

VACCINE BUZZ



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Summative Evaluation

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STUDY OVERVIEW

The Vaccine Buzz exhibition opened at the Science Museum of Minnesota in February 2014. The exhibition is located near the main entrance to the exhibit floor on Level 5 of the museum and is comprised of five exhibit components.

1. Two identical interactive computer kiosks that have five elements.
 - a. Quiz show
 - b. News video
 - c. Herd immunity simulation
 - d. Infographics
 - e. Gates Foundation whiteboard talk on power of vaccines and polio
2. Herd Immunity interactive
3. Marble Maze interactive
4. Scientist on the Spot computer kiosk
5. Infographics cards

The Vaccine Buzz exhibition is guided by two overarching main messages, which are conveyed through the individual exhibit components.

- *Primary message:* Vaccines break the chain of infection, stopping diseases from spreading in populations. By vaccinating yourself you are protecting others (the concept of “herd immunity”).
- *Secondary message:* It is a social norm to vaccinate oneself and one’s children, both for personal health and to prevent the spread of disease to others. This is especially important for those who may not be able to protect themselves because they are too young, old, or sick to be effectively vaccinated. In other words, the choice not to vaccinate is a choice to put others at higher risk.

The content within the components are designed for people eligible to make the decision to be vaccinated – upper middle school age and older. However, the exhibits were designed to ensure there were experiences for visitors of all ages to engage with.

This summative report describes how visitors experienced and interpret the Vaccine Buzz exhibition as a whole. This approach allowed us to understand what visitors were most interested in, at what level the exhibit elements are connected to each other, as well as how and where the main messages are being connected between exhibit elements.

The evaluation questions are:

- To what extent do visitors take away the main messages of the exhibition?
 - Do visitors understand that individuals’ vaccination decisions affect others?
 - Do visitors grasp the concept of “herd immunity”?
- How do visitors interact with the exhibition?
 - What is the difference in time spent on the individual exhibit components between kids and adults? Different types of visitor groups (parent/child group, adults only, kids only)?
- How do visitors interact with the individual exhibit components?

To answer these questions we conducted three different interconnected studies: 1) a counting study to understand how many visitors interact with the Vaccine Buzz exhibition during their museum visit, 2) an interview study of visitors after they complete their interaction with at least two components in the Vaccine Buzz exhibition, and 3) a timing and tracking study of visitors interacting with exhibits within the Vaccine Buzz exhibition.

METHODS

For the Counting study, an evaluator positioned him/herself close to the exhibition and drew an imaginary line on the floor. To ensure an unbiased sample, he/she observed every third visitor that crossed the line and indicated if the person stopped at the exhibit or passed by. A stop was considered standing in front of one of the exhibits for 3 seconds or more. There were three ways in which visitors could approach the exhibition – from the lobby entrance, from the other Level 5 exhibits, and from the stairs. We alternated how we did our data collection by switching off which entrance was being observed. We also alternated when data was collected to ensure we sampled during weekdays, weekends, spring break, and summer.

For the Interview study, an evaluator positioned him/herself close to the exhibition and used the red edge of the carpet in the exhibition area as the imaginary line (or in this case, actual line). To ensure an unbiased sample, the evaluator chose the third eligible visitor (age 8 or above) to exit the exhibition area by crossing over the line of the red carpet and approached him/her for an interview. We wanted visitors to have a minimal level of experience before conducting an interview, so we only interviewed people who interacted with at least two components. A total of 72 visitors were interviewed.

For the Timing and Tracking study, an evaluator positioned him/herself close to the exhibition and created an imaginary line on a part of the red carpet in the exhibition. To ensure an unbiased sample, the evaluator chose the third eligible visitor to enter the exhibition area by crossing over the line of the red carpet. Similar to the counting study, the evaluators alternated where they observed visitors from since there were three major directions in which visitors could enter the exhibition. A total of 80 visitors were observed.

RESULTS AND DISCUSSION

Total Visitation to Vaccine Buzz

From March 1 through August 31, 2014, a total of 261,078 visitors came to the museum (this number includes school groups). We counted a total of 611 visitors during this time, of which $23\% \pm 5\%$ stopped at the exhibition. Scaling this up to the total number of visitors, $60,047 \pm 13,053$ (so between 46,994 – 73,101) stopped at the Vaccine Buzz exhibition.

