

Human Papillomavirus (HPV) Vaccination in Kentucky: An Environmental Scan

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ABBREVIATIONS

ACOG	American Congress of Obstetricians and Gynecologists
ACS	American Cancer Society
AFIX	Assessment, Feedback, Incentives, and eXchange
CAPP	Center for the Advancement of Pharmacy Practice
CCFA	Cervical Cancer-Free America
CDC	Centers for Disease Control and Prevention
CoCASA	Comprehensive Clinical Assessment Software Application
CPCRN	Cancer Prevention and Control Network
EMR/EHR	Electronic Medical Record/Electronic Health Record
ES	Environmental Scan
FCHD	Franklin County Health Department
FQHC	Federally Qualified Health Center
HIT	HPV Initiatives Team
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus
IRB	Institutional Review Board
KAFP	Kentucky Academy of Family Physicians
KCAP	Kentucky Cancer Action Plan
KCC	Kentucky Cancer Consortium
KCR	Kentucky Cancer Registry
KCHA	Kentucky College Health Association
KIC	Kentucky Immunization Coalition
KDPH	Kentucky Department for Public Health
KSU	Kentucky State University
KWCSP	Kentucky Women's Cancer Screening Program
KY	Kentucky
LHD	Local Health Department
MCC	Markey Cancer Center
NCI	National Cancer Institute
OB/GYN	Obstetrics/Gynecology
PCP	President's Cancer Panel
QI	Quality Improvement
SEER	Surveillance, Epidemiology, and End Results
STD	Sexually Transmitted Disease
SWOT	Strengths, Weaknesses, Opportunities, Threats
Tdap	Tetanus, Diphtheria, and Pertussis

UHS..... University Health Services
UK..... University of Kentucky
U.S..... United States
VFC..... Vaccines for Children
WKU Western Kentucky University

Human Papillomavirus (HPV) Vaccination in Kentucky: An Environmental Scan

BACKGROUND

The [Markey Cancer Center](#) (MCC), a critical component of the [University of Kentucky's \(UK\) HealthCare enterprise](#) and a vital resource for the Commonwealth of Kentucky (KY), is a [National Cancer Institute](#) (NCI) designated cancer center emerging as a national leader in translational cancer science. Situated on a campus that is home to all six health professions colleges, MCC is located within a vibrant and expanding research community. The center's primary beneficiaries, rural populations in KY and notably, Appalachian KY, challenge the MCC with some of the most intractable health problems, and therefore provide a critically important population to understanding cancer prevention and control. MCC is dedicated to reducing the cancer incidence and mortality throughout its entire catchment area through a comprehensive program of cancer research, treatment, education, and community engagement.

Of significance, the MCC catchment area includes the mountains of eastern KY (**Figure 1**), which make up a significant portion of central Appalachia, one of the most economically disadvantaged, medically underserved, and disease-burdened areas in the nation [1-3]. Indeed, the residents of Appalachian KY carry an undue burden of cancer [4-6], including cancers resulting from human papillomavirus (HPV) infection [7]. As evidenced in **Table 1**, for 2008-2012, Appalachian KY had higher cervical, oral and pharynx, penile, anal, vulvar, and vaginal cancer incidence rates compared to non-Appalachian KY, the entire state, and the United States (U.S.). Similar results have been reported by Reiter et al., who found that for all HPV-related cancer types combined, Appalachian KY females had the highest incidence rates (1996-2008) compared to Appalachian West Virginia, Appalachian Ohio, and NCI SEER (Surveillance, Epidemiology, and End Results) 9 women; related, Appalachian KY men had higher incidence rates than SEER for all HPV-related cancers combined [7]. **Table 2** illustrates five-year mortality rates (2008-2012) for HPV-associated cancers, which are also higher in Appalachian KY compared to non-Appalachian KY, the entire state, and the U.S.

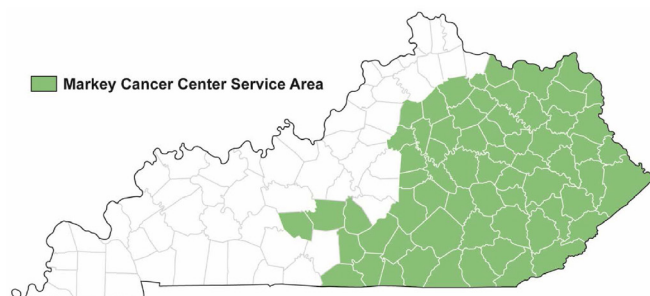


Figure 1. MCC Service Area.

As evidenced by local, state, and national cancer surveillance data, HPV-related cancers, which are highly preventable, are prevalent in the MCC catchment area [7]. As advocated by the [President's Cancer Panel](#) (PCP) and [Centers for Disease Control and Prevention](#) (CDC), much of this burden could be eliminated through

Table 1. Five-year invasive cancer incidence rates for HPV-related cancers, 2008-2012.

	Cervical	Oral & Pharynx	Penile	Anal	Vulvar	Vaginal
U.S.	7.7	11.0	0.9	1.8	2.4	0.7
KY	8.7	13.6	1.3	2.14	3.6	0.9
Non-Appalachian KY	8.4	13.5	1.1	2.12	3.3	0.8
Appalachian KY	9.6	13.7	1.6	2.19	4.3	1.4

Source: Kentucky Cancer Registry (KCR); NCI SEER*STAT.

widespread uptake of HPV vaccination among adolescents and young adults [8, 9]. However, current HPV vaccination rates in KY and Appalachian KY fall well below national health goals established by [Healthy People 2020](#) [10]. As evidenced in **Table 3**, adolescent males and females in KY have lower HPV vaccine initiation and completion rates compared to their national counterparts [11].

Although county-level HPV vaccination data in KY is not readily available, several published articles and state health department reports are available, detailing low HPV vaccination rates in MCC’s catchment area. For example, based on national immunization data (2008-2010), Reiter et al. reported that HPV vaccination initiation (28.7%) and completion (15.6%) rates among adolescent females aged 13-17 were significantly lower in central Appalachia compared to other sub-regions within Appalachia (e.g., northern, southern) and non-Appalachia [12]. Additionally, just over half (54.5%) of central Appalachian female adolescents who initiated the vaccine series followed through with completion [12]. Descriptive HPV vaccination data from the KY Immunization Registry, which is limited by optional provider participation, suggests some Appalachian KY counties are faring well with HPV vaccination efforts among 9-26 year old males and females, while others are not [13]. Personal communication with local health department staff also confirms low uptake and completion of the HPV vaccine series among youth in areas of eastern KY [14, 15].

The broader barriers to HPV vaccination identified in the PCP report (e.g., missed clinical opportunities, limited immunization venues, lack of parental education, absence of a provider recommendation, limited HPV and HPV vaccine knowledge, limited healthcare infrastructure supports, lack of comprehensive communication strategies [8]) are indeed relevant in MCC’s catchment area as evidenced in HPV vaccination literature focused on Appalachia [16-25]. For example, Krieger et al. found that Appalachian pediatricians were less likely to recommend the HPV vaccine compared to non-Appalachian pediatricians [24]; [UK Rural Cancer Prevention Center](#) researchers have found a significant HPV and HPV vaccination knowledge gap among Appalachian KY young adult women as well as clinic-centered inefficiencies [16-18]; and the importance of a provider recommendation for HPV vaccination has been well documented in the region [20, 22]. However, further complicating the HPV vaccination disparities in Appalachia is the fact that many of these barriers may be magnified – and clinical and public health efforts undermined – in this unique geographic region due to the limited number of healthcare providers (most counties are designated healthcare professional shortage areas) [26]; the poor socioeconomic and health status of the region (six Appalachian KY counties rank among the 10 most disadvantaged counties in the U.S.) [27]; health illiteracy [28]; geographic isolation and transportation barriers [3, 18, 29]; and cultural norms and religious beliefs, including fatalism [23, 30-32].

Table 2. Five-year cancer mortality rates for HPV-related cancers, 2008-2012.

	Cervical	Oral & Pharynx	Anal	Vulvar	Vaginal
	2.3	2.5	0.2	0.5	0.2
KY	2.9	2.8	0.23	0.6	0.2
Non-Appalachian KY	2.8	2.7	0.23	0.5	0.2
Appalachian KY	3.3	2.9	0.26	0.8	*

Source: KCR; NCI SEER*STAT.
 Note: Penile cancer death rates and Appalachian KY vaginal cancer death rates are unstable.

Table 3. HPV vaccine initiation and completion rates for adolescents aged 13-17, 2014.

	Male Initiation Rate	Male Completion Rate	Female Initiation Rate	Female Completion Rate
U.S.	41.7%	21.6%	60.0%	39.7%
KY	23.7%	13.3%	52.1%	37.5%

Source: Morbidity and Mortality Weekly Report 64, 784-794, 2015.

Despite the magnitude and complexity of addressing the burden of HPV-related cancer and HPV vaccination disparities in MCC's catchment area, there is a commitment among many public and private entities across the state to tackle this formidable – yet remediable – public health challenge. Through this NCI administrative supplement, MCC has a unique opportunity to make a significant contribution to the HPV vaccination education, research, and policy development activities already under way in KY as well as provide leadership for future collaborations and applied research initiatives to increase HPV vaccination and reduce the related cancer incidence, morbidity, and mortality that significantly affects the region.

The goal of the NCI administrative supplement awarded to the MCC was to conduct an environmental scan (ES), or needs assessment, of the HPV vaccination environment in KY and specifically within MCC's catchment area of Appalachian KY. The ES process allowed MCC to provide critical leadership in improving coordination and collaboration between existing partners, identification of new connections, alignment of goals and objectives, and generation of applied research opportunities to improve HPV vaccination uptake and completion among adolescents and young adults in KY. Specifically, the ES involved: identifying and connecting both new and established key HPV vaccination stakeholders; collecting and analyzing state and local data relevant to HPV vaccination; reviewing and updating the HPV vaccination goals in the [KY Cancer Action Plan \(KCAP\)](#); reviewing other state comprehensive cancer control plans and their goals/strategies for increasing HPV vaccination; conducting a literature review of HPV vaccination issues and barriers; conducting key informant interviews with academic, clinical, community, and public health constituents; engaging in a policy review; scanning the HPV vaccination research environment; scanning public health practice and school policy environments; and initiating a media scan of HPV vaccination-related issues. At the conclusion of the project, MCC staff continue to identify future research and funding opportunities to share with vested stakeholders.

Following the notice of award in September 2014, project co-leads Drs. Robin Vanderpool and Jennifer Knight proceeded to hire the HPV Cancer Control Coordinator, Amanda Wilburn, MPH, in early November 2014. In October 2014, the co-leads participated in the HPV administrative supplement orientation conference call hosted by NCI leadership in the [Division of Cancer Control and Population Sciences](#). This call brought together the [18 NCI-designated cancer centers](#) funded through this award mechanism to discuss supplement goals, the variety of submitted proposals, and ways NCI could support funded centers. As a result of this conference call, it was suggested that a national meeting be held at Moffitt Cancer Center in Tampa, Fla. in January 2015. In December 2014, team members participated in the second national conference call hosted by NCI. This call focused on developing the agenda for the January 2015 meeting in Tampa and provided background on [Cervical Cancer-Free America \(CCFA\)](#), an initiative spearheaded by the University of North Carolina and of which KY is an active participant.

