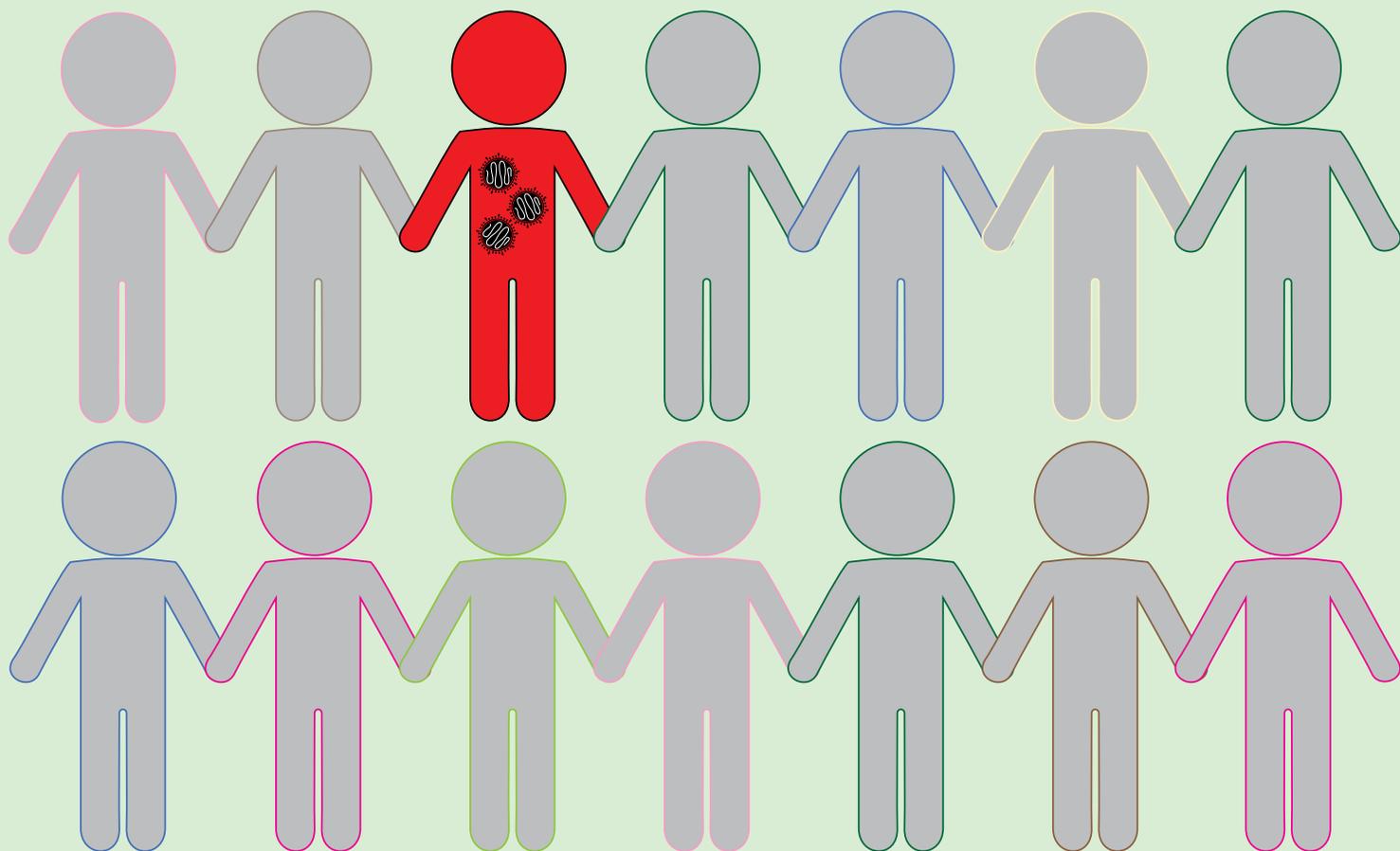




WOMEN THINKING, inc.

IMMUNIZATION: MYTHS, MISCONCEPTIONS, AND MISINFORMATION



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WOMEN THINKING, INC. (WT) AND THE JAMES RANDI EDUCATIONAL FOUNDATION (JREF)

Abstract

Women Thinking, Inc. and the James Randi Educational Foundation, as part of the Hug Me! I'm Vaccinated campaign, joined forces to focus on the best way to communicate a vaccine positive message. At baby and child expos, parents were given a marketing research survey about vaccination intentions for their children, their general knowledge of vaccine safety, and how well they respond to various persuasive messages for and against immunizations. Furthermore, we determined which sources are most likely to influence their vaccination decisions.

Through our marketing research, we were able to identify specific concepts that parents generally understood, such as herd immunity, and areas in which parents seemed to lack knowledge. Parents still believe that dangerous, infectious diseases exist, however there is uncertainty as to whether it is advantageous for the child to naturally fight the disease or risk a vaccination. Parents are apt to believe that vaccines are effective at preventing diseases, though at the same time, parents are not fully convinced by scientific evidence that these vaccines are also safe. This has resulted in delayed vaccination schedules and/or the administration of only select vaccines.

The most effective anti-vaccination arguments are those that induce fear in parents by naming frightening ingredients and by greatly exaggerating the risks of vaccinations. The best pro-vaccination arguments were those that focused on a good-parenting message, such as suggesting that not immunizing your child is equivalent to putting them in a car without a car seat. The successful nature of these tactics combined with scientific studies illustrates the importance of pro-vaccination, non-profit organizations combining both heart and mind to convince parents of the ever-important necessity of vaccination.

Introduction

We were interested in discovering ways to best communicate a positive vaccine message to the public. In the parts of the US where the number of parents choosing to vaccinate their children has dropped in recent years, we have seen a resurgence of the measles virus, which was essentially eradicated in the Americas by the year 2000¹. These areas have also seen a number of whooping cough outbreaks. We suspected that a lack of confidence in vaccines would also lead to a lack of willingness to opt-into non-required immunizations such as HPV and varicella (chicken pox).

These outbreaks may be the result of a fear over the safety and distrust of the effectiveness of vaccination, a lack of understanding of the dangers of most vaccine-preventable diseases, or something else entirely. What we do know is that messaging from science-based health advocates has been ineffective in convincing many parents to vaccinate their children. Our ultimate goal was to re-focus and effectively market Hug Me's vaccine-positive message and begin a public conversation with parents to counter anti-vaccine rhetoric. Previous research has looked at demographic variables that correlate with vaccination fears and misinformation, but so far there has been very little done to determine what types of messaging may get through to parents who are unsure about the decision to vaccinate.

To learn which messages were most effective, we surveyed parents at baby and child expos at three separate locations in the United States. The surveys included questions regarding the age of the parent or caretaker's youngest child, their perceived knowledge and understanding of immunization, their choices regarding vaccinating their youngest child, where they receive their information about vaccines and vaccine safety, how persuasive they felt many pro- and anti-vaccine arguments are and whether they were exposed to those arguments prior to taking our survey.