Overall Exhibition Use and Interest

To better understand how visitors interact with the exhibition, we will first take a look at visitor behaviors from a global, more general perspective. Overall, visitors spent a median time of 1 minute, 46 seconds in the exhibition. As illustrated in Table 1, the time visitors spent ranged from 9 seconds to over 13 minutes. The median time spent at the kiosk was not significantly different for adults and children ($U = 701, p = 0.4042$)¹.

Table 1. Total time visitors spent interacting with Vaccine Buzz exhibition

	Total (n=80)	Adults (n=45)	Children (n=35)
Median Time	1 min., 46 sec.	1 min., 45 sec.	1 min., 52 sec.
Minimum Time	9 sec.	9 sec.	25 sec.
Maximum Time	13 min., 24 sec.	13 min., 24 sec.	10 min., 47 sec.

¹ Since the data was positively skewed, the Mann-Whitney U-test (a non-parametric statistic test) was used to compare median times for both age groups of visitors.

As mentioned earlier, there were five exhibits visitors could interact with within the Vaccine Buzz exhibition: 1) one of the two identical interactive kiosks, 2) Herd Immunity interactive, 3) Marble Maze interactive 4) Scientist on the Spot kiosk, 5) and Infographics cards. As illustrated in Table 2, a majority of visitors only interacted with one exhibit in the exhibition. None of the visitors interacted with four or more exhibits. When comparing adults' and children's interactions with the exhibit components, similar amounts of adults and children interacted with one versus more than one exhibit. There was not a statistically significant difference between number of exhibits viewed by these two groups ($X^2 = 2.168, p = 0.141$)²

Table 2. Number of exhibits visitors stopped at

Number of Exhibits	Total (n=80)	Adults (n=45)	Children (n=35)
One	55%	62%	46%
Two	39%	29%	51%
Three	6%	9%	3%
Four	0%	0%	0%
Five	0%	0%	0%

When interviewed, many visitors indicated an interest with the Vaccine Buzz exhibition content. As illustrated in Figure 1, about four out of five visitors (83%) said the exhibition was interesting or very interesting. No one we talked to was not at all interested in the exhibition.

Table 3. Visitor Interest Level in Vaccine Buzz Exhibition

	Total (n=72)	Adults (n=55)	Children (n=17)
Very Interesting	55%	42%	53%
Interesting	39%	40%	35%
Somewhat Interesting	17%	18%	12%
Not at all Interesting	0%	0%	0%

Use of Individual Exhibits

All of the exhibits were used by visitors during the study. Table 4 provides a general ranking of the exhibit components visitors stopped at from most to least popular. The Marble Maze and Herd Immunity exhibits were most popular with a little over half of visitors stopping at these exhibits. The Infographic cards were the least popular component. Adults and children had similar interactions with each exhibit, meaning there was not a statistically significant difference between stops at exhibits for these groups³.

² A chi-square test of independence was used to compare number of exhibits stopped at (one, more than one) by different age group (adults, children).

³ A chi-square test of independence was used to compare interactions between adults and children at each exhibit. Results: Interactive Kiosk ($X^2 = 0.060, p = 0.806$), Marble Maze ($X^2 = 1.35, p = 0.713$), Herd Immunity ($X^2 = 2.076, p = 0.150$), Scientist on the Spot ($X^2 = 0.002, p = 0.964$), Infographics ($X^2 = 1.595, p = 0.207$).

Table 4. Stops at individual exhibit components

Element	Total (n=80)	Adults (n=45)	Children (n=35)
Marble Maze	54%	56%	51%
Herd Immunity	54%	47%	63%
Kiosk (visited either one)	30%	29%	31%
Kiosk facing the lobby*	18%	23%	11%
Kiosk facing the stairs	15%	16%	20%
Scientist on the Spot	11%	11%	11%
Infographic Cards	3%	4%	0%

* Two people stopped at both Kiosks

Visitors spent a variety of time interacting with each exhibit component. As illustrated in Table 5, Herd Immunity has the highest median time, with the maze and interactive kiosk not far behind. The Infographic cards are the element that was used by the fewest people and for the shortest amount of time.

