

2021-09-17

Provider perspectives on communication and dismissal policies with HPV vaccine hesitant parents

Jenny K. R. Francis
University of Texas Southwestern Medical Center

Et al.

Let us know how access to this document benefits you.

Follow this and additional works at: <https://escholarship.umassmed.edu/oapubs>



Part of the [Behavioral Medicine Commons](#), [Health Communication Commons](#), [Health Services Administration Commons](#), and the [Preventive Medicine Commons](#)

Repository Citation

Francis JK, Rodriguez SA, Dorsey O, Blackwell J, Balasubramanian BA, Kale N, Day P, Preston SM, Thompson EL, Pruitt SL, Tiro JA. (2021). Provider perspectives on communication and dismissal policies with HPV vaccine hesitant parents. Open Access Publications by UMass Chan Authors. <https://doi.org/10.1016/j.pmedr.2021.101562>. Retrieved from <https://escholarship.umassmed.edu/oapubs/4974>

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial-No Derivative Works 4.0 License](#). This material is brought to you by eScholarship@UMassChan. It has been accepted for inclusion in Open Access Publications by UMass Chan Authors by an authorized administrator of eScholarship@UMassChan. For more information, please contact Lisa.Palmer@umassmed.edu.



Provider perspectives on communication and dismissal policies with HPV vaccine hesitant parents

Jenny K.R. Francis^{a,b,*}, Serena A. Rodriguez^c, Olivia Dorsey^c, James-Michael Blackwell^c, Bijal A. Balasubramanian^d, Neelima Kale^e, Philip Day^f, Sharice M. Preston^{g,h}, Erika L. Thompsonⁱ, Sandi L. Pruitt^c, Jasmin A. Tiro^c

^a Department of Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

^b Children's Health, Dallas, TX

^c Department of Population and Data Sciences, University of Texas Southwestern Medical Center, Dallas, TX

^d Department of Epidemiology, Human Genetics, and Environmental Science, UTHealth School of Public Health, Houston, TX

^e Department of Family and Community Medicine, University of Kentucky College of Medicine, Lexington, KY

^f Department of Family Medicine and Community Health, University of Massachusetts Medical School, Worcester, MA

^g Department of Health Promotion and Behavioral Science, UTHealth School of Public Health, Dallas, TX

^h Center for Pediatric Population Health, UTHealth School of Public Health, Dallas, TX

ⁱ Department of Health Behavior and Health Systems, School of Public Health, University of North Texas Health Science Center, Fort Worth, TX

ARTICLE INFO

Keywords:

Vaccine hesitancy
HPV vaccine
Dismissal policies

ABSTRACT

Parental vaccine hesitancy is a growing concern. Less is known about provider or practice characteristics that encounter HPV-specific vaccine-hesitant parents, the providers' confidence in responding to HPV vaccine concerns, and the attitudes and use of vaccine dismissal policies (i.e., removing patients from the practice). North Texas providers completed an online survey. *Dependent variables* assessed: (1) percentage of HPV vaccine-hesitant parents encountered in practice defined as substantive, or high ($\geq 11\%$, or among more than one out of ten adolescent patient encounters) versus low ($\leq 10\%$) levels; (2) confidence in responding to 11 HPV vaccine concerns; (3) attitudes and use of vaccine dismissal policies. Chi-square and Fisher's exact tests were conducted. Among 156 providers, 29% reported high HPV vaccine hesitancy ($\geq 11\%$ of patient population). Overall, providers reported being "very confident" in addressing vaccine concerns (mean: 3.37 out of 4, SD: 0.57). Mean confidence scores were significantly higher for white (vs. non-white) providers and for pediatricians (vs. family practitioners). Providers were least confident in responding to parents' religious/personal beliefs (69%). Some providers (25%) agreed with policies that dismissed vaccine-hesitant parents after repeated counseling attempts. More providers used dismissal policies for childhood (19%) than adolescent (10%) immunizations. Provider communication training should include parental religious/personal beliefs to effectively address HPV vaccine hesitancy. Other regions should examine their HPV-specific vaccine hesitancy levels to understand how the use of dismissal policies might vary between adolescent and childhood immunizations.

1. Introduction

Despite their significant benefits in preventing many serious diseases, vaccines have come under increasing parental scrutiny due to concerns about safety and efficacy. (Okita et al., 2020) In 2019, the World Health Organization (WHO) defined vaccine hesitancy (delayed acceptance or refusal of a vaccine when available) as one of the top ten global health threats. (World Health Organization, 2019) In the United States (U.S.), vaccine hesitancy has steadily increased. (Failure to

vaccinate and vaccine failure, 2019) The American Academy of Pediatrics (AAP) found the proportion of providers reporting parental vaccine refusals of at least one vaccine in a typical month increased significantly from 74.5% in 2006 to 87% in 2013. (Hough-Telford et al., 2016) Refusal of all vaccines ranges from 2 to 5% across the U.S. with higher refusal in certain regions. (Gust et al., 2008; Elam-Evans et al., 2020)

While some definitions of hesitancy have focused on the ultimate behavior of vaccine refusal, others have focused the definition of

* Corresponding author at: Department of Pediatrics, 5323 Harry Hines Blvd., Dallas, TX 75390.

E-mail address: jenny.francis@utsouthwestern.edu (J.K.R. Francis).

<https://doi.org/10.1016/j.pmedr.2021.101562>

Received 12 April 2021; Received in revised form 10 September 2021; Accepted 12 September 2021

Available online 17 September 2021

2211-3355/© 2021 The Author(s).

Published by Elsevier Inc.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

hesitancy as attitudes or beliefs about vaccines. In a recent survey of parents of 6 months to >18 year-old children, a psychometrically validated Vaccine Hesitancy Scale (VHS) was used to assess for vaccine confidence and vaccine risks. Among US households, parents reported vaccine hesitancy was roughly 6.1% for routine childhood vaccines and 25.8% for influenza vaccines. (Kempe et al., 2020) It is challenging to determine vaccine hesitancy in specific regions, such as North Texas, due to sampling limitations and the survey focus of past studies. (Conrey et al., 2020) For example, studies using data from the 2017 National Immunization Survey-Teen found that the up-to-date coverage was lowest in Dallas County (the largest county in the North Texas region) compared to the whole state and the US (35.7%, 39.7%, 48.6%, respectively). (Elam-Evans et al., 2020; Conrey et al., 2020) Unfortunately, there is not representative data on uptake for the rest of the North Texas region outside of Dallas. However, others have noted that parental filing of non-medical exemptions for school-required vaccines based on religious, philosophical or personal beliefs is an indirect measure of vaccine hesitancy (Olive et al., 2018; Conis, 2020) and North Texas has some of highest numbers of non-medical exemptions filings in the state. (Roberts et al., 2015) The degree of vaccine hesitancy in the North Texas region is unknown and worthy of investigation.

