

Vaccine Message Framing and Parents' Intent to Immunize Their Infants for MMR

AUTHORS: Kristin S. Hendrix, PhD,^{a,b} S. Maria E. Finnell, MD, MS,^{a,b,c} Gregory D. Zimet, PhD,^a Lynne A. Sturm, PhD,^a Kathleen A. Lane, MS,^d and Stephen M. Downs, MD, MS^{a,b}

^aDepartments of Pediatrics, and ^dBiostatistics, Indiana University School of Medicine, Indianapolis, Indiana;

^bRegenstrief Institute, Inc, Indianapolis, Indiana; and ^cRyan White Center for Pediatric Infectious Disease, Riley Hospital for Children, Indianapolis, Indiana

KEY WORDS

MMR, vaccines, vaccination, messaging, communication, herd immunity, decision-making, attitudes

ABBREVIATIONS

ANOVA—analysis of variance

CDC—Centers for Disease Control and Prevention

LSD—least significant difference

MMR—measles-mumps-rubella

SSI—Survey Sampling International

VIS—Vaccine Information Statement

Dr Hendrix helped to conceptualize and design the study, coordinated and supervised survey instrument development and implementation in the field, assisted with analyses, and drafted the initial manuscript; Drs Finnell, Zimet, Sturm, and Downs helped to conceptualize and design the study, assisted with survey instrument development and implementation in the field, assisted with results interpretation, and edited the manuscript; Ms Lane conducted the data analyses, assisted with results interpretation, and edited the manuscript; and all authors approved the final manuscript as submitted.

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Address correspondence to Kristin S. Hendrix, PhD, Children's Health Services Research, 410 West 10th St, HITS Suite 1000, Indianapolis, IN 46202. E-mail: kshendri@iu.edu

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WHAT'S KNOWN ON THIS SUBJECT: Messages emphasizing societal benefits of vaccines have been linked to increased vaccination intentions in adults. It is unclear if this pattern holds for parents deciding whether to vaccinate their children.



WHAT THIS STUDY ADDS: Findings suggest that health care providers should emphasize the direct benefits of MMR vaccination to the child. Mentioning societal benefits seems to neither add value to, nor interfere with, information highlighting benefits directly to the child.

abstract



BACKGROUND AND OBJECTIVE: Emphasizing societal benefits of vaccines has been linked to increased vaccination intentions in adults. It is unclear if this pattern holds for parents deciding whether to vaccinate their children. The objective was to determine whether emphasizing the benefits of measles-mumps-rubella (MMR) vaccination directly to the vaccine recipient or to society differentially impacts parents' vaccine intentions for their infants.

METHODS: In a national online survey, parents ($N = 802$) of infants <12 months old were randomly assigned to receive 1 of 4 MMR vaccine messages: (1) the Centers for Disease Control and Prevention Vaccine Information Statement (VIS), (2) VIS and information emphasizing the MMR vaccine's benefits to the child, (3) VIS and information emphasizing societal benefits, or (4) VIS and information emphasizing benefits both to the child and society. Parents reported their likelihood of vaccinating their infants for MMR on a response scale of 0 (extremely unlikely) to 100 (extremely likely).

RESULTS: Compared with the VIS-only group (mean intention = 86.3), parents reported increased vaccine intentions for their infants when receiving additional information emphasizing the MMR vaccine's benefits either directly to the child (mean intention = 91.6, $P = .01$) or to both the child and society (mean intention = 90.8, $P = .03$). Emphasizing the MMR vaccine's benefits only to society did not increase intentions (mean intention = 86.4, $P = .97$).

