

Building vaccine acceptance through communication and advocacy

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In January 2019, the World Health Organization named vaccine hesitancy as one of the top ten threats to global health, alongside pandemic influenza, climate change, and poor access to primary health-care services. Indeed, in the past year, several countries have experienced measles outbreaks, including countries in which measles was nearly eliminated. In the U.S., there were two large measles outbreaks in Washington State and New York City, largely due to vaccine refusal. The world is now experiencing a pandemic due to novel coronavirus. When a vaccine becomes available, rapid and widespread uptake will be crucial to prevent ongoing or resurgent transmission.

Vaccines are estimated to prevent 2 to 3 million deaths per year. An additional 1.5 million lives could be saved if we can optimize vaccination coverage even further. While ensuring equitable and efficient access to vaccination services is one key facet to increasing immunization rates, addressing vaccine hesitancy is another. We may otherwise move further away from elimination of vaccine-preventable diseases like measles, miss the opportunity to eradicate polio, and begin to see increasing rather than decreasing rates of other vaccine-preventable diseases. Vaccine hesitancy has therefore become a focus of groups like the WHO Strategic Advisory Group of Experts, the Vaccine Confidence Project and the National Vaccine Advisory Committee in the U.S. Through these efforts, we have learned more about the drivers of decision-making about vaccines and potential strategies to effectively address vaccine hesitancy and strengthen vaccine acceptance. This Special Issue provides an opportunity to deepen our understanding about the drivers of vaccine-related decision-making, evaluate different policy approaches to increase vaccine acceptance, and identify communication strategies to address vaccine hesitancy. Contributions to this issue will also highlight the importance of vaccine advocacy in a range of settings to demonstrate the importance of context when considering the most effective approaches to improve vaccine acceptance.

Defining hesitancy

Vaccine hesitancy and drivers of vaccine-related decision-making

To further our understanding of factors that are associated with vaccine uptake, the first group of articles helps deepen our understanding of behavioral theories and other constructs that may influence vaccine-related decision-making.

Badur [p 1007] sets the stage for our discussion through a review of vaccine confidence along with recommended, evidence-based approaches for its maintenance. The papers by Pomares [p 1018], Finkelstein [p 1024], and Shen [p 1030] each present different cognitive processes and behavioral theories that can be applied to decision-making about vaccines. A deeper understanding of cognitive biases and other psychological factors may be a key consideration for the development of effective communication strategies as it is clear that one message or approach does not work for all hesitant persons. This body of work also supports the growing focus on tailored messaging as an approach for effective communication with parents. Vaccine hesitancy is indeed driven by a complex array of factors – while it may center around the concepts such as confidence, those concepts are influenced by a complex array of factors driven by local context. As an example of local context, Özeceylan [p 1034] describes vaccine hesitancy in Turkey. Among participants, vaccine hesitancy was most strongly associated with distrust of pharmaceutical companies as well as higher education and income. Those factors may not be as relevant in other settings, highlighting the need to understand both local context and health behavior. This is further illustrated by Halim's paper [p 1040] validating a vaccine hesitancy measurement tool that was developed in the U.S. in a different setting, Malaysia.

Decision-making may also be influenced by external factors, especially in our current era of rapid dissemination of information. Messages about vaccines can be expressed through a wide range of platforms and can sometimes amplify certain viewpoints or concerns. Quinn [p 1050] explores the impact of media coverage about the Disneyland measles outbreak on attitudes toward vaccination requirements, highlighting the growing influence of polarization. Media impact is also evaluated by Catalan-Matamoros [p 1055], who demonstrates an inverse correlation between negative coverage about vaccines and childhood vaccine uptake. Tavoschi [p 1062] demonstrates the role of social media in expressing opinions about vaccines and influencing discussion. It is clear that leveraging media platforms to communicate positive and accurate messages is a necessary strategy to address hesitancy.

Implementing vaccination recommendations: vaccine hesitancy in action

The next series of articles describes barriers and facilitators to the implementation of vaccination recommendations. This

provides an excellent foundation for our discussion about vaccine acceptance and highlights the importance of communication, policy, and advocacy in addressing the complex issue of vaccine hesitancy. Many of these papers focus upon influenza vaccines, for which acceptance is generally low despite routine recommendations.

