ID: 14
Title: Countering Anti-vax Misinformation via Social Media and Crowdsourcing Platforms: Message-Testing Experiments for HPV Vaccination Uptake
Authors: Olson AL, Kim SJ, Schiffelbein, Imset I
Abstract:
Purpose of study: To test the relative effectiveness of messages about HPV vaccination, on social media to change parents’ attitudes toward the vaccine and their intentions to vaccinate their child(ren).
Methods: A cohort of parents with children was recruited from social media sites for the message-testing study (n=1080). Based on the results from earlier focus groups we conducted on Facebook messages were created for five themes (distrust of the healthcare system, safety concerns, effectiveness concerns, connection to sexual activity, and misinformation). We developed five experimental messages for each theme, as well as six control messages about e-cigarettes. After completing pre-test questions, participants were randomly assigned to one message, which was presented in a simulated social media environment. After message exposure, participants completed post-test questions to measure changes in their attitudes and behavioral intentions to vaccinate their child(ren) against HPV.
Results: The experimental messages about the HPV vaccine significantly increased positive attitudes toward HPV vaccination, versus control messages (t = 3.03, p = .003). Parents’ behavioral intention to vaccinate their child(ren) against HPV was significantly associated with the increase in positive attitudes toward HPV vaccination (Pearson r = 1.14, p = .05). Structural equation modeling showed messages on four of the themes were more likely to increase behavioral intention to vaccinate, in part, due to the increased positive attitudes toward the vaccine (chi-square = 6.00, p = ns, RMSEA = .014, CFI = .91, SRMR = .031). Among the messages focused on correcting misinformation, those highlighting the effects of HPV vaccine for both boys and girls and messages directly countering misinformation (e.g. vaccine reuls sin death) were effective in changing parents’ behavioral intentions.
Conclusion: Social media platforms offer the opportunity to change attitudes and behavioral intentions toward HPV vaccination, rather than just facilitating the spread of misinformation. We identified messages and themes that were effective in changing not only attitudes, but also behavioral intention to vaccinate against the HPV.

ID: 9
Title: Provider Perspectives in Managing Misinformation about HPV Vaccination: Addressing Parental Hesitancy with Confident Communication & Dismissal Policies
Authors: Francis JKR, Rodriguez SA, Dorsey O, Monticalvo D, Blackwell JM, Thompson EL, Pruitt SL, Tiro JA
Abstract:
Objectives: Some providers have expressed a lack of confidence in their ability to communicate effectively with hesitant parents who present with misinformation. We examined provider and practice characteristics associated with addressing a sizable number of HPV vaccine-hesitant parents (>10%), providers’ confidence in responding to specific vaccine concerns, and use of vaccine dismissal policies.
Methods: We invited North Texas family and pediatric providers via email through two regional professional societies and one healthcare system to complete a survey between June 2018 to January 2019. Dependent variables assessed: (1) perceived percentage of HPV vaccine-hesitant parents encountered in practice; (2) confidence in responding to 11 different vaccine concerns; (3) attitudes towards and use of vaccine dismissal policies. Several independent variables measured provider and practice characteristics. Categorical outcomes were compared using chi-square and continuous outcomes were compared using independent t-test.

Results: Among 156 respondents, 29.5% (46/156) reported >10% of parents in their practice expressing HPV vaccine-hesitancy. There were no statistical differences in provider or practice characteristics between this group and providers who had ≤10% expressing hesitancy. Across all 11 items, providers’ reported being “very confident” in addressing a range of vaccine concerns (mean: 3.37 out of 4, SD: 0.57). Reported mean confidence scores were significantly higher for providers who were white (3.5, CI 3.4-3.6) vs. non-white (3.3, CI 3.1-3.4, p = 0.03), and pediatricians (3.6, CI 3.4-3.8) vs. family practitioners (3.3, CI 3.2-3.4, p = 0.01). When confidence items were investigated individually, most providers were less than “very confident” in responding to parents’ religious/personal beliefs (69.1%) or responding to parents who read “bad things about the vaccine on the internet and/or social media” (52.3%). Providers in practices with a higher percentage of HPV vaccine-hesitant parents were more likely to report being “very confident” at addressing parents’ religious/personal beliefs compared to providers in practices with a lower percentage of HPV vaccine-hesitant parents (p = 0.03). There were no significant differences in either group’s confidence to addressing misinformation on the internet/social media (p = 0.70). Most providers (86%) report encountering parents who accept other recommended adolescent vaccines and specifically refused HPV in the past 12 months. Finally, 26% of providers reported they somewhat/strongly agree 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 (9.6%).

Conclusions: Almost a third (29.5%) of North Texas providers encounter a sizeable proportion of HPV vaccine-hesitant parents. Providers report lower confidence in addressing hesitant parents’ religious/personal beliefs and parents’ misinformation obtained from the internet/social media. Provider education should focus on awareness about specific online misinformation and training on patient-centered communication to tailor messages to patient’s needs and to address personal/religious beliefs. Use of dismissal policies to manage vaccine-hesitant parents remains lower for adolescent than childhood immunizations despite the high prevalence of HPV vaccine-hesitant/refusal parents.

ID: 8
Title: Geographic Differences in HPV Vaccine Presentation and Parental Refusal
Authors: Kasting ML, Head KJ, Shedd-Steele R, Zimet GD
Abstract:
Purpose: The purpose of this study was to examine vaccine coordinators’ reports of frequency of HPV vaccine recommendation, how the vaccine is recommended, and reported parental refusal in rural versus urban counties in Indiana.

