

**Vaccine Safety Messages as Social Action:**

**Genre Analysis of “Let’s Talk Shots”**

Layli Liss

English Department, Portland State University

WR534: Science Writing

Dr. Sara Read

June 13, 2025

## Abstract

Vaccine safety messages can be understood to reflect Carolyn Miller's conceptualization of a genre - a typified rhetorical response to the recurring exigence of vaccine hesitancy in American culture. Researchers studying health communication have found that decision-making is impacted by a person's orientation along an individualism-collectivism spectrum. This paper seeks to demonstrate how the multimedia website, *Let's Talk Shots*, represents a genre of health communication that strongly leverages an individualistic frame to influence a reader/viewer's intention to vaccinate.

## **Vaccine Safety Messages as Social Action: Genre Analysis of “Let’s Talk Shots”**

Vaccines have successfully prevented a wide range of illness and death, and public health officials strive to maintain high rates of vaccination. However, according to data from the National Immunization Survey-Child (NIS-Child), vaccine coverage has declined for children born in 2020 and 2021 when compared with the cohort born in 2018 and 2019. While the COVID-19 pandemic disrupted the primary care system which likely accounts for some of this decline, studies have indicated an increase in parental vaccine hesitancy, particularly for influenza and COVID-19 vaccines (CDC, 2024). Indeed, during the late winter and early spring of 2025 in the United States, over 1000 confirmed cases of a vaccine-preventable infection, measles, captured headlines. This represents a nearly five fold increase in the number of cases from 2024. Ninety-six percent of these cases were in unvaccinated individuals (CDC, 2025). Naturally, health communicators seek to stem these trends by crafting messages that will influence parents to vaccinate their children.

Scholars researching health communications have applied framing theory to evaluate the effectiveness of such messages. Framing theory suggests that people will respond better to messages framed in ways that are more culturally responsive (Borah, 2025). How strongly a cultural group values individualism over collectivism and vice versa is one point of cultural differentiation that communication researchers have observed (Zaharna, 2013). Cultures steeped in individualism place the individual as the focal unit of society, whereas collectivist cultures place the group as the focal unit. Individualistic message framing would thus appeal to personal goals and individual attitudes, emphasize personal choice and self-interest, and prioritize the individual’s goals over group goals. Collectivist framing would appeal to relationship and group

interdependence, emphasize community norms, and individuals would prioritize group goals and behave based on what's expected by their community. Although such denotations should not be understood categorically, that is, people within a given culture can be as different from each other as they are from those outside of their culture, researchers have found that decision-making is impacted by a person's orientation along an individualism-collectivism spectrum (Yuan and Chu, 2022; Borah, 2025).

Vaccine safety messages can be understood to reflect Carolyn Miller's conceptualization of a genre - a typified rhetorical response to the recurring exigence of vaccine hesitancy in American culture. In this brief paper, I will use genre analysis to demonstrate how *Let's Talk Shots*, a multimedia website developed by the Johns Hopkins Bloomberg School of Public Health's Institute for Vaccine Safety (IVS) leverages an individualistic frame aimed at persuading hesitant individuals to vaccinate. In doing so, I will demonstrate how the site is one example of a "significant social action" that is a culturally situated, dynamic, and evolving response to a social problem (Miller, 2014, p. 57).

## **Site Structure**

The elements of the "Let's Talk Shots" site are:

- A Home page with an FAQ linked at the bottom,
- An About Us page,
- A Resources page,
- A Welcome page,
- A Survey with Branching Logic,
- Multiple Playlist pages,
- A Video Library.

I will discuss the rhetorical strategies of the Home page and Frequently Asked Questions, the Welcome page, the Survey, and three Playlists appealing to the following personas:

- Parent of a baby concerned about developing autism after vaccination who chooses Sean O’Leary, MD as their Guide;
- Parent concerned about infertility after their teen gets the HPV vaccine who chooses Laura Riley, MD as their Guide;
- Older adult concerned about the side effects of vaccines for themselves who chooses Barbara Pahud, MD as their Guide.

The discussion will be based on a mobile view of the page, given the assumption that most readers would be viewing the content from a mobile device rather than a desktop monitor.

### **Home Page and Frequently Asked Questions**

The Home page primarily directs visitors to select a hyperlink to the Welcome page, however it also provides information about the credibility of the site and the organizations who created it. It has a header, a body with three sections, and a footer. A link to the Frequently Asked Questions (FAQ) sits at the end of the page. Short declarations that directly address the reader, highlighting their individuality, dominate the content of the Home page and FAQ.

**Figure 1***Home Page Header****Header***

The header (Figure 1) lists the site sponsor, Johns Hopkins Bloomberg School of Public Health. Beneath the title of the site sponsor is a logo paired with the title of the affiliated organization and the copyright holder, the Institute for Vaccine Safety. Beneath these, there are three additional hyperlinks to “Home,” “About Us,” and “Resources” pages.

The most notable rhetorical move is the choice to name the institutional author the Institute for Vaccine *Safety*. The word *safety* conveys to the reader the primary purpose of the organization as one that either evaluates the safety of vaccines or advocates for the development of safe vaccines. Readers without prior knowledge of the institutional author may respond more positively to this name and perceive some credibility from it. It is relatively neutral in terms of its appeal to an individualistic value or collectivist value, as safety for the individual and safety for the group is equally important.