Concurrent with participation in national activities, the project coordinator – with support from the project co-leads – initiated the ES process locally. Upon beginning the ES, a 'how to' was drafted to help guide the process (**Appendix A**). Moving forward, there were four key components to collecting information and data to inform the scan: key informant interviews, a media scan, a provider survey, and in-depth interviews with providers who demonstrated high HPV vaccine completion rates in 2014. In addition to the scan itself, two team members have been active participants in national workgroups: the CDC-funded [Cancer Prevention and Control Network \(CPCRN\)](#) HPV vaccination signature project workgroup and the [American Cancer Society \(ACS\) National HPV Vaccination Roundtable](#).

METHODS

Key Informant Interviews

The project coordinator engaged select statewide academic, clinical, community, and public health partners through key informant interviews. This process started with the [KY Department for Public Health \(KDPH\) Immunization Branch](#), one of the largest partners established during the process. Branching out from connections made through KDPH and MCC, multiple stakeholders were identified and assessed for how they could

inform the ES. Stakeholders were given a brief introduction to the ES when first engaged in the project. When a person or group was asked to set aside time for a discussion, a plan and tailored set of questions were prepared to maximize participants' time. In some cases, stakeholders requested we share information with them. For example, a partnership was established with the KY College Health Association (KCHA) while identifying future research priorities. In return for their information, the project coordinator accepted an invitation to speak at the KCHA annual meeting about HPV vaccination in KY. As a result of the interaction with KDPH, the project coordinator was added as a participant on the KY HPV Initiatives Team (HIT), a group resulting from former Governor Steve Beshear championing HPV as a public health priority by making it an official Governor's Initiative (**Appendix B**). During the key informant interviews, notes were kept about each participant and the information they shared.

Media Scan

A media scan – beginning November 1, 2014 and running through August 31, 2015 – was initiated through a collaboration with the [UK Department of Communication](#) and focused on news and media coverage of the HPV vaccine with emphasis on the new 9-valent HPV vaccine developed by Merck. The University-built system, called CommTV, records 20 television channels (capturing major networks, local channels and local news coverage), 20 hours each day into a flash video version and corresponding processed transcript from closed captioning. Upon request, staff in the Department of Communication searched the database for the following terms, flagging each “hit” (one mention per half-hour): HPV, HPV vaccine, HPV vaccination, Gardasil, Gardasil 9, HPV nonavalent vaccine, new HPV vaccine, HPV cervical cancer, HPV cancer, HPV prevention, HPV KY, HPV shot, HPV immunization, HPV genital warts, sexually transmitted disease (STD) vaccine, HPV girls, HPV boys.

Provider Survey

A provider survey tool (**Appendix C**) was developed with the help of the Core Measures Workgroup that came together out of the funded NCI cancer centers, input from MD Anderson Cancer Center, and example survey questions from ACS. The survey was built into Qualtrics, pilot tested with a mix of providers (physicians, mid-level clinicians and nurses), approved by the UK's Institutional Review Board (IRB), and distributed in September via the following state agencies/organizations: KY local health departments (LHD), Vaccines for Children (VFC) Program Providers, American Academy of Pediatrics KY chapter, KY Area Health Education Center, KY Rural Health Association, KY Medical Association, KY Primary Care Association, KY Academy of Family Physicians (KAFP), University of Louisville Family Practice, and the KY Center for the Advancement of Pharmacy Practice (CAPP).

Provider Interviews

Currently, KY cannot extract meaningful population-based HPV vaccination data from the state immunization registry. As other data sources were considered, it was noted that, for the first time, [CDC's Comprehensive Clinical Assessment Software Application \(CoCASA\)](#) was used to estimate adolescent vaccination rates in KY in 2014. The KY Immunization Branch assisted in identifying six pediatricians in Appalachian KY who met two criteria: relatively high rates of HPV vaccine completion and a substantial number of adolescent patients. The project coordinator worked with the local immunization field representative to establish interest in participation in the project and, consequently, staff applied for/received a \$500 mini-grant from the [UK Center for Appalachian Studies](#) to move forward with the project. An interview guide (**Appendix D**) and budget were developed and the study was approved by UK's IRB. Early September, each pediatrician was interviewed separately for approximately 30 minutes; the interviews were recorded and later transcribed by a professional transcriptionist. Participants were compensated for their time.

RESULTS

Key Informant Interviews

The key informant interviews provided the majority of information included in the ES. **Table 4** highlights each

agency/group/person that participated in the key informant interview process and a brief description of their feedback. Many offered extensive insight into the HPV vaccination environment in KY. Several partners also identified future opportunities for research and/or collaboration.

Table 4. ES Key Informant Interviewees and Related Feedback.

Organization/Professional	Feedback
KDPH Immunization Branch*	CDC Prevention and Public Health Fund Grant Activities and Immunization Registry Update
KDPH Division of Women’s Health*	HPV Vaccine offered through division programs (Family Planning/Breast and Cervical Cancer Screening Programs)
KDPH Office of Adolescent Health*	School policies around education and vaccination
KDPH Office of Health Equity	Interested in collaborating to address racial/ethnic disparities in HPV vaccine update
KDPH Office of Oral Health	Dentists do not provide immunizations. They promote other vaccines (ex. measles) but not HPV, yet. The KY Dental Association is reviving their oral cancer screening program
KDPH Commissioner’s Office	Policy overview: no state mandate, three failed house bills, Affordable Care Act Medicaid Expansion State
Northern KY Immunization Coalition*	Overview of ongoing media campaigns
KY College Health Association*	Interest in collaborative research project with ‘catch-up’ group (young adults)
UK Center for the Advancement of Pharmacy Practice*	Ongoing research with pharmacists providing immunizations, including HPV. Interested in collaboration
UK Department of Pediatrics	Identified current HPV vaccination champions
UK Department of Communication	The department has participated in funded HPV vaccine media strategies and is interested in dissemination and implementation projects
KY HPV Initiatives Team*	Strategic Plan to be released
Local Health Departments*	Overview of typical LHD efforts around HPV vaccination
KY Department of Juvenile Justice*	Overview of immunization practices in facilities, statewide
Local Immunization Field Representative	Discussions of local VFC Program implementation.

* See **Appendix E** for more information.

Media Scan

Our initial search revealed 317 videos and transcripts of program coverage over a one-year period. The distribution of included programs across the networks varied moderately with videos and transcripts pulled from MTV (n = 70, 22.1%), Comedy Central (n = 61, 19.2%), CSPAN (n = 35, 11.0%), CBS (WKYT; n = 25, 7.9%), and KET2 (n = 24, 7.6%). One hundred seventy items were omitted during the coding process for multiple occurrences of original programming (i.e., reruns); however, this does not negate the importance of the repetitive messaging and its potential positive or negative influence on television audiences. The HPV mentions in the examined television news and entertainment programming covered a wide range of contexts and tones of which we discovered three primary frames, with corresponding secondary and tertiary frames. The first frame is relative to the stigma of HPV and includes stories of the protagonist and the victim, the promiscuous female versus the sexually liberated male, and chastity-driven objections to HPV vaccination. The second frame includes the presentation of scientific discovery surrounding HPV and HPV vaccination and concerns about the safety and efficacy of the vaccine. Lastly, the third frame includes the varied, conflicting, and incomplete information about HPV and HPV vaccination and the mixed advice given to viewers. The frames oscillate among the types of programming included in our analysis. There were clear differences between news and

popular culture channels in the communication of HPV-related messaging. These findings contribute to our understanding of common memes around HPV, present unique opportunities for health communication researchers and public health professionals to inform interventions and campaigns, and provide clear evidence for advocacy for entertainment-based education regarding HPV and HPV vaccination. The ES team currently has a manuscript in development with colleagues in the UK Department of Communication to present more detailed results from the media scan.

Provider Survey

Two hundred thirty-one individuals started the survey and 182 completed it and met requirements to be included in the analysis: 32 physicians (17.6%), 25 nurse practitioners (13.7%), 122 nurses (67%), and three pharmacists (1.7%). Ages ranged from 26 to 68 years with a median age of 45. Ninety-one percent of the participants identified as female. Ninety-six percent of the participants identified as white and 100% identified as non-Hispanic. Responses were from across the state; both urban and rural areas were represented as well as providers who serve a single county and those who serve multiple. When asked about type of care setting, 12.0% reported working in primary care, 15.4% in family medicine, 5.0% obstetrics/gynecology (OB/GYN), 13.2% pediatrics, and 54.4% reported ‘other’. Of those reporting ‘other’, nearly all specified that they work in ‘public health’. The types of organizations providers reported working for: private practice (9.9%), local health department (54.4%), federally qualified health center (FQHC) (9.9%), rural health clinic (5.5%), university health services (4.4%), correctional facility (1.1%), hospital-based clinic (3.3%), university-oriented clinic (12.1%), and other (3.3%). Nearly half (47.5%) reported that 1% to 25% of their patients are adolescents, 29.3% reported that 26% to 50% of their patients are adolescents, and 23.2% reported that more than half of their patients are adolescents.

Participants were asked what factors, and to what degree those factors, have led to low HPV vaccine completion rates in the past in KY. They responded separately for females and males. For females, providers most often indicated that ‘parent/patient perception that there is no need to vaccinate girls who are not sexually active’ has ‘a great deal’ to do with the low completion rates. ‘Lack of knowledge among parents/guardians that vaccine is a series of shots’ and ‘parent/patient concerns about safety or side effects’ were also common responses. For males, providers most often indicated that ‘parent/patient perception that boys are at low risk for HPV-related cancers’ has a ‘great deal’ to do with the low completion rates. ‘Parent/patient perception that girls and women should be the ones responsible to take preventive steps against HPV-related diseases such as cervical cancer’ and ‘parent/patient perception that boys are at low risk for genital warts’ were also common responses (detailed in **Appendix F**).

Ninety-three percent of responders were current VFC Program providers, 7% were not, and only one was currently in the process of enrolling in the program. Seventy-three percent currently have a system for billing third party payers, 25% do not, and 2% are building the capacity to bill for reimbursement. Forty-five percent of providers work in practices with a functional Electronic Medical Record (EMR)/Electronic Health Record (EHR). Sixteen percent have one in development and 39% are without an EMR/EHR. When asked what age group providers start recommending the vaccine, one provider replied that they do not recommend the vaccine. Others replied as follows: 9-10 years old (28%), 11-12 years old (65%), 13-17 years old (4%), and 18-26 years old (2%). Providers were asked how they present the vaccine, in what terms; they were able to choose more than one response (**Table 5**).

Table 5. How do you present the vaccine when it is offered?

