Review

Vaccine Hesitancy: Where We Are and Where We Are Going

Catherine C. McClure, MD, MPH[1]; Jessica R. Cataldi, MD[2]; and Sean T. O'Leary, MD, MPH[3]

[1]Department of Pediatrics, University of Colorado School of Medicine, Aurora, Colorado; [2]Department of Pediatrics, Section of Infectious Diseases, University of Colorado Denver, Denver, Colorado; and [3]Department of Pediatrics, Sections of Pediatric Infectious Diseases and General Academic Pediatrics, University of Colorado Denver/Anschutz Medical Campus, Children's Hospital Colorado/University of Colorado School of Medicine, and Adult and Child Consortium for Health Outcomes Research and Delivery Science, Denver, Colorado

ABSTRACT

Purpose: Vaccines represent one of the most important aspects of pediatric preventive care. However, parents are increasingly questioning the safety of and need for vaccines, and as a result, vaccination rates have fallen to dangerously low levels in certain communities. The effects of vaccine hesitancy are widespread. Community pediatricians who interact regularly with vaccine-hesitant parents report higher levels of burnout and lower levels of job satisfaction. Not surprisingly, vaccine hesitancy has also had direct influence on vaccination rates, which in turn are linked to increased emergency department use, morbidity, and mortality.

Methods: Literature from 1999 to 2017 regarding vaccines and vaccine hesitancy was reviewed.

Findings: Few evidence-based strategies exist to guide providers in their discussions with vaccines-hesitant parents. Recent research has shown a presumptive approach (ie, the provider uses language that presumes the caregiver will vaccinate his or her child) is associated with higher vaccination uptake. Motivational interviewing is a promising technique for more hesitant parents.

Implications: At the community level, evidence-based communication strategies to address vaccine hesitancy are needed. The practice of dismissing families from pediatric practices who refuse to vaccinate is common, although widely criticized. Other controversial and rapidly evolving topics include statewide vaccination mandates and school exemption policies. Electronic interventions, such as text-messaging services and social media, have recently emerged as effective methods of communication and may become more important in coming years. (*Clin Ther.* 2017;39:1550–1562) © 2017 Published by Elsevier HS Journals, Inc.

Key words: Vaccine Refusal, Vaccine Hesitancy, Motivational Interviewing.

INTRODUCTION

Vaccines have long been lauded as one of the most important public health achievements of the past century.[1,2] In the past decade, however, parents questioning the need for and safety of vaccines has become increasingly common, challenging the medical community's ability to maintain high vaccination rates in certain communities.[3,4] This review will focus on vaccine hesitancy and refusal in the childhood vaccine schedule in the United States, although many of the

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Table 1. Tips for communicating with parents about vaccines.

Presumptive recommendations
• Start with a presumptive statement about the vaccines for which a child is due
• Establish that vaccination is the normative choice, which keeps the conversation brief for most families
Motivational interviewing approach
• For hesitant parents, transition to a supportive discussion with open-ended questions to elicit parental concerns
• Ask permission to share information
• Keep it conversational—avoid launching into a lecture full of facts about vaccines
Beware when debunking myths
• Too much time talking about a vaccine myth can actually strengthen the myth in the listener's mind
• Identify the myth as a myth and state that it is false
• Focus on the facts
• State the core facts simply. If the truth seems more complicated the myth, it remains easier to accept the simple information in the myth
Disconfirmation bias
• When presented with evidence for and against an existing belief, people more easily accept evidence that supports the existing belief and are critical of evidence that refutes the belief
• Rather than refuting incorrect elements of existing beliefs, try to provide new information to replace those elements
• Pivot the conversation to focus on the diseases that vaccines prevent
Story-telling
• Personal anecdotes and stories are powerful communication tools
• Talk about the decision to vaccinate your own children
• Try to avoid scare tactics

concepts discussed are applicable in other countries and for adult vaccination Table 1.