## **Body, Section One**

### **Figure 2**

#### *Section One Image*



The dominant feature is an illustration of two semi-abstract human figures appearing to be female and male with an image of a vial floating next to each of their heads (Figure 2). An image of a shield floats in the region of each of their hearts. The use of a shield conveys the idea of protection, visually reinforcing the purpose of the site as one that establishes or advocates for safety. The fact that the image is of just two people - one male and one female - rather than a group illustrates a more individualistic appeal.

Below the image is a call-to-action: "Answer a few questions." Underneath the call-to-action is the statement "Get evidence-based answers tailored for you" followed by two buttons labeled "Let's Talk Shots" and "Let's Talk COVID Vaccines." The "Let's Talk Shots" button is a hyperlink to the Welcome page.

Notable elements of this section include two verbal signals that speak to two different concerns in the sub-title: "evidence-based answers" and "tailored for you." The expression "evidence-based answers" signals to medical professionals that the content of the site relies on information derived from presumably legitimate research rather than

individual narratives. This, combined with the credibility of Johns Hopkins University, is a clear rhetorical appeal to ethos for medical practitioners.

The expression “tailored for you” appeals to a general audience. “Tailored” connotes that the reader will be able to cut through complicated or irrelevant information and get answers to questions they have. “For you” represents a definitively individualistic framing of the information.

### ***Body, Section Two***

The reader must scroll down to access the heading of section two which reads “Why you should talk shots,” another direct appeal to the individual reader to act. Indeed, if the reader did not respond to the call-to-action above and select the link to the survey, then it may mean they are more skeptical of the site’s content or are seeking additional evidence of the site’s credibility. The author of the site offers up additional framing that promotes an ethos of trustworthiness and is situated in an individualistic perspective. Beneath the heading are three images in a row paired with the captions:

1. “Created and vetted by people like you;”
2. “Expertise of Johns Hopkins University;”
3. “No agenda, just the evidence.”

“Created and vetted by people like you” signals to the reader that the information can be trusted because the reader’s perspective was included in the development of the site.

“Expertise of Johns Hopkins University” conveys an aura of reliability of Johns Hopkins University to audiences that are both familiar and unfamiliar with it. “No agenda, just the evidence” signals an understanding that a skeptical reader might be wary of manipulation and hidden intentions and attempts to assuage that wariness.

### **Body, Section Three**

Scrolling further takes the reader to two large text boxes aligned vertically displaying direct quotes:

1. "I thought it was overall the best information for both the clinician and the patient that I could have access to. - Family Physician, Arizona, USA;"
2. "These animations do a really good job at speaking at a level that everyone can get. - Pediatrician, Oregon, USA."

These personal testimonies are another rhetorical technique that speak from an individualistic orientation. They emphasize a personal evaluation of the content and do not express any form of group affiliation or appeal to a group norm, value, or expectation.

Beneath the text boxes is a button labeled "Frequently Asked Questions" with an arrow on the upper right corner indicating it is a hyperlink to the resource. The FAQs continue to directly appeal to the reader as an individual whose personal interests are paramount. Such appeals are emphasized in italics below:

Q: What is Let's Talk Shots?

A: LetsTalkShots is a website designed *to support you* with vaccine decision-making. It shares information *on your top questions*. The website was developed first *by listening to people like you* with questions about vaccines, who told us that they were looking for straightforward and science-based information they could trust.

Q: How *do I know* if the content presented is factually correct?

A: We started by asking a lot of people, *just like you*, about the things they wonder and care about when it comes to vaccines.

Q: How does the website know what information *to provide to me*?

*A: Because you guide it! When you visit our page, you take an anonymous survey that assesses what you are wondering about*

### **Footer**

Here the rhetorical goal is more limited: acknowledging the contributors to the project. Scrupulous readers may investigate this element. The reader will see the heading “Created by.” Beneath the heading is a carousel object that displays the logo for Johns Hopkins Bloomberg School of Public Health. When advanced, the carousel will display another slide identifying the next contributor. There are 11 contributors. Beneath the carousel is the name of the site copyright holder, the Institute for Vaccine Safety, followed by its physical address and an email address for information.

### **Welcome Page**

It is likely that most viewers will not enter the Welcome Page (Figure 3) through the Home Page, but rather be directed to the there either by someone, likely a health-care provider, referring them to it or through an internet search. Thus, it immediately operationalizes an individualistic frame by greeting the reader and directing them to “Please choose a guide.”

Before investigating the slate of guides from which the reader can choose, it is useful to examine the title of the site which is shared in the greeting. “Let’s Talk Shots” addresses the rhetorical task of recruiting the reader’s attention and good will by expressing an approachable, conversational tone. First, it uses assonance, repeating the short o vowel sound in “shots” with the soft, unrounded sound (“aw”) in “talk” to accomplish this. Next, it uses the informal term “shots” instead of “vaccines,” signaling the intent of the site to reach a non-expert, general audience. The reader can expect that the information will be delivered in accessible language.