Methods: We surveyed 94 clinic vaccine coordinators from 64 of Indiana’s 92 counties about the frequency of HPV vaccination recommendations and parental refusal for the vaccine for adolescent boys and girls ages 9-10, 11-12, and 13-17 (never [1] to always [5]); we also asked how they present the vaccine to their patients (“due,” “optional,” etc.). Participants were compared by the reported clinic geographic location comparing rural (n=45) to urban/suburban (n=45). Participants who did not report a geographic location were excluded from the analyses (n=4). Geographic locations were compared using t-tests and chi-square tests as appropriate.
Results: All of the respondents were female and 82.3% reported their ethnicity as non-Hispanic White. Participants held various roles in the clinic but most (58.3%) reported being registered nurses. There were no statistically significant differences between geographic locations in how frequently participants reported recommending the HPV vaccine, regardless of patient age or gender. However, a significantly greater proportion of urban/suburban stakeholders reported presenting the vaccine as “due” as compared to rural stakeholders (70.5% vs. 48.9%; p=0.03). Furthermore, rural stakeholders reported significantly higher parental refusal than urban/suburban stakeholders for 13-17 year old girls (p=0.02) as well as 13-17 year old boys (p=0.01).

Conclusions: While there were no differences between geographic location on HPV vaccine recommendation frequency, there were differences in vaccine presentation and parental refusal. This could account, at least in part, to rural/urban disparities in HPV vaccine uptake for rural populations. Future research should focus on improving presumptive recommendations (i.e. stating the vaccine is due) particularly in rural populations.

ID: 16

Title: HPV Vaccine Missed Opportunities in a Safety Net Health System

Authors: McGee LU, Ressler KS, Boom JA, Sangi-Haghpeykar H, Jibaja-Weiss ML, Montealegre JR

Abstract:

Purpose of the study: To describe reasons for missed opportunities for HPV vaccination in a large urban safety net health system and elucidate their association with patient and clinic characteristics.

Methods: The electronic medical record was used to identify all patients ages 11-18 years who visited a primary care clinic between 06/01/18-08/31/18. Patients’ index visit was defined as their most recent visit to a health system clinic within that time frame. Based on dates of vaccine administration, patients were categorized as previously vaccinated (≥ 1 vaccine dose before index visit), vaccinated at index visit, or not vaccinated at index visit. Chart reviews were performed for patients not vaccinated at index visit. Charts were iteratively coded for reason for non-vaccination. Codes were collapsed into 5 themes: incomplete vaccine record (IVR), silent record (SR, i.e., no documentation that the HPV vaccine was offered, ordered, or administered), parental refusal, staff/provider error, and medical contraindication. Independent multivariable Poisson regression models were built to examine factors associated with each reason after adjusting for covariates.

Results: Non-vaccination at index visit was most commonly due to IVR (37%), followed by SR (24%), refusal (20%), staff/provider error (15%), and medical contraindication (4%). In multivariable analyses, IVR and SR were more prevalent among 13-18 vs 11-12 year-olds (adjusted prevalence ratio [APR]=3.0 and 2.5, p<0.01). IVR and refusal were more prevalent among patients attending pediatric vs family-practice clinics (APR=1.5 and 2.7, p<0.01). SR and refusal were more prevalent among patients attending sick vs well-child visits (APR=3.7 and 2.1, p<0.01). SR and refusal were more prevalent among patients with indigent vs commercial coverage (APR=0.3 and 0.2, p<0.01). Refusal was less prevalent among Black/African Americans vs non-Hispanic Whites (APR=0.4, p=0.01).

Conclusions: The most common reason for missed opportunity in our safety system was lack of adequate vaccine records. While parental refusal has been the primary focus of HPV vaccine interventions to improve coverage, our study highlights the importance of incomplete and silent records as an important focus for future provider-based interventions.
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<td><strong>Title:</strong> Going to the dentist: Feasibility of engaging dental hygienists to promote the HPV vaccine to their adolescent patients</td>
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<tr>
<td><strong>Authors:</strong> Askelson NM, Ryan GW, McKernan SC, Scherer A, Pieper FJ, Avdic LH, Kim T, Daly E</td>
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<td><strong>Abstract:</strong> Purpose of Study: This formative research documents current activities by dental hygienists to promote the HPV vaccine to adolescent patients and acceptability of increasing this role in clinical settings. Methods: Licensed dental hygienists in Iowa (n=2080) were mailed a survey about HPV vaccination promotion in dental settings. Outcome measures included current activities to promote HPV vaccination, attitudes, and willingness to participate in additional activities. Results: The adjusted survey response rate was 30.4% (n=597). Respondents were predominantly white (97.3%), worked in private practices (80.2%), and between the ages of 40-59 (48.7%). Of those that reported a zip code (n=501), 31.7% worked in a rural area. Most hygienists (78.9%) reported some level of interaction with parents of their adolescent patients. The vast majority reported that their clinics do not currently engage in HPV vaccination promotion activities. Limited methods of vaccination promotion include: asking about HPV vaccination on health history forms (6.7% of respondents), handing out HPV vaccine information (3.2%), and recommending the vaccine (3.7%). Only 26.9% of dental hygienists believe it is within their scope of practice to recommend the HPV vaccine; 20.9% believe that a parent would act on such a recommendation. However, the majority of respondents would be willing to participate in vaccine promotion activities: educating parents about HPV and oral cancer 74.7%), recommending the vaccine to parents (53.1%), or referring patients to health care providers for the vaccine (58.0%). Primary barriers to discussing the vaccine with parents were not knowing enough about the vaccine (67.5%) and not feeling comfortable talking to parents about HPV (40.0%). Finally, most respondents (88.1%) would be willing to receive continuing education about HPV and oral cancer. Conclusions: We identified very little activity in dental offices to promote the HPV vaccine. However, respondents expressed interest in becoming more involved and taking concrete steps to promote the vaccine. Our results highlight opportunities to engage dental hygienists with training that increases knowledge and comfort in talking to parents about these topics.</td>
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<td><strong>Title:</strong> School-Based Human Papillomavirus Vaccination Program for Increasing Vaccine Uptake in an Underserved Area of Texas</td>
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<tr>
<td><strong>Authors:</strong> Kaul S, Do TQN, Hsu En, Schmeler KM, Montealegre JR, Rodriguez AM</td>
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| **Abstract:** Purpose of the Study: To compare the effectiveness of onsite school-based HPV vaccination and community-based education versus community-based education alone for increasing HPV vaccine uptake in a rural, medically underserved area in Texas. Methods: This study was conducted in the Texas’ Rio Grande Valley along the U.S-Mexico border. Our cohort included 2,307 middle school students from 3 schools in the Rio Grande City Consolidated Independent School District (RGCCISD). Students were enrolled in our study in August 2016 and followed-up through April 2018. Using a quasi-experimental design, we implemented an onsite school-based vaccination program with community-based education at 1 middle school (“intervention school”), and education only at the other 2 schools (“comparison schools”). The school-based vaccination program involved vaccination events where children, with parental consent, received the HPV vaccine through a project-contracted vendor. The educational intervention involved physician-led
presentations on HPV and HPV vaccine for 3 target stakeholders: parents/guardians, school nurses/staff, and pediatric/family providers in the surrounding community (15-mile radius of RGCCISD). CDC educational materials supplemented our educational efforts. HPV vaccine status was obtained from school immunization and vaccine vendor records. HPV vaccine initiation and completion were compared pre- and post-intervention between the intervention and comparison schools. Logistic regression was used to compare the odds of initiating/completing vaccination between the intervention and comparison schools.