Response	Percentage
An ‘optional’ vaccine	42.9
A vaccine that is ‘due’	22.5
As a vaccine that prevents cancer	74.2
An ‘optional’ vaccine	42.9
A vaccine that is ‘due’	22.5
As a vaccine that prevents cancer	74.2

Nearly two-thirds of providers (66%) said they had no barriers to providing the vaccine. Nearly 10% cited the

cost of the vaccine and keeping the vaccine in stock as barriers. According to 81% of providers, the biggest facilitator for providing the vaccine is participation in the VFC Program. Four reasons were commonly cited for refusal among parents: concerns about the vaccine’s safety (70%), lack of knowledge about HPV-related diseases (56%), belief that child is too young to be vaccinated (56%), and fear of riskier sexual behavior/early initiation of sexual activity (56%). Providers cited patients’ most common refusal as ‘unwillingness to add a vaccine that isn’t required to immunization schedule’ (71%). Phone calls and mail is the most common means of distributing reminders among surveyed providers. Several of the open-ended responses about barriers and refusals were about misinformation on the internet and “fear-mongering on social media”.

Provider Interviews

Following IRB approval, all six invited pediatricians agreed to participate in the in-depth interviews. The interviews took place over two days at three practices in Pike County, KY. Highlights from each interview were placed into two categories: common themes and powerful messages/best practices (Tables 6 and 7). Additionally, there were several direct quotes the team found interesting or indicative of practices that have worked well for these physicians or exemplified attitudes about the vaccine in Appalachian KY (Appendix G).

National Workgroups

Staff continue to participate in the CDC-funded CPCRN HPV vaccination signature project workgroup to develop a cross-center project centered on identifying and building community-clinical linkages. Staff also participate in the ACS National HPV Vaccination Roundtable on two groups: the Pharmacy Task Group and the School-Based Parent Education Task Group.

Kentucky Cancer Action Plan

As part of the ES, staff revised the HPV vaccination section of the KCAP, the state’s comprehensive cancer control plan created by the [Kentucky Cancer Consortium](#) (KCC). The two objectives for this section are: 1) increase the percentage of Kentucky females ages 13-17 who have completed the recommended HPV vaccine series from 37.5% (2014) to 50% by (2020); and 2) increase the percentage of Kentucky males ages 13-17 who have completed the recommended HPV vaccine series from 13.3% (2014) to 25% by 2020. Strategies have been outlined under the following: policy, systems and environmental changes; health equity; communication education; healthcare professionals; insurers; worksite wellness; and data and research.

Table 6.

Common Themes
All providers believed the parents of their patients understand the connection between the virus, infection, and disease.
All providers stated that the link between HPV and other types of cancer, such as oropharyngeal, was not yet widely known/understood by the parents of their patients.
All provider stated that they felt comfortable discussing sexual transmission with their parents/patients.
All providers are VFC Program participants.
All providers reported having adequate stock/inventory of the HPV vaccine.
Common reminder/recall practices: schedule follow-up appointments at first dose, phone call reminders, flashing calendar magnets from Merck.
They all have educational material they distribute if a parent is reluctant or wants more information (e.g., HPV Vaccine Fact Sheet, ‘HPV and Your Child’).
The providers did not think external family members (ex. grandparents) had an influence on the deciding whether to vaccinate-unless child was being raised by that family member (common).
All providers report that the patients find the shot painful.
At the time of the interviews, all providers were offering Gardasil 9 in their offices.

Table 7.

Powerful Messages/Best Practices

When speaking with parents of males, several providers noted that they addressed it slightly differently emphasizing: protection against genital warts, protection against cervical cancer of future partners (“future wife”). There is also a heavy emphasis on it being cancer prevention.

Parents have been surprised to find that the vaccine is for boys, too.

More success with male patients who have older sisters, parents more agreeable to vaccinating their boys, too.

Providers, including nursing staff, share with parents that they vaccinated their sons.

Two providers reported that their insured patients posed the biggest problem with affording the vaccine. Their uninsured patients are covered under the VFC Program but their patients with private insurance, if they haven’t met their deductible, have to pay the full price of the vaccine out of pocket.

Providers stated they make zero profit by providing the HPV vaccine; it is a service they offer to their patients to keep them from having to seek it elsewhere.

There was variation in the view religion has on their parents’ decision about vaccinating their children. Some stated it was a big influence on them not getting the vaccine (sexual connotation) and others said it was not an influencing factor-being overridden by ‘family history’ or provider recommendation,

Providers saw an inverse relationship between education/income and willingness to get the vaccine. Several reported that those who were more educated were less likely to get their child(ren) vaccinated. They had researched on their own, online (mommy blogs, etc.) and were skeptical about its safety. Whereas, they find, patients with less education are more likely to trust the pediatrician and go along with provider recommendation. Some of the anti-vaccination movement recognized in this group, but not in clientele as a whole.

Several barriers cited as the biggest reason reported for not getting the vaccine: it isn’t required, they heard something negative about it from a family member, friend or neighbor, negativity on social media.

Providers reported diligence about follow-up doses at other visits-when patient comes in for a cold or other issue, use that as an opportunity to administer their next dose.

Providers reported offering the vaccine as one of three recommended, not as two required and one recommended.

One provider noted keeping a small inventory of Gardasil 4 for boys over age 15 so their insurance would pay for it.

Several stated they wished the vaccine was required for school entry.

CONCLUSIONS

There is adequate infrastructure in place across KY for collaboration around the HPV vaccine. The KY HIT already has organization, support, a direction, and vested stakeholders to address HPV vaccination issues. The inception of the KY Immunization Coalition (KIC) also shows promise for another statewide conduit for these efforts. However, KY needs a means of collecting and extracting meaningful HPV vaccination data from a reliable source. The KY Immunization Registry was completely redesigned and went live November 2015. It is a good time to push for HPV vaccines to be added as a required entry in the registry.

There is a difference in the way parents of adolescents perceive the HPV vaccine as it relates to females and males. For females, providers attribute low rates to parents’ beliefs about sexual activity. For males, providers attribute low rates to parents’ beliefs that boys aren’t at risk of HPV-related diseases. Reasons for refusing the vaccine included: concerns about the vaccine’s safety, lack of knowledge about HPV-related diseases, belief that child is too young to be vaccinated, fear of riskier sexual behavior/early initiation of sexual activity, and an unwillingness to add a vaccine that isn’t required to immunization schedule. The VFC Program is the biggest facilitator for providing the vaccine in KY.

Both the provider interviews and the provider survey responses noted the negative impact the internet can have on HPV vaccination acceptability among parents and, consequently, uptake and completion among adolescents. Parental opinions formed from misinformation or incomplete information on blogs and false testimonials on social media are a challenge for providers when recommending the vaccine. The media scan also revealed the significant, and often negative, influence of HPV-related messages in the news media and television programming, indicating the need for up-to-date and accurate health communication initiatives focused on factual and prevention-oriented messaging.

The ES process allowed MCC to thoroughly assess the HPV vaccination environment in KY. The team identified needs in both research and practice as well as highlighting several assets already in place to increase HPV vaccine completion rates among adolescents and young adults in KY.

Kentucky Cancer Action Plan

Objectives		
Measure	Baseline	Target
% of Kentucky females age 13-17 [†] who have completed the recommended HPV Vaccine series	37.5% [†]	50% by 2020
% of Kentucky males age 13-17 who have completed the recommended HPV Vaccine series	13.3% [†]	25% by 2020

[†]2014, National Immunization Survey- Teen;

[‡]2006 BRFSS. While the CDC recommends vaccination beginning at age 11, we utilized 13, as our ability to measure vaccination completions limited to ages 13-17 (as of 2009).

Goal

Reduce incidence of HPV-related cancers by increasing initiation and completion of the HPV vaccine series among adolescents and young adults who meet the Advisory Committee on Immunization Practices eligibility recommendations:

- Females: 2vHPV (Cervarix), 4vHPV (Gardasil), and 9vHPV (Gardasil 9) may be administered ages 9-26. Initiation recommended between ages 11 and 12.
- Males: 4vHPV and 9vHPV recommended ages 9-21. Initiation recommended between ages 11 and 12. Males who identify as men-who-have-sex-with-men or who are immunocompromised who have not previously been vaccinated recommended through age 26.

Policy and System Changes

- Assist with implementation of reminder and recall tools in healthcare providers' office systems.
- Encourage community-clinical linkages that increase initiation and completion of the HPV vaccine series.

Health Equity

- Focus HPV vaccine promotion in Appalachian KY, where cervical cancer rates are higher than the rest of the state, with tailored messaging for that population.

Communication/Education

- Promote statewide public awareness campaigns that encourage the HPV vaccine series.
- Encourage collaboration with external partners to engage creative, multi-level interventions that increase initiation and completion of the HPV vaccine series.

Healthcare Professionals

- Promote evidence-based tools to providers on how to recommend the vaccine to parents of adolescent patients.
- Assist with implementation of reminder and recall tools in healthcare providers' office systems.

Insurers

- Facilitate enrollment and participation in the state's VFC Program for providers who serve an eligible adolescent population and would like to participate.

Data & Research

- Collect data on attitudes of healthcare providers and parents about the HPV vaccine and examine how those perceptions influence vaccination rates in our state.
- Look beyond the KY Immunization Registry at alternative data sources for vaccination rates (e.g., CDC Clinical Assessment Software Application, Department for Medicaid Services).
- Determine if existing community guide recommendations for immunization are applicable to HPV vaccination.

Plan Moving Forward

Team members will disseminate ES findings to interested, participating stakeholders. Dr. Vanderpool will also continue to participate in the CPCR HPV workgroup and ACS National HPV Roundtable. Two subsequent activities are currently underway, including a pharmacy-HPV vaccination pilot project in Morehead, KY funded by the ACS National HPV Vaccination Roundtable and a CPCR HPV vaccination community-clinical linkage assessment with partners in both northern and south central Kentucky. Funded cancer centers also came together to develop a consensus statement for HPV vaccination which is presented in **Appendix H**. Two addi-

tional HPV vaccination-related cancer center meetings were held at MD Anderson Cancer Center (November 2015) and Ohio State University (June 2016).

Lessons Learned and Best Practices

As expected, provider recommendation is a key factor in HPV vaccine acceptance and uptake in KY. Parents of patients who are more educated, have shown a tendency to be more reluctant to vaccinate their children. There is an overwhelming willingness from providers across the state to participate, offer input, and collaborate on this work. There are several targeted efforts surrounding the vaccine; the KIC will continue to coordinate that work.

Research Needs Identified via the Scan

There are currently research ideas being considered by the national workgroups in which ES staff participate, including identification and assessment of community-clinical linkages focused on HPV vaccination and pharmacy-based projects. Additionally, there is perceived opportunity to collaborate with both KY CAPP and KCHA in future research and/or intervention projects.

Related to the ES scan process and preliminary findings, conference abstracts were accepted and presented at the following state meetings: KY Public Health Association annual conference (oral presentation accepted; March 2015), the annual Public Health Services and Systems Keeneland Conference (poster presentation accepted; April 2015), and MCC Research Day (poster presentation accepted; May 2015). The project coordinator was also invited to be a guest speaker during the 2014 KCHA Annual Meeting.

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Appendix A

Environmental Scanning as a Public Health Tool: Kentucky's Human Papillomavirus Vaccination Project

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Abstract

Borrowing from business, quality improvement programs, and strategic planning principles, environmental scanning is gaining popularity in public health practice and research and is advocated as an assessment and data collection tool by federal funding agencies and other health-related organizations. Applicable to a range of current and emerging health topics, environmental scans — through various methods — assess multiple facets of an issue by engaging stakeholders who can ask or answer research questions, exploring related policy, critiquing published and gray literature, collecting and analyzing qualitative and quantitative data in both primary and secondary forms, disseminating findings to internal and external stakeholders, and informing subsequent planning and decision making. To illustrate the environmental scanning process in a public health setting and showcase its value to practitioners in the field, we describe a federally funded environmental scan for a human papillomavirus vaccination project in Kentucky.

