

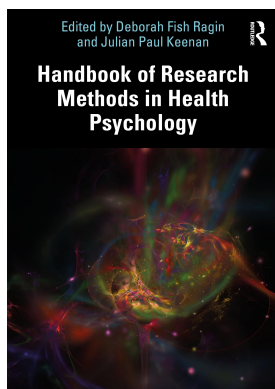
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Deborah Fish Ragin, Julian Paul Keenan

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Jennifer A. Reich

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MULTIPLE WAYS OF UNDERSTANDING VACCINE HESITANCE AND REFUSAL

Jennifer A. Reich

“My daughter is coming up on her second birthday, which is when we decided we’d start selectively vaccinating. I definitely want to keep shots to a minimum . . . but I’m struggling with what I want to move forward with. I was hoping the community could share what alternative schedules they’ve followed.”

“We haven’t vaccinated our 4½ year old daughter at all. After we did a ton of research into what vaccines actually do and don’t do, we can clearly see that vaccines do nothing good, don’t prevent any diseases, all they cause is harm in the body’s every system possible.”

Overview

This exchange in an online forum where mothers share information about their children’s health and family goals illustrates some of the contemporary disagreements about vaccines (see Reich, 2018b). Both of these mothers have rejected the vaccine schedule recommended by federal advisory boards, government agencies, and pediatric associations, yet each has landed on different views about whether vaccines are beneficial, when they might be necessary, and if and how they should be administered. Although they may seem like outliers in the world of healthcare decision-making, their views represent a growing trend.

The Gallup poll in early 2020 released data to show that while most Americans—84 percent—agree that parents should vaccinate their children, this figure is much lower than it was in 2001, when 94 percent of Americans answered that parents should (Reinhart, 2020). Of course, what people say they think is important on a poll may not fully represent what people actually do. However, when it comes to vaccines, we do know that a growing number of parents are opting out of some or all vaccines for their children (Samuel, 2017). Both **vaccine refusal**, meaning parents opting out of all vaccines by choice, and **vaccine hesitance**, in which parents reject select vaccines or delay them beyond when they are recommended by experts, are increasing. The result has been a rise in vaccine-preventable diseases (Phadke, Bednarczyk, Salmon, & Omer, 2016). This trend raises important questions. How has a technology that 20 years ago was overwhelmingly seen as an essential tool in protecting individual and community health come to be increasingly seen as a personal choice and one that is not really necessary or important? Who are the parents rejecting vaccines and expert recommendations for them? What can be done to change their minds?

Part of what is most perplexing about this trend is that those who reject vaccines are not, in fact, uneducated or anti-science, despite how they are often portrayed in the media. In fact, as I detail later in this chapter, parents who reject some or all vaccines for their children are more likely to be

white, college-educated, and have economic resources that support access to healthcare (Leask, 2011; McNutt, Desemone, DeNicola, El Chebib, Nadeau, Bednarczyk, et al., 2016). It is important that students and scholars of health understand the complexities of decision-making about vaccines as a way of understanding how parents make decisions for their children in hopes of protecting their health.

This chapter provides an overview of research on *vaccine refusal* and *vaccine hesitance* with particular attention to the different kinds of methods that reveal different information. Identifying how researchers design their studies in varied ways to answer particular questions about *vaccine hesitance* is key. For example, understanding population-level characteristics of families who opt out requires the use of existing datasets with hundreds of thousands of respondents. Some researchers wanting to understand what families do in medical encounters use administrative data that may record billing or health information like state vaccine records to identify patterns. These data were not created for the purposes of research, and thus researchers are limited by the information collected in these systems. However, they can be informative for understanding what is happening more quickly, with more generalizability, and many more participants than if researchers set out to collect that information themselves. When researchers want answers to more targeted questions, many conduct surveys to understand attitudes, decisions, and perceptions or conduct experiments where they control the options available to see how participants respond to controlled situations. To understand more in-depth questions, often with more exploratory goals, others conduct in-depth interviews with a smaller number of people or observe them in their social worlds to understand how interaction, experience, and context shape their decisions. Each of these research designs trades our ability to understand something about the broader population for a deeper understanding of a smaller number of participants. All approaches contribute to our understanding of this important topic.