CONCLUSIONS: We did not see increases in parents' MMR vaccine intentions for their infants when societal benefits were emphasized without mention of benefits directly to the child. This finding suggests that providers should emphasize benefits directly to the child. Mentioning societal benefits seems to neither add value to, nor interfere with, information highlighting benefits directly to the child. *Pediatrics* 2014;134:e675–e683

Recent news stories have covered studies concerning vaccine-related fears, such as those surrounding the frequency and amount of vaccine administration in childhood^{1,2} and worries that the childhood immunization schedule is linked to autism.^{3,4} Other articles have discussed vaccine-preventable illnesses/death, such as 105 children dying of influenza in the 2012–2013 influenza season, most of whom were unvaccinated.⁵ Yet other headlines have explicitly mentioned the importance of societal benefits and herd immunity⁶ or articulated the impact of decreased herd immunity when vaccines are skipped.^{7–9}

Herd immunity, or the protective benefit to the overall population as a result of a sufficient number of individuals in a given area receiving vaccinations themselves, is 1 important benefit of vaccination.^{10,11} Although childhood vaccine coverage remains fairly high in the United States, there has been an overall decrease in childhood vaccination rates over the past several years coupled with increases in rates of nonmedical exemptions for school immunization requirements.^{12,13} There is evidence supporting geographic clustering of nonmedical exemptions around the United States^{12,14} and evidence that these geographic variations in vaccine refusal are linked to increased risk of illness.¹⁵ In recent years, more parents have refused to vaccinate their children or requested delayed vaccine schedules or single-dose administration for their children.¹³ They have cited fears about overloading their children's systems with too many vaccines^{16,17}; possible harm to their children, for example, due to the chemical content of vaccines, side effects, or their children being too young to handle the vaccines^{18–22}; and concerns about the link between the measles-mumps-rubella (MMR) vaccine and autism.¹⁷ Vaccine refusals and delays are a threat to herd immunity,²³ and there is evidence to suggest that parents are un-

aware of how immunization results in protection.¹⁶

Research concerning pediatric vaccine acceptance has evaluated vaccine hesitancy among parents^{24–27} and strategies for increasing vaccine acceptance. One pilot study evaluated the impact of tailored messages to address specific concerns contributing to vaccine hesitancy.²⁸ Public health campaigns have adopted several communication approaches, including attempts to assuage concerns over risks of negative outcomes after vaccination.²⁹ However, a recent study in parents of children ≤ 17 years suggests that public health messaging concerning MMR vaccination, including pictorial and narrative communication, may actually decrease some parents' intentions to vaccinate their children.³⁰

As a means to increase adults' vaccination willingness for themselves, research has supported communication approaches that highlight vaccines' benefits to society at large (eg, by presenting arguments that vaccination promotes herd immunity).^{31–34} Several studies have shown that messages underscoring herd immunity as a vaccine benefit lead to increased willingness to vaccinate oneself.^{31–34} Various explanations have been presented for this effect, including leveraging people's sense of social responsibility to vaccinate oneself for the greater good, especially for the benefit of individuals with compromised immune systems or for whom vaccination is not possible.^{31,32,34} Indeed, the Centers for Disease Control and Prevention (CDC) uses this type of appeal in its Web site content: "Unvaccinated people put themselves and others at risk for measles and its serious complications."³⁵ However, there is a question as to whether such messaging would be as effective for parents deciding whether to vaccinate their children given that some research indicates surrogate decision-making, especially for a child, differs from decision-making for oneself.^{36,37}

A systematic review of the literature on parents' decisions surrounding childhood vaccination revealed that few studies have examined whether benefits to others beyond the vaccine recipient influence parents' decisions to vaccinate their children. No single study has been designed to evaluate this topic as its primary focus.³⁸ The few studies that did examine this topic varied in approach, from focus groups in which the topic was mentioned spontaneously³⁹ to quantitative assessments such as surveys.⁴⁰ Collectively, these studies produced mixed findings about the importance of benefits to others in parents' decisions to vaccinate their children. Some respondents indicated that benefits to others was a motivator in their decision to immunize their children,^{39,40} and others reported that it was not a strong factor for them.⁴¹

With this in mind, our objective was to compare messages to determine their impact on parents' intention to vaccinate their infants for MMR. Specifically, we sought to determine whether information highlighting the MMR vaccine's benefits to the child recipient and/or to society would increase vaccine intentions compared with standard CDC MMR vaccine information.

