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Identifying and Addressing Vaccine Hesitancy

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Abstract

In the 20th century, the introduction of multiple vaccines significantly reduced childhood morbidity, mortality, and disease outbreaks. Despite, and perhaps because of, their public health impact, an increasing number of parents and patients are choosing to delay or refuse vaccines. These individuals are described as vaccine hesitant. This phenomenon has developed due to the confluence of multiple social, cultural, political and personal factors. As immunization programs continue to expand, understanding and addressing vaccine hesitancy will be crucial to their successful implementation. This review explores the history of vaccine hesitancy, its causes, and suggested approaches for reducing hesitancy and strengthening vaccine acceptance.

Historical context

Resistance to vaccination has been present in the United States since the 1850s, when smallpox mandates were seen as a violation of liberty. In 1879, in response to states' attempts to enforce vaccination when smallpox again became epidemic, the Anti-Vaccination Society of America was formed. Similarly in the United Kingdom, an anti-vaccination movement grew against compulsory vaccination, which spread throughout Europe.[1] The second half of the 1900s saw an introduction of a number of vaccines able to prevent childhood death, including immunizations against polio, measles, tetanus, pertussis and tuberculosis. Parents overwhelming accepted vaccination, leading to significant decreases in outbreaks, morbidity and mortality. However, resurgence of anti-vaccine movements occurred in the 1970s in the United Kingdom, when the safety of the whole cell pertussis vaccine was questioned. In 1982, the documentary DTP: Vaccination Roulette ignited controversy in the United States.[2] Andrew Wakefield's erroneous publication in 1998 linking autism and the MMR vaccine created a worldwide crisis; the presence of the Internet now allows massive diffusion of information by anti-vaccination activists.[3] Today, anti-vaccination movements can be found worldwide.[4]

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Internationally, rates of vaccine-preventable diseases (VPDs) have increased in many communities in both developed and developing countries due to low or decreasing vaccination rates.[5,6] Recent studies estimate that approximately 1 in 8 children <2 years old in the United States are undervaccinated due to parental choice and a majority of pediatricians report at least one vaccine refusal per month.[7,8] The most recent National Immunization Survey shows 11 states in which ≥4% of children entering kindergarten have an exemption from school entry vaccine mandates.[9] This translates to increased periods of risk exposure for children and outbreaks of VPDs. In 2014, 644 cases of measles were recorded, with 23 outbreaks affecting 27 states. Recent pertussis outbreaks have been linked to undervaccination;[10] in a California outbreak, unvaccinated children were 8 times more likely to develop pertussis than vaccinated children.[11] In light of the alarming public health implications of vaccine hesitancy, it is imperative that both healthcare providers and policymakers confront this issue to maintain effective immunizations programs.

Defining Vaccine Hesitancy

Vaccine hesitant individuals are a heterogeneous group who hold varying degrees of indecision about specific vaccines or vaccination in general.[4] Along this spectrum of indecision, there is a range of vaccine uptake, depending on additional influences that move an individual toward or away from ultimately accepting a particular vaccine. Building upon expertise from multiple fields, including behavioral theory, social psychology, bioethics and behavioral economics, there are a growing number of models to describe the heterogeneity of vaccine hesitancy.[4,8,12–14] These models integrate the relevant social, cultural, political and personal factors which impact vaccine decision-making.

Keane, et al, in a survey-based study, identified four groups of parents who were: convinced of the benefit of vaccination, emotionally invested in their children and cautious about vaccination, more skeptical of vaccines, and distrustful of vaccines and vaccination policies.[12] In another study carried out in multiple lower income countries, parents who do not accept vaccines were categorized as those who: 1) are willing to go to immunization centers, but are logistically unable to do so; 2) refuse to go based on inadequate services, and 3) question the need for vaccination.[14] A systematic review by Leask et al. identified a spectrum of parent attitudes on vaccination, and consequently developed 5 groups based on their results and expert opinion that can help classify parents along this spectrum. These include unquestioning acceptors, cautious acceptors, hesitant parents, late or selective acceptors, and those who refuse all vaccines.[13]

While there are a small number of parents who unequivocally refuse all vaccines, and many parents who overwhelmingly accept vaccines, many families fall between these extremes and express some level of vaccine hesitancy, as characterized by these different models.[8] This group of vaccine-hesitant individuals has been a focus for more recent and ongoing research to identify strategies that can effectively move individuals toward vaccine acceptance.[15]

Factors contributing to vaccine hesitancy

Causes of vaccine hesitancy are best understood when placed in the appropriate historical, political and socio-cultural contexts. Parents' decisions to vaccinate are influenced by multiple factors, as outlined by Dube, et al.[16] These include parent-specific characteristics such as previous experience with VPDs or relationship with the healthcare system, community-level factors such as social norms, and external factors, such as vaccine policy. All of these factors must be considered together to better understand how to combat hesitancy within our practices and within our communities.[8]