Nekrasova [p 1070] in *Vaccine Hesitancy and Influenza Beliefs* describes a cohort of parents whose child received the first but not the second dose of the initial 2 dose influenza vaccine series. More than 10% of parents reported moderate to high vaccine hesitancy, and many also reported misperceptions about influenza and influenza vaccines that may have influenced their child's missing second dose. For example, some parents may not have prioritized getting the second dose because of underappreciation of disease risk or misperceptions about vaccine effectiveness. Even among parents who initially accept a recommendation, hesitancy is a consideration for series completion.

These conclusions are supported by Li [p 1078] who discusses influenza vaccine acceptance in a different setting where influenza vaccines are promoted but not universally recommended. There are many similarities to previously published work and papers in this issue. Parents with concerns about side effects and low perceived risk of influenza infection were less likely to have their child vaccinated. At the other end of the age spectrum, Shen [p 1086] describes patient characteristics associated with the likelihood of routinely recommended vaccines (influenza and pneumococcal vaccines) among Medicare beneficiaries. Results suggest that vaccine receipt in this group may be driven more by complacency or lack of knowledge about routine recommendations, emphasizing the importance of a strong recommendation.

Descamps [p 1093] Yakut [p 1101] and Dudley [p 1109] explore seasonal influenza and pertussis vaccine uptake in an important high-risk population, pregnant women. In the first two studies based in France and Turkey, vaccine uptake was low. These low rates were likely related to infrequent provider recommendation along with frequent vaccine refusal. In the sample from France, those who accepted vaccination were more likely to be health-care workers or have high-risk conditions while in Turkey, vaccine acceptors were more likely to report a history of vaccine receipt and high knowledge about disease risk suggesting that salience is a factor in a pregnant women's decision to accept vaccination. This is supported by a third study based in the U.S. in which vaccine acceptance was higher overall and positive intentions were associated with perceived risk and confidence in vaccine safety. An important theme in this population was also trust in information sources and social norms.

Related to salience, Lim [p 1118] and Mignot [p 1125] focus specifically upon health-care workers in Singapore and France, all of whom are at higher risk of influenza exposure. In the first study, overall vaccine receipt was high (70%) driven by beliefs about vaccine safety and effectiveness. In the second where uptake was much lower, intention to be vaccinated was associated with workplace factors. In sum, this exploration of influenza vaccination in different populations suggests that communication needs to target salience, vaccine safety/effectiveness, and confidence.

Taking action

The remainder of the Special Issue turns to action – how can we build upon insights from our growing knowledge of factors that influence vaccine acceptance to develop and implement effective strategies to improve vaccine uptake. As a complex issue, a multifaceted approach is likely needed.

Communication

Complementary to any effective vaccine policy initiative is effective communication. Effective communication can be delivered to individuals or a community and provides credible, accurate information to guide decision-making, addresses concerns and builds trust. Despite its crucial role in vaccine acceptance, there is much to learn about the best way to convey information in a compelling way that increases vaccine acceptance. Although provider recommendation is often cited as one of the most important predictors of vaccine acceptance, many studies have shown that recommendation practices are inconsistent. Elitok [p 1132] evaluates the factors associated with adolescent vaccination recommendation practices among pediatricians and family physicians in Turkey and found that very few physicians felt that they had sufficient knowledge about adolescent vaccines. Most importantly, only 10–15% reported frequently providing information about adolescent vaccines and one third recommended HPV vaccination. This work highlights the importance of building vaccine knowledge among providers. Berenson [p 1139] describes such an initiative. This paper presents an educational intervention designed to increase self-efficacy related to HPV vaccine recommendations. The intervention included one lecture, a strategy that is easily implementable, and demonstrated significant impact on vaccine knowledge and reported comfort discussing HPV vaccines.

Policy

Policy approaches are sometimes needed to influence decision-making despite beliefs (i.e., through immunization requirements) or address barriers related to access to vaccination services. Since the 2015 Disneyland outbreak in the U.S., there has been an increasing number of proposed bills to either strengthen or weaken state regulations that govern the ability to request an exemption for school vaccination requirements. Perhaps the most highly publicized legislative battle took place in California where the state legislature voted to remove all non-medical exemptions for all California students attending school. While many public health advocates, parents and health-care providers have hailed this change, there has also been vocal pushback and the potential for unintended consequences. Other states have implemented changes to make it more difficult to obtain a nonmedical exemption through educational mandates, or required vaccine education for parents/guardians who request an exemption. In 2017, the state of Pennsylvania implemented a significant change to their school vaccination requirements, condensing the grace period during which students are able to document compliance with vaccination requirements from 8 months to 5 days.