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TOOLS AND TECHNIQUES

Environmental Scanning as a Public Health Tool: Kentucky's Human Papillomavirus Vaccination Project

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PEER REVIEWED

Abstract

Borrowing from business, quality improvement programs, and strategic planning principles, environmental scanning is gaining popularity in public health practice and research and is advocated as an assessment and data collection tool by federal funding agencies and other health-related organizations. Applicable to a range of current and emerging health topics, environmental scans — through various methods — assess multiple facets of an issue by engaging stakeholders who can ask or answer research questions, exploring related policy, critiquing published and gray literature, collecting and analyzing qualitative and quantitative data in both primary and secondary forms, disseminating findings to internal and external stakeholders, and informing subsequent planning and decision making. To illustrate the environmental scanning process in a public health setting and showcase its value to practitioners in the field, we describe a federally funded environmental scan for a human papillomavirus vaccination project in Kentucky.

Background

Environmental scanning is a process used by businesses and other organizations to assess internal strengths and challenges and external opportunities and threats. Decision makers use environmental scans to collect, organize, and analyze data on their assets and shortcomings in external and internal environments to guide strategic planning and decision making (1–3). In business, environmental scans focus on acquiring relevant and credible information through various methods, including literature reviews, online

database assessments, social media scanning, policy reviews, competitor appraisal, and solicitation of stakeholders' opinions (eg, customers, board, staff), among other strategies (3). When properly executed, this process leads to a series of evidence-based responses that an organization can use to improve strategy and performance (4).

Recently, environmental scans were used to collect, organize, and analyze information on issues and practices in public health and medicine to look for quality improvement opportunities and research priorities, guide interventions, educate decision makers, and improve health outcomes. Environmental scans were used to address a range of topics, including chronic disease self-management (5), cancer care (2,6–8), mental health (9–11), injury prevention (12), and quality improvement programs (13–16). Environmental scanning integrates multiple strategies for information collection (2,17,18), including focus groups, in-depth interviews, and surveys with patients and providers; literature assessments; medical chart reviews; personal communications; review of internal documents; and policy analyses.

Similarities and differences exist between environmental scans and traditional public health evaluation principles. For example, similar to the Centers for Disease Control and Prevention's (CDC's) Framework for Program Evaluation in Public Health, an environmental scan has standards of utility, feasibility, propriety, and accuracy; it also has standards for engaging stakeholders, describing a program, focusing program design, gathering evidence, and sharing results (19). Additionally, an environmental scan and CDC's framework both emphasize using lessons learned to improve public health effectiveness and sharing those lessons with stakeholders. The difference between CDC's framework and an environmental scan is in the purpose. The purpose of an environmental scan is to understand context; collect information; and identify resources, links, and gaps whereas CDC's framework evaluates the merit, worth, or significance of a program or policy. When a program or policy is evaluated in CDC's framework, evidence is gathered and conclusions are justified to judge perform-



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ance and determine whether program goals and objectives were accomplished. In an environmental scan, activities focus on understanding the internal and external environment of a particular topic and providing input into strategic thinking, decision making, and planning (2,3).

Despite its adoption as an assessment tool in various health care contexts, an environmental scan does not have a consistent definition or process in public health practice. In some instances, an environmental scan is used as an informal catch-all term akin to a needs assessment (2); in other instances, it aligns with strategic planning and quality improvement initiatives (3,7,18,20). Additional application and critique of environmental scans is needed to improve the effectiveness of this tool and related methodology (5). In recognition of the utility of environmental scans in public health practice and the need for more applied examples, in this article we describe the steps for an environmental scan and use as an example the environmental scan that we conducted of a federally funded human papillomavirus (HPV) vaccination project in Kentucky. Our goal is to help public health practitioners successfully apply this methodology in the context of public health practice and research.

7 Steps of the Environmental Scan for Kentucky's HPV Vaccination Project

In September 2014, eighteen cancer centers, including the University of Kentucky Markey Cancer Center, were awarded 1-year support from the National Cancer Institute (NCI) to conduct an environmental scan and collaborate with other organizations to increase HPV vaccination uptake in pediatric care settings (21,22). The scan's design consisted of 7 steps that could be applied to many other public health areas.

Elements of the environmental scan process were used by the Kentucky Cancer Consortium to address other public health issues, including exposure to secondhand smoke; barriers to colorectal cancer screening, obesity, and cancer; and the Affordable Care Act's impact on cancer care (23). Lessons learned then contributed to creating and conducting our environmental scan for the HPV vaccination project. As we moved through phases of development, implementation, evaluation, and dissemination (Figure), we routinely shared our process and methodology with Kentucky Cancer Consortium's membership and academic colleagues who have environmental scan experience to help inform our work (3). Following is an outline of the 7 steps we used to conduct our environmental scan; each step includes an illustration of how the step was implemented in Kentucky's HPV vaccination project.

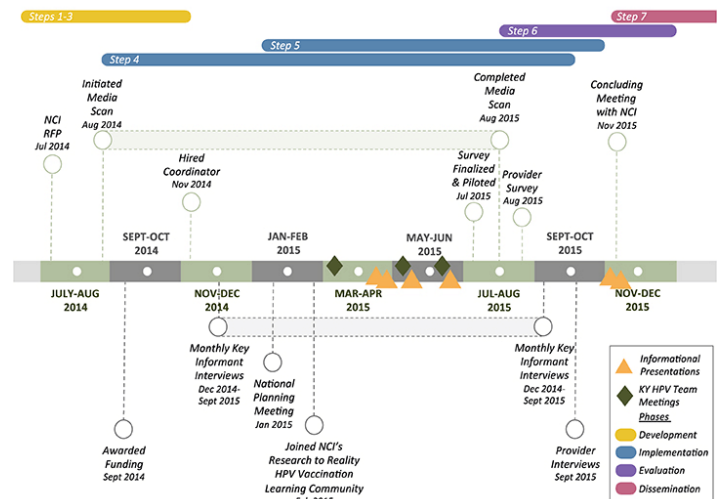


Figure. Timeline for developing and implementing an environmental scan for Kentucky's human papillomavirus (HPV) project, July 2014–December 2015. Abbreviations: KY, Kentucky; NCI, National Cancer Institute; RFP, request for proposal.

Step 1: Draw on experience to determine leadership and capacity for the project

A coordinator or team member must be designated to champion the entire environmental scan process from development to dissemination (3). Although resources vary by project and organization, an environmental scan must have dedicated leadership and clear roles and responsibilities for each team member. The scope and magnitude of the project needs to be within the organization's capacity.

Example from HPV vaccination project. Two project leaders (R.C.V. and J.R.K) with complementary expertise in public health and cancer control drew on their experience in policy, systems, and environmental change; partnership development; community needs assessments; strategic planning; and health communication to develop the proposal for NCI funding and the overall environmental scan process. NCI required that one full-time coordinator (A.W.) be hired to conduct the HPV vaccination environmental scan; that coordinator would be responsible for day-to-day implementation.

Step 2: Establish the focal area and purpose of the environmental scan

It is critical to specify a purpose for the environmental scan to anchor the process and focus the organization's limited time, energy,

and resources (3,20). Although the process can be flexible, a firm purpose will keep the environmental scan focused and its scope clear.

Example from HPV vaccination project. The purpose of the HPV environmental scan was to identify all public health activities, research, and information related to HPV vaccination in Kentucky, develop or improve links with existing programs, synthesize findings into a usable format for dissemination to stakeholders, and look for applied research opportunities to increase HPV vaccination uptake. The following definition was established by the investigative team:

A dynamic process of comprehensive assessment aimed at exploring HPV vaccination in a manner that makes connections not previously established and highlights barriers and facilitators not previously identified with the goal of empowering stakeholders with information for future strategic planning and decision making.

Step 3: Create and adhere to a timeline and set incremental goals

Timelines may be imposed by a funding agency or, if not, by organizational leadership. If the environmental scan is independently organized (ie, not dictated by a funding agency), establish a timeline at the outset. Plan environmental scan activities to optimize the process and stay on task. For example, if surveys or qualitative interviews are part of the environmental scan, allocate appropriate time for creating the survey tool and interview guides, pilot testing the instruments, getting approval from institutional review boards, recruiting participants, collecting and analyzing data, and synthesizing and interpreting data.

Example from HPV vaccination project. Our 1-year timeline was set by NCI; having a timeline helped prioritize the scan's components. Some components required attention during times specified by stakeholders; for example, the Kentucky HPV Initiatives Team met bimonthly and required us to schedule some activities accordingly. We planned to complete quantitative and qualitative data collection within 1 year (Figure). The time allocated for the provider survey, which was fielded in August 2015, included time for the following activities: developing the survey instrument through collaboration with other funded cancer centers; applying for university institutional review board approval; pilot testing survey constructs and preliminary questions with 6 clinicians; collecting responses from 231 physicians, midlevel clinicians, nurses, or pharmacists; and analyzing the preliminary data.

Step 4: Determine information to be collected for the environmental scan

Brainstorm all topics and resources that could inform the environmental scan (2,3,7,18,20). All desired information may not be available, but include everything that, ideally, should be part of the scan. Casting a wide net and finding that information is unavailable is better than risking missing something important. Unlike Step 2, the list of items in this step will be dynamic, changing as opportunities to engage stakeholders develop and new resources are discovered.

Example from HPV vaccination project. The project started with several general areas related to HPV vaccination activities in Kentucky: state cancer registry and immunization data, media coverage, the policy environment, public health practice and research environments, a literature review, an update of the Kentucky Cancer Action Plan, other states' HPV vaccination initiatives, 14 key informant interviews, and identification of research priorities. As the environmental scan progressed, several topics proved to be more robust than others. For example, the Kentucky Department for Public Health's Division of Immunization received CDC funding to conduct a multimedia campaign promoting HPV vaccination during the back-to-school season. In other instances, staff had to seek unique sources. For example, the Kentucky Immunization Registry does not require that data on HPV vaccination be entered into its system; therefore, other data were obtained to help create a picture of HPV vaccination trends in Kentucky, including data from the CDC's Comprehensive Clinical Assessment Software Application, a tool for assessing immunization coverage and practices in clinics and other places where immunizations are provided.

Step 5: Identify and engage stakeholders

Stakeholders, and their willingness to participate in the environmental scan, are the key to success. Create a diverse, iterative list of people or organizations that have information on each topic named in Step 4. Stakeholders may expand the original list of topics by recommending or connecting project staff members to other stakeholders (ie, snowball approach).

Before approaching stakeholders, know what is needed from them. Create a plan for conversations with participants, whether it is a set of questions, requests, or action items. Be prepared to answer questions about the topic and environmental scan process as well as the funding requirements. Note all suggestions even if they do not seem pertinent at the time; they may prove valuable further into the project. Be prepared to offer something in return for their participation (eg, access to final environmental scan results or promotional materials).