¹ <http://jid.oxfordjournals.org/content/196/10/1433.full.pdf+html>

Methodology

We set out to study parents' opinions regarding vaccination and their children's health. To accomplish this, we conducted formal surveys at three baby- and parenting-themed expos that took place in Sykesville, Maryland; Fort Lauderdale, Florida; and Bourbonnais, Illinois during the spring and summer of 2011. Because these expos took place in suburban, urban, and rural areas, respectively, we were able to survey parents from a wide variety of socioeconomic backgrounds.

Parents were fully informed as to the purpose of the survey, and we gave no indication of our views on these issues in order to avoid biasing the respondents. Participants gave their answers voluntarily and were informed that all identifying information would remain anonymous, although some did provide contact information for entrance in a prize drawing or to receive more information about vaccines. This contact information was kept separate from the anonymous survey answers.

We registered for a vendor booth at the various expos and used the booth to stop parents walking by and ask them if they would like to take our survey. This method of surveying parents who happened to be at a parenting expo and willing to take the survey means that our survey results are not necessarily applicable to all U.S. parents. Even so, the purpose of our survey was to learn the types of arguments that are effective in convincing fence-sitting parents to vaccinate their children. Although the results may not be applicable to all parents, we can say that they apply to many parents similar to those that we surveyed.

There were six distinct sections to the survey, listed in order of appearance:

I. Children and Vaccination Plans

II. Vaccines and the Media

III. Knowledge and Beliefs about Vaccines

IV. Arguments against Vaccinations

V. Arguments for Vaccinations

VI. Demographic Information

The specifics of each section are as follows:

I. Children and Vaccination Plans

The purpose of this section was to gain information about the respondents' general vaccine knowledge, the number and ages of their children, and initial opinions about vaccines and the predetermined

vaccine schedule for their children. This included a question about where they turned for information on vaccines (e.g. doctors, family, or friends).

II. Vaccines and the Media

This section focused upon the media sources the respondents used to gain general knowledge as well as health information. They were asked about whether or not they sought information from specific TV programs, radio shows, periodicals, websites, and other sources.

III. Knowledge and Beliefs About Vaccines

This section probed specific topics related to vaccine knowledge and safety via a series of vaccine-related statements. Respondents were asked to respond to each statement by choosing whether they strongly disagreed, slightly disagreed, neither agreed nor disagreed, slightly agreed, or strongly agreed.

IV. Arguments Against Vaccination

Here, common arguments against vaccinating children were presented. Upon reading each argument, parents were asked to state whether or not they had heard that argument in the past, then rate the argument as not at all persuasive, slightly not persuasive, unsure, slightly persuasive, or strongly persuasive.

V. Arguments For Vaccination

In contrast to the previous section, this section presented arguments in favor of vaccination. The answer choices were the same as in section IV.

VI. Demographic Information

The survey concluded by asking specific demographic information including age, gender, education level, the city/state of occupation, race, religion, political party, relationship status, employment, and household income.

Demographics

In our survey, 220 participants were female, whereas only 17 were male. There were 16 additional participants that marked “other” or offered no response to the question of gender (Figure 1). The average number of children per participant was 1.8. When breaking down participants by age, we found that the vast majority were in the 25-44 range. A significant portion of our participants were married (84%).

Our participants came from diverse ethnic backgrounds. About half of them were non-Hispanic white, about 30% Hispanic White, 15% Black and the rest were either Asian or American Indian. This distribution could be a result of the fact that the majority of our participants were from Fort Lauderdale, Florida (68%)—a state with a large Latino population—versus our other expos: Sykesville, MD (13%) and Bourbonnais, IL (19%).

Our participants’ levels of education were various and in a fairly even distribution between high school graduates, those with associate’s or vocational degrees, those with bachelor’s degrees, and those with master’s degrees (Figure 2).

Two thirds of respondents who answered the political party question self-identified as Democrats with the remainder identifying as Republicans.(Figure 3). The participants were predominately Christian of varying denominations (74%). Finally, our participants had a fairly even distribution of income brackets (Figure 4).

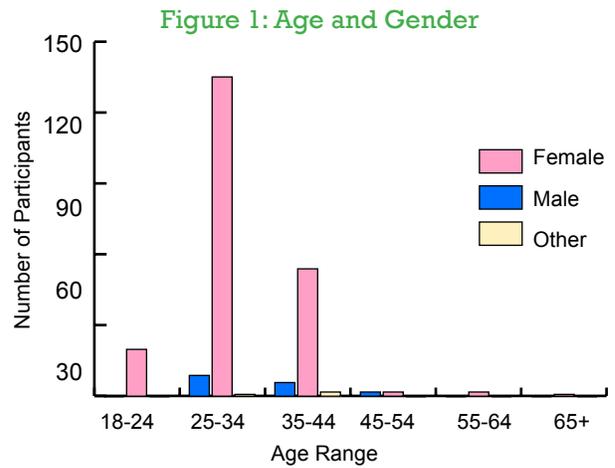


Figure 2: Highest Level of Education

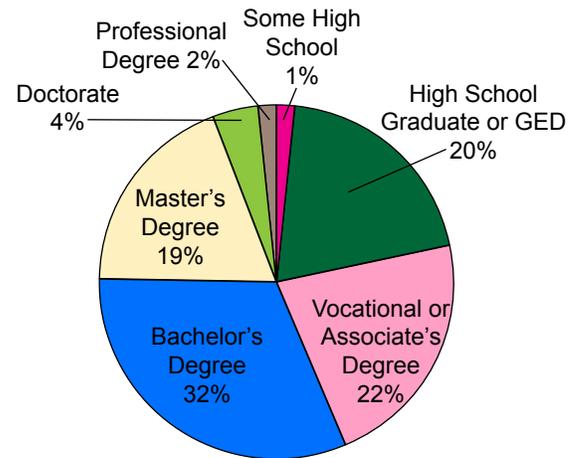


Figure 3: Political Leaning

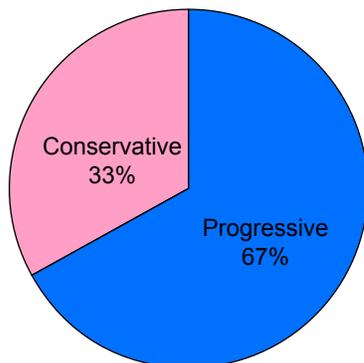
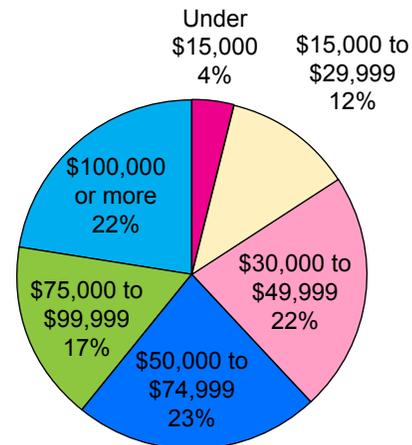


Figure 4: Household Income



Results

Our survey had multiple sections asking a variety of questions. The results portion will be split up into five different pieces to represent the different portions of the survey. The first section covers general views on vaccinations, the second covers the participants' knowledge of vaccines, the third covers their responses to arguments against immunization, the fourth covers responses to arguments for immunization, and the fifth determines correlations with certain media outlets.

