



Human Papillomavirus (HPV) Vaccination in Inland Northern California

FINDINGS FROM AN
ENVIRONMENTAL SCAN
2017-2019

Acknowledgements

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For additional information please feel free to contact Julie Dang, PhD, MPH
(jtdang@ucdavis.edu | 916.734.5222)

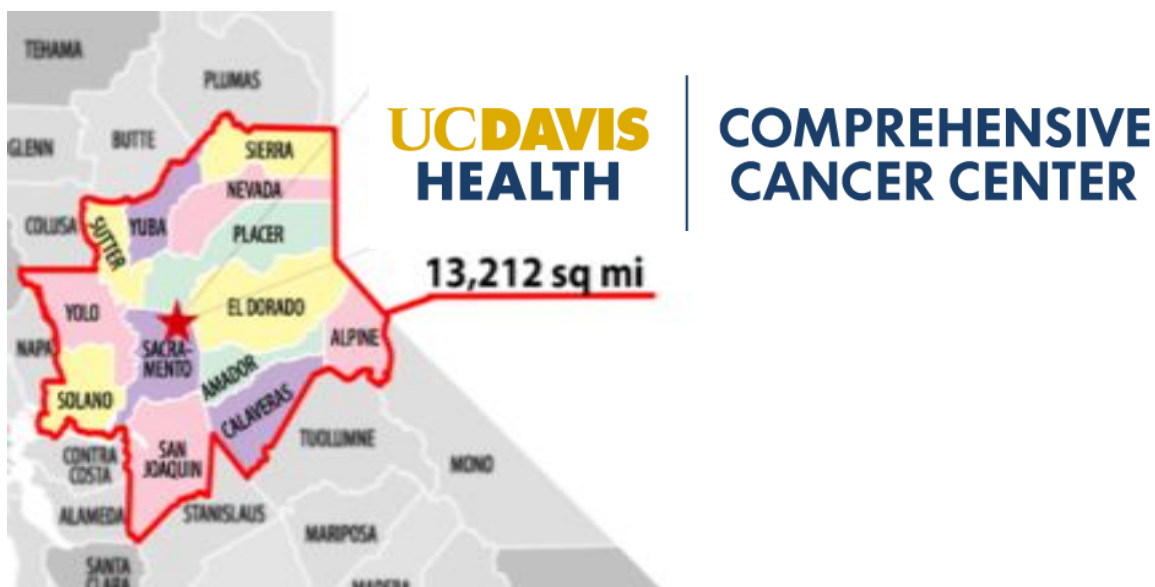
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Introduction

We chose the UC Davis Comprehensive Cancer Center's catchment area, the 13 adjoining counties that comprise SEER Region 3, as the region for our HPV vaccination environmental scan. SEER Region 3 is home to 86% of the patients we serve. This Region has a population of 3,842,725 which is approximately the same size population as the entire state of Oregon (3,831,074) and geographically represents an area larger than the state of Maryland. In 2017, nearly 372,000 adolescents (104,738 adolescents ages 11-12 and 266,905 adolescents ages 13-17), resided in this Region. Overall, the Region is comprised of: 52.6% non-Hispanic White; 24.6% Hispanic Whites; 13.9% Asian/Pacific Islander; 8.2% African American; and 0.8% Native American, exemplifying the diversity of inland northern California. Four counties within our catchment are considered rural (have a Rural Urban Continuum Code designation between 4-10). In 2017, we expanded our catchment area to 19 counties.

The purpose of this scan was to investigate barriers, facilitators, and implementation strategies to customize interventions and approaches that will accelerate HPV vaccination uptake in our 13-county inland northern California catchment area. To achieve this purpose we proposed the following specific aims: 1) assess and compile existing regional data sources and policies on HPV vaccination; 2) determine the factors related to missed clinic opportunities to administer the HPV vaccine through stakeholder engagement; and 3) develop and recommend evidence-based implementation strategies that will promote HPV vaccine uptake among adolescents.



Methodology



Vaccination Rates and Vaccine Policies

While the CDC's National Immunization Survey-Teen (NIS-Teen) provides HPV vaccination rates and trends on the national and state level, data on the local vaccination rates and analysis of current policies are critical for establishing a baseline to measure the local impact of proposed strategies. We first reviewed and compiled all of the existing sources of HPV vaccine data within the Region to assess the feasibility of using each one as a baseline for vaccination rates; and secondly, we conducted a formal policy analysis of current and pending HPV vaccination state laws and policies.

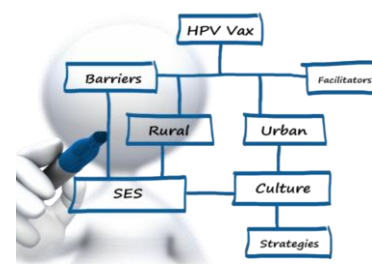
Stakeholder Engagement

We conducted key informant interviews and administered in-person and online surveys with HPV vaccine stakeholders representing parents, healthcare professional, health-care organizations, and county health departments. Questions were based on a review of the literature and HPV environmental scans conducted by other National Cancer Institute's designated cancer centers.¹ Questions examined HPV vaccination: attitudes; beliefs; clinical practices; local efforts; and priorities and strategies. Our goal was to interview three diverse stakeholders from each county and to administer the survey to at least 200 individuals.



Evidence-Based Strategies

Based on the information and data collected we developed and implemented strategies to promote and accelerate the uptake of the HPV vaccine among adolescents of our catchment.



¹ https://healthcaresdelivery.cancer.gov/hpvuptake/DCCPS_HPVueax-report_FINAL_508compliant.pdf

California's HPV Vaccination Rates

In 2018, coverage with ≥ 1 dose of HPV vaccine in California was 73.5% compared to 68.1% for the U.S. and the percentage of California adolescents up-to-date with the HPV vaccine series was 51.8% compared to 51.1% for the U.S.² While we were unable to identify city and county level data on HPV vaccination rates for our catchment, we did find rates available by health plans and medical groups that serve the counties in our catchment. These rates, provided by California's Office of the Patient Advocate (OPA), revealed our catchment counties had lower HPV completion rates than both the state and the nation (9%-47%).³

Heath Plans and Medical Groups	Completed HPV Vaccines Series by 13 th Birthday*	
	Females	Males
Kaiser Permanente - Modesto/Manteca Medical Centers	47%	47%
Sutter Independent Physicians	42%	38%
Sutter Medical Group	42%	24%
Kaiser Permanente - South Sacramento Medical Center	36%	36%
Hill Physicians Medical Group - Sacramento Region	35%	37%
Sutter Gould Medical Foundation - Gould Medical Group	29%	18%
Kaiser Permanente - Roseville/Sacramento Medical Centers	33%	30%
Mercy Medical Group/Dignity Health Medical Foundation	22%	23%
Hill Physicians Medical Group - San Joaquin Region	22%	24%
UC Davis Medical Group	20%	21%
Woodland Healthcare	12%	20%
All Care IPA	20%	10%
Sierra Nevada Medical Associates, Inc.	9%	23%

*Scores are based on information from at least 30 medical group patient records in 2016.