Vaccine hesitancy is a term coined in an attempt to depolarize the antivaccine rhetoric,[3] and is defined by the World Health Organization most simply as "a delay in acceptance or refusal of vaccines despite availability of vaccinations services."[5] Vaccine hesitancy, therefore, must be understood not as black and white, but as a spectrum of parental beliefs and concerns (Figure 1). From the perspective of medical providers, vaccine hesitancy is demonstrated by increased requests for alternative vaccination schedules or by altogether postponing or declining vaccines.[6,7] The percentage of parents who refuse all vaccines is small in comparison to those who choose alternative schedules,[8,9] with the majority choosing to delay certain vaccines, extend the interval between vaccines, or delay vaccines until a certain age.[10–12]

Overall, childhood vaccination rates in the United States remain relatively high. However, vaccine hesitancy represents a looming public health crisis. Rates of undervaccination in children younger than age 2 years continue to rise,[13] as does the rate of exemptions based on personal beliefs.[4] In Oregon, for example, rates of alternative immunization schedules have quadrupled.[7] Parents have become increasingly preoccupied about vaccines and their perceived side effects. Not surprisingly, pediatricians themselves are reporting increasing encounters with vaccine-hesitant caregivers.[14]

These numbers beg the question: How did we get here? It is important to note that mistrust of vaccines is not a new phenomenon. Poland and Jacobson[15] point

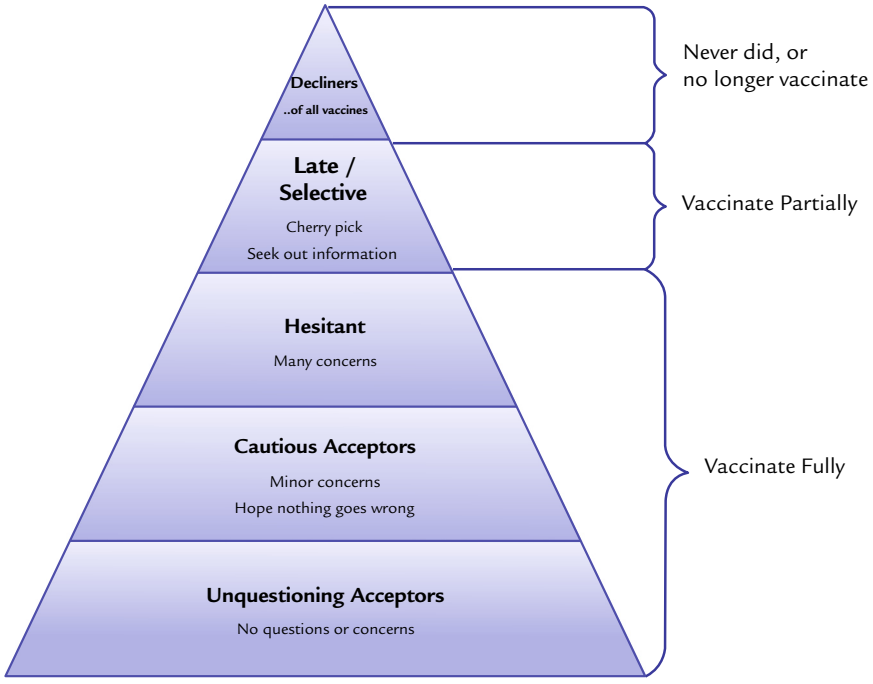

Figure 1. Vaccine acceptance spectrum. From: Leask, J. (2015, May 12). Improving communication about vaccination – "SARAH." [Blog post]. https://julieleask.wordpress.com/2015/05/12/improving-communication-about-vaccination-sarah/. Accessed 16 May 2017.

out that "since the 18th century, fear and mistrust have arisen every time a new vaccine has been introduced." Even amidst the deadly smallpox epidemic, increasing resistance to the smallpox vaccine led to mandated vaccination in the United Kingdom.[16] The United States encountered its own opposition to a mandatory smallpox vaccination, eventually resulting in the 1905 Supreme Court Case Jacobson v. Massachusetts, 197, U.S. 11 (1905). Ultimately, the US Supreme Court supported the rights of individual states to mandate smallpox vaccination.[17]

