled based on a vaccine news CA study by Madden, who applies more than two content parameters [Madden et al., 2012].

My solution or approach to address the first weakness in analyzing the content of (flu) news is to apply and expand a behavioral framework that is utilized for explaining or predicting behavior and is applicable across diagnostic, prevention or treatment disciplines. In this content analysis design, the Health Belief Model (HBM) is the guiding framework utilized to analyze flu news in major U.S. newspapers and on American Broadcasting Companies, Incorporated (ABC) network television during a twenty month period spanning two flu seasons and the intermediate 2009 H1N1 (swine) flu pandemic; the specific study period is October 2008 to May 2010. This model is the most applied theoretical belief model used in behavioral research and its structure has been applied in a few published CA studies on public health issues [Quick, 2010; Madden et al.; 2012;
Larson et al., 1982]. As flu is the expressed research interest, these behavioral-like markers, or more appropriately referenced “information markers” are applied to analyze for disease and prevention discussion content in flu news transcripts. This model application is valued as more rigorous than lesser focused or unstructured analysis techniques used in past content analyses including on the research topic of public health news [Harrison et al., 1992].

The HBM in its early application in the 1970s focused on four components including the disease attributes of susceptibility and severity, and the prevention attributes of benefits, and risks or other barriers, which are often considered as a negative feature that take away from benefits. The model has been modified over the decades of use, which is positive in the sense that it is widely utilized, but a drawback, like in content analyses, lies in the potential lack of consistency in application. After consideration of the literature and pilot read of news transcripts on two other disease (measles and pertussis) and prevention themes, this analysis is expanded to include additional belief or perception components. Important to flu news content are alleviatory messages that reduce common fears or barriers (so as to diminish the negative or deterrent effect on compliance), and messages of the actual prevention measure, in this case, the flu vaccine, in addition to precautionary or prevention alternatives such as those applied in general infectious disease control. The HBM feature known as cues to action is considered in this study as a means to exam for emotional and educational content that theoretically may remind or motivate some of the public to get the annual flu vaccine; this is likely the rarest HBM component in news and does not contribute to information completeness in this research design, but is a
bonus feature (see Chapter III) [Carpenter, 2010]. Another modification, based on the literature of safety focus, is to study mild harms or prevention risks as a separate characteristic from severe risks (barriers) (that in theory could allow for comparison of balance with benefit discussions in media frame analyses if sufficient presence of content). It is important that the mildness of harms content be more up front, since public fears and concerns hold back many from accepting the flu vaccine (opinion). Hence, casting a broader (eight characteristics) net to pull specific news content will allow for a better or truer assessment of information completeness and other quality determinants. Through this CA research, one can observe what types of flu information are mainstream, and where journalism has been weak or strong in supporting public health programs. This background lends in part to the main persuasiveness investigation, with a primary assessment of the information completeness (quality component) of flu news.

The second research design enhancement is a broadened or more robust analysis of quality factors. Common quality factors directly studied or implied include completeness, accuracy, balance and/or other features that presumably contribute to persuasiveness. The first two characteristics, as completeness is alluded to above, are fairly straightforward. The primary quality characteristic assessment of the flu news is based on examination of the frequency of disease and prevention information; modification through a more expanded HBM-guided content analysis enhances the assessment of the completeness realm. Inaccuracies in this research design involve assessment of exaggerations; any evidence of outdated (1976 deaths or paralysis, referred to as Guillain-Barré syndrome, or misleading (autism, mercury/thimerosal)
information pertaining to the flu vaccine are considered as information exaggerations (inaccuracy-like). Balance of media frames, representing two related or opposing themes, is also incorporated into the main persuasiveness portion of news quality. Thus, persuasiveness is mainly influenced by the three main features described above, and other factors that contribute to general persuasiveness.

In summary, assessment of the pertinent news content and quality is performed by a systematic content analysis driven by a broad, yet pointed codebook instrument to especially achieve an improved sense of the completeness quality aspect. Exemplary phrasing presence or absence is tracked in a coded-worksheet per individual study eligible news transcript, and score values of one or zero respectively are attentively transcribed in an excel spreadsheet that contains preset calculations to reassure accuracy in data entry expectations. Data sorting of large sets of hundreds of transcript files allows for specific analyses of hypothetical objectives. Important data findings pertain to the overabundance of disease information in flu news, and lack of information on flu vaccine benefits and risks, which are typically mild. Being that information completeness is critical to high or superior news quality, this research finds that the overall quality of flu news is suboptimal or mediocre.

1.1.3 Flu Burden —

Flu is a health (personal) and economic burden. In brief, the incidence of flu infection at a median rate of 10% means that over 30 million Americans are exposed to flu annually and millions become ill. The burden of flu is costing Americans tens of
billions of dollars in lost wages and direct medical expenses [Molinari et al., 2007].

Despite the traumatic number of deaths during the 1918, 1957 and 1968 flu pandemics, and the annual mortality rate in the tens of thousands, over half of the U.S. population does not receive the annual flu vaccine. While the country on the whole is approximately half and half on whether or not they follow through with an annual flu vaccine, unfortunately, our healthcare professionals represent a non-compliant population. Nationwide compliance below an 80-94% (herd immunity) level is a hardship for our communities, especially those few (approximate 15%) who are contraindicated or ineligible to receive an influenza vaccine. We are reminded seasonally in the news about the flu and prevention, as incidence rates escalate. Finding ways such as through this extensive content analysis to suggest mass communication enhancements may aid in a trend towards improved public knowledge and annual vaccination rates.

While flu is largely seasonal, it may in some years inflict illness in individuals whom may not typically pay attention to health news or their surroundings. The portion of the U.S. population who is perhaps habitually non-compliant with flu vaccination may be (unexpectedly) exposed to changes in their life, and subsequently more open to news information related to their environmental or health status and/or doctors’ recommendations regarding flu prevention. Annual flu news, like refresher training, may provoke the public to reassess their home and other daily or routine environmental situations and remind those who are especially in need of a flu vaccine, such as newly expecting moms, children entering day care, grandparent or parent in need of elder care, sickly child who requires rehospitalization, persons with newly developed diabetes,
asthma, heart condition, or morbid weight gain, or newly employed staff (or frequent visitors) at crowded or sickly locales including schools, hospitals, or assisted living facilities. Life changes could urge those who are typically or occasionally non-compliant with an annual flu vaccination into becoming more aware through news media (or physician) resources to reconsider a flu shot in the upcoming, i.e., near immediate, flu season. It is prudent to note that some of these types of life changes in health status or work locale may have occurred in the spring or summer outside of the typical flu season; hence, conversations with a health care provider at the time of a new chronic illness diagnosis are likely not focused flu vaccination. Importantly, seasonal flu news reaches out to millions of us and reminds some to get another vaccine in the new flu season, and perhaps sparks others to consider getting a flu vaccine unlike in past years.

1.2 Research Study Goal

1.2.1 Overarching Objective —

Through a manifest quantitative content analysis of flu news from October 2008 through May 2010, the quality of news content is determined [Berg, 2011]. The research question at hand, relates to what type and/or quality of disease and prevention (vaccination) information in the print and broadcast media news is being provided to the public. Given problems with poor- or non-compliance with annual flu vaccination, one must learn what type of information or facts might be important for the public to be reminded about or aware of as a directive for improving upon both communications and flu vaccine compliance. Content presence and accuracy (persuasiveness) are requisite
to being properly informed and potentially active in health appropriate behavior. The three main persuasiveness (quality) measures in this research design are information accuracy, balance, and completeness with completeness being the principle quality factor. The quality of flu news is important since how the public perceives or whether in reality news messages are sufficiently or inadequately addressing the importance and facts of a public health issue can be a factor in compliance (healthy or illness behavior). In essence, the overarching research question is “What is the quality of flu news in newsprint and television on disease and the preventive flu vaccine?”.

1.2.2 Research Significance —

Determination of the full or partial and balanced or imbalanced presentation patterns of flu information that the media provides to the public can be important knowledge for journalists and other gatekeepers whose agendas set those public health news stories and media frames [Lang & Lang, 1966 cited by McCombs & Shaw, 1972; Kiousis, 2004; Muschert & Carr, 2006; Anhang et al, 2004]. Through determining the content of flu news, we will gain an appreciation of which content needs to be expanded, added, and/or downplayed or perhaps omitted in future flu-relevant media news. Given up to nine HBM parameters that can be discussed in different media patterns, it is presumed to be rational for the media to cover the breadth of flu subtopics during early to late flu cycles to more fully educate and motivate the public regarding health care and flu prevention. The observations from this content analysis of flu news are revealed in Chapters IV-VI.
1.2.3 Roadmap —

The remainder of the dissertation contains six additional chapters. Chapter Two provides further background on health news communications and importance in decision making, a review of the published literature on CA studies to assess operationalization of agenda setting applications, and an introduction of various news quality factors. Chapter Three provides details on research materials, methodical tools, and application of a scoring system to evaluate news quality. Chapter Four summarizes research findings on overall flu news quality while Chapters Five and Six demonstrate additional research findings on televised and newsprint flu news quality respectively. The final chapter, Chapter Seven, concludes with a summary of news quality findings, discussion of unique and strengthened research design and limitations, and future application in behavioral or content analysis research and news journalism.
II. NEWS INFLUENCE AND QUALITY FEATURES

Chapter Two provides a brief summary of public attitudes regarding flu vaccination, the importance of the media (agenda) as a health information resource and the influential power in the public domain (and/or policy agenda). This chapter also lays out issues with previous news quality and content analysis studies. Through a review of the literature, importance and examples of news quality factors are presented and incorporated into research hypotheses on news quality conditions.

2.1 Public Attitudes about Flu or the Preventive Vaccine

2.1.1 Flu Vaccination Noncompliance —

Less than 50% of the U.S. population receives an annual flu vaccine, including hospital staff and other healthcare providers. This supposed health-oriented population is a valuable resource from whom to better understand flu vaccination compliance and noncompliance actions [MMWR 2011, 2013]. In several survey studies, reasons for healthcare worker (HCW) non-compliance with the flu vaccine have been assessed, many of which are relatable\(^1\) to the common public. Many noncompliance issues have

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\(^1\) Common excuses among, yet more specific to, HCW for not getting a flu shot include avoidance of medications (which is counterintuitive to their frequent job performance) and inconvenience, which may be due to their more intense schedules of twelve-hour shifts. Increased access through mobile vaccine carts on hospital wards can improve HCW vaccination rates [Nafziger et al., 1994].
to do with misconceptions, which is unfortunate in the health care venue. Approximately one-third of HCW, and other populations such as college students and staff, are concerned about getting the flu from the vaccine, and/or about severe reactions such as GBS [Weinstein et al., 2007; Hofmann et al., 2006; Weingarten et al., 1989; Christian, 1991; Watanakunakorn et al., 1993]. The former concern is much more common among nurses than physicians [Weingarten et al., 1989]; however, this issue of getting flu from the shot is a myth that HCW and the public need to be better educated on to minimize hesitation about getting a flu shot. Thus, explaining the rationale behind inactivated or attenuated flu vaccine designs or formulations (and/or disease incubation periods) could lead to better public education and compliance. The latter concern about GBS is in reality more relevant to natural infections by 100-fold than the flu vaccine; the CDC estimates that only one or two cases of GBS are potentially associated with up to one million administered flu shots [Ropper, 1992; CDC VIS]. Of course, those who have had a GBS reaction up to six weeks after a prior flu shot are contraindicated for a future flu shot. Another flu vaccine concern is that HCW and others believe that the flu vaccine is ineffective in protecting them (from getting or spreading the flu) and/or they are not likely to be exposed or become ill from flu [Hofmann et al., 2006; Weingarten et al., 1989; Christian, 1991; Heimberger et al., 1995]. This illogical concept is illuminated in a flu vaccine compliance study wherein 24% of respondents commented that the vaccine is believed to be ineffective, but 35% responded that they had developed a flu-like illness that season [Weingarten et al., 1989]. While some vaccines against other communicable diseases are 90% effective, the flu vaccine protection varies depending on whether the seasonal virus is an exact or
close match to the (approximate six month prior) predicted viral strain used to manufacture the annual vaccine. What the public needs to realize, is that in perspective, an example 50% chance of being protected from an illness that could put them out of work for at least one week is better than no protection and taking the chance that they won’t catch the flu from coming into contact with an ill person.

Besides the concern of severe side effects which are very rare, HCW and the common public have a fear about other side effects. Yet, a sore arm was reported to be much more common (35%) than a fever (7%) or flu-like symptoms (6%) based on a flu vaccine compliance study [Watanakunakorn et al., 1993]. Of all things considered, when it comes down to how (likely or) much less the public is concerned about side effects or risks from vaccination compared to other procedural activity or technology risks, in the end, vaccination is not a major risk concern. In a risk analysis by Slovic, experts and laypersons rated 30 different risky-like topics in order of their fears, and vaccinations ranked at or near the bottom of the thirty concerns [Slovic, 1987]. It’s possible that if the public wouldn’t react on impulse at flu season, but instead consider, on whole, that their fear, if any, is probably low compared to other procedural fears, then more people might be more accepting of the annual flu vaccine. Hence, the public needs factual information during flu seasons or outbreaks to remind them of important medical and event facts that are perhaps put in perspective.
2.1.2 Knowledge and/or Compliance Enhancement: Addressing Public Fears or Concerns —

Knowledge is a powerful factor in increasing healthcare (medical and nonmedical) staff’s and others’ intent to receive the annual flu vaccine [Nafziger & Herwaldt, 1994]. For example, one study showed a highly significant correlation of vaccination compliance among nurses who correctly answered basic knowledge questions about flu and the vaccine in comparison to nurses who opted to not get the vaccine that correlated with incorrect knowledge [Martinello et al., 2003]. In a concise communication report, a study indicated that a campaign strategy incorporating meetings, videotapes and pamphlets, at a chronic care psychiatric facility, doubled the flu vaccination rates of employees [Heimberger et al., 1995]. Hence, educational content can improve our understanding about disease and prevention.

Misconceptions about flu and the preventive vaccine are still out to haunt us. From some of the HCW fears mentioned above, it appears that HCW and the public need access to clarifications about the flu and preventive vaccine to better understand what is fact versus fiction in the form of perpetuated myth. One study indicated that out of five basic knowledge questions, only knowledge that the flu vaccine does not cause disease was a predictor of HCW being (twice as) likely to get vaccinated [Heimberger et al., 1995]. Such reassurance is an example of the unique type of content incorporated in a HBM-like category applied in this research design; this new category is referred to as concern clarifications or comfort concepts that serve as counter-barriers or alleviatory messages. The counter-barrier content captures truthful,
corrective or comforting statements that oppose common public concerns, myths or other deterrent barrier statements.

Other features suggested to improve vaccination compliance with the flu vaccine are personalized messages or targeted cues, trust, and vaccination campaigns. In 1982, Larson et al. demonstrated that a personalized reminder card (cues) from a physician significantly increased flu vaccinations rates from 20 to 41% [Larson et al., 1982]. Importantly, HBM content incorporated in the research study on behavioral cues, further increased vaccination rates. Multiple HBM-like categories applied in this flu news research design help to ensure that the information completeness quality assessment is rigorous (as is theoretically important to behavior). While an interventional component is outside this research scope, the principles of the HBM are examined in news content.

Physicians are trusted health information sources, that is, if they are available to the patient, or consulted by the media. In an Italian study, researchers showed that compliance with the 2009 H1N1 vaccine was associated with trust in communications from the Ministry (Department) of Health and also the media [Prati et al., 2011]. This latter point supports the relevance of this research study. There are multiple information and persuasive factors that can entice the public to comply with flu prevention measures and increase their understanding of disease risk (Table 1). The HBM factors that can be contained in news messages are of research interest. As described below, the primary research goal is to assess and compare the overall news quality of two traditional types of U.S. news media.
<table>
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<th><strong>Modifiers</strong></th>
<th><strong>Beliefs /theories</strong></th>
<th><strong>Perceptions /theories</strong></th>
<th><strong>Action /theories</strong></th>
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<tr>
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<td>Cultural or family traditions</td>
<td>Knowledge gap [Bonfadelli, 2002]</td>
<td>Access (Not direct causal link [Harrison et al., 1992])</td>
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<td>Knowledge (HBM core)</td>
<td>HBM core: Disease susceptibility &amp; severity; Benefits (-) barriers/ harms of recommended measure</td>
<td>Awareness of threat &amp; efficacy of measure (if interested/ agree); New knowledge</td>
<td>Individual Action</td>
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<td>Knowledge (novel or refresher)</td>
<td>HBM-like: Clarifications (myth busting); Official recommendation and alternatives</td>
<td>Awareness (if interested/ agree); New knowledge; Trust in authority</td>
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<tr>
<td>Personal experience</td>
<td>HBM (survey test): Self-efficacy</td>
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<td>Media: Agenda setting /message</td>
<td>HBM — Cues to action: media news [Harrison et al., 1992]</td>
<td>News agenda; Media frames (secondary)</td>
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<td>Motivation- Trust or targeted message</td>
<td>Trust in media; News quality (complete, credible)</td>
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<td>HBM — Cues: targeted or tailored /educational message (or emotional situation)</td>
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<td>Motivation- tone; personality</td>
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<td>Possible news tone or bias: dramatized, celebrity /personalized</td>
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<td>Motivation other</td>
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<td>Motivation- social trust or pressure [Rosenstock, 1959]</td>
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<td>Historical action</td>
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<td>Vaccination last year [Hofmann et al., 2006; Setbon &amp; Raude, 2010]</td>
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2.2 Media Information Influence

News media can influence public opinion about health\(^2\), politics, economy, etc. [Frost et al., 1997; Bonevski et al., 2008; MacDonald and Hoffman-Goetz, 2001; Martinson & Hindman, 2005; Davidson & Wallack, 2004]. Shared information, whether it is health, political, or entertainment, is communicated by the news media as well as among household members, neighbors, and coworkers [Slovic, 1987; Jardine et al., 2015]. Despite the multiple information sources, including within the medical community, the media is influential. Parts of the media's influence are mediated through agenda setting (primary) and media frames (secondary), which downstream can affect public (decisions and/or behavior) and/or policy agendas as expanded upon below.

2.2.1 News Media as a Health Information Provider —

Multiple information sources can influence health decisions; the public can be influenced not only by the media, but also through their physicians\(^3\), family and friends, and educational literature or communication campaigns [Jardine et al., 2015; Pineda & Myers, 2011; Li, 2007; Priest et al., 2003, Jones et al., 2012]. The public seeks or is attentive to health information provided through the mass media. Media forms nowadays can be newscast or social, the former of which is relevant to this research.

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\(^2\) Health news on television is less frequent than political or criminal news [Pew, 2013].

\(^3\) Doctors may be another source of vaccine information and encouragement, but physician visits may not be frequent enough or too short to keep the patients informed of recommendations and disease outbreak and/or vaccine updates [Gutiérrez-Doña et al., 2012; Gao et al., 2011].
Newscast and other media sources may pertain to the broadcast forms of television or radio, in addition to newsprint or internet. Based on CA studies of public health news, newspapers and television, which are the news media in this research, are common media news sources [Quick, 2010; Anhang et al., 2004; Moynihan et al., 2000; Kennedy & Bero, 1999; Schwartz & Woloshin, 2002; Long et al., 2006]. Health information provided through the media is influential and one must be careful from where they derive their news or health facts. Studies of online health news content have cautioned that important information may be inaccurate and/or incomplete, i.e., poor quality; thus, web info is not a medium in this study [Habel et al., 2009; Madden et al., 2012; Anhang et al., 2004; Bonevski et al., 2008; Kata, 2010; Eysenbach et al., 1999]. In obtaining quality public health information, one needs to receive factual information from professional sources, i.e., not risk rumors or anti-vaccine activist’s blogs [Gaziano & McGrath, 1986; Jardine et al., 2015; Gearhart et al., 2012].

According to the Pew Research Center for the People and the Press, Americans’ sources of general news are primarily television and less so newsprint [Pew, 2012]; these are the two forms of media examined in this research study. The selection of newsprint and televised news transcripts is further discussed in Chapter III. As relevance of print and televised media sources, is substantiated, these media also notably serve society in a way of reminding the public about the seasonal escalation of flu, which is a highly communicable (contagious), vaccine preventable disease caused by the influenza virus [MacDonald & Hoffman-Goetz, 2001]. Influence on public

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4 The internet and social media materials are much too fluid if one wanted to replicate the research approach with reproducible intent. Social media was least utilized for SARS or H1N1 news [Jardine et al., 2015]; the communication source is not part of this flu news research.
awareness, knowledge and/or decisions not only come from the salient media agenda, but as conveyed next, also from media frame(s) within a news story [Muschert & Carr, 2006; Martinson & Hindman, 2005].

2.2.2 Agenda Setting or Most Important Problem —

News making is a process. There are extensively more news events in a single day than the media can possibly cover [Graber & Dunaway, 2015]. The media, regardless of source, tend to cover similar stories [Robinson, 2011]. Salience of flu news is a measure of the media agenda, notably during the fall and winter season. On whole, agenda setting encompasses a relationship between media and public agendas (see below). Media agenda is the primary measure of agenda setting and supplemented by the secondary agenda level of information content presented in media frames [Marks et al, 2007; An & Gower, 2009; Druckman, 2001; Zelenkauskaite, 2012]. The subject or subtopic of news focus is the media agenda [Pew, Methods]; in simplistic terms, the news media bring light to emerging events in our society (as well as internationally) [Marks et al., 2007]. According to earlier scholars of the (predefined) agenda setting hypothesis, this essentially means that the media disseminate message content of “what the public should be attentive to or think about” [Cohen, 1963 cited by Soroka, 2003; Druckman, 2001; Martinson & Hindman, 2005]. There are several media features that define or capture the salience and prominence of a news event or story [Kiousis, 2004; Muschert & Carr, 2006].
Agenda setting involves the process through which gatekeepers and journalists select and highlight certain topics or events [Druckman, 2001; Kiousis, 2004; McCombs and Shaw, 1972; Muschert & Carr, 2006]. These key topics may represent what are the most important problems in the present time (see public agenda). There are several agenda setting characteristics that are studied in mass communications. The media agenda and/or issue salience can be measured according to the number of news stories or representative content respectively, while other prominence or qualitative measurements can be interpreted according to placement, size, graphics or other dimensions [Kiousis, 2004; Muschert & Carr, 2006]. In this research project, the former analysis approach of measuring the number of flu news articles by month is utilized [Kennedy & Bero, 1999; Durrant et al., 2003]. In summary, the agenda feature tells the public “what to think about” [McCombs & Shaw, 1972]. Public perceptions on how to think about society issues can be influenced by media frames as explained next.

2.2.2.1 Media Frames as an Influential Tactic

Besides salience of a news topic, the media employ communication or media frames, which is a secondary form of agenda setting. Frames applied by the media are like spotlight or snapshot, as opposed to panoramic, views of issue content that direct “how the public should think about” a particular issue in the headline or news storyline [Lippmann, 2000]. By applying news frames, media producers, editors and journalists
present the innate and/or modified perceptions of reality to the public [Muschert & Carr, 2006]. Framing is considered as the practice of selecting certain attributes of a topic and giving those attributes added emphasis [Zelenkauskaite et al., 2012; Druckman, 2001]; these communication frames in turn can affect the public's attitude and behavior [Chong & Druckman, 2007; Anhang et al., 2004; Madden et al., 2012; Martinson & Hindman, 2005].

The different means of focus on medical treatment recommendations, or disease prevention through vaccination, can be related to the framing theory defined by (political communications scholar) Entman who stated that “to frame is to select some aspects of a perceived reality and make them more salient in a communicating text in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" [Entman, 1993; Matthes, 2009]. The framed news messages can thus affect the public's understanding or interpretation of issues [Lowery & DeFleur, 1995 cited by Li, 2007]. These media frames may be generic, as applied in political or social science topics, or issue specific as applied in this flu news research [Li, 2007; Gearhart et al., 2012; Matthes, 2009]; generic types of frames include morality, conflict, issue, episodic, thematic, responsibility, economic, human interest, and leadership [An & Gower, 2009; Iyengar & Simon, 1993]. Generic frames are less commonly used compared to issue-specific frames [Matthes, 2009].

Studying personalized content in mass communications can be approached in several different ways, either through generic (human interest) media frames, or the

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5 In political or government news, media framing can be controlled through press releases from the White House.
HBM framework as applied in this research. Some scholars consider personalized (celebrity-like news) content as information bias⁶ [Bennett, 2015]; however, celebrity⁷ or soft news, for the most part, is less relevant to seasonal (or pandemic) flu news. In this research design, personalized content in flu news is examined as a modified, HBM feature known as cues to action, which is a motivation theme applied in behavioral studies; however, in this (non-behavioral) flu news CA study, cues to action content is applied as a persuasiveness news quality component (see below). The two forms of personalized content with a motivational-type angle examined in the flu news are associated with emotional or educational content; these types of personalized content are considered to be non-biased, and have varying motivational effects. The personalized content is analyzed for presence or absence, but not frame balance. The motivational aspect of cues to action content is further discussed in a later section on research hypothesis generation (see below).

In the inductive scheme strategy of this research, issue-specific frames are employed in this evaluative research [Matthes, 2009]; the main conceived study frames under content and balance analyses include disease risk and prevention approaches (see immediately below). The outcome of media agenda and frame analyses between the flu newsprint and broadcast news sets will help us gain an appreciation of the information or news message content and the open or one-sided, i.e. balanced or imbalanced,

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⁶ Perhaps one of the most familiar, yet biased (personalized), media frames was during the Bush administration with the Hollywood-style “mission accomplished” performance on a U.S. aircraft carrier, drawing attention away from the war in Iraq [Bennett, 2015].

⁷ Reference to a prominent figure such as the U.S. president is not considered celebrity or personalized content, but is tracked in this study as a credible government informant.
presentation of news messages that may be a source of how the public forms their health decisions and potential action (behavior).