METHODS

Overview

This study was a randomized trial in which we tested variations of vaccine messages via a national online survey administered to parents of infants. By using a factorial design, we examined 4 separate messages: (1) the MMR Vaccine Information Statement (VIS), which is standard information from the CDC⁴² describing MMR and the MMR vaccine; (2) VIS plus additional information highlighting the MMR vaccine's benefits directly to the child receiving the vaccine; (3) VIS plus additional information highlighting the MMR vaccine's benefits to society at

large; and (4) VIS plus additional information highlighting the MMR vaccine's benefits directly to the child receiving the vaccine and to society at large. Our outcome was parents' intention to vaccinate their infant for MMR. We hypothesized that the 3 message framings emphasizing the MMR vaccine's benefits would increase parental vaccine intention ratings compared with the control message group who received only the VIS, with the parents in the fourth group (benefits to child and society) reporting the highest intention ratings.

Study Sample and Recruitment

We conducted an online national survey in May of 2012. Respondents were recruited by Survey Sampling International⁴³ (SSI), a commercial sample vendor specializing in online survey delivery and sample recruitment. They recruited respondents from their body of panelists. To be eligible for participation in this study, respondents had to be ≥ 18 years of age with an infant < 12 months of age. These eligibility criteria were established to maximize the likelihood of recruiting enough respondents who had not yet vaccinated their infant for MMR. SSI respondents are compensated by SSI through quarterly financial lotteries of varying amounts of money for which they receive entries on the basis of the number of surveys they complete throughout the year. We confirmed respondents' eligibility via survey questions. We targeted a sample size of 200 per each of the 4 arms for a total of ~ 800 . This sample size afforded 80% power to detect a difference in means of 5.9 between any 2 arms, assuming a common SD of 21, using a 2-group *t* test with a .05 2-sided significance level.

Study Design

In this block randomized trial, parents were instructed to respond to the questions while keeping his or her

infant in mind unless instructed otherwise. There were 4 arms reflecting separate MMR vaccine messaging approaches to which respondents were block randomized; for every block of 4 participants, 1 was randomly assigned to each of the 4 possible arms. This process resulted in a balanced sample of ~ 200 respondents per arm, for a total of 802 participants.

The control arm received only the CDC's VIS concerning MMR and the MMR vaccine. The MMR VIS describes the illnesses, including their symptoms, as well as who should receive the MMR vaccine, when they should receive it, contraindications, vaccine risks, and what to do in the event of a serious reaction to the vaccine. This information was followed by a short synopsis of the VIS written by the investigators. The remaining 3 arms provided the CDC VIS and a brief synopsis of the VIS (exactly as it was provided in the control arm) as well as additional information either emphasizing the benefits of the MMR vaccine to (1) the child receiving the vaccine, (2) to other members of society, or (3) both to the child receiving the vaccine as well as to society (see Fig 1 A, B, and C). The messages were on a time delay such that they were displayed without navigation buttons ("Back" and "Next") appearing until 15 seconds had lapsed.

After exposure to 1 of the 4 arms, participants were then asked about their MMR vaccine intentions concerning their infants. The dependent variable was captured by the following: "On the scale below, please indicate how likely you are to have your baby receive the MMR vaccine." The 11-point response scale ranged from 0 (not at all likely) to 100 (extremely likely) in increments of 10. Participants also completed a set of questions to identify how many children they had and each child's gender and age.

In addition, respondents reported previous vaccine decisions regarding their

infants (eg, history of refusal, delayed or single-administration requests). If parents reported multiple children, a general vaccine history was also assessed for those other children. The survey concluded with a sociodemographic questionnaire.

Pilot testing, conducted online by SSI, included 25 respondents completing the survey to ensure that it was understandable and could be completed in < 20 minutes. After pilot testing, the survey was launched online. The Indiana University Institutional Review Board approved this study as exempt and waived informed consent before data collection.