Of the three routinely recommended adolescent vaccines, national studies reveal lower parental acceptance of the HPV vaccine compared to the meningococcal and Tdap vaccines. (Walker et al., 2019) HPV vaccination is the only recommended adolescent vaccine failing to reach the U.S. Healthy People 2020 goal of 80% coverage. (Office of disease prevention and health promotion, 2019) In addition to hesitancy, uptake differences between the HPV vaccine and other adolescent vaccines may be due to parental factors such as beliefs about the safety, effectiveness, or need for the HPV vaccine or provider factors such as communication about the vaccine. (Rodriguez et al., 2020)

Persistent, high-quality provider communication about the importance of vaccination is the most consistent predictor of adolescent HPV vaccine initiation. (Mullins et al., 2013; Shay et al., 2018) Many providers, however, struggle to communicate with families about the HPV vaccine. (Paterson et al., 2016; Hswen et al., 2017; Witteman, 2015) Healthcare providers' knowledge and attitudes about vaccines are important determinants of their intentions to recommend the vaccine to families. (Dube, 2017) While provider-patient communication is a component of most medical education curricula, some providers express low confidence in their ability to influence parents regarding vaccination, (Leung et al., 2019) and many do not have a systematic patient-centered approach to increase vaccination. (Walling et al., 2019; Gilkey et al., 2019) Several educational materials about communication by professional and governmental organizations are available. (Centers for Disease Control and Prevention, 2018; American Academy of Pediatrics, 2018) Less than half of the training resources include communication skills training to manage hesitant parents. (Kornides et al., 2017; Cates et al., 2020) Resources mostly focus on the HPV vaccine as a cancer prevention tool and presumptively bundle the HPV vaccine with other recommended adolescent vaccines or focus on motivational interviewing tactics. (Bernstein and Bocchini, 2017; Reno et al., 2018; Gilkey and McRee, 2016)

Given the continued surge of parental vaccine hesitancy, vaccine-hesitant families might seek out providers who allow for delays or selection of certain vaccines. (Edwards and Hackell, 2016) On the other hand, vaccine dismissal policies have emerged as a controversial strategy to manage hesitancy. (Oleary et al., 2015; Leask and Kinnersley, 2015) Dismissal policies document how providers can "let go" or refuse to treat and remove families from the practice if the parents continue to refuse to vaccinate their child after repeated counseling attempts. (Alexander et al., 2016) Nationally, 21% of pediatricians and 4% of family physicians reported dismissing families if they refused ≥ 1 infant vaccine. (Oleary et al., 2015) To date, no study to our knowledge has examined the use of dismissal policies specifically for adolescent vaccines.

With vaccine hesitancy increasing and the debate about dismissal policies growing, this study makes an important contribution by examining provider-reported: 1) estimates of vaccine-hesitant families encountered in practice; 2) confidence in responding to HPV vaccine concerns; 3) attitudes towards and use of dismissal policies for adolescent vaccines in North Texas.

2. Materials and methods

This cross-sectional study was a component of the Harold C. Simmons Comprehensive Cancer Center's environmental scan assessing HPV vaccination attitudes and behaviors among diverse stakeholders in North Texas and part of a nationwide initiative to examine HPV vaccination attitudes and behaviors. The University of Texas Southwestern Medical Center Institutional Review Board approved this study (STU 092017-076).

2.1. Study design and setting

North Texas family and pediatric providers were invited to participate in a 10-minute online survey. Potential respondents were identified through two regional professional societies and a large pediatric healthcare system. An email invitation was sent twice with a brief study description and a link to the survey between June 2018 and January 2019. Each respondent was offered a \$50 gift card for participation.

2.2. Participants and procedures

Criteria for inclusion was being a family medicine or pediatric provider who delivered primary care including vaccination services to patients ages 11–17 years old. Providers were excluded if they reported practicing in an urgent care setting ($n = 2$), did not offer the HPV vaccine ($n = 28$), or did not see 11–17-year-olds in practice ($n = 10$). We also excluded providers who did not estimate the number of vaccine-hesitant parents ($n = 2$) in their practice as this was a dependent variable in our analysis (Fig. 1). The survey measured several domains with embedded skip patterns to minimize respondent burden (Table 1).

2.3. Dependent variables

We assessed four dependent variables: providers' 1) perceived percentage of HPV vaccine hesitant parents encountered in practice; 2) confidence in responding to parental HPV vaccine concerns; 3) attitudes towards dismissal policies; and 4) clinic's use of adolescent vaccine dismissal policies.

Perceived parental vaccine hesitancy towards adolescent vaccination was measured with two items asking providers to estimate the percentage of families with adolescents who: (1) "expressed concerns about adolescent vaccines in the last year," and (2) "refused adolescent vaccination in the last year." Thus, our operational definition was comprehensive in combining both perceptions about parental communication behaviors (i.e., how they express their hesitant attitudes) and experiences with refusals by families. Response options included: 0–5%, 6–10%, 11–25%, 26–50%, or >50%. For analyses, we dichotomized the provider sample into having a substantive, or "high vaccine hesitancy" patient population ($\geq 11\%$ of families who expressed concern or refused adolescent vaccination) versus "low" ($\leq 10\%$). It is important to note that there is no gold standard or validated scale to assess providers' perceptions of vaccine refusals or hesitant attitudes encountered in practice. We applied a threshold of 11% based on the analytic approached used in past studies (Szilagyi et al., 2020) and our sample's skewed response distribution. Specifically, national data reported 2–5% of parents refuse all vaccines (Gust et al., 2008; Elam-Evans et al., 2020) and 23% report hesitant attitudes. (Szilagyi et al., 2020) In reviewing our data, the natural split for both questions was between the "6–10%" and "11–25%" response categories. This threshold value of " $\geq 11\%$ " also