² Walker et al. MMWR Morb Mortal Wkly Rep 2019;68:718-723

³ www.opa.ca.gov

California HPV Vaccination Related Legislative Review

We conducted a review of California state legislation efforts to enact or introduce HPV vaccine legislation to improve education and awareness or provide access to the HPV vaccine (this includes efforts to promote cervical cancer education). In total we documented Seven Bills related to HPV vaccinations. See summaries below.

Bill	Summary
ACR-11 Cervical Cancer Screening and Awareness Month (2017-2018)	Would designate the month of January every year as Cervical Cancer Screening and Awareness Month in the State of California. The measure would encourage all Californians, including the State Department of Public Health and the State Department of Health Care Services, to observe the month and observe appropriate activities, promote screening and educational outreach to women and the medical community, and develop programs to raise awareness about the causes of, symptoms of, and screening for, cervical cancer. (Signed into law)
A.B. 1117 (2016)	Would require the State Department of Health Care Services to establish and administer the California Childhood Immunization Quality Improvement Fund (CCIQIF) program to improve childhood immunization rates, and would require the department to submit an application to the federal Centers for Medicare and Medicaid Services for a waiver to implement a 5-year demonstration project to implement the program. (Passed in Assembly, from Senate committee without further action)
S.B. 277 (2015)	Would eliminate the exemption from existing specified immunization requirements based upon personal beliefs, but would allow exemption from future immunization requirements deemed appropriate by the State Department of Public Health for either medical reasons or personal beliefs. (Signed into law)
A.B. 499 (2011)	Would allow children 12 or older the right to obtain preventive treatment for sexually transmitted diseases without parental consent, including an HPV immunization for cervical cancer. (Signed into law)
SB 158 (2009)	Would require health care service plans and health insurance policies that include coverage for the treatment of cervical cancer to also provide coverage for human papillomavirus vaccination. (Passed Senate and Assembly; Vetoed by governor 10/11/09)
A.B. 16 (2008)	Would require insurance coverage for HPV screening, cervical cancer treatment, as well as HPV vaccine coverage. (Passed Senate and concurred by Assembly on 7/14/08. Vetoed by governor 9/30/08)
A.B. 1429 (2007-2008)	Would expand any insurance plan that covers cervical cancer screening or surgery to also cover the HPV vaccine with a referral from the healthcare provider. (Passed Legislature, sent to Governor)

Survey Respondents (n = 205)

We created four different surveys based on the following respondent types: public health/nonprofit professionals; parents; policymakers; and healthcare professionals (e.g. medical assistants, clinicians, nurses, clinical managers, etc.) Each survey had about forty questions and took approximately ten to fifteen minutes to complete. The survey was administered both in-person (paper) and online. The majority of survey respondents were: Racial/ethnic minorities (45.9%); worked in Sacramento County (43.4%); and were healthcare professionals (40%). The tables to the right describe the demographics of the individuals who participated in our survey.

Race/Ethnicity	N (%)
White	88 (42.9%)
Asian American, Native Hawaiian, or Pacific Islander	51 (24.9%)
Hispanic	27 (13.2 %)
Black or African American	9 (4.4%)
American Indian or Alaska Native	7 (3.4%)
Unknown	23 (11.2%)

County of Work	N (%)
Sacramento	89 (43.4%)
Other*	19 (9.3%)
Yolo	20 (9.8%)
Amador	12 (5.6%)
San Joaquin	10 (4.9%)
Solano	10 (4.9%)
Placer	8 (3.9%)
El Dorado	5 (2.4%)
Nevada	4 (2.0%)
Yuba	4 (2.0%)
Alpine	3 (1.5%)
Sutter	3 (1.5%)
Calaveras	1 (0.5%)
Sierra	1 (0.5%)
Unknown	17 (8.3%)

Profession	N (%)
Clinical	82 (39.0%)
Clinicians	31 (15.1%)
Medical Assistants	20 (9.8%)
Other clinical	31 (15.1%)
Parents	16 (7.8%)
Policy	7 (3.4%)
Public Health	27 (13.2%)
Non-Profit	12 (5.9%)
Other**	43 (21.0%)
Unknown	18 (8.8%)

* The majority (63.2%) of respondents from other counties are from Glenn and Butte County, two counties that were added to our catchment area in 2017 and represents counties in which we have efforts to increase HPV vaccination rates.

** The majority of respondents from the other category includes school based professions, researchers and general community members.

Key Informants (n = 39)

Key informant interviews were conducted to gain a more in-depth understanding of HPV vaccination practices and policies. We received participation from every catchment county. The table to the right summarizes the professions of our interviewees.

Profession	N (%)
Government (local and state)	12 (30.8%)
Immunization Coordinators	6 (15.4%)
Public Health Nurse	4 (10.2%)
Other	2 (5.1%)
Health Systems	11 (28.2%)
Clinicians &	3 (7.7%)
Nurses & Medical Assistants	5 (12.8%)
Outreach	3 (7.7%)
School Based Nurses	4 (10.2%)
Insurance Payers	3 (7.7%)
Parents	4 (10.2%)
Other	5 (12.8%)