Statistical Analyses

We used SAS 9.3 (SAS Institute, Cary, NC) to analyze data. Descriptive statistics were calculated including counts and percentages for categorical variables and means and SDs for continuous variables. We used χ^2 analysis and 1-way analysis of variance (ANOVA), as appropriate, to determine whether respondent sociodemographic characteristics were equitably distributed among the messaging arms. We conducted a 1-way ANOVA and an analysis of covariance to explore the impact of the 4 types of MMR messages on parents' MMR vaccine intentions. Following a significant *P* value for messaging arms, Fisher's protected least significant difference (LSD) *P* values were calculated comparing the mean vaccine intention ratings between each of the 3 messaging groups with the VIS-only control group.

RESULTS

A total of 1314 potential respondents entered the survey: 321 were determined to be ineligible because they were not parents of an infant < 12 months of age, 1 respondent had completed his/her quota for the maximum number of surveys allowed during the quarter, and 190 exited the survey before

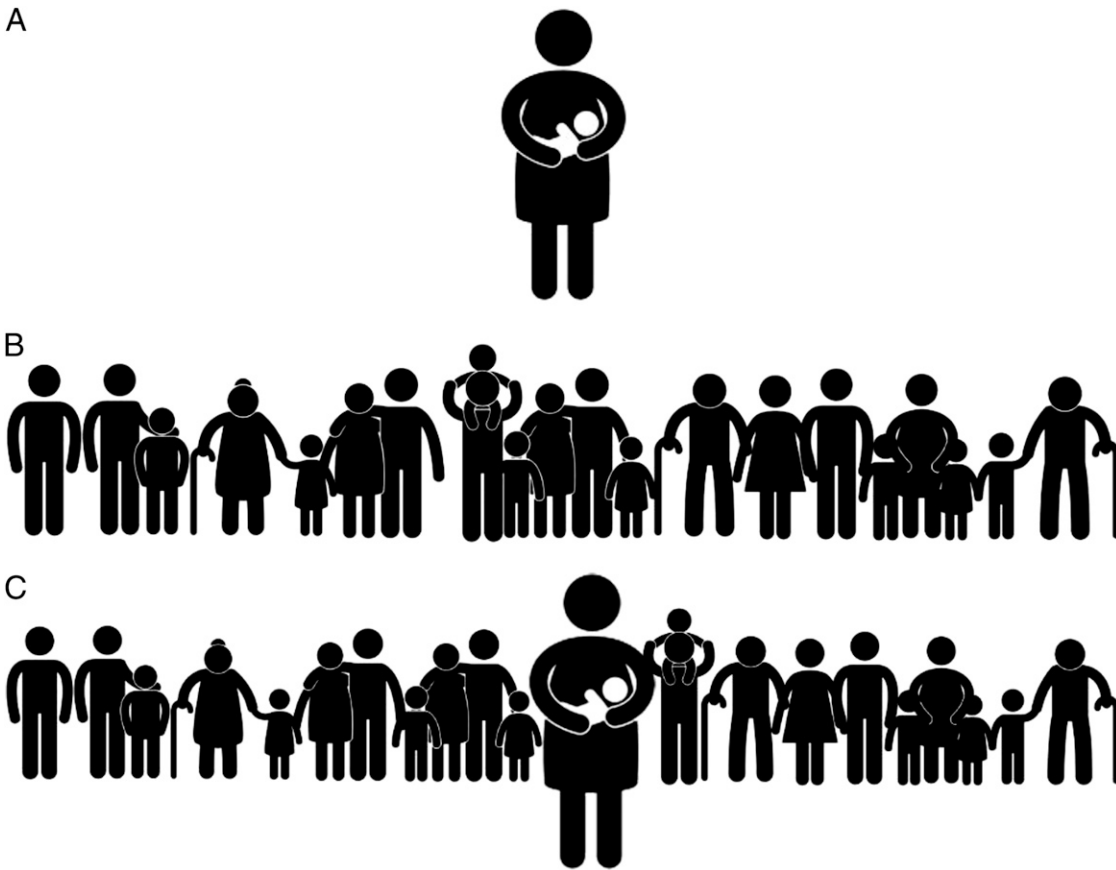


FIGURE 1

A, Benefit to infant message. The MMR vaccine protects your child from getting the diseases measles, mumps, or rubella or the complications caused by these diseases. After receiving this vaccine, your child will not miss school or activities due to these illnesses and will be able to play with friends during an outbreak. B, Benefit to society message. The MMR vaccine prevents your child from spreading measles, mumps, or rubella to those who cannot get the shot. Such people include infants <1 year old who are too young for the shot, the elderly who have outgrown their immunity, and someone with an immune system that does not respond to shots, such as some patients with cancer during therapy. C, Benefit to infant and to society message. The MMR vaccine protects your child from getting the diseases measles, mumps, or rubella or the complications caused by these diseases. After receiving the vaccine, your child will not miss school or activities due to these illnesses and will be able to play with friends during an