Results: At baseline, the intervention school had lower HPV vaccine initiation and completion rates than the comparison schools (20.00% and 8.70%, p<0.01 vs. 28.97% and 14.56%, p<0.01). Post-intervention, the intervention school had higher initiation and completion rates than the comparison schools (53.67% and 28.36%, p<0.01 vs. 41.56% and 20.53%, p<0.01). In multivariable analyses, students from the intervention school were >3.6-times more likely than those from the comparison schools to initiate/complete vaccination.

Conclusions: On-site school-based vaccination with community-based education increased HPV vaccine uptake at greater rates than education alone.

ID: 22
Title: Awareness of HPV and HPV Vaccination among U.S. Adults Ages 27-45 Years
Authors: Thompson EL, Wheldon CW, Rosen BL, Maness SB, Kasting ML, Massey PM
Abstract:
Purpose of the Study: Recently, the Advisory Committee on Immunization Practices recommended that adults 27-45 years old could receive the human papillomavirus (HPV) vaccine based on a shared decision with their healthcare provider. With this expansion in guidelines, there is a need to examine the awareness and knowledge of HPV and HPV vaccination among this new age group for cancer prevention.
Methods: Health Information National Trends Survey (HINTS) 5 Cycle 2 is a national survey of US adults. The sample was restricted to a complete case analysis of adults ages 27-45 years (N=725). Sociodemographic, healthcare, and health information correlates were assessed for the following outcomes: HPV awareness, HPV vaccination awareness and HPV, cervical cancer, and non-cervical cancers knowledge. Survey-weighted logistic regression models were conducted.
Results: A majority of respondents were aware of HPV (72.9%) and HPV vaccination (67.1%). Respondents were more likely to be aware of HPV and HPV vaccination if they were female, had a higher level of education, and had previous cancer information seeking behaviors. Although there was widespread knowledge of HPV as a cause of cervical cancer (79.6%), knowledge of HPV as a cause of non-cervical cancers was reported by a minority of respondents (36.1%). College education was positively associated with cervical cancer knowledge (aOR=4.62; 95%CI: 1.81-11.78); however, no statistically significant correlates were identified for non-cervical HPV associated cancer knowledge.
Conclusions: This is one of the first studies to examine HPV and HPV vaccination correlates among 27-45 year olds within the context of the HPV vaccine guidelines change. While more than half of adults in this age group were aware of HPV and HPV vaccination, there are opportunities to improve awareness and knowledge as these are critical first steps toward shared decision-making for HPV vaccination in mid-adulthood.
Title: A Mixed Methods Study of Florida Healthcare Providers’ HPV Vaccine Recommendations

Authors: Staras SAS, Bylund C, Thompson LA, Desai S, Mohan V

Abstract:
Purpose: Based on the strong influence of healthcare provider recommendations on HPV vaccination, national agencies have endorsed bundling (presenting Tdap, HPV, and meningococcal vaccines together), benefits (endorsing cancer prevention, safety, vaccine efficacy, and 11- to 12-year-olds), and presumptive strategies (stating the vaccine will be given). We aimed to understand the recommendation strategies used by Florida healthcare providers for parents of 11- to 12-year-olds.

Methods: In 2018, we conducted a cross-sectional survey of 270 healthcare providers practicing in the University of Florida Cancer Catchment Area identified from the AMA Physician Masterfile and the Florida Health Care Practitioner Data Portal. From the 1,841 providers, we selected a random sample of 45 providers from six strata: urban/rural practice by provider type (MD/DO, ARNP, and PA). Survey questions focused on HPV vaccine recommendation strategies with closed- and open-ended responses. We sent providers a notification postcard, a survey via FedEx with $10, a reminder survey, and a reminder postcard. We sent non-responders four email invitations. Two coders evaluated open-ended responses with planned categories.

Results: Among the 270 providers, 152 returned the survey (56% participation rate), but 88 were ineligible (68 did not provide preventive care or vaccines to 11- to 12-year-olds, 5 did not offer the HPV vaccine, and 15 were outside the catchment area or retired). The survey was completed by 46 providers (25% response rate). When asked about HPV vaccine recommendation strategies, providers reported most often using bundling (7%), benefits (50%), and both benefits and bundling (30%). Most participants (87%) responded to the open-ended question of their typical HPV vaccine recommendation. Recommendations were consistent with bundling for 10%, all characteristics of benefits for 0%, and presumptive for 39%. Unfortunately, 21% contained inaccurate information, 46% mentioned parental choice, and 5% offered vaccination delay. Promisingly, 62% mentioned preventing cancer, 44% said to vaccinate today, and 28% offered a strong recommendation.