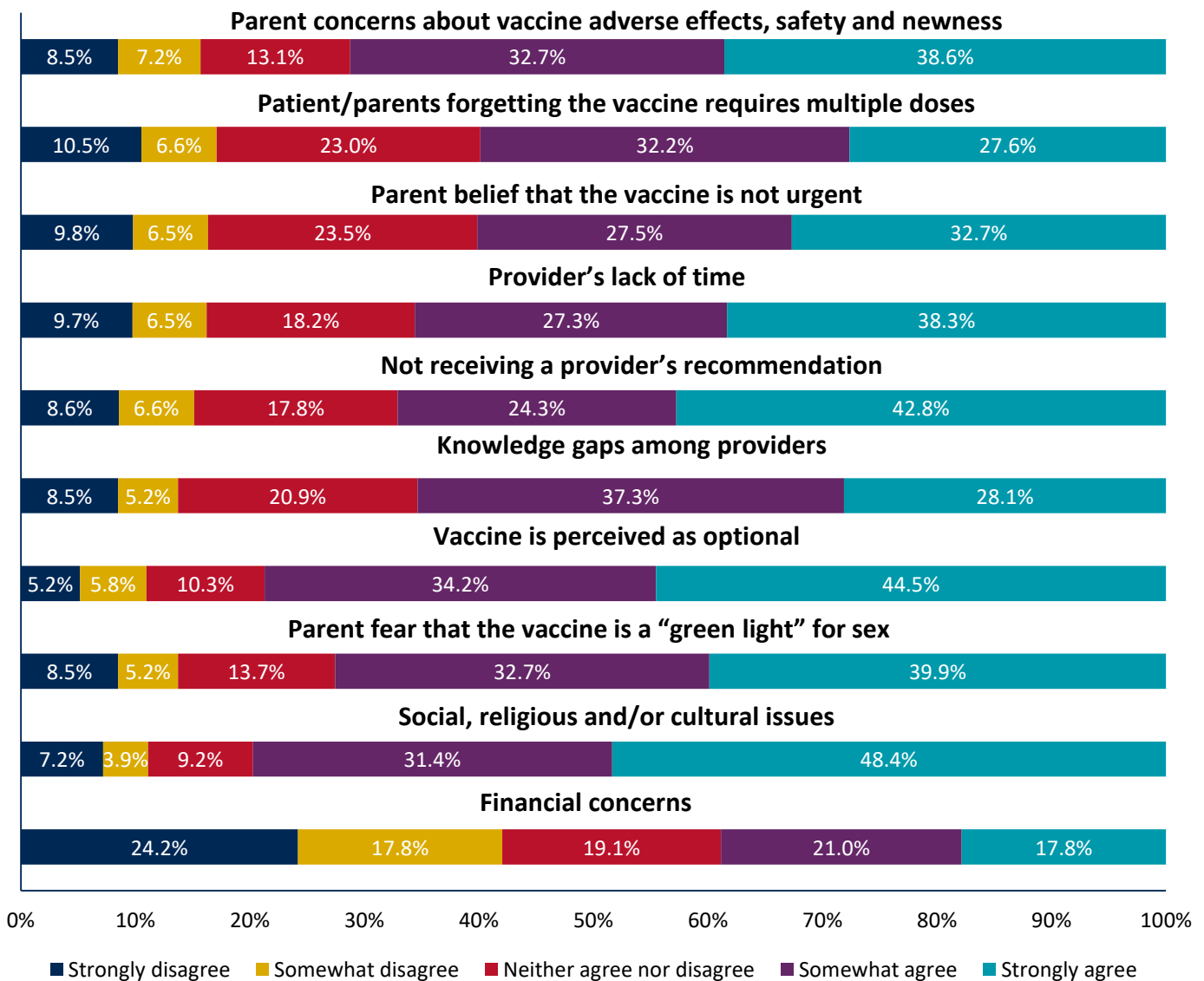


Factors Affecting Uptake of the HPV Vaccine

We asked participants (n = 144) to what extent did they agree/disagree that the issues below influenced uptake of the HPV vaccine. Of the ten issues included in the survey, participants stated these impacted uptake the greatest:

- Social, religious, and/or cultural issues (48.4%)
- Vaccine is perceived as optional (44.5%)
- Not receiving a provider’s recommendation (42.8%)

Based on these results, we divided the following sections into three broad categories: Parent; Provider/Clinic Staff/Health System; and Community factors. We first list the facilitators and barriers at each level followed by recommended strategies. Additionally, we found geographic differences in participant respondents and included a section on factors unique to rural communities.



Parent Factors

We interviewed and surveyed participants on parent factors that influence uptake of the HPV vaccination. While the majority of our participants agreed that parents have heard of the HPV vaccine, many stated that parental knowledge (or lack of knowledge), attitudes and beliefs towards the HPV vaccine as one of the most influencing factor affecting uptake of the HPV vaccine.

Knowledge



The majority of parents have heard of the HPV vaccine, however we found misinformation regarding potential adverse effects of getting the vaccine; incomplete information in which parents were unaware the vaccine protects against cancers; and misconceptions related to the vaccine providing protection against a sexually transmitted infection (STI).

Attitudes



Parents wanted to delay vaccination because they felt that it was too early to vaccinate their child against an STI • After receiving the first dose, subsequent doses are not administered because their child complains the vaccine is painful • Parents are worried their child is receiving too many shots during one visit and would like to space the vaccines out • The vaccine is optional because it is not required for school

Beliefs



Receiving the vaccine will promote sexual activity • The vaccine can cause autism, infertility, paralysis, etc. • The vaccine will prevent cancer

Opinions of others



The opinions of deemed important individuals (spouse, family, friends, social network, health professionals, celebrities, etc.) influences parents' vaccine acceptance in both positive and negative ways.

““My daughter was really hurt by the first vaccine, and she’s afraid to get the next shot.”-Parent

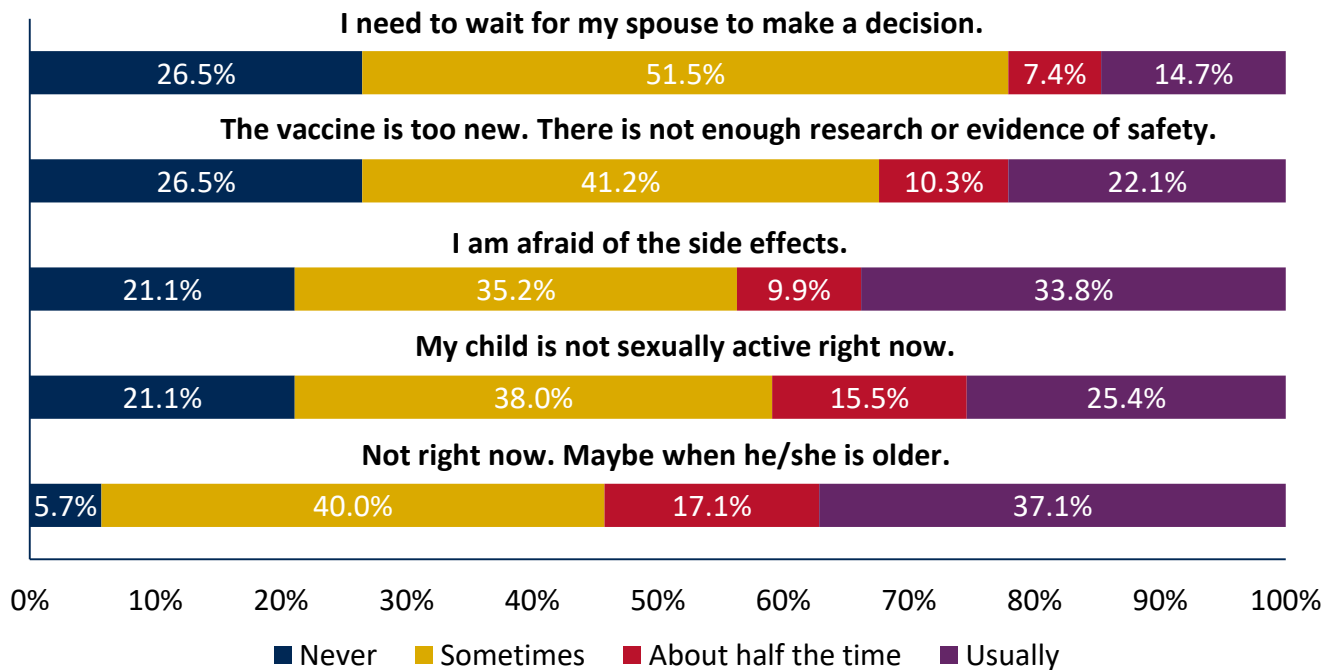
“...I got the daughter the vaccine because I did not want her to get cancer...”-Parent