In this chapter, I begin with an overview of the policies and practices of vaccination in the United States. I then highlight some studies that use quantitative data—from existing datasets and surveys—to provide important measures of patterns among parents of children who are not fully immunized. Next, I describe key ways that qualitative methods—including interviews and ethnographic observations—build on these quantitative studies to identify more subtle processes that inform parental decision-making. Finally, I point to some research that aims to identify ways to persuade parents to choose differently and fully participate in public health campaigns like those for childhood immunization.

Research in Practice

Vaccines in Context

Vaccine policy alongside vaccine decision-making are significant issues for those interested in health. Unlike most other healthcare and medical interventions in which the individual derives all of the benefit, vaccines are most effective when used by approximately 85 to 95 percent of the community (depending on the disease) to create what public health experts call herd immunity (CDC, 2001). These high levels of protection keep infectious disease contained and protect those in the community who are most vulnerable to infection, including those who are immune-compromised, are too young to be vaccinated, have lost immunity with age or illness, or for whom immunizations are not effective (Sobo, 2016).

In pursuit of these broader public health goals, parents in the United States are expected to consent to immunize their children against 13 diseases on a schedule set by a federal advisory panel, approved by the American Academy of Pediatrics, and then administered in doctors' offices as part of routine pediatric care to children. Experts typically recommend use of these vaccines between birth and six years of age, with other vaccines offered later into adolescence and young adulthood.

The expectation that parents will provide consent is communicated culturally through public health messaging, during appointments with healthcare providers, and through institutional requirements in which parents must show evidence of immunization for admission to schools or childcare settings or must file an application for an exemption as allowed in their state. Currently, all states and the District of Columbia (WDC) allow exemption for medical reasons and 45 states and WDC allow exemptions for people who have religious objections to immunizations. Additionally, 15 states allow philosophical exemptions for those who object to immunizations because of personal, philosophical, or conscientiously held beliefs (NCSL, 2020). Exemptions to vaccine requirements allow kids to attend school without evidence of immunization and are used most often by white, affluent families (McNutt, Desemone, DeNicola, El Chebib, Nadeau, Bednarczyk, et al., 2016; Smith, Chu, & Barker, 2004; Yang, Delamater, Leslie, & Mello, 2016). Studies of California, a state that until 2016 had a religious and philosophical belief exemption, suggest that by removing exemptions from law, fewer families are opting out (Buttenheim, Jones, Mckown, Salmon, & Omer, 2018).

These legal requirements for vaccination affect children prior to enrolling in school. However, many vaccines are most beneficial to younger children. As a result, pediatricians and family practitioners who provide medical care to children often must persuade parents to consent to vaccines in the first few years of life, since infants and toddlers are at highest risk of the devastating complications of infection. Whether parents perceive healthcare providers are trustworthy, empathetic, honest about what they perceive to be the possible risks of vaccination, and independent of government or pharmaceutical sources of information matters in these encounters (Leask, 2009; Paulussen, Hoekstra, Lanting, Buijs, & Hirasing, 2006; Ward, Peretti-Watel, Bocquier, Seror, & Verger, 2019). Public health agencies and pharmaceutical companies encourage parents to see the benefits of vaccines for their babies with campaigns and advertisements that promise that “vaccines help strengthen your baby’s immune system and keep him safe from vaccine-preventable diseases” and that advise parents “Love them. Protect them. Immunize them” (Reich, 2020). The result is that parents largely see vaccines as technology for personal benefit, rather than part of a community strategy and view their decision as a personal one in which they must weigh the risks and benefits for their own children but not for anyone else’s (Reich, 2016; Sobo, 2016). As an increasing number of parents approach vaccines in a cafeteria style of picking and choosing which vaccines, if any, they want for their children, rates of infectious diseases are growing, which increases risk to others (Reich, 2016). How then do we understand who the refusers are, how they come to reject vaccines, and possible solutions to this challenge to public health? It turns out that the solution requires a variety of methods and tools.

