"To each his own": Discussions of vaccine decision-making in top parenting blogs

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ABSTRACT
Although social media provides a way for people to congregate with like-minded others, it can also play a role in spreading misinformation about public health interventions. Previous research demonstrates that parents who use the Internet to gather information on vaccination are more likely to hold anti-vaccination beliefs. There has been little examination of vaccination decision-making discussions on parenting blogs. This study seeks to fill that gap. Posts and comments on the top 25 top parenting blogs were analyzed using a mixed-method approach. Comments were analyzed using deductive coding scheme that examined whether content areas of interest were present or absent in vaccination discussions. Posts were coded inductively using a thematic analysis. Posts and comments were further coded as strongly vaccine-discouraging, vaccine-ambivalent, or strongly vaccine-encouraging. Finally, posts were grouped by year of publication and comments were analyzed within each group to examine the evolution of vaccination decision-making discussions in the parenting blogosphere over the past decade. Fifty-two percent of posts were categorized as strongly vaccine-discouraging and were most commonly associated with expressions of individual liberty. Comments were nearly 3 times as likely to strongly discourage vaccination than to strongly encourage it. Comments on the oldest posts (2006–2009), were more likely to strongly discourage vaccination (p = 0.008), whereas comments on newer posts (2013–2015), were more likely to strongly encourage vaccination (p = 0.003). These findings suggest there is a need for public health professionals to understand the concerns being expressed in these forums, and develop innovative ways to dispel anti-vaccination myths, as these views may create obstacles in the meeting the goals of the public health agenda.

Introduction
Historically speaking, some of the greatest achievements in public health are associated with successful vaccine development. As such, eradication of smallpox has been achieved, and we are nearing eradication of other infectious diseases. Vaccines are a cost-effective method of preventing childhood diseases. However, like other medical interventions, vaccines are not devoid of risk. Repercussions from vaccinations range from allergic reactions to life threatening complications. Surveillance programs have been established to monitor adverse reactions to vaccines and although reactions to vaccines are not common, when they do occur, they often gain public attention and heighten concern among the public, and of parents in particular. Over the past several decades, fear has shifted from contracting infectious diseases to vaccine reactions in industrialized countries.

Parents play an integral role in maintaining the immunization schedule of their children. Concerns regarding the number of vaccinations and the potential to inundate the child’s immune system may lead parents to believe that a non-standard schedule is safer because the vaccines will be spread out over a longer period of time. In concert, parents may be concerned about the composition of the vaccines including antigens, adjuvants, aluminum, or Thimerosal. Parents may additionally fear that the composition of the vaccines are the causative agent for conditions ranging from autism to idiopathic illness. Based on such concerns, parents may try to determine if their child’s risk of exposure to specific diseases outweighs the risk believed to be associated with vaccination. In understanding how parents negotiate fears, weigh risks and benefits, and ultimately make choices around vaccination, sources of information become an important factor to consider.

In the digital era, the Internet impacts parents’ vaccination choices for their children. Individuals who use the Internet are more likely to hold beliefs about vaccinations that are not supported by scientific research. Internet users are also more likely to believe that healthy children do not need to be vaccinated and vaccines do more harm than good. A study conducted by Davies et al. (2002) involved searching “vaccination” in 7 search engines with 43% of the hits yielding an anti-vaccination site. Moreover, 100% of the first 10 hits on Google were anti-vaccination. Notably, Google searches for information about possible
vaccine-related side-effects have increased over time. In Bronson’s (2013) survey of 196 parents’ vaccination views and practices, 70 parents stated they did not follow the recommended vaccination schedule. Furthermore, these 70 parents had a high percentage (72%) of individuals in their social networks who advised not conforming to the recommended vaccination schedule. Only 13% of members on conformers’ social networks recommended not conforming.

