

Stop the Cough: A Content Analysis of Knowledge, Fear Appeals, and Efficacy in Pertussis PSAs

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Abstract

Pertussis, also known as whooping cough, is on the rise in the United States. Although pertussis is one of the easiest diseases to prevent, many are unaware of the disease, symptoms, who can contract pertussis, and long-term health effects. Relying on the Extended Parallel Process Model, this study reports a content analysis of 50 public service announcements for pertussis awareness and vaccination. A majority of PSAs do not define what pertussis is, but mention some form of prevention. A majority also reinforce efficacy by emphasizing the emotional and physical security associated with prevention. Finally, although fear appeals were used in a majority of PSAs, the results indicate that guilt for infecting children or guilt from not protecting children is a primary emotional appeal.

Key Words: Health Campaigns, Health Communication, Public Service Announcements, Vaccination, Whooping Cough

Introduction

Pertussis, also known as whooping cough, is on the rise in the United States. Pertussis is a bacterial infection which causes inflammation in the lungs, resulting in difficulty breathing and the “whoop” sound of the cough (Cherry, 2005). According to the Centers for Disease Control and Prevention (CDC), the United States is currently experiencing its most severe outbreak in 50 years (CDC, 2012). Pertussis infection can occur at any age; however, infants under one year are the most susceptible because of underdeveloped immune systems and incomplete vaccination schedules. Additionally, adolescents and adults are increasingly not receiving their adult boosters, making them more likely to contract and spread pertussis. A variety of reasons may exist for why people do not vaccinate their children or receive a pertussis vaccine, including lack of knowledge about vaccination schedules and boosters, fear of autism, and lack of time, transportation, and money (Zimmerman et al., 1997). In addition, switching the pertussis vaccine from a whole cell vaccine (DTP) to an acellular vaccine (DTaP) in the 1990s may have contributed to waning community immunity (CDC, 2013). Pertussis is completely preventable with up-to-date immunizations. Communicating the importance of infant vaccinations and adult boosters to a variety of populations can play an important role in decision making about vaccinations. The aim of this article is to

examine public communication about pertussis in order to determine what messages adults receive about pertussis vaccinations.

When a health risk, such as communicable diseases, manifests, a crisis exists. Public health messages, then, must not only make the public aware of the health risk, but also provide treatment options and promote preventative measures in order to contain the crisis and manage the health risk (Backer, Rogers, & Sopory, 1992; Noar et al., 2010). A common tool for communicating health messages to a variety of publics is the public service announcement (PSA). Via radio, television, or print, PSA messages specifically targeting certain emotions as a means of persuasion have proven effective for a variety of health issues (Noar, 2006). Vaccination PSA messages for a variety of health issues, including MMR, genital human papillomavirus (HPV), and flu (Abhyankar, O'Connor, & Lawton, 2008; Krieger & Sarge, 2013; Nan, 2012; Nan et al., 2012; Prati, Pietrantonio, & Zani, 2012), focus on individual responsibility and the negative consequences to an individual when he or she does not vaccinate. The current US pertussis outbreak has been attributed to a decline in herd immunity (Mascarelli, 2011). A group approach, herd immunity has not been a focus in health communication messaging. An understanding of pertussis campaign messages is needed in order to determine what information target audiences are

receiving. This understanding guided the following research questions:

RQ1: *What populations are targeted in pertussis public service announcements?*

RQ2: *How is pertussis defined in the public service announcements?*

RQ3: *What treatment options are recommended in the public service announcement?*

The Extended Parallel Process Model

Health communication practitioners often rely on fear and shock as ways to reinforce the dangers and consequences of risky behavior (Stephenson & Witte, 1998). Fear has been operationalized in many different ways including disgust, anxiety, concern and worry, and panic (Witte, 1992). A fear appeal must cause a high level of arousal in order to elicit behavior change. In order to evaluate the use and salience of fear appeals, scholars and campaign designers often rely on the Extended Parallel Process Model (EPPM). Different from other health behavior change models which simply include fear as a part of change, EPPM positions fear and danger as the central variable around which messages are constructed (Witte, 1992).

The EPPM is comprised of two main appraisals: threat and efficacy. The threat appraisal focuses on severity and susceptibility. Severity emphasizes the need for messaging to focus on personal threat; the greater the fear, the greater the threat, which leads to behavior change (Witte, 1992). A person also evaluates a fear appeal message for its perceived level of susceptibility to the presented threat; if an individual believes he or she is likely to experience or encounter the threat, the greater the susceptibility. If fear and threat are firmly established, then the message must make clear what can be done to reduce, prevent, or stop the threat. This is the basis of the efficacy appraisal (Witte, 1992). The message must show that individuals can take action (self-efficacy) and that the proposed action will lead to the desired outcome (response efficacy).