Table 5. Total Time interacting with each exhibit

Exhibit	Median Time	Minimum Time	Maximum Time
Herd Immunity (n=43)	1 min., 20 sec.	11 sec.	4 min., 31 sec.
Maze (n=43)	1 min., 2 sec.	9 sec.	8 min., 35 sec.
Kiosk (n=24)	58 sec.	6 sec.	7 min., 8 sec.
Scientist on the Spot (n=9)	24 sec.	13 sec.	1 min., 11 sec.
Infographic Cards (n=2)	19 sec.	2 sec.	36 sec.

Table 6 shows the distribution of the visitors by the exhibits they visited and if they selected that exhibit as the most interesting. In other words, of the visitors that interacted with the Marble Maze, 75% of adults and 75% of children said it was their favorite.

Table 6. Of the exhibits you looked at, which did you find most interesting?

Exhibit components	Total adults that selected it as their favorite	Exhibit components	Total children that selected it as their favorite
Marble Maze (n=49)	75%	Marble Maze (n=16)	75%
Herd Immunity (n=42)	38%	Herd Immunity (n=16)	25%
Video Kiosk (n=25)	44%	Video Kiosk (n=5)	0%
Scientist on the Spot (n=12)	17%	Scientist on the Spot (n=3)	0%
Infographics cards (n=10)	20%	Infographics cards (n=1)	0%

Because we interviewed visitors who interacted with two or more components, this data should be interpreted cautiously; no visitor used all the components so as to be able to compare all five. But we can understand the popularity of different exhibit components and how much visitors enjoyed them. It should be noted that only three of the 72 visitors interviewed did NOT visit either the Marble Maze or Herd Immunity component.

Visitor Understanding and Learning in Vaccine Buzz

The collection of exhibits in Vaccine Buzz present a variety of information about vaccines in different ways. Connecting these five exhibits are the main messages of the exhibit: the main message, that vaccines break the cycle of infection and getting vaccinated is a health benefit for yourself and others, and the secondary message, that getting vaccinated is a social norm that everyone should participate in. While the main messages may not be explicitly stated at each exhibit, they are the intended big idea that connects the exhibition. The way in which visitors connected with and talked about these main messages is explored further in this section.

Over the course of the interview we asked several questions to get at what visitors learned or understood about the Vaccine Buzz exhibit as a whole and within individual exhibit components. First, we asked the question, “Overall, what would you say the exhibits in this area are about?” We anticipated that visitors may simply say “Vaccines” or “the importance of vaccines,” so other questions later in the interview probed for more specificity about what they interpreted the exhibit’s main messages to be. Below we describe visitors’ responses to many of the individual questions, and later a broad view of the entire interview to assess visitors’ overall understanding and learning from the exhibit.

Exhibit Main Messages

The first open-ended question on the interview asked for visitors’ perspective about what the exhibits were about. This question yielded responses that reflect what visitors thought the museum was trying to communicate through the exhibit. As shown in Table 7, some of the topics that visitors provided were health and prevention, the idea of “herd immunity,” and facts about vaccines. Beyond these topics, some visitors interpreted the messaging of the exhibit as a persuasive argument for either the benefits of vaccines or encouraging people to get vaccinated.

Table 7. Overall, what would you say the exhibits in this area are about? (Open-ended)

Codes	Total (n=72)	Adults (n=55)	Children (n=17)
Health and Prevention	28%	25%	35%
Encouraging people to get vaccinated	18%	13%	35%
“Herd Immunity”	17%	20%	6%
Importance / Benefits of immunization	11%	14%	0%
Communicating facts about vaccines	4%	5%	0%
Interactive Experience	8%	7%	12%
Other	14%	14%	12%

Adults and children were most likely to make a comment that the exhibit was about health or prevention of getting sick. More children than adults thought that an exhibit message was to persuade visitors to get

vaccinated. Adults were more likely than children to speak about the benefits of vaccinations and to cite facts about how vaccines work.

Next, we asked the open-ended question, “*What is something you learned from these exhibits that you didn’t know before?*” Over half of all visitors said they did not learn anything new from the exhibit (57%). Roughly 15% of this group said they were already an expert in the area because of professional reasons, working in the medical field or having done their own research. Others simply did not recall anything specific.