Online media platforms such as blogs, YouTube, Twitter, and Facebook transcend across geographical boundaries allowing people to communicate with individuals they once never had access to. Although social media provides a way for people with like-minded beliefs to congregate leading to them feeling empowered, it can also play a role in spreading misinformation. Social media can serve as a platform for individuals to undermine medical advances, such as the value of vaccines. Wilson & Keelan (2013) found that people with anti-vaccination attitudes using social media prefer to connect with those who take similar stances and are not interested in hearing views that counter their own. In fact, hearing alternate viewpoints lead to greater intensification of opposition.

Given the ability of Internet users to disseminate information and opinions to wide audiences, it is important that healthcare professionals understand the current online content related to vaccinations. Centers for Disease Control and Prevention (CDC) uses a variety of social media sites, including Facebook, LinkedIn, and Twitter, to provide information seekers with scientifically based health information. The CDC attempts to be where the conversation is happening in attempt to prevent the spread of misinformation. The use of blogs is a popular method for engaging in conversations and disseminating information on vaccines. They thus need to be monitored to understand current sentiments regarding vaccination and respond to criticism. Nevertheless, to date, there is a paucity of research analyzing the content of parenting blogs for vaccination content. In particular, given the option on many blogs for readers to leave comments, it is necessary to analyze the conversations that follow. The purpose of this study is thus to fill that gap by describing content related to vaccination on the most popular parenting blogs. We sought to understand, using both quantitative and qualitative methods, what evidence and attitudes are used on blog posts and the corresponding discussions that ensue in the comments sections, and second, whether or not discussions of vaccination on parenting blogs had changed over the past decade.

Methods

To analyze discussions of vaccination decision-making among parents, the 25 most popular parenting blogs were identified using the Blogmetrics website, which rates blogs by content area and popularity. Specifically, blogs were chosen using Blogmetrics’ “Ultimate Ranking” system, which classifies blogs according to cumulative results of 6 different individual ranking systems: Feedburner RSS membership; unique monthly visitors; Google indexed pages; the number of incoming links via Bing; Google PR, and Alexa rank. The blogs included in this study were ranked most popular as of 7/19/2016.

To be included in the data set, blogs needed to meet the following criteria: have searchable content; allow comments, and have articles on vaccines or vaccination for humans. Inclusion criteria for articles consisted of the following: articles must have been published within the last 10 years; articles must include discussion of vaccines/vaccination for humans; articles must have comments; comments must have discussed vaccines/vaccination for humans. If the article only mentioned but didn’t discuss vaccines/vaccination and it wasn’t discussed in the comments, it was rejected. Based on these criteria, 14 blogs, 46 blog articles, and 697 comments were included in the final data set (Table 1).

Articles and comments were analyzed using a mixed-method approach. Article comments were first analyzed with a deductive coding scheme that examined whether or not the following were present or absent in discussions of vaccinating children: evidence from medical/animal studies to support views; autism causality; signs/symptoms of adverse reaction to vaccination; Thimerosal or Mercury in vaccines; SIDS/Guillain Barre Syndrome/Medical condition other than autism as related to vaccination; overloading the immune system with too many vaccines at once; deviating from recommended vaccination schedule; risk of adverse reaction is less than risk of illness; herd immunity; dosage for infants vs. adults; VAERS or vaccine count; mandates for school entry; risks not fully understood or disclosed; condescending attitudes of doctors when refusing vaccines; trusting doctors’ opinions and recommendations toward vaccines; motivations of pharmaceutical industry; distrust of government; entanglement of government and industry, and natural remedies to boost immunity. Blogs and comments were further categorized as strongly vaccine-encouraging, vaccine-ambivalent, or strongly vaccine-discouraging as well as strongly encouraging, ambivalent about, or strongly discouraging the use of natural remedies to boost immunity. This coding scheme was adapted from one used in a previous study by Basch et al. (2017), which examined discussions of vaccination in YouTube videos. Due to limited frequency counts, blog content was not conducted quantitatively, but rather the 46 blog articles were coded inductively using a thematic analysis. Finally, to examine the evolution of vaccination decision-making discussions in the parenting blogosphere over the past decade, blog articles were grouped by year of publication and comments were analyzed within each group. Natural breaks were used to create 3 groups of approximately equal numbers of posts within each group: 2006–2009, 2010–2012, and 2013–2015.