“...parents believe the HPV vaccine can kill their children...and that children are neurologically changed forever after the vaccine”-Nurse

Reasons Why Parents Refuse the Vaccine

Of the surveys we administered, clinicians and clinic support staff (n=71) reported that the following reasons were what they heard most often by parents who refused the HPV vaccine for their child:

- Not right now. Maybe when he/she is older (37.1%)
- I'm afraid of the side effects (33.8%)
- My child is not sexually active right now (25.4%)
- The vaccine is too new. There is not enough research or evidence of safety (22.1%)
- I need to wait for my spouse to make a decision (14.7%)



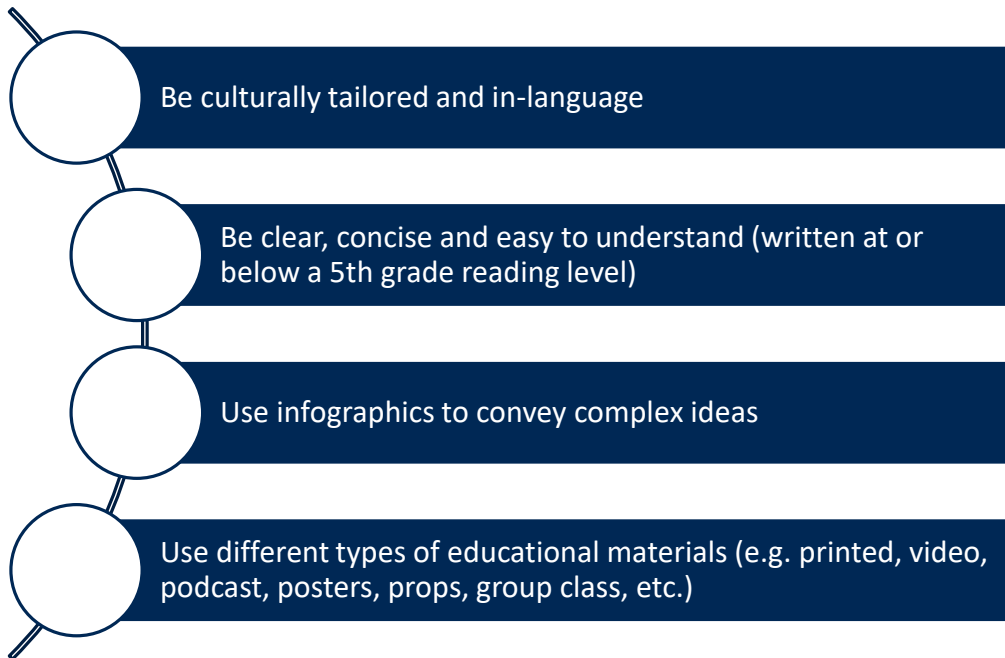
“My son isn’t having sex yet, so it’s not necessary”-Parent

“Many parents are concerned about HPV vaccine’s safety, more than others...it is the most common patient/parent concern”-Nurse

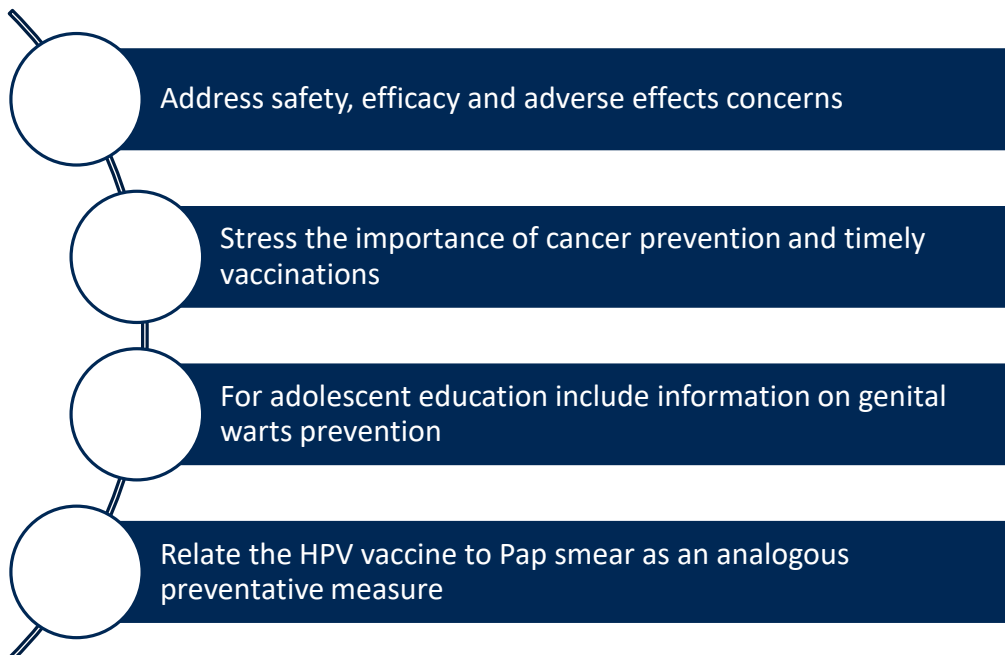
**“Parents just don’t believe there is a risk”
-Clinic Support Staff**

Parent Strategies

All participants agreed that increasing parent education on the importance of HPV vaccination would help accelerate HPV vaccination rates. However, participants also stated that the education provided needed to:



Respondents also provided suggestions on what to include in HPV vaccination educational messaging:



“You can only change a parent’s mind if (they are) given proper education”
-Clinician

Clinician, Clinic Support Staff, & Health System Factors

Participants cited that parent's decision to vaccinate their child against HPV is greatly influenced by their relationship with their provider, the primary care team as well as the health system in which their child is receiving care. Below are factors that clinician and clinic staff have reported inhibits or facilitates their ability to provide the HPV vaccine to patients.



Parent's knowledge, attitudes and behaviors towards the vaccine

Ability (time, knowledge and confidence) to appropriately address parent's concerns and general attitudes towards the HPV vaccine.



Patient Educational Materials/Health Literacy

Lack of available in-language culturally appropriate educational materials • Medical interpreters not readily available • Available materials are outdated • Available materials are at a reading level above that of the patient population (e.g. VIS)



Clinicians/Primary Care Team Recommendation

Suggesting that the HPV vaccine is optional • Making a distinction between the HPV vaccine and the other adolescent vaccines • Strength and quality of recommendation



Electronic Health System

Tracking and documenting vaccines administered • Provision of provider and patient reminders

"I was willing to delay it for my daughter, but my husband said to trust the doctor's recommendation. He said if that's what doctors are recommending, then we'll go with that."