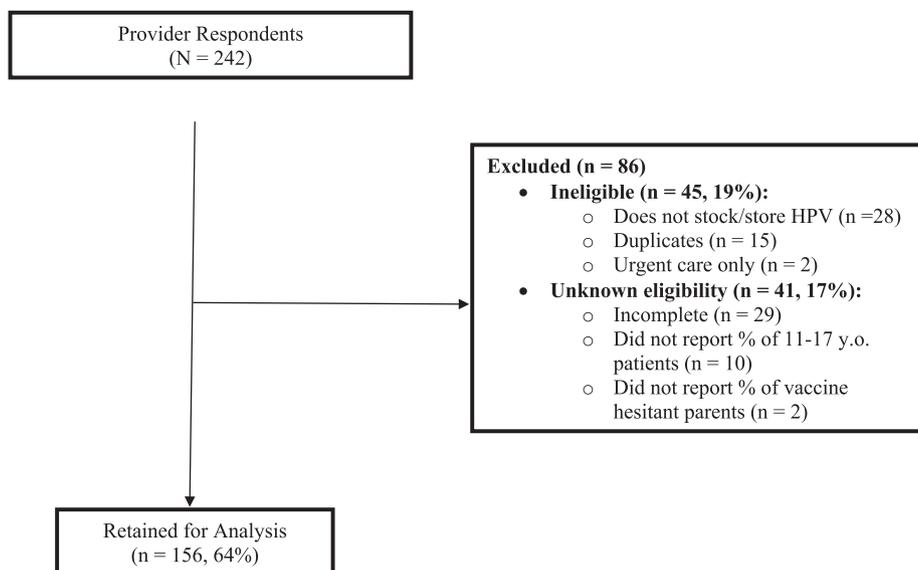


Fig. 1. CONSORT Flow Diagram.

Table 1
Survey Flow of Constructs.

Initial Descriptive Constructs	Example Questions
Provider Demographics (8 items)	What is your specialty? How many years has it been since you completed your residency training?
Practice Characteristics (17 items)	What is the geographical location of your main clinical practice site? Are you a Texas Vaccines for Children (TVFC) provider? What is the most common patient payment method for children in your clinic?
Patient Characteristics (3 items)	What proportion of your patients are between the ages 11–17 years? What is the estimated average number of patients you see in a week?
HPV Specific Constructs	
Provider HPV Recommendation (16 items)	When discussing vaccination with parents of 11–12-year-olds, I typically say... (pick the phrase that most closely approximates your approach)
Vaccine Hesitancy Experience (12 items)	What percentage of families with adolescents aged 11–17 years in your practice do you estimate have expressed concerns about adolescent vaccines in the last year? What percentage of families with adolescents aged 11–17 years in your practice do you estimate have refused vaccination in the last year?
Provider Attitudes about Dismissals (2 items)	Providers should dismiss parents who refuse vaccination after repeated attempts to counsel and education them. (Likert scale) What are your reasons for dismissing families who refuse vaccines? (Choose up to 2)
Provider Behaviors with Dismissals (3 items)	Does your practice or clinic dismiss families who continue to refuse childhood vaccination (up to age 5) after numerous attempts at vaccine counseling and education? Does your practice or clinic dismiss families who continue to refuse adolescent vaccination after numerous attempts at vaccine counseling and education?
Provider Confidence (11 items)	See Fig. 2
Provider Tools (6 items)	Please check any materials you use when discussing the HPV vaccine with parents.

pragmatically describes providers who experience vaccine hesitancy in more than one out of ten adolescent patient encounters.

Providers’ confidence in responding to HPV vaccine concerns was

measured through an 11-item scale ($\alpha = 0.94$) with the following stem: “How confident are you in your ability to respond to parents who want to delay or refuse the HPV vaccine because...” The 11 reasons for delaying/refusing were based on parent-reported concerns about HPV vaccination in the National Immunization Survey-Teen. (Elam-Evans et al., 2020) Response options were measured on a 4-point Likert scale ranging from “not at all confident” to “very confident.”

Vaccine dismissal policies were measured with items that distinguished between behaviors and attitudes. First, providers were asked whether they encountered parents who accept all adolescent vaccines but refuse the HPV vaccine in the past 12 months. After focusing providers on this experience with the HPV vaccine, providers were asked if they agreed/disagreed with this statement: “Providers should dismiss parents who refuse vaccination after repeated attempts to counsel and educate”. Then, two items asked about dismissal behaviors or policies specific to age groups: “Does your practice or clinic dismiss families who continue to refuse [childhood vaccines (up to age 5)/adolescent vaccines] after numerous attempts at vaccine counseling and education.” Response items included yes, no, or I don’t know. Providers were also asked to list the top three reasons parents refuse adolescent vaccines and specifically the HPV vaccine.

2.4. Independent variables

Both provider and their practice characteristics were measured. Provider characteristics included specialty, years since training, race/ethnicity, age and sex. Practice characteristics included practice type, urban versus suburban/rural location, most common type of payor, participation in the Vaccines for Children (VFC) program (a federal-state partnership to cover the cost of recommended vaccines for qualifying families), proportion of patients seen on an average week, the estimated distribution of patients’ race/ethnicity within a practice, and the percent of patients aged 11–17 years old seen in their practice.

2.5. Analysis

Categorical outcomes were compared using chi-square or Fisher’s exact tests. For the first analysis, we compared characteristics of practices with high versus low vaccine-hesitant patient populations. Next, providers’ confidence in responding to 11 different HPV vaccine concerns was ordered by rank to show least to most confidence, and then cross-tabulated with provider and practice characteristics that

conceptually might be associated with mean confidence scores. Finally, attitudes towards clinic dismissal policies and use of adolescent vaccine dismissal policies were described as frequencies. All analyses were carried out using SAS (Institute Inc 2013 SAS/ACCESS® 9.4 Interface to ADABAS: Cary, NC).

3. Results

Of the 242 providers who completed the survey, 156 (65%) were eligible for analysis. Reasons for ineligibility are noted in Fig. 1. Most respondents were family physicians (76%), few were advanced practice provider (4.5%), half were in practice less than 10 years (48%), and half were female (53%). There were no demographic differences between providers excluded and included in analyses.

A third of providers (46/156 = 30%) reported that ≥ 11% of parents of adolescents in their practice expressed HPV vaccine hesitancy (hereafter labeled the high hesitancy group). There were no differences in provider or practice characteristics between the high and low hesitancy groups (Table 2).