This paper is primarily descriptive in nature. SPSS (version 23) was used to calculate frequencies and perform statistical tests. Chi-square tests of association were used to compare blog posts based on time period. When one or more cells had an expected frequency of 5 or less, Fisher’s exact tests were used instead. The additional inductive thematic coding analysis was conducted using cloud-based internet software Dedoose. One hundred and 10 inductive codes were examined for co-occurrence with the categorization of blog articles as vaccine-encouraging, vaccine-ambivalent, or vaccine-discouraging.

The institutional review board at William Paterson University does not review studies that do not involve human subjects research.
Using the qualitative data analysis software program Dedoose\(^1\) inductive codes were examined for co-occurrence with the designation of a blog post as strongly vaccine-discouraging (24 out of 46 articles), vaccine-ambivalent (6 out of 46 articles), or strongly vaccine-encouraging (18 out of 46 articles). Based on this analysis, blogs coded as strongly vaccine-discouraging were commonly associated with the belief that parents who refuse vaccination have made informed decisions, a suspicion of biomedical interventions, the belief that vaccines as being filled

| Rank | Blog Post | Year Published | Vaccine Stance |
|------|-----------|----------------|----------------|
| 1    | Nature Moms Blog | 2006 | Discouraging |
|      | Gardasil Vaccine Hoax | 2007 | Discouraging |
|      | New Jersey Poised to Make Vaccines Required by Law! | 2007 | Discouraging |
|      | The Vaccine Issue - My Son's Story | 2007 | Discouraging |
|      | He's not Autistic, but... | 2008 | Discouraging |
|      | Vaccines, Toys, and Homeschool Stuff | 2008 | Discouraging |
|      | Anger Toward the Anti-Vaccine & Informed Consent Movements Speech, Vaccines, and Earth Day | 2009 | Discouraging |
|      | Happy Birthday Paige! | 2009 | Discouraging |
|      | Motherhood Regret and Mistakes | 2009 | Discouraging |
|      | Wrap-up - Butterflies for the Holocaust | 2009 | Discouraging |
|      | Stay Well - Stay Away from the White Stuff | 2009 | Discouraging |
| 2    | 2 Wired 2 Tired How You Can Help Kmart Support the March of Dimes & A Giveaway | ** | Encouraging |
| 3    | A Happy Hippy Mom Pro-Vax - Anti-Vax? Enough is Enough? | ** | Encouraging |
| 4    | The Shopping Mama Is your little one getting Vitamin D? | 2010 | Encouraging |
| 5    | Southern Bella’s Ways Autism-Vaccine Link Debunked (Again) | 2011 | Encouraging |
| 6    | MomFuse Why Your Choice Not to Vaccinate Puts Everyone at Risk | 2015 | Encouraging |
| 7    | From Dates to Diapers, and Beyond! Am I A “Parasite”? | ** | Ambivalent |
| 8    | MomDot Two Chicken Pox Vaccinations…So Why Am I Home with a Child who has Chicken Pox? Friendly Government Intervention | 2010 | Ambivalent |
| 9    | Baby Loving Mama/ Finding Zest Protect Yourself and Your Family with a Flu Vaccination #NIVW2014 | 2014 | Encouraging |
| 10   | An Island Life “One Pack = One Vaccine” - How You Can Help | 2008 | Encouraging |
| 11   | Green Mama’s Pad You Can’t Force Me To Stick a Needle In My Child | 2011 | Ambivalent |
| 12   | Wanting What You Have We’ve Got the Pox (and the Rest of Your Email Questions) | 2012 | Encouraging |
| 13   | Imperfect Parent Pennsylvania preschooler bit by a bat in the classroom Measles cases US at highest rate in 15 years AAP corrects Michele Bachmann on HPV vaccine safety Study: No increase of febrile seizures in kids ages 4 to 6 after MMRV vaccine Sarah Michelle Gellar advocates for pertussis vaccine Is whooping cough rise result of anti-vaccination movement? Pennsylvania Toddler Dies of Common Ear Infection | 2011 | Ambivalent |
| 14   | My Thoughts, Ideas and Ramblings I’m Saving Babies Lives and so can you Back to School with Walgreens #Giveashot #shop #CBIAS | 2014 | Encouraging |