2.2.2.1.1  **Issue-specific Media Frames in Flu News**

The two media or issue-specific frames analyzed in this research, center around HBM concepts that the public might think about; these disease risk and prevention approaches frames are introduced here and their specific HBM components are explained in more detail in the next chapter (see Chapter III). Briefly, the disease risk frame includes (disease) susceptibility and severity parameters that in combination may be said to be relevant to risk in terms of societal reality and/or individual perceptions [Fung et al., 2011; Weinstein, 1988]. A second media frame, prevention approaches, captures the balance or imbalance of news content on the flu vaccine versus alternative prevention measures such as handwashing (see Appendix and Chapter III).

Discussion frequencies of two components within a media frame are compared for balance or imbalance to achieve a sense of whether news is evenhanded or one-sided respectively. Imbalanced frames are an unfair representation by definition and can be considered a form of media bias; thus, if the majority of media frames are imbalanced, then a lower quality score is assigned. In summary, frame balance is important to aid in ensuring that the public receives information that is more complete, which is a complementary news quality feature.
Salient topics or issues may represent what are the most important problems in the present time (public agenda). As stated above, the media agenda or coverage of an issue can alter the public’s attitude or opinion towards the emphasized (health) issue [Long et al, 2006; Druckman, 2001; Anhang et al., 2004; Martinson & Hindman, 2005], that is, the media agenda can set a downstream public agenda (Figure 1, thick line) [Dearing and Rogers, 1996]. The public agenda effect was postulated by Walter Lippmann in 1922. This connection was demonstrated in 1972 in a study, referred to as the Chapel Hill study, by journalism scholars, associate professors at the time, McCombs and Shaw who coined the term “agenda setting”. The authors evaluated (surveyed) what government issues were most important among undecided voters during the 1968 presidential campaign compared to prominent political campaign issues in the media. The study found a high correlation of voters’ views of the two most important government issues with a matched ranking of media agendas set in North Carolinian media news [McCombs & Shaw, 1972]. This work built upon earlier research by Lang and Lang on the mass media and voting [Lang & Lang, 1966 cited by McCombs & Shaw, 1972]. At around the same time, in 1973, Funkhouser, assistant professor at the time, also demonstrated an effect of the media (weekly newsmagazines) over a decade during the Vietnam War era and the public or national agenda measured through the Gallop Poll [Dearing and Rogers, 1996]. George Gallop, in 1935, initiated the survey of what the public thought was the most important problem facing the country; in essence, public agenda research preceded media agenda research [Dearing and Rogers, 1996].
The public agenda beyond the media agenda may be a reflection of prominent media topics and/or frames, however not encompassing the entire public mindset. The public agenda may represent what is the national most important problem, but everyday citizens may have other public problems on their mind. For instance, many may be concerned about gasoline prices or the high cost of mass transit, and their long or treacherous commutes. The transportation issue is often on the local politician ticket, but is lower on the national agenda and spending budget. Even with supporting advocates as well as opponents, there are many societal problems that do not make it on the public agenda; problems require media coverage in order to be labeled as a “public” issue [Dearing & Rogers, 1996; Davidson & Wallack, 2004]. The public agenda may even be misled by the media; for example, the local news most often leads with crime, shootings, or disaster reports. This continuously dismissal media exposure can lead the public, nation or tourists to believe that the streets of Washington or New York are unsafe [Graber & Dunaway, 2015]. Also, some audiences may be affected more than others by various public agendas; in the case of crime, women and the elderly are more sensitive to crime news [Erbring et al., 1980 cited by Page et al., 2000; Dearing &
Rogers, 1996]. The influence of the media and public agendas can be illustrated by changes in behavior, from this scenario, such as women clutching tightly to their purse, tourists avoiding major downtown cities, or locals not driving through unfamiliar streets at dark. Rather than a direct behavioral context, the goal of this research is to define how flu news is portrayed in the media agenda over two flu seasons and to rate news quality based on a multitude of factors.

On a larger scale, the public agenda can affect policymaker’s decisions, i.e., the policy agenda, although less frequently studied (Figure 1, dotted line). In the case of foreign policy, for example, policymakers may make judgment calls in anticipation of what they think the public will pay attention or react to [Dearing & Rogers, 1996]. As an example, the notorious “CNN effect” is reported to have rallied up the public (agenda) cry to policymakers to act on foreign aid to assist starving citizens in Somalia during the 2009 crisis of Iraqi invasions. That is, the human interest or media frame of starvation took precedence over the war or conflict issue. In addition to the multiple consecutive phases of agendas, policymakers are directly influenced by the media. As an example of the three interrelated agendas is the issue of anti-smoking; public advocacy against smoking lead to a decline in the frequency of actors smoking on television programs and cigarette advertisements, as well as laws banning smoking in restaurants. The standards of measuring policy agendas are more variable than those measuring media agenda [Dearing and Rogers, 1996]. Policy agendas may be better known among the elite than the common public; however, this knowledge gap tends to be squelched during the late stages of conflict [Baum & Potter, 2008]. Hence, if flu news is quintessential seasonal or routine, there is probably less evidence of a policy
agenda. In summary, these depictions reinforce that content analysis is a common technique among communication, and political and social science scholars. A key objective of this flu news research is in lines with analysis of the media content or agenda. Next, the connection between health news importance and news quality issues is explained below.

2.2.3 Linking Media or Public Agenda to News Quality —

An important part of the information flow into the public agenda is the potential effect on public decisions and behavior. The continuous health information in the news media can increase and/or change (confirm or contradict) the knowledge base in our society [Bonfadelli, 2002; Durrant et al, 2003; Anhang et al, 2004; Moynihan et al, 2000; Bonevski et al., 2008]. As events or new recommendations or products may unfold, the news or investigative reporter on the health or medical news beat may be more likely to cover the new storyline. New or refreshing facts can change one’s perceptions and may bring about changes in attitudes and behavior. Hence, disease prevention (health news) coverage in the media is indispensable for the public to make decisions about their well-being [Wang & Armstrong, 2012]. As news media is important for public health direction (Figure 2), the quality of the news messages that the public is exposed to must

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8 It may be unapparent whether or to what level the public may be influenced by the media, but they do approach media sources for health information [Durrant et al., 2003; Wang & Armstrong, 2012; Danovaro-Holliday et al., 2002; Baker et al., 2003; Jones et al., 2012; Fabry et al., 2011; Davidson & Wallack, 2004]. Even with the mass of content analysis studies on political news, for example, it is difficult to tell or pinpoint the effect of the media on public decisions or voting [Graber & Dunaway, 2015]; this difficulty is due in part to the narrow measurements (earlier technique) or lack of good indicators, but more so due to the multiplicity or multitude of information sources from which we become aware of important issues. This is all the more cause for the media and other communication sources to provide consistent health information as assessed in this research.
be of a high standard (substantive breadth) and reliably consistent overtime and among media sources. The quality of mass communications is important as the general public tends to have opinions of low quality that are unstable [Rubin et al., 2009]. Thus, the primary objective is to assess the quality of flu news over two flu seasons and the intermediate 2009 H1N1 pandemic period.

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**Figure 2** Importance and Interrelationships between Public Health Issues, Facts, or Updates in News Media content and Citizens’ Health Decisions dependent on News Quality
2.3 News Quality Issues and Optimization of Content Study Approaches

Earlier, it was mentioned that online news quality is not always dependable. The premise of this research is raised by uncertainty of the media news quality of health information pertaining to flu; thus, it is important to flesh out how this quality concern was raised in prior published CA studies, how this field of CA studies could be broadened and strengthened, and a specified layout of the multiple quality features applied in this comprehensive analysis.

2.3.1 Research Problem: Questionable News Quality and Former Content Study Shortcomings —

In a report from the Pew Research Center for the People and the Press, news quality is a journalism concern according to journalists on the national and local news level [Pew, 2008; Graber, 2015]. This research brings into question the “quality” of news media (HBM-based) information on flu that has been provided to the public. Good or poor quality health information could have an effect on the public’s health decision-making and/or behavior processes of whether to comply with the annually recommended flu vaccine (see Figure 2). The uncertainty of health news quality, based on published CA literature stating findings of missing factual health information, precipitated this research focus mainly on the information completeness of flu news in U.S. newspapers and network television during the specified 2008-2010 period.
Despite the common research findings, a weakness of CA studies seems to be that many studies merely measure media attention (salience) and/or frames (opinion). Many CA studies basically measure salience of news topics, while other CA studies merely focus on media frame as occasionally indicated in the title of published articles [Leader, et al., 2009]. Rarely do studies when mentioning the importance of balance (quality) clearly define the two reference points such as harms and benefits (which can be interpreted as media frame content) [Bonevski et al., 2008]. The operative definition or investigation of news quality is also inconsistent and often narrow; in several scholars’ publications, researchers analyze completeness and/or accuracy, which are important to persuade the public in a non-misleading manner. Some CA studies also analyze credibility, typically of the informant source and occasionally the news media source [Li, 2007; Long et al., 2006; Goodall et al., 2012; Price & Grann, 2012; Prabhu et al., 1996; Gaziano & McGrath, 1986]. Most published studies lack methodology transparency, perhaps because of publication costs and space [Matthes, 2009]; some journals may nowadays have supplemental articles online. Yet, in an example publication where content quality examination was somewhat detailed, the minute details of scoring individual content (on a 1-5 scale) were absence, but details were included of how the scoring system range was converted into a 1-5 star rating system [Bonevski et al., 2008]. Seeing the need for news quality expansion and clarity, there are additional characteristics as described below to measure the news quality, not the least of which the completeness feature is broadened, in this research design.
2.3.2 Research Solution: Broadened Investigation into additional Health Belief Model-like Components —

While previous CA studies investigate a narrow fraction of content characteristics or components, this research design expands the completeness quality factor investigation of flu and vaccine relevant content under a structured framework, the HBM; this model is commonly used in behavioral research and in some CA studies [Harrison et al., 1992; Quick, 2010; Madden et al., 2012]. There is evidence upon a review of the CA literature on public health issues, that CA studies incorporate fewer than four (HBM-type) components, thus, leaving the impression that CA researchers studying public health issues fall short on researching major influential factors pertinent to public health decisions or compliance [Moynihan et al, 2000; Schwartz & Woloshin, 2002; Bubela & Caulfield, 2004; Danovaro-Holliday et al, 2002; Marks et al, 2007; Frost et al., 1997; Bonevski et al., 2008; Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012; Eysenbach et al., 1999; Bubela & Caulfield, 2004].

Thus, the first strengthened approach of this CA research is the inclusion of a much more comprehensive examination of news covering up to nine HBM categories compared to past studies that examined half to a quarter as many categories, yet demonstrated information gaps. This expansion logically allows better assessment of whether a full picture on flu is provided in mass media. Despite the narrow scope of other CA studies, it could be hypothesized that news stories on flu may not frequently cover all HBM categories (not excusing for journalists’ habits or weak examples or models). Therefore, to get a truer sense of news quality, other features besides information completeness are examined.
2.3.3 Research Solution: Broadened Quality Assessment —

One needs to review a vast assortment of previous studies on news quality assessments to compile a variety of characteristics that are important in investigating news quality. The main three news quality features applied in this flu news research design include completeness, accuracy, and balance of media content [Gaziano & McGrath, 1986]. Persuasiveness, another quality feature; is like an umbrella characteristic or overall identifier of quality news in this research design. Mainly, persuasiveness entails the three main quality components, as well as general characteristics such as credibility and other features (Table 1). Instinctively, one needs content discussions that are (encouraging or) persuasive to more fully appreciate the health recommendations or best behavioral action(s). To address this concept, a new (HBM-like) category is employed, in this research design, to study positive-type content derived from messages that incorporate clarification of common public concerns about the flu shot as a means of possible alleviation in worries or hesitations. Additionally, in examination of the CA and flu vaccination noncompliance literature, it became apparent that trust is an issue that affects public attitudes and/or decisions; thus, in this research design, evidence of credible informants is investigated as a persuasive quality characteristic. Most common in the CA literature or field is the investigation of topic salience or newsworthiness; hence, in this research design, higher salience qualification is associated with peak news volumes on flu and as a form of persuasion or signal of importance. The HBM relevant cues to action is more often applied in interventional
studies such as counseling, but content may refer to a person dying or seeking a prevention measure; the emotional attachment presented in communications may persuade some to act upon prevention measures, and thus contributes to flu news quality.

To summarize a few findings of published CA, some studies exam a couple of quality features while other studies are very limited in scope. Information completeness comes across in many CA studies as a research inquisition value, and accuracy is sometimes investigated in CA or information quality studies. Several mass communication studies have suggested that incomplete or inaccurate information including that pertinent to public health can mislead the public [Habel, et al., 2009; Madden et al., 2012; Anhang et al., 2004; Bonevski et al., 2008]. Other scholars have suggested that in the public health arena, it is important for the media to present (market) a properly informative (and balanced) product so as to not undermine the public health authorities’ directives toward health compliance outcomes and improvements among communities and the nation [Kennedy & Bero, 1999; Habel et al., 2009; Bonevski et al., 2008]. These main quality and other general factors in combination become increasingly persuasive. The factors that form higher quality news messages are summarized in the next section and further applied or described in the literature review.
<table>
<thead>
<tr>
<th>Persuasive:</th>
<th>POOR QUALITY NEWS</th>
<th>GOOD QUALITY NEWS</th>
<th>Score Range (0.5/1/3 Points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Consistency (media sources)</td>
<td>(RH1) All factors combined</td>
<td>(RH1) All factors combined</td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>Incomplete</td>
<td>Multi-issue salience</td>
<td>0.5-3</td>
</tr>
<tr>
<td>Accurate</td>
<td>Inaccurate</td>
<td>Accurate</td>
<td>0.5-3</td>
</tr>
<tr>
<td>Realistic</td>
<td>Outdated, mythical, exaggerated, biased, misleading</td>
<td>Current / no old-controversies</td>
<td>&lt; 0.5 (if poor)</td>
</tr>
<tr>
<td>Balanced</td>
<td>Imbalanced (one-sided) (&lt; 1 frame balanced)</td>
<td>Multidimensional (2/3 frames balanced)</td>
<td>0.5-1</td>
</tr>
<tr>
<td>General Persuasiveness:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salient stories (newsworthy)</td>
<td>Less news volume (non-peak)</td>
<td>Higher news volume (season/epidemic)</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Credible informants (RH3)</td>
<td>Other representatives or professionals</td>
<td>Government leaders, Medical professionals or mix</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Clarifying/Comforting</td>
<td>Lack myth corrections; misleading</td>
<td>Corrective explanations</td>
<td>1 (if present)</td>
</tr>
<tr>
<td>Cues (non-biased, motivational-like, complement completeness):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional/Personalized (partial motivation)</td>
<td>Argue: Missing connection to ordinary citizen</td>
<td>Argue: Likely more attention grabbing or less ignored</td>
<td>0.3 -1.2 (bonus)</td>
</tr>
<tr>
<td>Educational/Targeted or Tailored</td>
<td>Argue: Perpetuates unawareness if missing (or if generalized at-risk-populace)</td>
<td>Argue: Better outreach &amp;/or recall (per more specific at-risk-populace and explanations)</td>
<td>1 (bonus, rare)</td>
</tr>
</tbody>
</table>
2.3.4 News Quality Factor Structure —

Based on the uncertainty of whether health (flu) or medical news messages are of high quality [Bonevski et al., 2008], it is pertinent to emphasize the factors positioned as relevant to higher flu news quality. Characteristics of quality public health information can include information completeness, accurateness, balance, and general persuasiveness (consistent, credible (trusted source), corrective or alleviatory, salient, etc.) and are of research inquisition in this study.

To more clearly explain these quality features of study interest, Table 2 provides a preview of how these various quality features are tracked and judged in the overall scheme of news persuasiveness and good or poor quality. Incompleteness is a research expectation based on prior published CA studies irrespective of expanded content scope. Inaccuracies are rare or not outstanding as other quality mishaps in traditional media (as opposed to online), and likewise are not an expected CA concern regarding flu messages based on a literature review of vaccine-focused CA studies, historical availability (1945) of the flu vaccine, and pilot read of infectious diseases news [Danovaro-Holliday et al., 2002; Habel et al., 2009; Wilkes & Kravitz, 1992]. However some minor exaggerations may be apparent or repeated through the media [Bubela & Caulfield, 2004; Frost et al., 1997]. In this research design, exaggerations in the form of inappropriate or outdated barriers are tracked as a content inaccuracy that somewhat deducts from the accuracy quality score (see Chapter III) [Pineda & Myers, 2011; Doyle et al., 2012]. Information imbalance or balance is in relation to two opposing sides of a media frame in this research design. The frames described earlier include disease risk
and prevention approaches. The fourth quality feature, general persuasiveness, encompasses credible informants, flu news prominence, and unique presence of comforting factors and rare cues to action content (Table 1; Figure 3).
**Figure 3** Factorial News Quality Features

**Quality News Features:**

- Timely/Newsworthy
- Credible Informant(s)
- Clarifying/Comforting
- Cues: Targeted or Personal
- Current: Non-exaggerated
- Consistency (media sources)
- Issue/content (salience)
- Complete
- Balanced
- Persuasive
- Accurate
- Flu News Quality
- Consistency between/among media

RH1
RH3
These features of news quality not only stand as single components affecting overall news quality, but have an interconnected effect on the overall persuasiveness (Figure 3). The three main news quality factors relevant to the flu news research may be interrelated such that if the news is incomplete, inaccurate and/or imbalanced it could diminish the persuasive potential of news content towards prevention actions. Thus, a frequent occurrence of incomplete or missing HBM information pertaining to flu and associated vaccines could portray poor or mediocre news media quality with the possibility of affecting both the completeness, and persuasiveness quality-type features. This research direction is aligned with other CA scholars who implied that the news on public health issues should provide a “complete picture” of prevention facts surrounding the immediate health issue [Habel et al, 2009]. Given the overall quality issues noted in public health relevant publications, this flu news-quality evaluation project sets out to primarily examine whether the coverage of HBM content in flu news during the specified 2008-2010 period is “all inclusive”. More broadly, for the purposes of this flu research project, “high quality” news media messaging is defined as being complete, accurate, balanced, and complemented by general persuasiveness factors [Gaziano & McGrath, 1986; Doyle et al., 2012; Bonevski et al., 2008; Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012; Danovaro-Holliday et al, 2002; Eysenbach et al., 1999; Li, 2007].
2.4 Literature Review of Content Quality and Prior Study Designs and/or Inadequacies as basis for Hypothesis Generation

Being able to visualize the important factors associated with news quality as introduced above, it is pertinent to examine the literature for research concepts and findings related to these news quality features to determine actual or past trends that can direct the research hypotheses. Other lessons to be gained from the published literature include CA study designs and limitations or inadequacies. In this literature review, the individual news quality features are discussed separately in terms of published studies and/or suggested research relevance.

2.4.1 News Quality Factors —

In this flu research project, “high quality” news messaging is defined as being complete, accurate, balanced, salient, and supported by credible expert consultation [Gaziano & McGrath, 1986; Doyle et al., 2012; Bonevski et al., 2008; Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012; Danovaro-Holliday et al, 2002; Eysenbach et al., 1999; Li, 2007]. Quality news is ideally persuasive. By design in this research, persuasiveness is broken down into main and general persuasiveness (Table 2). Main persuasiveness refers to information completeness, accuracy and balance. General persuasiveness encompasses flu news salience, credible informants, clarifications, emotional cues and targeted (educational) content [Gaziano & McGrath, 1986; Li, 2007; Muschert & Carr, 2006].
The application of quality features in the CA literature varies with most researchers examining minimal factors. The primary quality components of completeness (information richness) and accuracy are well noted in the literature [Bennett, 2015]. A study by Doyle et al. evaluated multiple features that affect quality such as inaccurate and inappropriate or outdated (exaggerated) information [Doyle et al., 2012]. This important chapter section first reviews the individual news quality or persuasiveness-type features of completeness, accuracy, exaggerations, and balance as interpreted from the published communications or CA literature. Later in this literature review, research inquisitions of news quality regarding media consistency, event and news triggers, credible informants and delivery schedule or format are explained and incorporated into research hypotheses. The means by which all of these quality components are evaluated through a scoring system is further discussed in Chapter III.

2.4.1.1 Completeness (Multi-issue Content)

Based on the bulk of the CA literature on health issues, the quality feature of news completeness is considered one of the two key core principles, besides accuracy, in higher quality information. Lack of information completeness may be one of the major faults studied or found in content analyses of public health news. Several mass communication scholars have suggested that incomplete or inaccurate information including that pertinent to public health can mislead the public [Eysenbach et al., 1999; Pineda & Myers, 2011; Bonevski et al., 2008; Madden et al., 2012; Anhang et al., 2004]. Some of this published evidence suggesting that the media and other health information
sources have provided incomplete public health guidance regarded vaccines [Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012]. Examples of missing health information identified in previous CA studies relate to content about disease transmission, associations between infection and disease outcome, vaccine safety, and common side effects and financial costs of prevention [Habel et al., 2009]. A few CA studies noting absence of information on benefits and/or harms relate to prescribed or complementary and alternative medicine (treatment) [Bonevski et al., 2008; Moynihan et al., 2000]. Anhang et al. found that media coverage of a HPV screening test was not comprehensive with many news stories leaving out basic information about infection, disease consequences (cancer), diagnosis guidelines, and cost effectiveness [Anhang et al., 2004].

By design, the intended scholarly approach in this study includes an expansive investigation of news quality features. Determination of the full or partial presentation patterns of flu information that the media provides to the public can be important knowledge for scholars as well as journalists whose agendas set those public health news stories. Part of the expansive investigation of this research design is ensuring that the completeness category is broadened to more truly investigate the full scope of completeness (as well as other affected quality factors). This research expansion of completeness-related content includes the addition of extra HBM-like components as an improved means to measure content completeness as well as issue salience. In sum, the matter of information completeness is tracked as an individual news quality and/or persuasiveness factor in this research study (Table 2); quality scores range from 0.5-3 points (see Chapter III). The themes of the eight HBM components are introduced
below; however, this main quality feature, information completeness, is not directly incorporated into a specific research hypothesis. With completeness and accuracy being the two key quality features, it could be assumed that if accuracy is consistently high (see below), then completeness could be the primary determinate of news quality.

### Expanded Scope of Health Belief Model-like Factors

A drawback of most published CA studies is that they do not incorporate a broad content assessment panel; such studies were limited to assessment for mention of benefits and/or harms of prevention (or treatment, etc.), while a few investigations covered up to four HBM parameters. Studies on (mild or severe) harms or benefits content (or associated media frames) have been applied to subject matters of mammography (diagnostic), medications, agricultural biotechnology (e.g. relevant to genetically modified foods), and the HPV, rotavirus, or flu vaccines [Moynihan et al., 2000; Schwartz & Woloshin, 2002; Bubela & Caulfield, 2004; Danovaro-Holliday, 2001; Marks et al., 2007]. Barriers have been investigated, but some study investigations included costs, which were not often detected in media content; thus, expenses content is specifically not investigated in this study. Disease has been investigated in published CA studies in a variety of formats such as content on symptoms or severe outcomes (cancer). Examples of susceptibility and severity content assessed in this research refer to populations, incidence rates, and severe symptoms of high fever or pneumonia [Anhang et al., 2004; Goodall et al., 2012].
Briefly, in this research design, the disease and prevention content features tracked include up to nine HBM-like categories (see Chapter III), thus allowing a more thorough investigation of issue salience and the quality feature of completeness. The two disease components include disease susceptibility and severity. The flu prevention components include vaccine benefits or harms, vaccination barriers, concern clarifications, and the preventive measures of the vaccine and alternative measures of infectious disease control. The codebook instrument in the appendix provides in depth detail of the HBM-types of disease and prevention content assessed in this research study. The expansion of HBM-style information contributing to completeness is tracked as a news quality and/or persuasiveness factor in this research study; completeness-related quality scores are discussed above. In the communications field, complete information is linked to high news quality.

Rare messages of cues to action, another established HBM feature, are tracked as a (bonus) persuasive factor in news content that is not incorporated into the information completeness measurement, yet representative of a form of persuasiveness. The types of cues in flu news may be personalized or targeted content that may be emotional or educational respectively, and these cues are considered in this research as persuasive or informative as opposed to biased. Besides having a persuasive quality, the educational content may be recalled over time by the public from a televised or newsprint flu news story (yet effects are beyond the scope of this CA study).
2.4.1.1.2 Issue Salience: Specific Measure of Prominence

Issue-specific salience is a prompt of “what the public should think about” in relation to a salient or newsworthy topic (that sometimes may be recalled at a later point in time). Soroka refers to issue salience in the public’s eye as the most important problem [Soroka, 2003]. Aside from news quality, CA enables us to learn of the presentation magnitude of problem issues or specific content. According to Kiousis and others, issue salience can be measured in terms of media attention, prominence or valence [Kiousis, 2004; Muschert & Carr, 2006]. Issue attention is quantified in this research study. Quantifying the portion (amount) of different issues reflecting various (flu or public health) subtopics in news content is a standard means to measure issue-specific salience. In this research study on flu news, example content trends are focused on susceptible populations, crowded environments, disease indices, and vaccine recommendation news as well as other issues (see Appendix) [Goodall et al., 2012]. Through determining salient and non-salient issues, one gains a better understanding of what is commonly being addressed and which important topics in the case of flu prevention are commonly left out of media content (thus in part addressing the completeness quality feature). While this most important problem or content salience is investigated, but not incorporated into a specific research hypothesis, the individual frequencies of flu and prevention issues are assessed in this study.