Conclusions: Recommendations reported by Florida providers are less than ideal, with a disturbing percentage containing inaccurate information.

Title: Adaptation of the Emory Vaccine Confidence Index for Parents of Adolescents

Authors: Parks S, King AR, Bednarczyk RA

Abstract:
Purpose of the Study:
To adapt the Emory Vaccine Confidence Index (EVCI) developed for parents of young children into a short form instrument for assessing vaccine confidence among parents of adolescents.

METHODS:
A sample of 701 parents of adolescents from the state of Georgia was obtained via Qualtrics panel survey. Data gathered included demographic data and 31 EVCI questions. Exploratory Factor Analysis was used to reduce the original 31 EVCI to scales containing 15, 10, 6 and 5 questions. The composite scores for each version were divided
into low, medium, and high confidence categories and compared to self-reported adolescent vaccine receipt using logistic regression controlled for age, gender, race, income, education, and insurance status.

RESULTS:
Using factor analysis, the EVCI was able to be reduced to 5 questions (Chronbach's alpha 0.819). Question domains identified to be the most essential were trust in health care providers, vaccine efficacy, and societal obligation surrounding vaccines. In controlled logistic regression the 5 question EVCI predicted self-reported receipt of the Meningococcal vaccine (OR 2.09 1.55-2.80), HPV vaccine (OR2.24 1.69-2.97) and TDAP vaccine (OR 2.97 1.96-4.50).

CONCLUSIONS:
The 5 question EVCI is strongly associated with self-reported adolescent vaccine receipt and could prove a useful tool for assessing attitudes and likelihood of vaccination in practice. Identified domains of trust in healthcare providers, vaccine efficacy, and societal pressures could represent an opportunity for changes in messaging to parents of adolescents surrounding vaccines, notably safety did not appear to be an important factor when trust in healthcare was included.

ID: 31
Title: Assessing Views of the Immunization Neighborhood to Improve HPV vaccine rates: The Provider Perspective
Authors: Cunningham-Erves J, Frazier N, Hull PC
Abstract:
Purpose of study: To better understand immunization provider perceptions towards the idea of collaborating with immunization providers in other settings (the “Immunization Neighborhood”) to improve HPV vaccination rates.
Methods: We conducted qualitative interviews among a purposive sample of 37 immunization providers (9 healthcare providers, 8 pharmacists, 10 health department staff, 10 school staff). Prior to the interview, we provided participants a brief survey to determine willingness to collaborate with other immunization providers in various vaccination settings (i.e., medical home, pharmacies, health departments, and schools). An inductive, qualitative content analysis approach was used to analyze the data, and a constant comparison method was used to compare codes for theme development. Univariate statistics were used to describe the quantitative data.
Results: Majority (n=35) of providers perceived the immunization neighborhood concept was a good strategy to improve HPV vaccination rates. Most healthcare providers were willing to collaborate with health department and school staff. Most school staff were willing to collaborate with health department staff and healthcare providers. Similarly, most health department staff were willing to collaborate with school staff and healthcare providers. However, majority of healthcare providers, school staff, and health department staff were unwilling to work with pharmacists. Half of pharmacists were unwilling to work with the healthcare providers, health department staff, and school staff. Perceived benefits of the immunization neighborhood were convenience and improved access to care. Major concerns were poor communication across stakeholders to track vaccinations and potential break in continuity of care. Bringing all stakeholders to the table was suggested as a key strategy to promote cross-setting coordination.
Conclusion: Findings suggest greater coordination of HPV vaccination across the medical home, health departments and schools, as well as potential barriers to coordinate vaccinations with pharmacies. Any efforts to potentially shift the traditional model to provide the HPV vaccine solely in the medical home should involve all relevant stakeholders in planning to ensure buy-in.
Title: Preliminary Results from a Multi-Level Intervention (Parent, Provider/Staff, Clinic and Community) to Accelerate HPV Vaccine Uptake in a Rural Health Clinic

Abstract:
Purpose: To accelerate uptake of the human papillomavirus (HPV) vaccine among adolescent patients at the Willows Clinic, a rural health clinic in Glenn County, CA.

Methods: We conducted an environmental scan comprised of surveys, interviews and focus groups with stakeholders to understand barriers and facilitators to HPV vaccination. Based on this scan and previous research, we developed and are currently implementing a multi-level intervention that included: 1) parent educational workshops; 2) in-service training for providers and clinic support staff; 3) review of the electronic health system (EHS) capabilities and clinic policies and procedures as it related to HPV vaccinations; and 4) community outreach and engagement.

Results: Our scan revealed that community members had low knowledge and awareness of the HPV vaccine; community misinformation regarding vaccine safety was widespread; and that the provider recommendation is an important factor in deciding whether they would vaccinate their child. Additionally, because of transportation and scheduling issues, community members suggested alternative means to in-clinic vaccinations. After our first in-service training there was a shift in prioritizing HPV vaccination from the 3rd most important vaccine for adolescents to the first most important vaccine. During this time, the Willow’s Clinic transitioned to a new EHS system and a review of the capabilities suggest that these systems are not well equipped for population health management. From baseline (1/1/17-12/31/17) to Interim (as of 8/16/19) HPV vaccination rates increased by 4.7% for completion of series (27% to 31.7%) and 8.5% for series initiation (52.4% to 60.9%).