Today, the reasons for the increasing prevalence of vaccine hesitancy are numerous and nuanced. To begin with, vaccines have become, as many have described, "victims of their own success."[18,19] *The Economist* further argues that "the risks of the vaccine are visible; its benefits are not."[18] Vaccines, which have been so highly effective, are no longer seen as necessary by many parents, because the diseases they prevent are virtually unknown to the general population.[10,20] A balance exists between perceived risk and benefit of vaccines. As concern for a vaccine-preventable disease grows (usually in the setting of an outbreak), vaccination rates similarly improve. Likewise, as rates of vaccine preventable diseases dwindle, caregivers may grow to fear the vaccine more than the disease it prevents, thus leading to decreased vaccination rates. Figure 2 demonstrates the complex interactions among vaccine coverage, disease incidence, and adverse events.[21]

Additionally, highly publicized antivaccine arguments have caused tremendous public backlash against vaccines.[15] Perhaps the most well-known of these arguments originated as an article in *The Lancet*, in which Wakefield falsified data to establish a link between the MMR vaccine and autism.[22] Although the article was later retracted,[23] and Wakefield was stripped of his medical license, the damage was done. He had successfully mobilized a large, vocal antivaccine following from which he continues to benefit. In fact, Wakefield has even directed a recent documentary: *Vaxxed: From Cover-up to Catastrophe*.[24]

In addition to Wakefield, there is no shortage of vaccine-hesitant celebrities. Well-known names such as Jenny McCarthy, Alicia Silverstone, Jim Carey, Kirstie Alley, and even President Donald Trump have expressed concern regarding—if not outright opposition to—vaccines and have undoubtedly contributed

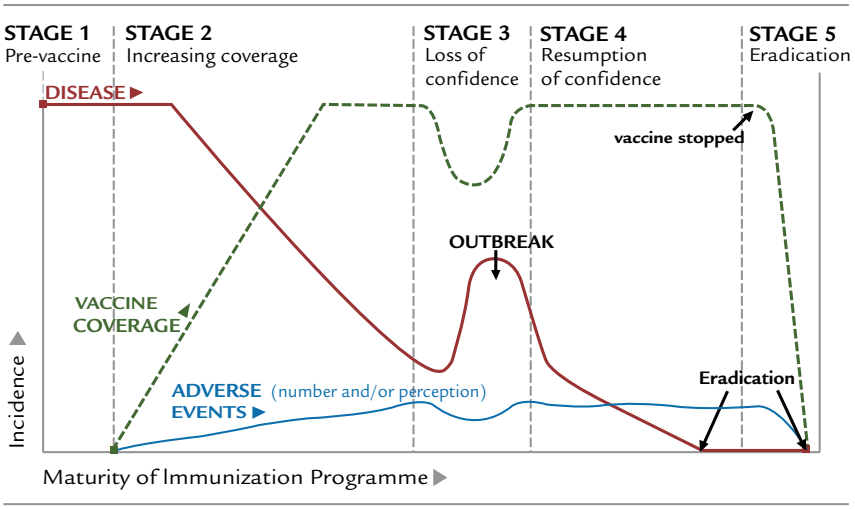

Figure 2. The interactions between vaccine coverage, disease incidence, and adverse events.[21] Reprinted with permission.

to the general public's confusion on vaccine safety. Parental concerns about vaccine safety in general are a major contributor to vaccine hesitancy.[25] As concerns regarding vaccine safety increase, there is simultaneously a growing popular interest in so-called natural products and remedies has led many parents to question vaccines due to fears of so-called toxins and additives in vaccines. Other parental concerns include multiple needlesticks and too many vaccines for the immune system to safely handle.