About 20% of visitors mentioned a specific fact they learned, such as the number of people who fully vaccinate their children or low chance of getting sick after a vaccination. Another 6% of visitors mentioned a fact about the history of vaccines, such as, “*The rates that people contract disease 100 years ago compared to now.*” Beyond these isolated facts, 6% of visitors mentioned that they learned about the concept of “herd immunity.” “*If you don’t have a shot you are putting other people at risk.*” “*That vaccines affect more than just the one person. Never really thought of it that way.*” Finally, a handful of visitors said a general comment about the importance of getting vaccinated, such as, “*Vaccines, and how they are very life changing.*”

Table 8. Responses to interview question, “*What is something you learned from these exhibits that you didn’t know before?*”

Theme	Total (n=72)	Adults (n=55)	Children (n=17)
Nothing	57%	64%	35%
Facts about vaccines	22%	18%	35%
Facts about Herd Immunity	11%	9%	18%
Historic facts about vaccines	6%	7%	0%
The importance of vaccines	4%	2%	12%

In addition, we asked visitors if the exhibits had changed their thinking about vaccines and how they relate to the health of both individuals and groups. This question was intended to gain deeper insight into the ways in which the exhibit had an impact on visitor’s beliefs or knowledge about vaccines. A quarter (24%) of visitors said their thinking had changed; the remaining visitors stated their thinking had not changed, or if anything, possibly just confirmed their prior thinking. For the visitors whose thinking did change, their comments fell into two categories:

- Learning about the concept of “herd immunity.” (14% of visitors)
 - “*Vaccines are important for your health and to prevent sickness in others as well.*” (17 year old)
 - “*That it’s a public issue. Thought of vaccines as something you do just for yourself.*” (adult visitor)
- Developing a stronger belief in the importance of vaccines. (10% of visitors)
 - “*When you are young, you don’t like getting shots, but now I know how they are helpful.*” (9 year old)
 - “*I hadn’t really thought about it. I know [my son] needs vaccinations for school.*” (adult visitor)

While the number of visitors overall who noted a change in their thinking was small, when broken out by child and adult visitor responses, we see that more adults mentioned the concept of “herd immunity” and more children said their beliefs in the importance of vaccines had changed.

Table 9. How likely are you to share what you learned today with a friend?

	Total (n=71)	Adults (n=55)	Children (n=16)
Very Likely	23%	27%	6%
Likely	24%	22%	31%
Somewhat Likely	34%	31%	44%
Not at all Likely	20%	20%	19%

Visitors that said they would talk about the vaccine exhibit with friends mentioned a variety of topics. The distribution of these different topics is fairly balanced. Visitors who said they would talk about the experience of visiting the exhibit most often mentioned the Marble Maze and Herd Immunity interactive components. But for visitors who said they would talk about information they learned in the exhibit, their comments fell into four categories:

- The importance of vaccines
 - “The importance. They could save your life.” (11 year old)
 - “How the kids learned about the importance of vaccination.” (adult visitor)
- Facts about vaccines
 - “The percentage of people vaccinated.” (adult visitor)
 - “The difference in disease 100 years ago to today.” (adult visitor)
- The concept of “herd immunity”
 - “If you don’t take vaccines, you’ll get sick and you’ll get others sick.” (8 year old)
 - “Maybe just ask if they know this--that individual decisions about vaccines affect the public.” (adult visitor)
- Information the challenges misconceptions about vaccines
 - “Interesting facts and will use them in opposing arguments.” (adult visitor)
 - “All my friends know all this. I would be more likely to talk about how to change minds in anti-vaccine community. I would talk to kids about why vaccines are important.” (adult visitor)

Table 10. What would you talk about?

Themes	Total (n=60)	Adults (n=46)	Children (n=14)
The exhibit in general	27%	26%	28%
The importance of vaccines	18%	19%	14%
Facts about vaccines	18%	17%	21%
Herd Immunity	15%	17%	7%
Challenge the misconceptions about vaccines	13%	17%	0%
I won’t/I’m not sure what I would say	8%	2%	28%

Findings about specific Exhibit Components

Individual formative evaluations were conducted for many of the Vaccine Buzz exhibits, but did not include the Marble Maze or Herd Immunity components. This section is a closer look at how visitors interacted with these exhibits and how they interpreted their messages.