Our participants had varying views on child vaccination. According to survey responses regarding their views on vaccine safety, participants were classified as vaccine-averse, vaccine-unsure, or pro-vaccine on a 1–5 scale, where 1 indicated their belief that vaccines are not safe at all and 5 indicated their belief that vaccines are very safe. Participants that answered 1 or 2 on this scale were classified as vaccine-averse, those who answered 3 were classified as vaccine-unsure, and those who answered 4 or 5 were classified as pro-vaccine. Henceforth, our results will predominantly be discussed via these three classifications. In the entire study, 38 respondents were vaccine-averse, 72 were vaccine-unsure, and 143 were pro-vaccine. For the remainder of the study, we focus on the 72 vaccine-unsure participants, since this audience is the most open to and in need of education about the protection afforded to their young children by proper vaccine administration.

1. Vaccine Views

To begin our investigation, we asked parents about their current plan for childhood vaccination (Figure 8). Of the vaccine-unsure audience, approximately two-thirds of the participants plan to forgo optional vaccinations. Furthermore, approximately a quarter of the pro-vaccination participants also intend to give their children only those vaccines that are required (by public schools, for instance). As expected, the vaccine-averse participants are either forgoing vaccination for their children entirely or limiting their children's vaccinations to only required vaccines. Also, of the vaccine-unsure participants, one-third of the participants plan to delay the vaccine schedule for their children.

While most respondents were confident in the safety of vaccines, a large number were unsure about or averse to vaccinating. We believe that parents who are fully convinced that vaccines pose a serious

health risk are likely to remain unconvinced by most pro-vaccine arguments. However, those who are unsure on the subject are likely to still be persuaded because they overwhelmingly continue to vaccinate despite their uncertainty or fears, even if they don't choose to follow the recommended schedule or opt out of certain immunizations. If they are willing to receive most recommended or required immunizations, they have a basic understanding of the importance of vaccines even while they are still convinced by arguments against vaccines. If pro-vaccine advocates can craft an effective message, they can help these parents become confident in the safety of vaccines.

Figure 8: What is the immunization schedule for your youngest child?

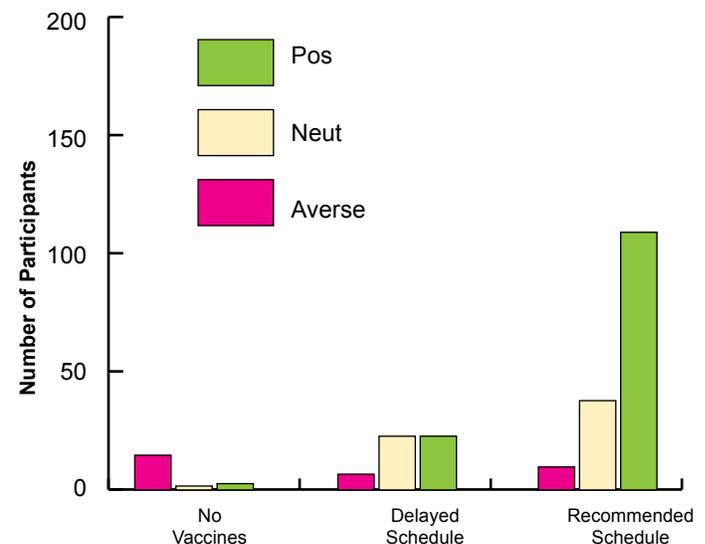
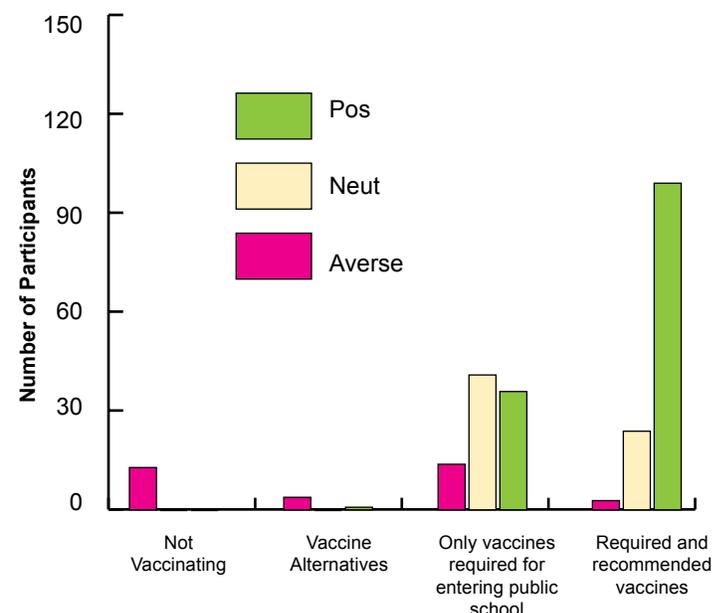


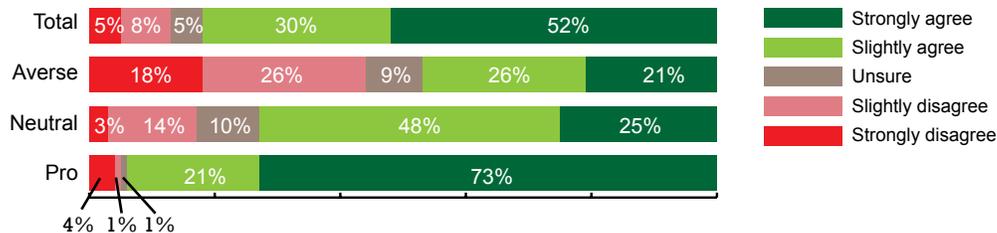
Figure 9: Which vaccines have you given or do you plan to give to your youngest child?



2. Vaccine Knowledge

To further determine parents' knowledge of vaccines, we probed their general comprehension of the subject. Again, we focus on vaccine-unsure parents, as this is the audience most in need of education and the one that stands to experience the greatest impact.

Figure 10: Vaccines provide protection from contracting infectious diseases.



Although this one seems like an obvious question, in perusing anti-vaccination websites, it is clear that there are many people who simply believe that vaccinations do not work in protecting against diseases (Figure 10). As the results of this question show, this is not a prevailing belief within the parenting community. Four fifths of all participants said they strongly or slightly agreed that vaccines provide protection from contracting infectious diseases. Only 13% of people said they slightly or strongly disagree with this statement, and that was mostly concentrated in the vaccine-averse group. Even the majority of our vaccine-unsure group believes that vaccines work in protecting against diseases.