Who Are These Parents?

When the polio vaccine was licensed in 1955, it was broadly seen as a miracle that could relieve the sense of fear parents experienced as they worried about their children’s well-being (Oshinsky, 2005). Yet upon licensing, there was immediately more demand than supply. Passionate arguments about how the vaccine should be distributed, followed by whether those with private physicians and able to pay full price for the vaccine should have first claim to it, soon followed (Colgrove, 2006). As new vaccines were licensed through the 1960s, these arguments continued, particularly as good evidence showed that low-income children did not access vaccines in equal numbers as higher-income children. Public health researchers became increasingly concerned about these under-vaccinated children who lacked resources or access to medical care. In fact, many of the state-level mandates for vaccines became law through the 1960s and 1970s as a way to increase access by leveraging new federal funding for vaccines (Conis, 2015).

Despite long-standing concern about the under-vaccinated, a new trend emerged that would also concern public health experts. In 2003, county health departments began reporting the problem of children who were unvaccinated because their parents refused vaccines. In one New York county,

the county health commissioner identified an outbreak of pertussis (also known as whooping cough) that started with children who were not vaccinated because their parents had decided against it. That outbreak then spread into a neighboring county where up to 25 children also contracted pertussis (Smith, et al., 2004). Understanding which children were unvaccinated by choice was important.

Efforts to understand this outbreak specifically and broad patterns in *vaccine refusal* generally required large-scale epidemiological data that can tell us something about the population. Public health researchers Smith and colleagues from the federal Centers for Disease Control and Prevention (CDC) responded to the aforementioned pertussis outbreak in New York in the article “Children Who Have Received No Vaccines: Who Are They and Where Do They Live?” and provided an important framework for understanding vaccine refusal.

These researchers analyzed the National Immunization Survey (NIS), a survey that since 1994 has sampled parents of children 19 to 35 months of age in 27 metropolitan statistical areas in all 50 states. The CDC conducts the NIS to collect statistical information on health and does not include identifiable information about individuals. At the time (around 2001), the larger NIS was conducted by contacting households with children who are age one year or older by using list-assisted, random-digit dialing to call people. Individuals with children the right age answered a survey about each child in the home as well as demographic and socioeconomic information about the child’s mother and household, as well as answering questions about the child’s vaccination history. Interviewers then asked for consent to access children’s medical records. If parents provided consent, someone from NIS contacted these healthcare providers by mail to get children’s vaccination histories, which allowed researchers to verify whether children have received all doses of recommended vaccines and to estimate vaccination coverage rates.

This study found that in 2001, about 62.8 percent of all children 19 to 35 months of age (the age range reported for evaluations of early vaccines) in the United States were fully vaccinated, an estimated 36.9 percent were under-vaccinated, and approximately 0.3 percent were unvaccinated (Smith, et al., 2004). What was perhaps most significant in this study was the differences they uncovered between the families of children who were under-vaccinated and those that were unvaccinated by choice. The researchers found that compared with fully vaccinated children, under-vaccinated children were significantly more likely to be black (than Hispanic or white), younger, and foreign-born. Under-vaccinated children also were significantly more likely to have a mother who was young; widowed, divorced, or separated; and whose highest level of educational attainment was high school or less than a college degree. In addition, under-vaccinated children were significantly more likely to live in a household with an annual income below the poverty level and to have moved across state lines since birth. In contrast, the researchers found that unvaccinated children whose parents did not want vaccines were significantly more likely to be white, to have a mother who had a college degree, to have a mother older than 30 years of age, and to live in a household with an annual income at or exceeding \$75,000 (Smith, et al., 2004).