Knowledge and Information Sources

Access to vaccine information and misinformation from a wide range of sources has influenced vaccine decision-making. Parents now hear a multitude of messages, often conflicting, and this can lead to questions about vaccines. Not all of this information is accurate and instead contributes to misperceptions that can influence vaccine acceptance. As summarized by Dube et al., media coverage with negative stories about vaccine safety in the news and on television correlate with increased incidence of VPDs.[16] It is also known that parents who lack sufficient knowledge about vaccines or VPDs are more likely to have negative attitudes towards immunizations, providers, immunization requirements, and trust in the individuals and institutions responsible for immunization policy.[17] Providing accurate information to boost knowledge about vaccines and VPDs will therefore be an important element of strategies to reduce hesitancy, however, the way in which information is provided is equally as important. Individuals are most likely to seek out information that already aligns with their beliefs- as such accessing different media sources may reinforce rather than alter hesitancy.

Experiences with vaccination and vaccine-preventable diseases

Parents perception of the utility of vaccines is based upon their perceived risk of VPDs. Many parents have little experience with VPDs, and therefore may have more fear of vaccines than the diseases they are designed to eliminate. As long as vaccines continue to be successful, the risk of obtaining a VPD may not motivate parents to immunize their children. Instead, parents may be more focused upon vaccine safety and raise concerns about potential short-term and long-term side effects or the number and timing of injections.[18]

Role of health professionals and their recommendations

Health professionals are essential promoters of vaccine acceptance. Despite the availability of information from a wide range of resources, providers remain the most important predictor of vaccine acceptance. Recent studies have emphasized the importance of a strong recommendation.[19–21] However, increasingly, parents may question information received from providers. Providers therefore must be prepared to communicate with parents and patients about specific concerns that are raised by a family.[22] The rapidly evolving immunization schedule can make it difficult to have all of the answers when questions do arise which may also challenge the parent – provider relationship. Finally, providers themselves may have questions and concerns about vaccines, especially new vaccines. If

providers themselves are hesitant, they are less likely to encourage their patients to vaccinate.[23]

Role of the public health system

There are three primary ways the public health system may influence vaccine acceptance: 1) the development and implementation of immunization recommendations; 2) vaccine policy such as school entry mandates; 3) vaccine safety monitoring. In the U.S., all immunization recommendations are developed by the Advisory Commission on Immunization Practices, a part of the Centers for Disease Control and Prevention. ACIP recommendations send an important message to both providers and parents. Providers may be more likely to give a strong recommendation to parents for vaccines that are recommended for routine administration by the ACIP and parents may be more likely to view recommended vaccines as important to their child. Also, recommendations influence state policies about vaccination and school entry requirements.

Lastly, the public health system also serves to educate the public about vaccines and VPDs, and ensure the public that vaccines are safe. Vaccine safety is one of the leading concerns among parents and there is an extensive vaccine safety monitoring infrastructure hosted by multiple agencies within the public health system. Ongoing surveillance and programs such as the Vaccine Injury Compensation Program provides financial compensation to families who may have experienced a vaccine-associated adverse event may influence confidence in the immunization program. Conversely, any miscommunication from public health agencies can reduce confidence in vaccine safety and increase hesitancy. As an example, in 2001 the Food and Drug Administration removed thimerosal from the majority of vaccines due to a theoretical risk of mercury toxicity, even though this outcome was not supported by evidence. This decision inadvertently raised concern than thimerosal is not a safe vaccine additive and many individuals refuse vaccines containing thimerosal as a preservative.[24]

Social norms and parental responsibility

Parents' motivation to vaccinate their children is also influenced by social norms, which are the rules that a group uses for appropriate and inappropriate values, beliefs, attitudes and behaviors.[25] Physicians, other parents, family members, and collective community values can inform decision making in both directions. In many communities, vaccinating a child is viewed as a positive parental decision and a social responsibility; in communities where many parents are hesitant about vaccines, and vocalize this hesitancy, the reverse may be true.[8]

Trust

Underlying many of the factors described above is trust. With rapid-fire information dissemination, it is easy for parents to hear inconsistent messages about vaccines, which may erode trust in vaccines, providers and the healthcare system. The issue of trust has been described as the vaccine-confidence gap.[26] A number of factors determine whether the public trusts an individual or institution. The trustworthiness of the information source, which may be the pharmaceutical industry, the government, a health care provider, or even a community member, impacts the credibility of the information. For example, some

individuals view pharmaceutical companies with skeptism and consider vaccines as a product designed to ensure profit at the expense of safety or true need. Additionally, many have embraced “natural” products and alternative medicine, distrusting many medical interventions including vaccines which may be considered an ‘unnatural’ way to boost the immune system.[22]