### Figure 3

#### *Welcome Page*



There are four guides who are all doctors, and their physical appearance conveys a social identity to the reader and thus signals something about the guide's respective credibility. Three guides appear female, suggesting that the authors expect that a majority of readers will identify with or respond positively to a female guide. One of the guides, Laura Riley, appears African American while the other three appear to be of European descent.

### **Survey**


The survey itself is a powerful frame appealing to an individualistic perspective as it linguistically and tactilely conveys that the reader's singular perspective is primary and they are engaging in self-directed action.

Upon selecting a guide, the reader is directed to a survey. The image of the guide is positioned at the top of the page. The questions are the same, regardless of which guide the reader selects, however.

The informal, friendly, conversational tone persists in the survey language with the salutation “Hi” followed by the gently probing expression “tell me a bit more.” From there, the reader’s goal is articulated for them: to *learn* more about vaccines. Learning typically has a positive connotation. The sentence stem is in the first person point of view, conveying agency - again underscoring the self-directedness of the experience.

#### Figure 4

##### Side-by-Side Comparison Q1 Survey

letstalkshots.com	letstalkshots.com
 <p>Hi, please tell me a bit more about what brings you to Let's Talk Shots.</p> <p><b>I want to learn about vaccines for:</b></p> <ul style="list-style-type: none"> <li><input type="radio"/> My baby (0-2 years)</li> <li><input type="radio"/> My child (3-10 years)</li> <li><input type="radio"/> My pre-teen or teen (11-18 years)</li> <li><input type="radio"/> Me, and I am pregnant</li> <li><input type="radio"/> Me (11-18 years)</li> <li><input type="radio"/> Me (19-50 years)</li> <li><input type="radio"/> Me (50+ years)</li> </ul>	 <p>Hi, please tell me a bit more about what brings you to Let's Talk Shots.</p> <p><b>I want to learn about vaccines for:</b></p> <ul style="list-style-type: none"> <li><input type="radio"/> My baby (0-2 years)</li> <li><input type="radio"/> My child (3-10 years)</li> <li><input type="radio"/> My pre-teen or teen (11-18 years)</li> <li><input type="radio"/> Me, and I am pregnant</li> <li><input type="radio"/> Me (11-18 years)</li> <li><input type="radio"/> Me (19-50 years)</li> <li><input type="radio"/> Me (50+ years)</li> </ul>

The reader's response to each survey question will determine the next prompt or page presented to them. Appendix A lists the full survey options for each of the pathways discussed below.

### **A Message From...**

No matter which path a reader chooses, the first video in their curated playlist will come from their chosen Guide. The same message is delivered regardless of what concern the reader brings with them to the site. See Appendix B for the full transcript of these statements.

Notably, three of the four Guides emphasize their social identity as a parent: "I'm a mother," "I'm also a dad," "I'm also a mom." Placing this signal at the end of their introductory statement likely focuses the listener's attention on this identity, rather than their medical credentials. All three also state that they are sharing what they have learned from their personal "experience" rather than from research. This is in contrast with the Home page, since it emphasizes personal experience rather than evidence. Given a viewer who is a concerned parent, this strongly frames the message to appeal to the individual's concerns.

### **Playlist: Concerns about Autism with Sean O'Leary, MD**

For this experience, the reader will have selected the following answers to the survey questions:

1. I want to learn more about vaccines for *my baby (0-2 years)*
2. Do you have concerns about vaccines for babies? **Yes**
3. What's your biggest concern about vaccines for babies? *Developing autism after vaccination*

After the opening message, the viewer will encounter a two-minute, 10 second video titled "What do we know about vaccines and autism?" narrated by a male voice

who is not Sean O'Leary. The video discusses what medical researchers currently understand about what causes autism, explains the correlation fallacy and how it has led to people thinking vaccines cause autism, and ends by stating that medical research has shown that vaccines do not cause autism. The narration is accompanied by naively-drawn, stick-figure style images and animations. The full transcript is presented in Appendix B.

The video opens with the expression, "You've probably heard it before." It directly addresses the viewer and connects with their personal experience and what they have individually encountered. It continues with a rhetorical question, "What about vaccines?" which anticipates the individual reader's specific concern and directly addresses it.

Following the video discussing autism and vaccines, the viewer is directed to a four-minute video titled "What should I know about vaccines for my baby?" The title itself frames the information within an individualistic perspective. From there, the video discusses the low prevalence of vaccine-preventable diseases in children in the US, that low vaccination rates can lead to disease resurgence, that vaccine-preventable diseases can be severe or fatal, and that vaccines are safe and effective. The rhetorical approach in this transcript leans on a community protection perspective rather than use an individualistic frame. One expression, "the MMR vaccine protects your baby from three dangerous diseases" is the only direct appeal to the individual. With that said, the relatively graphic depiction of severe symptoms could alarm viewers sufficiently to motivate them to vaccinate their children.

### **Playlist: Concerns about Infertility with Laura Riley, MD**

For this experience, the viewer will have selected the following answers to the survey questions:

1. I want to learn more about vaccines for *my pre-teen or teen (11-18 years)*

2. Do you have concerns about vaccines for pre-teens and teens? Yes
3. What's your biggest concern about vaccines for pre-teens and teens?