\(^1\)Rank based on inclusion criteria.
\(^\text{**}\)Date not published.

Results

Blog posts

Using the qualitative data analysis software program Dedoose\(^1\) 110 inductive codes were examined for co-occurrence with the designation of a blog post as strongly vaccine-discouraging (24 out of 46 articles), vaccine-ambivalent (6 out of 46 articles), or strongly vaccine-encouraging (18 out of 46 articles). Based on this analysis, blogs coded as strongly vaccine-discouraging were commonly associated with the belief that parents who refuse vaccination have made informed decisions, a suspicion of biomedical interventions, the belief that vaccines as being filled
with dangerous chemicals and toxins, and fear that vaccination causes harm to children. As the most prolific poster on vaccination within the data set (and, notably, the top parenting site according to Blogmetrics’ Ultimate Ranking system by far), Green Mama’s Blog best exemplifies these viewpoints. For instance, in a 2007 post, a Green Mama blogger states that she blogs on vaccination not to convince others, but to tell “both sides” of the story because it is a parent’s right to know the “whole truth” (9/25/2007). Bloggers whose posts were characterized as strongly vaccine-discouraging tended to frame the issue of vaccination as one of individual liberty and a private family matter. As an illustration, a Green Mama blogger argues in a 2008 post that she had her husband concluded after years of research that the probability of their children being harmed by vaccines was greater than the probability that vaccines would protect their children from infectious disease. She acknowledged that other parents may make different decisions and concluded, “to each his own” (7/25/2008). Similarly, in a 2011 post, a Green Mama’s Pad blogger asserts, “I might not agree with your choices, but that is none of my business. They are your choices to make, not mine. I expect the same in return” (11/14/2011). And a From Dates to Diapers, and Beyond! blogger writes that although she and her husband made their decision not to vaccinate their children after engaging in lengthy research and prayer, she does not criticize others parents for making different decisions. Notably, in other posts these same bloggers harshly criticized state vaccination requirements for public education.

Blog posts that were classified as vaccine-ambivalent were most commonly associated with concerns that vaccines are not 100% effective and the belief in an alternative schedule. In the following quote, the author of the blog Southern Bella’s Ways to Save can be seen to struggle with the efficacy of vaccination: “I went back and forth about vaccinations this year. We were planning on it, but then a friend of ours got her family vaccinated and her son got the flu. I know it’s a SMALL percentage that actually get the flu from the vaccine and I’m pro vaccine in other areas, but after talking with my husband we decided to not get it this year” (11/26/2013, emphasis in the original). Similarly, in referring to the 2014–2015 Disneyland measles outbreak, a Happy Hippy Mom blogger argues that vaccination didn’t protect children in the amusement park from contracting the disease (no published date). She states that although she supports vaccination, she believes more research should be done on the immunization schedule and bundled shot effectiveness. Bloggers on Dates to Diapers, and Beyond! (July 2008), Mom Dot (December 2013), and Green Mama’s Pad (11/14/2011) all follow alternative vaccination schedules in an attempt to avoid what they believe to be an overloading of children’s immune systems. As a Mom Dot blogger puts it, “I simply don’t believe a 5 month old needs a 5 injections at once. This is simply a personal opinion from a parent that has 2 very healthy awesome kids that are no worse for the wear over delaying” (December 2013). In concert with strongly vaccine-discouraging bloggers, in the vaccine-ambivalent posts, alternative schedules were often described as a matter of personal choice.