These findings, along with subsequent ones, have provided important information about which families opt out of vaccines. Yet over time, the question of which parents are rejecting some vaccines has become more complex. There is information that parents who would have been classified as the under-vaccinated based on the aforementioned characteristics are also intentionally skipping and spacing vaccines and that the number of parents doing so is increasing (Robison, Groom, & Young, 2012). At times, parents appear to be following an alternative schedule—consenting to some vaccines in a manner inconsistent with expert recommendations. Understanding these patterns has become increasingly important to thinking about herd immunity. Different research teams have set out to understand this trend in different ways. One group used a cross-sectional (data collected at one point in time), internet-based survey of a nationally representative sample of parents of children six months to six years of age to understand patterns in vaccine decision-making and “malleability” (Dempsey,

Schaffer, Singer, Butchart, Davis, & Freed, 2011). Their findings suggest that 13 percent of parents reported following an alternative vaccine schedule. Most delayed certain vaccines or delayed some vaccines until their children were older. They also found that even among parents who fully vaccinated their children, many feel uncertain this was the safest course. Specifically, 28 percent of parents following the recommended vaccination schedule thought that delaying vaccine doses was safer than the schedule they had used, and 22 percent disagreed that the best vaccination schedule to follow was the one recommended by vaccination experts. This study is significant in providing information about parents who delay vaccines, but also about how many parents who fully vaccinate their children lack confidence in that choice.

Another research group aimed to understand the use of alternative vaccine schedules using existing immunization information system data (Nadeau, Bednarczyk, Masawi, Meldrum, Santilli, Zansky, et al., 2014). They evaluated children born in New York State (outside of New York City) between 2009 and 2011 and identified those vaccine patterns are consistent with use of an alternative schedule. They found that of the 222,628 children studied, the proportion of children following an alternative schedule was about 25 percent. These children were significantly less likely to be up-to-date with recommended vaccines at nine months of age (15 percent) compared with those following the routine schedule (90 percent). This study is significant in suggesting that as many as one in four children may not be fully vaccinated consistent with expert-recommended schedules because of parental choice. Using newer data from the aforementioned NIS, a more recent study suggests the number of children not fully vaccinated may be even higher. Hargreaves, Nowak, Frew, Hinman, Orenstein, Mendel, et al. (2020) estimate that only 63 percent of children ages 19 to 35 months were classified as following recommended vaccine schedules and only 58 percent were up-to-date on those recommendations. This study suggests that as many as one-third of children are receiving vaccines on an alternate or delayed schedule.

How Do We Understand Parental Decision-Making?

How parents come to delay or refuse vaccines is not only a complex question but important for public health goals. Some survey data identify reasons parents space or skip vaccines, including fear of a complication or reaction (Dempsey, et al., 2011; Salmon, Sotir, Pan, Berg, Omer, Stokley, et al., 2009). Survey methods are good for understanding patterns in preferences, particularly in well-powered and randomly selected samples. However, they require a limited number of options from which respondents can choose. Those options must be known to those who design and deploy the survey and thus potentially eliminate other possibilities. Although these quantitative health data are essential for understanding broader patterns among parents in communities, they cannot necessarily elucidate the myriad reasons parents may opt to space or skip vaccines and the reasons for those decisions. They also miss the cultural contexts in which parents make these choices. A deeper exploration of how parents view vaccines requires more fine-grained measurements. How do parents decide? What values and goals do these decisions represent? How do social networks and communities shape these outcomes? Which sources of information do they trust?

In a broader effort to measure vaccine concerns in different countries, researchers from the Social Science and Immunization Project (SSIM) drew on ethnographic data along with interviews, focus groups, and surveys from Bangladesh, Ethiopia, India, Malawi, The Netherlands, and The Philippines. The SSIM was a transnational multi-institutional research project that used mixed methods to understand vaccine acceptance. With these data, the SSIM researchers were able to identify “local vaccine cultures” that reflect how parents understand health systems, share information with neighbors and families, view disease, and perceive the potency of modern medicine—including preventative measures (Streefland, 1999). This is a significant reminder of how cultural context shapes perceptions, even as the specific contexts may be different.