-Mother

"We do not have electronic health records...we have the yellow immunization cards for vaccinations that we keep in patient charts. It becomes a challenge to keep track of the cards (parents lose them)..."

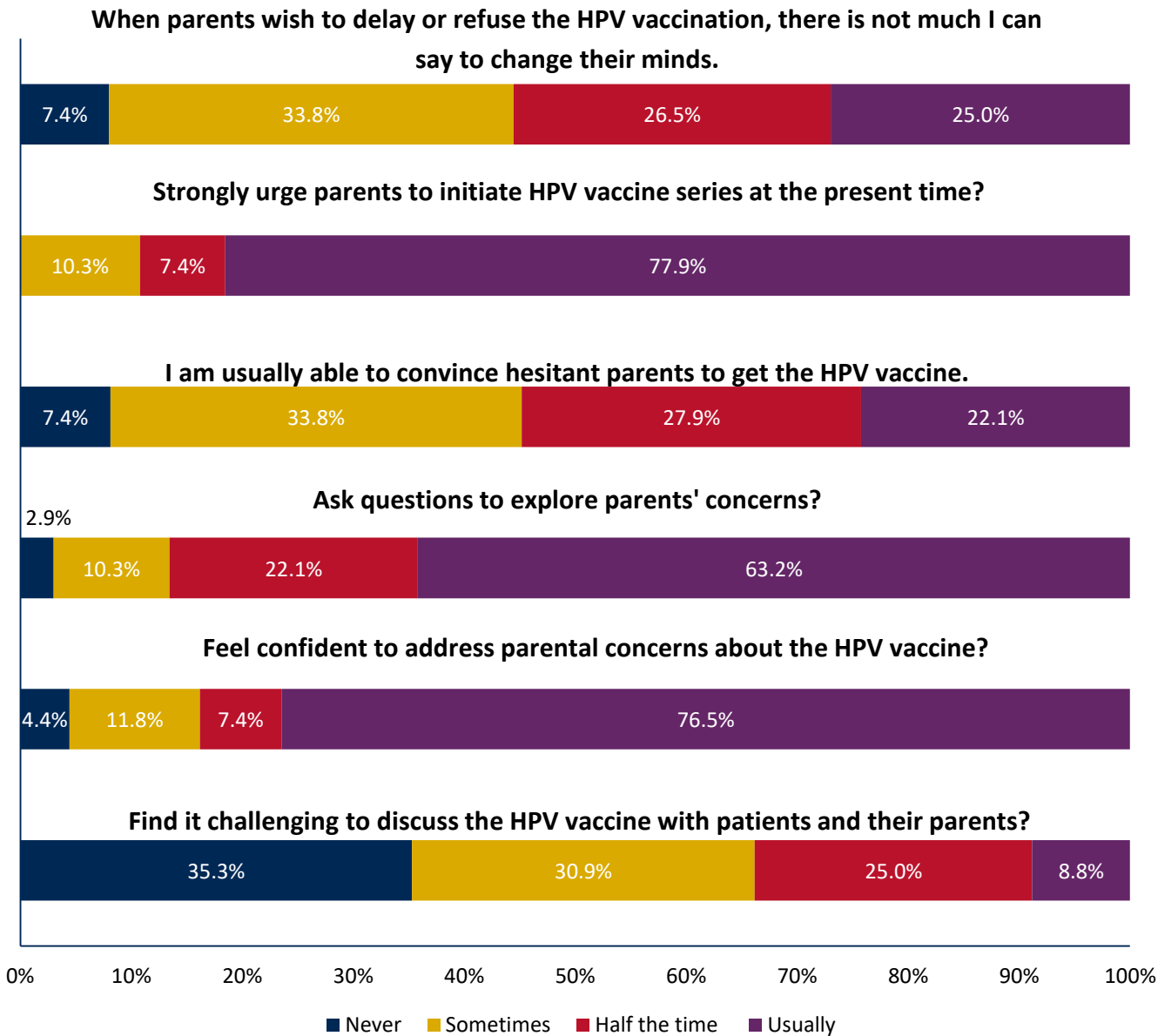
-Nurse

"We have outdated posters, says it's for girls only. Not updated, from 2007"

-School Nurse

Confidence in Providing a Strong HPV Vaccination Recommendation

In our survey clinicians and clinical staff (n = 74) responded to questions related to their HPV vaccination behaviors and confidence in ability to discuss the HPV vaccine with parents and patients. While most primary care team members strongly urged parents to get their child vaccinated on the same day as the medical visit (71.6%), more than half found it challenging to discuss the HPV vaccine with patients/parents. Additionally, a quarter of participants felt that there was not much they can say to change a parent’s mind when a parent wishes to delay or refuse the vaccine.



“I can probably change parents mind about 20% of the time...and that’s only with proper education...” - Clinician

Primary Care Team & Health Systems Strategies

In addition to the well-known cited strategies of: bundling the vaccine with other vaccines due at the same time, presenting the vaccine as an anti-cancer vaccine, and ensuring that clinicians provide a strong HPV vaccination recommendation, respondents suggested the following strategies:

Vaccination Tracking System

- Respondents agreed that having a reliable vaccine tracking is critical to ensuring healthcare providers are efficiently distributing and managing vaccines. A school nurse in Amador County stated that having access to the student’s immunization records has aided in confirming whether or not the child’s immunizations are up to date.
- Documentation through California’s Immunization Online System (CAIR), a system which tracks an individual’s immunization history from all clinic or doctor visits has proven to be a dependable source for providers. Counties utilizing the system claim it has been useful in staying updated with patient vaccination histories, while also serving as a reference to check student immunization records. Interviewees in El Dorado and Sacramento Counties said it was a simple way to ensure and check if patients are up-to-date on their necessary vaccinations.

Trusting Relationship between Primary Care Team and Patient/Parent

- Primary care team members shared personal stories with parents regarding their own vaccination decisions.
- Team members also stated that after parents expressed concern regarding the vaccine, they would respond by validating and acknowledging the concern.
- Making sure that all primary care team members are providing a strong HPV vaccination recommendation.

Clinical Decision Support Tools

- Respondents suggested that all Electronic Health Systems (EHS’s) be equipped with reminder systems that will alert the primary care team when a patient comes in that is eligible for the vaccine and that will also alert patients when they are due for vaccinations.

“I shared the same concerns as you when the vaccine first came out, and as a good provider who is sincerely concerned about my patient’s health – I did my research. This is my professional clinical opinion as your provider.”-Clinician

“Some providers don’t use CAIR so it makes it hard to track the vaccines when kids move around”-Immunization Coordinator

“Medical assistants play a key role.”- Clinician

Community & Societal Factors

Respondents reported that the HPV vaccine knowledge, attitudes and behaviors of parents is influenced by the communities they identify with and belong to. Below are community and social factors respondents stated impacts HPV vaccine uptake.