Overall, providers reported being “very confident” in addressing a range of vaccine concerns (mean: 3.37 out of 4, SD: 0.57; Fig. 2). Reported mean confidence scores were significantly higher for providers who were white (3.5, 95% Confidence Interval [CI] 3.4–3.6) vs. non-white (3.3, 95% CI 3.1–3.4, p = 0.03), and pediatricians (3.6, 95% CI 3.4–3.8) vs. family practitioners (3.3, 95% CI 3.2–3.4, p = 0.01).

When confidence items were investigated individually, providers were most confident (64% report very confident vs. 36% not at all/slightly/moderately confident) in responding to parents about the appropriateness of recommending the HPV vaccine for a child who is not sexually active. Providers were least confident in responding to hesitant parents’ religious/personal beliefs about the HPV vaccine (69% were not at all/slightly/moderately confident). Of note, similar numbers of providers were less confident responding to parents’ misinformation obtained from the Internet/social media or the news, as well as responding to lasting health problems due to the HPV vaccine (range 51–52% not at all/slightly/moderately confident). We cross-tabulated each individual confidence item by the perceived percentage of hesitant parents and found the providers in the high hesitancy group setting (≥11% of parents) were more likely to report being “very confident” at addressing parents’ religious/personal beliefs compared to providers classified into the low hesitancy group (p = 0.03). There were no significant differences in either group’s confidence to address misinformation on the Internet/social media (p = 0.70).

Finally, most providers (86%) reported encountering parents who accepted other recommended adolescent vaccines and specifically refused HPV in the past 12 months. A quarter (25%) of providers reported agreement with policies that dismiss hesitant parents after repeated counseling and educational attempts. More providers reported their clinic uses a dismissal policy for childhood immunizations (19%) than for adolescent immunizations (10%). According to providers, the most commonly endorsed reasons why parents refuse adolescent vaccines in general and the HPV vaccine specifically were safety concerns and beliefs about the vaccine(s) were not needed (Table 3).

4. Discussion

Almost a third (29.5%) of North Texas family medicine and pediatric providers reported encountering a sizeable number of HPV vaccine-hesitant parents (≥11% of families in their practice). The cutoff of 11% to define high or low levels of vaccine-hesitant families provides a conservative boundary that doubles the national average of 2–5% of parents refusing all vaccines. (Gust et al., 2008; Elam-Evans et al., 2020) With the recent COVID pandemic, attention to vaccine hesitancy and potential increase in hesitancy (Dudley et al., 2020) may, or may not, spill over to HPV specific hesitancy. This study collected survey data in 2018 and 20019, pre-COVID. Thus, more data on the intersection about

Table 2
Provider and Practice Characteristics with High[†] or Low Levels of Families with Adolescent Vaccine Hesitancy.

	Low Hesitancy n = 110 (70.5%)	High [†] Hesitancy n = 46 (29.5%)	Total n = 156 (%)	p- value
Provider Characteristics				
Specialty				
Pediatrician	21 (19.1)	7 (15.2)	28 (17.9)	0.28 [§]
Family Physician	86 (78.2)	35 (76.1)	121 (77.6)	
Nurse Practitioner/Physician Assistant	3 (2.7)	4 (8.7)	7 (4.5)	
Years Since Residency*				
In Training	5 (4.7)	2 (4.8)	7 (4.6)	0.93 [§]
<10 years	45 (42.1)	19 (45.2)	65 (43.0)	
10–19 years	24 (22.4)	11 (26.2)	35 (23.2)	
20 years or more	28 (26.2)	8 (19.0)	37 (24.5)	
Not applicable, did not complete residency training	5 (4.7)	2 (4.8)	7 (4.6)	
Provider Gender				
Female	61 (55.5)	29 (63.0)	90 (57.7)	0.63
Male	45 (40.9)	15 (32.6)	60 (38.5)	
Missing [‡]	4 (3.6)	2 (4.3)	6 (3.8)	
Provider Race/Ethnicity				
Asian Non-Hispanic	30 (27.3)	10 (21.7)	40 (25.6)	0.61 [§]
Black/African American Non-Hispanic	8 (7.3)	2 (4.3)	10 (6.4)	
Hispanic	10 (9.1)	3 (6.5)	13 (8.3)	
Non-Hispanic White	58 (52.7)	31 (67.4)	89 (57.1)	
Missing [‡]	4 (3.6)	0 (0)	4 (2.6)	
Provider Age Group				
<31	21 (19.1)	11 (23.9)	32 (20.5)	0.47
31–40	32 (29.1)	16 (34.8)	48 (30.8)	
41–50	22 (20.0)	10 (21.7)	32 (20.5)	
51+	26 (23.6)	6 (13.0)	32 (20.5)	
Missing [‡]	9 (8.2)	3 (6.5)	12 (7.7)	
Practice Characteristics				
Practice Type				
Academic/teaching clinic	25 (22.7)	7 (15.2)	32 (20.5)	0.39 [§]
Employed by health system	45 (40.9)	17 (37.0)	62 (39.7)	
Federally Qualified Health Center or community health center	7 (6.4)	2 (4.3)	9 (5.77)	
Independent solo/group/large group practice	32 (29.1)	20 (43.5)	52 (33.3)	
Missing [‡]	1 (0.9)	0 (0)	1 (0.6)	
Practice Location				
Rural/Suburban	59 (53.6)	28 (60.9)	87 (55.8)	0.41
Urban	51 (46.4)	18 (39.1)	69 (44.2)	
Payor				
Medicaid/Children’s Health Insurance Program (CHIP)	46 (41.8)	18 (39.1)	64 (41.0)	0.42 [§]
Private insurance	59 (53.6)	28 (60.9)	87 (55.8)	
Don’t know	5 (4.5)	0 (0.0)	5 (3.2)	

(continued on next page)

Table 2 (continued)

	Low Hesitancy n = 110 (70.5%)	High [†] Hesitancy n = 46 (29.5%)	Total n = 156 (%)	p-value
Vaccines for Children Program Participant				
No	28 (25.5)	13 (28.3)	41 (26.3)	0.77
Yes	52 (47.3)	23 (50.0)	75 (48.1)	
Don't know	30 (27.3)	10 (21.7)	40 (25.6)	
Patient Characteristics				
Patients Per Week				
Less than 25	14 (12.7)	6 (13.0)	20 (12.8)	0.96
25–49	26 (23.6)	10 (21.7)	36 (23.1)	
50 or more	69 (62.7)	30 (65.2)	99 (63.5)	
Missing [‡]	1 (0.9)	0 (0)	1 (0.6)	
Patient Race/Ethnicity Majority				
African American Non-Hispanic	10 (9.1)	2 (4.3)	12 (7.7)	0.72 [§]
Hispanic	25 (22.7)	11 (23.9)	36 (23.1)	
White Non-Hispanic	64 (58.2)	30 (65.2)	94 (60.3)	
Don't know	11 (10.0)	3 (6.5)	14 (9.0)	
Percent of Patients Between 11 and 17				
Less than 10%	37 (33.6)	13 (28.3)	50 (32.1)	0.10 [§]
10%–19%	39 (35.5)	11 (23.9)	50 (32.1)	
20%–29%	19 (17.3)	10 (21.7)	29 (18.6)	
30%–39%	8 (7.3)	10 (21.7)	18 (11.5)	
>40%	7 (6.4)	2 (4.3)	9 (5.8)	

* Among 151 respondents who reported participating in a residency program.