Conclusions: While we made modest gains on increasing Willow’s HPV vaccination rates, more extensive interventions are needed to understand the culture of rural clinics and the community they serve. More progress could be made after the incorporation of a population health management software to the current EHS system, drawing upon the camaraderie and closeness of the community, and ensuring that the all clinic staff from top to bottom provide the same strong consistent HPV vaccination recommendation.

Title: HPV Vaccine Recommendations and Barriers Among Rural Providers in the Mountain West

Abstract:
Purpose: The purpose of this study is to assess HPV vaccination knowledge & recommendation practices in rural Mountain West (MW) clinics

Methods: Clinic recruitment occurred using healthcare teams in rural settings from the MW HPV Coalition. The five invited clinics in Montana, Colorado, Utah, and Arizona agreed to participate, four rural and one small urban. Participants, clinicians and other healthcare team members, were asked to complete an 11-item mini-survey, prior to focus groups, including HPV knowledge, challenges around administering the vaccine, and recommendation practices. Pearson correlation coefficient was used to measure the association between recommendation practices and the healthcare team as well as knowledge scores. We applied logistic regression to assess recommendation practices among the health care team.

Results: Participants from each clinic (n=99) included medical doctors (MD), physician assistants (PA), nurse practitioners (NP), nurses, medical assistants (MA), clinical staff, and administrators. Clinicians were more likely to answer ‘almost always’ in recommending vaccine to boys and girls at 11-12 years of age (OR 3.31, 95%, [1.11-9.88])
and recommend to get the vaccine the same day of appointment (OR 3.55, 95%, [1.29-9.72]) compared to other healthcare team members. Among other healthcare team members, the highest correlation was observed between recommendation practices (p=0.84812, p<0.05) and HPV vaccinations, and overall knowledge and HPV vaccination (p=0.41628, p<0.05). Clinicians in rural areas reported higher number of challenges that limit HPV vaccination compared to small urban clinicians (p<0.05). Recommendation practice scores for HPV vaccination in small urban settings had higher recommendations scores than rural, and a significant difference was observed in the MA group (p<0.05).

Conclusions: Our findings indicate that a higher level of knowledge and understanding of the HPV vaccine among the healthcare team are more likely to recommend the vaccine to parents compared to those who have limited knowledge about the vaccine. Furthermore, rural clinicians had more barriers to providing the vaccine than small urban clinicians, suggesting that rural clinics additional resources and education.

**ID: 18**  
**Title:** Coalition-Building Strategies to Address Barriers to HPV Vaccination in a Regional DFW Catchment Area  
**Authors:** Higashi RT, Rodriguez SA, Quirk L, Thomas A, Jimenez K, Pruitt SL, Tiro JA.  
**Abstract:**  
BACKGROUND: Barriers to HPV vaccination are varied and require a multi-strategy approach. Coalitions facilitate design and implementation of multi-strategy approaches because they draw upon the strengths of multiple stakeholder groups. For example, some stakeholders contribute direct services, others provide access to target populations, while others lend resources or educational expertise. However, the best practices of coalition-building to promote HPV vaccination are unknown. The objective of this study was to assess how community stakeholders establish partnerships to support HPV vaccination, and to identify opportunities for coalition building.  
METHODS: Qualitative exploratory design. We developed a semi-structured interview guide to probe stakeholders’ perceptions of local knowledge and attitudes toward the HPV vaccine, and solicit their suggestions for coalition-building. We conducted semi-structured interviews with stakeholders from 6 counties surrounding Dallas, including health services providers, school nurses and district administrators, cancer organizations, community service organizations, health departments, and advocates. Interviewers took notes during interviews and recorded detailed fieldnotes afterwards. These fieldnotes, along with complete transcripts from 7 interviews, were thematically analyzed in NVivo 12.0 using a deductively driven codebook that corresponded to topics in the interview guide. Interviews were halted once thematic saturation had been reached.  
RESULTS: Findings from interviews with 37 individuals, presented through a series of vignettes, illustrate how stakeholders utilized local networks to create successful partnerships. At the same time, findings also demonstrate ongoing challenges in aligning stakeholder responsibilities, resources, and knowledge. While many stakeholders expressed a willingness to participate in coalitions, few voiced the desire or knowledge of how to initiate such action.  
DISCUSSION: Coalition building is successful when local stakeholders establish partnerships that complement each other’s needs and strengths. Initiating these partnerships, however, may require greater leadership, creativity and training in coalition best practices to activate stakeholders to contribute to an ecosystem that enhances HPV vaccine uptake.

**ID: 5**  
**Title:** Social Media Engagement Association with HPV and Vaccine Awareness and Perceptions: Results from the 2017 US Health Information National Trends Survey  
**Authors:** Rosen BL, Thompson E, Wheldon C, Maness SB, Massey P
Abstract:
Purpose: The purpose of the study was to determine the associations between participants’ level of social media engagement (SME) and: HPV-related awareness, HPV vaccine-related awareness, and perceived HPV vaccine efficacy.

Methods. We conducted a secondary analysis (n=3,171) of the Health Information National Trends Survey (2017 Cycle 5.1). We created the SME index from five items assessing social media and internet use. The index was coded as: No engagement (no use), low engagement (only observing but not sharing information), and high engagement (observing and sharing information). HPV-related awareness was assessed by asking participants: if they had heard of HPV, if HPV caused anal, oral, penile, and cervical cancer, respectively, if HPV was a sexually transmitted disease, and if HPV required medical treatment. Respondents were also asked if they had heard of the HPV vaccine, and how successful the HPV vaccine is at preventing cervical cancer. For each outcome variable, multinomial logistic regression was conducted.