A belief in the efficacy of vaccination, the assertion that vaccination and vaccination schedules were based on sound scientific evidence, and the moral duty to help stop the spread of disease (including by protecting the immunocompromised) were most frequently seen in posts characterized as strongly-vaccine encouraging. In their discussions of vaccination, bloggers on The Shopping Mama (1/6/2011) and Imperfect Parent (5/25/2011) both take aim at anti-vaccination beliefs by discussing the Andrew Wakefield scandal, noting that Wakefield’s assertion that the MMR vaccine causes Autism has been thoroughly disproven. Authors at Finding Zest (12/9/2014) and Imperfect Parent (9/13/2011) cite agencies and organizations such as the American Academy of Pediatrics, the Centers for Disease Control and Prevention, and the American Academy of Family Physicians in arguing for the efficacy and importance of vaccination. And as with many of the strongly-vaccine encouraging posts, a Mom Fuse (2/19/15) blogger frames vaccination as a duty of citizenship. In the following post, she can be seen as challenging the notion that personal choice outweighs collective responsibility: “It’s important in America that we all have a right to make choices, but what happens when those choices put others at risk?”

**Blog comments**

The number of comments on individual blog posts ranged from 1 to 77 with an average of 29. Comments were nearly 3 times as likely to strongly discourage vaccination (18.9%) than to strongly encourage it (7%) (Table 2). Thirty-three comments (4.7%) mentioned delaying vaccination from the recommended scheduling. Similarly to the bloggers, the use of scientific evidence by readers either in favor of or against vaccination was uncommon, occurring in only 50 comments (7.2%). Seventy-four comments (10.6%) mentioned the signs or symptoms of adverse reactions. These included Sudden Infant Death Syndrome, Guillain-Barre Syndrome or another medical condition (6.6%) and autism (5.4%). Discussions of Thimerosal or mercury (1.4%), overloading the immune system (1.7%), the risk of illness being less than the risk of adverse reactions (1.4%), or the risks of vaccines not being fully understood or disclosed (1%) were rare. Forty-five comments (6.4%) mentioned natural remedies to boost immunity in place of vaccination. Slightly fewer comments (2.6%) mentioned trusting doctors’ opinions and recommendations toward vaccines than mentioned the condescending attitudes of doctors when refusing vaccines (3.7%). Roughly 2 dozen comments mentioned political immunization mandates for school entry (3.2%), profit motivations of the pharmaceutical industry (3.2%), distrust of the government (3.3%), or the entanglement of the government and the pharmaceutical industry (4.2%).

The blogs with the highest percentage of comments strongly encouraging vaccines were A Happy Hippy Mom (100%), An Island Life (60.0%), and Finding Zest (33.3%). The highest percentages of comments strongly discouraging vaccines were found on From Dates to Diapers, and Beyond! (42.9%) and Nature Mom’s Blog (24.6%). While the overall use of scientific evidence was uncommon, Imperfect Parent was an outlier with 64% of comments using evidence. Of the 26 comments that mentioned the condescending attitudes of doctors when refusing vaccines, 24 were on Nature Mom’s Blog, compromising 5.5% of comments on the blog. Natural remedies were most frequently mentioned on The Shopping Mama (23.1%) and Southern Bella’s Way to Save (28.6%). Due to the heterogeneity
of the blogs in terms of number of posts and number of comments, we chose not to perform statistical tests on the 14 blogs but rather to group them by publication date.

Table 3 presents the descriptive statistics for the blog posts by date of publication. In examining the evolution of comments on vaccination over the past decade, comments on the oldest posts, published from 2006–2009, were more likely to strongly discourage vaccination (p = 0.008), whereas comments on newer posts, published from 2013–2015, were more likely to strongly encourage vaccination (p = 0.003). Comments on older posts were more likely to mention Thimerosal or mercury in vaccines (p = 0.010), risks of vaccines not being fully disclosed or understood (p = 0.042), and the condescending attitudes of doctors when refusing vaccines (p = 0.037).