† High hesitancy is defined as providers reporting a patient population with ≥ 11% of families who expressed concern or refused adolescent vaccination versus “low” (<10%).

‡ Missing not included in chi-square or Fisher’s exact test statistic.

§ Denotes Fisher’s exact test statistic.

general vaccine hesitancy and vaccines against specific diseases is needed to understand effective communication strategies for providers.

Across the U.S., prevalence of vaccine hesitancy varies, and may in part stem from variation in the operational definition used. (Edwards and Hackell, 2016) Across the globe, the WHO and the United Nations Children’s Fund (UNICEF) jointly determined that vaccine hesitancy is common (>90% of countries) and varies by country income level, by WHO region, and has been increasing over time. (Lane et al., 2018) This study shows that a regional cohort of North Texas providers from rural and urban areas, across pediatric and family medicine practices, experience similar rates of HPV vaccine hesitancy despite differences in practice type and location. Most providers (86%) in this study encountered parents who accepted other recommended adolescent vaccines and specifically refused HPV in the past 12 months. A recent national survey of physicians found that the proportion reporting a parental HPV vaccine refusal or deferral rate of >50% ranged from 3% to 36% and varied when the question specified different patient ages (11–12, 13–14, 15+ years old) and when analytically stratified by sex of the patient and provider specialty (pediatricians, family medicine). (Kempe et al., 2019) Differences in survey methodology (i.e., specification of patient age when measuring refusal/deferral, and inclusion of communications expressing vaccine concerns) between the national survey and the present study might explain the variation in results.

This study was the first to determine where providers have the least

amount of confidence by assessing 11 different topics about vaccine concerns that may require counseling. In Texas, where HPV uptake is lower than most of the U.S., (Elam-Evans et al., 2020) providers were most confident in responding to parents about the appropriateness of recommending the HPV vaccine for a child who is not sexually active, and least confident in responding to hesitant parents’ religious/personal beliefs and misinformation on the Internet or social media. Of note, providers encountering more parents with hesitancy felt more confident discussing parents’ religious and personal beliefs. Having to repeatedly communicate about challenging vaccination topics may improve provider confidence and self-efficacy. This may explain why pediatricians reported higher confidence than family medicine clinicians, who likely see fewer adolescents and may have less opportunity to exercise this communication skill.

Most of the providers who participated in this study were family physicians. The American Academy of Family Physicians suggests strategies for overcoming vaccine hesitancy include giving strong, favorable vaccine recommendations and to face ambivalence as a “friend” as ambivalence suggests room for the patient/parent to consider vaccination. (Loehr and Savoy, 2016) Future provider education efforts should focus specifically on building skills to address topics with the lowest levels of confidence. These efforts should employ interactive training components that allow for self-guided assessment and practice to address each provider’s specific needs as this learner-centered approach will facilitate real-world application.

While many resources provide scripts for specific HPV scenarios, (Centers for Disease Control and Prevention, 2018; American Academy of Pediatrics, 2018) their efficacy and level of utilization is largely unknown. Simply providing providers with talking points or scripts may not be enough as demonstrated by a randomized control trial to test a physician-targeted communication intervention that resulted in no detectable effect in reducing maternal vaccine hesitancy or increasing physicians’ confidence in communicating with vaccine-hesitant parents. (Henrikson et al., 2015) Another study analyzed the content of different web-based Continuing Medical Education (CME) activities. Most lacked substantive content on how to change communication behaviors to improve HPV vaccine delivery. (Kornides et al., 2017) Finally, another study measured provider satisfaction with online course material after an average of 6 h spent with online material, 47% of providers reported being “much more likely” or “more likely” to recommend the vaccine. (Cates et al., 2020)

Available materials are often evaluated with cognitive outcomes (willingness to recommend) and do not assess communication skills or if providers leave the training feeling confident or prepared to respond to hesitancy. Efforts should start earlier in the medical education process, perhaps with the National Board of Medical Examiners (NBME), ensuring evaluation of provider communication competency and use of different strategies. With such a reorientation, providers could be evaluated on connecting with patients, confidence in their interviewing skills with techniques to promote behavioral changes, and responding to difficult patients or scenarios.

Finally, we found dismissal policies for adolescent immunizations are used less often when compared to dismissal policies for childhood immunizations, despite HPV having the lowest uptake of any recommended vaccine. (Elam-Evans et al., 2020) While all vaccines, in general, are important to prevent negative health outcomes, the HPV vaccine is the only vaccine shown to prevent six different types of cancer. Many feel the HPV vaccine should be held to the same public health “esteem” as the other vaccines. Dismissal policies, even for adolescent vaccines, are a potential strategy for providers who want to promote the importance of vaccines, attest to their safety, and minimize the time spent convincing hesitant families to vaccinate.