Example from HPV vaccination project. During the NCI application process, we collected letters of support from local and state

partners. These letters helped gain early support from established stakeholders. For example, the project coordinator had previously worked with the Kentucky Department for Public Health and had professional rapport with its immunization branch. In turn, the immunization branch told us of stakeholders unknown to the vaccination project team. The list of stakeholders quickly expanded to include local immunization coalitions, a practice-based pharmacy research network, and pediatricians in rural Appalachia who had success with HPV vaccination.

We gave stakeholders a brief introduction to the environmental scan and devised a plan to maximize efficient use of their time. Some stakeholders asked us to participate in their public health activities. For example, the Kentucky College Health Association asked the project coordinator to speak at its annual meeting about HPV vaccination. A minigrant through the University of Kentucky's Appalachian Center allowed the team to incentivize (with \$75 gift cards) the pediatricians identified as successful vaccinators to participate in qualitative, in-depth interviews; these 6 interviews were invaluable to the environmental scan. Another grant from the American Cancer Society allowed us to work with the University of Kentucky's Center for the Advancement of Pharmacy Practice and a local pharmacy chain in Appalachian Kentucky to promote HPV vaccination outside the medical home.

Step 6: Analyze and synthesize results from the environmental scan into a concise summary report

Analyze all collected data and triangulate the data according to the environmental scan plan (18,20,24). Document quantitative and qualitative results from survey instruments, key informant interviews, policy and media assessments, and literature reviews and synthesize the results into meaningful conclusions as they relate to the focus area (3). In addition, identify evidence-based research priorities or intervention target areas, and use the results to support decision-making steps and an action plan that will guide public health research or practice projects and that empowers partners to move forward.

Example from HPV vaccination project. Near the end of the funding period, staff began analyzing data from the provider survey; identifying common themes from the in-depth provider interviews; synthesizing information from the key informant interviews; and analyzing television program transcripts from the 1-year HPV vaccination media scan. All activities were conducted with the objectives of creating an HPV vaccination research agenda, identifying effective partnerships and policies for replication, and ascertaining priority educational and interventional areas for key stakeholders.

Step 7: Disseminate results and conclusions to key stakeholders

Researchers and practitioners may arrive at the final product in several ways (3,18). For example, the funding agency may provide a template for summarizing data in a final report. If following such a template is not required or no such template exists, create one at the beginning of the project or at the end. In the report to stakeholders, address how well the initial, overarching question and its subtopics were answered and list informational sources. Make the results of the environmental scan available to the funding agency, the organization's leadership, and those who participated in the process.

Example from HPV vaccination project. NCI did not provide a final reporting template for this project. The format was not determined at the start of the project; rather it took form around the informational sources established in Step 4 of the scan. We made the final report available in paper and poster presentation form for the funding agency, key stakeholders, and other interested parties. Additionally, the environmental scan team gave 6 informational presentations at national, state, and local conferences.

Discussion

An environmental scan can be used to assess the external and internal environments of health programs or to identify barriers and facilitators to solving health problems in the context of a community or national priority area. An environmental scan may inform strategic planning and decision making for projects or interventions, guide the directions of a new public health activity, raise awareness of health disparities or other inequities, or initiate a project or funding opportunity (2,17,18). For example, HPV vaccination, although now recommended for more than a decade, is still relatively new on the public's radar and is vastly underused in Kentucky and nationally for the prevention of HPV-related cancers (25–27). The environmental scan was a strategic and creative approach for NCI to gain a big-picture view of HPV vaccination activities in the catchment areas of 18 cancer centers. The 18 environmental scans provided NCI and each grantee with strategic, local information about links among cancer, immunization, and public health coalitions and programs to promote HPV vaccination; identified new collaborations aimed at increasing HPV vaccination uptake through applied research; and informed research and practice agendas, all with the goal of reducing the incidence of HPV-related disease.

Before starting an environmental scan, establish a working definition for an environmental scan (2). The definition needs to have

detailed yet flexible steps to achieve the desired outcome, and the process must be fluid enough to allow for changes suggested by information gained from stakeholders and new questions that arise.

Perhaps the most important step of an environmental scan is to determine how to use the results (18,20). Share the final product (ie, hardcopy report, presentation) with stakeholders, including those who provided information for the environmental scan. Ideally, the final product will generate research priorities, identify funding gaps, create opportunities for effective intervention, and identify new partnerships for cultivation. Kentucky's final report and poster presentation, made available to NCI and stakeholders, highlighted the need for robust HPV vaccination data, energized partners and identified new partners, and generated a list of research priorities, including conducting a pharmacy-based vaccination study and using community-clinical linkages to promote HPV vaccination.

Our description of an environmental scan has at least 2 limitations. First, a standard definition for or consistent approach to the environmental scan does not exist in the field of public health (2,18). The resulting ambiguity is a limitation of the process, and the definition and process will probably evolve as more public health organizations and practitioners adopt the tool. In time, the process described in this article may become more applicable or less applicable. Second, our environmental scan was conducted under one set of circumstances: it included funding and support from a federal agency, a full-time project coordinator, established relationships with key informants, and a 1-year timeline. The steps described in this article may not be generalizable to other public health environments. Regardless of these limitations, these environmental scan steps, or an adapted version of them, can be applied to many public health questions and areas of research and practice.

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The opinions expressed by authors contributing to this journal do not necessarily reflect the opinions of the U.S. Department of Health and Human Services, the Public Health Service, the Centers for Disease Control and Prevention, or the authors' affiliated institutions.

APPENDIX B

Lt. Gov. Luallen, Public Health Officials Urge HPV Vaccine for Youth Ages 11, 12

Monday, 07 13, 2015

Kerri Richardson
Terry Sebastian
502-564-2611

Kentucky unveils new educational campaign to promote vaccine, stop spread of HPV

FRANKFORT, Ky. – Lieutenant Governor Crit Luallen joined public health officials and advocates today in Frankfort to unveil Kentucky’s new “Stop HPV” campaign. The public awareness campaign, which launches statewide July 20, aims to encourage parents to get their children vaccinated against the cancer-causing human papillomavirus (HPV).

The campaign will feature television, radio and print advertisements promoting the benefits of the vaccine, which is recommended for 11- and 12-year-old boys and girls to prevent HPV infection. The advertisements, developed and produced by Louisville-based Doe Anderson, will be placed in media markets throughout the state. The campaign is funded through a \$500,000 grant from the Centers for Disease Control and Prevention.

“As parents, we want to do everything we can to protect our children, and the HPV vaccine does exactly that by significantly reducing a child’s risk of getting HPV-related cancer,” said Lt. Gov. Luallen. “If you want to know more, particularly if you have children between the ages of 11 and 12 years old, we strongly encourage you to talk to your health care provider and make a plan to get your child vaccinated. It will protect your child and help us stop HPV.”

“The HPV vaccine is one of the most powerful tools we have to help us prevent cancer and reach our goal of reducing cancer deaths. Yet many children in Kentucky aren’t being vaccinated,” said Gov. Steve Beshear. “We are excited to launch the Stop HPV campaign so more parents can learn about the benefits of the HPV vaccine and more children in Kentucky will be protected.”

HPV is an extremely common virus and serious health risk. Certain strains of the virus cause cervical and other cancers and diseases. Cervical cancer kills more women in Kentucky than many other parts of the country.

“Immunizations are the cornerstone of the American public health system and have prevented the spread of numerous infectious diseases. Like all other vaccines, the HPV vaccine is safe, effective and should be utilized for the protection of the public’s health,” said Cabinet for Health and Family Services Secretary Audrey Tayse Haynes. “We look forward to the day when the HPV vaccine is a routine part of adolescent health and all Kentuckian children are protected from the HPV virus.”

In February 2014, Gov. Beshear launched the kyhealthnow initiative in an effort to reverse or significantly reduce the major indicators of poor health in the state. The program set seven major goals to be achieved over five years, including reducing cancer deaths in Kentucky by 10 percent.

The HPV vaccine is identified in the kyhealthnow strategies for reducing cancer deaths with a target of increasing vaccination rates by 25 percent. Currently, only 27 percent of Kentucky’s adolescent females 13 to 17 years old have received the recommended three doses of the HPV vaccine, and 19 percent of boys have received one dose of vaccine.

Dr. Hatim Omar, a professor of pediatrics, obstetrics and gynecology at the University of Kentucky (UK) College of Medicine and chief of the division of adolescent medicine, runs an adolescent health clinic at UK. He said rates for HPV vaccination among his patients are nearly 100 percent.

“In reality, almost everyone will get one or more types of HPV at some point in their lives and, in some, the virus will cause genital warts, cervical, vulvar, penile, oral and other cancers,” said Dr. Omar. “The vaccine is safe and effective in preventing 70-90 percent of these diseases, which makes it a no-brainer to have everyone eligible immunized. Furthermore, some babies will get HPV during pregnancy, so it is crucial to vaccinate future moms to protect their babies.”

Dr. Gary S. Marshall, professor of pediatrics and division chief of pediatric infectious diseases at the University of Louisville, said immunizations can be tremendously beneficial for parents who face constant worries raising children.

“We spend a lot of time worrying about our teenagers — about everything from driving to drugs to making good career choices. It sucks the life force out of you. Vaccines are a way of taking at least some worries off the list. Fully vaccinated teenagers are much less likely to get influenza, measles, chickenpox, meningitis, whooping cough and HPV-related cancers, among other things. At a minimum, that breathes some of the life force back into you.”

Public health and government officials emphasize the importance of making the HPV vaccine a routine part of adolescent health. In fact, making the vaccine mandatory for school entry is listed as one of the kyhealthnow strategies for reducing cancer deaths.

“At this time, the HPV vaccine is not on the list of immunizations required when your child goes back to school — but that doesn’t mean it isn’t just as important,” said DPH Commissioner Dr. Stephanie Mayfield. “We want children who are 11 or 12 years old to get the three-dose series of the HPV vaccine. It can protect your child’s health, so please ask your pediatrician or provider about it when you go in for your child’s back-to-school checkup.”

According to the Centers for Disease Control and Prevention, about 79 million Americans are currently infected with HPV, and about 14 million people become newly infected each year. HPV is so common that most men and women will get at least one type of HPV at some point in their lives.

The target demographic for the HPV vaccine is children who are 11 or 12 years old. Teen boys and girls who did not get the vaccine when they were younger should request it from their provider now. Young women can get the HPV vaccine through age 26, and young men can get vaccinated through age 21. Certain other high-risk populations may be recommended to get the vaccine through age 26, if they did not get HPV vaccine when they were younger.

The HPV vaccine includes three injections given over the course of a year. Shots are given in the arm and, like most injections, can produce some minor discomfort. These common side effects go away on their own and include pain, redness at injection site and soreness of the arm from the shot, mild or moderate fever and headache. Many people who get the HPV vaccine have no side effects at all.

If you are insured, health plans also cover the cost of the HPV vaccine. The Vaccines for Children (VFC) program helps families of eligible children who might not otherwise have access to vaccines. The program provides vaccines at no cost to doctors who serve eligible children. Children younger than 19 years of age are eligible for VFC vaccines if they are Medicaid-eligible, American Indian or Alaska Native or have no health insurance. To learn more see VFC program.