At the same time, trust in institutional medicine is low[26] and medical providers' relationships with patients is changing. More and more parents, for example, have come to value (and perhaps expect) a shared-decision-making model with their pediatrician.[20] A shared-decision-making model, when applied to vaccines in the pediatric population, presents both practical and ethical challenges for pediatricians.[27]

These cultural shifts have occurred in the context of a vaccine schedule that has become more crowded,[10] with a substantial increase in the number of vaccines given to a child before age 2 years since 1994.[20] Perhaps not surprisingly, parental concerns regarding the number of vaccines received at a single visit is a well-documented reason for delaying or refusing vaccines.[28]

However, even if parents attempt to educate themselves about the risks and benefits of vaccines, their efforts often leave them confused and frustrated.[29] The Internet is filled with blogs, websites, and articles touting the dangers of vaccines, leaving parents with mixed messages and uncertain of which sources to trust.[29] A search of the term *vaccination* on the internet may yield more antivaccination materials than provaccination materials.[30] This even includes YouTube videos.[31]

The proportion of parents who are vaccine hesitant (and thus have unvaccinated and/or undervaccinated children) varies substantially across the United States, and geographic clustering of nonmedical vaccination exemptions has been well documented.[17,20] Although this clustering effect is not entirely understood, one may hypothesize that the culture of a local population, influenced by characteristics such as socioeconomic status, education level, and race or ethnicity, may influence attitudes and thus exemption rates.[17] Supporting this hypothesis are data from the National Immunization Survey from 1995 to 2001 demonstrating that unvaccinated children were more like to be white, to have a married, college-educated mother, and to belong to households with a higher income than compared with undervaccinated children.[9] Clustering of unvaccinated children is particularly problematic because these communities are prone to outbreaks of vaccine-preventable diseases that may then spread into larger populations.[32,33]

WHY IT MATTERS: THE EFFECTS OF HESITANCY

The well-publicized 2014-2015 Disneyland measles outbreak was a stark reminder of the direct influence

of vaccine hesitancy and refusal.[34] However, we have seen evidence of the influence of vaccine hesitancy in the United States for decades, and there are results at several levels. In a nationally representative survey, 48% of pediatricians and family physicians reported spending ≥10 minutes discussing vaccines with parents who had concerns about vaccines.[35] Considering that the average well-child visit is 18 minutes long,[36] families with concerns about vaccines are likely missing out on other important anticipatory guidance. Further, approximately half of pediatricians report that their job is less satisfying because of having to talk about vaccines with hesitant parents.[14] More important are the influences that vaccine hesitancy and refusal have on actual vaccination rates and incidence of disease. Glanz et al[37] have done extensive work on the direct risks of vaccine refusal for an individual child whose parents refuse vaccines. This work has shown that, compared with vaccinated children, children whose parents refuse pertussis-containing vaccines are 23 times more likely to be diagnosed with pertussis, that children whose parents refused varicella vaccine are 9 times more likely to be diagnosed with chicken pox,[38] and that children whose parents refused pneumococcal conjugate vaccine are 6 times more likely to be hospitalized for invasive pneumococcal disease or lobar pneumonia.[39] Numerous studies have also demonstrated that states and communities with higher rates of vaccine exemptions are more prone to outbreaks of vaccine-preventable diseases such as measles, mumps, and pertussis.[40–42] Parental refusal or delay of childhood vaccines is a key contributor to the persistence of these outbreaks of vaccine-preventable diseases[43] and is associated with higher inpatient admission and emergency department utilization rates,[13] increased morbidity,[38–40] and death.[44]