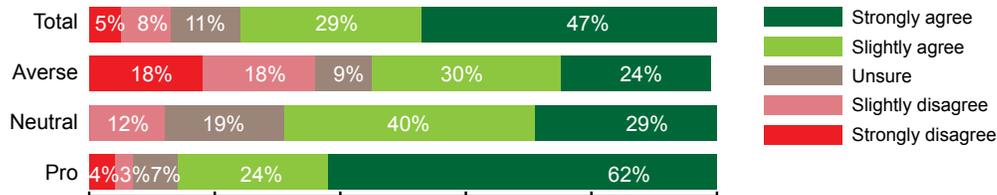
Figure 11: The benefits of vaccines for my child and the community outweigh the potential side effects.



When making the decision to immunize or not to immunize their child, every parent goes through a cost-benefit analysis weighing the potential benefits against the potential risk. This question is trying to determine where the parent taking the survey falls on this continuum. More than two thirds of all survey takers agreed that the benefits of vaccinations outweighed the risks (Figure 11). The vaccine-averse participants, however, were far more likely to say that they disagreed with this statement. This group also had a high percentage of parents who said they were either not vaccinating or delaying vaccinations, which fits with their cost-benefit analysis of immunizations. Of the vaccine-unsure audience, more than two thirds believe that the benefits of vaccination—for both their child and the community—outweigh the risks.

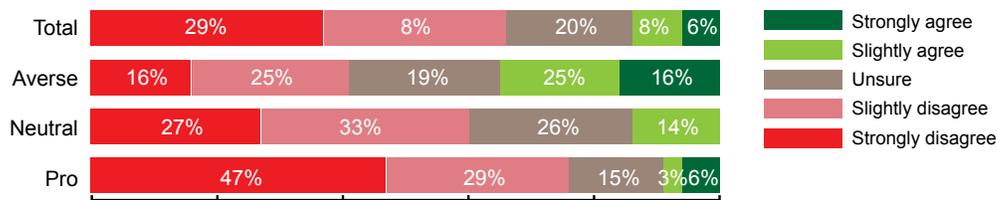
This is particularly good news. It means that even parents who are unsure about vaccinations still generally believe that they work, can protect their child, and that this is worth the risk. However, what we found earlier is that this ambivalence has led to many of these parents choosing riskier options like delaying vaccinations or foregoing non-required vaccinations. It seems that these parents are attempting to lower the risks of vaccinations even as they are leaving their children at risk of contracting a disease.

Figure 12: Getting vaccinated not only protects the person who is vaccinated, but also reduces the risk of people around them contracting the disease.



One concept often mentioned by science-based immunization groups is that if many people in a population are vaccinated, even the people who are unvaccinated benefit from protection against diseases because it is difficult for the diseases to make their way through all the vaccinated people to infect them. This concept is called herd immunity. It is worth noting here that all three vaccine groups, including the vaccine-averse, view herd immunity as a benefit of immunization (Figure 12). Specifically, 54% of the vaccine-averse, 69% of the vaccine-unsure, and 86% of the pro-vaccine participants believe that protecting their child helps to protect the community. This may be another reason to explain why parents who are unsure are still choosing to vaccinate even if it is on a delayed schedule or only with the required vaccinations. It also suggests that educating about the topic of herd immunity by science-based groups has been effective in reaching parents.

Figure 13: Today in the US, infectious disease rates are so low that there is no longer a need to vaccinate against diseases like measles or whooping cough.

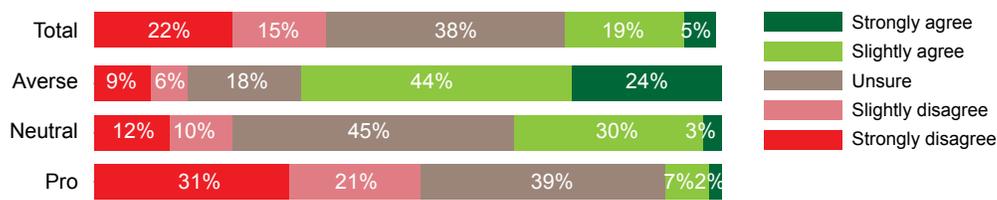


Science-based immunization advocates often discuss why they think parents are increasingly not vaccinating their children. Often mentioned is that vaccinations have been so successful at eradicating disease that parents no longer see these diseases on a regular basis, and therefore do not realize that there is still risk of contraction. This question was meant to test this hypothesis, and in doing so we've found it doesn't seem to hold water.

In fact, not only did two thirds of all respondents disagree with this statement, but even among the vaccine-averse crowd, 41% disagreed with the statement that infectious disease rates are so low that vaccines are no longer needed (Figure 13). Among our vaccine-unsure participants, only 14% agreed with this statement and 60% either strongly or slightly agreed.

Currently, many immunization advocates spend a lot of time talking about statistics on disease rates. These messages are getting through, yet are not fully convincing parents of the need to vaccinate. It seems that our message has been saturated with these types of statistics and there needs to be more focus on other areas of vaccine safety to fully bring parents over to our side.

Figure 14: Childhood vaccines cause some children to contract autism.



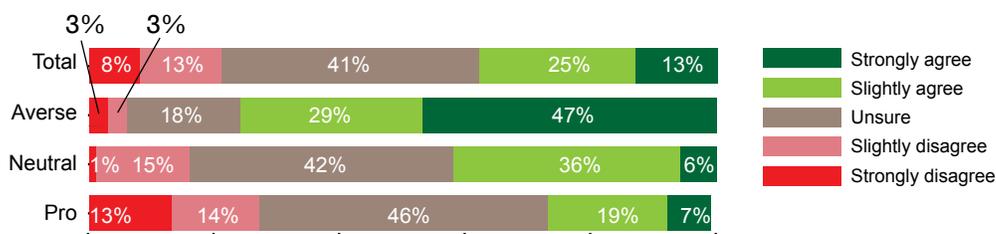
Many myths are associated with the subject of vaccination. One of the most persistent myths of the last two decades—and the one that gets the most media attention—is that vaccines cause autism. However, there has also been just as much media attention to combat this myth. It is often not clear which side is winning this battle of information.

The responses to our survey question are worrying. Of all our survey participants, only 37% disagree that vaccines cause autism (Figure 14). Just as many are unsure whether this is true or not. Even in our pro-vaccine group, only 52% of parents disagree that vaccines cause autism. It seems as if the disagreements over whether vaccines cause autism are causing parents to believe there is a false controversy, even as the science has decisively come down on the side that vaccines do not cause autism.

The situation looks even worse when considering solely our vaccine-unsure respondents. Of this group, only 22% believe vaccines do not cause autism, a worrying 33% believe they do and 45% are unsure. These results are substantial and illustrate the need for education on this topic in particular.

Vaccine advocates might be tired of repeating the mantra “vaccines don’t cause autism” but so many parents, even those that are vaccinating their children, are still unsure whether it is true or not. The science may be in but public opinion is not. Vaccine resources need to be specifically addressing autism risks and deliver the facts in such a way that leaves no doubt that vaccines do not cause autism.