The HPV vaccine is offered in a variety of health care settings, including family practice and pediatric providers. Local health departments also provide the vaccine. If you are unsure if the vaccine is available in your community, call your health care provider or your local health department for more information.

More information about the HPV vaccine and Kentucky’s Stop HPV campaign can be found at Stophpv.ky.gov.

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Appendix C

Provider Survey Letter

Dear Kentucky Healthcare Provider:

Thank you in advance for your time and assistance with this important project.

Researchers at the University of Kentucky (UK) Markey Cancer Center are conducting a 1-year project examining human papillomavirus (HPV) vaccine-related data, media, policy, research, and practice in our state. This brief survey will serve to gather information from healthcare providers statewide who provide care for adolescents who are eligible for HPV vaccination. Your responses will help generate research priorities aimed at increasing HPV vaccination rates in our state. We would like to assess your experiences with your practice, patients and patients' parents when offering and promoting the HPV vaccine.

We're interested in the related barriers and facilitators you encounter.

Although you will not receive personal benefit or compensation from taking part in this survey, your responses will help us better understand the HPV vaccination clinical environment. We hope to receive completed surveys from at least 250 providers, so your answers are very important to us. Your participation in the survey is optional. If you choose to participate many of the questions will require an answer before moving on to the next question. If you feel uncomfortable with the questions or need to stop the survey for any reason, you may discontinue at any time.

This survey is confidential. It will take approximately 10-15 minutes to complete. Your response to the survey is confidential which means no names will appear or be used on research documents, presentations, or publications. The research team will not know that any information you provided came from you. In addition, please do not provide any identifying information about your specific patients or parents in the open-ended sections. There are no known risks to participating in this survey.

Please be aware, while we make every effort to safeguard your data once we receive it, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while still en route to us.

This survey will close at the end of the day on Friday, September 25. Once we have gathered all the information and analyzed the surveys, we will provide a summary of the findings to interested participants. If you would like to contribute further and provide more detailed input, contact information is listed at the end.

If you have any questions about this survey or related project, please feel free to ask: Robin Vanderpool, DrPH from the UK College of Public Health is the Principal Investigator on the project and her contact information includes:

email: robin@kcr.uky.edu; phone: 859-218-2102

Amanda Wilburn is the UK Markey Cancer Center HPV Cancer Control Coordinator assisting with this project; her contact information includes:

email: awilburn@kcr.uky.edu; phone: 606-316-5150

If you have complaints, suggestions, or questions about your rights as a research volunteer, contact staff in the University of Kentucky, Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

Thank you again for your participation,

Robin Vanderpool

University of Kentucky, College of Public Health

Amanda Wilburn

University of Kentucky, Markey Cancer Center

Provider Survey Questions

Q1. Please specify your occupation:

- Physician
- Physician Assistant
- Nurse Practitioner
- Other Nursing Professional (e.g., RN, LPN)
- Pharmacist
- Other, please specify

Q2. In what care setting do you practice?

- Primary Care
- Internal Medicine
- Family Medicine
- OB/GYN
- Pediatrics
- Other, please specify

Q3. What is your gender?

- Male
- Female

Q4. What is your age?

Q5. How many years, excluding training, have you been in practice?

Q6. Please specify your race.

- White
- Black, African American Asian/Pacific Islander
- Native American/Alaska Native Other, please specify

Q7. Please specify your ethnicity.

- Hispanic
- Non-Hispanic

Q8. Please select the type of organization (Check all that apply):

- Private practice
- Local Health Department Federally Qualified Health Center Rural Health Center
- University Health Services Veteran's Affairs Correctional Health Hospital-based clinic University-oriented clinic Other, please specify

Q9. Please specify the primary county(ies) in which you practice.

Q10. What percentage of your patients is youth/adolescents age 9-17 (i.e., eligible for the HPV vaccine)?

- 1%-25%
- 26%-50%
- 51%-75%
- 76%-100%
- We do not serve adolescents

Q11. In 2013, the HPV vaccine completion rate for adolescent females in Kentucky was 26.8% compared to the US rate of 37.6%. In your opinion, to what extent are the following issues responsible for the low rates of HPV vaccination among girls 9 to 17 in Kentucky?

- Cervical and other HPV- related cancers
- Parent/patient perception that girls are at low risk for genital warts
- Parent/patient perception that there is no need to vaccinate girls who are not sexually active

Q12. Can you identify other reasons for the low rates of HPV vaccination among girls 9 to 17? If so, please explain.

Q13. In 2013, 19% of adolescent males in Kentucky initiated the HPV vaccine, compared to 34.6% of US males (KY male completion rates are not available). In your opinion, to what extent are the following issues responsible for the low rates of HPV vaccination among boys 9 to 17 in Kentucky?

- That boys are at low risk for HPV-related cancers
- Parent/patient perception that boys are at low risk for genital warts
- Parent/patient belief that girls and women should be the ones to take preventative steps against HPV-related diseases such as cervical cancer

Q14. Can you identify other reasons for the low rates of HPV vaccination among boys 9 to 17? If so, please explain.

Q15. Is your practice or clinic a Vaccines for Children (VFC) provider?

- Yes
- No
- Not currently but application in process or planning to apply

Q16. Does your practice or clinic currently bill third party payer sources?

- Yes
- No
- Not currently but working on a third party payer reimbursement system

Q17. Does your practice or clinic have an Electronic Health/Medical Record (EHR or EMR) system?

- Yes
- No
- In development

Q18. Do you directly provide the HPV vaccine to your age-eligible patients?

- Yes
- No, why not?

Q19. Which vaccine is provided?

- Gardasil (4HPV) only
- Gardasil (4HPV) but planning to offer Gardasil (9HPV) Gardasil (9HPV) only
- Cervarix (2HPV)

Q20. Does your practice or clinic ever refer patients to other places to get the HPV vaccine?

- Yes
- No

Q21. Please specify where they are referred.

Q22. At what age do you start recommending patients initiate the HPV vaccine series?

- 9-10 years old
- 11-12 years old
- 13-17 years old
- 18-26 years old

Q23. How do you present the HPV vaccine when it is offered? (Check all that apply)

- As an 'optional' vaccine As a vaccine that is 'due'
- As a vaccine that prevents cancer
- As a vaccine that prevents STIs/STDs
- A vaccine that is a part of the adolescent platform of vaccinations (tetanus, diphtheria, and pertussis [Tdap], meningococcal, annual influenza, etc.)
- Other, please specify

Q24. As a provider, how would you rate the strength of the recommendation that you give patients for HPV vaccination, based on their age?

Q25. Which of the following are barriers to you providing the vaccine? (Check all that apply)

- The cost of the vaccine
- The time it takes to discuss HPV vaccination during an office visit Your concern about the vaccine's safety
- Keeping the vaccine in stock in the clinic Storing the vaccine (e.g., refrigeration, space) Other, please specify
- None, I have no barriers.

Q26. Which of the following are facilitators to you providing the vaccine? (Check all that apply)

- Support and training from professional organization(s) VFC Program participation
- Community support of HPV vaccine
- Other, please specify

Q27. Which of the following are barriers to you promoting the vaccine? (Check all that apply)

- Difficulty discussing sexual health with patients/parents Concern that patients will not complete 3-dose series
- I'm not prepared to discuss the vaccine or HPV-related diseases
- My staff and I are not adequately trained on the vaccine or HPV-related diseases
- Other, please specify
- None, I have no barriers.

Q28. What are the most common reasons for HPV vaccine refusal among your adolescent patients? (Check all that apply)

- Inadequate insurance coverage/Inability to pay Lack of knowledge about HPV-related diseases Concerns about the vaccine's safety
- Unwillingness to add a vaccine that isn't required to immunization schedule Other, please specify
- There are no refusals.

Q29. What are the most common reasons for HPV vaccine refusal among your patients' parents? (Check all that apply)

- Inadequate insurance coverage/Inability to pay Lack of knowledge about HPV-related diseases
- Fear of riskier sexual behaviors/early initiation of sexual activity Belief that child is too young to be vaccinated
- Concerns about the vaccine's safety Other, please specify
- There are no refusals.

Q30. How do you respond to HPV vaccine refusal? (Check all that apply)

- Document and do not recommend
- Document and make vaccine recommendation at next visit
- Provide educational materials for patient/parents to review
- Other, please specify

Q31. Does your practice or clinic use any particular methods of recall or reminders to improve HPV vaccination series completion (i.e., doses 2 and 3)? (Check all that apply)

- Yes, mailed reminder cards
- Yes, text reminders
- Yes, phone call reminders
- Yes, other method
- No

Q32. Please share any barriers to you providing a reminder system.**Q33. Does your care setting provide any educational materials on HPV-associated diseases and cancers for patients and families at time of consultation?**

- No
- Yes, please specify material and its source

Q34. Does your care setting provide any educational materials on the HPV vaccine to patients and their families?

- No
- Yes, please specify material and its source

Q35. In your estimation, what percentage of HPV vaccination-eligible patients in your clinic have NOT completed the 3-dose series?

- Less than 25%
- Between 25% and 50%
- Between 51% and 75%
- Between 76% and 100% Unable to determine

Q36. How likely are you to switch to the new 9-valent HPV vaccine (Gardasil 9) once it is available?

- Very Unlikely Unlikely
- Don't know/Not Sure Likely
- Very Likely

Q37. How does your practice or clinic document patients' immunization records? (Check all that apply)

- EMR
- Paper Charts
- Through internal billing system
- Kentucky Department for Public Health Immunization Registry Other, please specify
- Immunization records are not maintained

Q38. How would you classify the majority of your HPV vaccine eligible patients' insurance status?

- Private Insurance
- Public Insurance
- Uninsured
- VFC eligible (if VFC provider)

Q39. How did you hear about this survey? (Check all that apply)

- Email from the University of Kentucky
- Email from the American Academy of Pediatrics
- Email from the Area Health Education Center
- Email from the Kentucky Ambulatory Network
- Email from the Kentucky Board of Nursing
- Email from the Kentucky Medical Association
- Email from the Kentucky Primary Care Association
- Email from the Kentucky Academy of Family Physicians
- Other, please specify

Are you interested in providing more detailed feedback on HPV vaccine uptake via a Key Informant Interview? The interview is a conference call discussion that will allow you to share your successes and challenges with your efforts regarding HPV vaccination among adolescents. If so, please contact us individually by emailing Amanda Wilburn, HPV Cancer Control Coordinator, at awilburn@kcr.uky.edu.

Appendix D

Draft Interview Guide • Providers

I. Introduction

[Have them read and sign the written informed consent document]

Hello and thank you for speaking with me today. My name is Amanda Wilburn and I'm with the University of Kentucky Markey Cancer Center. We're interested in learning about your perceptions of the barriers to and facilitators of HPV vaccine uptake and adherences among adolescents in your community. We are particularly interested in your interactions with parents of your adolescent patients and experiences you have when promoting and providing the vaccine. As medical providers, you are the experts. And you, specifically, have demonstrated high HPV vaccination coverage rates in 2014. Through your ideas and suggestions, we want to learn what works well with this population and how providers in Appalachian Kentucky can improve their initiation and completion rates

This interview is being tape recorded, and we will be taking notes during the discussion. The reason is that we want to make sure we remember everything you say. However, your comments are confidential and will be used for research purposes only. Is this ok? (start the tape) We're interested in all of your ideas; there are no right or wrong answers. We'd actually like to hear all of your different views. We have a lot of ground to cover, so I may change the subject or move ahead. Please stop me if you want to add something. Our interview is expected to last less than an hour. Let's begin.