There is limited research exploring the potential of fear appeals to motivate increased vaccination rates for communicable diseases, such as pertussis. Smith (1997) examined general immunization materials for fear appeals. She found that although materials established general threat and response efficacy, there was extremely low self-efficacy, which she hypothesized might lead to more fear control reactions. Unfortunately, Smith's study did not identify specific illnesses associated with vaccinations, so it unclear if there were differences in immunization messages based on specific illnesses. Cameron et al. (2009) relied on the four EPPM

input variables to conduct focus groups in order better understand why elderly African Americans were less likely to receive influenza vaccines when compared to non-Hispanic White seniors. For these participants, threat, self-efficacy, and response efficacy were difficult to identify because of the differing views about the flu as a nuisance or a dangerous threat, the ease of seeking vaccinations, and the success of vaccines to prevent the flu. Although not specific to pertussis, these findings do shed light on the difficulty of crafting fear messages for preventable or "easy" diseases.

Pertussis campaign messages, then, are presented with a unique challenge in that they must address several issues. First, the lack of knowledge about pertussis means that campaigns might need to establish threat messages which will evoke a danger control reaction. This makes EPPM an effective model to use in this analysis because fear needs to be cultivated and positioned as the central variable in campaigns. These messages also need to clearly establish efficacy and keep a balance between threat and efficacy. Relying on EPPM, the following research questions guided the study:

RQ4: *How are fear appeal elements (threat, severity, and susceptibility) communicated in pertussis public service announcements?*

RQ5: *What efficacy messages are used in the public service announcements?*

RQ5a: *How do the public service announcements reinforce efficacy?*

RQ6: *Are other emotional appeals used in pertussis public service announcements?*

RQ7: *Do relationships exist between fear appeals (threat, severity, susceptibility) and other emotional appeals?*

Method

Sampling Selection

National and local PSAs, available online, were selected for content analysis using online search engines and public health department homepages. A total of 50 PSAs met the study criteria and were coded. To be included the following criteria were applied: First, the text had to be labeled or identified as a public service announcement/advertisement. Second, it had to specifically address pertussis as at least one element of the PSA. Websites, private videos, and other online materials that discussed pertussis but were not identified as PSA were not included in the analysis.

Print, audio, and video PSAs were included to allow for a broader view and analysis of pertussis prevention materials as well as provide specific elements

unique to each type of PSA (e.g., whooping cough sounds for audio and video; detailed descriptions for print). In the final sample, 16 print (32%), five audio (10%), and 29 video (58%) PSAs were included, ranging in origin from materials retrieved from national and local governmental agencies (e.g., CDC, Indian Health Services, California Department of Public Health) to nonprofit organizations (e.g., PKids.org, March of Dimes).

Codebook and Measurement

The codebook was adopted and revised from Ryan et al. (2012), who used EPPM variables to content analyze children's emergency preparedness websites. For this study, each individual PSA was the unit of analysis. On the coding sheet, coders were first asked to identify the type of PSA (print, video, audio), and the perceived target audience (children, parents, mothers, fathers, or other adults). Second, the coders were asked to identify content of the PSAs. Content categories included people (e.g., mother, father, spokesperson, baby/child, healthcare provider, unidentified speaker), sounds (e.g., whooping cough), visuals (e.g., shots, text, cartoons), scene (e.g., home, doctor's office), story/informational, ethnicity, age, and income.

Next, specific categories were used to measure pertussis prevention and EPPM related categories. Pertussis prevention categories included coding for the presence of a definition of pertussis, the explanation of why pertussis should be prevented and specific steps that can be taken to prevent pertussis. The next section captured the consequences of a lack of prevention. The EPPM-framework codes captured the components of fear appeals, perceived threat, perceived susceptibility, perceived severity and efficacy. The number of fear appeals in each PSA was counted and the format in which they were expressed (e.g., in the verbiage or in a photo). Similarly, the use of severity and susceptibility messages was coded, along with how these messages were presented (e.g., in descriptive words, personal stories). Self-efficacy messages were divided into eight categories measuring the explicit promotion of efficacy and ten items measuring the reinforcement of efficacy.