Salient issues or news can also be persuasive in nature and sometimes can be recalled at a later point in time. However, info recall and/or persuasiveness may not be directly linked to issue salience or substantive news, but rather influenced by
supplemental or other news presentation features [Bennett, 2015]. Some argue that info recall of news content is stronger from television; recollected information could be better obtained if it is about a topic or what a person is interested or believes in, or perhaps influenced by graphics and verbal presentations of news [Graber & Dunaway, 2015]. With the push for more infotainment (soft news), which has public appeal, audiences can learn and retain factual information from this type of programming; for example, a recent study of health info incorporated into a television entertainment program demonstrated that after one episode of *Grey’s Anatomy*, viewers six weeks later recalled facts about treatment of human immunodeficiency virus infection associated with acquired immune disease syndrome [Graber & Dunaway, 2015]. Yet, research materials of this flu news research are focused on newspaper and television “news”, not entertainment shows or (celebrity) news. Others argue, in the case of cancer news, that health info from newspapers is recalled better than from television [MacDonald & Hoffman-Goetz, 2001]. Recollected messages could in theory influence decisions and/or (persuade) actions; since this is a non-behavioral study, this CA research does not account for whether flu news increases awareness, recollection or activity traits within the populace. The prominence of information or issue salience, which contributes to completeness, is tracked as a news quality and/or persuasiveness factor in this research study; completeness scores are discussed above.
2.4.1.2 Accuracy

Of note, CA studies of medicine and health issues often have limited objectives to examine quality-related features, since most are designed to evaluate basic quantification of specific content. In a CA study by Bonevski et al., the authors examined the adequacy and accuracy of news stories about complementary and alternative medicines and therapies [Bonevski et al., 2008]; thus, demarcating what are presumed to be the two primary news quality features. That is, next to information completeness, accuracy is an important quality factor. Inaccuracies have been noted in the portrayal of prevention, treatment or risks content [Bonevski et al., 2008; Frost et al., 1996; Habel et al., 2009; Anhang et al., 2004; Madden et al., 2012]. The concern of inaccuracies has been noted in traditional news and especially online sources; the general understanding in the journalism field is that accuracy of online news is less dependable as assessed by the Federal Trade Commission and U.S. Science Panel on Interactive Health Communication [Eysenbach et al., 1999; Doyle et al., 2012; Kata, 2010; Habel et al., 2009; Madden et al., 2012]. An example of media content inaccuracies in vaccine-related news stories comes from a study of online news by Habel et al.; these inaccuracies of online health messages, in association with a new vaccine at the time, centered on misrepresentations of effectiveness and duration of protection [Habel et al., 2009].

On the whole, accuracy of flu news is expected to be maintained at a high level given the stability of the disease cycle and information base from prior flu news reports and extensive CDC resources. Foremost, accuracy represents the key “code of
journalism” [SPJ, 2014]. Responsibility, i.e. professional or societal norms, falls on the media reporter(s) to do their fact checking. Credibility of information sources, separate from accuracy of provided information, also plays a role in news quality; this matter of informant credibility is broached later (see hypotheses generation below).

Keeping an open mind that inaccuracies in flu news may occur, accuracy is an evaluated factor in this research study. While accuracy is notably mentioned as a news quality criterion in CA studies, this does not necessarily implicate that there are often accuracy issues. Yet, accuracy could be affected by bias or issue complexity. That is, accuracy of media news may come into question around news of newly marketed products (especially if nondisclosure of financial interests), or press releases stemming from a medical or science journal publication that may be difficult for an inexperienced reporter to comprehend and in the absence of scientific consultation(s) [Woloshin & Schwartz, 2002; Jardine et al., 2015; Gaziano & McGrath, 1986; Chappell & Hartz, 1998; Priest et al., 2003]. Since flu news is a traditional topic, i.e., annual, there is not a high angst about risk of inaccuracies (and the complexity of medical journal articles; thus, reporting- or financial-biases do not significantly apply here) [Woloshin & Schwartz, 2002]. Therefore, it is expected that the flu news is highly accurate. In the communications field, accurate information is an important news quality factor. The matter of accuracy is tracked as a news quality and/or persuasiveness factor in this research study (Table 2); quality scores range from 0.5-3 points (see Chapter III). However, being that accuracy is not expected to drastically fluctuate nor a major concern, this individual quality feature is not incorporated into a specific research hypothesis. Having said that inaccuracy generally should not be a concern in the
context of flu news, inaccuracies in terms of exaggerated statements are specifically investigated in this research design as explained next.

2.4.1.2.1 Exaggerations: Mythical or Inappropriate News

The media has been known to embellish or exaggerate some facets in their news reporting. For example, while different types of cancer are known to be linked to certain environmental or other causes, such as nuclear radiation, sunburn, or smoking, one study pointed to how the majority of eleven associations were overstated or understated as opposed to fairly stated in news stories [Graber & Dunaway, 2015]. In another investigative study of content quality, example assessments included examination of inappropriate and/or outdated information [Doyle et al., 2012]. Such exaggerations are another form of media bias that can mislead the public. In contrast, Bubela and Caulfield state that scientific (genetic research) news is not overly exaggerated [Bubela & Caulfield, 2004]. As a measure of information inaccuracy, examples of distortion, especially focused on barriers or myths, are investigated in this research design [Frost et al., 1997; Pineda & Myers, 2011]. In essence, the barrier category is split into two; that is, the inappropriate, mythical or inaccurate content reflect bad barriers. Specific to flu content, exaggerations pertaining to myth perpetuation or outdated claims of one-time events occurring decades ago are considered inappropriate and tracked (deducted) as an inaccuracy (Table 2).

Just the mention of autism (myth) puts a negative connotation on a news story in the context of the flu vaccine. Much of the public may nowadays understand that
there is no scientific evidence or link of autism to any vaccine, yet it could take decades to unscare the public. After all, it wasn’t until twelve years after Dr. Wakefield’s fraudulent autism claim that he lost his medical license in the United Kingdom. Similarly, scaring or frightening the public by occasional mention of one potentially bad vaccine lot in the late 1970s (long-ago) inconclusively associated with an increase in GBS (paralysis) also does an injustice to public health promotion, especially when manufacturing technology has since improved and vaccines are now more pure; it is just as important to know that this morbidity is common in unvaccinated populations due to naturally occurring infections [CDC, 1977; Ropper, 1992]. These are examples of inaccurate or inappropriate info or news bias; that is, incorrect (unsupported by scientific evidence) and/or of insignificance based on distance and exclusivity of history.

From the perspective that barriers detract from discussions on prevention (benefits in some HBM applications and) compliance, it is important to not only look for barrier content, but to evaluate the accuracy in the sense of whether it truly matters in conjecture with today’s purer and safer manufactured vaccine products. Accurate information in the form of truthful, realistic or current information can reflect good news quality. An exaggerated as opposed to reality-type or accurate matter is tracked as a negative contributor towards news quality and/or persuasiveness in this research study (Table 2); a negative quality score of 0.5 point is subtracted from the accuracy score (see Chapter III). However, as alluded to above, the individual quality feature of accuracy, on whole, is not incorporated into a specific research hypothesis.
2.4.1.3 **Balance**

As well as information completeness and accuracy, CA studies make reference to findings of information or media frame balance, and that imbalanced information undermines public health authority initiatives [Frost et al., 1997; Bonevski et al., 2008]. By definition, information imbalance is unfairness in representation, thus is considered one form of bias. As an example, in a study on genetic research, the authors found that media content was primarily focused on (97%) benefits and not inclusive of content on (15%) harms [Bubela & Caulfield, 2004].

As mentioned earlier, the study-specific frames in this research study center on disease risks and prevention approaches (see above). An advantage of issue-specific frames is that the frequency of content presentations can be clearly analyzed in comparison. In this research design, the two sides of an issue are examined for co-presentation in single news stories for evidence of balanced content. For example, within the prevention approaches frame, if flu news mainly discusses alternative precautions like handwashing, the public may not be reminded through other means to get an annual flu shot. On the same token, if news stories concentrate on the flu shot and not hygiene, then some may be in the mindset ("feel "overconfident) that they are fully protected, yet aren’t reminded through mass communications to continue good habits like handwashing after touching shared objects such as elevator buttons or entrance doors where flu viruses (or other pathogens) may be lingering for several hours. The purpose of a balanced prevention approaches frame is to remind the public that both prevention measures are necessary to maximize health protection. Balance is
dependent on information completeness; in theory, balanced information is linked to higher news quality. The matter of information balance is tracked as an individual news quality and/or persuasiveness factor in this research study (Table 2); quality scores range 0.5-1 point (see Chapter III). However, being that media frames are less numerous than news topics, this individual quality feature is not incorporated into a specific research hypothesis.

2.4.1.4 General Persuasiveness

There are additional quality characteristics besides the three main persuasiveness factors that contribute towards overall quality of mass communications. To enhance the robustness of the news quality investigation, persuasiveness in this research study design, also encompasses flu news (topic) salience, myth busting through clarifications, informant credibility, and arguably personalized and/or targeted messages (cues) as supported by the infectious disease control noncompliance literature. Of these features, informant credibility is introduced in this section, and builds up to a research hypothesis that is further expanded upon near the end of this chapter.

2.4.1.4.1 Newsworthiness: Flu Topic Salience over time

Gatekeepers control which topics are presented as the news, i.e., that are newsworthy. Communal topics have to be obvious or part of the media agenda, i.e., a
“news story”, for the public to be aware of or react to them [Dearing & Rogers, 1996; Davidson & Wallack, 2004]. Mass communications is a way of getting across similar and/or poignant messages across a large audience. Newsworthy topics (as well as specific issues) are a prompt of what the public should think about as salient. In the political setting, for example, important newsworthy topics may include gun control, immigration, abortion, the U.S. economy, and foreign affairs [McCombs & Shaw, 1972; Dearing & Rogers, 1996]. Trends change on what are the hot topics or events of the (campaign), month or year. Salience of flu news is not expected to be continuous over the full calendar year; in general, the public health-related newsworthiness of “flu news” is cyclical and usually peaks during the winter “flu season”.

In sum, CA is a common analysis among communications, social and political scholars, and the volume of news story presentations is a standard means to measure salience. The featured prominence of flu news, that is measured by volume, is one indicator of news quality; thus, in the context that “knowledge is power” through news media exposure, “peak news” over the 20-month study period is traced as a feature of general persuasiveness or higher quality flu news in this research design (Table 2); quality scores range from 0.5 to 1 point (see Chapter III). This individual quality feature of newsworthiness or flu news prominence is not incorporated into a specific research hypothesis.

In another light, news topic escalation during a crisis such as the 2009 H1N1 pandemic is expected. While an increase in news volume is likely common during crises or extraordinary events, the quality could be affected and possibly diminished; the
status of news quality at the initiation of a flu news trigger is evaluated as part of a research hypothesis and is discussed in more detail later (see news triggers below).

### 2.4.1.4.2 Clarifications of Misconceived Public Concerns

Reassurance can be persuasive in public health compliance. Although the novel assessment of clarifying or comforting factors is applied in this research study and contributes toward completeness, this rare, yet important persuasive content is of considerable importance and might be valued as a quality contribution to public health news in the future. If the public has doubts (disbelief or mistrust), they are less inclined to act in proper ways recommended by officials. The media should soothe or calm the public, in the event of a crisis or public health emergency [Graber & Dunaway, 2015; Li, 2007]. This comforting value holds true or is very important for the many Americans of whom are noncompliant with annual flu vaccination possibly due to their fears based on (bad) experience(s) or passed down from family beliefs. A unique design of this research project is inclusion of a HBM-like category that encompasses themes of message content that could help alleviate some of the common public concerns about fear of pain, or debunk the common myth of getting sick from the flu shot. This category was conceived to pair or counteract the barrier (HBM) category which deters from prevention compliance. Being that this is a new HBM-like category, there likely isn’t similar content investigation in published CA studies. However, the alleviating or comforting, and clarifying factor discussions are based on scientific evidence published in medical journals, textbooks, or on the CDC website. More detailed information of this
novel category is provided in Chapter III and the Appendix. In theory, corrective-type (or accurate-like) information in the form of added clarifications to counter myths or rumors is linked to higher news quality. This feature or matter of clarifications is measured as a news (completeness) quality and general persuasiveness factor in this research study (Table 2); given the (novelty and) rarity of this motivational-type clarifying or comforting content that balances out barrier content, a news quality (persuasiveness) score of one point is added for info presence (see Chapter III). This individual quality feature is not incorporated into a specific research hypothesis.

### 2.4.1.4.3 Credibility of Informants

The media do not always consult with outside information sources, but the presence or reference to a reputable source can affect public trust or influence their opinions [Davidson & Wallack, 2004; Prati et al., 2011]. Informant credibility is an important news quality feature (see Table 2). Especially credible informants in this flu news study include government officials and medical professionals. Higher quality news content is presumably associated with interview presentations by or consultations with credible experts; a quality (persuasiveness) score of one point is assigned for evidence of expert contribution in a flu news story (see Chapter III). Since credibility is incorporated into one of the research hypotheses pertaining to flu news, this subject is expanded upon later (see below).
2.4.1.4.4 Cues to Action or Audience Attraction: Emotional and/or Targeted Population Content

Besides clarifying message content, people can be motivated through (messages of encouragement, positive tone, and/or) cues to action such as reminders, personal advisors, or rewards; while interventions are outside of this research scope, relevant content cues are examined. For example, personalized message content about ordinary citizens or specific high-risk populations may serve as reminders or be education-driven. There may be differences in opinion whether personalized or targeted messages contribute to higher news quality, but this could be a difference between political and health sciences (the comparison which is outside this research scope).

Media formats are utilized to capture audience attention or daily viewership (public appeal) and advertisers. The debated strength or weakness in personalized news quality perhaps depends on the topic field. Bennett refers to this type of personalized and/or dramatized news as biased and detractive from content or issue significance, i.e. news quality [Bennett, 2015]. Not all personal type content should be considered as biased. While political scientists may argue that personalized (celebrity) or dramatized news is fragmented, this may not often be the case for health sciences

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9 Event triggers or crises are studied in this research scope as an effect on news quality as opposed to behavioral reactions based on a CA study as opposed to an observational study design.

10 In the principal "monkey see, monkey do", in infectious disease control through hygiene or vaccination measures, knowing or seeing that others in the community are behaving in the societal norm or responsibility can be motivating. While message content of recommendations to get a flu vaccine or reports of the numbers of persons who got a vaccine are tracked in this research study under the prevention key component towards info completeness, a personalized messages of an individual getting the flu shot or nasal spray is tracked as a cues to action (bonus) towards info persuasiveness.
news. A cancer news CA study examining news trends of celebrity and non-famous profile stories found evidence that personalized news stories are not common and on a declining trend [Jensen et al., 2010; Gearhart et al., 2012]. Also, since the television news transcript source in this research study is ABC, reporter contact with celebrity physician Dr. Oz, who is affiliated with the Fox network, is not expected to be noticeable or prominent in this study news set. One caveat of this research design, is that news transcripts are eliminated that do not have a devoted focus to flu news [Calloway et al., 2006]; as happenstance, many of the eliminated sports stories, largely unrelated to flu, are in reference to professional athletes who were sick possibly from the influenza virus. Therefore, the celebrity form of content is expected to be rare and there is a very low expectation of personalized bias. However, celebrity effect on public actions or persuasiveness, as demonstrated in a human immunodeficiency infection counseling study, supports personal content (or cues) as a strength of the HBM [Brown & Basil, 1995].

The two forms of non-biased, personalized content studied in this research are in reference to emotional- or educational-type content that may be partially or specifically motivating respectively (see Table 2). Some scholars suggest that familiar or personalized reference can be in the context of the ordinary citizen (John Jones) [Leask et al., 2010; Graber & Dunaway, 2015]. In this research study, personalized, emotional-type content may refer to sick persons with a flu-like illness, or dying children, students or staff, or interviews of family members, either named or anonymous. Even if personalized messages are rare, emotional content is considered in this research design, as potentially motivating and contributory towards flu news quality as opposed to bias.
It is unclear whether news of a healthy teenager who died from flu often has an effect on vaccination motivation, but such personalized cases may reach out to a few in the public audience. Mention of pro-vaccine as well as anti-vaccine sentiments among the public are also tracked to be open to the balance of opposing opinions stated in the news. The emotional-type human content is assigned a bonus quality (persuasiveness) score of 0.3 point per occurrence (see Chapter III); however, if there are multiple presentations of personal news accounts, the maximum cues to action score is 1.2 point.

The second type of personalized, yet rare, content assessed in this study is targeted, educational messages, which can increase awareness, comprehension, and possibly motivation through clarifying-like content. Targeted messages can be geared towards specific audiences such as high risk populations for whom the annual flu vaccine is highly recommended. In theory, educational messages, even if rare in flu news, are positive towards health promotion and these informative-types of content contribute towards flu news quality (Table 2). In an example investigation of gender (targeted) content, a HPV vaccine news study examined for content referencing the licensure of the vaccine for girls or women (and not for boys or men) [Habel et al., 2009]. Additionally, in the health field, several infectious disease control compliance studies conclude that educational (or news) messages should be targeted to specific audiences; for example in relevance to flu, focus could be on pregnant women or those with underlying heart or kidney conditions [Fabry et al., 2011]. If there is evidence of either personalized emotion (non-biased) or targeted messaging in flu news, these motivating features (that possibly play a role in behavioral actions) could be considered as contributing to the (completeness and especially the) persuasiveness features of
news quality [Leask et al., 2010]. The educational trait is considered more valuable in this research design than the emotional trait based on infectious disease philosophy; the targeted-type human content is assigned a bonus quality (persuasiveness) score of one point (see Chapter III). In essence, more enhanced content in the sense of being more informative or clearer to a variety of audiences is a good (quality) trait and not a setback. In sum, in this format of news quality study, the aspect of motivational-like cues in personalized messages or targeted content to specific audiences is tracked as a general persuasiveness (and completeness-additive) quality. This individual quality feature is not incorporated into a specific research hypothesis.

2.4.1.4.5 Reliable and Consistent Media Quality

On whole, the principal of this CA research is to measure the overall quality of flu news in the television and newsprint sectors. The media forum, not to be confused with credible information sources, is held accountable for the overall quality of the news stories. Reliability and consistency among media sources or organizations are important news quality features in the realm of media communications. Since the consistency of reliable news quality between (televised and newsprint) media sources is applied to a research hypothesis (RH1), this quality issue is discussed below.
2.4.2 Hypothesis Generation: Research-oriented Assessments of News Quality and Added Persuasiveness —

In summarizing the magnitude of quality factors, former CA studies on public health issues have been shallow, i.e., scholars formerly have focused on one or two news quality features and shown primary findings of news content incompleteness, which is missing information that could otherwise be helpful to public knowledge and decision making (citizen and policymaker). Thus, this research design is considered more robust. Having revealed the key features important to news quality, this section lays out the focus of the news quality research inquisitions or patterns that are investigated and relevant to the formation of research hypotheses. The four research hypotheses center on reliable media and consistent news quality, news triggers, credible informants and delivery schedule or sponsor in relation to news quality. The supporting literature foundation is also described here.

2.4.2.1 Consistency among Reliable Media Sources

Overall news persuasiveness and/or quality encompasses the gamut of accuracy, completeness, and balance in addition to topic salience, credible informants, and theoretically clarifying, emotional and/or educational messages, as well as consistency of content quality among media sources. The true test of quality, if all of these features are correctly contributors, is that the news content quality should be similar among traditional media sources. While internet news is on the rise, it is earlier pointed out that its’ quality has not been as reliable as traditional media, the latter which is the focus
of this research study on flu news. There may be different opinions on whether television or newsprint news quality is equivalent or disparate. On one side, Page et al. state that media content comes from the same (elite or wire service) sources, and thus the messages concerning public policy are similar [Page et al., 2000]; such consistency could be also attributed to organizational norms. On the other hand, we know that the public receives more of their news from television than newsprint; from the public’s perspective, the common citizen trusts the news from television more so than from newsprint [Gaziano & McGrath, 1986].

The best judges or critics of news quality are the journalism professional; the undoubtedly more knowledgeable professional journalists contend that the television medium is less reliable than newsprint or other news forms. In 2008, the Pew Research Center polled journalists from national, local and internet media sources. A strong indicator that television news quality is inferior to newsprint news quality is this survey of national as well as other journalists who rated the quality of television news worse than newspaper news [Pew, 2008]. The quality of televised news was rated 32% by national journalists compared to a 41% quality rating of newspaper news [Pew, 2008; Graber & Dunaway, 2015]. Of note, inaccuracies were not a major quality concern among journalists [Pew, 2008]. Particular television networks have been criticized more than others, especially Fox News. In one instance, The Union of Concerned Scientists pointed out that news on the controversial topic of climate change was more inaccurate on Fox cable news (television) than the Wall Street Journal (newspaper) [UCS, 2012]. Of course, one or two networks associated with poor news quality may not apply to most of the traditional news organizations and/or may improve with time or new
ownership. Since media sources should be consistent in the accuracy and quality of their reporting, it is important to assess whether television and newsprint (media are providing high- or sub-par quality news and whether) news quality is equivalent.

Differences between television and newspaper organizations could account for differences in news quality. One link has to do with their infrastructure, whereby smaller size of investigative staff and writers may contribute to differences in reported content quality [Anhang et al., 2004; Graber & Dunaway, 2015]. This major difference applies to television organizations, especially local, that may have fewer staff and resources [MacDonald & Hoffman-Goetz, 2001]. Good reporting is dependent on professionals who are trained in journalism and an expert in the news beat that they cover [Gaziano & McGrath, 1986; Chappell & Hartz, 1998; Bonevski et al., 2008; Leask et al., 2010]. The organization’s output quality could be affected by operations run in line with ownership\(^{11}\) views and financial interests. Corporate television networks and newspapers have vested interests in profits (economic pressures) and may be swayed by the views or withdrawal of funding support from advertisers, as in the case when Columbia Broadcasting System aired a documentary on gun control in opposition of lobbyists [Graber & Dunaway, 2015].

Other issues, besides economic pressures, are competitive pressures that can affect news quality [Caulfield & Condit, 2012; Graber & Dunaway, 2015]. There are too many events that occur during a full day that the news can’t cover but a fraction of the stories in a high pace news world. The newspaper venue, at the forefront of new crises,

\(^{11}\) In political news coverage, some cable news networks or newspapers are known for partisan slant (bias).
runs more investigative stories and can be a bit more flexible in moving around or eliminating other news to create space to print a newly emerging event [Graber & Dunaway, 2015]; this type of competitive (fit) pressure could affect the quality of either the newsprint or television sector. A competitive-like pressure linked to crises or news triggers and inquisition into news quality is discussed later under a separate research hypotheses (see RH2 below). A limitation in time and/or resources can be a risk factor for fewer stories (and possible revenues), not to mention, less fact checking. Even large organizations are at risk of maintaining good news quality under pressure.

In sum, high quality news and consistency among media sources is considered persuasive in guiding the decisions of the common public and policymakers. The combination of accuracy, information completeness, and flu news salience in addition to the other news quality features are assessed on whole to determine the overall quality of each of the two media sources in this research plan. Overall quality of televised and newsprint flu news is reported in this study as an average percentage (see Chapter IV). The questionable trustworthiness status based on insights of professional journalists points to the first research hypothesis.

RH1: Television news on flu will be of a lower quality compared to newsprint news.
2.4.2.2 **News Events or Triggers**

Tying into news salience (volume), as mentioned earlier, news can be trendy or triggered during crises, extraordinary events, or newly emerging issues that are valued by media gatekeepers as newsworthy topics. The volume as well as quality of news reporting could vary during crises or controversial events. Variation in crisis news could be associated with a rush (competitive pressure) to be the first reporting on the scene or about an alarming situation, or due to dramatization rather than substantive reporting on issue significance [Graber & Dunaway, 2015]. In a crisis, with the public glued to their televisions, there are (again economic and competitive) pressures to quickly release a breaking news story and early updates. Investigative reporting is a more thorough process and time consuming, yet television organizations may lack trained investigative reporters compared to newspaper organizations; the television sector tends to be quicker in running a breaking news story in light of delayed, official investigations of scenes and situation parameters. Hence, haste and inexperience could be potential factors in poorer news quality [Graber & Dunaway, 2015]. Also, daily and crisis news nowadays tends to suffer from soft news presentations, which have substituted for hard news. According to Graber and Dunaway, the quality of “crisis news” is worst in the television sector; this again is in accordance with the literature review and hypothesis above [Graber & Dunaway, 2015]. The soft news rut means that when under a time crunch and other pressures, news reporters are less likely to take time to consult on scientifically complex issues. In the medical and health science fields, extraordinary
medical breakthroughs or technology events can trigger newsworthy articles with questionable news quality especially if scientifically complex.

Example controversial topics related to public health issues include genetic research, the licensure of the HPV (2006) vaccine, and withdrawal of a newly manufactured rotavirus vaccine. For instance, medical biotechnology news was triggered in the 1980’s when *Dolly* the sheep was cloned. In CA studies involving examination of related news on biological and/or agricultural bioengineering, studies found problems in news quality such as frame imbalance [Bubela & Caulfield, 2004]. Similarly, public unrest or the controversial topic about teenagers receiving the HPV vaccine to protect against cervical cancer was linked to poor online news quality in relation to the accuracy and completeness features of news content [Habel et al., 2009]. In other CA studies on viral (HPV) infection and/or diagnosis, noted quality issues related to a high prevalence of factual omissions (incompleteness), as opposed to errors, in newsprint and televised news stories [Anhang et al., 2004]. Some CA studies on the rotavirus vaccine focused on media content during “events of controversial” side effects (risks) and vaccine withdrawal; despite content analysis of only two HBM-like components, fluctuation in media tone was noted as well as a journalism need for accuracy and balance [Danovaro-Holliday et al, 2002].

Thus, news during crises can affect multiple quality features. With this background base of published content analyses, a research hypothesis is centered on the quality of news during flu epidemic periods, when there is a likely increase in volume of flu news.
RH2: While news volume is expected to increase during the flu season and/or pandemic, the quality of media (televised and newsprint) coverage of flu news will be lower at the start of the 2009 H1N1 flu pandemic (crisis) compared to an annual flu season.