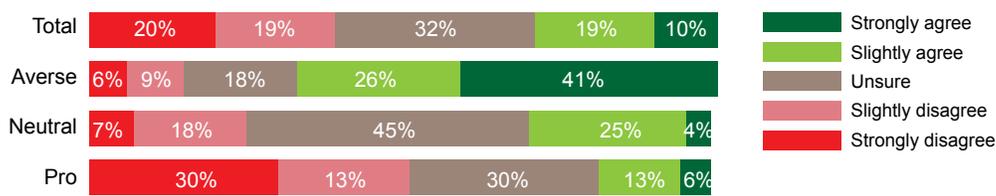
Figure 15: Health organizations like the Center for Disease Control (CDC) and the World Health Organization (WHO) downplay the true risks of vaccines.



Despite participants’ understanding of many vaccination benefits, they are unsure if the World Health Organization (WHO) and Center for Disease Control (CDC) are downplaying the risks of vaccines. Only one fifth of all participants disagreed with this statement, two fifths were unsure, and the rest agreed (Figure 15). Of the vaccine-unsure participants, 42% are unsure and 42% believe that these organizations are downplaying the risks. Only 15% slightly disagreed and a very small 1% strongly disagreed. Even of our pro-vaccine respondents, only 27% disagreed with this statement and 26% agreed.

These results are rather shocking and imply that distrust of government authorities on the issue of immunization safety is a huge driver in spreading fear about vaccinations. The Center for Disease Control (CDC) is the largest provider of vaccination information in the US. If parents do not trust them and believe they are actually downplaying vaccination risks, then anything they say might be discounted, no matter how good their science is. This also means that smaller organizations not associated with the government could be more trusted by parents to provide information and education about immunization safety.

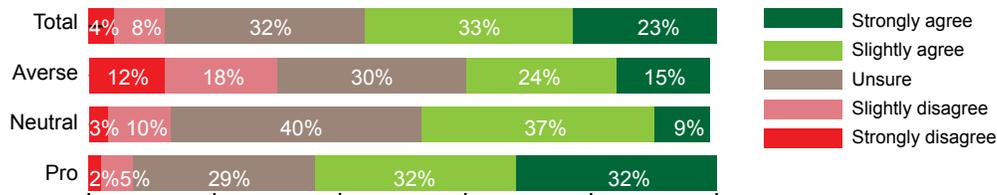
Figure 16: Many childhood vaccines contain large doses of toxic chemicals that are hazardous to children, such as lead, mercury or arsenic.



When perusing anti-vaccination websites, one will often come across statements that list scary-sounding ingredients in vaccinations, some real and some not, and imply that these ingredients are toxic chemicals dangerous to children. Typically, pro-immunization websites will gloss over this myth with a small assurance that everything in vaccinations is safe before moving on to other things. Clearly, the lack of information addressing these fears suggests that pro-vaccine advocates do not see this as a driving factor in vaccine refusal.

Our survey responses, on the other hand, suggest that this is a more important topic than most people think. A majority of participants said that they are either unsure about or agree with the statement that vaccines contain toxic chemicals hazardous to children's health. Even less than half of the pro-vaccine respondents said they disagreed with this statement. 45% of vaccine-unsure respondents don't know whether vaccines contain large doses of toxic chemicals that can hurt their children. Even more alarming, an additional 29% vaccine-unsure parents believe this to be true. These results further confirm our belief that vaccine-safety education is critical, especially for the vaccine-unsure population.

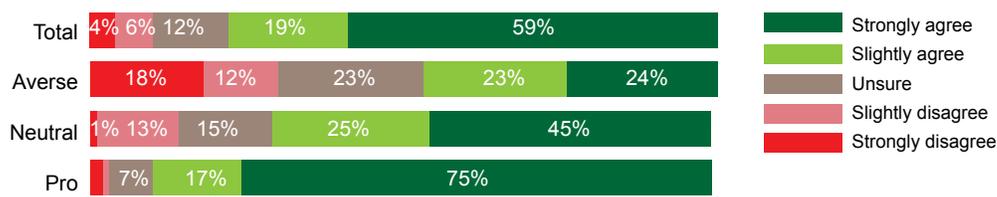
Figure 17: Vaccines wear off over time, so often booster shots are needed every 10-20 years, depending on the vaccine, in order to remain fully effective.



One of the biggest drivers in the recent whooping cough epidemic in the US is the small number of adults that are up-to-date on their booster shots. In fact, booster shots for Tdap, the vaccine that protects against whooping cough (among other things), is recommended every ten years to keep up full immunity. People who have been vaccinated more than ten years ago may still get the disease, but are more likely to have less severe symptoms. This can mask the seriousness of the disease, causing some people to continue to go to work or be around children even while infected, thus spreading the diseases to a more at-risk population. Even so, there is very little education on booster shots being done by pro-vaccine advocates.

According to our survey respondents, approximately one-third of all participants seem generally unaware that vaccine effectiveness diminishes over time and that booster shots are necessary (Figure 17). This is true even in the pro-vaccination group, which is especially worrying. People who are pro-vaccine are already completely on the side of immunization. These people don't need to be convinced that vaccines are important—they already know it. Increasing education about booster shots to pro-vaccine people could be highly effective in raising the total number of people in the community that are vaccinated against diseases like whooping cough, and thus protect the portion of the population who is not vaccinated and at risk of infection. It is far easier to educate a pro-vaccine person about booster shots than it is to convince a vaccine-unsure or vaccine-averse person to vaccinate their children. In a larger focus on education about booster shots, there is great potential for disease prevention.

Figure 18: I trust my doctor and believe s/he would never purposefully endanger my child.

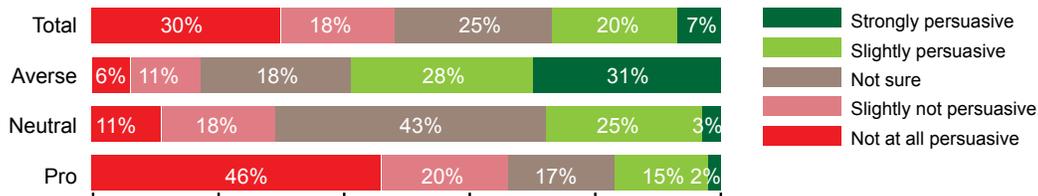


It is interesting to contrast this question with the one in Figure 14, where the general distrust of major health organizations was revealed (Figure 18). While even pro-vaccine participants hesitated to trust large organizations, here there is far more trust for one's own doctor. In other words, organizations are worthy of suspicion, but individual doctors are, for the most part, not. Of course, positive attitudes towards vaccines correlated with how much trust each group was willing to place in their family doctor.

3. Arguments Against Vaccinations

The next section of the survey gave respondents five common arguments against immunization. These were put together by reading various anti-vaccination websites and re-writing versions of their arguments as genuinely as possible.

Figure 19: It is safer and more natural to let children fight off diseases themselves than to give them drugs that contain unnatural and untested chemicals and toxins.