outbreak. It also prevents your child from spreading measles, mumps, or rubella to those who cannot get the shot. Such people include infants <1 year who are too young for the shot, the elderly who have outgrown their immunity, and someone with an immune system that does not respond to shots, such as some patients with cancer during therapy.

being block randomized to a messaging arm. Thus, 802 respondents (61% of 1314) completed the survey.

Demographic data are presented in Table 1 arranged by the 4 possible arms to which participants were randomly assigned. Respondents ranged in age from 18 to 65 years old (average age of 29 years). They were mostly mothers, white, not Hispanic or Latino/a, well educated, and with a relatively high household income. Referent infants were largely covered by their parents' insurance. Respondents' sociodemographic characteristics were equitably distributed among the messaging arms, with

the exception of ethnicity, for which there was a failure of randomization ($P = .04$). Specifically, only 19 individuals identifying themselves as Hispanic/Latino were randomly assigned to the benefits to society message; this number was between 34 and 38 for the other messaging arms.

When asked if they had ever refused a vaccine for their infant, 13% of parents responded "yes." When asked if all of their children had received all of the recommended vaccinations and immunizations, 42% reported "yes," whereas 52% did not have other children. These characteristics were also equitably

distributed among the 4 arms and are shown in Table 1 ($P > .05$).

Overall, respondents reported high MMR vaccine intentions for their infants (mean = 88.8, SD = 21). One-way ANOVA revealed a significant main effect of message framing on the dependent variable of parents' MMR vaccine intentions for their infants ($P = .01$). Following this significant overall F test P value, Fisher's protected LSD P values showed that, relative to receiving only the VIS (mean = 86.3, SD = 22.5), additional information highlighting the MMR vaccine's benefits to the child produced greater vaccine intentions

TABLE 1 Respondent Sociodemographic Information as Distributed Across Message Framings