II. Potential Questions

Do you feel that your patients understand the link between the human papillomavirus (HPV) and cervical cancer? How about other types of cancer? Please explain.

Are HPV infection and cervical cancer something you discuss with your patients and parents of your patients? Please explain.

How comfortable are you with discussing the vaccine with your patients and parents of your patients? Please explain.

Much of the pharmaceutical company's marketing campaign for Gardasil has been centered on young female adolescents. However, as you know, the vaccine is recommended for males, as well. Do you recommend the HPV vaccine to young males the same way you do females? Do you get different responses from parents of boys versus girls?

Describe the vaccination services at your clinic. Can patients receive the vaccine at a reduced cost or sliding scale rate? Are you a VFC provider? Are reminder systems in place for vaccines that require booster doses? Please explain.

Is there enough vaccine stock at your clinic to meet the demand for the HPV vaccine? Please explain.

Does the clinic provide information on HPV, the HPV vaccine, and HPV-related cancers? If yes, what type and where is it located in the clinic? Please explain.

Do you find that religious beliefs affect or hinder patients/parents decision to receive the HPV vaccine? Please explain.

Do you find that family members (beyond who is with the adolescent patient that day) impact the parent's decision to have their child vaccinated against HPV? Please explain.

Do you believe education and income play a role in the likelihood of your patients accepting and initiating the HPV vaccine? Please explain.

What do you hear parents say when they refuse or do not immediately accept your offer to vaccinate their children against HPV? Please explain.

Have you heard patients say the shot is painful? How do you respond?

If the vaccine were offered for free what factors (if any) do you think may still preclude parents from having their children vaccinated? Please explain.

Do you think parents comprehend the value of the HPV vaccine? How about the adolescents, themselves? Please explain.

What are the barriers and facilitators of patients returning to the clinic for Doses 2 and 3 of the HPV vaccine? Please explain.

What kind of reminders do you use in your clinic to help patients return for the booster doses?

How could changes in the healthcare system help eliminate these barriers? Please explain.

Gardasil or Cervarix? Are you stocking Gardasil 9 yet? If so, how are you transitioning to the new vaccine?

Why do you think there is a drop off in vaccine uptake between dose 1 and doses 2 and 3? You've been effective at getting patients to complete the series, what works for your practice?

Thank you again for participating in our study. My contact information as well as the University of Kentucky Office of Research Integrity phone number is included in the copy of the informed consent document should you have any questions, suggestions, concerns, or complaints about the study that come to mind later.

Thank you and goodbye.

Appendix E

Key Informant Interviews-Comprehensive Summaries

KDPH Immunization Branch

The Immunization Branch received the PPHF 2013: Immunization-Increasing Human Papillomavirus (HPV) Vaccination Coverage Rates among Adolescents grant (CDC-RFA-IPI13-130101PPHF13) in October, 2014. They have since received carry-forward approval through October, 2016. Here are the five objectives of the grant and the corresponding activities, to date:

1) Develop a jurisdiction-wide joint initiative with immunization stakeholders.

In process of developing a statewide coalition, KIC. They have a logo and mission statement. There are four start-up meetings scheduled in December across the state. The first year, they will focus on adolescent immunizations. There is a workgroup dedicated to developing this coalition and they are inviting everyone attending the KY Immunization Conference to participate as well as all of the following members: KY American Academy of Pediatrics, KAFP, all VFC Program providers, KCC members, Rural Health Clinics.

2) Implement a comprehensive communication campaign targeted to the public.

A multi-media campaign was developed by a local ad agency early 2015 and rolled out July 17, 2015 through September 30, 2015. The Immunization Branch is waiting on a report from the agency with some metrics. Also under this objective, the branch distributed CDC educational materials at the state fair and developed an HPV landing page through the governor's office (stop HPV.ky.gov) (see Appendix C).

3) Reminder recall for adolescents aged 11-18 years (this is through our new registry)

An internal workgroup is managing this project. A guide/users manual has been developed and staff are preparing to pilot in 16 counties. The system will have the capability to do letters, postcards, phone calls and text messages. The pilot is only going to be with postcards. KDPH received funds from [Assessment, Feedback, Incentives, and eXchange](#) (AFIX) that will be used to supplement this project.

4) Use AFIX to evaluate and improve performance for HPV vaccine.

Field staff are collecting data on all adolescent vaccines for 30 providers to use as a sample-to be completed 3/31/16.

5) Implement strategies targeted to immunization providers to increase knowledge in HPV related diseases, HPV vaccine safety and effectiveness, delivering a strong HPV vaccine recommendation, decrease missed opportunities for HPV vaccine and increase the administration of HPV vaccine.

Using funds to host a KY Immunization Conference in Louisville, KY October 14 – October 16, 2015.

The Immunization Branch also provided an update on the state's immunization registry: Historically, providers have not been required to enter the HPV vaccine into the registry since it is not a required vaccine. There is a new registry that is going live November 2015, but HPV will still not be a required entry. The infectious disease section chief advises that it will be several years before there is enough data to make meaningful statements about the output.

KDPH Division of Women's Health

The KY Women's Cancer Screening Program (KWCSF) and Family Planning Program are both under the Division of Women's Health. KWCSF has a protocol in place for recommending the HPV vaccine. Nurses in the program assess immunization status and then advise vaccinations to those who had not completed the series. The Family Planning Program does the same.

KDPH Office of Adolescent Health

Currently in KY, school nurses do not administer the HPV vaccine. There are two curricula for sexual health in KY schools, summarized as follows:

For the 2013-2014 School Year

Abstinence Grant: 21,460 middle school students and 571 high school students (teen mentors and 9th grade assemblies in 2 schools) were taught abstinence education. The middle school students received HPV information along with the teen mentors (about 100 HS students). Additionally, 2,562 parents/adults were educated. They did not have an STD lesson but the HPV vaccine was promoted.

PREP Grant: 3,083 HS teens were taught Reducing the Risk. This curriculum was mostly taught in 9th grade health classes and included some upper classmen who still needed the health credit. It was also taught at several alternative schools to teens of all ages. 589 middle and high school teens participated in Teen Outreach Program clubs during the school year. They also had an STD lesson and HPV vaccine encouragement.

Both the Abstinence and PREP Grant Programs teach about STDs and, under directive of KDPH Adolescent Health Program, all educators are to emphasize the importance of the HPV vaccine.

Northern KY Immunization Coalition

There is the only one [local immunization coalition in KY](#) and that is in Northern KY. It has been in place for just over seven years and serves Boone, Campbell, Grant and Kenton counties. They listed the following initiatives for 2014 and 2015:

Representatives of the coalition went on a local cable show to answer call-in questions about HPV-related diseases and the vaccine.

They went into LHD sites to talk to them about educating and promoting HPV vaccine - emphasized changing the conversation to cancer prevention. Used CDC talking points as well as results from a provider study in Chicago.

College student interns developed posters "give a gift to your child" (HPV vaccine) for providers offices and LHDs.

The district director of health put an article in the community reporter paper about HPV and the vaccine.

A county-specific magazine "What's Happening" included an article about HPV vaccine and cancer prevention. That magazine goes to every resident. (Boone, Kenton)

Coalition bases initiatives on information from professional agencies: American Congress of Obstetricians and Gynecologists (ACOG), American Medical Association, etc.

Coalition communicates with all providers via blast emails.

Hosted a spring conference for VFC providers in the region; they had a speaker talk about HPV, promoting the vaccine and highlighting what local providers were doing well. Same presentation was given to nurses and school health staff at different meetings.

Participates in KDPH HIT.

Putting HPV vaccine ads on local buses/public transportation. Working with coffee shops to get an HPV message on those hot coffee sleeves (targeting catch-up group). Distributing CDC posters via the KDPH Immunization Branch.

They use CoCASA to estimate coverage rates. Typically for private providers and LHDs. In 2015, they were only able to do private providers. Consists of a chart audit (ex. pull every fourth chart) and enter into program.

KY College Health Association

KCHA is a group of university health services (UHS) staff who have been organized for about 20 years. They displayed interest in working to increase HPV vaccine completion rates among the previously unvaccinated catch-up group on their respective campuses.

Many, however, do not bill any traditional third party payers for clinical services, including immunizations. The only insurance they bill is student health insurance which not all patients have (graduate and international students, mostly). So, the majority of their patients must pay for all services out of pocket and then, if they have it, bill their insurance on their own. If, for example, a young woman needs an expensive procedure like a colposcopy and has insurance, they will refer her to a hospital so her insurance can cover it.

Other than cost to the patient, a large barrier is clinician time-not enough time for adequate education and promotion of the vaccine while in a room with the patient. Other things heard from patients included: 'my mom doesn't want me to', 'too new', 'I don't think it's safe'. On the issue of time, staff discussed how nice it would be to have something like ['1-2-3 Pap'](#) in the exam rooms while the patients waited on the providers.

Several UHS have a strong social media presence (Instagram, Twitter and Facebook)with dedicated staff who could potentially manage an HPV campaign.

Some intervention ideas from this group:

- 1-2-3 Pap, or something similar, in clinic.
- Something resembling their flu clinics where they actually go into (freshman) dorms and start vaccinating.
- Some campus clinics have an Human Immunodeficiency Virus (HIV) testing clinic one day a month. They are interested in adding self-collected vaginal swabs for Chlamydia testing. Could be a place for vaccination, as well.

UK Center for the Advancement of Pharmacy Practice (CAPP)

Since 2004, KY pharmacists have had statutory authority to administer immunizations following a protocol created by providers. So when the HPV vaccine was approved, they could provide it. At the time, however, they could only vaccinate patients 18+. In 2010, they changed their protocol to age 14 for HPV. But patients under 18 must have parental consent. The exception is the flu vaccine which can be given down to age 9. As far as HPV goes, the CAPP director stated, anecdotally, that pharmacists have been reluctant to give the HPV vaccine because of it being a series-they think they'll do it wrong, don't want to be responsible for reminders, etc. There is a large education gap, especially among older pharmacists, and there is huge benefit to helping them understand the importance of starting the series and helping them with reminder/recall plans. There are some Kroger pharmacies currently administering the HPV vaccine. Those are the only ones currently providing it. CAPP is working on a manuscript of nearly 200 surveyed pharmacists. Of those only 18% had ever given an HPV vaccine compared to 94-96% range for Flu/Pneumonia vaccines.

Pharmacies do not participate in VFC. They require a third party payer. KY CAPP is interested in partnering in the future on a project and/or facilitating MCC reaching out to all of the pharmacists in the state via mail; b) one or both of the professional organizations via email; or c) connecting MCC internally to the pharmacists in preceptor roles (there are over 600 statewide). CAPPnet is their Practice-Based Research Network and while they haven't had a project funded yet, they're very eager. They want to increase their vaccination rates, particularly for HPV. They have a good rapport with Kroger corporate in Louisville (regional office) if there was a project to do in the pharmacies.