The first argument against vaccinations was one of the most common found on anti-vaccination websites: That it is more natural to let children fight off a disease than give them unnatural medications. The argument that natural things are always safer than manufactured items is commonly known as the “naturalistic fallacy.” In this case, among pro-vaccine individuals it clearly was not an effective argument (Figure 19). It was a very different story among vaccine-unsure respondents. These participants are generally not sure whether they find this argument persuasive (43%) and another 25% find it slightly convincing. Very few, however, find it strongly persuasive. The fact that this argument is considered slightly persuasive by many vaccine-unsure participants probably stems from the fact that it fits in nicely with their prior beliefs that vaccines are made of toxic chemicals that can be harmful to children.

One way vaccine advocates can use naturalistic arguments to their benefit is to frame vaccines as building a child’s immunity naturally, but also with fewer risks. This might be achieved by explaining that a vaccine works in the body the same way a disease does but without the downside of actually infecting the body with the disease. This should be a helpful argument, since most respondents believe that vaccines are effective at preventing disease and are important for the health and safety of individuals and their communities.

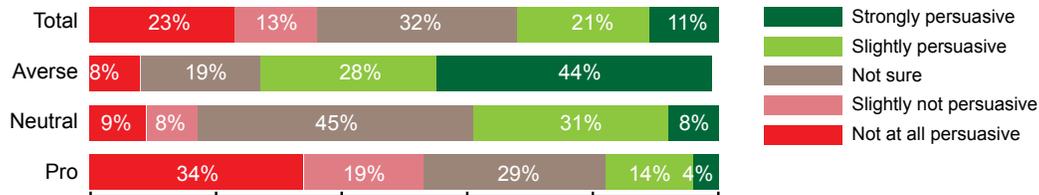
Figure 20: Babies are too young to put many drugs into their bodies. A single vaccine given to a six-pound newborn is the equivalent of giving a 180-pound adult 30 vaccinations in the same day. Therefore, it is better to wait until they are older and stronger before giving them vaccines.



This argument that babies are too small and weak to be given so many vaccinations at such a young age is a common in the anti-vaccination community. In our survey, we found that this argument was extremely persuasive to the vaccine-unsure group, with almost half of them saying they found it slightly or strongly persuasive (Figure 20). This makes sense because the argument seems true on an intuitive level. Babies really are tiny, weak and vulnerable. It also likely explains why so many parents are choosing a delayed vaccination schedule and waiting until their children are older and stronger before vaccinating. Pro-vaccination advocates can use the same argument to illustrate the scientific evidence by pointing out that small infants are especially vulnerable to deadly infectious diseases and that this is the most important time to make sure they are immunized and protected. Delaying immunizations until the time they are older can be deadly.

Figure 21: Mothers of children with developmental disorders have been saying for years that they believe they can see the effects of vaccines changing their children and causing diseases like autism. Doctors treat these

parents with contempt rather than listening to their concerns.



Another effective anti-vaccination argument is that doctors treat parents with contempt when expressing vaccination safety concerns, specifically when related to autism. 45% of the unsure parents don't know what to make of this statement and another 39% find this argument convincing (Figure 21). Clearly many parents do not feel like they get respect from the medical community, which again relates to issues with trust. If parents don't feel they can trust the medical community, then no matter how good the science is, they are unlikely to believe it. Many pro-vaccine advocates ridiculed Jenny McCarthy when she told Oprah's audience that she knew vaccines caused her son's autism because of her "mommy instinct." The fact that so many women feel that the medical community treats them with contempt is what can make arguments like McCarthy's so convincing. Bringing more "heart" into the arguments for immunizations might make them more compelling to parents who believe in the "mommy instinct" or feel they are being talked down to by the medical community.

Figure 22: The US government and media are strongly influenced by the pharmaceutical industry, which makes millions off of vaccines. They care more about advertising dollars and campaign contributions than about our children's safety.



Another type of argument often seen on anti-vaccination websites plays on conspiracy theories regarding the US government and media, usually regarding some sort of payment from pharmaceutical companies. Write something on the internet praising immunizations and it won't be long before someone comes along claiming you must be a shill for Big Pharma. Usually, pro-vaccine advocates will just brush off these arguments rather than deal with them directly, believing that the only ones who believe these conspiracy theories are extremists on the fringe of society. However, the responses to our survey showed that just as parents believe that government agencies are downplaying the true risks of vaccines, they also are quite persuaded by conspiracy-like arguments that play into this fear. In our sample, 42% of parents found the argument that the US government and media are strongly influenced by pharmaceutical companies to be slightly or strongly persuasive (Figure 22). Of our vaccine-unsure parents, a majority found it persuasive with only 13% saying they did not find it persuasive. This means that non-government affiliated organizations may want to make it clear they are not getting money from pharmaceutical companies and acting completely on their own accord rather than just brushing off these arguments. It also means that organizations not affiliated with the medical community may have distinct advantages in passing along information to some of the more unconvinced parents.

Figure 23: There is no convincing evidence that vaccines reduce the death rate for diseases such as measles. In fact, most deaths from measles deaths had already been reduced 99.4% before vaccinations were introduced.



This argument is one of the more extreme tactics used by anti-vaccination proponents. The 99.4% number was actually seen on an anti-vaccine website arguing that vaccines are ineffective in preventing diseases. This was one of the least persuasive arguments on our survey (Figure 23). Of the vaccine-unsure parents, the vast majority of them (60%) seemed confused that the very specific number mentioned might be true, but generally skeptical and unwilling to say they found it convincing (21%).

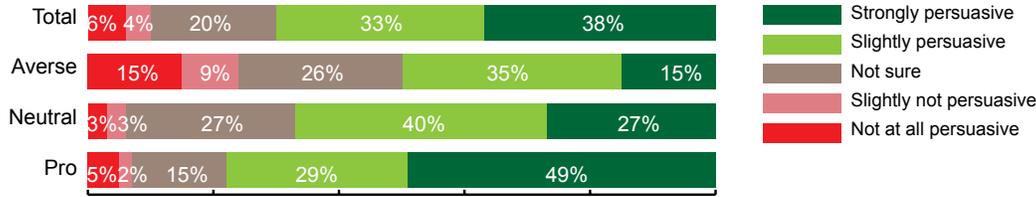


Members of Women Thinking, Inc with James Randi at The Amazing Meeting 2012.

4. Arguments for Vaccines

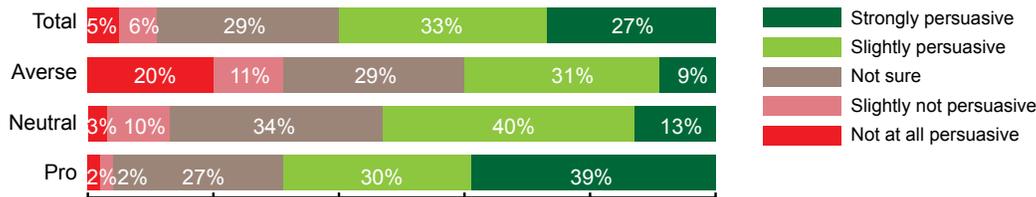
We followed up the anti-vaccination arguments by giving parents five arguments for vaccinations.