Media & Internet

Media coverage and online controversy about the vaccine • Unreliable sources of information for parents • Antivaccination groups posting misinformation on social media sites



Social Networks

Adverse events associated with the vaccine passed down through word of mouth • Vocal community members who speak out against the vaccine • Religious affiliation not in support of the vaccine



Outreach/Education

Lack of funding for broad based community campaigns to combat media and social misinformation • Lack of HPV vaccine advocates in the community • Not enough community education and support



School

Not required for school entry • Not included in health education curriculum • Not enough community education and support

“...we have a chiropractor in town that has spoken out against the HPV vaccine and has told parents not to get it for their child”-Caretaker

“The Internet is a major resource for misinformation; you can find anything that will support your beliefs”-Nurse


“...parents get many negative stories from Facebook and online communities... Dr. Google is an issue”-Clinician

“...did you hear what happened in Placer County? We don’t want to have that type of backlash...”
- Government Employee

Timeline Photos

HPV Vaccine Facts

for boys and girls



Every year **31,500** women and men in the U.S. develop HPV-related cancer.

The newest HPV vaccine protects against 9 HPV types and **6 kinds of cancer.**

90% of genital warts, 74% of all HPV cancers, and 81% of cervical cancers are prevented by the vaccine.

In the U.S., **79 million** are currently infected with HPV. Half of all new infections are in boys and girls aged 15-24.

Up to **80%** of sexually active individuals have had HPV. Safer sex practices like condoms and monogamy do not fully protect against HPV.

11-12 years is the optimal age for the vaccine because antibody production is highest, and it should be given long before most protect

source: CDC MMWR 2015,64(11);300-304 and CDC 2013 Surveillance Illustration by Hannah Henry, courtesy of CDC

“...Parents who believe in anti-vax movement believe in it passionately...it’s a passion in their lives...”
- Placer County Employee



Placer County
 Like This Page · February 14 · 🌐

This is Preteen Vaccine Week, and we encourage Placer residents to learn about crucial vaccines to protect your children: <http://www.shotsforschool.org/>. The HPV vaccine protects against cancer-causing infections.

Like · Comment · Share · 🌐

👍❤️👍 74 · Most Relevant · 18 Shares · 51 Comments

Placer County Hi all: The Placer County Public Health Division's recommendations regarding the HPV vaccine are consistent with state (CDPH) and federal (CDC) recommendations. You can find more information from the CDC here: <https://www.cdc.gov/vac.../vaccines/hpv/hpv-safety-faqs.html> As always, we encourage people to consult with their physician about their personal health.

Like · Reply · 13w · 14

👍 11 Replies

👤 [Red] Merck created Gardasil to offset the \$4.85 billion they paid out to victims of Vioxx. Ignore shills like Dorit, who get money to vomit garbage defending dangerous, untested drugs.

Like · Reply · 13w · 20

👍 22 Replies

👤 [Orange] And what about all the kids who are paralyzed? In pain the rest of their lives? Or the ones who died? This vaccine is dangerous to say the least!!!

Like · Reply · 14w · 4

👤 [Blue] Even many pediatricians don't recommend this vaccine. Linked to waaay too many injuries and deaths. Check the CDC and VAERS website. Very irresponsible post Placer County-I'm so saddened by this!

Like · Reply · 14w · 21

👍 12 Replies

👤 [Green] Seriously? Placer County endorsing one of THE most controversial vaccines that Pharmaceuticals are also pushing? Aren't California school kids already assaulted enough by SB277? If people are injured or die from this vaccine will you be ready, willing, and able to take full liability for that? No. I didn't think so. But I would sure love to hear your reply.

Like · Reply · 13w · 13

👍 9 Replies

👤 [Yellow] I'm pro-vaccine. I would Never Ever give this vaccine to my kid.

Like · Reply · 14w · 31

👍 11 Replies

👤 [Pink] Maybe placer county should butt out of this and leave this decision to parents and the Dr. This one is scary! Doesn't take much research to find the evidence.

Like · Reply · 14w · 12

👍 1 Reply

When asked about HPV vaccination social media campaigns, several participants mentioned instances where anti-vaccination groups have posted comments on local government’s Facebook page speaking out against the vaccine. Above is an example of what Placer County posted on their Facebook page for Preteen Vaccine Week and the comments that pursued.

Rural Communities

We found differences in the themes associated with HPV vaccination among rural and urban populations. The level of inconvenience for those living in rural counties coupled with having to manage limited finances and traveling long distances to get quality health care remains a major barrier.

Competing Priorities

- HPV vaccination was considered a low priority compared to ensuring basic needs are met.
- HPV vaccination was not considered a necessity as it is not required for school entry.
- Providers are not pushing for vaccination because of the sentiments of the community.

Financial Considerations

- Despite the presence of federally-funded programs such as the Vaccines for Children (VFC) program, key informant interviewees still report on cost discrepancies of the vaccine for their patients due to the complexity of health insurance coverage.
- For example, some Medi-Cal patients are unable to obtain care in Reno since the state Medicaid insurance differ. Geography determines proximity to health centers, yet county or state lines determine health insurance policies.
- While some respondents noted that the vaccine was free, cost was still a factor in their vaccination decision. (e.g. the gas it would take if they had to travel to another county/state to get the vaccine; and the cost of taking time off of work to take their child to get the vaccine).

Access and Transportation

- In Sierra County, with a population of only 2,885 people there are only two private-run clinics that provide primary care. Those requiring emergency and specialty health services need to travel to a different county.
- In Alpine County, with a population of 1,184 people, there is only one county health nurse. Some individuals must go to another county to seek medical care or travel to the state of Nevada. Respondents, however mentioned that Nevada is sometimes inaccessible during winter months due to roadway closures.
- Respondents reported having limited access to providers, which contributes to the small volume of amount of patients that can be seen at clinics and delays in getting appointment times (e.g. unable to schedule appointment for follow up HPV vaccine doses)
- Some clinics did not stock the vaccine and suggested patients go to another clinic (out of town) to get the vaccine.

Rural Communities & HPV Vax Sentiments

Respondents from rural communities reported more barriers related to anti-vaccination sentiments than urban respondents. These barriers are related to the following themes:

- **Negative false anecdotes** that are passed down through community members (e.g. someone's cousin getting paralyzed or died after getting the vaccine; the vaccine caused someone's family member to have fertility issues).
- **Vocal anti-vaccination groups** that post false vaccine information on social media and throughout the county. The photos on the right were taken from the side of a freeway that led to a clinic. On the next page, we have an example of a county that posted an HPV vaccine factsheet on their Facebook page and the comments they received shortly after.
- **Media and the internet misinformation**
 - One respondent stated that the media portraying opposition to the vaccination has been greater than support and that there is a perceived lack of positive ad campaigns for the vaccine.