The last section of the codebook emerged during the first round of coding and was added to capture if information seeking behaviors were encouraged, if there were any tools provided to children to overcome parental apathy, and if there were any emotional or psychological impacts mentioned connected to contracting pertussis (e.g., feeling bad for children, feeling guilt for having passed the illness on to a child, feeling good about getting vaccinated).

Reliability Analysis

The codebook was adapted from a prior research study in which "moderate agreement" had been reached among coders (Neuendorf, 2002). The researchers acted as coders for this study. Both researchers are knowledgeable about health prevention campaign and risk communication literature. Intercoder reliability was calculated using SPSS's Cohen's Kappa (κ) calculations. This reliability measure accounts for chance agreements and is considered an appropriate measure (Lombard, Snyder-Duch, & Bracken, 2002).

Studies with intercoder reliability of .70 or higher are viewed as acceptable (Lombard et al., 2002). In a first wave, 10% of the PSAs ($n=5$) were coded by both coders individually, yielding Cohen Kappa scores ranging from .77-.90. All coding disagreements were discussed and the codebook refined to eliminate discrepancies. In a second wave, an additional 10% of the PSAs were coded ($n=6$) by each researcher individually, yielding an improved Cohen Kappa score of .95-.98. The remainder of the sample was divided randomly between both researchers and coded individually. To analyze the data and answer the research questions, frequencies and Chi-squares were computed using SPSS.

Results

The first research question focused on who is targeted in pertussis PSAs. A large majority of the PSAs ($n = 40$) target parents, while a small number of PSAs target children ($n = 6$) or any adults ($n = 4$). PSAs specifically targeting children focused on older children who would be in need of a booster shot. Other adults targeted were primarily grandparents. Half of the PSAs featured mothers ($n = 25$) and a majority of the print and video PSAs ($n = 31$) had Caucasian actors or spokespersons.

The second research question focused on how pertussis is defined and portrayed in the PSAs. A majority of the PSAs did not define pertussis ($n = 29$); however, 44 of the PSAs used the colloquial term whooping cough to define pertussis ("Pertussis, or whooping cough, is on the rise"). The PSAs primarily used a variety of coughing comparisons to define pertussis. Pertussis was defined as "more than a cough" ($n = 22$), a "severe cough" ($n = 21$), or a cough that makes a "whooping sound" ($n = 10$).

Although not specifically defined using disease terminology, pertussis was framed using threat-laden synonyms. A majority of the PSAs used health threat language to describe pertussis, associating it with dangerous threats to children's health ($n = 42$) and death ($n = 32$). A small minority of the PSAs ($n = 11$) stressed the unexpected nature of pertussis; however, because

pertussis is an illness which can be prevented, a majority of the PSAs did not frame pertussis as unexpected.

Finally, the PSAs frame pertussis in terms of how it can be contracted. Many of the PSAs ($n = 31$) identify pertussis as a communicable disease, using language that stressed the fact that people, primarily children, can “catch” or “contract” pertussis. Twenty-two PSAs mention that there are many ways to contract pertussis (such as coughing on someone, drinking from an infected person’s cup, etc.) while nine PSAs identify only one way for pertussis to be contracted (such as close contact with an infected individual).

The third research question sought to identify the treatment options discussed in the PSAs. Although pertussis was not medically defined (RQ1), 75 % of the PSAs did emphasize why pertussis prevention was important ($n = 37$). Prevention was emphasized through language encouraging parents to prevent children from getting sick or dying, to prevent the entire family from contracting pertussis, and even to prevent pertussis from spreading in the community. Most of the PSAs ($n = 48$) explained that pertussis could be prevented and 96 % of the PSAs identified the DTaP, Tdap, or “pertussis vaccine” as a treatment option ($n = 48$). Thirty-three PSAs recommended that parents talk to their doctors or visit a doctor’s office for treatment, seven recommended that healthy people should avoid contact with people with pertussis or that people with pertussis should quarantine themselves, and eight PSAs recommended another treatment option, such as washing hands frequently.

Moving beyond illness definition and treatment options, the fourth research question sought to analyze the presence and use of fear as a primary emotional appeal, which is consistent with other communication research on immunization messaging. 74 % ($n = 37$) of the PSA relied on messages that met the criteria for a fear appeal. Fear was communicated via language choice, audio, and images designed to induce fear. The sound of pertussis (the whooping cough) was often used in audio and video PSAs. Severity ($n = 45$) was emphasized slightly more than susceptibility ($n = 37$); however, both variables were communicated heavily via descriptive language choice. Statement using severity relied primarily on the emphasis on death (“we watched him die”, “feeling for those last beats of his heart”, “potentially deadly”), the violent nature of pertussis (“coughed so hard he turned blue”, “popping ribs”, “imagine a cough barreling through your infant’s body at up to 100 miles per hour”), the number of preventable cases (“over 8000 cases”, “hundreds hospitalized each year”), and the temporal nature of pertussis (“a very quick decline”, “imagine it continues for the rest of the day”, “little rest for weeks and even months”).