2.4.2.3 Credibility of News Informants

Medical experts and public health authorities have a high degree of credibility, which is critical for public trust and influence [Page et al., 2000; Gearhart et al., 2012]. It is previously emphasized that online news or websites may be the wrong venue to look for medical advice; the exception relates to if the website is associated with a credible medical institution or professional society [Eysenbach et al., 1999]. Traditional media then has to rely on insider and external medical consultants, some of whom may be consulted more dependably than others. Journalists or news organizations often develop close ties with familiar professional contacts, a bias risk, however, not the main objective of this research [Graber & Dunaway, 2015]. Media professionals who have been in journalism longer than younger peers may have better connections with experts in specific fields. Anyhow, several infectious disease control or hygiene noncompliance studies conclude with recommendations that public health authorities should communicate more openly or be accessible to health beat journalists to expand and improve science and medicine news content [Leask et al., 2010; Habel et al., 2009; Davidson & Wallack, 2004; Shuchman & Wilkes, 1997].
In some CA studies, scholars examine the frequency of informant sources sought by the media. Journalists in the health news may consult with government authorities more than medical professionals [Madden et al., 2012; Davidson & Wallack, 2004]. The elite of credible informants in this flu news research study include government officials especially those from health institutions within the Department of Health and Human Services such as the CDC and National Institutes of Health [Price & Grann, 2012; Kennedy & Bero, 1999; Schwartz & Woloshin, 2002; Long et al., 2006; Li, 2007; Slovic, 1987]. The government agency responsible for vaccine and schedule recommendations is the CDC. The Advisory Committee on Immunization Practices that advises the CDC consists of medical professionals from societies including the American Academy of Pediatrics and the American Academy of Family Physicians [Prabhu et al., 1996; Habel et al., 2009; Price & Grann, 2012]. According to Prati et al., trust in the Department of Health and other health authorities is essential in flu vaccination compliance [Prati et al., 2011]. Other credible informants could include authors of peer-reviewed articles in prestigious\textsuperscript{12} scientific and medical journals [Price & Grann, 2012]; however, being again cognizant of (inaccuracies or) bias, one must be cautious of any financial ties or professional gain that may be an incentive for the news story [Woloshin & Schwartz, 2002]. Many public citizens like or prefer to confer with their physicians. In this research design, medical professionals, some affiliated with university hospitals or medical centers, are regarded as highly credible informants [Kennedy & Bero, 1999; Madden et al., 2012]. Also with a medical background, news organizations reply on

\textsuperscript{12} Reputable medical science journals include \textit{JAMA}, \textit{NEJM} and \textit{Cell} [Price & Grann, 2012].
senior staff with medical expertise; these senior medical reporters are also regarded as reputable health information sources.

Although doctors and government officials are designated as credible informant sources in this flu news study, the public may have distrust issues [Biasi et al., 2012]. According to Priest et al., the public has less trust of the government and media than in their doctors, at least when consulting on the topic of (medical or food) biotechnology [Priest et al., 2003]. In contrast, a few medical doctors or registered nurses may have anti-vaccine sentiments and vocalize them on the news or online blogs [Kata, 2010; Pineda & Myers, 2011]. Despite distrust complications, trustworthy sources are commonly available. Credible information is presumed to be linked to higher news quality. This feature or matter of informant credibility is tracked as a news quality and/or general persuasiveness factor (Table 2); quality scores range from 0.5-1 point (see Chapter III). A research hypothesis is centered on the concept of credible information sources.

RH3: If television and newspaper reporters consult with credible sources, they will consult with or mention more government officials or representatives than medical experts or health beat reporters.

2.4.2.4 Schedule or Source of News Delivery

Earlier it is debated whether television or newsprint news quality is consistent. If consistency is observed, it could be attributed to organizational norms [Page et al.,
2000]. On the other hand, differences in organizational norms can be internal as well. While the first research hypothesis focuses on the two different media sources, the last research hypothesis digs into the functional aspects of each of these mediums. The media’s functions center on day versus nighttime television programs, or status of elite and highly reputable newspaper organizations.

Expanding beyond the different types of media sources, it is of added research interest to investigate more direct news quality associations within the television or newsprint news sector especially pertaining to delivery. Outside of economic and competitive pressures discussed above, other organizational factors can influence news presentations. Additional factors can vary from time or space allotment, familiar connections with credible experts, and/or specific network program or elite/national versus other regional newspapers; thus, the latter linkages to news delivery are of research interest in the study of flu news quality.

While news salience through measurement of word counts is not a research priority, a side note, is that dragging out news over a 24 hour news day may undermine news quality as news reporters ad lib or repeat slightly different variations of a news day or event to fill in the media time or news holes [Graber & Dunaway, 2015]. One objective within the flu news research scope is to determine whether the timing of news delivery in a news day could reflect on the quality of news; this is applicable to television news in this research study as opposed to early versus final editions of newspapers, which may too few to grasp any associations. As for televised news, anecdotal evidence in the literature suggests that the evening news is apt to contain inaccurate information [Pineda & Myers, 2011]. As a simulation, it is known that healthcare in hospitals is
worse in the evenings or on weekends (in part related to staff skills); the same may be true for reporting on health or other news. Also, morning versus evening news could differ by network programs that target different audiences (and advertisers, i.e., for appeal and profit purposes). In theory, the quality of flu news may be worse in the evening compared to morning television news delivery. This theory is incorporated in a portion of the final research hypothesis below related to the television sector. The other portion of the thesis relates to the status of specific newspapers.

On the newspaper front, elite newspapers are expected to produce higher quality news compared to non-elite newspapers [Carpenter, 2007]. Disregarding circulation size of news organization, elite newspaper organizations focus on national news coverage; the three newspapers regarded as elite in this research study are the New York Times, USA Today, and the Washington Post [Graber & Dunaway, 2015]. The non-elite newspaper journalists may rely on elite and other large newspaper organizations or wire services for the prominent news content of the news day. There is evidence in the literature that small newspapers model their news presentations of those from large newspapers [MacDonald & Hoffman-Goetz, 2001]. This allows the smaller organization to manage with fewer staff and do less investigative reporting especially since they likely have a tighter budget [Anhang et al., 2004; Graber & Dunaway, 2015; Carpenter, 2007]. Since some news may be replicated from different sources, yet perhaps of similar content or context, the news versions are however modified [Page et al., 2000; Robinson, 2011]; thus, the news editors’ and journalists’ modifications and edits could transpose some errors, or the news story could be cut to a length whereby key critical information is missing, or lacks balance. Thus, in combination, the final research
hypothesis addresses the potential quality of flu news dependent on news delivery from each of the traditional media sources.

RH4: The quality of flu news may be affected by the mode of delivery whereby the morning news will be of a higher quality than the evening news on flu, or elite newspapers (New York Times, USA Today and Washington Post) will print higher quality flu news than other newsprint media sources.

2.5 Summarized Research Hypotheses

High quality health communications and public perceptions go hand-in-hand in behavioral outcomes. The quality of news is important since whether messages expressed through the mass media are addressing, sufficiently or inadequately, the importance and facts of a public health issue can be a factor in compliance (health behavior). The research question at hand, thus relates to the level of disclosure and quality of disease and prevention information in the print and broadcast media that has been provided to the public. The research approach involves a CA-based characterization to assess the quality and persuasiveness features such as completeness, consistency, clarifying or corrective implication, realistic and current representation, minimized exaggerations, and balance within media frames (see Figure 3). The news content pertaining to several Health Belief Model components (see Chapter III) are analyzed to understand media frame usage and info completeness in flu news. Additionally, determination of credibility of news information on disease
prevention measures, disease severity, and the like adds to the assessment of flu news quality. The umbrella research question asks “What is the quality of print and broadcast news on flu and the flu vaccine?”. The flu news research direction is addressed in the specific research hypotheses below.

2.5.1 Research Hypotheses Summarized —

The hypotheses of this flu news research are based on evidence gathered from the literature, generally from the public health field. These hypotheses are tested in the three research data chapters. To reiterate the hypotheses dispersed throughout the immediate section above, the four research hypotheses are:

Media source (Chapter IV)—

RH1: Television news on flu will be of a lower quality compared to newsprint news.

Trigger/Event (Chapter IV)—

RH2: While news volume is expected to increase during the flu season and/or pandemic, the quality of media (televised and newsprint) coverage of flu news will be lower at the start of the 2009 H1N1 flu pandemic (crisis) compared to an annual flu season.
Credible Informants (Chapter V-VI)—

RH3: If television and newspaper reporters consult with credible sources, they will consult with or mention more government officials or representatives than medical experts or health beat reporters.

News Delivery (Chapter V-VI)—

RH4: The quality of flu news may be affected by the mode of delivery whereby the morning news will be of a higher quality than the evening news on flu, or elite newspapers (*New York Times, USA Today* and *Washington Post*) will print higher quality flu news than other newsprint media sources.

It is anticipated that flu news overall will not be found to be markedly incomplete nor minimally persuasive, but perhaps of a mediocre quality. Expanded specifications of the research methodology and analysis detail are provided in Chapter III.
III. ANALYTICAL APPROACH: FRAMEWORK, MATERIALS, AND METHODS

Chapter Three provides the fundamentals of the research materials, codebook design, and collection and analyses methods. Specifically revealed here are details of the news study periods and database filter qualifiers used to obtain the televised or newsprint transcript study materials, and structure of the analytical design. Appendix A, which contains the codebook instrument, complements this chapter. Prior to delving into the materials and analytical methods, a historical background of the Health Belief Model and diverse applications is reviewed, in addition to explanations of model components in the context of flu and prevention. The methods section details the scoring of the various quality factors, as introduced in the previous chapter.

3.1 Analytical Framework: Health Belief Model

3.1.1 Health Belief Model: History —

Perceptions and beliefs are known to have an effect on compliance with health recommendations and other behaviors as are applicable during outbreaks of infectious respiratory diseases such as severe acute respiratory syndrome or influenza [Rubin et al., 2009]. There are several models that measure beliefs, motivation and/or behavior, of which the HBM is the most applied to explain or predict behaviors in health outcomes.
The HBM theory was initially developed in the early 1950’s by the Public Health Service to explain failed compliance with x-ray screening (diagnostic) for tuberculosis in asymptomatic patients [Hochbaum et al., 1952]. The model further came to form in the late 1960s to early 1970s and has been utilized in behavioral, survey or interventional studies to monitor people’s perceptions [Rosenstock, 1966].

The fundamental component factors of the theoretical value-expectancy model focus on perceptions of threat or risk measurements pertaining to 1) susceptibility and 2) severity in addition to perceptions of efficacy relating to 3) benefits that outweigh 4) barriers, which may include prevention harms (psychological, physical) [Rosenstock, 1966; Rosenstock et al., 1988; Mattson, 1999]. For example, if one feels or believes that they are susceptible and the (complications from or extent of) disease is severe and they have a high expectation of (benefit or) success of desired outcome, then they are more likely to comply with a prevention (or treatment) recommendation or method [Maiman & Becker, 1974; Renz & Newton, 2000; Kegeles, 1963]. On a cautionary note, the HBM model has been studied with numerous adaptations that may in part lead to inconsistencies in predictive findings [Yarbrough & Braden, 2001]. Not only affiliated with variations in HBM component applications, but depending on the type of disease, diagnostic screening, health prevention measure, treatment intervention plan, or meta-analyses under study, the individual HBM components have variable behavioral-predictive power. Of the four main features, a literature review in the 1980s ranked the importance of HBM features on behavior in the descending order of susceptibility,

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13 In 1988, another additional HBM construct, derived from the social learning theory, was self-efficacy, which relates to one’s perception of their ability to comply with the health recommendation [Rosenstock et al., 1988; Carpenter, 2010].
benefits, risks and severity perceptions [Janz & Becker, 1984]. In the 1970s, a motivational component, cues to action, was added as an optional feature of the HBM behavioral theory model [Carpenter, 2010]. Comprehension of these influential HBM components as well as additional elements can provide an understanding of meaningful factors that should be often communicated to the common public at the time of disease incidence or health preparedness. Rather than using, in the flu news study, the HBM components as (direct) behavioral markers, the multitude of HBM elements are employed as “informational markers”. An improved or more robust framework incorporating at least eight HBM components thus relates to information completeness (news quality) and could be a means for a higher standard of public health communications and broadly applicable to CA studies.

In sum, the HBM is the prominent model used in prevention behavior studies including a few studies on vaccination intentions [Harrison et al., 1992; Quick, 2010]. Of interest to this research, the HBM framework is not necessarily used as a predictive or interventional tool, but rather as a model construct of influential types of information that possibly affect the public’s willingness to get an annual- or schedule-recommended vaccine. The HBM has also been applied in a small assortment of CA studies relating to several diseases or vaccines [Rosenstock et al., 1988; Mattson, 1999]; thus, application of the HBM framework is appropriate for this flu news study. The span of HBM components or categories of interest to this flu news study include disease susceptibility and severity, prevention benefits and mild harms, and present-day barriers, which is inclusive of severe harms that are rare. As the model has been modified as of the late 1980s, this flu news research design incorporates three additional HBM-like components;
these include a novel component representative of public concern clarifications, in addition to the main and alternative prevention measures of the flu vaccine and infectious disease control precautions respectively. As a “guide of influential type information”, the fundamental HBM components or categories are considered to be of high value in this CA of health news focused on the seasonal and the atypical H1N1 pandemic flu during a consecutive 20-month span between 2008 and 2010. The specific HBM components gained from published studies and applied in this flu news research project are expanded upon next.

3.1.2.1 Health Belief Model Background: Basic Defined Components

Eight important HBM categories reflected upon in public health communications include disease susceptibility and severity, prevention benefits, mild harms, and present-day barriers, which is inclusive of (moderate to) severe harms that are rare in addition to the HBM-like components representative of public concern clarifications, the flu vaccine, and alternative infectious disease control precautions. Understanding the HBM application in flu news is accomplished through the codebook instrument (see Appendix) that supplements this and the succeeding flu relevant section.

Disease susceptibility relates to a person’s perception of getting and/or causing infection, i.e., spreading disease through person to person transmission among social, family or work contacts (see Appendix). Disease severity indicates the broad scale of disease spread regionally (2009 pandemic reference) and may be reflected by incidence rates of cases, hospitalizations and/or deaths. Severity of disease may also relate to
primary or secondary infection or other complications. Vaccine (prevention) benefits are reflected by messages regarding protective effectiveness and/or safety based on history or millions of annually administered doses.

Mild vaccine harms are applied separately in this research design. Upon a review of the literature, it is apparent that many CA studies (unrelated to a HBM framework) compare frequencies of content relating to benefits versus harms. Thus one modification is this separate HBM category (mild harms), which is amendable to common concerns that shouldn’t have the deterrent weight in comparison to severe harms, which happen to be rare given improved vaccine formulations. On the other hand, accounts of moderate to severe harms that partially detract from vaccination acceptance are more representative of a barrier type of HBM category. Other present-day barriers include realistic public fears as well as inappropriate misconceptions (myths; some of which are exaggerated). Seldom noted basic barriers (cost, location) are disqualified so as to keep the research focused on actual and current concerns (despite repeated invalid myths) that are relevant to the public’s knowledge of flu vaccination and conceivably more likely mentioned in flu news stories [Moynihan et al., 2000; Schwartz & Woloshin, 2002; Bubela & Caulfield, 2004; Bonevski et al, 2008].

In addition to the above HBM categories, which are very representative of a large portion of key health information regarding flu and prevention, there appears to be (in my opinion) a gap in HBM and CA studies examining the presence of statements that can squelch people’s concerns or common myths about vaccines. Thus, thinking in pairs, a complementary counterpart to barriers is applied in this research design; this newly developed HBM category reflects concern clarifications and/or comforting
concepts that may serve as counter barriers, and uniquely capture and maximize the completeness-like feature of quality assessment. Importantly, this HBM category also embodies the general persuasiveness quality measurement that is assessed in this research study (see Chapter IV).

Being critical that disease prevention be frequently discussed, the flu vaccine is also included as a HBM-like category in this research design. Mention of the flu vaccine or vaccination can evolve from several different formats. Thus, representative HBM-like elements may make reference to recommending, getting, administering or manufacturing and distributing the flu vaccine. The counterparts to the flu vaccine, then, are the infectious disease “precautions”, such as hand washing, which is frequently recommended to prevent the spread of germs. Other alternative prevention or precautionary measures include avoiding contact such as keeping distance from sick persons and/or not touching one’s face or eyes. The codebook instrument in the appendix contains in depth details on phrasing or elements reflecting these disease and prevention related HBM categories.

3.1.2.2 **Health Belief Model Components in relation to Flu Facts**

The HBM components applied in this research study entail key disease and vaccine or vaccination topics that are pertinent to flu. The HBM categories of research interest can be analytically broken up into two main groupings (clusters) that separate disease from prevention discussions. A brief insight into important facts related to the eight HBM categories is provided from an educational or informational perspective.
3.1.2.2.1  Disease related HBM Content

On average, five to 20 percent of the U.S. population “gets the flu”, meaning that, each year, over 15 or possibly upwards of 60 million Americans are infected carriers (symptomatic and asymptomatic) seasonally [CDC Burden]. Two HBM categories relating to disease susceptibility and severity make up the disease risk cluster or media frame (dependent on presence of either or both HBM categories respectively). Important disease susceptibility content in this research has to do with populations of susceptible people, where they might come into contact with other people suffering or infected with flu, and route of infection or transmissibility. The basics of flu are that it is highly contagious and can be spread person-to-person, i.e., airborne via respiratory droplets, or by contact with contaminated\textsuperscript{14} objects. People in crowds associated with schools, camps, the military, and mass transit as well as child and elder care institutions are at greater risk of exposure to flu. Additional examples of populations and places can be found in the codebook instrument (see Appendix).

Flu severity can be widespread within a state, or in multiple regions, countries (pandemic level 5, 2009) or continental regions (pandemic level 6, 2009); this was the basis for the World Health Organization declaration of the 2009 pandemic when flu had spread to four WHO-defined continental regions. The severity of disease sequelae from different flu variants can range from mild (2009 pandemic) to severe (1918 pandemic);

\textsuperscript{14} Flu viruses (or other pathogens) can survive for several hours on objects. Falling ill with flu does not occur the same evening as one touched a contaminated door knob or phone; the incubation period for influenza is one to three days. The prodromal or syndrome phase is approximately seven to ten days in adults with longer periods of virus shedding in children.
important disease severity content in this research has to do with complications from flu infection such as high fever, (seizures, coma), or risk of secondary bacterial infections like pneumonia. In the current era, there may still be high rates of flu infection or hospitalization, but with the availability of today’s antibiotics compared to absence during the 1918 flu pandemic, the death rates in the past 30 years average around 36,000 compared to the millions of deaths during the three (1918, 1957, and 1968) pandemics in the 20th century [Beigel, 2008, MMWR 2010a]. Cases numbers as often reported in the media are mostly estimated, that is not laboratory confirmed, while hospitalization rates associated with flu may be a more accurate means of reporting flu severity; annually over 200,000 persons in the U.S. are hospitalized with flu [Thompson et al., 2004; Perrotta et al., 1985]. Other reporting factors associated with disease severity can be found in the codebook instrument.

3.1.2.2 Flu Prevention HBM Content

The six prevention topics in this study encompass flu vaccine benefits, mild harms, vaccination barriers (moderate to severe harms), concern clarifications, recommendations to get vaccinated, and alternatives to vaccine protection. Flu vaccine effectiveness, a beneficial factor, is dependent on whether the flu strain used for the vaccine development (more than six months prior to distribution) is a near match to the circulating strain of the annual flu season, and the age, and health or immune status of the individual. The flu vaccine has been administered for almost 70 years (since 1945) and in recent years to over 100 million Americans annually, i.e., the U.S. vaccine is safe
for those not contraindicated to receive a flu vaccine. Other related vaccine benefit content in this research has to do with benefits including protection against flu infection or reduced severity, and reduction in the spread of flu among communities and across regions. Recent statistics indicate that the 2013-2014 flu vaccine prevented an estimated 90,000 hospitalizations and an estimated 3.1 million doctor visits [MMWR 2014].

Keeping in mind the safety of the flu vaccine, there is little harm associated with the flu shot or nasal spray. Either prevention method cannot cause the flu due to controlled and designed manufacturing techniques, but can result in brief discomfort, or mild symptoms that could last up to two days [Margolis et al., 1990; Luke et al. 2013; CDC VIS]. Yet others, some of whom are well rested and hydrated, usually do not develop any symptoms of runny nose or sore throat. If a flu-like illness develops post-vaccination, then chances are of a recent exposure to a flu carrier (symptomatic or asymptomatic) up to two weeks prior to the flu shot when we are unprotected or lack full vaccine-induced antibody protection. A very severe (neurologic) reaction to a flu shot, GBS, occurs on the rarest of occasion, which is on the order of 1 or 2 cases per one million administered flu shots (CDC VIS, 2015; MMWR, 2010b). In this research design, the rarity of severe adverse events is a worthy educational point for the public to understand; such informational content accompanies the mild harms HBM category.

In the past, barrier components may refer to costs, inconvenience\textsuperscript{15}, and fears and in some studies to the perceived harms of the recommended health measure.

\textsuperscript{15} Vaccines are easily accessible at grocery and chain store pharmacies as well as traditional locations and may be offered free at some workplaces; these two types of barriers are not commonly found in the CA literature.
Actual reports of severe adverse events, as opposed to a sore arm, are considered as more harmful and represented in this research design as a (behavioral or perception) barrier consistent with the HBM framework. Despite the flu virus in the vaccine being inactivated (shot) or weakened (spray), i.e., immune response stimulating but not harmful, there may still remain concerns or other fears among the public that constitute barriers or deterrents to vaccination compliance decisions and actions. During the development and distribution of the new 2009 monovalent H1N1 vaccine, there were fears that the vaccine manufacturing and safety testing were rushed. Another lingering barrier concept has to do with skepticism about whether there is a vaccine link to autism despite no direct scientific evidence and the withdrawal of Dr. Wakefield’s medical license in the United Kingdom. In the research design, a novel HBM category is conceived from the point of view of counteracting some of the incorrect barriers or less reasonable public concerns. Many barriers are largely addressable by concern clarifications or comforting content in public health communications. Outdated and erroneous barriers should not continue to be mentioned in 21st century flu news reports; the presence of inappropriate barriers is tracked as exaggerations that detract from information accuracy (news quality).

The crux or keystone of flu protection is the flu vaccine. Corresponding vaccine content in this research has primarily to do with messages encouraging the public or specific populations to get vaccinated, or updates on the manufacturing or delivery of the new monovalent H1N1 vaccine, in the 2009 news set, and/or seasonal flu vaccines. Of the representations below, the first three illustrate the main crux of the prevention flu

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16 The flu vaccine is annually tested in volunteers at multiple medical centers prior to mass distribution.
vaccine news messages. Vaccine recommendations or news message directions may be represented by:

i. Group or subject “X” is recommended to get the flu vaccine or get vaccinated;

ii. We’ll give/offer the flu vaccine;

iii. We’ve gotten or been vaccinated with the flu vaccine;

iv. Number of flu doses distributed or shipped;

v. Number of flu doses administered (bearing in mind that young children need two doses, at least one month apart, if first time receiving flu vaccine);

vi. Vaccination rates (usually specific population although it would be nice to learn updates of the national rates during the flu season) which are “compliance indicators”); and

vii. Vaccination program or campaign (at school, clinic, county or national).
Everybody of the age six months or older is recommended for a flu vaccine except for those with severe egg allergies or history of a GBS reaction within six weeks of a prior flu vaccine. Pregnant women are a population highly recommended for the flu shot; however, they may be confused since they are contraindicated for live vaccines such as FluMist or MMR(V) that protects against measles (and chickenpox). Proper knowledge among our public health communicators can lead to better public education on these types of disease prevention issues.

Flu vaccines are developed based on disease surveillance and prediction of seasonal strains. To comprehend the makeup of annual flu vaccines, one must understand a few basics about influenza. There are 16 strains of highly variable influenza A flu viruses based on (16) hemagglutinin and (9) neuraminidase surface proteins. Humans are susceptible to H1N1 (2009 and 1918 pandemics), H2N2 (1957 pandemic), and H3N2 (1968 pandemic). The H5N1 and H7N9 (bird flu) viruses are not highly transmissible to humans, but at some point in time could mutate, or reassort with human flu viruses. Thus, when an animal or person has two or more different replicating flu viruses, there could be a major change (gene reassortment) in viral structure and/or function through what is called antigenic shift. Flu vaccines then are not fully protective nor when due in part to the continual or slight gene modifications (antigenic drift) during viral replication; effectiveness may average between 20% and 70% in a given flu season. Yet, vaccination provides “the best protection” against the spread of flu.

In the U.S., there are now multiple types of inactivated influenza vaccine shots in addition to the quadrivalent FluMist (spray) vaccine (licensed for people 2 through 49
years of age) which protects against two influenza A and two influenza B strains. Special formulations of the flu "shot" include single-needle thimerosal-free, short needle (intradermal; approved for adults 18 through 64 years of age), or high dose for elder persons 65 years of age and older. There are also cell culture based and egg-free, recombinant flu vaccines for those who have allergies to egg proteins. Depending on the formulation, the 2015-2016 flu shot is trivalent (one influenza B strain) or quadrivalent. Vaccine distribution is not regulated by the government; rather, vaccines are ordered from the private sector and shipped to doctor’s offices, pharmacies and college health centers and also state and county health departments. The vaccination rate for flu is below 50% among the general public (and HCW as well) [MMWR 2013a]; this vaccination rate is below the approximate 80-94% community level supposedly required for broad or herd immunity [Eisenfeld et al., 1994].