### Discussion

The findings of this study demonstrate that many blog posts and subsequent comments take an anti-vaccination standpoint. This is consistent with findings from other studies, which indicate that there is an anti-vaccination sentiment apparent when searching on the Internet. A study by Nan and Madden (2012) found that those who read anti-vaccination blogs related to HPV were not only more likely to view the HPV vaccination as being less safe, but were noted to have lower intention for HPV vaccine compliance. Furthermore, our results are consistent with those of Tangherlini et al (2016), who found that parents use blog sites to promote anti-vaccination sentiments and encourage each other. Our research adds to the literature by further examining the discussion between bloggers and readers through an analysis of comments, as well as charting the shift in commenters’ perspectives on vaccination over time.

The content of the blogs in our study, along with the results of Dredze et al. (2016) from Twitter postings, demonstrate that social media is seen by the public as a source of useful information. Among Internet users, 80% seek health information online and 16% of those specifically seek information about vaccination. The source of online information, whether it be a news organization, a health organization, or a parenting blog, is not always an indicator of its popularity. Radzikowski et al. (2016) found that Twitter posts on vaccination from news organizations were shared more often than those from health organizations. Social media posts related to vaccination are considered more compelling and shared more often on Facebook when they have a clear bottom-line meaning or “gist.” To the extent that blogs can influence knowledge, attitudes, and behaviors related to vaccination, pediatricians and public health officials should be aware of the potential for widespread misinformation. It is worth underlining our finding that the writing on the most highly rated (and thus most followed) parenting blog according to Blogmetrics’ “Ultimate Rank,” Nature Moms
Table 3. Analysis of blog posts by date of publication.

|                          | Total N (%) | 2006–2009 N (%) | 2010–2012 N (%) | 2013–2015 N (%) | p     |
|--------------------------|------------|-----------------|-----------------|-----------------|-------|
| **Total comments**       | 698        | 360             | 174             | 150             |       |
| Uses evidence            | 50 (7.2)   | 25 (6.9)        | 16 (9.2)        | 9 (6.0)         | 0.506 |
| Strongly encourages vacci| 49 (7.0)   | 16 (4.4)        | 11 (6.3)        | 19 (12.7)       | 0.003 |
| Strongly discourages vacci| 132 (18.9)| 83 (23.1)       | 28 (16.1)       | 18 (12.0)       | 0.008 |
| **Mentions…**            |            |                 |                 |                 |       |
| Natural remedies to boost immunity | 45 (6.4) | 19 (5.3) | 18 (10.3) | 8 (5.3) | 0.068 |
| Signs and symptoms of adverse reaction | 74 (10.6) | 5 (1.4) | 0 (0.0) | 0 (0.0) | 0.278* |
| Vaccine efficacy          | 38 (5.4)   | 24 (6.7)        | 8 (4.6)         | 5 (3.3)         | 0.273 |
| Thimerosal or mercury in vaccines | 10 (1.4) | 10 (2.8) | 0 (0.0) | 0 (0.0) | 0.010* |
| Sudden Infant Death Syndrome, Guillain-Barre Syndrome, or other medical condition | 46 (6.6) | 24 (6.7) | 11 (6.3) | 10 (6.7) | 0.998 |
| Overloading immune system with too many vaccines at once | 12 (1.7) | 3 (0.8) | 4 (2.3) | 5 (3.3) | 0.105* |
| Herd immunity             | 4 (0.6)    | 0 (0.0)         | 0 (0.0)         | 2 (1.3)         | 0.048* |
| Risk of illness being less than risk of adverse reaction | 10 (1.4) | 7 (1.9) | 1 (0.6) | 2 (1.3) | 0.585* |
| Risks not being fully disclosed or understood | 7 (1.0) | 7 (1.9) | 0 (0.0) | 0 (0.0) | 0.042* |
| Delaying vaccination from recommended scheduling | 33 (4.7) | 14 (3.9) | 7 (4.0) | 12 (8.0) | 0.121 |
| Political immunization mandates for school entry | 22 (3.2) | 8 (2.2) | 8 (4.6) | 5 (3.3) | 0.293* |
| Condescending attitudes of doctors when refusing vaccines | 26 (3.7) | 20 (5.6) | 4 (2.3) | 2 (1.3) | 0.037 |
| Trusting doctors’ opinions and recommendations toward vaccines | 18 (2.6) | 10 (2.8) | 4 (2.3) | 3 (2.0) | 0.948* |
| Profit motivations of pharmaceutical industry | 22 (3.2) | 13 (3.6) | 3 (1.7) | 5 (3.3) | 0.532* |
| Trust in government       | 23 (3.3)   | 15 (4.2)        | 2 (1.1)         | 6 (4.0)         | 0.171 |
| Entanglement of government and pharmaceutical industry | 29 (4.2) | 15 (4.2) | 8 (4.6) | 6 (4.0) | 0.968 |