*Infertility after getting the HPV vaccine*

After the opening message, the viewer will encounter a two-minute, 23 second video titled "What about my teen's fertility later in life?" narrated by a different male voice. Again, the title directly addresses the individual viewer and acknowledges their individual concern. The video discusses what causes infertility, how vaccines can protect fertility, and the medical consensus that vaccines do not affect fertility. Appendix C contains the full transcript. The author relies on the second person point of view periodically. For example:

- "Fertility naturally declines as you get older, but health issues can reduce fertility even when you're young."
- "One way to further protect your fertility is by being fully vaccinated against HPV."

The closing paragraph avoids using the short-hand expression "medical researchers" that was used in the autism transcript. Instead, the author references "doctors who care for adolescents, treat infertility in men and women, deliver babies, and help people prepare for pregnancy." This emphasizes the individual doctor-patient relationship rather than just citing abstract authorities.

Following the video discussing fertility, the viewer has the option to view a four-minute video titled "What should I know about the vaccines recommended for my teen?" The video discusses the vaccines recommended for pre-teens and teens and the diseases they are intended to either prevent or reduce harm. The framing is more individualistic than the video developed to describe vaccines for babies.

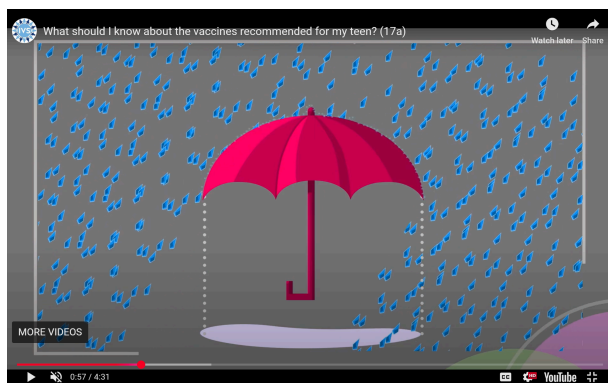
The most notable rhetorical move is the use of an umbrella-in-the-rain analogy (Figure 5) to describe the flu vaccine's effectiveness:

An umbrella can keep you dry, sometimes completely, but if it's raining very hard, it won't prevent you from getting hit by some rain. In the same way, the flu vaccine provides protection but not always complete protection...No vaccine is perfect. However, like an umbrella that reduces how wet you get in the rain, a vaccine also reduces symptoms—so your child won't get as sick if they do get infected.

An umbrella is most effective when used by a single person, not shared. The imagery is strongly individualistic. The benefits discussed are also narrowly focused on the individual or their child.

### Figure 5

#### *Umbrella in the Rain Image*



Like the video discussing vaccinations for babies, this video shifts toward a community health perspective as it describes the impact of “everyone” getting the HPV vaccine in terms of reducing the incidence of HPV infections, genital warts, and HPV-related cancer.

#### ***Playlist: Concerns about Side Effects with Barbara Pahud, MD***

For this experience, the reader will have selected the following answers to the survey questions:

1. I want to learn more about vaccines for *me (50+ years)*
2. Do you have concerns about vaccines for adults over 50? *Yes*
3. What's your biggest concern about vaccines for adults over 50? *Serious side effects*

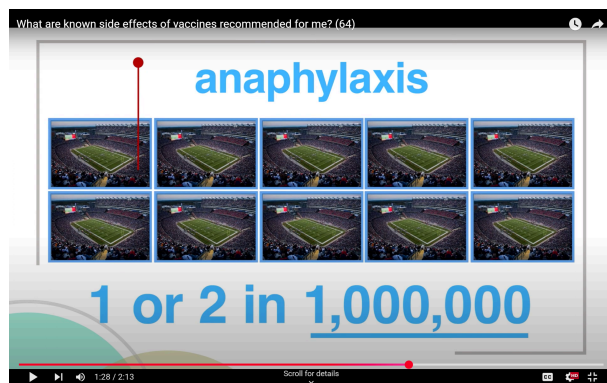
After the opening message, the viewer will encounter a two-minute, 13 second video titled "What are known side effects of vaccines recommended for me?" The narrator also has a male voice. The video discusses general vaccine safety, common mild reactions, the rarity of serious reactions, and ongoing safety monitoring. Appendix E contains the full transcript.

This video is more overtly oriented to individual decision making than the others. The author directly addresses the individual and several passages framing the information as useful for individual decision-making:

- "vaccines help protect you from serious disease;"
- "your immune system is working hard;"
- "If you have concerns, you can talk to your doctor about whether Motrin or Tylenol after vaccination is right for you."

## Figure 6

*Ten Football Stadiums Image*



To convey the low risk of anaphylaxis, the author relies on the imagery of a football stadium “filled with 70,000 adults.” The viewer is told that, “it would take about 10 filled stadiums for one person to experience anaphylaxis. That’s one or two out of one million vaccinations”(Figure 6). This comparison focuses on individual risk.