	VIS Only (<i>n</i> = 200)			VIS + Benefits to Child (<i>n</i> = 201)		VIS + Benefits to Society (<i>n</i> = 201)		VIS + Benefits to Child and to Society (<i>n</i> = 200)		Total (<i>N</i> = 802)	<i>P</i>
Age, <i>n</i>	198	200	198	200	198	198	198	198	794	.49	
Mean ± SD, y	28.5 ± 7.0	29.0 ± 7.4	29.3 ± 7.4	29.0 ± 7.4	29.3 ± 7.9	29.3 ± 7.9	29.3 ± 7.3	29.1 ± 7.4	29.1 ± 7.4		
Gender, <i>n</i>	200	200	200	200	198	198	200	798	798	.95	
Male, %	20.5	22.00	22.00	22.00	22.7	22.7	21.0	21.6	21.6		
Female, %	79.5	78.00	78.00	78.00	77.3	77.3	79.0	78.5	78.5		
Race, <i>n</i>	196	195	195	195	201	201	193	785 (reported at least 1 race)	785 (reported at least 1 race)	.06	
Black, %	15.3	11.8	11.8	11.8	15.4	15.4	20.7	15.8	15.8		
White, %	76.0	78.5	78.5	78.5	74.1	74.1	64.2	73.2	73.2		
Other/multiple, %	8.7	9.7	9.7	9.7	10.4	10.4	15.0	11.0	11.0		
Ethnicity, <i>n</i>	200	199	199	199	201	201	198	798	798	.04	
Hispanic/Latino, %	19.0	17.1	17.1	17.1	9.5	9.5	17.2	15.7	15.7		
Not Hispanic/Latino, %	81.0	82.9	82.9	82.9	90.6	90.6	82.8	84.3	84.3		
Relationship to referent child, <i>n</i>	197	199	199	199	200	200	200	796	796	.78	
Mother, %	79.7	79.9	79.9	79.9	76.5	76.5	77.0	77.3	77.3		
Father, %	19.3	21.6	21.6	21.6	20.0	20.0	20.0	20.2	20.2		
Other, %	1.0	2.5	2.5	2.5	3.5	3.5	3.0	2.5	2.5		
Highest education, <i>n</i>	199	200	200	200	201	201	200	800	800	.63	
Less than high school, %	4.5	2.5	2.5	2.5	5.5	5.5	2.0	3.6	3.6		
High school graduate, %	17.6	19.5	19.5	19.5	20.4	20.4	19.5	19.3	19.3		
Some college, %	37.2	34.0	34.0	34.0	28.4	28.4	36.0	33.9	33.9		
College graduate, %	31.2	35.5	35.5	35.5	34.3	34.3	31.0	33.0	33.0		
Graduate school, %	9.6	8.5	8.5	8.5	11.4	11.4	11.5	10.3	10.3		
Household income, <i>n</i>	198	198	198	198	199	199	195	790	790	.91	
<\$10 000, %	14.1	10.1	10.1	10.1	11.1	11.1	11.3	11.4	11.4		
\$10 000–\$24 999, %	18.7	16.2	16.2	16.2	14.6	14.6	14.9	17.1	17.1		
\$25 000–\$49 999, %	27.8	33.3	33.3	33.3	31.7	31.7	32.3	31.4	31.4		
\$50 000–\$75 000, %	24.2	21.2	21.2	21.2	24.1	24.1	24.6	22.9	22.9		
>\$75 000, %	15.2	19.2	19.2	19.2	16.6	16.6	16.9	17.2	17.2		
Referent child's health care payer, <i>n</i>	198	199	199	199	199	199	200	796	796		
Private insurance: parent's or caregiver's employer, %	42.9	45.7	45.7	45.7	45.7	45.7	51.5	46.5	46.5	.91	
Private insurance: individual, %	8.6	8.0	8.0	8.0	10.1	10.1	8.5	8.8	8.8		
Public: Medicaid or similar, %	34.3	30.7	30.7	30.7	31.7	31.7	29.0	31.4	31.4		
Medicare, %	12.1	13.6	13.6	13.6	11.1	11.1	10.5	11.8	11.8		
Uninsured/self-pay, %	2.0	2.0	2.0	2.0	1.5	1.5	0.5	1.5	1.5		
History of vaccine refusal for infant, <i>n</i>	200	201	201	201	201	201	200	802	802	.23	
No, %	84.0	90.0	90.0	90.0	84.6	84.6	88.0	86.7	86.7		
Yes, %	16.0	10.0	10.0	10.0	15.4	15.4	12.0	13.3	13.3		
All other children have had vaccinations, <i>n</i>	200	201	201	201	201	201	200	802 ^a	802 ^a	.10	
Yes, %	38.5	47.8	47.8	47.8	37.3	37.3	43.5	6.5	6.5		
No, %	5.0	4.0	4.0	4.0	8.5	8.5	8.5	41.8	41.8		
No other children, %	56.5	48.3	48.3	48.3	54.2	54.2	48.0	51.7	51.7		

Percentage estimates in Table 1 are calculated on the basis of the number (*n*) of respondents completing the question within each message framing arm.