Figure 24: Infectious diseases that could kill your child are still around, and immunization is the only thing keeping them from being more prevalent. Sadly, many children in the US die every year from preventable diseases. Immunizing protects your child.



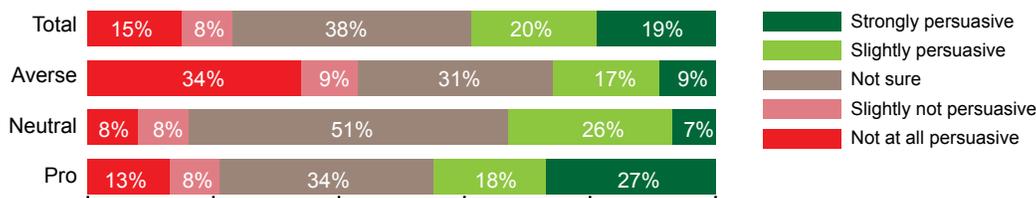
As we saw in the knowledge section, most of the parents taking are survey already believe that infectious diseases are not so uncommon that immunizations are no longer needed. Therefore, it's not surprising that parents also find this argument very compelling, with two thirds of even the vaccine-unsure group saying this argument was persuasive (Figure 24). Even though this is clearly a good argument, it seems that parents are already on the pro-vaccine side and advocates don't need to do much convincing that infectious diseases are still a threat in modern day society.

Figure 25: The decline in vaccinations has caused new outbreaks that put our communities at greater risk. By getting the recommended immunizations, we can all do our part to make sure our communities stay healthy.



As we saw earlier, parents already know about and believe in herd immunity. Unlike the last argument, which related to the individual, this one focuses on the community. It seems that this is also an effective argument, although less so than the individually focused one. Half of vaccine-unsure parents found the argument to be slightly or strongly persuasive (Figure 25).

Figure 26: No legitimate study has ever found any link between vaccines and autism. The only study that found such a link was retracted and exposed as a fraud after it was revealed that the researcher was secretly paid hundreds of thousands of dollars by lawyers who wanted to make money suing the manufacturers of childhood vaccines. Yet, a vaccine-panic industry has emerged to take advantage of parents' worst fears, making millions by selling misinformation to people who only want what is best for their children.

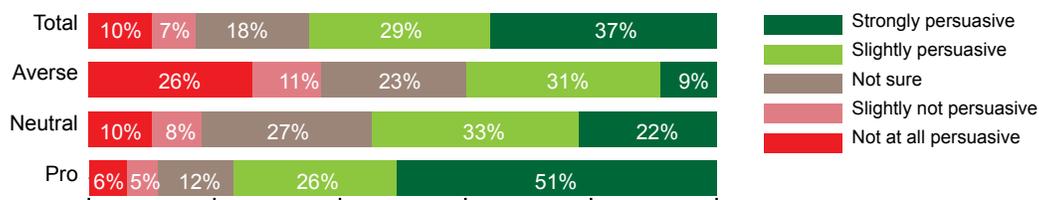


Read any science-based website promoting immunizations and you'll find the story of Andrew Wakefield, the man responsible for the original study, showing that autism and vaccines might be connected. His study was later retracted for fraud and his medical license was revoked. This story is often used to convince parents

that there is no evidence on the anti-vaccination side. However, based on our survey, this is one of the least persuasive arguments pro-vaccination advocates can use (Figure 26). The media has been talking about vaccines and autism for so long that it's hard to convince parents that one study being retracted means that the whole thing is false. It just takes too long to explain the entire story to parents, and by vilifying the anti-vaccination proponents, advocates might actually be causing parents to go on the defensive.

When Nixon responded to the Watergate scandal by saying "I am not a crook," all the public heard was "Nixon" and "crook." By denying it, it made him look more guilty. Indeed, in the case of vaccinations, the more advocates say "vaccines don't cause autism," the more parents hear "vaccines" and "autism." By attempting to tell an entire story related to this subject, they're just making the connections of vaccines to autism stronger in parents' minds. Unfortunately, as we saw earlier, the vaccine-autism myth is one that has caught on and pro-vaccine advocates are going to have to spend time denying it. However, they should not make it their focus and are better off focusing on how safe vaccinations are than on what types of bad things they don't cause.

Figure 27: I wouldn't put my child into a car without a safety belt or a car seat. I won't put my child at risk by leaving him/her without immunizations, either. It's my responsibility to make sure my child is protected from dangerous illnesses.



Often, parents who are unsure about vaccines end up not immunizing their children or waiting until they are much older to do so. Indeed, vaccinating can seem really scary. There is a large needle involved, a complicated mix of chemicals, and usually lots of crying. As we saw earlier, parents believe the risks of immunizations to be much higher than their actual risk even though they understand the benefits associated with vaccinations. Often when unsure or worried, it's easiest to take the default route. In the case of vaccinations, the default is all too often not vaccinating. This argument comparing not vaccinating your child to not putting your child into a car seat (something no good parent would do), turns the default position on its head. It makes immunizing the passive default position and not vaccinating the active position. This argument becomes persuasive because it convinces unsure parents that not vaccinating could leave their children vulnerable to disease the way putting them in a car without a car seat leaves them vulnerable to injuries. It also associates immunizing with good parenting. This good-parenting message is one that is uncommonly used in science-based immunizations literature, yet as evidenced by our survey, it can be quite effective. In our sample, 45% of unsure parents found this argument compelling (Figure 27).

Figure 28: I trust my friends completely for advice about toys and strollers, but I trust my doctor when it comes to keeping my child safe from serious illness. There is a lot of misinformation and rumors out there about vaccines and my doctor helps me cut through the noise and do what is best for my child's health.



Finally, another persuasive pro-vaccination argument is that medical professionals provide important information about keeping children safe from serious illnesses. Although earlier we found that parents don't trust the medical community, they do seem to trust their individual pediatrician (Figure 28). By framing evidence for vaccinations as coming from expert doctors similar to their own pediatrician who care about their child, advocates can help combat many of the conspiracy theories that keep parents from believing evidence that comes from the government agencies and the medical community.

5. Media Influences

There are a number of media sources that regularly carry anti-vaccination news and stories. Pro-vaccine advocates often claim that these sources are the main reason why so many parents believe myths about immunizations. In our survey, we examined whether an individual's opinion about immunization is affected by consuming media that contains bad science about immunizations. However, we did not want participants to know which media sources we were looking at in particular, so we included a variety of other common media sources to hide the ones we were actually most interested in.

Due to their vaccine-averse reputation, we looked specifically at whether parents who watch or read *Dr Oz*, *Parenting Magazine*, or *Oprah* have higher levels of anti-vaccine sentiments than the general populace. We found that both parents who watched *Dr. Oz* and those who read *Parenting Magazine* were not any more likely to be opposed to vaccinations than people who do not consume these media sources.