Religious beliefs

In 48 of 50 in the U.S., religious exemptions from school entry mandates are accepted. While there are few canonical bases for refusing vaccination, passages in religious texts are left open to interpretation for each believer within each tradition. Some faith groups eschew all medical intervention while others have specific beliefs related to vaccine components. It can be difficult to move strongly held religious beliefs, though providers can provide information about certain facts, such as cell line origins or porcine content, that may allay some concerns.[27]

Addressing Vaccine Hesitancy

There are a growing number of suggested approaches to move parents toward vaccine acceptance. Many of these approaches are well described in a recent review by Gowda and Dempsey.[8] Tailored messaging based upon where one lies on the vaccine hesitance spectrum is one strategy. For example, if a parent has refused vaccines in the past, the conversation should begin with asking permission to discuss vaccines, followed by allowing exploration of the parent’s specific concerns, and eliciting what would motivate a change in position.[13] Educational materials should be tailored to experiences of patient or parent to increase their salience. As many anti-vaccine messages are delivered by influential figures, celebrity Immunization Champions should also be identified who are likeable, trustworthy, and have common goals with the audience. Shelby and Ernst also describe story telling as a method of disseminating messages, as parents and patients may be more motivated by stories than scientific communication.[28] This strategy has been effectively utilized by the anti-vaccine movement.

Providers themselves must also be confident in vaccine safety and efficacy and translate this confidence into a strong recommendation, as a physician’s recommendation is frequently cited as the reason parents choose to vaccinate their children.[29] Parents’ concerns should be elicited through questioning so that they can be specifically addressed. Providers must prioritize communicating the need for vaccination and be able to address concerns about vaccine safety with comprehensive information. This means having resources readily available so that providers can remain up to date and have their own concerns answered. Resources can also be shared with parents when there is not enough time for an in depth discussion. Lastly, providers can also lead by example, complying with any immunization recommendations for themselves.[23]

The majority of methods explored for moving vaccine hesitant families toward acceptance focus on the provider-patient relationship. Public health policy can also be utilized to increase immunization rates. School entry mandates provide an excellent example of a policy that has contributed to significant increases in vaccination rates. However, almost

every state has a wide range of policies that allow parents to obtain personal belief and/or religious exemptions for mandates. Studies show that states with more lenient policies have higher exemption rates and states with higher exemption rates are more likely to experience outbreaks of VPDs. [18,30,31] This suggests that tightening exemption policies can make it more difficult for vaccine hesitant parents to delay or refuse vaccination. In fact, there is legal precedence for compulsory vaccination when the benefit of the public outweighs a person's liberty.[32] While some may argue that this takes away individual choice, vaccines are public health tools that benefit the entire community. Future exploration of stricter exemption laws, economic incentives for those who are vaccinated, restrictions on social activities, and stricter mandates may be necessary to protect public safety.[33]

Finally, policies at the provider level may also be pursued. Family dismissal in the setting of vaccine refusal is challenging and there are ethical arguments that support both dismissal and maintenance of the provider-family relationship. Providers must balance a desire to maintain their relationship with the family and their desire to provide what they consider standard of care and protect other families in their practice. Practices have developed a range of policies to guide their response in the setting of vaccine refusal that may include provision of vaccine education, signing a declination form or, when these efforts are not successful, dismissal. The American Academy of Pediatrics provides guidance to support the development of practice policies. Ultimately, implementing a consistent policy may send a strong message to parents that vaccines are a key component of the child health platform.

Future Directions

Ongoing research is needed to develop the most effective strategies to confront vaccine acceptance. Such strategies will require a multi-faceted approach. A systematic review of interventions designed to reduce parental hesitancy identified three key areas: state laws, school- and state-level implementation of laws, and parent-centered education. However, there is limited evidence to guide widespread implementation of a specific strategy at this time to effectively minimize the impact of vaccine refusal.[34] Public health strategies that have been trialed to counter anti-vaccination movements have focused mainly on reducing the knowledge gaps and these have not been successful. Indeed, multiple studies have shown that increasing knowledge alone will not change behaviors.[3]

As outlined in a recent report by the American Academy of Arts and Sciences, it will be more important to focus efforts on determining how parents make decisions about immunization, how their attitudes and beliefs develop, and where they obtain information.[35] A focus upon the health care visit can help elucidate the most effective communication strategies for both presenting information and negotiating with hesitant parents. Finally, a focus upon communities most at-risk for high rates of hesitancy can identify socio-cultural factors that influence vaccine decision-making to inform the development of effective community-based interventions. Vaccine hesitancy presents a significant challenge that will require a multidisciplinary approach. The profound impact of immunizations on public health mandates continued attention to this topic to prevent the reemergence of vaccine-preventable diseases.

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