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**State of Vaccine Hesitancy in the United States** 197

Glen J. Nowak and Michael A. Cacciatore

Although the term “vaccine hesitancy” has achieved great prominence, the extent to which US parents have reluctance, doubts, or indecision when it comes to vaccines recommended for children and how such hesitancy is manifest are unclear. A narrative review approach that placed emphasis on recent data and published work is used to surface evidence and insights into the current state of US parent vaccine hesitancy. The assessment finds evidence that ~6% to 25% of parents may be vaccine hesitant, that hesitancy is higher for influenza and HPV vaccines, and there are indications that addressing parent hesitancy has become more challenging.

## Vaccine Hesitancy and Specific Vaccines

**Human Papillomavirus Vaccine Hesitancy in the United States** 211

Daisy Y. Morales-Campos, Gregory D. Zimet, and Jessica A. Kahn

Although the US Advisory Committee on Immunization Practices recommends vaccinating adolescents against the human papillomavirus (HPV) to prevent HPV-associated cancers, vaccine initiation and completion rates are suboptimal. Parental and provider hesitancy contributes significantly to low HPV vaccine uptake. This review describes sources of HPV vaccine hesitancy using a World Health Organization framework that categorizes determinants of vaccine hesitancy as follows: contextual factors (historical, sociocultural, environmental, or political factors), individual and group factors (personal perception or influences of the social/peer environment), and vaccine/vaccination-specific issues (directly related to vaccine or vaccination).

**Influenza Vaccine Hesitancy: Scope, Influencing Factors, and Strategic Interventions** 227

Ashley B. Stephens, Annika M. Hofstetter, and Melissa S. Stockwell

Influenza vaccination rates in children are suboptimal. One underlying reason is influenza vaccine hesitancy. Tools such as the Parent Attitudes about Childhood Vaccines survey and the Vaccine Hesitancy Scale can be used to measure influenza vaccine hesitancy. The adapted Increasing Vaccination Model from Brewer and colleagues can help identify factors that influence influenza vaccine hesitancy, motivation, and uptake. Several

strategies can be used to address influenza vaccine hesitancy, which we discuss further in this review.

### **Coronavirus Disease-2019 Vaccine Hesitancy**

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E. Adrienne Hammershaimb, James D. Campbell, and Sean T. O'Leary

Early in the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, before coronavirus disease-2019 (COVID-19) vaccines were authorized, surveys began tracking public acceptance of a hypothetical COVID-19 vaccine. As vaccines became more widely available, the focus shifted from evaluating premeditative thoughts about COVID-19 vaccines to observing behaviors, measuring uptake, and characterizing factors associated with acceptance. A wealth of peer-reviewed literature examining the complexities of COVID-19 vaccine acceptance has emerged, but our understanding of COVID-19 vaccine acceptance is constantly evolving. In this article, we review the current state of knowledge regarding COVID-19 vaccine hesitancy, with an emphasis on pediatric vaccination.

## **Vaccine Hesitancy in Specific Groups**

### **Maternal Vaccination and Vaccine Hesitancy**

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Cynthia M. Rand and Courtney Olson-Chen

The American College of Obstetrics and Gynecology recommends influenza vaccine annually, Tdap with each pregnancy, and COVID-19 vaccine for those not previously vaccinated or who are due for boosters. The influenza and COVID-19 vaccines are safe during pregnancy and are effective in reducing morbidity in both the pregnant person and infant. The Tdap vaccine is given primarily to protect the newborn from pertussis through transplacental antibody transfer. Methods to enhance vaccination rates include stocking and giving vaccines in the obstetric office, recommending eligible vaccines at each visit, and focusing on the health of the infant in conversations with patients.

### **A Structural Lens Approach to Vaccine Hesitancy and Identity**

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Jennifer D. Kusma, Leslie Walker-Harding, Maria Veronica Svetaz, and Tamera Coyne-Beasley

Vaccine hesitancy is an increasing global health threat, and to improve vaccine uptake, it is critical to account for identity-based considerations including racial and ethnic, religious, and contemporary socio-political identities. Using critical consciousness to create awareness of the diverse cultural viewpoints on vaccines can help providers have conversations that are identity aware, equity-focused, and linguistically sensitive with their patients. It is necessary to collaborate with patients, families, communities, and community leaders to share information about vaccines, their safety profiles, and on how to have vaccines readily accessible in each community, to protect children and adolescents against vaccine preventable illnesses.