Conversely, some providers consider dismissal policies as excessive, controversial and ethically problematic. (Hendrix et al., 2016) Instead of dismissing or “firing” patients, these providers allow for vaccine dissent, and allow parents to be vaccine selective—negotiate when and which

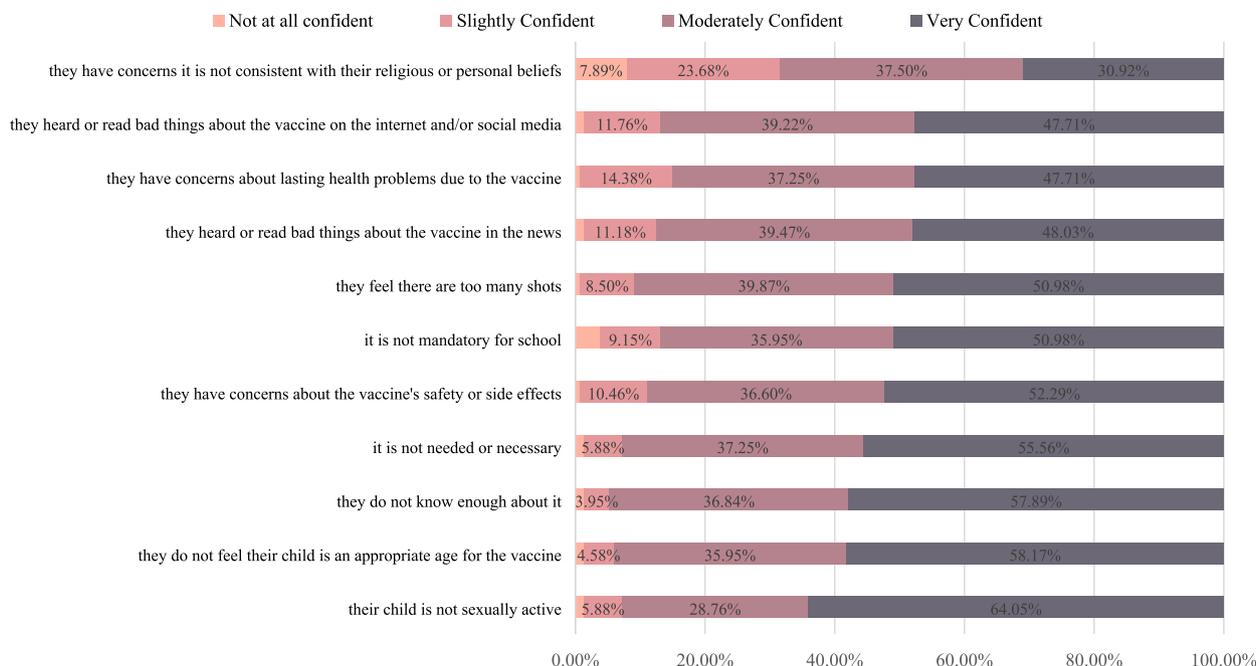


Fig. 2. Providers' Confidence in Responding to 11 Different Parental Concerns Contributing to HPV Vaccine Hesitancy.

Table 3
Providers' Reported Reasons for Families' Refusal of Adolescent versus HPV Vaccination.

Reasons for refusal, n = 156	Adolescent vaccines, n (%)	HPV vaccine, n (%)
Safety concerns	101 (65)	79 (51)
Vaccine(s) not needed	95 (61)	112 (72)
Philosophical/religious	65 (42)	54 (35)
Lack of knowledge	62 (40)	58 (37)
Does not want multiple vaccines	53 (34)	17 (11)
Child not appropriate age	29 (19)	53 (34)

vaccines to accept. These practices would not dismiss a family based on vaccine “preferences” alone. By allowing for flexible, alternative or exempt schedules, some providers feel they are offering a patient-centered, shared decision-making approach. Some suggest that dismissal may also adversely affect other providers’ ability to communicate with vaccine-hesitant families in the future and the long-term consequences on patient-provider interactions. (Garcia and O’Leary, 2020) Others contend that dismissal policies should only be used for diseases that could be transmitted in clinic areas (e.g. airborne transmission of meningitis). The fact that only a quarter (25%) of providers in this study agreed with dismissal policies after repeated attempts of counseling speaks to the level of indecision with this approach, and percolating need for strategies to manage the changing scope and growing dynamic of vaccine hesitancy. This area needs further investigation to determine the legal, ethical, and health effects of dismissal policies.

Despite the novelty of this study, it is not without its restrictions. Limitations of this study include the cross-sectional nature and potential for selection bias. Providers may have unreliable recall of the proportions of parents who express hesitancy or refuse vaccines due to well-established cognitive biases, such as availability heuristics. (Marewski and Gigerenzer, 2012) This may bias results in both directions based on frequency and recency of contact with hesitant parents which could

influence memory and thus, selection of response options. Likewise, emotions could play a role in heuristic decision-making in medicine. (Kahneman et al., 1982) If a frustrated provider, for example, has to deal with hesitant parents, then emotions could introduce bias in selection of response options.

A response rate could not be calculated for this study as it was a public link sent by regional professional societies and a large pediatric healthcare system where the contact information and total unique number of providers across the distribution lists was not shared with the researchers. While this survey invitation strategy preserved the anonymity of participating providers it did not enable linkage of providers to clinics/practices; thus, we could not apply a nested analytic approach to assess if multiple providers from one practice shared similar perceptions and confidence. Future studies could investigate how practice policies might impact personal decisions. While we queried providers about a diverse array of circumstances, our confidence scale may not detect the full range of factors contributing to hesitant attitudes. Finally, this North Texas study population may not be generalizable to other geographic regions. This region, however, deserves thoughtful attention as it has one of the lowest HPV vaccine uptake rates within the state of Texas (Conrey et al., 2020) and the country. (Elam-Evans et al., 2020)

5. Conclusion

Providers need patient-centered communication tools to address parent HPV vaccine hesitancy and refusal behaviors. Ideally, evaluation of these tools would determine what strategies work best in certain contexts and with specific concerns. (MacDonald and Dube, 2015) Dismissing families is one type of reaction to counter hesitancy yet does not address the family’s underlying cognitions, emotions, or social context. Communication is an essential part of any office visit between an adolescent, parent and a provider, and evidence-based tools focused specifically on managing vaccine hesitancy and conflict resolution should be developed and evaluated.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Erika Thompson is a consultant for Merck Pharmaceuticals related to HPV vaccination. She became a consultant after the paper was originally submitted for publication.

Acknowledgements

We would like to acknowledge the effort by the entire research team, specifically the research coordinators (David Montcalvo and Lisa Quirk), the organizations that assisted with recruitment, and the survey participants.

Funding

This work was funded by the National Cancer Institute (No. P30 CA142543-08S1), Lyda Hill Philanthropies, Dallas TX; and the National Institutes of Health (No. K23 HD097291). The content is solely the responsibility of the authors and does not necessarily represent the official views of the study sponsors. The sponsors did not have a role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2021.101562>.