Last but not least are infectious disease precautionary steps that are alternative to vaccination, but should be supplemental and not treated as a substitute for those who are eligible to receive the annual flu vaccine. Important precautions or hygiene content in this research is represented by recommendations to keep distant from others when sick with a fever, cover one’s cough or sneeze, and wash hands frequently. More on these HBM features can be found in the codebook instrument. With a basic understanding of the HBM content of research interest, the procedures of collecting HBM and news quality data is explained in the next two sections below.
3.2 Mass Media Materials: News Transcript Sources and Selection Criteria

Research materials on flu news in this content analysis study include popular national newspaper and televised American Broadcasting Corporation news during October 2008 to May 2010 (20 consecutive months); these mass communication sources, further justified below, are representative of national news coverage. Multiple levels of filter applications are utilized to maximize subject focus on flu as opposed to other diseases or irrelevant material. All downloaded transcripts are reviewed for study eligibility based on exclusion criteria as discussed below.

3.2.1 News Salience Comparisons: Flu versus other Health and Non-health News Coverage —

The extent of flu news coverage is first assessed and compared to other popular news topics, since health news is expected to be less frequent than political or crime news [Pew, 2013]. Figures 4-5 indicate that political news is more popular than flu (open double circle symbol) news during the specified 20-month period; crime news represented by the term “shootings” is intermediate to political or flu news frequencies (not shown). In comparing two government-related news topics or informant sources, the CDC, a U.S. public health institution, is mentioned less frequently than President Obama (diamond symbol) or flu; yet, it is noted that peaks in CDC (asterisk symbol) news coincide with peaks in flu (open double circle symbol) news over the 20-month
period (Figure 4-5). Flu news during the (April-October) 2009 H1N1 pandemic was less frequent than Presidential news in the newsprint and televised sectors.

![Graph showing Flu news, President Obama, and Centers for Disease Control coverage over time from October 2008 to August 2011.](image)

**Figure 4** Televised Flu News Coverage compared to Government-related News
To grasp a sense of how the frequency of flu news coverage compares to other health topics, the frequencies of diet or exercise news transcripts based on a keyword search in the LexisNexis database are also assessed. The average frequency of flu (open double circle symbol) and diet (triangle symbol) news is similar in both the newsprint and ABC network sectors as is the average frequency of exercise (square symbol) news in the televised sector over the specified 20-month period (Figure 6-7).

In national newspapers, the health topic of exercise is more popular than the news on diet or flu. 2009 H1N1 pandemic and seasonal flu news peaks exceed diet news in both news mediums, and reach levels of exercise news in the televised sector. On whole, flu
news is less evident during the 2008-2009 flu season, while news volumes escalated during the 2009 pandemic and subsequent 2009-2010 flu season.

Figure 6  Televised Health News Coverage Comparisons
3.2.1.1 **Justification of Flu News Media Sources and Study Period**

As discussed earlier, the media is a common source of health information sought by or delivered to the public. Also, previously mentioned is that, in published CA studies, analyzed health news has been primarily from newsprint, television or internet sources; however, the quality of health information on the internet may be unreliable, and the fluidity of web links may be too unstable to reproduce data findings. Based on transcript access from LexisNexis and more warranted data reproducibility, the former two news sources of newsprint and national network television are utilized in this research study.
Flu news typically centers on the flu season, which in general occurs in the fall/winter seasons from October up to May. Flu illnesses may peak around February or March depending on the viral strain and geographical U.S. region. Figure 6 and Figure 7 show flu seasonal (non-pandemic) news peaks in November 2008 or February 2009 (2008-09 flu season) in televised or newsprint news respectively, and a prominent peak (media agenda) in October 2009 (2009-10 flu season). The twenty month study period of this study is justified based on the evidence of flu season news especially during the 2009-2010 season, and the previous seasonal news that may serve as a baseline. The intermediate period including April through October 2009 is especially of interest based on the escalation of the 2009 H1N1 pandemic. Thus, the 20-month period in this research study covers the pandemic period united by the preceding and subsequent flu seasons. The research study period is from October 2008 through May 2010.

3.2.2 Flu News Transcript Access and Material Selection —

3.2.2.1 Media Material Sources

Consideration of news transcript accessibility and fixed copies are important in the selection of television and newspapers as the research mediums for this CA. For this research project, all downloaded news media transcripts are obtained through George Mason University access to the LexisNexis Academic database. The news folder access or search approaches varies for the two forms of news media based on the database

17 The LexisNexis Academic source browser was applied through several steps with the “news” folder being the primary database publication category. For newsprint news transcript downloads, subfolder sources included newspapers, then major U.S. newspapers. For television news transcript downloads, selected search subfolders included news transcripts, then ABC news transcripts.
search engine. The downloaded newsprint news transcripts are accessed from database search engine folders specific to the major U.S. newspapers subfolder. In this research study, the newsprint flu news transcript set of highly circulating\footnote{The national newspapers USA Today and NYT have a wide circulation and reach a large audience [Moynihan et al., 2000; Kennedy & Bero, 1999; Anhang et al., 2004; Schwartz & Woloshin, 2002; Davidson & Wallack, 2004]. Newspapers are a prominent and frequently studied media source [Moynihan et al., 2000; Kennedy & Bero, 1999; Anhang et al., 2004].} and popular national newspapers includes the New York Times (NYT), USA Today, the Washington Post, the New York Post, the Daily News (New York), Buffalo News (New York), Christian Science Monitor, the Philadelphia Inquirer, the Pittsburgh Post-Gazette, the Philadelphia Daily News, the St. Louis Post-Dispatch, the Star Tribune (Minneapolis), the Oklahoman, the Atlanta Journal-Constitution, the Tampa Tribune, the St. Petersburg Times, and the Orange County Register (California). Of the ABC news transcript set, television sources covering flu news include Good Morning America (GMA), ABC World News, World News Sunday, Nightline, ABC Nightly News, and ABC This Week.

3.2.2.2 Study Transcript Inclusion and Exclusion: Keyword, Advanced Filter and other Criteria

News transcript downloads are initially based on flu terminology and study time period search criteria, and secondary focus on influenza through additional application of the database advance filter. The news transcript download search term “flu” captures research material on the disease as well as the associated preventive vaccine. The study time period is October 2008- May 2010 as mentioned above. Secondary LexisNexis Academic database filters are further employed to optimize the subject
matter of the flu transcripts to specific subject relevance. Based on noise, the initial downloads are somewhat less focused on the relevant disease (flu) topic and require the additional application of the pre-set database advance filter specific to “influenza”. The combination of the primary keyword and secondary advance filter-mediated database search of flu news is referred to as dual filtered.

The initial transcript download yield based on flu and influenza terminologies, i.e., dual-filter application, and study time periods through use of the date, subject and advance filters, is approximately 600 resource materials from the television database search and a much more extensive quantity of resource materials from the major U.S. newspaper database search (Figure 8-9). Being under a quantity of 1000, the televised 20-month set of flu news is downloaded as a single portable document file as manageable by the search engine tool. In contrast, the newspaper set of flu news transcripts is broken into monthly or biweekly search files based on database function. The monthly totals of dual-filtered newspaper articles from April to December 2009 range between 100 and 800 transcripts, while the preceding and subsequent months range between 10 and 90 transcripts. Systematic sampling is applied to those months yielding over 100 transcripts of flu news [Krippendorff, 1980]. A representative sample from the excessive news periods is accomplished by dividing the monthly transcript total by a factor of 60 to determine the systematic process of downloading the research study set of newspaper flu transcript materials. For example, the dual-filter search from July 2009 yielded n=163 transcripts, that upon division by the factor of 60 lead to (n=2) every other transcript per date ascending order being downloaded for study. In the
month of May 2009, with the highest\textsuperscript{19} dual-filter material count of $n=746$, every twelfth transcript is downloaded for study. The initial dual-filter and downsized-sample set of downloaded newspaper material for the 20-month study period equates to $n=1098$ transcripts. Since topic focus on flu isn’t always consistently represented or throughout the whole news transcript, study eligibility is further optimized (based on exclusion) as discussed in the next section.

\textsuperscript{19} Reference markers in Figures 8-9 reflect national and international triggers that may be associated with increased newsworthiness (volume) [Goodall et al., 2012].
Figure 8  Televised Flu News Volumes and Peaks
Transcript exclusion criteria are defined as well to form the concentrated research materials due to a significant portion of the dual-filtered and sampled news transcript sets being less pertinent or inferior for the flu news media content analysis. News transcripts are excluded if they are: duplicative of the previous or same day’s news, letter(s) to the editor, diffuse news stories in a single transcript, i.e., on several diseases, less-relevant focus on the death of a scientific pioneer or major athlete, irrelevant focus on a disease different than influenza, zoonosis, or pork industry, limited...
focus on a list-like presentation of clinics for vaccine administration or calendar of events, non-U.S. population (international or World Health Organization focus), or newsprint articles that contain less than 111 words. The total research study eligible transcript breakdown is n=207 televised news segments and n=448 newsprint articles, from which research data are collected and analyzed. The study coded data from these two eligible media sets of news transcripts are methodically analyzed as described in the next two sections.

3.3 Research Instrument and Content Coding

This CA research involves examination of traditional media communications to gain an understanding of whether the media had been presenting or omitting important disease exposure risk and prevention/vaccination messages related to flu. Coding of flu news content is guided by a codebook instrument. In the sense that the back-to-back weekly/monthly\textsuperscript{20} news isn’t intended or usually expected to be overly repetitive, to keep the public interested in important health topics or problems, the inductively-designed codebook thus incorporates an assortment\textsuperscript{21} of subcomponents or phrases, generally applicable to eight HBM categories that capture elements of flu and prevention. In comparing the overall HBM content frequencies among individual news stories, values for each HBM category are compressed; the codebook in the Appendix

\textsuperscript{20} Daily news could be repetitive across multiple news media and wire services, yet writers and editors may redesign or edit parts of their version of the news story.

\textsuperscript{21} The idea is that while an informative news story should include many HBM categories, the individual category may be represented by one or two of the sub-components (to keep the messages interesting and adaptable).
reinforces that discussion-presence of one or more HBM-like subcomponent(s) or elements is scored as a maximum or compressed value of one towards a specific HBM category (see codebook).

3.3.1 Codebook Guidance —

An exploratory assessment of the unit material, i.e., news transcripts of newspaper articles or televised news segments is undertaken to make broad generalizations about flu news content and prevalence [Matthes, 2009]. Media content is extracted inductively in this quantitative CA research study of flu news; the inductive nature of the research study involves design of a codebook instrument exemplifying multiple attributes. Flu-related phrases or attributes representing HBM elements applicable to the eight theoretical HBM categories are partially based on a pilot study of news transcripts on infectious diseases, including flu, or flu vaccine from at least four different media sources (see Appendix for codebook instrument guidelines). Guidance references to the parameters representing HBM-related content markers are predominantly based on factual information from the CDC website and resource links as the primary vaccine preventable disease and vaccine facts source, in addition to virology and vaccine textbooks, and literature review of peer reviewed publications [Wright et al., 2013; Fiore et al., 2013; Luke et al., 2013; MMWR 2010b; CDC Pinkbook; CDC Indian; CDC Benefits]. Some phasing themes may seem to represent more than one HBM category. Since occasional transcript text may (out of context) appear to overlap with
more than one HBM category, additional\textsuperscript{22} research guidance is developed to clarify non-overlapping concepts that optimize coding consistency (see codebook in Appendix). The physical and countable data elements form the basis of the manifest property of the CA material [Berg, 2011].

3.3.1.1 Coded Examples

As an illustration of flu news content in television and newsprint transcripts, example messages are provided for each of the eight HBM categories. In these examples, wording or phrases representative of that individual category are underlined. Although wording repetition might be highlighted (underlined) in these example messages, duplicative phrasing representation is not coded in this research study.

\textbf{HBM 1 \{WHO, WHERE, HOW\}:

Televised:

“\textit{So those who are in the highest risk groups include pregnant women, children from six months to 24 years of age, those adults with chronic, underlying medical conditions, emergency medical workers and health care workers, and those people who are caring for very young children because the very young, those six month and under, can’t get the vaccine.},” ABC, GMA 7:03am, September 11, 2009;

“We’re all susceptible because it’s easily transmitted from person-to-person”, ABC, GMA 8:08 am, April 25, 2009;

\textsuperscript{22}Diagram drawings for personal use help to visualize these non-overlapping themes.
“One school in New York is running tests after 75 of its students fell ill with flu-like symptoms, to determine if it’s the same strain”, ABC, GMA 8:06am, April 25, 2009;

“Pregnant women are among the most vulnerable”, ABC Nightline 11:35 pm, July 29, 2009;

Newsprint:

“State’s priority list as of this week included anyone aged 6 months to 24 years old, pregnant women, health care workers, people who live with or care for infants, and adults with chronic health conditions; plans to conduct a flu shot clinic for all comers.”, Star Tribune, MN. December 12, 2009.

“A local doctor had caught the swine flu twice, with both cases lab-confirmed, Dr. Schuchat said it was not common, but not impossible.”, The New York Times. November 26, 2009.

“We were first told that it was just a virus,” said Jonathan Henderson, 14, a freshman at St. Francis Preparatory School.; Most were students from St. Francis, the Queens private school where at least eight are believed to have contracted the human swine flu.”, Daily News (New York). April 26, 2009.

SPECIFIC/UNIQUE (HBM 1 continued) ---


“Toward that end, legitimate concern over the H1N1 virus led to the early cancellation of “Jerry’s Kids” at a camp in suburban Rochester, and the Muscular Dystrophy Association later canceled the rest of that national summer camp program – citing health concerns for campers who are more vulnerable because of weakened respiratory muscles.”, Buffalo News. July 6, 2009.
“We don’t want a Santa to be spreading the virus to a child – and of course we don’t want our Santas to get sick.”, Daily News, NY. November 19, 2009.

“Famed Cherokee actor Wes Studi is joining the federal government’s effort to urge American Indians to get swine flu vaccinations; American Indians, she said, have disproportionately high rates of asthma, diabetes and heart disease – conditions that can exacerbate the impact of the swine flu, or H1N1 virus.”, The Oklahoman. January 13, 2010.

“More likely is a call for sub-populations within a school to stay home if infection rates start to rise in, say, the football team, the marching band or a particular class.”, St. Petersburg Times. August 30, 2009.

“Walt Disney World has installed dozens of hand sanitizer dispensers throughout the theme park, hotel lobbies.”, Pittsburgh Post-Gazette. November 15, 2009.

“Nine new, confirmed cases of swine flu at county jails prompted officials to extend a lockdown at the Men’s Central Jail to at least Wednesday.”, Orange County Register (California). July 28, 2009.

**HBM 2 {SEVERE DISEASE}**:  

Televisioned:

“*Well, normally late April to October is when flu takes a break and clearly, that’s not the case this year. What they said, millions of cases across the country, 20,000 hospitalizations, and 1,000 deaths. And we don’t know where we are in this pandemic, so, clearly this is something serious.*”, ABC World News 6:39pm, October 23, 2009;
“Forty-six states are reporting H1N1 as widespread, with more than a thousand deaths and 20,000 hospitalizations. And while an average case is usually no more dangerous than other flu, this strain has its unknowns. 30% of the deaths are in healthy people with no underlying problems.”, ABC, GMA 7:02am, October 26, 2009;

Newsprint:

“Word of the outbreak came as the city recorded its eighth death from the disease – a victim over age 65 with a pre-existing health condition.”, The New York Post. June 6, 2009.

“He said that since the virus is so widespread, the state has asked for a curtailment of testing, with tests to be conducted only for patients in high-risk categories.”, Buffalo News. June 30, 2009.

“The World Health Organization yesterday declared a full-blown pandemic while at the same time saying that most people were in no imminent danger.”, The Philadelphia Inquirer. June 12, 2009.

“The nation’s top public health officials are alerting doctors that swine flu may cause seizures, after four children were hospitalized in Texas for neurological complications. Because flu-related brain complications are more common in children than adults, and swine flu seems to infect children more often than adults, public health experts said they expect to see more cases of children who develop swine-flu-related neurological complications as the pandemic continues.”, Pittsburgh Post-Gazette. July 24, 2009.

HBM 3 {BENEFIT, SAFE}:

Television:

“Well, every season, there are two vaccines. There’s a nasal spray and there’s a shot. Both are safe and effective.”, ABC, GMA 7:15am, September 21, 2009;
“It is safe. It’s made the same way the usual influenza vaccine is made. And, of course, we give that in the tens of millions of doses.”, ABC, GMA 7:09am, August 7, 2009;

“In this country, the first H1N1 vaccine shots were being administered today, offering protection for pregnant women and other people who have been advised not to get the nasal spray form of the vaccine.”, ABC World News 6:43pm, October 14, 2009;

Newsprint:

“If I was pregnant, I would do everything possible to get swine influenza vaccine to protect myself and my baby, said Dr. Carol J. Baker, a member of the Advisory Committee on Immunization Practices to the U.S. Centers for Disease Control and Prevention.”, St. Petersburg Times. August 15, 2009.

“If proven safe and effective, the vaccine should prevent people from coming down with the flu or keep them from becoming seriously ill.”, St. Louis Post-Dispatch. July 25, 2009.

**HBM 4 {MILD HARMS}:**

“There have been no serious adverse events, Fauci said.”, The Washington Post. September 22, 2009.

“8,294 adverse events have been reported to the CDC. But 94% of them were classified as “non-serious”, such as soreness at the injection site or a tingling in the arm.”, USA Today. February 8, 2010.
HBM 5 {BARRIERS AND SEVERE HARMS}:

Televised:

“There is skepticism. Nearly a third of Americans are not confident the vaccine is safe. Fresh on the minds of some, the swine flu debacle of the 1970s when 500 of those vaccinated came down with a rare neurological disorder, and 25 died. It's still unclear what went so wrong. The government insists today's vaccines are much safer, but wants to ensure no repeat”, ABC World News 6:44pm, November 2, 2009;

“Some believe a widely criticized theory that a preservative used in some doses is linked to autism.”, ABC, GMA 8:07am, October 8, 2009;

“But many moms worry about whether the new vaccine will be tested enough before millions of doses are distributed.”, ABC World News 6:49pm, August 28, 2009;

Newsprint:

“The 6% “serious” adverse events is about the same as seasonal flu.”, USA Today. February 8, 2010

“Despite the tight supplies, the county has been able to hold three mass vaccination clinics at local schools.”, Buffalo News. January 3, 2010.

“I called the Cleveland County Health Department to see if they still had vaccines, and I was told they only had children's vaccine left.”, The Oklahoman. December 11, 2008.
Television:

“No. It is definitely not too late. And in fact the flu vaccine, which prevents the flu, is still the best thing to do. Before you ever get it, you can get the vaccine. And you can still be vaccinated, even now, and prevent the risk of flu later.”, ABC, GMA 8:14am, January 10, 2009;

“And it was the same methods, the same production methods, and the same testing that’s done every year for coming up with a new flu vaccine.”, ABC, GMA 8:07am, October 4, 2009;

“Flu experts tell us the vaccines are now more precise, purer and though this one was fast-tracked, that they did not cut corners.”, ABC World News 6:36pm, May 6, 2009;

“The best protection remains the vaccine, and there are still long lines to get it.”, ABC World News 6:37pm, November 11, 2009;

Newsprint:

“Being that Florida does come into the flu season later than the rest of the nation, now is a really good time to get a flu shot if you haven’t done so already.”, The Tampa Tribune. December 23, 2008.

“The trials will be conducted at eight hospital and medical organizations that have been used since 1962 to test seasonal flu shots and other experimental vaccines.”, Pittsburgh Post-Gazette. July 23, 2009.

“The nasal spray contains live viruses, but they are weakened and cannot cause flu illness.”, The Oklahoman. October 3, 2009.
"With the flu season approaching, the Centers for Disease Control recommend receiving a flu shot as the best method of protection., “Pittsburgh Post-Gazette. October 2, 2008.

HBM 7 \{VACCINE\}:

Televised:

“\textit{They have said that they're gonna let businesses give you two hours to leave your workplace, during work hours, to get the vaccine, in order to promote getting the vaccine.}”, ABC, GMA 7:40am, September 2, 2009;

“\textit{Well, the vaccine is starting to arrive. People are getting vaccinated. As we heard, doctors’ offices are getting swamped with calls, people looking for this vaccine. And it will be weeks if not more than a month, before there's enough vaccine for all those people who want the vaccine.}”, ABC World News 6:30pm, October 5, 2009;

“\textit{Well, this is clearly the most ambitious influenza vaccination program ever mounted in the United States or anywhere in the world}; “\textit{Shipments this week include 600,000 tubes of nasal spray vaccine and six to seven million doses of injectable vaccine.”} ABC World News 6:44pm, October 4, 2009.

Newsprint:

“\textit{Get vaccinated for both seasonal flu and H1N1.}, “The Oklahoman. November 24, 2009.

“Less than half of the 229 million doses of H1N1 vaccine the government bought to fight the pandemic have been administered”; “between 81 and 91 million doses of swine flu vaccine were injected into peoples’ arms or squirted up their noses; the most ambitious immunization campaign in U.S. history”; “between 72 million and 81 million people are estimated to have been immunized”; “overall, about one-third of people considered at the highest risk from the virus, including nearly 37 percent of children ages 6 months to 17 years were vaccinated.”, “The Washington Post. April 1, 2010.
“All of the region’s school districts say they’re planning to coordinate a major, voluntary inoculation effort in schools once vaccines arrive in October.”, *St. Petersburg Times*. August 19, 2009.

“ Didn’t stop HHS Secretary Kathleen Sebelius from making the rounds of TV’s morning news shows on Oct. 7 to launch a public relations drive urging Americans to get vaccinated.”, *USA Today*. October 29, 2009.

**HBM 8 {ALTERNATIVES-PRECAUTIONS}:

Televised:

“ Keep your hands washed, cover your mouth when you cough. *Stay home* from work if you’re sick and *keep your children home* from school if they’re sick.”, President Obama, ABC Nightline 11:35pm, April 29, 2009 and GMA 7:01am, April 30, 2009;

“ Well, you know, when it comes to flu, protection is really in our hands. We’ve got to learn to *keep our hands clean*, to *cover our nose and mouth* when we *sneeze and cough*, and *not touch* our mucous membranes, and most importantly, to *stay home* when we’re sick, *don’t send* our kids to camp if they’re sick, and certainly, *keep children out of school* and other areas where they could transmit the virus to other kids.”, ABC, GMA 7:15am, July 17, 2009;

Newsprint:

“The key to staying well is *avoiding crowds*, where the flu spreads quickly; *keeping your distance* from sick co-workers and friends; and *frequent hand-washing or sanitizing*.”, *The Tampa Tribune*. August 30, 2009.

“The hospital *isolates* patients believed to have the flu.; * Unless a child needs to be in the emergency department, they’re better off getting well at home.”, *The Atlanta Journal-Constitution*. September 21, 2009
“Virgin America has anti-bacterial wipes and sanitizing gel on planes and at airports for passengers and crew. It began equipping flights with masks for passengers who might become sick, and stripped daytime flights of pillows and blankets, providing a limited number that are sterilized and pre-wrapped on red-eye flights only.”, USA Today. September 1, 2009.

“The “wash your hands, cover your cough” message became a public health mantra.”, Star Tribune, MN. January 3, 2010.

“More than 100 strong at Emory, they belong to a growing number of students at colleges across America experiencing a bizarre start to the year: the on-campus quarantine.”, The New York Times. September 5, 2009.

“Everybody in the house should clean their hands with soap and water frequently, including after every contact with the sick person or the person’s room or bathroom.; Keep surfaces clean by wiping them down with a household disinfectant according to directions on the product label.”, Star Tribune (MN). October 7, 2009.

3.3.2 Data Collection: Coded- and Compressed-component Tracking Scores —

Phrase or word tracking consists of a broad spectrum of HBM-like characteristics or elements that represent the mass of the eight main HBM categories (severity, susceptibility, benefits, mild harms, barriers, comfort factors, vaccine, and alternative precautions) as (the CA data collection is) guided by the codebook. Since the extent of content variety of flu news is a critical focus of this research, wording repetition is not tracked. Key flu and prevention related phrases in the television and newsprint flu news transcripts are highlighted during an initial read of each qualified (non-excluded) news transcript. Coding of the representative phrases is condensed to two-value evaluations.
(dichotomous), which has been demonstrated to limit subjective judgments in other CA studies; the simplicity of divergent assessment (presence/absence) of categorical phrasing typically ensures more consistent coding [Bonevski et al, 2008; Moynihan et al, 2000]. Study phrases indicated as present (mentioned) are assigned a score value of 1, while absent (not discussed) analysis text receives a score value of 0 (zero); the associated theme or category score (one or null) of each key research category representative phrasing or element is manually entered in an excel spreadsheet that tracks each research qualified television or newsprint transcript. As multiple elements reflect a HBM category, the representative data are consolidated or compressed to a value of one towards the individual HBM category score; this compression allows for a truer comparison of the eight HBM category frequencies to determine on whole which categories are overrepresented or underrepresented. Once the data is collected and tabulated in an excel worksheet, the positive (1) and null (0) scores are regrouped by data sorting in descending order to allow analysis from several different viewpoints. The thematic data are analyzed to mainly determine the frequency of HBM-type elements or markers included in news stories relevant to flu as well as other news quality features.

3.4 News Quality Evaluation System: Quality Scores and Ratings Criteria

News quality evaluations of factors of information completeness, balance and general persuasiveness can commence once all of the HBM content is coded and entered in an excel worksheet. The overall quality score is a sum of the multiple quality
factor scores and is also converted to a quality rating of poor, moderate or high news quality (Table 3; see below). Briefly, the overall news source quality is based on a combination of quality features that have different weights\textsuperscript{23} in contributing to the quality score. The important quality features of accuracy and completeness are worth up to three points. General-type persuasiveness is worth a maximum of three points split among three important sub-features (salience, alleviatory or comfort messages, and credible informant sources), while balance is worth up to one point. The maximum score that either media source can be assigned is 10 points. Occasionally, bonus points are assigned to single news stories. Tailored or population targeted messages are rare, yet educational, and given a one point bonus score. Personal content alone may not be that persuasive (0.3 point) unless repeated several times in a message; personal content in a single news story can receive a maximum of a 1.2 bonus point.