Several papers in this issue evaluate the implementation and impact of such changes in school vaccination requirements. Caplan [p 1145] presents results from interviews with health department officials related to facilitators and barriers to the introduction of education mandates. Study conclusions highlight inconsistent content and delivery methods, however, educational mandates as a strategy to reduce the frequency of nonmedical exemptions was endorsed by study participants. To increase effectiveness, participants emphasized the importance of using dialogue-based educational approaches and open communication with health-care providers. Thus, educational mandates represent a policy that can leverage effective provider communication. Srivastava [p 1155] and Mohanty [p 1166] provide an additional policy evaluation through their studies examining the impact of Pennsylvania's school requirement change. Their results suggest that tightening implementation of requirements can improve timely vaccination rates for recommended vaccines. However, enforcement may not be uniform across all districts reflecting different challenges in enforcing exclusions. These considerations are important when developing vaccine policies.

While these studies focus upon implementation and short-term impact, Delamater [p 1171] provides an examination of the potential long-term impact of different policy approaches on vaccination rates and concludes that restriction of non-medical exemptions may not be most effective. As such, considering other policy approaches that can increase vaccine uptake will be important. Shen [p 1178] reviews the role of pharmacies as vaccination providers, especially for adults. Policies that support the ability of pharmacies to provide recommended vaccines have the potential to significantly increase vaccination rates. Sato [p 1181] evaluates the use of incentives as a policy approach in a resource-limited setting. Cash incentives sufficient enough to address transportation barriers were found to be most effective. Lastly, policy can also be effective on a smaller scale, particularly within primary care practices. Dismissal policies for families or patients who refuse or delay vaccines are perhaps the most actively discussed. Their utilization and potential impact on vaccine hesitancy is explored in the review by Garcia [p 1189]. As more practices adopt dismissal policies, an evaluation of both intended and unintended consequences is crucial.

Advocacy to increase vaccine acceptance

The ability to influence vaccine policy requires advocacy from stakeholders who play a role in the implementation of vaccination recommendations and understand the impact of vaccine-preventable diseases. Pediatricians are therefore an important

voice to include in the development and communication of vaccination recommendations. Pediatricians are often viewed as a trustworthy voice by parents and caregivers and their experience provides clinical perspective when considering when and for whom to recommend a vaccine. The role of pediatricians in vaccine policy development in the U.S. is well developed, primarily through their professional organization, the American Academy of Pediatrics. Engagement of pediatric societies in other countries, especially LMICs, is not as well developed. Pediatricians may not play as central a role in vaccination services delivery in LMICs; however, they are a trusted voice that can be impactful. As such, the AAP has received grant support from the Centers for Disease Control and Prevention to build vaccination advocacy capacity among pediatric societies in Gavi-eligible LMICs.

The impact of this initiative is described in the paper by Tan [p 1194]. This work can serve as a roadmap for advocacy initiatives in other settings, highlighting ways in which advocacy activities among pediatricians in partnership with other stakeholders can positively support vaccination program delivery. The remaining articles provide examples of health services challenges impacting vaccine uptake in several low and middle income (Ali [p 1202], Jalloh [p 1208], Sato [p 1215]) and high income (Wilcox [p 1221]) countries. These challenges demonstrate the importance of engagement across multiple sectors and could be targeted in advocacy initiatives described by Tan

Conclusion

The key issues for increasing the number of vaccinated people worldwide, especially children, is to increase the supply of available vaccines, assure funding and affordability for lower-income countries, improve distribution and storage networks, assure the availability of healthcare workers to administer vaccines, improve the ability of the population to access vaccination centers, and minimize refusal / hesitation to maximize acceptability of vaccines. It is noteworthy that among these key issues, all involve physical activities except for the final issue, which is the subject of this Special Issue. Vaccine acceptance / hesitation / refusal is unique in being a state of mind for the potential vaccinee or caregiver, such that different methods must be applied to improve acceptability. The ability of workers in the field to improve acceptability will be directly reflected in increased vaccinations with concomitant reductions in morbidity and mortality from vaccine-preventable diseases. This is a major public health challenge for the coming decade and beyond, which also will be very important for the success of new vaccines in the development pipeline.