References

- Okita, T., Enzo, A., Kadooka, Y., Tanaka, M., Asai, A., 2020. The controversy on HPV vaccination in Japan: Criticism of the ethical validity of the arguments for the suspension of the proactive recommendation. *Health Policy* 124 (2), 199–204. <https://doi.org/10.1016/j.healthpol.2019.12.011>.
- World Health Organization. Ten threats to global health in 2019, <https://www.who.int/emergencies/ten-threats-to-global-health-in-2019>; 2019 [Accessed Nov 14, 2019].
- Failure to vaccinate and vaccine failure, 2019. *Nat Microbiol* 4 (5), 725. <https://doi.org/10.1038/s41564-019-0450-5>.
- Hough-Telford, C., Kimberlin, D.W., Aban, I., Hitchcock, W.P., Almquist, J., Kratz, R., O'Connor, K.G., 2016. Vaccine delays, refusals, and patient dismissals: A survey of pediatricians. *Pediatrics* 138 (3), e20162127. <https://doi.org/10.1542/peds.2016-2127>.
- Gust, D.A., Darling, N., Kennedy, A., Schwartz, B., 2008. Parents with doubts about vaccines: Which vaccines and reasons why. *Pediatrics* 122 (4), 718–725. <https://doi.org/10.1542/peds.2007-0538>.
- Elam-Evans, L.D., Yankey, D., Singleton, J.A., Sterrett, N., Markowitz, L.E., Williams, C. L., Fredua, B., McNamara, L., Stokley, S., 2020. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years – United States, 2019. *MMWR Morb Mortal Wkly Rep* 69 (33), 1109–1116. <https://doi.org/10.15585/mmwr.mm6933a1>.
- Kempe, A., Saville, A.W., Albertin, C., Zimet, G., Breck, A., Helmkamp, L., Vangala, S., Dickinson, L.M., Rand, C., Humiston, S., Szilagyi, P.G., 2020. Parental hesitancy about routine childhood and influenza vaccinations: A national survey. *Pediatrics* 146 (1), e20193852. <https://doi.org/10.1542/peds.2019-3852>.
- Conrey, R., Valencia, V., Cioletti, A., Williams-Brown, M.Y., 2020. Regional variation in human papillomavirus vaccination uptake and completion among adolescents 13–17 in the state of Texas. *Vaccine* 38 (25), 4119–4124. <https://doi.org/10.1016/j.vaccine.2020.03.059>.
- Olive, J.K., Hotez, P.J., Damania, A., Nolan, M.S., 2018. Correction: The state of the antivaccine movement in the United States: A focused examination of nonmedical exemptions in states and counties. *PLoS Med* 15 (7), e1002616. <https://doi.org/10.1371/journal.pmed.1002616>. <https://doi.org/10.1371/journal.pmed.1002616.g00110.1371/journal.pmed.1002616.g00210.1371/journal.pmed.1002616.g00310.1371/journal.pmed.1002616.t001>.
- Conis, E., 2020. The history of the personal belief exemption. *Pediatrics* 145 (4), e20192551. <https://doi.org/10.1542/peds.2019-2551>.
- Roberts, J.R., Thompson, D., Rogacki, B., Hale, J.J., Jacobson, R.M., Opel, D.J., Darden, P.M., 2015. Vaccine hesitancy among parents of adolescents and its association with vaccine uptake. *Vaccine* 33 (14), 1748–1755. <https://doi.org/10.1016/j.vaccine.2015.01.068>.
- Walker, T.Y., Elam-Evans, L.D., Yankey, D., Markowitz, L.E., Williams, C.L., Fredua, B., Singleton, J.A., Stokley, S., 2019. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years – United States, 2018. *MMWR Morb Mortal Wkly Rep* 68 (33), 718–723. <https://doi.org/10.15585/mmwr.mm6833a2>.
- Office of disease prevention and health promotion. Increase routine vaccination coverage levels for adolescents. <https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives>; 2019 [accessed Nov 19, 2019].
- Rodriguez, S.A., Mullen, P.D., Lopez, D.M., Savas, L.S., Fernández, M.E., 2020. Factors associated with adolescent HPV vaccination in the U.S.: A systematic review of reviews and multilevel framework to inform intervention development. *Prev Med* 131, 105968. <https://doi.org/10.1016/j.ypmed.2019.105968>.
- Mullins, T.L.K., Griffioen, A.M., Glynn, S., Zimet, G.D., Rosenthal, S.L., Fortenberry, J.D., Kahn, J.A., 2013. Human papillomavirus vaccine communication: Perspectives of 11–12 year-old girls, mothers, and clinicians. *Vaccine* 31 (42), 4894–4901. <https://doi.org/10.1016/j.vaccine.2013.07.033>.
- Shay, L.A., Baldwin, A.S., Betts, A.C., Marks, E.G., Higashi, R.T., Street, R.L., Persaud, D., Tiro, J.A., 2018. Parent-provider communication of HPV vaccine hesitancy. *Pediatrics* 141 (6), e20172312. <https://doi.org/10.1542/peds.2017-2312>.
- Paterson, P., Meurice, F., Stanberry, L.R., Glismann, S., Rosenthal, S.L., Larson, H.J., 2016. Vaccine hesitancy and healthcare providers. *Vaccine* 34 (52), 6700–6706. <https://doi.org/10.1016/j.vaccine.2016.10.042>.
- Hswen, Y., Gilkey, M.B., Rimer, B.K., Brewer, N.T., 2017. Improving physician recommendations for human papillomavirus vaccination: The role of professional organizations. *Sex Transm Dis* 44 (1), 43–48. <https://doi.org/10.1097/OLQ.0000000000000543>.
- Wittman, H.O., 2015. Addressing vaccine hesitancy with values. *Pediatrics* 136 (2), 215–217. <https://doi.org/10.1542/peds.2015-0949>.
- Dube, E., 2017. Addressing vaccine hesitancy: The crucial role of healthcare providers. *Clin Microbiol Infect* 23 (5), 279–280. <https://doi.org/10.1016/j.cmi.2016.11.007>.
- Leung SOA, Akinwunmi B, Elias KM, et al. Educating healthcare providers to increase human papillomavirus (HPV) vaccination rates: A qualitative systematic review. *Vaccine* X 2019;3100037. DOI: 10.1016/j.jvax.2019.100037.
- Walling, E.B., Dodd, S., Bobenhouse, N., Reis, E.C., Sterkel, R., Garbutt, J., 2019. Implementation of strategies to improve human papillomavirus vaccine coverage: A provider survey. *Am J Prev Med* 56 (1), 74–83. <https://doi.org/10.1016/j.amepre.2018.07.038>.
- Gilkey, M.B., Parks, M.J., Margolis, M.A., McRee, A.-L., Terk, J.V., 2019. Implementing evidence-based strategies to improve HPV vaccine delivery. *Pediatrics* 144 (1), e20182500. <https://doi.org/10.1542/peds.2018-2500>.
- Centers for Disease Control and Prevention. You are the key to HPV cancer prevention, <https://www.cdc.gov/vaccines/ed/vaccine-communication/you-are-key-2018.html>; 2018 [accessed Nov 19, 2019].
- American Academy of Pediatrics. HPV champion toolkit, <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/immunizations/HPV-Champion-Toolkit/Pages/HPV-Champion-Toolkit.aspx>; 2018 [accessed Nov 19, 2019].
- Kornides ML, Garrell JM, and Gilkey MB. Content of web-based continuing medical education about HPV vaccination. *Vaccine* 2017;35(35 Pt B):4510-14. DOI: 10.1016/j.vaccine.2017.07.038.
- Cates JR, Diehl SJ, Fuemmeler BF, et al. Toward optimal communication about HPV vaccination for preteens and their parents: Evaluation of an online training for pediatric and family medicine health care providers. *J Public Health Manag Pract* 2020;26(2):159-67. DOI: 10.1097/PHH.0000000000001022.
- Bernstein, H.H., Bocchini, J.A., 2017. and COMMITTEE ON INFECTIOUS DISEASES. Practical approaches to optimize adolescent immunization. *Pediatrics* 139 (3), e20164187. <https://doi.org/10.1542/peds.2016-4187>.
- Reno, J.E., O'Leary, S., Garrett, K., Pyrzanowski, J., Lockhart, S., Campagna, E., Barnard, J., Dempsey, A.F., 2018. Improving provider communication about HPV vaccines for vaccine-hesitant parents through the use of motivational interviewing. *J Health Commun* 23 (4), 313–320. <https://doi.org/10.1080/10810730.2018.1442530>.
- Gilkey, M.B., McRee, A.L., 2016. Provider communication about HPV vaccination: A systematic review. *Hum Vaccin Immunother* 12 (6), 1454–1468. <https://doi.org/10.1080/21645515.2015.1129090>.
- Edwards, K.M., Hackell, J.M., 2016. Countering vaccine hesitancy. *Pediatrics* 138 (3), e20162146. <https://doi.org/10.1542/peds.2016-2146>.
- O'Leary, S.T., Allison, M.A., Fisher, A., Crane, L., Beaty, B., Hurley, L., Brtnikova, M., Jimenez-Zambrano, A., Stokley, S., Kempe, A., 2015. Characteristics of physicians who dismiss families for refusing vaccines. *Pediatrics* 136 (6), 1103–1111. <https://doi.org/10.1542/peds.2015-2086>.
- Leask, J., Kinnersley, P., 2015. Physician communication with vaccine-hesitant parents: The start, not the end, of the story. *Pediatrics* 136 (1), 180–182. <https://doi.org/10.1542/peds.2015-1382>.
- Alexander, K., Lacy, T.A., Myers, A.L., Lantos, J.D., 2016. Should pediatric practices have policies to not care for children with vaccine-hesitant parents? *Pediatrics* 138 (4), e20161597. <https://doi.org/10.1542/peds.2016-1597>.
- Szilagyi, P.G., Albertin, C.S., Gurfinkel, D., Saville, A.W., Vangala, S., Rice, J.D., Helmkamp, L., Zimet, G.D., Valderrama, R., Breck, A., Rand, C.M., Humiston, S.G., Kempe, A., 2020. Prevalence and characteristics of HPV vaccine hesitancy among parents of adolescents across the U.S. *Vaccine* 38 (38), 6027–6037. <https://doi.org/10.1016/j.vaccine.2020.06.074>.
- Dudley, M.Z., Privor-Dumm, L., Dubé, È., MacDonald, N.E., 2020. Words matter: Vaccine hesitancy, vaccine demand, vaccine confidence, herd immunity and mandatory vaccination. *Vaccine* 38 (4), 709–711. <https://doi.org/10.1016/j.vaccine.2019.11.056>.
- Lane, S., MacDonald, N.E., Marti, M., Dumolard, L., 2018. Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF joint reporting form data-2015-2017. *Vaccine* 36 (26), 3861–3867. <https://doi.org/10.1016/j.vaccine.2018.03.063>.