Following the video specifically addressing side effects, the viewer may choose to view one of the longer videos in the series. At nearly six and a half minutes, “What should I know about the vaccines recommended for me” assumes a longer attention span or deeper concern related to vaccines. The number of vaccines appears greater for this population, and discussing all of them takes more time. This video follows the same pattern as the previous “What should I know about” videos directed at parents. However, it leans much more heavily on understanding the individual risks of not getting vaccinated than with community health concerns. It relies on a second person point of view and also uses the umbrella analogy to describe how vaccines protect, but aren’t completely effective.

By strongly leveraging individualistic framing—emphasizing personal experience, direct address, and individualized information—*Let’s Talk Shots* aligns with culturally resonant messaging strategies for American audiences. It is a clear example of a dynamic health communication genre that responds rhetorically to the persistent problem of vaccine hesitancy in the United States. Indeed, “Mom’s Talk Shots” was a precursor to *Let’s Talk Shots* and evaluations of the approach - “algorithmically tailored videos based on parent needs to deliver an intervention that was specifically responsive to individual vaccine attitudes, beliefs and intentions, demographics, and source credibility” - indicated that it was successful in as much as the majority of vaccine hesitant respondents stated that the content was “was helpful (91%), trustworthy (85%), interesting (97%) and clear (99%) (Salmon et al, 2019, p.)” Of course, this does not necessarily translate to behavior. Nevertheless, given the overarching goal of the

website was to establish credibility and share information, such feedback suggests the strategy would be an effective supplement to other interventions.

## References

- Borah, P. (2025). Credibility perceptions of information and vaccine intention: The role of collective vs. Individual framing messages. *Health Communication*, 40(6), 1115–1124. <https://doi.org/10.1080/10410236.2024.2386718>
- CDC. (2025, June 6). *Measles cases and outbreaks*. Measles (Rubeola). <https://www.cdc.gov/measles/data-research/index.html>
- Hill, H. A. (2024). Decline in vaccination coverage by age 24 months and vaccination inequities among children born in 2020 and 2021—National immunization survey-child, united states, 2021–2023. *MMWR. Morbidity and Mortality Weekly Report*, 73. <https://doi.org/10.15585/mmwr.mm7338a3>
- Miller, C. R. (2015). Genre as social action (1984), revisited 30 years later(2014). *Letras & Letras*, 31(3), 56–72. <https://doi.org/10.14393/LL63-v31n3a2015-5>
- Salmon, D. A., Limaye, R. J., Dudley, M. Z., Oloko, O. K., Church-Balin, C., Ellingson, M. K., Spina, C. I., Brewer, S. E., Orenstein, W. A., Halsey, N. A., Chamberlain, A. T., Bednarczyk, R. A., Malik, F. A., Frew, P. M., O’Leary, S. T., & Omer, S. B. (2019). MomsTalkShots: An individually tailored educational application for maternal and infant vaccines. *Vaccine [Abstract]*, 37(43), 6478–6485. <https://doi.org/10.1016/j.vaccine.2019.08.080>
- Yuan, S., & Chu, H. (2022). Vaccine for yourself, your community, or your country? Examining audiences’ response to distance framing of COVID-19 vaccine messages. *Patient Education and Counseling*, 105(2), 284–289. <https://doi.org/10.1016/j.pec.2021.08.019>
- Zaharna, R. S. (2013, January 28). *Culture posts: Individualism, collectivism – and relationalism*. USC Center on Public Diplomacy.

<https://uscpublicdiplomacy.org/blog/culture-posts-individualism-collectivism-%E2%80%93-and-relationalism>

## Appendix A

### Survey Path: Concerns About Autism

1. I want to learn about vaccines for:
  - My baby (0-2 years)**
  - My child (3-10 years)
  - My pre-teen or teen (11-18 years)
  - Me, and I am pregnant
  - Me (11-18 years)
  - Me (19-50 years)
  - Me (50+ years)
2. Do you have concerns about vaccines for babies?
  - Yes**
  - No
3. What is your biggest concern about vaccines for babies?
  - Vaccine ingredients
  - Developing autism after vaccination**
  - Serious side effects
  - Getting too many vaccines at once

### Survey Path: Concerns about Infertility

1. I want to learn about vaccines for:
  - My baby (0-2 years)
  - My child (3-10 years)
  - My pre-teen or teen (11-18 years)**
  - Me, and I am pregnant

- Me (11-18 years)
  - Me (19-50 years)
  - Me (50+ years)
2. Do you have concerns about vaccines for pre-teens and teens?
- Yes**
  - No
3. What is your biggest concern about vaccines for pre-teens and teens?
- Vaccine ingredients
  - Serious side effects
  - Getting too many vaccines at once
  - The HPV vaccine is too new
  - Increased sexual activity after getting the HPV vaccine
  - Infertility after getting the HPV vaccine**
  - My child is afraid of needles

### **Survey Path: Concerns about Side Effects**

1. I want to learn about vaccines for:
- My baby (0-2 years)
  - My child (3-10 years)
  - My pre-teen or teen (11-18 years)
  - Me, and I am pregnant
  - Me (11-18 years)
  - Me (19-50 years)
  - Me (50+ years)**
2. Do you have concerns about vaccines for pre-teens and teens?