N = 16 blog posts in 2006–2009; N = 16 posts in 2010–2012; N = 12 posts in 2013–2015
* Fisher-exact test used instead of chi-square test.

Blog, is also the most vehemently and pugnaciously anti-vaccination. The extent to which such blogs can shape health decision-making around vaccination should not be underestimated.

Our results suggest that some of the negative ideas about vaccines, such as efficacy and safety, can be directly addressed by the expertise of pediatricians. In fact, evidence shows that health care providers generally have a positive influence on parents in encouraging vaccination. The American Academy of Pediatrics Committee on Bioethics advises that pediatricians take an understanding and respectful approach when addressing reasons for vaccine hesitancy with patients, as it is a complex topic. Our results demonstrating great anti-vaccination sentiments on parenting blogs support the idea that such a framework could be a helpful tool to be used by healthcare providers when talking to hesitant parents.

Furthermore, although anti-vaccination sentiments proliferate on the Internet, social media can also be used to increase understanding of vaccines and disease prevention. Preliminary results of a 2013 study suggest that a mobile application designed to educate the public about invasive pneumococcal disease was successful in increasing public awareness and prevention through a risk checker. Our findings suggest that because individuals seek information about and advice regarding vaccination in the parenting blogosphere, this may be an important target for public health interventions.

While much of the discussion in the parenting blogs and comments that we examined suggests that parents remain concerned about the safety and efficacy of vaccines, it is also clear from our analysis that vaccination remains a highly-charged issue in the United States that reflects larger political tensions. There is an age-old debate regarding whether vaccination is a matter of personal choice and an individual liberty or is a matter of public health law best overseen by the government. Despite evidence that vaccination is a true public health success, there remains strong resistance to vaccination discussed in all levels of US politics. As seen in this study, many parents who are using this cohort of blogs to express their feelings are taking an anti-vaccination standpoint for reasons such as concern over the relationship between the government and the pharmaceutical industry and infringement on individual liberty. These reasons have been outlined in other studies as primary reasons for vaccine hesitancy.

This study is limited in that it is cross-sectional, and as such, the findings from these selected parenting blogs cannot be generalized to all parenting blogs. In addition, the popularity ranking of these particular blogs is not static and may change over time. Nevertheless, this study filled a gap in literature by describing the content on the most popular parenting blogs. These findings indicate that there is a need for public health professionals to (1) understand the concerns being expressed in these forums, and (2) develop innovative ways to dispel myths being expressed and viewed by the public, as these views may create obstacles in meeting the goals of the public health agenda.
Disclosure of potential conflicts of interest

No potential conflict of interest was reported by the authors.

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