STRATEGIES TO ADDRESS VACCINE HESITANCY

There have been extensive efforts to develop effective strategies to address vaccine-hesitant parents. Results of these efforts have been varied. To date, there are few effective evidence-based strategies for communication with vaccine-hesitant parents, or addressing vaccine hesitancy at the community level.[45,46] We hypothesize that this may be, in part, because of a well intentioned but naïve approach to the problem. Most interventions to address vaccine hesitancy have operated on principles based on the Information Deficit Model,[47] which assumes that misperceptions are due to a lack of knowledge and that the solution is to provide more information. Yet there is robust literature across disciplines to suggest that simply providing information often does not lead to people changing their views and may even create a dynamic in which a patient or parent is actually less receptive to information a provider may impart.[48,49] Corace[50] summarizes this well: "While knowledge is a necessary first step, it is not sufficient to tip the scales of behavior change." The medical community's inability to influence vaccine decisions simply by correcting misinformation is well documented. For example, a randomized trial designed to test the effectiveness of messaging to reduce vaccine misperceptions and misinformation failed to find any targeted interventions to increase parental intention to vaccinate.[49] Additional research has shown that increased knowledge about human papillomavirus (HPV) did not translate into increased uptake of completion of the HPV series.[51] In some cases, efforts at correcting misinformation may not only not be effective at increasing vaccination uptake, they may be more harmful than beneficial. An intervention designed to correct misinformation regarding influenza vaccine found that correction of misinformation significantly reduced the intent to vaccinate.[48] Lewandowsky et al[52] summarized several strategies to prevent further reinforcing misinformation. Briefly, these include avoiding repetition of vaccine-related misinformation so as not to reinforce it; reiterating simple, correct facts[53] in lieu of misinformation (eg, pivoting away from myths to emphasize disease risk); warning parents before repeating any misinformation; using fewer, simpler arguments; and inviting healthy skepticism by challenging untrustworthy sources of information.[52]

While investigators continue to study which communication techniques promote vaccine acceptance, it is clear that medical providers play a crucial role in influencing parents' decision to vaccinate[26] and are a trusted source of information about vaccines.[11] When referencing previous research,[54] Edwards et al. states "the single most important factor in getting parents to accept vaccines remains the one-on-one contact with an informed, caring, and concerned pediatrician."[55]

Furthermore, a recent Cochrane Review revealed that parents wanted more, unbiased vaccine information than they had been receiving. The review also showed that poor communication and/or poor relationships with health providers had the ability to negatively influence vaccine decisions.[29] Building a trusting relationship with parents and patients can promote vaccine acceptance and also influence other important aspects of care. Because vaccination decisions may be the first point of contention between a provider and a vaccine-hesitant parent, it is important that providers use this opportunity to build trust with these parents.

The way in which providers build trust and positively influence parents' beliefs and actions is not fully understood and there does not seem to be a one-size-fits-all approach to countering vaccine hesitancy. There is research to suggest, as briefly discussed earlier, that the content of the provider-parent conversations (ie, not just having the conversations themselves) are an important determinant of parental resistance or acceptance to the vaccine recommendation.[27] For example, in an observational study, Opel et al[27] describes the "presumptive" and "participatory" approach to provider-parent vaccine discussions. The presumptive approach presents the vaccine information in a manner that assumes parental consent (ie, "Johnny has some shots today"), whereas the "participatory" approach invites a conversation in keeping with a model in which decisions are shared (ie, "What do you think about Johnny's shots today?"). In the 2013 study, Opel et al[27] found that among all parents, a much larger proportion resisted vaccine recommendations when providers used a participatory rather than presumptive discussion format. Additionally, the study found that almost half of parents who initially resisted vaccination later accepted the provider's initial vaccine recommendation if the provider continued to recommend the vaccine ("provider pursuit").

More recent research by Brewer et al[56] documented similar results: in a cluster-randomized trial, health care providers who were trained to use "announcements" (ie, the presumptive approach) saw an increase in HPV vaccine initiation by 5 percentage points over patients in control practices. There seems to be clear added benefit if providers use announcements or a presumptive approach, as opposed to engaging parents via a participatory approach with open-ended discussions. There is tension, then, in how our current research guides pediatricians in their vaccine discussions. On one hand, it seems that the presumptive Johnny-will-get-his-shots-today approach improves vaccine uptake. On the other hand, research has also documented that parents often expect a more engaged, open-ended approach to vaccine discussions, and some evidence suggests that a presumptive approach may lead to decreased parent visit satisfaction.[57,58]

The participatory approach to vaccine conversations has much in common with shared decision making (SDM), which, in its purest form, represents the ideal balance between decisions made solely by a patient and those made solely by a provider. As the practice of medicine has shifted away from its historical paternalist approach, SDM has become the model approach.[59] SDM is not as easily applied to pediatrics because pediatric patients are typically unable to meaningfully participate in these discussions. Furthermore, SDM is only truly indicated for so-called preference-sensitive decisions; that is, situations in which there is more than 1 medically acceptable option.[59] As such, SDM is not well suited for vaccine discussions because the benefits of routine childhood vaccination so clearly outweigh the risks from a medical standpoint. As Opel points out,[27] use of SDM "may need to be reconsidered if it leads to fewer children being fully vaccinated and/or vaccinated on time."