**Yes**

No

3. What is your biggest concern about vaccines for adults over 50?

Vaccine ingredients

**Serious side effects**

I'm afraid of needles

## Appendix B

### Transcripts of “A Message From...” Videos

#### ***Dr. Laura Riley***

Hello, I'm Dr Laura Reilly and I'm the Vice Chair of Obstetrics at Massachusetts General Hospital and I'm a mother. We've all heard lots of things about vaccines: good and bad and about their potential side effects. Let me share with you what I've learned from my experience and what I tell my family, my friends, and my patients.

#### ***Dr. Sean O'Leary***

Hi, I'm Sean O'Leary and I'm a pediatrician. I'm also a dad. We've all heard lots of things about vaccines good and bad and there's so much information out there that I understand that it's difficult to separate what's true and what's not true. Let me share with you what I've learned from my experience as a pediatrician and as a father about the safety of vaccines and what I share with all of my friends and family and my patients.

#### ***Dr. Lindsay Bradbee***

I'm Dr Lindsey Bradbee. If you're anything like me, you want to make sure you're making the correct decision regarding vaccines for yourself and your family. There can be lots of misinformation out there and it's difficult to tell what's true and what isn't. My hope is that these short videos provide answers to some of the questions you may have.

#### ***Dr. Barbara Pahud***

Hello, I'm Barbara Pahud, and I'm a pediatric infectious disease specialist at Children's Mercy Hospital. I'm also a mom. There are so many opinions out there about vaccines—on Facebook, the internet, social media, blogs, and from your

neighbors. It can be very difficult to figure out who to trust. So let me share with you what I've learned from my experience as a pediatrician and as a mom, and what I tell my friends, my family, and my patients about vaccines.

## Appendix C

### Transcripts for Concerns about Autism

#### *What Do We Know About Vaccines and Autism?*

You've probably heard it before: someone saying that vaccines cause autism. What causes autism? Medical researchers have long studied the factors leading to autism. While research continues, here's what they've discovered so far. Autism can develop from genetic and environmental influences. These include advanced parental age, complications that occur in pregnancy such as low birth weight and premature birth, and pregnancies spaced less than a year apart. Autism also tends to run in families, meaning genes play a strong role, but scientists need to know more, so they continue to conduct research. This can leave parents wondering what caused their child's autism.

What about vaccines? Because signs of autism are often noticed around the same time children receive their one-year vaccines, such as MMR, some people have pointed to vaccines as a cause. But in fact, signs of autism can sometimes be seen in babies as early as six to nine months of age, long before the MMR vaccine is given. Even so, people often think that if two events happen at about the same time, they must have a cause and effect relationship—that one event must cause the other. This mistake is so common it's called the correlation fallacy.

Here's an example: every morning there are auto accidents. Lots of people take vitamins in the morning before their daily drive to work or school or wherever. Since some people take vitamins and then get in a car accident, does this mean that vitamins cause car accidents? Certainly not. Because two events happen around the same time does not necessarily mean one causes the other.

Just like vaccines and autism, medical researchers have conducted more than a dozen studies totaling millions of children focused on autism and vaccines. The evidence is clear: vaccines do not cause autism.

***What should I know about vaccines for my baby?***

Rubella, whooping cough, Hib, polio—many diseases are now rare in the United States since most American children are vaccinated against them. But because these diseases are rare, it's easy to ignore them. Some of these diseases, like measles, are still common elsewhere around the globe. So when enough children in a community are not vaccinated, these diseases can reappear. And that's what's starting to happen.

Because some parents are delaying or choosing not to vaccinate their children, outbreaks of measles are again happening in the U.S. Thousands of American babies and children now get sick every year—sick from vaccine-preventable diseases. Some die.

But measles and many other dangerous diseases are preventable—how?  
Vaccines.

For example, the MMR vaccine protects your baby from three dangerous diseases: measles, mumps, and rubella. About one child in twenty infected with measles also gets pneumonia. About one out of one thousand gets a brain infection, which can lead to brain damage. And one or two of those one thousand children die. But there's a solution. The MMR vaccine is highly effective in protecting babies against measles, mumps, and rubella. Vaccinated children are far less likely to become infected and far less likely to become seriously ill with these diseases.

Pertussis, also known as whooping cough, has been greatly reduced in the U.S. because of vaccines. But it's still around—more than 20 million cases every year worldwide and tens of thousands in the U.S. The reasons? Whooping cough is easy to

spread. Protection from the vaccine wanes over time, and some parents are delaying or choosing not to vaccinate their children.

Unvaccinated babies are more likely to get whooping cough and transmit it to others. Whooping cough is serious and can last for weeks. Violent coughing fits give the disease its name, as babies must struggle for air through their swollen windpipes. Sometimes babies vomit from coughing so hard, or turn blue and pass out from lack of oxygen. The intensity of the coughing fits can even lead to bleeding in the eyes or brain, broken ribs, dehydration, starvation, and seizures.