^a Number with other children = 397; number without other children = 415.

(mean = 91.6, SD = 16.9; $P = .01$). Additional information highlighting the MMR vaccine's benefits to both the child recipient and to society also produced greater vaccine intentions than the VIS (mean = 90.8, SD = 18.2; $P = .03$). However, compared with receiving only the VIS, additional information highlighting the MMR vaccine's benefits to society did not produce greater vaccine intentions (mean = 86.4, SD = 24.9; $P = .97$) (see Fig 2).

We also used analysis of covariance to adjust for ethnicity, because it was not equitably randomized among the messaging arms. The main effect of message framing remained significant ($P = .01$). We again calculated Fisher's LSD P values to compare mean intention ratings between the messaging groups with the VIS-only control group. The Fisher's protected LSD P value between the VIS only and benefits to child message remained significant ($P = .01$), as did the comparison between the VIS-only and benefits to both child and society message ($P = .04$). The benefits to society message remained nonsignificant ($P = .95$).

DISCUSSION

Our findings suggest that emphasizing the various benefits of MMR vaccination directly to the vaccine recipient or to society may differentially impact parents' intentions to vaccinate their infants for MMR. Specifically, compared to receiving only the CDC's MMR VIS, receiving additional information underscoring the MMR vaccine's benefits directly to the child recipient or receiving information underscoring the vaccine's benefits to the child and to individuals beyond the child (ie, society) both resulted in higher intentions to vaccinate. Information underscoring the vaccine's benefits to society, without explicit mention of benefits directly to the child, did not result in higher levels of parental intentions to vaccinate.

This finding is striking because it does not replicate patterns observed in research evaluating the impact of information about herd immunity on adults' vaccine intentions for themselves.^{31–34} It appears as though information linked to increased vaccine intentions in adults, ie, information highlighting benefits to others if one vaccinates him/herself, does not also

produce higher levels of intentions in parents reporting their intentions to vaccinate their infants for MMR when compared with receiving only the MMR VIS. Although offering additional information about the MMR vaccine's benefits to society does not increase MMR vaccine intentions of parents for their infants, it does not reduce vaccine intentions, nor does it interfere with additional information highlighting the MMR vaccine's benefits directly to the recipient.

Limitations

There are limitations to our study. Although we recruited a national sample, it was not a nationally representative sample. There is the possibility that respondents who are sociodemographically different from our sample could produce different intention response patterns as a function of message framing. There is evidence to suggest that there are sociodemographic differences in vaccine acceptability; for example, compared with white or black parents, Hispanic parents are less likely to decline vaccination for their children.⁴⁴ Additionally, we do not have data on the 190 individuals who exited the survey before being assigned to 1 of the messaging arms; therefore, we are unable to conduct analyses to detect any biases in these individuals who exited the survey before exposure to messaging.

We also did not assess location of respondents, and geographic location has been linked to vaccine-related decision-making.^{12,14} We presented the information to respondents via an online survey; there is the possibility that different presentation modalities could interact with message framing to produce different vaccine intention levels. For example, messaging by a health care provider might be a more effective approach. Perhaps presenting information via personal narratives, as has been done in some vaccine