**Adolescents, Young Adults, and Vaccine Hesitancy: Who and What Drives the Decision to Vaccinate?** 283

Abigail English and Amy B. Middleman

Although vaccines are important for all age groups, issues of vaccine uptake and vaccine hesitancy have particular salience for the adolescent and young adult age group. This article reviews the importance of vaccination for adolescents and young adults, the variability in uptake of different vaccines, the reasons for vaccine hesitancy for this age group, and the legal framework for consent for vaccination. One important difference between vaccine hesitancy for adolescents and hesitancy for younger children or adults is the unique developmental, clinical, ethical, and legal context in which the decision to vaccinate is made.

## **Overcoming Parents' Vaccine Hesitancy**

**Using Technology to Overcome Vaccine Hesitancy** 297

Francis J. Real, Matthew W. Zackoff, and Brittany L. Rosen

Technology holds great potential to address many vaccine hesitancy determinants and support vaccine uptake given its ability to amplify positive messages, support knowledge, and enhance providers' recommendations. Modalities previously implemented with variable success have included automated reminder systems, decision support for clinicians, online education programs, social media campaigns, and virtual reality curricula. Further research is needed to identify the optimal uses of technology at the patient/parent and provider levels to overcome vaccine hesitancy. The most effective interventions will likely be multipronged providing patients, parents, and providers with information related to vaccine status.

**Clinician Communication to Address Vaccine Hesitancy** 309

Douglas J. Opel

There are several factors that influence childhood vaccine uptake. Pediatric clinicians play a particularly influential role in parent vaccine decision-making. It is critical therefore that pediatric clinicians have a "communication toolbox"—a set of effective, evidence-based communication strategies to facilitate uptake of childhood vaccines—that they can use in conversations with parents about vaccines. In this article, recent advances in our understanding of what constitutes effective clinician vaccine communication with parents are discussed.

**Training Residents and Medical Students to Overcome Parents' Vaccine Hesitancy** 321

Amisha Malhotra and Patricia Whitley-Williams

Strong provider recommendations increase vaccine confidence. Medical students and pediatric residents, as future physicians, will play an important role in the messaging about vaccines to their parents and patients. The importance of inclusion of vaccine education and communication skills in the medical school curriculum and residency training programs must be recognized to ensure provider confidence in discussions with vaccine-hesitant parents and patients.

**Social Media and Vaccine Hesitancy: Help Us Move the Needle**

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Todd Wolynn, Chad Hermann, and Beth L. Hoffman

With more than 75% of parents and pediatric caregivers getting their health-related information online, reaching families on social media is a powerful way to leverage the trust built in the examination room to address vaccine hesitancy. This article first reviews the ways the antivaccine movement has leveraged social media to expand its considerable influence, and why social media companies have failed to reduce antivaccine misinformation and disinformation. Next, it reviews the barriers to adoption of social media-based communication by pediatric health-care providers and concludes with action-oriented items to increase the adoption of this powerful tool.

**Optimizing Your Pediatric Office for Vaccine Confidence**

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Patricia Stinchfield, Joseph Kurland, and Pamela Gigi Chawla

Parents trust their pediatric clinicians for up-to-date information about vaccines. To reduce vaccine hesitancy, clinics must promote confidence by building trust, communicating clearly, using patient safety and infection control principles to reduce errors, and reducing missed opportunities by having a vaccination infrastructure that makes every visit a vaccine visit. Education and communication must be consistent among all staff and culturally competent to optimize vaccine confidence. Parents have a role in seeking reliable resources, raising concerns, and seeking trusted, evidence-based experts for vaccination conversations. Safe, effective vaccines are vital; however, vaccination, a complex operational process, prevents disease and saves lives.

**Overcoming Vaccine Hesitancy Using Community-Based Efforts**

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Lori E. Crosby, Francis J. Real, Jodi Cunningham, and Monica Mitchell

Vaccine acceptance by parents and caregivers remains a public health challenge that can potentially be addressed via community-based strategies. Such strategies might augment current vaccine hesitancy interventions occurring within medical homes. This article reviews the key challenges and advantages of evidence-based community strategies for overcoming parent/caregiver vaccine hesitancy, specifically (1) community-participatory vaccine hesitancy measurement, (2) communication approaches, (3) reinforcement techniques (eg, incentives, mandates), and (4) community-engaged partnerships (eg, vaccine champion training, vaccination in community settings). This article also discusses important considerations when vaccinating children and adolescents in non-primary care settings (school-based health centers, pharmacies, community events).