Now, Hib—Hib stands for *Haemophilus influenzae* type B, an infectious bacteria. Before 1985, Hib was the leading cause of brain infections among children under five. About 20,000 cases of severe Hib disease occurred in this age group every year, many resulting in deafness, blindness, and severe brain damage. Each year, about 1,000 young children died from Hib. Then the Hib vaccine was introduced—and Hib disease nearly disappeared.

Now there are fewer than 50 cases among young children in the U.S. each year, mostly in children who didn't have all their shots. Within 20 years, the Hib vaccine nearly eliminated Hib disease, preventing thousands of children from becoming deaf, blind, or suffering severe brain damage.

Finally, polio. At one time, paralysis and iron lungs were common. Thanks to vaccines, polio is nearly gone from the United States and hopefully can soon be eradicated throughout the world. Vaccines have turned diseases that were once frequent into rare events.

Choosing to vaccinate helps protect babies, children, and communities from dangerous diseases.

## Appendix D

### Transcripts for Concerns about Fertility

#### *“What About My Teen’s Fertility Later in Life?”*

For many people, fertility is important. About one out of every 10 men and women report infertility issues. Doctors define infertility as one year or longer of unprotected sex that does not result in a pregnancy. Lots of things can cause infertility. Fertility naturally declines as you get older, but health issues can reduce fertility even when you’re young. Obesity, alcohol, smoking, or exposure to certain chemicals can play a role. Sexually transmitted infections can cause infertility, as can other infectious diseases such as Zika and tuberculosis, and it can be genetic.

However, no vaccine has ever been shown to reduce short or long-term fertility for women or for men. This includes vaccines given to teens and pre-teens like the HPV vaccine, which has been used in the U.S. since 2006. Some women report that vaccines have caused short-term changes with their period, which return to normal on their own. It’s normal for stress and infection to cause short-term changes to a woman’s period, but these short-term changes do not impact fertility.

In fact, HPV vaccine can actually help protect against certain fertility issues in the future by preventing HPV infection. Cervical cancer, penile cancer, and other HPV-related cancers often must be treated with chemotherapy or surgery, which can then lead to infertility. One way to further protect your fertility is by being fully vaccinated against HPV.

Medical organizations that represent doctors who care for adolescents, treat infertility in men and women, deliver babies, and help people prepare for pregnancy confirm that there is no evidence of vaccines impacting fertility. They encourage everyone to get vaccinated on schedule, including against HPV.

***What should I know about the vaccines recommended for my teen?***

Vaccines are very safe and effective. They help protect teens from a number of dangerous diseases: influenza, HPV, meningococcus, tetanus, diphtheria, and pertussis (also known as whooping cough). Each vaccine provides two important benefits: it reduces the risk of infection, and if your child does get infected, it can reduce their symptoms so they don't get as sick.

Let's start with a familiar one: the influenza, or flu, vaccine. The flu vaccine reduces—but doesn't eliminate—the risk of getting infected with the influenza virus. Think of a vaccine like an umbrella in the rain. An umbrella can keep you dry, sometimes completely, but if it's raining very hard, it won't prevent you from getting hit by some rain. In the same way, the flu vaccine provides protection but not always complete protection.

No vaccine is perfect. However, like an umbrella that reduces how wet you get in the rain, a vaccine also reduces symptoms—so your child won't get as sick if they do get infected. Some people feel lousy after getting vaccinated, but that's not the flu—it's the body's immune system building protection. These reactions go away on their own within a few days and are much better than getting the flu itself.

It's also possible to get infected before the vaccine takes effect. And while the flu vaccine works for many, it doesn't work for everyone. The flu virus mutates much faster than most viruses, so having the flu—or getting the vaccine—in previous years may not protect well against this year's strain. That's why it's important for everyone to get the updated flu vaccine each year.

Another important vaccine for teens is Tdap, which stands for tetanus, diphtheria, and acellular pertussis (whooping cough). These bacterial diseases used to be common, and they're much less common now because of vaccines. However, they're still around—especially whooping cough, which is making a comeback. Outbreaks continue to occur, mostly among children whose parents delay or choose not to vaccinate.

Next is the meningococcal vaccine. Meningococcal disease is caused by bacteria and can be very serious. It spreads rapidly and can infect the brain, sometimes leading to death within 24 hours. In the U.S., outbreaks often occur among college students.

The final vaccine available to teens is the HPV vaccine. HPV stands for human papillomavirus. Most HPV infections have no symptoms at first, so people often transmit it without knowing they have it. But HPV can cause genital warts and, many years later, several types of cancer in both males and females—including cancers of the mouth, throat, cervix, anus, and other parts of the body.

HPV is extremely common. Imagine a football stadium with 70,000 teens and adults. Every year, we would expect to see more than 3,000 cases of HPV, resulting in about 600 cases of warts and 11 cases of HPV-related cancer. However, if everyone in that stadium had been vaccinated against HPV, we'd see only about one-tenth as many infections—approximately 300 cases of HPV, 60 cases of warts, and just one case of HPV-related cancer.

When teens are vaccinated, they are less likely to get infected, less likely to suffer severe symptoms, and less likely to spread these diseases to others. This is especially important because influenza and whooping cough are particularly dangerous for pregnant women, babies, and the elderly.