This leads us to the question: How should a provider respond to a vaccine-hesitant caregiver who remains hesitant despite use of vaccine "announcements," or the presumptive approach to vaccination? Many providers in this scenario would begin with an open-ended question regarding why he or she is hesitant to vaccinate the child. Though a well-intentioned question, the provider has just unknowingly placed the parent in a position in which he or she must defend his or her concerns, which only serves to further strengthen the parent's resolve against vaccination. The provider, in turn, is in a difficult position to reply in a way that continues to engage the caregiver (who now likely feels defensive). The provider's natural reaction may be to persuade or lecture; that is, to convince the parent to vaccinate by dismissing any myths or concerns and simultaneously providing the parent with the facts regarding vaccination. This approach is problematic because simply replacing myths with facts does not typically lead to behavior change. Further, the caregiver and provider are likely to have found themselves in a somewhat

argumentative encounter. One approach our group and others are investigating for handling this situation is the use of motivational interviewing.[60]

Motivational interviewing is the process of engaging in an open-ended discussion with an individual to assess an individual's readiness to change with the goal of drawing upon the person's own desire and motivation to change, rather than the provider's motivation. In the 2016 Clinical Report on Countering Vaccine Hesitancy by the American Academy of Pediatrics, motivational interviewing is listed as a potential communication technique that may be useful as pediatricians discuss vaccines with vaccine-hesitant parents.[55] In a recent cluster-randomized trial by our group, motivational interviewing training, as part of a larger multimodal intervention, was shown to be effective at increasing uptake of HPV vaccine (data not yet published). For example, a provider is interacting with a vaccine-hesitant parent who has just described his or her concerns regarding vaccination. Instead of attempting to respond with persuasive arguments or lecturing with facts, motivational interviewing suggests that the provider continue to create a welcoming, nonthreatening environment by reflecting back the parent's concerns, which conveys both empathy and understanding. As the parent demonstrates willingness to further engage in the conversation, the provider can strategically pivot the conversation from the parent's concerns (which the provider has already assured the parent that he or she has heard and understands) to disease process at hand, because there is some evidence that focusing on the disease rather than the barrier is more likely to improve intention to vaccinate. Asking permission to share information and offering the parent autonomy are other principles of motivational interviewing. Finally, employing behavior change principles such as emphasizing social norms (as described below) may also be incorporated into motivational interviewing conversations. See below for an example conversation.

Provider: You seem to have concerns about the HPV vaccine. That's perfectly understandable. I've had a number of questions about this one. Would you mind sharing what your particular concerns are?
Parent: I've heard that it's a vaccine to prevent a disease that's transmitted by having sex, and she is a long way from having sex.
Provider: I can hear that you're concerned that she's too young for the HPV vaccine because HPV is transmitted by sexual activity. Well, I completely get that—she is only 11 after all. I've thought a lot about this. Is it okay if I go over how I've come to think about this vaccine?
Parent: Sure.
Provider: I used to think of this vaccine as something to prevent a sexually transmitted disease, but realized it's really about preventing cancer. Almost everyone gets this virus, so I think it's important for everyone. Almost all of my patients are now getting this vaccine, which is great. That said, this is a decision only you can make. What do you think?

Table 1 provides tips for communicating with parents about vaccines.

WHERE WE ARE TODAY AND WHAT IS NEXT?