A clinician reported that there were anti-vax signs posted up along side the freeway that leads to the clinic.

“The community seems to be split on the vaccine, some are for the vaccine and some are not” -Rural Nurse

Community Strategies

Rural communities

- **Doing your homework.** For example, several respondents were able to identify various health care providers in their community by name that are against HPV vaccination. Knowing who these individuals are can help facilitate the conversation during outreach and education events.
- **Small scale outreach** (e.g. one on one, small groups, etc.). In Alpine County, a nurse suggested parent outreach in the smaller clinics can be highly influential to the rest of the community since most parents and patients know one another. She stated that in these smaller communities' parent outreach efforts could have the potential to expand further since information has the tendency to spread rather quickly.
- **Showing up.** Participants stated that having a continued and consistent presence in the community will build community trust and reduce vaccine hesitancy.

Urban communities

- **Harnessing the power of social media.** Respondents from urban communities favored large scale educational campaigns that included the use of social media messaging to combat vaccine misinformation. Participants suggested having local clinicians post positive vaccine messages to their social media accounts.

Racial/Ethnic communities

- **In-language.** Provide outreach and education that is in-language and culturally appropriate.
- **Tailored Approach.** Some racial/ethnic group were more receptive to the HPV vaccine than others. For example, health professionals noted that their Hispanic and African American patients were more likely than their Russian/Ukrainian patients to agree to vaccinate their child. Strategies needed to understand and address these cultural differences.

All communities

- **Access to experts.** Host community events in which HPV vaccine experts are available to engage the community in meaningful dialogue.
- **Statistics.** Provide HPV vaccination rates and statistics on HPV associated cancers relevant to community.
- **Broad based campaigns.** Increasing awareness and visibility of the vaccine through bus advertisements; billboards; and use of public announcements.
- **School-based education.** Many participants advocated for the inclusion of HPV vaccine education to the 6-8th grade health curriculum. Educational campaigns such as the "California Health Campaign" or just general "back to school" campaigns emphasizing the importance of getting kids vaccinated is a practice multiple counties have suggested incorporating within their communities.

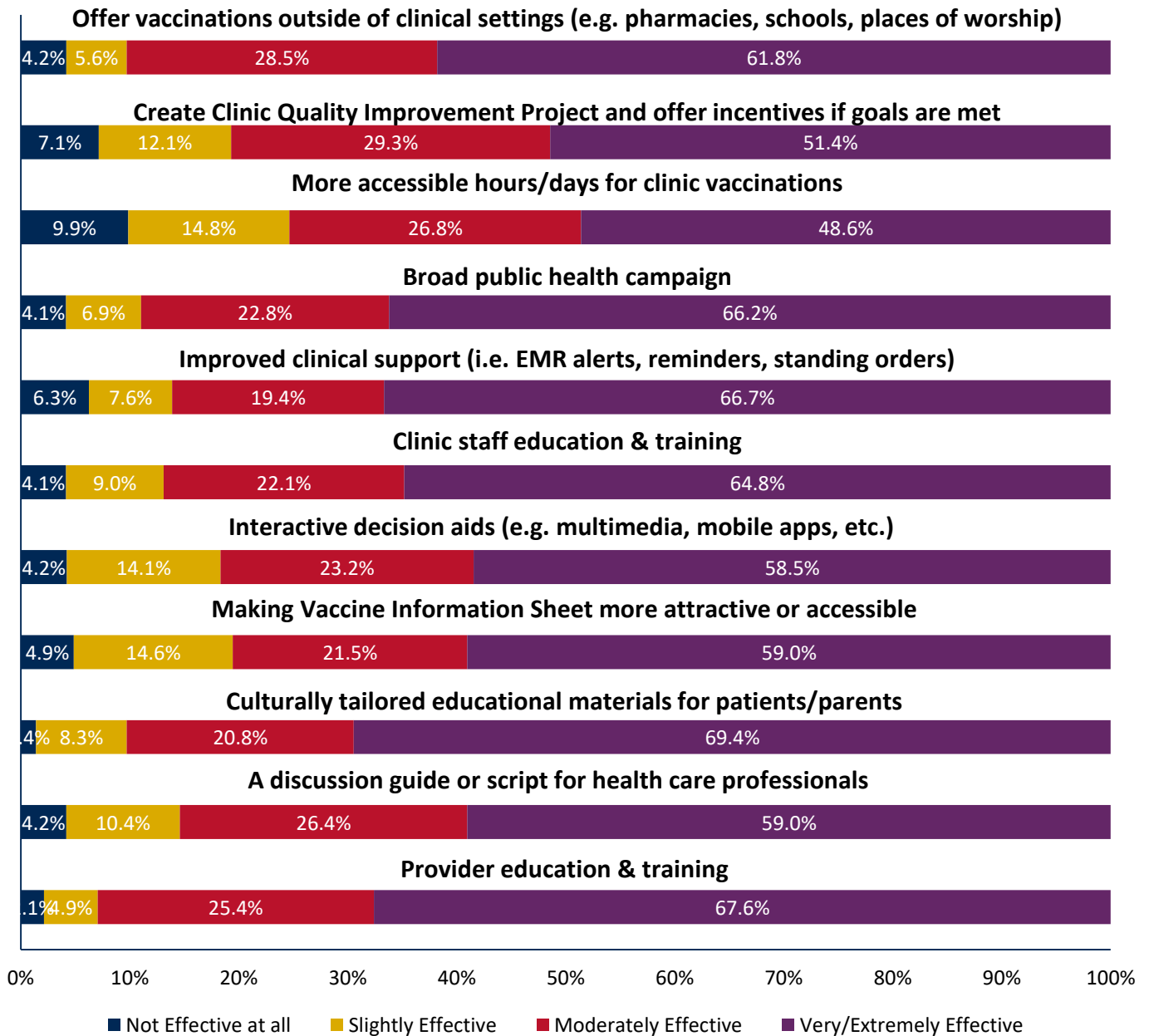
"We need more education in different forums in the community. More outreach events in different places in the community..." -County Nurse

"If you can get an expert and allow people to ask questions and get answers from that... like a community forum and panel..." - School Nurse

Overall Strategies

We asked participants (n = 145) on what strategies that they felt would be most effective to increase HPV vaccination rates. The top three strategies are (those ranked very/extremely effective):

- Availability of culturally tailored educational materials for patients/parents (69.4%)
- Provider education and training (67.6%)
- Improved clinical support (66.7%)



“Providers need tools to talk to patient, particularly culture-specific education/training in presenting the vaccine...”-Clinician