Contrary to what we thought, *Oprah* viewers were found to be more pro-vaccine than the parents in our sample who do not watch *Oprah*. *The Oprah Winfrey Show* is often blamed for starting the modern day anti-vaccination movement by allowing Jenny McCarthy to talk about her belief that her son contracted autism from vaccinations. However, our survey does not seem to bear this out, and in fact shows the opposite, though it is not clear why. This result was shown to be statistically significant at the 95% level.

Previously, the pro-vaccination community's approach has been to combat common media outlets known for anti-vaccine sentiment. We conclude that this is fruitless labor because, due to the abundant quantity of media sources available to the general public, one particular resource does not have a distinct effect. Additionally, though these media sources might sometimes communicate bad science related to vaccination, they overwhelmingly feature subject matter not related to the topic. A really bad individual episode likely does not have much effect on its own. It's more likely that the preponderance of anti-vaccination views in the media as a whole and the parenting culture are more likely at fault rather than any one single source.

Discussion

Upon beginning this project, we predicted that the public lacked a clear understanding of vaccines and how they work, not only within the body, but also in protecting the entire community. Vaccine advocates believe that vaccines are victims of their own success. The public minimizes the seriousness of most vaccine-preventable diseases due to a lifetime of non-exposure, therefore resulting in the mindset that most vaccines are frivolous.

Based on our survey results, however, we learned that parents do understand the seriousness of vaccine-preventable diseases despite having never experienced them. They also understand that there is a real risk associated with not being vaccinated and that the risk increases as vaccine compliance decreases.

Additionally, parents comprehend the concept and importance of herd immunity. However, they are still wary of vaccines even when they believe that immunizations are vital to individual and public health. Their fears stem from a lack of understanding vaccine risks compared to the disease risks. Hence, the choice between potentially contracting disease(s) versus having complications from vaccination (either real or imagined) is a matter of choosing the lesser of two evils.

Anti-vaccine messages are effective because they reinforce the conviction that vaccines cause real and relatively widespread harm. Furthermore, these same messages support the belief that autism is a side effect of vaccines and that vaccines are filled with so-called "toxins."

We believe that vaccine advocates have missed the core of the public who is wary of vaccines by assuming they are ignorant of the facts, therefore focusing on disease and prevention while widely ignoring their bigger concerns. The strategy has been to present the facts, assuming that the minds would follow. This has worked in that the majority of parents continue to vaccinate despite fears, but many of those parents are still choosing delayed vaccination schedules and opting out of some vaccines altogether.

Parents who are convinced by the science and evidence alone are already on our side. However, the large number of parents believing anti-vaccination arguments still causes enough anxiety that the science of disease prevention is not enough. Many undecided parents are falling prey to the idea that we need a compromise between the vaccine schedule we have and no vaccines at all. In their

minds, a reasonable solution seems to be a reduction or delayed vaccination schedule that balances the necessity of vaccinations and their overall scariness.

A combined strategy targeting parents' intellectual understanding of vaccines and their emotional reaction needs to be employed. Currently, the anti-vaccine movement does this. They offer made-up facts that, to the layperson and especially the overwhelmed new parent, are indistinguishable from the legitimate, scientifically supported facts being presented by the pro-vaccine messages. The anti-vaccine messages have an advantage because they combine their information with emotionally gripping stories of vaccine injury that do not have to be fully convincing to give a parent enough pause to ask themselves "But...what if?"

When facing the dilemma of possibly hurting their children while protecting them from disease, many parents choose a compromise of only administering required vaccinations to enter school and/or delaying vaccines. Others choose "vaccine alternatives" that offer little to no protection despite their claims. It seems reasonable to "split the difference" between vaccinating and not vaccinating, but the reality is that the children who are put on alternative schedules are not facing a significantly reduced risk of harm from vaccines, but they are facing a significantly increased risk of infectious disease.

Opting out of the recommended vaccine schedule should be reframed as an active decision that parents are opting into as opposed to one they are passively opting out of. For example, infant car seats offer important lifesaving protection with minimal risk in a similar way that vaccines do. Framing the decision on whether or not to vaccinate as a decision similar to putting a child in a car seat helps parents to understand that vaccines are the default good-parenting decision and that not adhering to the recommended schedule is an action with consequences, not a safe and passive compromise.

Current vaccine literature tends to focus on vaccines as the first line of defense for preventing disease. This is important, but we also need to focus on reassuring parents that the risk of vaccinating is small, especially compared to the risk of disease.

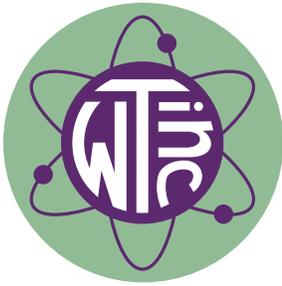
Though not included in our survey, we believe an effective way to communicate this is to compare the risk of vaccines to the necessary risks we take in daily life. What are the odds that a family will sustain serious injuries while driving to the pediatrician compared to the odds of receiving a vaccine? What

are the risks of food poisoning? We let our children play outside, in the sun, near the street; we let them swim and play sports; and even taking a bath poses a greater risk to a child's health than vaccines. These examples show parents that yes, there are risks involved in vaccinating, and it's understandable that they may be worried, but the risks are much smaller than most risks everyone takes every day. The rewards of eating and playing outweigh the risks of injury and poisoning; likewise, the long and healthy life a child gains from vaccinating outweighs the small chance of negative effects. We suggest that future marketing surveys or research address the effectiveness of these approaches.

Our survey also tells us that the pro-vaccination movement needs more citizen-based and grassroots non-profit organizations promoting immunizations. People trust their own doctors, but they do not trust doctors as a group. They also do not trust government agencies or pharmaceutical companies. The best approach to communicating emotionally wrought issues like vaccines to the public involves combining the efforts of physicians and community-based outreach.

This is a battle for both minds and hearts. Advocates should target both to penetrate the parenting culture and convince as many parents as possible to protect their children with immunizations. We plan to use these results to build an effective pro-immunization program for our Hug Me! I'm Vaccinated campaign and we hope that other organizations and individuals use the results of our survey to persuade families in their own communities to vaccinate.

About the Organizations



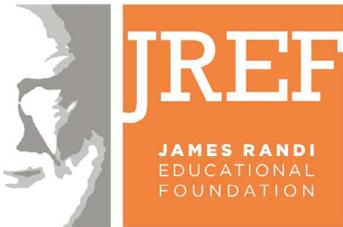
Women Thinking, Inc seeks to bring science, skepticism and critical thinking to the women of the Midwest and throughout the country. They promote and educate on the importance of childhood vaccinations and booster shots via the Hug Me! I'm Vaccinated campaign.

For more information on Women Thinking, Inc:

<http://www.womenthinking.org>

For more information on the Hug Me! I'm Vaccinated Campaign:

<http://www.hugmeimvaccinated.org>



The James Randi Education Foundation promotes critical thinking by reaching out to the public and media with reliable information about paranormal and supernatural ideas so widespread in our society today. Through scholarships, workshops, and innovative resources for educators, the JREF works to inspire the investigative spirit in a new generation of critical thinkers.

For more information on the James Randi Education Foundation:

<http://www.randi.org>

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