\textsuperscript{23} Most of the quality related levels fall into one of the three- or two-range scales depending on the unique news quality attribute.
Table 3 News Quality Factor Score Spectrum and Maximum

<table>
<thead>
<tr>
<th>Quality Factor</th>
<th>3 Points</th>
<th>1 Point</th>
<th>+/- 0.5 Point</th>
<th>Max Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>x 5-8 HBM</td>
<td>x 3-4 HBM</td>
<td>x 1-2 HBM</td>
<td>3</td>
</tr>
<tr>
<td>Accurate</td>
<td>High</td>
<td>1 misstatement</td>
<td>2+ misstatements</td>
<td>3</td>
</tr>
<tr>
<td>Barrier unrealistic (Inaccurate)</td>
<td></td>
<td></td>
<td>some exaggeration [-0.5]</td>
<td>(-0.5)</td>
</tr>
<tr>
<td>Balanced</td>
<td></td>
<td>&gt;=2 frame(s) balanced</td>
<td>1 frame balanced</td>
<td>1</td>
</tr>
<tr>
<td>Persuasive subtotal:</td>
<td></td>
<td></td>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>Salient (Persuasive)</td>
<td></td>
<td></td>
<td>Seasonal or epidemic peak</td>
<td>Non-peak / low volume</td>
</tr>
<tr>
<td>Credible (Persuasive)</td>
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<td></td>
<td>Government, medical</td>
<td>less credible / non-media, non-government, non-medical</td>
</tr>
<tr>
<td>Comforting (Persuasive)</td>
<td></td>
<td></td>
<td>Present</td>
<td>1</td>
</tr>
<tr>
<td>Persuasive (bonus 0.3 or 1pt)</td>
<td></td>
<td>Rare bonus: 1pt</td>
<td>Bonus: 0.3pt / presence, max 1.2pt</td>
<td>Bonus</td>
</tr>
<tr>
<td>Cues (rare bonus)</td>
<td></td>
<td>Tailored (1pt)</td>
<td>Emotional situation (0.3pt @)</td>
<td>1 // 1.2</td>
</tr>
</tbody>
</table>

A ten point scoring system is used to measure flu news quality level of the six main and general persuasiveness or quality factors. The system structure basically involves three or two variable score ranges to reflect the better or worse quality fit of the unique quality factor with potential score values of three points, or one or 0.5 point (Table 3). The scoring system is developed since a prior foundation is not available, yet the applicable score variations are guided by the literature and/or transcript sampling.
For example, those features commonly mentioned in the published communications literature as being important to news quality, information completeness and accuracy, can be assigned the highest maximum score of three points.

Three ranges in the point system are applied to completeness and accurateness. The completeness point system is based on samples of study eligible flu transcripts and a comparison of those with the most and least HBM content; therefore the high range (3 points) HBM content presence is set at 5-8 HBM categories, the medium range (1 point) is set at 3-4 HBM categories, and the low range (0.5 point) is set at news presence of 1-2 HBM categories. The accuracy of news reports recapitulating the science and medicine literature has been quantified in a couple of studies. In general, news reports reflecting science or medical journal findings are found on average to be 86% accurate [Wilkes & Kravitz, 1992]. In a published study on the HPV vaccine, Habel et al. found that accurateness of three vaccine subtopics varied in accuracy that ranges from 69% to 98.6% [Habel et al., 2009]. In flu news, which is historically annual, it is expected that journalists are for the most part knowledgeable, and news will be extremely accurate. Therefore the high range (3 points) accuracy level represents highly accurate news stories, the medium range (1 point) represents stories containing one misstatement or confusing content possibly associated with a rare mishap of transposed info, and the low range (0.5 point) represents stories containing two or more misstatements. News bias or exaggerations are not to be rewarded as a quality feature. Instead, unrealistic information such as misleading (myth perpetuation) or outdated information particularly centered on barriers is assigned a negative score value of -0.5 point; this negative value takes away from the accuracy score.
Other quality features mentioned in the published literature are balance and general persuasiveness factors, which each may be assigned a maximum of one point in this scoring system. As alluded to in the previous chapter, media frame balance is based on a higher than 50% balance or presence of frame content between two discrete HBM components in a single news story. A minimum of two balanced media frames is reflected by a high range score (1 point), while balance of a single media frame is assigned a low range score (0.5 point). Imbalance, which is likely common in flu news, does not add to news quality and is not rewarded in this point system.

Two ranges in the point system are also applied to the general persuasiveness factors of salience and credible informant(s). The salience point system is based on quantitative measurements of newsworthiness indicated by news volume. Typically, a seasonal flu news story is likely to be more visible to the public compared to scant news in the summer or off season. But, the 2009 pandemic news is very prominent during April to October 2009; thus, the pandemic period is assigned a higher salience score (1 point) in this research design compared to a televised or printed flu news story in the non-pandemic period (0.5 point). The informant credibility point system is based on presence of two key types of informant sources, i.e., governmental or medical; therefore the high range score (1 point) is associated with government leaders and representatives as well as medical doctors including medical health beat reporters, while the low range score (0.5 point) reflects consultation with non-government or non-physician sources such as HCW, academic professors, researchers, or other university representatives, school officials, and other informants. News stories that do not consult with professionals and/or non-professionals, not including the common public citizen,
are not assigned a credibility score point. The third general persuasiveness factor in this research study is the HBM feature of clarifying or comforting messages; while this HBM component is tracked as one of the eight HBM categories in association with information completeness, this unique category is so valued, that it’s potential importance towards improving (communications and) health behavior or compliance is assigned an additional one-point value if present in a news story. The six quality factors if present in a single flu news story can total up to ten points (Table 4). Since the public can be influenced by other’s actions or opinions and/or rare targeted (specific population) messages, these cues to action are assigned a bonus score of 0.3 or one point respectively (Table 3). Since cues to action might be more commonly applied in behavioral or interventional studies than communications studies, this feature is supplementary to the general persuasiveness quality feature. Examples of how an individual flu news story might score less than 10 points are demonstrated in Table 5 and Table 6.
<table>
<thead>
<tr>
<th>Feature</th>
<th>3 Points</th>
<th>1 Point</th>
<th>+/- 0.5 Point</th>
<th>Example Points</th>
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<tr>
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<tr>
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<td>≥2 frame(s) balanced</td>
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<td>1</td>
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<tr>
<td>Persuasive subtotal:</td>
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<tr>
<td>Salient (Persuasive)</td>
<td></td>
<td>Seasonal or epidemic peak</td>
<td>Non-peak / low volume</td>
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<tr>
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<td>Present</td>
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<tr>
<td>Cues (rare bonus)</td>
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<td>Tailored (1pt)</td>
<td>Emotional situation (0.3pt @)</td>
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<tr>
<td>EXAMPLE Score</td>
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<td>4</td>
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</table>

**Quality level:**

High

100%
<table>
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<tr>
<th>Feature</th>
<th>3 Points</th>
<th>1 Point</th>
<th>+/- 0.5 Point</th>
<th>Example Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>x 5-8 HBM</td>
<td>x 3-4 HBM</td>
<td>x 1-2 HBM</td>
<td>1</td>
</tr>
<tr>
<td>Accurate</td>
<td>High</td>
<td>1 misstatement</td>
<td>2+ misstatements</td>
<td>3</td>
</tr>
<tr>
<td>Barrier unrealistic</td>
<td></td>
<td></td>
<td>some exaggeration [-0.5]</td>
<td>0</td>
</tr>
<tr>
<td>Balanced</td>
<td></td>
<td>≥2 frame(s) balanced</td>
<td>1 frame balanced</td>
<td>1</td>
</tr>
<tr>
<td>Persuasive subtotal:</td>
<td>\ \ \ \ \ \ \ \</td>
<td>\ \ \ \ \ \ \ \</td>
<td>\ \ \ \ \ \ \ \</td>
<td>1</td>
</tr>
<tr>
<td>Salient</td>
<td></td>
<td>Seasonal or epidemic peak</td>
<td>Non-peak / low volume</td>
<td>1</td>
</tr>
<tr>
<td>Credible</td>
<td></td>
<td>Government, medical</td>
<td>less credible / non-media, non-government, non-medical</td>
<td>1</td>
</tr>
<tr>
<td>Comforting</td>
<td></td>
<td>Present</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Cues</td>
<td></td>
<td>Tailored (1pt)</td>
<td>Emotional situation (0.3pt @)</td>
<td>0</td>
</tr>
</tbody>
</table>

**EXAMPLE Score**

3 4 7

**Quality level:**

Moderate 70%
Table 6  Example of Score Qualifiers: Poor News Quality

<table>
<thead>
<tr>
<th>Feature</th>
<th>3 Points</th>
<th>1 Point</th>
<th>+/- 0.5 Point</th>
<th>Example Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>x 5-8 HBM</td>
<td>x 3-4 HBM</td>
<td>x 1-2 HBM</td>
<td>0.5</td>
</tr>
<tr>
<td>Accurate</td>
<td>High</td>
<td>1 misstatement</td>
<td>2+ misstatements</td>
<td>3</td>
</tr>
<tr>
<td>Barrier unrealistic (Inaccurate)</td>
<td>≥2 frame(s) balanced</td>
<td>1 frame balanced</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Balanced</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persuasive</td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>Salient (Persuasive)</td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>Credible (Persuasive)</td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>Comforting (Persuasive)</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Cues (rare bonus)</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

**EXAMPLE Score**

| 3 | 2 | 5 |

**Quality level:**

| Poor | 50% |

The scores based on a 10 point plus bonus system are easily converted to a percentile quality score and a news quality rating level. The three news quality ratings are poor, moderate and high. In referring to the published literature to determine what percentage ranges fall into the corresponding quality classifications there are at least
two references, in which the scores are coincidently separated in 20% increments; however, one study used the range from 1-100% to split and correlate with a 1-5 star rating system, yet the data only corresponded to two of the five ranges [Bovenkamp et al., 2008]. The percentile scale used in this study is based on a slight modification from the methods used in a tailored communication evaluation; in the example of poor, moderate or good communication-fit, the respective scales were <50%, 50-69% and > 70% [Kreuter & Wray, 2003]. Since 50% is the likely baseline quality score for flu news stories in this study, the 50-69% score reflects poor flu news quality, a 70-89% score reflects moderate flu news quality, and a 90-102% score reflects high flu news quality (Figure 10).
In conclusion, with a basic understanding of the public health and news quality issues (Chapter 1), HBM-based CA literature (Chapter 2), and flu news CA materials and analytical strategies (Chapter 3), the next three chapters reveal data findings on overall quality between the two media sets, characteristic features of high quality flu news and HBM category prominence or agenda setting as well as information gaps that send different messages to the public audience.
IV. OVERALL AND MAIN PERSUASIVENESS FLU NEWS QUALITY

4.1 Overall Flu News Quality and Coverage Patterns

Main persuasiveness data discussed in this chapter centers on information accuracy, completeness and balance. While overall quality is first discussed, a secondary analysis on the quality score ranges associated with an individual quality factor lends credence to which quality factors are a good indicator of news quality.

4.1.1 Flu News Quality Overall —

Research hypothesis One (RH1) posited that the overall quality of televised news would be worse than newsprint news on influenza. After comparing the average quality score of all the eligible flu news stories, the research data indicate that the overall quality is consistent for the most part between the two media sources; the overall flu news quality is 74% in the televised news set and 71% in the newsprint news set (Figure 11). The percentiles range from 50-100% for the television and 40-101% for the newsprint news sets. Thus, the first hypothesis is false. These research findings oppose the differential news quality sentiments remarked by journalists and scholars. Consistency in media sources is a tribute towards information persuasiveness and potential actions among the public, but a moderate quality rating may not be sufficient
to switch the non-compliant half of the U.S. population to comply with flu vaccinations. Approximately two thirds of the flu news stories are of a moderate quality and one third are of a low quality (Figure 12). An improvement in news quality may aid in educating the public and better addressing their concerns. The components of the news quality ratings are broken down to understand which qualify factors are supporting or holding back flu news quality. Details of these findings, on the features contributing to overall quality, are examined throughout the three data analyses chapters.

Figure 11 Overall Quality of Televised and Newsprint Flu News
Research hypothesis Two (RH2) posited that the overall quality of flu news at the start of the pandemic would be worse than news on influenza during the beginning of a fall/winter flu season. The quality of the flu news in April 2009, i.e., at the commencement of the pandemic in the U.S., is not comparable between the two media data sets. The news quality actually fluctuates during seasons and the 2009 pandemic. Since the seasonal news quality doesn't serve as a valuable baseline, the quality of the initial pandemic news is compared to the average news quality. Hence, the second hypothesis is true in essence. In the 2008-09 season, televised news quality varied from 60-80% whereby half the time quality was below or above average; thus 2008 flu season did not serve as a valuable baseline as intended or hoped for. In addressing the second hypothesis, it is true that news quality of televised flu news is worse during the
initial stage of the flu pandemic crisis compared to the average news quality, while the news quality of newsprint flu news is near the 20-month average quality level (Figure 13-15).

Since the comparison of the flu news quality over the 20 month study period shows fluctuations in the news quality as opposed to a plateau, the news quality is plotted against flu news volume\textsuperscript{24} along with additional indicators of U.S. or international pandemic responses to understand why these fluctuations may occur. Based on the televised flu news set, it appears that the volume of U.S. news reflects domestic\textsuperscript{25} catastrophic or triggered events as opposed to international triggers (Figure 14-15).

The events triggering peak flu news volumes in April and October 2009 are likely associated with the U.S. government declarations of a U.S. public health (solid square symbol) and national health (solid triangle symbol) emergency respectively. The latter emergency situation may have usurped the effect of the 2009 flu season, which is October through May. In all, the data indicate that the news quality during the initial crisis was below or at average for televised or newsprint flu news respectively and it took two to three months for the news quality, which is (clearly) independent of news volume, to improve; this is in agreement with Graber and Dunaway, i.e., it takes time for news quality to (steadily) ramp up. In the 2009-2010 flu season, newsprint news quality held at a higher level through the beginning two months, but is more likely to

\textsuperscript{24} Several news months have a low number or absence of dual-filtered flu news transcripts; while the minimum dual-filter newsprint count is 13 news stories in May 2010, televised flu news is absent from several time points including March 2009 and February through May 2010.

\textsuperscript{25} Either U.S. emergency declaration was often accompanied by messages to not panic. The April 26, 2009 public health emergency declaration was associated with released of antiviral drugs and ventilators from the National Stockpile. The October 24, 2009 national health emergency declaration was in anticipation of large hospital surges of ill and the worried well should an outbreak occur in the fall/winter; the latter preparedness planning lead to lifting of federal restrictions so hospitals could setup offsite triage tents and waiver of some insurance regulations.
have been affected by the second national catastrophic event trigger. While RH2 is true in the sense that news quality is worse during the initial crisis, if however, there are successive crises of a similar kind (health related in this case) within a short time span of approximately six months, then the quality of news during the second crisis may be higher.

Figure 13  Comparison of Televised versus Newsprint Coverage Quality
Figure 14  Televised Flu News Quality and Newsworthiness Trends
Figure 15  Newsprint Flu News Quality and Newsworthiness Trends
4.2 Main Persuasiveness Flu News Quality Patterns

The concentration of research data findings on information accuracy, frame balance, and information completeness that reflect the three main factors of news quality or persuasiveness per the research design are detailed throughout the remainder of this chapter.

4.2.1 Flu News Quality Breakdown: Persuasiveness Features —

In examining the multiple factors “contributing” to news quality, accuracy seemingly ranked as the best news quality feature with a 97% score weight in televised flu news and 98% score weight in newsprint flu news (Figure 16-17). The general persuasiveness and completeness score potentials (of 68% and 63% respectively in televised flu news and 63% and 61% respectively in newsprint flu news) appear to closely contribute to the overall news quality level. Of the main persuasiveness features, media frame balance is below 50%, and this news imbalance may be underestimated as there are too few messages on mild vaccine harms and benefits to study the importance of a safety frame. As expected, targeted content is extremely rare in newsprint and especially televised flu news messages.
Figure 16  Preview of Quality Factor Weight associated with Televised Flu Coverage

Figure 17  Preview of Quality Factor Weight associated with Newsprint Flu Coverage
The influence of the four key quality characteristics is investigated among all of the study eligible flu news transcripts; however, it may be deceiving to assume that these quality factors are in rank order of theoretically contributing the most to least towards overall news quality. Actually, the determination of news quality contribution more accurately stems from secondary analysis of the maximum quality average typically linked with the higher score range (two- or three-range scores) among of each of the specific quality factors. As a more representative summary, Table 7 indicates that three important factors contributing to overall news quality are most likely information completeness, clarifications, and frame balance for televised (91%, 85.8%, 85.4% respectively) and newsprint (88%, 83.5%, 83.4% respectively) flu news. This type of analysis is continued throughout the remainder of the data analysis chapters.
Table 7  Relationships of Televised and Newsprint News Quality and Persuasiveness

<table>
<thead>
<tr>
<th>Persuasiveness (% quality):</th>
<th>Television Maximum (%)</th>
<th>Television Average (%)</th>
<th>Newsprint Maximum (%)</th>
<th>Newsprint Average (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Quality (%)</td>
<td>N/A</td>
<td>74.3</td>
<td>N/A</td>
<td>71.3</td>
</tr>
<tr>
<td><em>Main Persuasiveness:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completeness</td>
<td>91.3</td>
<td>76.4</td>
<td>88.5</td>
<td>73.8</td>
</tr>
<tr>
<td>Balance</td>
<td>85.4</td>
<td>75.9</td>
<td>83.4</td>
<td>73.0</td>
</tr>
<tr>
<td>Accuracy</td>
<td>80.4</td>
<td>76.8</td>
<td>79.6</td>
<td>67.5</td>
</tr>
<tr>
<td><em>General Persuasiveness:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarification presence</td>
<td>85.8</td>
<td>78.6</td>
<td>83.5</td>
<td>75.9</td>
</tr>
<tr>
<td>Credible experts</td>
<td>76.3</td>
<td>68.6</td>
<td>72.7</td>
<td>67.1</td>
</tr>
<tr>
<td>Peak salience</td>
<td>74.6</td>
<td>71.3</td>
<td>73.75</td>
<td>70.5</td>
</tr>
</tbody>
</table>

4.2.1.1  Flu News Accuracy

Initially, based on the preview of news quality data among the various quality factors, it seemed that the news accurateness is a good reflection of news quality (see above). In this research design, accuracy of flu related (and other) facts is one of the principal quality features and was expected to be extremely high based on the historical knowledge and media base. Figure 18 shows that the majority of flu news stories are
highly accurate, taking into account factual information in the absence of the contentious portion of content on prevention barriers that is subjected to myths or other misinformation; fact wise, there were barely any mistakes in either news source on flu or prevention content.

Figure 18 Overall Presence of Accurate Televised and Newsprint Flu News

However, any exaggerations through inappropriate barriers detected in the flu news content detract from the overall accuracy; the potential of media exaggeration is considered a form of inaccuracy in this research design. Some prevention barrier-type HBM discussion is acceptable as long as it is realistic and not spreading misinformation, i.e., a wrongful deterrent. In further examining detected barriers in flu news, this HBM
category is split into acceptable versus inappropriate barriers; the data show that approximately 50/50 or 60/40 of the barrier-inclusive televised or newsprint stories respectively are appropriate versus inappropriate (Figure 19). In television flu news, 27 out of 207 news stories contained non-realistic (exaggerated) barriers compared to 30 out of 448 flu stories in newsprint. The (inappropriate) barriers (one of the rightly so, uncommon HBM categories) detract from the overall media frequency; thus, what would have been near perfect accuracy is slightly diminished. Before concluding whether accuracy contributes well to the overall news quality, a better means of assessment is to exam the quality levels corresponding to each of the score ranges as explained below; this means of secondary analysis is applied throughout the remainder of this study.
4.2.1.1.1 Quality based on Flu News Accuracy Status

In the 10-point scoring system, maximum accuracy rates 3 points, one misstatement rates 1 point, two misstatements rates 0.5 point, and inappropriate barriers score minus (-) 0.5 point; thus, final accuracy scores are either 1, 2.5 or 3 points since none of the flu news stories contained more than one noted misstatement (Table 8). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that the
higher accuracy-scoring, realistic content did not correspond to better news quality (Figure 20). Since flu news containing exaggerations is associated with a greater news quality level, this indicates that quality factors other than accuracy are a better determinant of overall news quality. This may support the research by Prati et al. who demonstrated that the public, who has trust in authorities, accepts news with exaggerations.

Table 8 Relationships of Televised and Newsprint News Quality and Accuracy

<table>
<thead>
<tr>
<th>Accurate:</th>
<th>With misstatement (1 point)</th>
<th>With exaggerations (2.5 points)</th>
<th>Realistic (3 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Televised news:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (74% threshold)</td>
<td>N/A</td>
<td>80.4%</td>
<td>73%</td>
</tr>
<tr>
<td>News stories (# of n=207)</td>
<td>N/A</td>
<td>n= 27</td>
<td>n= 180</td>
</tr>
<tr>
<td><strong>Newsprint news:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (71% threshold)</td>
<td>52%</td>
<td>79.6%</td>
<td>71%</td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n =4</td>
<td>n= 30</td>
<td>n= 414</td>
</tr>
</tbody>
</table>
However, being that the majority of accurate news stores are realistic, as opposed to exaggerated, then the accuracy factor does contribute to news quality and should not be dismissed. In conclusion, in news stories that have a whole quality score above the televised or newsprint threshold (average rank) as well as those with a $\geq 90\%$ quality score (high rank), some of that (barrier) content is likely to be exaggerated. The potential of other news quality factors that supersede accuracy are examined below.

Figure 20  Relationships of Televised or Newsprint News Quality and Accuracy
4.2.1.2 Flu News Completeness Patterns

Information completeness in this flu news study takes into account the coverage of the eight HBM components described earlier. To fully understand the scale of how complete or incomplete flu news is, the data are methodically analyzed in a multistep fashion. Upon a cluster analysis of the two disease risk HBM components and the remaining prevention HBM components, it appears that news coverage on disease and prevention components relating to influenza is even (Figure 21-22, second and top bar respectively); however, it is not fair to compare a two- versus six-component cluster for balance or completeness on the surface. In fact, in single news stories that contain three of more HBM components, there is definitely a mix of disease and prevention content.
Figure 21  Possibility of Complete Televised Content on Disease and (Barrier-inclusive) Prevention
Figure 22: Possibility of Complete Newsprint Content on Disease and (Barrier-inclusive) Prevention

Figure 23 captures how extensive is the quality feature of information completeness through analysis of the average amount of HBM content in single news stories in either of the two media in this research study of flu news. The data reveal a limited span of content in flu news; this limitation is represented by two to four HBM categories in the majority of individual televised and newsprint stories on flu (Figure 23). None of the televised and one of the eligible newsprint flu news stories contained discussions on all eight HBM categories. These research findings show that flu information is incomplete in the traditional news and support the findings of other communication scholars. This lack of important flu information could play a substantial role in the suboptimal rate of flu vaccination compliance among the American public.
Thus far, we identified that in the televised and newsprint flu news, an average of three HBM categories are represented in the majority of news stories; this information incompleteness is a major signature of a less than optimal news quality. Of the eight HBM categories, barrier content, although appropriately held to a minimal level, is a deterrent from practicing health behavior as recommended by public health officials. As analyzed above, some barriers are realistic and others are exaggerated. In order to gain a clearer understanding of the actual disease versus prevention news coverage, the
frequency of each HBM category is examined individually and in the absence of barrier content that allows a more pertinent focus on disease prevention outreach to the public.

Figure 24 Absolute Frequencies of Televised Non-barrier Flu Coverage
From the analysis of individual HBM categories in contrast to clustered analysis, the coverage of disease discussions in both media sources (n= 151 television or n= 372 newsprint stories) in flu news overpower the content coverage on the multiple flu prevention topics, thus representing a quasi-type of imbalance in flu news presentation (Figure 24-25). From this viewpoint, the majority of flu news stories mention disease susceptibility that is a marker of issue salience; as the upper limit of HBM content is typically four HBM categories, then the media typically also choose disease severity, flu vaccine or prevention alternatives as their story material. Despite the lack of completeness of flu prevention news during the specified 20-month period, the full spectrum of HBM categories can easily be covered over the seasonal or epidemic cycle.
of the flu news stories. It could be presumed that if flu information were more complete, it would remain to be accurate.

4.2.1.2.1 Quality based on Flu News Completeness Status

The research findings pertaining to flu news during the specified 20-month study period are in agreement with Habel et al. and others who find incomplete public health information in news sources. This study confirms that incomplete flu news coverage is relevant to both the television and newspaper media. The importance of info completeness is harped upon in the CA literature and one might assume that this is the most important of the four major news quality features. In the 10-point scoring system, completeness rates a maximum of 3 points and the final completeness scores are 1, 2, or 3 points (Table 9). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that the higher completeness scoring content does indeed correspond with a higher news quality level (Figure 26); in fact, this is the only quality factor that nearly reaches the high quality rank above 89%. Televised flu stories containing more than two HBM category content reach the average quality threshold or moderate quality rank while those stories with more than four HBM category content reach the highest quality rank.
Based on this high correspondence in score and rating of a higher quality level, then the news quality feature of completeness is a direct or main determinant of persuasiveness, i.e., information completeness is an optimal news quality factor determinant. In conclusion, in news stories that have a whole quality score above the televised or newsprint threshold (average rank) as well as those with a $\geq 90\%$ quality score (high rank), some of that fuller content is certainly in reference to HBM categories besides disease susceptibility and severity.
4.2.1.3 **Flu News Balance**

In media frame analyses, it appears of two media frames, that there may be a high level of balance for at least one frame, the disease risk frame, occurring in a consistent manner between the two media sources. In this research design, the disease risk frame is composed of the susceptibility and severity components. In examining the frequency of flu news stories that contain both components versus separately, there is a high degree of balance based on 74% or 65% of televised or newsprint stories respectively with the susceptibility-severity combination (Figure 27-28). In receiving both disease risk component information, the public may be less apt to ignore the
barrage of severity content and make a stronger public health connection with who is at highest risk during the active flu season associated with a new flu variant or strain (H1N1, H2N2, or H3N2).