## Appendix E

### Transcripts: Concerns about Side Effects

#### ***“What are known side effects of vaccines recommended for me?”***

Vaccines have become big news and it seems everyone has an opinion. The science shows that vaccines help protect you from serious disease, and these vaccines rarely cause serious side effects.

Vaccines sometimes cause temporary mild reactions. These can include fever, tiredness, and swelling or redness where the shot was given. They are signs that your immune system is working hard to build strong protection.

These reactions are common and don't require treatment. However, if you have concerns, you can talk to your doctor about whether Motrin or Tylenol after vaccination is right for you.

Vaccines can rarely cause severe allergic reactions such as anaphylaxis, and the flu vaccine can rarely cause Guillain-Barré syndrome or GBS, a serious neurological condition. Fortunately, serious side effects like these are extremely rare.

How rare? Imagine a football stadium filled with 70,000 adults. If everyone in the stadium got the flu vaccine, it would take about 10 filled stadiums for one person to experience anaphylaxis. That's one or two out of one million vaccinations.

GBS is also very rare for older adults. It's estimated that GBS happens about three times for every one million flu vaccines. That's about five completely filled stadiums for one occurrence of GBS due to the vaccine.

Finally, it's important to know that public health experts are always monitoring the safety of vaccines, even after the vaccines have been approved, licensed, and given to millions upon millions of people. Vaccines are continually checked for safety and effectiveness.

***What should I know about the vaccines recommended for me?***

Vaccines can help protect adults from a number of dangerous diseases, including influenza, tetanus, diphtheria, pertussis (also known as whooping cough), pneumococcus (which causes pneumonia), varicella zoster virus (which causes shingles), and respiratory syncytial virus (RSV).

Each vaccine provides two important benefits: it reduces your risk of infection, and if you do get infected, it reduces the severity of your symptoms so you don't get as sick.

Let's start with a familiar vaccine: the influenza, or flu, vaccine. The flu vaccine can reduce—but does not eliminate—your risk of getting infected with the influenza virus.

Think of the flu vaccine like an umbrella in the rain. An umbrella can keep you dry, sometimes completely. But if it's raining very hard, an umbrella won't stop all the rain from reaching you. Similarly, the flu vaccine offers protection but sometimes not complete protection. No vaccine is perfect. Because the flu virus mutates rapidly, everyone needs an updated flu vaccine each year.

People who are older or have certain health conditions may have weaker immune systems and may not develop as much protection from vaccines as they once did. Fortunately, there are three enhanced flu vaccines specifically designed for people aged 65 and older.

Like an umbrella that reduces how wet you get in the rain, the flu vaccine can reduce your symptoms, helping ensure you don't get as sick if you do become infected.

Some people feel lousy after getting the flu vaccine, but this isn't the flu—it's the body's immune system building protection. These reactions disappear within a few days and are far better than actually getting the flu.

It's also possible to get infected before the vaccine takes effect, and while the vaccine works for many people, it does not work for everyone.

Are there serious, life-threatening side effects from the flu vaccine? Yes, but they are extremely rare. Imagine a football stadium filled with 70,000 adults. If all of them got the flu vaccine, it would take more than five completely filled stadiums before one person experienced a serious side effect.

Now consider the risks of flu infection. If a stadium of 70,000 unvaccinated people were exposed, over 6,000 would get the flu. About 230 of them would be hospitalized, and 23 would die. In contrast, if the same group had been vaccinated, you'd see about 3,800 cases of flu, 140 hospitalizations, and 14 deaths. Flu vaccines protect most people, most of the time. Because you can get the flu more than once, choosing to get vaccinated every year helps maintain protection.

Another important vaccine for adults is Tdap, which protects against tetanus, diphtheria, and acellular pertussis (whooping cough). These bacterial diseases used to be common but are now much rarer thanks to vaccines. However, they still exist, and whooping cough is making a comeback, especially in people who are unvaccinated or not up to date on their vaccinations.

Because immunity to pertussis wanes over time, all adults are advised to get a Tdap or Td booster every ten years to stay protected.

For adults aged 65 and older, the pneumococcal vaccine is another important tool. Pneumococcus is a bacteria that can cause serious diseases, including pneumonia, which can be deadly—particularly for older adults.

Adults aged 50 and older are eligible for the shingles vaccine. Shingles is caused by a reactivation of the varicella (chickenpox) virus that remains in the body after childhood infection. One in three adults will get shingles, which causes a painful rash of blisters. In some cases, severe pain persists long after the rash goes away.

Lastly, the RSV (respiratory syncytial virus) vaccine is available to adults aged 60 and older. RSV is a highly contagious virus that affects the lungs and can cause pneumonia. This can be especially dangerous for older adults. For example, in a group of 70,000 unvaccinated adults over 65, about 115 would be hospitalized with severe RSV in a typical year. If all were vaccinated, that number would drop to about 7.

Very safe and effective vaccines are available to help protect you against all these diseases. By choosing to get vaccinated, you reduce your risk of infection, reduce the chance of severe symptoms, and are also less likely to pass diseases to others. This matters, especially because illnesses like influenza and whooping cough can be particularly dangerous for older adults, pregnant women, babies, and people with underlying health conditions.