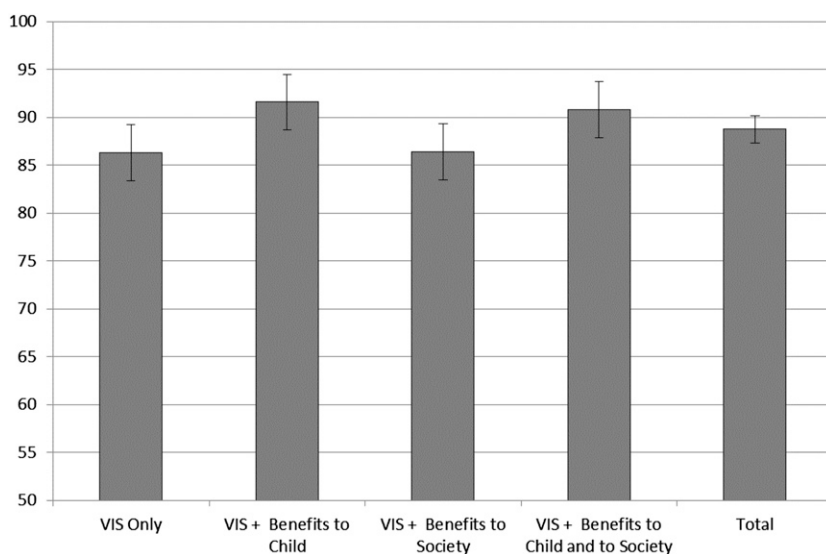


FIGURE 2

Parents' MMR vaccine intentions for their infants as a function of message framing. Mean vaccine intention ratings and 95% confidence intervals are shown.

research,^{45,46} in which families share their thoughts about the importance of a vaccine's societal benefits, would produce different outcomes. The way we operationalized societal benefits in our study reflects only 1 possible way that this concept could be defined. We chose to highlight benefits to others in one's community and provide examples (eg, patients undergoing chemotherapy) as a means to illustrate the concept of herd immunity, which can be difficult to explain. Societal benefits of vaccines could be defined differently, such as focusing on herd immunity from a regional or national level.

Moreover, we evaluated vaccine intention as our primary dependent variable. Although intention is a moderately strong predictor of actual behavior,^{47,48} we cannot conclude from our data whether parents actually followed through on their reported intentions by vaccinating their infants for MMR. Our respondents reported high levels of MMR vaccine intention across all groups (mean = 88.8 on a 0–100 scale), suggesting a possible ceiling effect, which may have limited the impact of our communication approaches. We did not use vaccine hesitancy as a criterion to determine participant eligibility in this study. Future research should focus more specifically on vaccine-hesitant parents.^{26,27} Nonetheless, our study is the first, to our knowledge, to systematically study this type of message framing on

parents' intentions to vaccinate their infants for MMR.

Last, the differences in MMR vaccine intention levels between messaging groups were modest. However, we contend that, despite these relatively modest differences, they are meaningful. From a public health perspective, even small increases in vaccine intention and subsequent behavior can have significant ramifications for coverage and maintaining herd immunity, especially in cases of particularly infectious diseases. Furthermore, we hypothesize that the mean differences we observed in our study would be greater in magnitude if a vaccine-hesitant sample were targeted to test the impact of these messaging approaches.

Conclusions

The implications of this research are potentially far-reaching. This work contributes to the emerging literature about vaccine communication with parents and can provide additional evidence to inform MMR vaccine communication approaches and perhaps vaccine communication in general. With growing interest in childhood vaccine decision aids,⁴⁹ evidence-based approaches are critical to ensuring effective communication about childhood vaccines. Moreover, this work suggests a pattern of parental focus on the child's well-being, perhaps to the exclusion of concerns about population health.

These data provide additional evidence suggesting differences in how individuals respond to information when making decisions for themselves compared with how they make decisions for their children. Previous work has indicated that adults making vaccine decisions for themselves can be motivated by information highlighting the benefits of vaccination to others beyond them; however, information highlighting benefits to others did not increase parents' MMR vaccine intentions for their children in our study. In addition to specifically studying the impact of message approaches in vaccine-hesitant parents, future research should examine these various communication approaches on actual vaccine behaviors and more directly compare parent decision-making for vaccinating oneself compared with parent decision-making for vaccinating a dependent. Future research directions should also systematically study the impact of message framing on parents' vaccine intentions for their children for different vaccine types (eg, determine whether the current pattern of findings extends to other childhood vaccine types, such as influenza vaccination).

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