Figure 27  Disease Risk Frame Balance in Televised Flu Stories
Figure 28  Disease Risk Frame Balance in Newsprint Flu Stories

As for flu prevention news, the preventive measure of the vaccine versus precautionary alternatives studied for frame balance is referred to as the prevention approaches frame. Unlike the disease risk frame, the prevention approaches frame is imbalanced in televised and newsprint news (Figure 29-30). Approximately one in five television segments or newsprint articles mention both flu vaccine and alternative precautions, however, either one third or one half of each respective news source mentions prevention through the flu vaccine, but not supplemental precautionary approaches. Hygiene is an important infectious disease control tactic that prevents the spread of contagious respiratory diseases (and foodborne illness germs). These habits need to be applied constantly and not an intended behavior only during outbreaks as one may be forgetful, distracted, or not in the routine. Another problem with an imbalance of disease prevention approaches as in the televised flu news set is that many
news stories only mention alternatives like handwashing and not the vaccine (availability, or manufacturing and safety testing, and importance of protection). Overall, an increase in vaccine news encouragement or content may enhance vaccination rates, and an increase in news content of both prevention approaches may aid in a decline in flu infection rates (disease incidence).
Figure 30 Prevention Approaches Frame Imbalance in Newsprint Flu Stories

4.2.1.3.1 Quality based on Status of Balanced Media Frames in Flu News

The data show that the prevention measures frame is imbalanced in contrast to a balanced disease risk frame in both media sources. In the 10-point scoring system, frame balance rates a maximum of 1 point, thus final balanced frame scores of up to two media frames are either 0, 0.5, or 1 point (Table 10). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that the higher frame balance scoring content does correspond with better news quality although at a moderate level (Figure 31). Important to note is that frame balance presence, whether of 1 or 2 frames, did exceed the threshold level in televised and newsprint flu news. Since (frame) balanced news
stories may correspond to a moderately higher quality level, then, the news quality feature of frame balance is an important determinant of persuasiveness.

Table 10  Relationships of Televised and Newsprint News Quality and Frame Balance

<table>
<thead>
<tr>
<th>Balance:</th>
<th>No Frame Balance (0 point)</th>
<th>1 Balanced Frame (0.5 point)</th>
<th>2 Balanced Frames (1 point)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Televised news:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (74% threshold)</td>
<td>67%</td>
<td>75%</td>
<td>85.4%</td>
</tr>
<tr>
<td>News stories (# of n=207)</td>
<td>n= 55</td>
<td>n= 128</td>
<td>n= 24</td>
</tr>
<tr>
<td><strong>Newsprint news:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (71% threshold)</td>
<td>62%</td>
<td>74%</td>
<td>83%</td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n= 143</td>
<td>n= 249</td>
<td>n= 56</td>
</tr>
</tbody>
</table>

In conclusion, in news stories that have a whole quality score above the televised or newsprint threshold (average rank), some of that (media frame) content may help make flu prevention news more visible to the public and perhaps some policymakers or health authorities; however, the prevention content could still benefit from added news
material to enhance information completeness as well as balance. In sum, the overall mediocre news quality reflects accurate information, but news is marred by an imbalance and incompleteness of important flu information pertaining to prevention features including the vaccine, benefits and rarity of severe risks, and complementary infectious disease precautions. The weakness among two (key quality determinants) of the three main persuasiveness factors may affect the public’s perceptions and inactions in regards to flu outbreaks and prevention. As discussed in the next two chapters, several additional features that make up a general persuasiveness theme can also influence public health behaviors. These subsequent chapters on televised (Chapter V) or newsprint (Chapter VI) news respectively detail further investigations into informant credibility, and when higher quality news discussions occur.
Figure 31  Relationships of Televised or Newsprint News Quality and Balance
V. GENERAL PERSUASIVENESS AND OTHER NEWS QUALITY PATTERNS OF TELEVISED FLU NEWS

The purpose of this data chapter is to examine additional persuasive factors such as flu news salience, informant credibility and comforting or clarifying content that add to the primary news quality factors (completeness, balance) reviewed in Chapter IV.

5.1 General Persuasiveness Flu News Quality Patterns

5.1.1 Flu News Quality: General Persuasiveness Overview —

In the earlier chapter on main persuasiveness news quality, the data preview suggests that the combined general persuasiveness components contribute to overall news quality slightly less than information accuracy; yet, accuracy is not proven to hold up as a strong determinant of flu news quality. The three characteristics representing general persuasiveness are analyzed separately in this and the next chapter dependent on the news medium.

5.1.1.1 Quality based on Flu News General Persuasiveness

Before breaking down the contribution of the three quality factors contributing to general persuasiveness, it is of interest to exam the total general persuasiveness scores
in relation to television flu news quality rank. The maximum general persuasiveness score in this research design is 3 points. The salience (0.5 or 1 point) and comforting content (0 or 1 point) in each news story are assigned from a two range score, while the presence and type of credible informant has a three range score (0, 0.5, or 1 point; see Chapter III). The overall general persuasiveness scores that reach above the 74.3% average television news quality threshold correspond to 2.5-3 point totals (Table 11, Figure 32); this indicates that the more persuasive news story is salient, includes credible informants, and contains clarifying content.

Table 11 Relationship of Televised News Quality and General Persuasiveness

<table>
<thead>
<tr>
<th>General Persuasiveness:</th>
<th>0.5 point</th>
<th>1 point</th>
<th>1.5 point</th>
<th>2 points</th>
<th>2.5 points</th>
<th>3 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Televised news:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (74.3% threshold)</td>
<td>60%</td>
<td>59.8%</td>
<td>66%</td>
<td>74.1%</td>
<td>79%</td>
<td>86%</td>
</tr>
<tr>
<td>News stories (# of n=207)</td>
<td>n= 1</td>
<td>n= 22</td>
<td>n= 11</td>
<td>n= 133</td>
<td>n= 4</td>
<td>n= 36</td>
</tr>
</tbody>
</table>
Based on the potential of a higher quality score, the news quality feature of general persuasiveness may be a strong determinant of overall persuasiveness. Earlier data suggest that the general persuasiveness weigh might be nearly equivalent to that of information completeness as an important overall news quality factor (see Figure 16). It is however important to note that so few news stories in television represent all three general persuasiveness characteristics (3 points). In the televised flu news set over the specified 2008-2010 period, more televised news stories have maximum general persuasiveness (n= 36) as opposed to information completeness (n= 26). Yet, information completeness reflects a more prominent news quality determinant than individual general persuasiveness factors.
5.1.1.2 Salience: Newsworthiness of Televised Flu News

Flu news is not expected to be salient year round, and as demonstrated in Chapter II, the newsworthiness on the topic of flu fluctuated in televised news during October 2008-May 2010. This necessitates, in this research design, only a two-scale quality classification to reflect flu news that is salient (during peak-expected periods of an annual October to May flu season and/or) during an enormous nationwide epidemic or pandemic as in April to November 2009.

5.1.1.2.1 Quality based on Flu News Salience Status

In the 10-point scoring system, salience rates a maximum of 1 point, out of three general persuasiveness points, and the final salience scores are either 0.5 or 1 point to reflect salient flu news presentation or newsworthiness (Table 12). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that the higher salient scoring content does indeed correspond with the majority of televised news stories reaching an average news quality level of 75%, just above the overall flu news quality threshold.
5.1.1.3 **Credibility and News Quality Associations: Television Flu News Informants**

Research hypothesis Three (RH3) posited that government sources would be consulted more frequently than medical informants in flu news stories; this supposition is false for the televised flu news (as opposed to the newsprint set of news). The televised data findings reveal that medical doctors are consulted equally as government officials (Figure 33). However, if one combines both medical types of informants, i.e., physicians and medically trained health beat reporters, then the medical experts exceed government sources in televised flu news. Of note is that approximately 10% of televised flu news stories are by news anchors and broadcast reporters in the absence of expert, professional, or institutional consultation.
Figure 33  Frequency that Credible and Other Informants are consulted for Televised Flu News Stories

While the frequency of consultation with government informants is comparable to medical doctors or health beat reporters on flu news, in examination of single televised news stories, it becomes more apparent that at times multiple government sources may contribute to a televised flu story. Governmental agencies or leaders consulted during the flu season or national public health emergency include the Departments of Homeland Security, Health and Humans Services (including the CDC and/or National Institutes of Health (Dr. Fauci)), and Education, and the White House including President Obama. In retrospect, the government may have been contacted more in this study period due to the pandemic and the unusual circumstance of no vaccine to protect against the 2009 H1N1 flu strain that was spreading globally and rapidly. Hence, in a more typical (two) flu season span, doctors or reporters may be the
more frequent experts or discussants about the flu and prevention. Personal interviews also occur on rare occasion (n= 3) with celebrity doctors, like Drs. Oz or Weil, in the ABC, Inc. flu news set during the 2008-2010 study period (Figure 33).

Since the focus of this research is centered on news quality, the research investigation is also extended to assess news quality associated with informant credibility. It could be assumed that the news quality of both medical and government authorities is nearly equivalent; however this inquisition is worth pursuing to be consistent with the thorough research on whole. The quality is assessed by splitting informants into two credibility categories; medical and government representatives are recognized as having more expertise on flu and infectious disease policies than other informants. Informants with the most credibility, including federal and state government officials and physicians whom are very knowledge about infectious diseases, and the flu vaccine or vaccination programs, are influential. Other informants consulted in flu news include school officials, academia or researchers, and health care workers. In the 10-point scoring system, credibility rates a maximum of 1 point and the final credibility scores are 0, 0.5, or 1 point (Table 13). The research findings in bulk reveal that consultation with credible informants with or without other professional or institutional sources is associated with a higher, above average threshold news quality compared to flu news stories that do not seek credible or any consultants (Table 13, Figure 34). Keen to note is that if consultants (credible or other) are not associated with a flu news story, then the news quality (59%) ranks poorly.
Table 13  Relationship of Televised News Quality and Informant Credibility

| Informant(s): | None  
(0 point) | Non-government, Non-medical  
(0.5 point) | Credible +/- other  
(1 point) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Televised news:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Average Quality (%)  
(74% threshold) | 59% | 70% | 76% |
| News stories  
(# of n=207) | n= 23 | n= 6 | n= 178 |

Figure 34  Frequency that Credible versus Less Credible Informants are consulted for Televised Flu News Stories
The majority of flu news stories delivered through television consulted with a mixture of credible types of sources and/or other professional contacts such as school representatives or healthcare workers. To get a deeper understanding of contribution to the quality of flu news, stories limited to one type of informant are investigated. When examining flu news stories with bulk versus sole consultation from one type of credible source, government only, medical doctor only or medical health beat reporter only, message qualities are nearly equivalent (74-77%; Table 14, Figure 35). Thus, these data reveal that regardless of type of background, credible sources used in television provide an equivocal quality level of flu news.

Table 14  Relationship of Televised News Quality and Credible Informants

<table>
<thead>
<tr>
<th>Informant(s):</th>
<th>Government</th>
<th>Doctor / medical</th>
<th>Doctor / reporter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixture or sole informants:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%)</td>
<td>76%</td>
<td>76%</td>
<td>77%</td>
</tr>
<tr>
<td>News stories (# of n=207)</td>
<td>n= 95</td>
<td>n= 89</td>
<td>n= 62</td>
</tr>
<tr>
<td><strong>Sole informant:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%)</td>
<td>77%</td>
<td>74%</td>
<td>76%</td>
</tr>
<tr>
<td>News stories (# of n=207)</td>
<td>n= 35</td>
<td>n= 27</td>
<td>n= 32</td>
</tr>
</tbody>
</table>
5.1.1.3.1 **Flu Vaccine News and Credibility Associations: Vaccine Messengers in Television**

Data show that credible informant- and news staff-relayed flu messages are associated with higher quality televised flu news. Being that the flu vaccine is the best protection against influenza, thus keenly important to be discussed among the media and public agenda, a focused analysis of credible informants relaying vaccine information is evaluated. Credible sources relied upon in preventive vaccine-related
televised news includes senior medical reporters and government officials or representatives more so than medical doctors (Figure 36). Since these findings suggest that vaccine news is relayed by news staff with a medical background, even in the absence of government or medical professionals, to emphasize public health importance, the media could more frequently mention vaccines in tune with disease prevention messages. Reference to the flu vaccine is mentioned in 90 out of 207 study eligible news stories, and the majority of vaccine discussions are by the news anchor or other broadcasters. Given that news networks or organizations may not invest in consulting with elite information sources on this specific content, broadcasters (and newspaper journalists) should remember how the simple inclusion of vaccine discussion plays a role in public health promotion. This is likely more important for the television sector since their presentation of flu vaccine content is less frequent compared to the newsprint sector. The next chapter reviews the general persuasiveness and vaccine informant content in newsprint flu news (see Chapter VI).
5.1.1.4 Reassurance: Clarifying Content in Televised Flu News

The expansion of the HBM perception- and behavior-type content referred to as either clarifying content or comfort factors is a novel concept with development in mind to balance barrier (deterrent) content with hopes of future applications. In this research design, comforting or clarifying message content is tracked for absence or presence; thus a two-scale quality classification reflects this HBM-like component that contributes to information completeness (main persuasiveness) as well as general persuasiveness.
5.1.1.4.1 Quality based on Flu News Clarification Status

In the 10-point scoring system, clarification rates a maximum of 1 point, out of three general persuasiveness points, and the final clarification scores are either 0 or 1 point (Table 15). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that the higher clarification scoring content does approach a near high news quality level; in fact, this is the second highest quality factor in televised flu news next to information completeness.

Table 15 Relationship of Televised News Quality and Informative Clarifications

<table>
<thead>
<tr>
<th>Clarifying content:</th>
<th>Not discussed (0 point)</th>
<th>Mentioned (1 point)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Televised news:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (74% threshold)</td>
<td>71.5%</td>
<td>85.8%</td>
</tr>
<tr>
<td>News stories (# of n=207)</td>
<td>n= 167</td>
<td>n= 40</td>
</tr>
</tbody>
</table>

Based on the observation that 20% of televised flu news stories contain clarifying content, this study supports application of clarifying message content in future
research and communications. In conclusion, even though only 40 of 207 new stories are associated with this quality feature, the quality rank level for comfort factors is greater than the other two general persuasiveness factors, thus indicating that the clarifying and comforting factor theme has weight as a news quality determinant. In the schema of overall news quality, the top three quality rank averages in televised flu news are associated with information completeness, comfort factors, and media frame balance (91.3%, 85.8%, and 85.4% respectively).

5.2 Additional Flu News Quality Patterns

Besides associations with the main and general persuasiveness features of completeness, accuracy, balance, salience and credibility with higher quality flu news, other reasons could be related to televised time or programming format. Different formats may be associated with specific network, daytime versus nighttime, specific show or news program, or air time allotment (indirectly indicated by number of words). In this research study, flu news transcripts were limited to ABC, Inc. based on the focused content accessible through the LexisNexis database. Of research interest in televised news are the time of daily delivery and the news program associated with high flu news quality.
5.2.1 News Quality Associations: Timing of Televised News Delivery —

Research hypothesis Four (RH4) posited that in televised flu news, higher news quality is associated with morning as opposed to evening news. This final hypothesis is false as the average news quality of daytime and evening flu news is equivalent. Although the average news quality of daytime and evening delivered flu news is nearly equivalent, there is a slightly lower quality from the evening sources of flu news (Figure 37). However, analysis of the high quality flu news sample reveals that there is a slight shift in trend wherein the high quality, evening flu news is better than the high quality, morning flu news (Figure 38).

Figure 37 Daytime versus Nighttime Televised Flu News Quality
5.2.2 High Quality News Associations: Televised Show —

Since news producers and networks as the gatekeepers have an influence on the news format, selection and content, it is also of research interest to determine whether there are differences in flu news delivery and the frequency of high quality news. The morning and evening shows are analyzed to determine if one show applied higher quality than another. In the sample of high quality televised flu news, the majority of
flu stories occur in the morning and all of these high quality flu news segments are produced by Good Morning America (Figure 39-40). The evening news, in contrast, was not dominated by one news program (Figure 41).

![Bar chart showing high quality flu news during daytime versus nighttime](chart.png)

Figure 39  High Quality Flu News and Frequency during Daytime versus Nighttime
Figure 40  High Quality Morning News Programs with Flu Coverage

Figure 41  High Quality Evening News Programs with Flu Coverage
Overall, televised flu news is accurate, incomplete and partially balanced that lends to a mediocre news quality. Completeness is the most prominent determinant of televised higher flu news quality followed by the presence of comforting content or clarifications. The quality factors least associated with televised news quality are credibility or salience. Overall, flu news is of a moderate quality. An additional assessment of timing of televised flu news delivery did not reveal a difference between morning and evening news. A similar assessment of general persuasiveness news qualities pertaining to newsprint flu news is detailed in the next chapter.
VI. GENERAL PERSUASIVENESS AND OTHER NEWS QUALITY PATTERNS OF NEWSPRINT FLU NEWS

This data chapter applies the general persuasiveness quality analysis towards the newsprint flu news data set. In the previous chapter, we learn that higher quality televised flu news is influenced by clarifications or alleviatory content more than by credible informants or salience. The general persuasiveness data similarly hold true for the newsprint flu news data set.

6.1 General Persuasiveness Flu News Quality Patterns

6.1.1 Flu News Quality: General Persuasiveness Overview —

On the surface, the data preview in Chapter IV seemed to indicate that the combined general persuasiveness components (63%) of clarifications, salience and credibility contribute to overall newsprint news quality less than the main persuasiveness component of information accuracy; however, accuracy does not hold up as a strong determinant of newsprint flu news quality. The three characteristics representing general persuasiveness are analyzed separately in this chapter focused on the newsprint news medium.
6.1.1.1 Quality based on Flu News General Persuasiveness

Before breaking down the contribution of the three quality factors contributing to general persuasiveness, it is of interest to exam the total general persuasiveness scores in relation to newsprint flu news quality rank. The maximum general persuasiveness score in this research design is 3 points. The salience (0.5 or 1 point) and comforting content (0 or 1 point) in each news story are assigned from a two range score, while the presence and type of credible informant has a three range score (0, 0.5, or 1 point; see Chapter III). The overall general persuasiveness scores that reach above the 71.3% average newsprint news quality threshold correspond to 2-3 point totals (Table 16, Figure 42); this indicates that the more persuasive news story includes two or three of these quality factors.

Table 16 Relationship of Newsprint News Quality and General Persuasiveness

<table>
<thead>
<tr>
<th>General Persuasiveness:</th>
<th>0.5 point</th>
<th>1 point</th>
<th>1.5 point</th>
<th>2 points</th>
<th>2.5 points</th>
<th>3 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsprint news:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(71% threshold)</td>
<td>57%</td>
<td>59%</td>
<td>66%</td>
<td>72.4%</td>
<td>82%</td>
<td>87.1%</td>
</tr>
<tr>
<td>News stories</td>
<td>n= 8</td>
<td>n= 24</td>
<td>n= 160</td>
<td>n= 177</td>
<td>n= 33</td>
<td>n= 46</td>
</tr>
<tr>
<td>(# of n=448)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

175
Based on the potential of a high quality score, the news quality feature of general persuasiveness could be a strong determinant of overall persuasiveness. Earlier data suggest that the general persuasiveness weigh might be nearly equivalent to that of information completeness as an important overall news quality factor (see Figure 17). It is however important to note that roughly 10% of news stories in newsprint represent all three general persuasiveness characteristics (3 points). In the newsprint flu news set over the specified 2008-2010 period, more news stories have maximum information
completeness (n= 56) compared to general persuasiveness (n= 46). Yet, information completeness reflects a marginally more prominent news quality determinant than individual general persuasiveness factors.

6.1.1.2 Salience: Newsworthiness of Newsprint Flu News

Flu news is not expected to be salient year round and as demonstrated in Chapter II, the salience or newsworthiness on the topic of flu fluctuated in newsprint news during October 2008-May 2010. This necessitates, in this research design, only a two-scale quality classification to reflect flu news that is salient during peak-expected periods of an annual October to May flu season and/or during an enormous nationwide epidemic or pandemic as in April to November 2009.

6.1.1.2.1 Quality based on Flu News Salience Status

In the 10-point scoring system, salience rates a maximum of 1 point, out of three general persuasiveness points, and the final salience scores are either 0.5 or 1 point to reflect occurrence of flu news presentation (Table 17). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that the higher salient scoring content does indeed correspond with the majority of newsprint news stories with an average news quality level of 74%, reaching above the overall newsprint flu news quality threshold.
Table 17  Relationship of Newsprint News Quality and Salience

<table>
<thead>
<tr>
<th>Newsworthiness:</th>
<th>Non-peak (0.5 point)</th>
<th>Seasonal / Pandemic (1 point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsprint news:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (71% threshold)</td>
<td>67%</td>
<td>73.8%</td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n= 171</td>
<td>n= 277</td>
</tr>
</tbody>
</table>

6.1.1.3  Credibility and News Quality Associations: Newsprint Flu News Informants

Research hypothesis Three (RH3), while proven false for televised flu news, held true for newsprint flu news in that government authorities are consulted more frequently than medical informants (Figure 43). Other informants consulted in flu news include school officials, academia or researchers, health care workers, and other news sources. Of note is that in approximately 10% of newsprint flu news stories, informant access includes wire services of the Associated Press in addition to expert, professional, or institutional consultants. Personal interviews also occur on rare occasion (n= 4) with celebrities or celebrity doctors, like Dr. Sears, in the newsprint flu news set during the 2008-2010 study period.
As consistent with the research schema, the news quality of government and other sources is examined. The quality is assessed by splitting informants into two credibility categories, i.e., the more credible and influential medical and government representatives compared to other informants inclusive of school officials, academia or researchers, and health care workers. In the 10-point scoring system, credibility rates a maximum of 1 point and the final credibility scores are 0, 0.5, or 1 point (Table 18). The research findings in bulk reveal that consultation with credible informants is associated with a higher, above average threshold news quality compared to flu news stories when other or no consultants are sought (Table 18, Figure 44). Keen to note is
that if credible consultants are not associated with a flu news story, then the news quality (62-66%) ranks poorly.

Table 18  Relationship of Newsprint News Quality and Informant Credibility

<table>
<thead>
<tr>
<th>Informant(s):</th>
<th>None (0 point)</th>
<th>Non-government, Non-medical (0.5 point)</th>
<th>Credible +/- other (1 point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsprint news:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%)</td>
<td>62%</td>
<td>66%</td>
<td>73%</td>
</tr>
<tr>
<td>(71% threshold)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n= 27</td>
<td>n= 56</td>
<td>n= 365</td>
</tr>
</tbody>
</table>
The majority of flu news stories delivered through newsprint consulted with a mixture of credible types of sources and/or other professional contacts such as school representatives or healthcare workers. To get a deeper understanding of contribution to the quality of flu news, stories limited to one type of informant are investigated. The bulk informant investigation reveals that regardless of type of credible sources, flu news presentations have a nearly equivocal level of news quality with a slightly higher newsprint news quality associated with medical doctor (76%) compared to more heavily consulted government sources (Table 19). When examining flu news stories with sole consultation from one type of credible source, government only or medical doctor only, messages are near or above the average threshold and nearly equivocal (70-73%; Table 19, Figure 45).
Table 19  Relationship of Newsprint News Quality and Informants

<table>
<thead>
<tr>
<th>Informant(s):</th>
<th>Government</th>
<th>Doctor / medical</th>
<th>Wire service, Television or Large Newspaper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixture or sole informants:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%)</td>
<td>72.7%</td>
<td>76%</td>
<td>72.2%</td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n= 345</td>
<td>n= 69</td>
<td>n= 39</td>
</tr>
<tr>
<td>Sole informant:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%)</td>
<td>70%</td>
<td>73%</td>
<td>N/A</td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n= 152</td>
<td>n= 8</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Figure 45  Quality and Frequency that Credible and Other Informants are solely consulted for Newsprint Flu News Stories

6.1.3.1 Flu Vaccine News and Credibility Associations: Vaccine Messengers in Newsprint

Reference to the flu vaccine is mentioned more frequently in study eligible newsprint flu stories compared to televised news stories. Data show that both the government- and medical-types of credible informants relay flu messages in higher quality newsprint flu news. Being that the flu vaccine is the best protection against influenza, the issue is keenly important to being discussed among the media and public agenda. An analysis of credible informants relaying vaccine information shows that government sources are relied upon in preventive vaccine-related newsprint news
extensively more so than medical doctors (Figure 46). Since the government was responsible for the pandemic flu vaccine production or procurement, and testing in American volunteers, they were foreseeably given more opportunities to consult in vaccine related newsprint flu news stories. This supports the communications literature that newspaper organizations have more staff and/or time to consult with government officials or representatives.

![Figure 46 Frequency that Flu Vaccine Informants are solely consulted for Newsprint Flu News Stories](image)

6.1.1.4 Reassurance: Clarifying Content in Newsprint Flu News

The expansion of the HBM perception- and behavior-type content referred to as either clarifying content or comfort factors is a novel concept. In this research design,
comforting or clarifying message content is tracked for absence or presence; thus a two-scale quality classification reflects this HBM-like component that contributes to information completeness (main persuasiveness) as well as general persuasiveness.