- Kempe, A., O'Leary, S.T., Markowitz, L.E., Crane, L.A., Hurley, L.P., Brtnikova, M., Beaty, B.L., Meites, E., Stokley, S., Lindley, M.C., 2019. HPV vaccine delivery practices by primary care physicians. *Pediatrics* 144 (4), e20191475. <https://doi.org/10.1542/peds.2019-1475>.
- Loehr J and Savoy M. Strategies for addressing and overcoming vaccine hesitancy: Editorial. *American Family Physician* 2016;94(2), www.aafp.org/afp.
- Henrikson, N.B., Opel, D.J., Grothaus, L., Nelson, J., Scrol, A., Dunn, J., Faubion, T., Roberts, M., Marcuse, E.K., Grossman, D.C., 2015. Physician communication training and parental vaccine hesitancy: A randomized trial. *Pediatrics* 136 (1), 70–79. <https://doi.org/10.1542/peds.2014-3199>.
- Hendrix, K.S., Sturm, L.A., Zimet, G.D., Meslin, E.M., 2016. Ethics and childhood vaccination policy in the United States. *Am J Public Health* 106 (2), 273–278. <https://doi.org/10.2105/AJPH.2015.302952>.
- Garcia, T.B., O'Leary, S.T., 2020. Dismissal policies for vaccine refusal among us physicians: A literature review. *Hum Vaccin Immunother* 16 (5), 1189–1193. <https://doi.org/10.1080/21645515.2020.1724742>.
- Marewski, J.N., Gigerenzer, G., 2012. Heuristic decision making in medicine. *Dialogues Clin Neurosci* 14 (1), 77–89. <https://www.ncbi.nlm.nih.gov/pubmed/22577307>.
- Kahneman D, Slovic P, Tversky A, eds. *Judgment under uncertainty: Heuristics and biases*. Cambridge, UK: Cambridge University Press; 1982.
- MacDonald, N.E., Dube, E., 2015. Unpacking vaccine hesitancy among healthcare providers. *EBioMedicine* 2 (8), 792–793. <https://doi.org/10.1016/j.ebiom.2015.06.028>.