Results. SME in the sample was low (M=0.9). Respondents with higher SME had higher odds of HPV awareness, even after adjusting for demographics (AOR=2.01;95%CI:1.60-2.51) and internet use (AOR=1.56;95%CI:1.23-1.98). Higher SME was associated with awareness of the HPV vaccine after adjusting the models for demographics and internet use (AOR=1.95;95%CI:1.57-2.43; AOR=1.46;95%CI:1.16-1.84, respectively). Respondents with higher SME had higher odds of perceiving HPV vaccine to be “not at all successful (AOR=2.22;95%CI:1.18-4.18), “a little successful” (AOR = 1.99;95%CI:1.36-2.91), “pretty successful” (AOR=1.40;95%CI:1.05-1.88), and “very successful” (AOR=1.40;95%CI:1.03-1.90) compared to those who selected “don’t know.”

Conclusions. Higher SME was associated with perceived effectiveness of HPV vaccination preventing cervical cancer. However, opinions ranged from perceiving the vaccine as ineffective to very effective. These results possibly reflect the information people are exposed to while engaging on social media. Our study highlights novel findings using a comprehensive SME index with a national sample providing insight to leverage existing consumer behaviors to better connect and disseminate accurate information in a strategic manner.

ID: 29

Title: Patient comfort levels with dental providers discussing and recommending the human papillomavirus (HPV) vaccine

Authors: Daley EM, Thompson E, Beckstead J, Vamos C, Piepenbrink R, Richardson M, Desch J, Owens H

Abstract:
Purpose: The purpose of this study was to assess patient comfort levels with dental providers discussing and recommending the human papillomavirus (HPV) vaccine.

Methods: Anonymous surveys were completed via Qualtrics to assess perspectives of US adults ages 18 to 45 (n=298) regarding the acceptability of dental providers’ role in education and recommendation of the HPV vaccine. Paired sample t-test and two-way ANOVA were conducted to assess patient comfort level with dental providers discussing and recommending the HPV vaccine. Comfort levels were also analyzed by sex of the participant. All analyses were conducted in SPSS 25.

Results: There were no significant differences in level of comfort discussing the HPV vaccine with dental providers by sex of the participant (p=0.082), indicating that male and female participants were equally comfortable discussing the HPV vaccine with both dentists and dental hygienists. However, differences were observed regarding dental provider recommendation of the HPV vaccine. Males were more comfortable receiving an HPV vaccine recommendation from dental providers as compared to females (p=.003, η2=.029). The interaction between provider type and sex of
participant was not significant (p=.506), suggesting that comfort level with vaccine recommendation does not vary by dental provider type.

Conclusions: The prevention of HPV and HPV-related cancers can be furthered by understanding patient acceptability of dental providers’ role in education and recommendation of the HPV vaccine. This study demonstrates that sex of the patient is a strong predictor of comfort with receiving an HPV vaccine recommendation from dental providers. Compared to female patients, male patients are more comfortable receiving an HPV vaccine recommendation from a dental provider. Future research should explore patient preferences regarding HPV-related communication with dental providers, including additional factors that influence patient comfort and acceptability.
**Authors:** King AR, Vu M, Bednarczyk RA

**Abstract:**
Purpose of the Study: Human Papillomavirus (HPV) vaccine initiation and completion in Georgia remains sub-optimal. A strong healthcare provider recommendation for HPV vaccination was identified one of the strongest motivators for encouraging acceptance of the HPV vaccine. We sought to gather a better understanding of current provider recommendation styles and practices of vaccine promotion in order to identify strategies to reduce barriers and reinforce motivators affecting vaccine uptake.

Methods: We conducted six semi-structured focus group discussions with 55 healthcare providers in Georgia in 2018 and conducted a thematic analysis of the data.

Results: We identified four primary focus areas which providers discussed: 1) parental communication with children surrounding HPV vaccination; 2) provider sharing HPV and vaccine-related knowledge; 3) strategies for discussing adolescent HPV vaccination; and 4) the practice’s influence on HPV vaccination acceptance. Providers’ perceptions of parental motivators and barriers to vaccination affected their approach and effort level toward vaccine recommendation.

Conclusions: Effective communication strategies between parents, patients, and providers (through the systems-level P3 model) are needed for increasing understanding of the importance of HPV vaccination, as part of encouraging a culture of prevention within the healthcare system more broadly. Utilization of the P3 model in development of future interventions to increase vaccination uptake may aid in the development of this culture and in developing strong communication strategies.

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**ID:** 11

**Title:** United States oral health students' willingness to train and administer the HPV vaccine in dental practices

**Authors:** Kepka D, Rutkoski H, Pappas L, Tay DL, Winkler JR, Dixon B, Velazquez A, Pinzon LM

**Abstract:**
HPV oropharyngeal cancers have now surpassed cervical cancer rates in the US. Dental providers' engagement in HPV education and vaccination efforts may help reduce the burden of HPV oropharyngeal cancers. We examined factors associated with oral health students' willingness to train and administer the human papillomavirus (HPV) vaccine in dental settings. US students in 15 oral health programs participated in an online survey in 2016. Unadjusted and adjusted multivariable logistic regression were conducted and odds ratios (OR) and 95% confidence intervals (CI) were reported. Analyses were conducted in SAS Version 9.4. Data from a total of N = 306 students were analyzed to examine sociodemographic, educational, practice, and attitudinal factors associated with willingness to train and administer the HPV vaccine. Majority of the participants were female (70.3%), non-Hispanic/Latino (90.8%), and White (62.1%). Perceiving that HPV vaccination recommendation (OR = 1.95, 95% CI = 1.14-3.35) and administration (OR = 3.79, 95% CI = 1.63-8.81) was in the dental professional's scope was positively associated with outcome measures when other factors were held constant. Students with greater patient contact time (OR = 4.47, 95% CI = 1.14-17.58) and lower role conflict (agreed that HPV vaccine administration was in the dental professional's scope) had higher odds of willingness to administer the HPV vaccine when other factors were held constant (OR = 5.9, 95% CI = 2.27-15.3). The major barrier to engaging oral health students in HPV vaccination efforts was role conflict. Professional organizations and oral health programs should strongly support the role of oral health professionals in HPV oropharyngeal prevention.
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Title: Attitudes Driving Vaccine Hesitant Behavior among Parents: A Latent Class Analysis