Susceptibility statements focus on lack of immunity (“not fully protected”, “my own immunity had worn off”, “almost everyone who is not immune will get sick if exposed”) and the contagious nature of pertussis (“very contagious”, “passed easily from person to person”, “easy to spread it”).

The fifth research question sought to identify how efficacy was used. In order to combat fear, PSAs need to encourage efficacy. Children ($n = 38$) and adults ($n = 33$) are encouraged to receive pertussis vaccines. Adult involvement is emphasized in 84 % of the PSAs ($n = 42$), with talking to physicians as one of primary actions ($n = 34$). A small number of PSAs ($n = 4$) recommended parents talk with schools about vaccinations. Although the PSAs identify specific recommendations for efficacy, the PSAs do not use arguments to encourage efficacy. Only 20 PSAs made the argument that the solution (vaccine) is easy to get and cost effective and only 16 PSAs emphasized the fact that the pertussis vaccine also treats other diseases (tetanus and diphtheria).

The PSAs also need to reinforce efficacy. This can be accomplished by making positive or negative arguments. Three positive arguments appeared in the PSAs to reinforce efficacy: stating positive outcomes of getting the pertussis vaccine ($n = 29$), emphasizing the emotional and psychological security and well-being that comes with prevention ($n = 36$), and identifying what parents need to do (talk to physicians, get the vaccine) ($n = 48$). A minority of PSAs also emphasized the positive impact prevention can have on the community ($n = 6$) and past stories of prevention ($n = 3$). Negative arguments appeared in a minority of the PSAs, with 32 % of the PSAs emphasizing what happens if pertussis is not prevented ($n = 16$) and 6 % reinforcing the random nature of pertussis ($n = 3$).

The sixth research question was interested in other emotional appeals that may have been used in the pertussis PSAs. Two other emotional appeals featured prominently in the PSAs: guilt and positive affect. The PSAs used guilt by using language and images designed to make adults feel bad for children ($n = 30$, 60 %), guilt for passing pertussis on to children ($n = 21$, 42 %), guilt for passing pertussis on to others ($n = 24$, 48 %), and guilt because infants cannot be vaccinated early ($n = 12$, 24 %). The PSAs also used positive affect, using language and images to make adults feel good about getting the vaccine ($n = 18$, 36%) and to make adults feel good about protecting self, family, and their community ($n = 29$, 58 %).

The final research question for this study was interested in what relationships exist between the major elements of EPPM (fear appeals, severity, susceptibility) and the emotional impact of vaccinating or not

vaccinating. Pearson Chi-square tests were calculated to determine if associations existed between EPPM elements and the psychological and emotional impact of contracting pertussis or vaccinating against pertussis. Susceptibility was the element of the EPPM which was the most significantly associated to the psychological and emotional impact of contracting pertussis. Susceptibility was significantly associated to feeling bad for children contracting pertussis, $\chi^2(1, N = 50) = 6.25, p < .05$, feeling guilty for passing on pertussis to children, $\chi^2(1, N = 50) = 12.72, p < .00$, feeling guilty about passing on pertussis to others, $\chi^2(1, N = 50) = 16.22, p < .00$, and feeling guilty that babies could not be vaccinated early against pertussis, $\chi^2(1, N = 50) = 5.55, p < .05$. Susceptibility was also significantly associated to feeling good about protecting self, family members, and/or society by getting the vaccination, $\chi^2(1, N = 50) = 5.35, p < .05$.

Significant associations were also found between the use of fear appeals and feeling bad for children contracting pertussis, $\chi^2(1, N = 50) = 14.57, p < .00$, fear appeals and feeling good about protecting self, family members, and/or society by getting the vaccination, $\chi^2(1, N = 50) = 5.35, p < .05$, and fear appeals and guilt about passing on pertussis to others, $\chi^2(1, N = 50) = 4.37, p < .05$. Severity was only significantly associated to feeling bad for children contracting pertussis, $\chi^2(1, N = 50) = 8.33, p < .00$. No other significant associations were observed.