Marble Maze

In our interview study, 79% of visitors said they used the Marble Maze component. About half (51%) of them reported that it was the one that was most interesting exhibit they used. During the interview, visitors stated that they enjoyed the exhibit because it was game-like, challenging or required teamwork. *“It required cooperation and skill. It was hands-on.”* *“[The Marble Maze] held [my] kids attention. It took time to do so I could explain what was going on. Good pacing for a science exhibit.”*

We asked visitors to describe what they were doing when playing with the Marble Maze and how it related to the topic of vaccines. Visitor comments fell roughly into two categories; those that connected that the vaccine path helped keep them “healthy” and those that did not include the influence of vaccines in trying to “win” the game. As shown in Table 11, over 40% of visitors had difficulty making an explicit connection between what they were doing with the maze and how it related to vaccines.

Table 11. How do you think the Marble Maze related to the topic of vaccines?

	Total (n=57)	Adults (n=42)	Children (n=15)
Vaccines prevent disease	40%	38%	47%
Avoiding disease	17%	17%	20%
No connection	42%	45%	33%

Visitors who made the connection between taking the vaccinated path and having better health outcomes often used the maze as a sort of analogy to explain: *“If you didn’t get shots (blue route) you get sick (fell in holes). There were fewer holes in blue path.”* (9 year old) *“Vaccinated people are on the healthier path.”*

Less than 20% of visitors did not make an explicit connection between staying healthy or avoiding disease and getting vaccinated. *“Saw pictures of disease. Trying to avoid getting those diseases.”* (10 year old) *“Going down ‘wrong path’ you got sick.”*

Visitors who did not make a connection between the activity and the topic of vaccines either said they hadn’t read any of the text, had only watched their companions play the game, or mentioned it was about vaccines but did not elaborate.

Marble Maze Exhibit Use and Behavior

In the Tracking and Timing study, a total of 43 visitors stopped at the Marble Maze exhibit. These visitors spent a median total time of 1 minute, 20 seconds at the exhibit. As illustrated in Table 12, over three-fourths of visitors physically interacted with the exhibit, with around two-thirds of visitors interacting with another person and only 10% interacting alone.

Table 12. Behaviors at Maze exhibit (n=43)

Behavior	Yes	No
Interacted with exhibit (moves the ball, touches the knob)	77%	23%
Interacted with another visitor	67%	33%
Observed another visitor interacting	63%	37%

Confusing aspects of Marble Maze

Very few visitors found anything confusing about the Marble Maze exhibit. The three visitors that stated they were confused by the exhibit were critical of minor issues. One thought the exhibit was for intended for older children. Another criticized the ability of a maze to represent a progression through time because the ball is able to roll backwards in the maze. The final point of criticism was that the magnet wasn't strong enough to move the ball to the top of the tube. All of these seem to be minor points that only a handful of visitors had an issue with.

Herd Immunity

In the interview study, 72% of visitors said they had interacted with the Herd Immunity exhibit. Nearly 40% of visitors who had interacted with the Herd Immunity exhibit said it was most interesting to them.

As shown in Table 13, 60% of visitors made comments to suggest that vaccines (“the sticks”) prevent people from getting diseases. Nearly 30% of visitors described how the interactive showed the concept of “herd immunity.” Only 10% of visitors had difficulty explaining how it connected to the topic of vaccines.

Table 13. How do you think the Herd Immunity exhibit related to the topic of vaccines?

	Total (n=52)	Adult Visitors (n=39)	Child Visitors (n=13)
Vaccines prevent disease	60%	56%	69%
“Herd immunity”	27%	28%	23%
Other	4%	5%	0%
No connection	10%	10%	8%

The idea that the sticks (vaccines) held back the balls (disease) from getting through was a common way of describing the connection. *“Shows that the shots are a barrier that keeps germs away.”* (10 year old) *“Put the sticks in to prevent viruses from spreading.”* Some visitors elaborated on this idea to describe how vaccinated people protect others, or the concept of “herd immunity.” *“We [my son and I] put the sticks into the holes. I explained that sticks were the vaccinated people, balls were viruses, and the people were those not vaccinated. It explained herd immunity.”* *“How lots of people need vaccines for them to work.”* Visitors also made the connection that by getting vaccinated they were protecting others, *“Some people can't be vaccinated so we have to protect them.”*

The two comments that did not fall into these categories reflect other analogies for the exhibit: *“Sometimes vaccines get through, even with vaccines.”* *“Vaccines are tricky, like a screen.”*

Herd Immunity Exhibit Use and Behavior

From the Timing and Tracking data (see Table 14) we can see that almost every visitor observed (86%) interacted with the Herd Immunity Exhibit. Almost every visitor that interacted with the Exhibit was likely to do so with a partner (81%) with about half were likely to observe someone else interact with the kiosk (55%).