Authors: Tiro JA, Rodriguez SA, Blackwell JM, Preston S, Monticalvo D, Thompson EL, Francis JKR, Pruitt SL

Abstract:
Objectives:
Vaccine-hesitant parents are a heterogeneous group, and may be susceptible to misinformation on social media. Multiple scales measure aspects of vaccine hesitancy including general vaccine attitudes (Opel, 2011), conspiracy beliefs (Shapiro, 2016), and attitudes about social media misinformation. Few studies measure these attitudes in the same population and little is known about which attitudes drive hesitant behavior (i.e., delaying or refusing vaccines). Our purpose was to: (1) identify subtypes of vaccine hesitant attitudes among parents and (2) examine which subtypes are associated with hesitant behavior.

Methods:
Via mail and email, we invited parents of adolescents (9-18 years) living in North Texas to complete a Web-based survey between April and June 2019. Two items assessed vaccine hesitant behavior (dependent variable): (1) “ever delayed having,” and (2) “ever decided not to have” your child get a vaccine (Response: Yes/no/don’t know). We measured parental beliefs with: (a) an 8-item general vaccine attitudes scale (Opel, 2010); (b) a 7-item vaccine conspiracy beliefs scale (Shapiro, 2016); and (c) 2 items about the credibility of HPV vaccine information on social media. Trust in provider was also measured. Latent class analysis and logistic regression were used for data analysis.

Results:
Among 1,193 respondents, most were mothers (65.6%), non-Hispanic white (60.0%), and college graduates (62.6%). Approximately half of parents (55.3%) reported their adolescent had not initiated the HPV vaccine series. Among these 660 parents of HPV-unvaccinated children, 25.8% reported delaying or refusing a vaccine at least once. With the total sample, we identified six distinct classes of parents along the vaccine hesitancy continuum—
(1) Very hesitant: endorses conspiracies, and believes social media misinformation [7.9%];
(2) Very hesitant: endorses conspiracies especially about pharmaceutical companies, mixed beliefs about social media misinformation [13.7%];
(3) Moderately hesitant: endorses conspiracies [5.6%];
(4) Neutral about vaccines, conspiracies, and social media misinformation [10.5%];
(5) Not hesitant: does not endorse conspiracies, has mixed beliefs about social media misinformation [23.8%];
(6) Not hesitant: does not endorse conspiracies or believe social media misinformation [38.6%].

Despite the range in hesitant attitudes, a sizeable proportion of adolescents within each class were vaccinated (25.6% -73.4%). Trust in provider was lowest among parents in Class #2 (P <0.001). Among the 660 parents of unvaccinated children when compared to the neutral class #4, the very hesitant groups (Classes #1 and #2) were more likely to report hesitant behavior (adjusted odds ratio (aOR) 3.30 and 4.98, respectively), while non-hesitant groups (Classes #5 and #6) were less likely to report hesitant behavior (aORs 0.72 and 0.29, respectively).

Conclusions:
Approximately 27% of parents were classified into a vaccine hesitant group that endorsed conspiracy beliefs; notably, this population was mixed in whether they believed information on social media was credible. Given the rise of social media misinformation, social media campaigns targeted to parents in each of these six classes are needed. Messages addressing mistrust in providers and pharmaceutical conspiracy beliefs should be developed to help parents manage vaccine misinformation found on social media.
Title: Practice-, Provider-, and Patient-Level Facilitators of and Barriers to HPV Vaccine Promotion and Uptake in the State of Georgia: A Qualitative Study of Healthcare Providers’ Perspectives

Authors: Vu M, King AR, Jan MM, Bednarczyk RA

Abstract:
Purpose of the study: The state of Georgia (U.S.) experiences higher HPV-associated cancer burden and lower HPV vaccine uptake compared to national estimates. Little research has utilized a multilevel framework to study facilitators of and barriers to HPV vaccine promotion and uptake in Georgia. Guided by the P3 model that concomitantly assesses practice-, provider-, and patient-level factors influencing preventive health behaviors, we examined this question, using the perspectives of diverse healthcare providers recruited from five geographic regions in Georgia.

Methods: Between April and July 2018, we conducted six focus group discussions with a total of 55 healthcare providers. Questions focused on multilevel facilitators of and barriers to HPV vaccine promotion and uptake that healthcare providers observed in their practices. Data analysis was guided by the P3 model and a deductive coding approach based in grounded theory.

Results: At the practice level, providers discussed organizational priorities of HPV vaccinations, ability to schedule future HPV vaccine doses, use of informatics for immunization medical records, availability of HPV vaccine, and ability to coordinate with community resources. At the provider level, influential themes included time constraints, role, knowledge, self-efficacy to discuss HPV vaccine, and HPV vaccine confidence. At the patient level, providers noted issues related to patients’ trust, experiences with HPV vaccine-preventable diseases, perceived high costs, perceived side effects, and concerns with sexual activity.

Conclusions: Effective interventions will be those incorporating multilevel elements addressing each of the P3 level. Interventions can consider implementing incentives to boost vaccine rates and incorporating technology for scheduling future vaccination appointments. Additionally, we should focus on improving across-practice information exchange and providing additional education for providers on HPV vaccine knowledge. Patient-provider communication and trust also emerge as an important intervention target. Providers should be trained in addressing concerns about HPV vaccine, such as those related to costs, side effects, and sexual activity.