To understand the cultural contexts that lead to *vaccine refusal*, researchers must study vaccines and families in contexts. Returning to the United States, anthropologist Elisa Sobo, for example, used focus groups and in-depth interviews to examine the views of vaccines held by parents in a Waldorf school, a private school with low rates of immunization. Sobo found that parents were not ignorant about vaccines and infection, but rather saw vaccines as unnecessary, toxic, developmentally inappropriate, and profit driven. Most notable, Sobo found that vaccine concerns grew after school enrollment, suggesting that refusal is cultivated in social contexts and through networks—including in a school that encourages questioning health and vaccines. Quantitative studies have shown that *vaccine refusal* clusters in networks (Lieu, Ray, Klein, Chung, & Kulldorff, 2015; May & Silverman, 2003; Omer, Enger, Moulton, Halsey, Stokley, & Salmon, 2008; Salathé & Bonhoeffer, 2008)—that knowing others who do not vaccinate increases the odds that someone also will not vaccinate. Qualitative findings like these help provide explanation of these processes (Poltorak, Leach, Fairhead, & Cassell, 2005; Reich, 2018a, 2018b; Sobo, 2015). Sobo also showed that even when parents understood the scientific goals of herd immunity, they were not necessarily inclined to believe those goals were important or to perceive their role in contributing to it.

My own sociological research explored patterns of vaccine refusal and vaccine hesitance, including how parents make decisions in the context of law, health policy, cultural information, and pediatric encounters (Reich, 2016). To do so, I drew on a range of data. First, I analyzed in-depth interviews with parents, pediatricians, other healthcare providers, and key informants, which included vaccine researchers and policy makers. Second, I collected data during ethnographic observations in spaces where vaccines are discussed, including at meetings of organizations opposed to vaccine mandates, parent education events about vaccines, hearings in the vaccine injury compensation program, meetings of parenting groups discussing vaccines, and pediatric trainings at a local children's hospital. Unlike interview data, where participants respond to questions the researcher poses, ethnographic observation allowed me to analyze conversations as they occur without my prompting and to observe different social worlds that contribute to shaping the social meanings that in turn shape vaccine encounters. Additionally, I analyzed popular cultural media, online parenting blogs in which parents talk to each other about vaccines, like the ones at the beginning of the chapter, and policies relating to vaccines. Together, this research aimed to understand parent decision-making in context and to identify how broader cultural definitions of good parenting and of good health inform vaccine decisions. Rather than focusing solely on vaccines, my research identified how parents in general, and mothers specifically, see themselves as experts on their own children and able to make the best healthcare decisions for their family. Given the aforementioned patterns that White women with higher incomes are most likely to deliberately reject vaccines, this study allowed me to understand how women with privilege view both definitions of good parenting and health as a series of individual informed consumption choices (Reich, 2014).

What Changes Perceptions of Vaccines?

These different lines of research—both quantitative and qualitative—have allowed for a more nuanced understanding of how parents make decisions, what the outcomes of those decisions are, and how they are based on individually held values and views. The question then is what to do about this? Newer research has aimed to find empirically tested ways to design and implement interventions that might change parents' minds. This has led to innovative experimental designs to test how communication about vaccines affects views, which in turn has yielded some mixed results.

A group of political scientists and public health researchers set out to test how vaccine messaging affected parental views (Nyhan, et al., 2014). To do so, they conducted a two-wave online survey. In the first wave, before the intervention, participants answered questions about health and vaccine attitudes, including questions about the health status of their children and eight