Table 14. Behaviors at Herd Immunity exhibit (n=43)

Element	Percent of Visitors
Interacted with exhibit (pick up sticks, puts them in the exhibit, and/or moves tube around)	86%
Interacted with another visitor	81%
Observed another visitor interacting	55%

Confusing aspects of Herd Immunity

Very few visitors found anything confusing about the Herd Immunity exhibit. Some visitors had trouble figuring out how to use the exhibit. Similar criticisms came from visitors that were frustrated by the fact that when they spun the tube sticks would fall out and not all the balls were stopped. Other visitors were not sure what the sticks and the balls represented.

Kiosk Videos

We interviewed a total of 25 visitors who used one of the two video kiosks. The two most popular videos were the Newscast video and the Infographics.

Newscast video

Of the visitors who watched the Newscast video (n=10), some thought that this video was very good at getting the main message of the exhibit across to kids, *“Great for kids because of the Muppet and actor. Help kids figure out vaccinations.”* Variations on this point were focused on the humor in the video.

Other visitors liked the Newscast video because of the dialogue between the newscasters, *“The guy saying you don’t need to be vaccinated because he was healthy and the other newscaster explaining why you still need to be vaccinated. The back and forth between them was good.”*

Infographics on the Kiosks

Visitors that made comments related to the infographics (n=10) tended to mention a fact they learned from one of the slides. The probability of lightning striking a person, a child becoming a billionaire, or how one child can infect 20 were some of the more popular responses. One person talked about it like this, *“Just the percentage [of people who fully vaccinate their kids] part that I mentioned earlier. It was the first thing we looked at, so it stuck in there.”*

Quiz Show

Very few visitors saw or recalled anything from the quiz show (n=3). The one visitor we talked to that did recollect something had this to say, *“Vaccination is the single most medical advancement even more than heart surgery.”*

Gates Video

A few visitors connected with the information in the Bill Gates video (n=7). Most comments were about how Bill Gates is using his fortune to fight polio. One visitor talked about it this way, *“Due to people not vaccinating their kids, I heard some disease are coming back that were eradicated.”*

Herd Immunity Simulation

Very few visitors that we talked to interacted with the Herd Immunity simulation (n=4). Those that did mentioned that it supported their reasons for vaccinating in the first place. One visitor made the point, “Telling people that not everyone can get vaccines due to allergies and that they don’t work for everyone. So that’s why we need more coverage.”

Confusing aspects of the Video Kiosks

Overall, most visitors found the Video Kiosks easy to use and navigate. A few individuals mentioned some minor points of confusion. One thought it was hard to operate and while another visitor thought it would have benefited from a main menu button. There were two points of confusion related to the content of the videos. One visitor had a difficult time making the connection between the odds a child will become a billionaire to vaccines. And another visitor thought the Newscast video was about smoking, not vaccines.

Overall Understanding of Main Messages

One of the reasons for conducting the Interview study was to understand whether or not visitors understand, connect with, and then plan to talk about the main messages of the exhibit. To better understand whether or not visitors were making this connection, we took a look across all of their responses to assess whether or not they mentioned the primary and secondary message at any point in the interview.

In our analysis, we separated out two ideas:

1. Vaccines prevent disease (referencing self)
2. Vaccines prevent the spread of disease (referencing groups of people)

The first category included comments that described how getting shots keep you healthy, or how vaccines can prevent you from getting deadly diseases. In contrast, the second category included references to how vaccines help more than just one person by preventing the spread of disease or protecting a group of people through “herd immunity”. As shown in Table 16, more visitors (33%) mentioned the first statement than either both statements (28%) or just the second statement about “herd immunity” (15%).

Table 16. Analysis of visitors connecting with the main messages of the exhibit.