Title: Physician reported communication strategies for HPV vaccine recommendation: A qualitative study within a large academic hospital system

Authors: Tsui J, Vincent A, Anuforo B, Btoush R, Crabtree BF

Abstract:
Introduction: Although HPV vaccination rates have improved, they remain suboptimal in the United States (US). Several states, including New Jersey, have lower uptake compared to the national average. Strong physician recommendation is associated with increased uptake; however, specific strategies used by physicians to recommend the vaccine are underexplored.

Methods: We conducted a qualitative study using in-depth interviews with family medicine, pediatrics, and adolescent medicine physicians (n=12) within a large academic-hospital system in New Jersey. We recruited physicians from four primary care settings. Interviews aimed to understand factors influencing physician
recommendations and differences in recommendation strategies across settings (e.g., federally qualified health centers (FQHCs), hospital-affiliated practices) and between specialties.

Results: All physicians reported strong support for HPV vaccination, intention to recommend at the target 11-12 age groups, and providing factsheets to parents. Many physicians used electronic medical records and/or the state immunization registry for monitoring rates, but few were able to report clinic level rates. The majority needed to overcome hesitancy for at least 10-30% of parents and misinformation from the internet. Physicians in hospital-affiliated practices reported more vaccine refusals compared to physicians at FQHCs. Most physicians used the example of having their own children vaccinated for HPV as a first line strategy for addressing parental hesitancy. Other strategies included using data or professional authority to address safety concerns, linking HPV to cervical cancer, highlighting only needing two doses if vaccinated younger, and normalizing the vaccine rather than providing too much information.

Conclusions: While our findings indicate physicians are knowledgeable about HPV vaccination and recommend it to parents, they find it necessary to use varying strategies to overcome parental hesitancy. Future research should examine how physician communication strategies relate to uptake and the effectiveness/implementation of alternate physician communication strategies within real-world contexts.

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Title: Having the Conversation: Usability Results of a Facilitated Interactive Role Playing Activity for School Nurses and School-Based Health Center Staff

Authors: Rosen BL, Real FJ, Bishop JM, McDonald S, Klein M, Kahn JA, Kreps G

Abstract:
Purpose: The purpose of the study was to evaluate the usability of five interactive role-playing scenarios related to HPV vaccine counseling among school nurses and school-based health centers staff.

Methods: A local children’s hospital organized a one day workshop intended for school nurses and school-based health staff aimed at improving HPV vaccination rates in schools. The workshop included presentations about successful strategies for promoting HPV vaccination and cancer prevention in schools, including how to address vaccine hesitancy. At the conclusion of the lectures, certified health education specialists moderated a 60-minute interactive role-playing activity, involving scenarios related to recommending the HPV vaccine to parents. Scenarios were informed by empirical studies addressing safety concerns, age and sex concerns, vaccinating boys, and school requirements. After the role-playing activity, participants completed a usability survey with open-ended questions assessing their experience with the role playing scenarios. We used a content analysis approach to examine responses and identity themes.

Results: Of the 15 participants who completed the workshop. Strengths specific to the role playing scenarios included: ability to practice evidence-based communication skills, increased comfort responding to parental concerns, and reduced provider misperceptions. Areas identified for improvement included: increased diversity within the scenarios (including a broader patient age range); increased complexity of scenarios; provision of a brief summary of successful strategies; more time to implement the full activity; include HIPPA compliance in scenarios.

Conclusions: While participants identified being able to practice evidence-based strategies as a strength of the activity, there was a need for more diverse and complex scenarios with consideration for different (?) work environments. The results provide critical insights from the users’ perspective, which are necessary for the design of
Effective education and interventions. These results could shift current educational and clinical paradigms through the implementation of hands-on education strategies to effectively train school-based clinicians to strongly recommend the HPV vaccine.

ID: 25
Title: Provider perspectives on systems-level barriers to HPV vaccine uptake among HIV+ individuals in the catch-up range
Authors: Muthukrishnan M, Arnold LD
Abstract:
Purpose: To identify provider and clinic-level characteristics that impact HPV vaccine recommendations for HIV+ patients aged 18-26 years.
Methods: In this ongoing mixed methods study, healthcare providers who provide care for HIV+ patients were recruited to complete an online survey (n=48) and interviews (n=11) about clinic barriers/facilitators of HPV vaccine recommendation. Descriptive statistics examined barriers/facilitators reported in the surveys, and interviews were analyzed for themes.
Results: The majority (95.9%) of respondents were infectious disease specialists. Preliminary results found all providers used an EHR system in their clinic, but only 16.7% used it to identify HPV vaccine eligible patients. Only 14.6% reported having clinic guidelines/policies for HPV vaccination. Most (72.9%) reported scheduling subsequent HPV vaccine doses at the current visit, and 45.8% provided literature for their patients to read. Other procedures to encourage HPV vaccine uptake were not as widely used, i.e. reminder cards for initial dose (6.3%) or next dose (17.0%), mailed patient reminders for initial dose (0%) or next dose (4.2%), using a flowchart for patient visits (12.5%), EHR prompted reminders (16.7%), flagging eligible unvaccinated patients’ charts (14.6%), phone call reminders for next doses (20.8%), and noting medical history responses to decide whether to recommend the vaccine (21.3%). This pattern was reflected in the interviews, with themes of provider uncertainty regarding clinic policies or lack of clinic policies to maximize HPV vaccination in HIV+ patients 18-26yrs. Providers noted that an automated EHR prompt to identify an unvaccinated patient would help increase vaccine conversations, instead of having to search the EHR themselves.
Conclusions: Because provider recommendation is the strongest predictor of HPV vaccine uptake, identifying provider- and clinic-level barriers and facilitators to HPV vaccine uptake provides opportunities to inform the development of targeted interventions. Several underutilized strategies were identified by providers that may inform interventions to increase HPV vaccine uptake in HIV+ patients in the catch-up vaccine range, ultimately reducing the burden of HPV-related cancers among these high-risk individuals.