Immunization Laws and School Exemptions

The United States childhood vaccination schedule is promoted and enforced by school-entry requirements.[61] All states in the United States allow medical exemptions to vaccination, 3 states (California, Mississippi, and West Virginia) allow only medical exemptions, and the remainder allow religious and/or personal belief exemptions. Higher rates of nonmedical exemptions cluster geographically[62] and are associated with rural communities, private schools, and with sociodemographic factors that have also been associated with vaccine hesitancy.[63–67] Legal strategies to strengthen vaccination and counter vaccine hesitancy have focused on eliminating nonmedical exemptions or making exemptions more difficult to obtain.[68,69] Elimination of nonmedical exemptions may succeed in raising vaccination rates; however, there are ethical and political factors that support allowing the existence of nonmedical exemptions while making them more difficult to obtain. Many experts argue that making vaccination compulsory removes the elements of choice and personal liberty, which may provoke political advocacy by those who oppose vaccination and government regulation.[70] It remains to be seen what is the best legislative approach to counter vaccine hesitancy.

Dismissing Families for Refusing Vaccines

Most state immunization policies attempt to balance personal liberty with individual and public health. These concerns are mirrored in the challenges providers face when considering dismissal of families who refuse

vaccines. Physicians are directly influenced by parental vaccine hesitancy and are put in the uncomfortable position of having to decide how to respond to requests to delay or forgo vaccination. A nationally representative survey showed that 93% of physicians who see children receive parental requests to spread out early childhood vaccines in a typical month and 21% receive these requests from ≥10% of parents.[35] Among pediatricians, 21% report always or often dismissing families who refuse 1 or more vaccines. The proportion of pediatricians who dismiss families is lower in states with more permissive exemption policies, suggesting that there is an interaction between state level vaccine policy and the practice of dismissing families.[71] It is known that vaccination rates are higher in states with stricter exemption policies, but it is not known to what extent the practice of dismissing families contributes to those higher rates. An approach to dismissal of nonvaccinating families requires consideration of legal and ethical issues. A pediatrician's duty to act in the best interest of the child is challenged both by allowing parents to refuse vaccines and by dismissal, which results in abdicating responsibility for that child's health care.[72] Current guidance from the American Academy of Pediatrics describes dismissal of families who refuse vaccination as an acceptable option in some circumstances, but a decision that should not be made lightly. Dismissal should be considered only when a pediatrician has exhausted all educational efforts and informed a family of any office policy related to dismissal of families who refuse vaccines. In addition, dismissal should be considered only in geographic settings where there are other pediatric providers and with the condition that a provider or practice will care for a family until they can find another medical home.[55] There are many unanswered questions regarding this practice. Although some providers who have a policy of dismissal argue that such a policy convinces parents to vaccinate their children, there are no data to confirm that this is the case. Further, it is unknown whether these children end up receiving adequate medical care, or if such a practice leads to more intense clustering of unvaccinated patients and thus increased risk of outbreaks.

Nudges for Behavior Change

Nudges and choice architecture may be useful tools to address vaccine hesitancy and influence behavior change. Decisions are often influenced not only by the content of the choice, but also by the way in which options are presented, or the choice architecture.[73] Establishing mandatory vaccination influences choice architecture directly by limiting available choices. Nudges are more subtle, noncompulsory interventions designed to influence decisions.[74] Elements of choice architecture have been applied to electronic medical record interventions with prompts and decision support for vaccination.[75] Nudges to influence patient and parent decision making have been applied to behaviors such as healthy eating with some success.[76] The presumptive approach to communication about vaccines (described above) can be seen as a nudge because it changes the structure of the conversation by altering how the choice is presented but does not eliminate the option to decline vaccines. Some have argued that nudges are a gentle subversion of patient autonomy, whereas others emphasize that nudges are acceptable as long as they adhere to the principle of promoting the best interest of the patient.[77] In the context of vaccination, using nudges to present vaccination as a default choice may be preferable to and more effective than establishing mandatory requirements.[78] Choice architecture and nudges are examples of how the fields of psychology and behavioral economics may improve our response to vaccine hesitancy.