Discussion

The purpose of this study was to identify the different elements of EPPM in pertussis PSAs. These PSAs primarily frame pertussis as a family health issue, reinforcing women as the primary caregivers responsible for ensuring the health of children. Additionally, the lack of definition of what pertussis is and why it needs to be prevented is surprising given the lack of general understanding of pertussis. Guilt and positive affect were identified as primary emotional appeals in the pertussis PSAs, with an emphasis on messaging that reinforces the responsibility associated with having children. Fear appeals were also heavily featured in radio and television PSAs using the “whooping” cough sound. Finally, susceptibility was the EPPM element featured most prominently in PSAs, with many PSAs focusing on how easy it is to contract pertussis if someone is not vaccinated.

One of the most interesting findings of this study was the lack of explanation of pertussis. Although some of the PSAs explain that pertussis is a communicable disease and most emphasized why pertussis prevention is important, the medical definition or symptoms of pertussis were consistently not

mentioned. The hallmark symptom of pertussis, the whooping cough sound, is often used a synonym for pertussis, but it is not the only symptom. In fact, if an individual develops the whooping cough, it is too late to treat pertussis with antibiotics (CDC, 2013). A recent pertussis study of 629 individuals found that over 90% of the participants reported not knowing what pertussis was (Heiss, Carmack, & Chadwick, 2015). It is difficult to establish a health risk and encourage efficacy if the general public does not know what the disease is. It is also difficult for audiences to evaluate the response efficacy of the message if they are not clear about the diagnosis.

Although there was a heavy emphasis on the health threat and emotional appeals in the PSAs, there was not a strong emphasis on efficacy messages. This may be because, like other infectious diseases such as measles, mumps, and rubella, there is really only one solution: vaccination. However, as an airborne communicable disease, there are more efficacy responses to prevent the contraction and spread of pertussis. Many PSAs simply encouraged parents to talk to their provider, never mentioning vaccination. In the case of pertussis, the burden of self-efficacy usually lies with the parents because infants and toddlers are not old enough to enact efficacious behaviors. It is possible that pertussis PSAs are more concerned with establishing a health risk than with efficacy. However, the de-emphasis on efficacy messages could lead to the decreased effectiveness of the overall campaign messages.

The PSAs analyzed in this study featured a high prevalence of guilt appeals. This may mean that fear is not the appropriate negative emotion to promote infant and child vaccination uptake. For example, Botta et al. (2008) found that disgust could replace fear as a motivating emotional appeal. Although fear appeals have been the primary emotion used to establish threat (Witte, 1992), EPPM might better be extended to be a model of negatively valenced emotions and persuasion, rather than just fear and persuasion (Popova, 2012). Other scholars have also found guilt to be an effective emotional motivator and substitute for fear in EPPM when studying donation decision-making (Basil, Ridgway, & Basil, 2008). Those authors argued that empathy and self-efficacy emerge as antecedents for guilt-induced behavior change. The findings of the current study support Basil et al.’s argument. For pertussis, the potential guilt associated with not protecting their children could be more effective than the fear of the actual whooping cough sound in getting parents to vaccinate their children.

Limitations and Directions for Future Studies

There are several opportunities to examine different pertussis messages. First, the sample for this content analysis was relatively small and limited to only include PSAs in traditional PSA formats, excluding other materials, such as interactive websites. Moreover, the investigators only included official PSAs from national, state, or local healthcare organizations. Future researchers need to explore other campaign materials, including grassroots organizational materials, in order to create a holistic picture of pertussis campaigns. Additionally, researchers need to move beyond studying traditional media formats and examine the impact of PSAs communicated on social media platforms.

Second, this analysis focused on EPPM as the theoretical framework for coding. This limited what was coded and the scope of the conclusions. Given that the results of this study indicate that other emotions are the primary affective cues used in pertussis PSAs, future researchers could examine the role of other emotions in

creating health behavior changes. The types of effective efficacy messages might change given the emotional stimulus used in messages. Communication researchers should continue to examine effective efficacy messages and their connection to different negative emotions.

Third, the content analysis method limits us from moving beyond dichotomous coding and analysis. This is a common limitation associated with content analyses (Silk, Parrott, & Dillow, 2003). Researchers should examine pertussis messages from other methodological approaches, such as focus groups, experimental designs, and mixed methods to develop a more complete picture of pertussis messaging. More health communication research is needed specifically examining how different audiences communicate about pertussis outbreak and vaccinations in order to reduce the potential crisis impact.

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