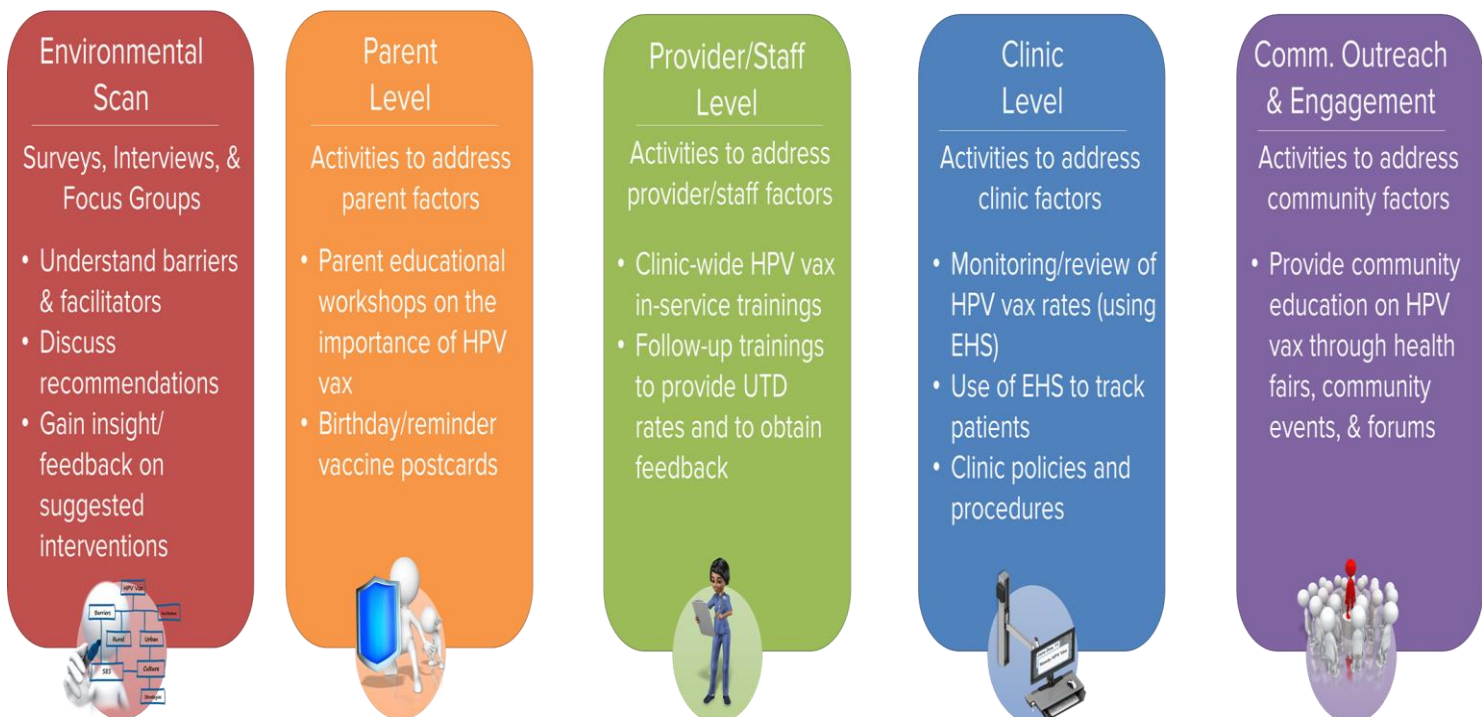
Conclusions

The UC Davis Comprehensive Cancer Center's HPV Environmental Scan revealed factors associated with HPV vaccine uptake at the parent, primary care team/health system, and community level. At the parent level, misinformation and incomplete information regarding the safety, potential adverse effects and importance of on time vaccination resulted in vaccine hesitancy and a desire to delay vaccination to a future visit. At the primary care team/health system level, clinicians and clinic support staff reported recommending the vaccine to all eligible patients; however the strength and quality of that recommendation varied. Additionally, primary care team participants highlighted the importance of having an electronic health system that can track patient's vaccine status and remind both the patient and the primary care team when vaccines are due. Primary care team members also cited a lack of available culturally appropriate, in-language HPV patient educational materials. At the community level, participants cited the media and the Internet as major sources for vaccine misinformation.

Additionally, we found differences in the themes associated with HPV vaccination among rural and urban populations. In rural counties, increasing uptake of the HPV vaccine was not viewed as a public health priority because of competing daily demands and was further impacted by the lack of available resources to access vaccinations. Among respondents from urban counties, we found higher support for vaccination. Misinformation and a lack of a strong recommendation from providers were common themes among both rural and urban respondents. Respondents suggested that the development of culturally tailored (ethnic as well as regionally specific) materials and clinic based quality improvement projects that included EMR based reminder/recall systems and provider prompts were strategies that would accelerate HPV vaccine uptake.

Based on our findings, we developed and are implementing and evaluating strategies to increase HPV vaccine uptake among adolescents of our catchment counties. These strategies include multi-level interventions to not only address barriers at the parent, primary care team/health system, and community level, but also interventions that take into consideration cultural and community differences (see figure below on our comprehensive multi-level approach). Our tailored community based campaigns to address misinformation and clinic based interventions to improve provider's recommendation have accelerated HPV vaccine uptake in our catchment. We conclude this report with an example of how we are successfully increasing HPV vaccination among rural and Native adolescents.

Multi-level Approach



Pilot Program to Increase HPV Vaccination Among Rural and Native Adolescents

In collaboration with Northern Valley Indian Health (NVIH), we developed, implemented and evaluated a program to increase HPV vaccination rates among adolescent patients (ages 11-17) of their Willows Clinic. The Willows Clinic is located in Glenn County and is considered a rural community.

Our multi-level intervention included: 1) parent educational workshops; 2) in-service trainings for providers and clinic support staff; 3) review of the electronic health system (EHS) capabilities and clinic policies and procedures as it relates to HPV vaccinations; and 4) community outreach and engagement.

“...providing the baseline rates and subsequent rates on a regular basis helped us see where we were and where we needed to be”
-Clinician

“...a patient came with a broken arm and I remember you (the trainer) saying broken leg, vaccinate...and I did just that”
-Clinician

Key Findings

- **Parent Workshops**
 - Not enough information from providers to make an informed decision.
 - Need easy to read informative educational materials for parents to take home.
 - Would get the vaccine if recommended by provider.
- **Environmental Scan**
 - Limited knowledge of HPV
 - Would get the vaccine if recommend by the provider and if required for school entry
- **Clinic In-Serve Training**
 - Staff:
 - Increase in knowledge of the HPV vaccine (29.4%) and an increase in agreement that the HPV vaccine is important for adolescents (11.1%)
 - Providers:
 - Increase in ranking of HPV from 3rd most important vaccination for adolescents to being the most important.
 - 30% increase in confidence to discuss the HPV vaccine with parents.

From baseline (1/1/17-12/31/17) to Interim (as of 10/31/19) HPV vaccination rates increased by 15.9 percentage points for completion of series (27% to 42.9%) and 32.0 percentage points for series initiation (52.4% to 84.4%).