6.1.1.4.1 Quality based on Flu News Clarification Status

In the 10-point scoring system, clarification rates a maximum of 1 point, out of three general persuasiveness points, and the final clarification scores are either 0 or 1 point (Table 20). Secondary analysis of quality score averages based on the ranking of the total score points of the individual quality factor in each news story reveals that of the three general persuasiveness factors, clarification content contributes to higher quality newsprint flu news despite the approximate 20% application in flu news stories.

Table 20 Relationship of Newsprint News Quality and Informative Clarifications

<table>
<thead>
<tr>
<th>Clarifying content:</th>
<th>Not discussed (0 point)</th>
<th>Mentioned (1 point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsprint news:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Quality (%) (71% threshold)</td>
<td>68%</td>
<td>83%</td>
</tr>
<tr>
<td>News stories (# of n=448)</td>
<td>n= 361</td>
<td>n= 87</td>
</tr>
</tbody>
</table>
In the schema of overall news quality, the top three factors linked to maximum quality rank in newsprint flu news are information completeness, media frame balance, and comfort factors (88%, 83%, and 83% respectively) similar to the televised news.

6.2 Additional Flu News Quality Patterns

Besides associations with the main and general persuasiveness features of completeness, accuracy, balance, salience, clarifications, and credibility with higher quality flu news, other linkages could be related to newspaper organizations. Different formats may be associated with specific newspaper source, edition, or print space. Of research interest in newsprint news are the separation of elite versus other major U.S. newspapers and the potential U.S. region associated with higher flu news quality.

6.2.1 News Quality Associations: Newsprint News Source —

Research hypothesis Four (RH4) posited that in newsprint flu news, higher news quality is associated with news from elite or national newspaper organizations. This final hypothesis is false as the average news quality of elite newspaper flu news is equivalent to that from other major U.S. newspapers (Figure 47). Although the average news quality of flu news delivered is essentially equivalent (71%), there is a slightly greater quality from the elite sources of flu news. Of the three national newspapers, the
highest news quality is associated with the *Washington Post* (73%) compared to the *New York Times* and *USA Today* (Figure 48).

![Figure 47](image_url)  
*Figure 47  Elite versus Non-elite Newsprint Flu News Quality*
6.2.2 News Quality Associations: Regional Distribution of Major U.S. Newspapers —

Since news editors as the gatekeepers have an influence on the news format, selection and content, it is also of research interest to determine whether there are differences in flu news delivery region and the frequency of high quality news. The major U.S. newspaper articles are analyzed to determine if one coastal or regional source applied higher quality than another. Of the newsprint flu news, the majority of flu stories occur in the east coast (n= 311 of 448). The additional assessment of regional source of newsprint flu news delivery reveals an above average and higher news quality from the eastern U.S. region compared to the west coast, and Midwest and southwest regions (Figure 49).
Overall, similar to televised flu news, newsprint flu news is accurate, incomplete and partially balanced that lends to a mediocre news quality. Completeness is the most prominent determinant of higher flu news quality in the newsprint sector followed by the presence of comforting content or clarifications. The quality factors least associated with newsprint news quality are credibility and salience. Overall, newsprint and televised flu news are of a moderate quality.
VII. DISCUSSION AND CONCLUSION

7.1 Brief Summary of Research Findings

The easily accessible media news is a sought out and effective source of health information. Investigation of news quality is important to gain a better understanding of the trend of public health communications, especially in areas like flu vaccination, which is below 50% in the United States. The findings from this research show that the quality of televised (73%) flu news is slightly higher than the quality of newsprint (71%) flu news presented during October 2008 through May 2010 as investigated through the first research hypothesis. Common quality factors associated with moderate to high news quality of either news medium are information completeness and balance of multiple media frames. The most prominent quality factor associated with maximum news quality level is completeness as defined by more than four HBM categories in a news story while the least prominent factors are credibility and salience.

Other research hypotheses addressed news quality during the initial pandemic crisis, or associations with credible informants or media delivery. The quality of flu news at the beginning of the H1N1 pandemic in April 2009 was low and took two months to ramp up to an improved quality level. From the newsprint news with a full data set over the 20 month study period, it is more obvious that news quality was greater in the initial or early portion of the fall/winter flu season. Regarding credible informants, the
frequency of consultation varied between the two media sources. On the one hand, the news quality is equivalent in the televised flu news, when reporters consulted solely government or solely medical informant sources. Although the government was heavily consulted by the newsprint sector, the associated flu news quality was slightly lower when government sources were solely consulted compared to the fewer news stories linked solely to medical informants. Of note, news quality in the televised set was lowest if reported solely by news anchors without any co-presentation by internal medical experts or external consultations. As funds might increase or be redirected during a flu season or epidemic, the news venues should consult with credible or other (non-government, non-medical) sources to enhance the news quality. Finally, the quality of flu news does not appear to be affected by morning or evening television news delivery, or in the newsprint sector if delivered from elite versus other major U.S. newspaper sources. However, newspaper organizations from the east coast delivered slightly higher quality flu news compared to other regional newspaper sources. Although the flu news quality is consistent between the two media sources and specific delivery formats, the quality greatly varies over time even within a six month seasonal timeframe. Indeed, there is ample opportunity for communicators to apply a higher standard to enhance and maintain information quality above a moderate level.
7.2 Public Health Information Modifications: Communication and Policy Implications

The strengths of this research design are the robust approaches to assess information completeness and overall news quality. Based on a review of the literature, info completeness has often been assessed by content analysis of two to five informational markers indirectly or directly related to the HBM framework. In past CA studies, on a variety of health topics from biotechnology to HPV screening, the focus was primarily on the benefits and risks of the public health topic. The CA studies guided by the HBM framework have typically tended to focus on (at least) the four main HBM components of susceptibility, severity, benefits and barriers, which are inclusive of harms. The expansion to a panel of eight HBM categories in the research design contributes to the information completeness characterization of news quality. In order to study other news quality factors such as balance, and accuracy, one must lay out a plan to capture a broad panel of structured information to focus first on information completeness that lends itself to a stronger foundation on which to perform other quality assessments. Those prior studies which examined only two (HBM) parameters are not good examples to study balance or completeness. If one exams a broader content panel and multiple media frames, then one can make better observations about overall quality including whether news stories are complete and presenting a one sided or balanced format. Out of the eight HBM content components, the news media, regardless of source, tend to limit their flu stories to a maximum of four HBM components with a prominent focus on disease susceptibility and severity. The disease risk media frame (agenda) usurps media attention away from vaccine recommendations
and other prevention reminders. This sizable communications gap may in part affect public behavior and could be associated with mediocre flu vaccination rates across the country. Yet, a pronounced communications effort can have a positive effect. In 2009, a media and public service announcement campaign before the H1N1 vaccine was manufactured, lead to one of the largest seasonal vaccination rates among our healthcare workers, who were one of three priority groups for the delayed monovalent H1N1 vaccine. Unfortunately, the group who was at the highest risk of hospitalization from a 2009 H1N1 flu infection, pregnant women, still questioned the safety of the flu vaccine despite the historical safety in (500,000 annually flu vaccinated) pregnant women and millions of other flu vaccinees. Therefore, a fuller info package containing safety, eligibility and alleviatory content is needed to get across a clearer message to the public.

Critical thinking beyond a quantitative content analysis can aid policymakers. For instance, as an alternate to cookie-cutter (raw) versions of populations who are susceptible to flu and in greatest need of an annual flu vaccine, it would behoove public health and medical communicators to provide some (repeated) explanation behind those standard claims. For example, broader understanding and data interpretations—that the flu vaccine protects the mother and baby and prevents hospitalizations, and pregnancy limits the lung capacity of the mother during the second and third trimester or lowers the immune response putting her at a disadvantage to ward off a flu infection—may bring more awareness to vaccine safety and benefits versus flu infection complications. This again shows that specific populations need to be better educated on specific health issues, and targeted news messages can be a vehicle to transport flu news information
for specific and general understanding about disease and prevention. Despite the volume of flu news during outbreaks and flu seasons and that the news stories have variety, some repetition of facts should be encouraged as we tend to be forgetful or slow to be persuaded as to what is in our best community health interests. Targeted messages are likely to be better recalled and represent the types of news stories that your mother may clip out of the newspaper. Such explanatory styles also apply to the cookie-cutter messages merely stating that the elderly suffer from severe flu complications or are at high risk. While the elderly receive a higher dose vaccine and are the most flu vaccine-compliant population, they may not be optimally protected as our immune response wanes with age and co-morbidities. It could be helpful for the media to provide communication reminders about this population’s susceptibility, and our role in protecting them through our own immunization; that is, caregivers, visitors and grandchildren play a role in disease transmission and therefore have a responsibility of being immunized against flu. Thus, the media could help the community in comprehending their role in vaccination to protect those who are unhealthy, or ineligible for a flu vaccine. Being that some of the chronically ill with lung, heart or neuromuscular conditions or diabetes may not be vaccinated or not fully protected, it is our communal responsibility to partake in and set examples of flu vaccine acceptance. Just as important, health authorities could stand to reassess how they group vaccine eligible or priority populations by health and/or age status since high risk, chronic diseases do not discriminate by age.

While the media tend to pay attention to rates of disease incidence, by typically mentioning severity in terms of disease incidence rates across a state or the country,
they occasionally tied in conversation of susceptibility plus severity by mention of the number or rate of a high risk population that was hospitalized or succumbed to flu and/or secondary infections; this disease risk combination message may be more targeted and educational as opposed to the broader or general incidence reports that the public might be overexposed to and/or ignore. To combat some of the raw messages on numerical incidence rates, perhaps public health communicators could discuss infection, hospitalization, or death rates in more meaningful terms of the average annual incidence for a specific locale and/or the nation as levels approach 25%, 50%, or 75%, or exceed 100%. These new language applications could bring about more public alertness before a disease outbreak approaches a health emergency.

Earlier alertness and actions to protect family members may reduce the severity of future epidemics. Likewise, a competitive angle in the media focused on vaccination rates among school districts or local communities might entice more persons through social pressure or responsibility to comply with vaccination. This could supplement the media reports of vaccination rates among flu vaccine-eligible populations.

Additionally, addressing the HBM gaps in news communications could convince more of the public about flu vaccine safety and benefits. The unique design of this study to separate mild from severe adverse events is to encourage public health communicators to mention how rare are any severe neurological conditions from the vaccine compared to natural bacterial and viral infections, and how mild are any discomfort reactions from the vaccine. The benefits of the flu vaccine greatly outweigh the risks. In relatable terms, the vaccine can protect us from the inconvenience of being bedridden and possibly losing wages for a week or more in an event of a non-severe
infection. The media seldom seems to mention that it takes two weeks to be protected post-vaccination or that exposure to ill or asymptomatic carriers occurs one to two days before flu symptoms appear, thus reinforcing that the shot doesn’t cause flu! Since the virus in the vaccine is inactivated or weakened, communicators need to understand some of the technology basics to relay the facts to the public and do a more superior job of dispelling myths that deter from vaccination compliance. The novel category, concern clarifications and comfort concepts, in this research design proved to be a valid HBM-like component that is present in media communications and seems to strongly contribute to news quality; should this concept take off in future media and other public health communications, we could see a better educated society in which persons are more willing to accept vaccines that prevent or reduce the severity and spread of disease(s).

Lastly, despite the overabundance of disease severity information, the public during the 2009 pandemic still considered holding flu, or pox-like, parties to purposefully expose their children, thinking that the 2009 flu epidemic was mild. Improved medical communications should remind the public that exposure to the chickenpox in childhood means that in later adult years, one can suffer from the neurological pain of shingles. Similarly, flu is unpredictable in how widespread it occurs or severe it affects healthy and chronically ill persons as 2009 hospitalization rates were actually higher than typically seasonal incidence rates; we know that on average 200,000 persons are hospitalized annually. Do we need more dramatized stories of persons on ventilators or in the intensive care for months to consider not taking unnecessary risks of self-exposure or vaccination hesitancy? Or, it may be more respectful for the media to not
discuss disease exposure parties since varicella (chickenpox) vaccination rates are over 90% for the two doses. While childhood vaccines are being more mandated for kindergarten and elementary school aged children as well as college students, a focus on vaccinated populations over unvaccinated populations may be more sensitive and not encourage unorthodox behavior in local communities. If discussed more judiciously, then more of us might be on the same page and act with more community health responsibility.

7.3 Future Media and Research Directions

The HBM framework under a robust structure similar to this research design can be used to guide and maintain a higher standard in analyzing information whether educational or from mass media. After all, the codebook provides a gold standard that can be applied across multiple disciplines. This study clearly identifies that the media need to greatly expand beyond the average content of three HBM components in a single flu news story. Instead of using space and time to discuss cookie-cutter type populations susceptible to disease, the media could instead focus on specific populations, and discuss safety and benefits so that the general public can understand in a new light. Key HBM components should perhaps include discussion of the vaccine (prevention or primary health recommendation), the benefits, mildness of harms, myth busting clarifications or other comfort concepts and a disease risk update whether about susceptibility or severity; Prati et al. concluded in their trust oriented study with a similar sentiment. Additional message variations can remind the public about the primary
(recommendation) accompanied by alternative prevention measures and a mixture of other HBM components including “present day” barriers such as vaccine shortages when relevant. Although exaggerations did not markedly detract from news quality in this study, nor diminish public trust in the media or compliance according to a study by Prati et al., there is no need for the media to persist in using valuable media space to discuss antiquated mishaps or unproven vaccine rumors. If the media sees clearly their role in serving the public and as an advocate for health promotion programs, they need to not senselessly undermine their efforts in the communications process.

Most of the breath of this HBM model can be applied to emerging diseases for which we don’t yet have protective vaccines or sufficient treatments, but we are knowledgeable about precautionary measures. For example, in 2015, when the first cases of Ebola hit America, the news heavily focused on disease severity (case numbers) and susceptibility or transmission with added mention of the shortfall of proper medical facilities, supplies, and protocols. Since safety is always a concern and to squelch panic is a priority, the novel HBM component of concern clarifications and comfort concepts can come into play in these situations. Since Ebola is transmitted through contact with contaminated blood and other bodily fluids (of the living and deceased), the media didn’t need to hype that passengers on a plane with a suspected, yet asymptomatic victim could be at risk. The medical community needs to be available to educate the public health communicators at the forefront. Besides these three HBM components, in a situation of an emerging outbreak, communicators did and could mention alternative precautions such as social distance (quarantines) and donning of protective equipment such as gloves, masks or gowns as necessary. In this case, precautionary measures
tend to surpass prevention or treatment discussions. However, in coming full circle back to flu, if the media or other health educators are discussing precautions, they need to balance that discussion with content about the primary means of prevention such as the flu vaccine, even if in early manufacturing stages; by presenting a balanced disease prevention approaches frame, the public should be better able to grasp that the vaccine is the best means of protection, whereas handwashing and other hygiene techniques are the second best means of protection. Unfortunately, when the 2009 H1N1 flu came about and we didn’t have a specific flu strain vaccine, the (especially television) media tended to drop discussion of the vaccine and sometimes referred to precautions as the best means of protection; this type of lax communication can unfortunately lead to some confusion or undermining of mass vaccination programs. When the vaccine supply became more ample and the second wave of the flu epidemic was waning, the U.S. vaccination rates for the new H1N1 vaccine ended up below 30%; possibly low vaccination rates, in southern states, may have been associated with a disease uptick in December 2009. There are so many ways to bring up the flu vaccine topic, as laid out in this research design. So, when an early (flu) crisis situation occurs, the media need to be more persistent in mentioning vaccine development or distribution plans or other flu vaccine discussions in conjunction with precautionary methods discussions, so that the public is aware of the prevention priorities and does not excuse one for the other. The newspaper venue is a better model for more vaccine content compared to the televised flu news based on the October 2008-May 2010 flu news. One lesson that the U.S. government authorities did learn from the 2009 scenario is to not overpromise vaccine delivery, since it takes a minimum of six months to develop and test, and we
were overly reliant on international manufacturers at the time. In a scenario of an emerging disease where we don’t have a vaccine, there are at least four important HBM parameters that the media can discuss (susceptibility, severity, clarifications, and precautions). Thus, on an annual basis, flu discussions, which can cover up to eight or nine HBM categories, should mention more than an average of three HBM related components to educate and remind the public about safety and community health.

If the media were to start employing more of the eight HBM components as in this research model, then future CA scholars could evaluate for improved effects on news quality. Likewise, social scientists and psychologists might apply a more expansive or variable HBM panel in interventional, behavioral studies to determine effects on compliance. Given that there are multiple HBM factors and sources of public information and influence, the HBM factors may need to be studied in bulk variations. For example, it might be interesting to study behavioral effects after exposure to messages on prevention recommendations in conjunction with content on disease risks and prevention benefits, mild harms and clarifications in the presence and absence of content on barriers and/or alternative measures.

### 7.4 Limits and Lessons

This as well as other CA studies have limitations. The focus of eligible news transcripts in this study is on prevention and general flu news. Findings might be different in stories focused on antiviral treatment, which are few. Inclusion of irrelevant studies on sick athletes would skew the evaluation outcomes of this study. While data
coding was performed by a single coder for consistency, validation studies of news within the same and other timeframes are needed to support future directions of these robust analyses. In principle, the codebook instrument can be applied to multiple diseases and other recommended measures relevant to treatment or diagnostic screening. On the same token, the methodology of the news quality scoring system needs to be validated as no other studies are this expansive and transparent. The methods section in this research design is straightforward in describing the quality range variables for accuracy versus misstatements, balance and completeness. If different score weights were to be applied, then the overall quality could possibly be found to be lower or higher.

This first quality expansive attempt is on par with expectations after pilot reads of news stories and the published literature especially the quality of online health news. If the media is further convinced that CA studies and scholars support their evaluations of suboptimal news quality, then perhaps the gatekeepers might become more open to ways of improving health communications. In all, the main quality features of information completeness and balance are important to persuade the public, and the additional persuasiveness factors of accuracy, clarifying concepts that address health facts as divergent from fiction, and credible informants can add to that persuasion. While news salience did not contribute as much as the other quality factors, news holes can be filled with flu info and updates during the early and peak season and also during an unusual outbreak, but hopefully not at the initial sacrifice of news quality especially since we may now have an improved guidance model based on this research. Gatekeepers need not forget that there are constantly new high risk populations for the
flu vaccine based on lifestyle changes (school, jobs, aging) as we evolve into our golden years and that the potential variety of flu news is newsworthy. Accordingly, an increase in the prominence of the flu topic on the media agenda accompanied by a broad span of salient disease and prevention issues can enhance public awareness. In conclusion, prevention messages and the like should focus on the recommended measure (vaccine in this case) and a safety core or frame centered on benefits, the mildness of harms, and reassurance through concern clarifications and comfort concepts as applicable. Such adjustments in public health communications may lead to higher news quality and importantly, greater understanding and cooperation that could alleviate some of the common excuses or concerns associated with poor or mediocre compliance rates.
APPENDIX A

APPENDIX A. Codebook Phrasing Instrument

GUIDEBOOK OF HBM AND FRAMING ELEMENTS

Disease susceptibility (risks) terms (contagious, populations):

Spread: easily spread/transmitted, (highly or very) contagious, get ill /infected, susceptible/ vulnerable, seasonal, airborne/ droplets, person to person;

Age-risk populations: young child/ infant/ <5 years old), 6 month to 24 year old, elder/ >65 years old, adolescent/ teen, everyone should get vaccine;

High risk populations: pregnant, chronic medical condition;

Person to person (P2P) family/ close contact(s): child/ kid, sibling, parent/ caregiver, teammate/ athlete, scout, teacher/ principle;

Person to person (P2P) medical contact(s): health care provider (HCP)/ doctor/ nurse;

Crowd/Social exposure (locale): school/ college, day care, camp, military, ER/doctor office, plane/ train/ bus (mentioned as example or actual disease case).
Note: international element(s) noted if U.S. flu news story.

Note: example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.

Disease severity (risks) terms (outbreak, cases):

*Incidence*: number of cases, hospitalizations and/or deaths (#),

dangerous/deadly;

*Increasing or emerging disease*: outbreak, epidemic/ pandemic, on rise/

increase;

*Breadth*: widespread, multi-state (multiple states mentioned), nationwide, public health or national emergency;

*Severe symptoms*: pneumonia, high fever, intensive care unit (ICU);

*Extreme measures*: close/ shutdown, sanitize, cancel /postpone (somewhat temporary or reversible; non-quarantine).

Note: international element(s) noted if U.S. flu news story.

Note: example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.
**Vaccine benefits terms** (effective, safety framing):

*Vaccine effective:* percent (%) effectiveness;

*Vaccine beneficial:* prevents disease/ minimizes spread, protects/protective (provides immunity[^26]), saves lives (fewer hospitalization or deaths, lowers severity of illness);

*Vaccine safe:* history/evidence of safety, many (millions of) doses administered, vaccines used for years/decades.

*Note:* example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.

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**Vaccine harm mildness terms** (aches, safety framing):

*Mild vaccine side effects:* sore arm/ headache, mild fever, brief cold-like illness;

*Rarity of severe adverse events (SAE):* rarely Guillain-Barré syndrome (GBS; one to two events in one million administered shots, may or may not be causal).

*Note:* example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.

[^26]: Potential long term (decades of) protection as older adults vaccinated against the 1918 H1N1 flu were cross-protected against the 2009 pandemic H1N1 flu.
Barrier terms (deterrence: unwarranted or real fear/concerns or poor facts):

Historical repetition: unknown cause of autism, media perpetuation of 1976 GBS incident;

Fear: mercury in thimerosal preservative;

Concern/hesitant: belief (false) that unsafe for baby in utero;

Myth perpetuated: belief (false) that will get flu (disease) from shot;

Wrongly skeptical: rushed vaccine development, insufficient safety testing;

Concern/reluctant: dislike side effects/discomfort;

Bad advice/ poor awareness of disease severity: doctor not recommend;

Low confidence/ question imperfect protection: not fully (<90%) protected;

Shortage or recall: difficult to find vaccine, bad batch of vaccine;

Moderate “vaccine-specific” harms or severe adverse events (SAE) occurrence:

allergic reaction, Guillain-Barré syndrome (GBS event; flu vaccine or natural infection cause), febrile seizure (co-administered Flu + pneumonia (PCV13) vaccines).

Note: example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.
Concern clarifications or comfort concepts (persuasive, factual-like) terms:

Myth (Autism rumor) debunked: no scientific evidence of (autism/other specified) harm, none of vaccines linked to autism, fraudulent\(^{27}\) claim, Dr. Wakefield lost medical license (2010);

Formulation options: Free of or low mercury content (Hg preservative removed in some formulations), no scientific evidence of harm from Hg;

Added opportunity to receive vaccine: not too late, flu shot after December;

Protection of unvaccinated baby: maternal antibodies from vaccination protect unborn/newborn;

Concern (harm) downgrade/mitigation: the best protection (and/or better than no prevention), benefits outweigh risks (seldom extreme vaccine reactions), purer, improved vaccine formulation;

Fact (non-causal): cannot get flu from shot (formulations either inactivated, cold temperature adapted, or no virus); protection not effective until build up immune (antibody) response (~2weeks);

Calm: don’t panic, not be alarmed (national emergency or pandemic announcement(s)).

Note: example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.

\(^{27}\) Dr. Wakefield, a British gastroenterologist, was the controversial leader in the (falsely claimed) autism link to the MMR vaccine. His original studies were found to be fraudulent that resulted in his 1998 publication being retracted and medical license revoked in 2010 (12 years later).
**Vaccine /Vaccination** (development, administration, seeking):

*Vaccine recommendation:* get/got vaccine/vaccinated, looking for, immunized, vaccination rate(s);

*Vaccine production:* undergoing development;

*Doses:* distributed, administered.

*Note:* example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.

**Prevention alternatives** (handwashing, distance):

*Standard precautions:* wash hands, don’t touch face/eyes, fist/elbow bump, wear mask, cover cough/sneeze, clean with disinfectant;

*Isolation:* stay/keep home with fever, quarantine, social distance;

*Travel precautions:* advisories, screening at U.S. airport/border.

*Note:* international element(s) noted if U.S. flu news story.

*Note:* example terminologies; a minimum of one reflective message will count towards one HBM element/parameter in a news message.
The dichotomous scoring scale for individual elements will be one (1) or null (0) to reflect a subtopic that is discussed or not discussed respectively. In high level analyses at the HBM category level, each of the eight HBM categories in a single news story having at least one represented element will receive a compressed score of one (1).

*Note of non-overlapping examples:* News messages must be read manually to clarify meaning of message, e.g., to differentiate between: a) getting sick from contact, versus actual soreness/achiness after vaccine, versus fear of getting flu illness from vaccine or anticipation of pain (which are representative of susceptibility, versus harm, or barrier respectively), b) extreme (severe) disease incidence versus lessened severity (which are representative of severity versus benefit respectively), c) benefits outweigh risks, versus general prevention benefit, or specific vaccine risk (which are representative of comfort concepts, versus vaccine benefit, or harm or barrier respectively), and d) uncertainty of benefit, versus effectiveness, or the best protection (which are representative of barrier, versus benefit, or clarifying concepts respectively).
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BIOGRAPHY

Patricia Kehn graduated from Herndon High School, Herndon, Virginia, in 1979. She received her Bachelor of Science with a major in Animal Science and minor in Biology from Virginia Polytechnic Institute and State University in 1983. She began her Master's studies while working at Hazleton Laboratories and earned her Master of Science in Biology with a concentration in Immunology from American University in 1990 on work performed in the Laboratory of Immunology at the National Institute of Allergy and Infectious Diseases. Patricia has been a very dedicated employee of the National Institutes of Health since 1987 and transitioned to Programmatic responsibilities in the Transplantation Branch in 1999. Being in an environment of scientific intellectuals, Patricia aspired to receive her terminal degree. She also aspires to continue to help others and welcomes new adventures.