“agree/disagree” questions about attitudes toward vaccines. Participants were also asked if they had ever delayed or refused a recommended vaccine, how important vaccines were to them personally, and how much trust they placed in various health professions and institutions. Then the researchers randomly assigned participants from that first survey to receive one of four pro-vaccine messages or to a control message. The messages provided information about the safety of the vaccine against measles, mumps, and rubella (MMR) or the danger of contracting MMR. The four strategies, the authors explained, were adopted from messages distributed by public health agencies and included text from the CDC. One test condition aimed specifically to correct misinformation (like debunking false claims that the MMR vaccine can cause autism). A second presented information on disease risks (including symptoms and risks of MMR infection). A third condition used dramatic narratives (including stories of parents whose children were hospitalized for MMR). The fourth test condition displayed visuals to make disease risks more salient or accessible (including images of children who are infected). After viewing the assigned message, the participants were asked a series of questions designed to assess misperceptions about the MMR vaccine, concerns about side effects, and intent to give MMR to future children.

This study found that none of the interventions increased parental intent to vaccinate a future child. They also found that “refuting claims of an MMR/autism link successfully reduced misperceptions that vaccines cause autism but nonetheless decreased intent to vaccinate among parents who had the least favorable vaccine attitudes” (Nyhan, et al., 2014: e835). Images of sick children surprisingly increased expressed belief in a link between vaccine and autism. A dramatic narrative about an infant in danger actually increased participant-reported beliefs in serious vaccine side effects. In this study and a related one of efforts to correct misinformation about the flu vaccine (Nyhan & Reifler, 2015), the authors conclude that “public health messaging might not be successful in increasing vaccination and might in fact unintentionally increase misperceptions about vaccines, thereby lowering usage. Notably, efforts to correct false information “may be especially likely to be counterproductive” (Nyhan, et al., 2014, p. e835).

Experimental studies have been important in revealing how public education efforts can have unintended consequences. However, follow-up experiments have suggested that not all messaging is unsuccessful. For example, in an effort to increase confidence in vaccines in adults (who were not necessarily parents), one study tested the effects of consensus statements like, “90 percent of medical scientists agree that vaccines are safe” or “90 percent of medical scientists agree that all parents should be required to vaccinate their children” or a combination of both. The authors found that these consensus statements appear to be positive in increasing support for vaccines (van der Linden, et al., 2015, p. 2). Information criticizing vaccines may also be influential in changing minds. Other research suggests that accessing vaccine-critical websites for as little as five to ten minutes increased the perception that vaccination carries risks, decreased fear of skipping vaccines, and possibly decreased intent to vaccinate (Betsch, et al., 2010).

Rather than focusing solely on parents, some research has focused on pediatricians and family practitioners who see children in their offices and recommend vaccines to see how they advise parents. For example, one survey of pediatricians found that 87 percent of providers in 2013 encounter *vaccine refusal*, an increase of about 12.5 percent since 2006. Exploring the outcomes of these encounters, the researchers found that 11.7 percent of pediatricians report that they always dismiss families from their practice for continued *vaccine refusal*, an increase from 6.1 percent in 2006 (Hough-Telford, et al., 2016).

How tolerant physicians should be of *vaccine refusal* is controversial, with some advocates suggesting pediatricians should no longer treat families who distrust or reject their judgment about vaccines presenting a risk to other patients, and others suggesting that partnerships with families can provide opportunities for ongoing discussions (Reich, 2016). How pediatricians emerge from their residency training programs and the experience they have with supervisors appear to shape their approaches.

One study examined how pediatric residents felt about advising parents about vaccines. The authors surveyed 87 residents at two institutions in a region with relatively high *vaccine hesitancy* and found that most residents (68 [79.1 percent]) reported feeling confident in their ability to discuss vaccines. They found, though, that residents who had observed their pediatric faculty agreeing to alternative or delayed vaccinations were more likely to believe this to be acceptable vaccine practice, which they suggest raises questions about how pediatricians are trained (Arora, Lehman, Charlu, Ross, Ardy, Gordon, et al., 2019). Others have evaluated physician views on the importance of particular vaccines (Daley, Crane, Markowitz, Black, Beaty, Barrow, et al., 2010) and to what degree parents trust physicians as a source of information (Freed, Clark, Butchart, Singer, & Davis, 2011).