Electronic Interventions

Many parents report receiving information about vaccine-related topics from online sources and yet some of these sources may not be accurate or based on science.[79] With parents looking online for information already and providers pressed for time during busy office visits, web-based interventions to address vaccine hesitancy are a promising approach.[80,81] Researchers have worked with communities to design web-based interventions and social media tools to address parental concerns about early childhood and adolescent vaccines.[82,83] Some studies have shown success in the use of text messaging, web-based patient portals, and online promotion of immunization campaigns; however, there is still a paucity of evidence on use of social media.[84] Online media may prove useful both for communication about vaccines and in monitoring hesitancy. The Vaccine Sentimeter is a tool for "global monitoring of vaccination conversations" that uses data from online news sources and social media to detect and analyze

trends in content, geography, and time.[85] By monitoring news media and online discourse about vaccines, public health entities will be better able to respond to shifting vaccine concerns over time,[80] and physicians may find that web-based communication strategies can address hesitancy outside of the time constraints of an office visit.

Values

In considering how to address vaccine hesitancy, behavior change theories can help contextualize the challenge. The Theory of Planned Behavior describes attitudes, perceived self-efficacy for change, and subjective norms as influencing intentions and ultimately behavior.[86] Vaccine hesitancy is best understood as an attitude that may influence intention to vaccinate and vaccination behavior. Although attitudes are often context-specific, the psychological concept of values describes priorities and beliefs that motivate personal attitudes and behaviors but are more constant throughout situations and time.[87] Aligning with personal values may improve communication of scientific ideas, including information about vaccines.[88] In other contexts (eg, smoking cessation and diabetes management) affirming a person's values has made them more likely to accept health information and engage in behavior change.[89] Preliminary work to apply personal values to childhood vaccination has succeeded in establishing a framework of immunization values that are associated with vaccine hesitancy and with delayed vaccination behavior.[90] A trial is underway measuring the influence of values-tailored communication about childhood vaccines on timely vaccination behavior.[91]

Social Norms, Community-based Interventions, and Advocacy Training

Values are one potentially powerful target for addressing vaccine hesitancy and social norms may be another. In other health contexts, social norms have been applied to change behavior such as alcohol use and energy conservation.[92] Social norms have also been successful in promoting vaccination in developing countries.[93] As previously discussed, a presumptive approach to vaccine conversations in a medical office is associated with vaccine acceptance.[27] This communication strategy relies upon the assumption that vaccination is the default choice, (ie, the social norm). The overwhelming majority of families accept vaccines. Giving voice to this message and to the parents who choose vaccination can help counter the highly publicized messages of those who oppose vaccines. In Washington, the public-private partnership VaxNorthwest has developed a program called Immunity Community. Parents who support vaccination are trained to be effective communicators and advocates in their local communities.[94] Colorado Parents for Vaccinated Communities is a grassroots engagement project of the Colorado Children's Immunization Coalition that works to engage parents in advocacy to support vaccination.[95] These community engagement projects show promise in harnessing the energy of parents who vaccinate to counter vaccine hesitancy and refusal and to promote vaccination as a social norm.

CONCLUSIONS

Vaccines represent an important aspect of pediatric preventive care. Although vaccine hesitancy is not new, increasing numbers of parents opting out of vaccination represents a significant public health threat. Although significant research regarding vaccine hesitancy has been conducted, few evidence-based strategies for addressing such hesitancy exist. Use of behavior change principles and communication strategies such as motivational interviewing represent promising approaches to address vaccine hesitancy at the individual level. At the community level, strengthening state policies regarding school vaccination requirements has the potential to increase vaccination rates. Identifying new strategies to address vaccine hesitancy is an emerging field of research, with many promising avenues.

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CONFLICTS OF INTEREST

The authors have indicated that they have no conflicts of interest regarding the content of this article.

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Address correspondence to: Catherine C. McClure, MD, MPH, Pediatrics Resident, Department of Pediatrics, University of Colorado Denver, 13123 E 16th Ave, Aurora, CO 80045. E-mail: Catherin.mcclure@childrenscolorado.org