	Total (n=72)	Adult Visitors (n=55)	Child Visitors (n=17)
How vaccines prevent disease	33%	34%	29%
How vaccines prevent disease AND “Herd Immunity”	28%	27%	30%
“Herd Immunity”	15%	16%	12%
Not articulated	22%	22%	29%

These trends generally hold true for both adults and children, suggesting that the messaging in the exhibit is comprehensible to younger visitors. Some comments that illustrate typical responses for each category by age are below:

- Vaccines prevent disease (referencing self)
 - “You can be safe from a lot of diseases with vaccinations.” (17 year old)
 - “Vaccinations. How they work, protect people, why to do them. Even if some diseases are not prevalent in the United States.” (adult visitor)
- Vaccines prevent disease (referencing self) AND Vaccines prevent the spread of disease (referencing groups of people)
 - “If you don’t take vaccines, you’ll get sick and you’ll get others sick. ... Taking the blue path is taking your shots and you are less likely to fall into the holes.” (referencing the Marble Maze Exhibit) (8 year old)
 - “Vaccines act as protection from germs and different viruses. ... Dangerous to others and you if you don’t vaccinate. Vaccinations stops disease before it starts.” (adult visitor)
- Vaccines prevent the spread of disease (referencing groups of people)
 - “Shows how getting vaccinated protects other people who aren’t.” (14 year old)
 - “Some people can’t be vaccinated so we have to protect them.” (adult visitor)

It should be noted that even though some people did not mention either message, it may not have been due to a lack of understanding or interest. In fact, for several visitors who we spoke with revealed they had a connection to the healthcare field or were teachers, they said they were familiar with the content already and did not elaborate on their responses to our questions about main messages.

One trend in the data is that visitors who saw the Herd Immunity component were more likely to at some point mention that main message, and visitors who saw the Marble Maze were more likely to talk about how vaccines prevent disease.

Only a small number (n=6) of visitors made a comment about vaccinating as a social norm. All were adults, and many cited the statistics of how many people get vaccinated or made a comment about how important it is to have a public dialog about vaccines.

Demographics

We interviewed a total of 72 visitors who had interacted with at least two of the exhibits that make up the Vaccine Buzz exhibition. In total we spoke with 17 children between the age of 8 and 18, as well as 55 adults between the ages of 19 and 71.

Table 17. Age [Interview Data]

Respondent	Total (n=72)	Others in group	Total (n=191)
8 to 18	24%	0 to 18	63%
19 to 29	17%	19 to 29	6%
30 to 39	28%	30 to 39	11%
40 to 49	24%	40 to 49	11%
50 to 71	8%	50 to 71	9%
Average	32	Average	19
Median	36	Median	9

Every visitor we talked to was visiting the Science Museum with at least one other person. As we can see in Table 1 above, we talked with people of all ages, from 8 to 71. Also of note from this table is that a majority of the groups (79%) included at least one child.

We observed 80 visitors for our Tracking and Timing study, 56% were adults and 44% were children. Additionally, 53% of the visitors were female and 48% were male.

CONCLUSION

The Vaccine Buzz exhibit provided visitors with ways to confirm or expand their understanding of vaccines and the concepts that underlie benefits. We found an overwhelming positive response to the exhibit components, their interest to visitors, and the ways they described their experience using them. Four out of every five visitors found the exhibit to be interesting or very interesting. While a little over half of the visitors we interviewed said they didn't learn anything new about vaccines, many commented that the topic is important to discuss publicly and that they enjoyed the exhibit components.

For visitors who did learn something new, they most often spoke about either new facts they had learned or deepened their understanding of the importance of vaccines for a group. Only 20% of visitors said they were not likely to share what they had learned, suggesting that at least some information or experience from visiting the exhibit was compelling enough for 80% visitors to share with others.

The two most physically interactive components, the Marble Maze and Herd Immunity components, were the most popular and most interesting to visitors. When speaking with visitors about the experience of using them, many visitors commented that they enjoyed playing with other members in their group. Some adult parents mentioned they liked having the opportunity to talk with and show their children certain facts about vaccines while using these components.

The majority of visitors were able to articulate connections to one of the two main messages of the exhibit and link it to the exhibit components they interacted with. It was slightly more common for visitors to comment on how vaccines prevent disease for an individual than the protection for a group of people. Finally, many visitors made a comment at some point during the interview about how important vaccines are for staying healthy, suggesting a broad base of support for the topic.