Other research more directly tested provider communication to identify approaches that are comfortable for providers and more effective (Leask, 2009). One of the more interesting studies tested whether vaccine uptake was higher when a provider announced a child would be vaccinated that day or when they invited an open-ended conversation about vaccination with parents. To test this, the researchers randomized 30 pediatricians to receive no training (which served as a control), training in the “announcement” of vaccines approach, or training in the “conversation” approach. Announcements are described as brief statements that assume parents are ready to vaccinate, whereas conversations engage parents in open-ended discussions. Each approach focused specifically on encouraging use of the vaccine against the human papilloma virus (HPV), which is recommended for boys and girls between 11 and 12 years of age and older. The researchers then monitored vaccines according to a state vaccine registry and found that there was no difference in HPV vaccine rates between the control group who had not received any training and the test group that participated in open-ended discussion. However, they did find that the announcement approach led to increases in HPV uptake by about 5 to 6 percent (Brewer, Hall, Malo, Gilkey, Quinn, & Lathren, 2017). However, this approach did not lead to an increase in other vaccines recommended for teens.

One study asked four stakeholder groups to advise them on which kinds of communication and outcomes are important and to advise them on a survey. These stakeholders included parents or community members, healthcare providers, researchers, and government or non-governmental organization representatives. This method, known as a *Delphi survey*, works to find consensus on particular measures. Participants were asked to rate the importance of eight outcome domains for each of the three communication types, which included efforts to inform and educate, to communicate reminders, and to encourage community engagement. All three communication types were rated as important, but the communication styles that prioritized the “attitudes or beliefs” domain and included “trust” scored the highest and was rated most important. The authors concluded from this process that although some domains were rated higher, communication about vaccination cannot be a “single homogenous intervention,” but “has a range of purposes.” They suggest that researchers evaluating vaccination communication should select outcomes accordingly (Kaufman, Ryan, Lewin, Bosch-Capblanch, Glenton, Cliff, et al., 2018, 6520). This study reminds us that as researchers continue to evaluate which communication styles are most promising, it is clear that how information is communicated is as important as what is communicated and to whom (Thomson, Vallee-Tourangeau, & Suggs, 2018).

Conclusion

Different research designs answer different questions, and thus yield different results. Quantitative data from surveys and analysis of administrative data are important for providing descriptions of trends about who rejects vaccines, where they live, and how providers respond. Qualitative data have been used to advance contextual meanings of *vaccine hesitance* and *vaccine refusal* by examining the perspectives of those who make vaccine decisions as they perceive meanings and values. At times, findings

from qualitative studies inform quantitative studies and at other times, they help to explain patterns. Together, we can see fairly consistent patterns in qualitative and quantitative data about who rejects vaccines and some indications of why. The mechanisms by which individuals come to reject vaccines and the interventions that might change their minds are multifaceted. As a result, research cannot provide easy answers or simple solutions to affect healthcare decision-making. One research method is unlikely to yield the information researchers, practitioners, and policy makers need to advance this issue. Instead, the body of research that draws on multiple methods offers the best path forward to finding the multiple tools that may affect decision-making.

It is tempting to dismiss *vaccine refusal* as simply a personal choice and one that does not require as much attention or tests of intervention as it has received. Unlike other personal health choices, infectious disease does not reside with the individual. The outcomes can be far-reaching for everyone in a community, particularly those that are most vulnerable to the worst outcomes of infection. Looking at infectious disease historically reveals that vaccines have been seen at times as a miraculous solution to life-threatening conditions and also as a source of misgivings (Colgrove, 2006). Yet as parents increasingly voice distrust of vaccines and delay or reject them, they undermine the power vaccines have to potentially save lives. As Australian vaccine researcher Julie Leask cautions, “The safest and most effective vaccines are of little use if too few people take them” (Leask, 2011, p. 445). Thus, it is up to researchers to represent parents’ concerns authentically and accurately, and also to find ways to alleviate their concerns.

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