HPV Initiatives Team

In 2012, KY's Governor, Steven L. Beshear, made HPV prevention a top health initiative on his agenda. The Governor's commitment and support for HPV prevention generated opportunities for advancement in HPV awareness, testing, and vaccination. Moving forward, HPV prevention became a noted strategy for preventing cancer deaths on the Governor's 2014 'kyhealthnow' plan, which outlines goals for improving the health status of Kentuckians. The KY Cabinet of Health and Family Services, in conjunction with the KDPH, were directed by the Governor to address this issue. Subsequently, KDPH Commissioner, Stephanie Mayfield, MD, FCAP, organized an HIT. This team has been charged with generating HPV prevention and intervention activities. The team is comprised of numerous KDPH representatives, including: the Commissioner's Office, Adolescent Health, Family Planning, HIV Prevention, Immunization, Health Equity, Oral Health, School Nursing, STD Program, and the Woman's Breast and Cervical Cancer Screening Program. External partners include the UK College of Public Health, University of Louisville Division of Pediatric and Adolescent Gynecology, LHD immunization staff and pharmaceutical representatives. The development of this team served as the first step in creating a statewide partnership of stakeholders concerned about HPV prevention in KY.

Early discussions determined that there was a lack of accurate HPV-related information in many communities and that misinformation was widespread. This medically inaccurate information seemed to be common not only in the community but also among healthcare providers. Accordingly, the team recognized this as a possible cause for KY's low HPV vaccination rates. To combat this issue, HIT agreed that their first goal would be to increase HPV education and awareness at multiple levels of the socio-ecological model. KDPH's Adolescent Health Coordinator assures that medically accurate information is provided to students during the STD lessons in abstinence and personal responsibility programs which are conducted in middle schools and high schools across the state. The KDPH Immunizations staff provides educational programs and materials to local health departments, VFC providers, and clinic and school-based nurses. Ongoing educational outreach is conducted via webinars and conferences for healthcare and public health professionals. Education to the general public is provided through activities at local health events and the KY State Fair. Through these efforts, the HIT is working to assure that medically accurate information is being disseminated throughout the state.

From the beginning, HIT recognized the need for a comprehensive strategic plan for providing HPV vaccination and education, and to expand efforts involving cervical cancer screening, diagnosis, and treatment. In 2013, the team applied for and was awarded a grant from CCFA in order to develop and implement a statewide HPV strategic plan. An initial strategic planning meeting involving team members as well as other KDPH representatives and external partners was held in early 2014. The goals of this meeting were to develop a mission and vision statement and the objectives for the strategic plan. Under the guidance of a facilitator from the Eastern Kentucky University Facilitation Center, the meeting attendees first conducted a strengths, weaknesses, opportunities, and threats (SWOT) analysis of current HPV initiatives in KY. Findings from the SWOT analysis were then used to develop the plan's mission and vision statement. Results were then categorized into six main planning themes: access, education/promotion, research/evidence-based information, policy/advocacy, capacity/diversity/sustainability and funding/resources. In the subsequent HIT strategic planning meeting, four of the themes were chosen as the main goals for the strategic plan: access, education/promotion, research/evidence-based information, and policy/advocacy.

It was agreed that the remaining themes, capacity/diversity/sustainability and funding/resources, were to be considered throughout the plan. The team was then divided into workgroups who were asked to develop strategies for each goal. The strategies, which were presented at the next planning meeting, were a mix of KDPH- and state partner-led initiatives and actions. There was also discussion about the trajectory of the HPV strategic plan, whether to have a KDPH-centered plan and a separate statewide plan. The team decided that separate plans would not be productive and began preparations for a statewide HPV strategic planning conference.

In September 2014, HIT hosted the HPV-Free KY Conference. To encourage participation, invitations were

sent to a multitude of stakeholders across the state, including: the Governor's Office, Cabinet Secretary's office, legislators, governmental agencies (e.g., Department of Insurance and Department for Medicaid Services), provider organizations (e.g., ACOG, KAFP, KY Chapter of American Academy of Pediatrics, LHDs, Managed Care Organizations, FQHCs, school youth resource center staff, and school nurses. Eighty-five stakeholders representing many geographic regions, organizations, and populations from across the state attended the conference.

The morning plenary session was dedicated to ensuring that all attendees had an accurate knowledge of HPV and current prevention and control measures. In-depth information on HPV was provided including the prevalence of the HPV virus and current prevention efforts. The HIT also reported on progress in regards to the KY HPV strategic plan. The afternoon sessions focused on each conference participant's involvement in one of four workgroups aimed at furthering progress towards the strategic plan's goals. The workgroups were facilitated by HIT members who had previously led similar workgroups. Each workgroup spent two to three hours assessing the HIT's prior work and developed objectives and actions for each goal.

The KDPH Adolescent Health Coordinator aggregated the information gleaned from stakeholders at the conference and presented these recommendations to the HIT members. A strategic plan has been drafted is currently in the revisions and approval process in the KDPH Commissioner's Office.

Local Health Departments

Example of LHD activities from [Franklin County Health Department \(FCHD\)](#): In the medical clinic, adolescents, young adults, and parents receive education about HPV vaccination. Nurses assess vaccination status at every visit, whether the purpose of the visit is immunization update, well child exam, family planning, STD/HIV testing and/or treatment, or other. The VFC Program and stimulus vaccine stock allow them to provide qualifying patients with free vaccine, and their reduced administration fees further remove cost barriers. Once an individual receives the first dose of HPV vaccine, a return appointment reminder system is in place to encourage timely completion of the series.

FCHD nurses have noted difficulties in initiating and completing the HPV vaccination series in children. During conversations with parents, nurses must respond to "bad publicity" surrounding side effects of the vaccine, the fact that it is not "required" for entry into public schools, and the issue of starting the vaccine before child's sexual debut.

Increasing HPV vaccination rates among FCHD patients has also served as a Quality Improvement (QI) goal in their internal QI processes.

During the past couple of years, FCHD has also been invited to work with [Kentucky State University \(KSU\)](#) and cancer prevention agencies to provide HPV vaccination to students on campus. FCHD staff have provided HPV education to KSU peer mentors, created promotional flyers for vaccination events, and administered HPV vaccinations during campus vaccination events. Through HPV grant funding, KSU has been able to provide incentives at most of these campus events. Students receive HPV vaccination free of charge and are eligible to receive gift cards upon completion of the 3-dose series. These incentives have been extremely valuable in encouraging student participation.

KY Department of Juvenile Justice

Statewide there are nine group homes, seven detention centers and 10 treatment centers. The number of youth in these facilities fluctuates daily. The day staff spoke with the lead nurse, the census report was 524. The majority are males; there are only two facilities for females in the state.

No parental consent is required for medical care (including immunizations), only consent of the youth. A CDC information sheet is provided to each patient informing them about the vaccine and HPV-related diseases as soon as possible. For those that may have trouble reading or comprehending the info sheet, a nurse

explains it to them in detail.

“Very few kids decline the shot”, the lead nurse stated; most of the kids who decline the shot have a ‘needle phobia’ and are asked at subsequent clinical visits. They vaccinate nearly every resident.

They are a VFC provider and each facility has their own VFC profile. Their medical intake form has HPV vaccination status on the first page. It stays in the patient’s chart and they follow-up to make the series is complete. If they transfer to another facility before the series is complete, they send their records and follow-up with the new facility to ensure continuity of care and completion of the series. If he/she is released/picked up before the series is complete, they send their immunization record home and provide information on where to get the final dose(s) for free and include reminder dates.

KY American Cancer Society Representatives

In Eastern KY, the ACS has a Community Health Advisor that supported the Rural Cancer Prevention Center’s CDC HPV grant. The advocacy arm, ACS Cancer Action Network, has participated in conversations about policy with regards to the vaccine. There is a close relationship with Humana and two highly targeted, co-branded direct mailers to Humana members for Breast and Colon Cancer screening have been completed. There is strong interest to do something like that with HPV. There are Primary Care Representatives who work as consultants to FQHC and are currently researching their FQHC’s Health Resources and Services Administration data to see which clinics have the highest pediatric population, ages 9-13. ACS will be targeting those FQHCs in 2015 and providing them with information regarding HPV. They will also be using the educational materials and resources from the CDC’s website. ACS staff received a CDC grant for [Mountain Comprehensive Health Corporation](#), an FQHC in Eastern Ky.

There are three levels of participation for this particular grant:

- “practice changing” \$90,000 each
- “capacity building” \$10,000 each
- provider education/training resources, these are not funded and is more just technical support and consultation

Thirty FQHCs were chosen for each level: Mountain Comprehensive Health Corporation was awarded \$10,000 for capacity building. They are using the money to see what needs to improve before submitting their ‘practice changing’ application. They are doing this by using their money to build an EHR that will allow them to create baseline reports for HPV, meningococcal and Tdap. They want to recommend HPV at the same time as those two and that’s why they’re including those in the report-to pin point if HPV is not being recommended at the same time/frequency as meningococcal and Tdap. Once built, they’ll be able to do baselines for each location and each provider. They must wait to hear from the EHR vendor (nextgen) on final cost. The project started in July and they have already done some carry-forward. They have a report due at the end of October and based on that will determine next steps. They also have some provider education/training planned for [Park DuValle](#) in 2016.

Barren River District Health Department

This district health department received funding from [National Association of County and City Health Officials](#) to improve their HPV vaccination rates. To date they have trained approximately 50 of their nursing staff on HPV and ways to more effectively promote the vaccine with parents. They partnered with MERCK on a provider workshop in August (MERCK calls them ‘thought leader sessions’). They hired a new Public Health Associate with the Communicable Disease Team. The associate will be with them for two years, and a third of their time in the first year will be providing support for implementation of the HPV plan. They have started pushing out the state educational materials to provider offices, and will do much more of that over the next 9-10 months. All clinical staff are now trained to use the new KY Immunization Registry, and they are planning to use it when it rolls out in November. They have been working with the faculty and staff of Western KY University (WKU), along with some student groups, on finalizing their on-campus HPV promotion - seeing college

students as a 'catch up' population. They are giving WKU \$2000 of their grant funds, and they will implement a student education program, and will work with their on-campus health services to organize some HPV vaccine blitz days. They want to work especially with the campus greek organizations and also wish to ensure that the HPV promotion activities are incorporated into their 'usual' health promotion activities, for sustainability.

KY VFC Program

There are approximately 700 providers under the VFC Program in KY, including: private practices, rural health clinics, FQHCs and LHDs. VFC providers in KY have been offering Gardasil 9 for several months. Private providers started ordering in May and June, the LHDs had to wait until their protocols were signed by their medical director in July.

Appendix F

Reasons for Low Completion Rates among Females.

	Not at All	A Little	Somewhat	A Great Deal	Don't Know
% Provider Responses					
Adolescent girls don't receive routine medical care	10.4	16.5	50.0	18.7	4.4
Lack of knowledge among providers	30.2	26.9	30.2	8.8	3.9
Lack of knowledge among parents/guardians that vaccine is a series of shots	6.6	14.8	23.6	55.0	0
Logistical barriers to returning for series of three shots	6.0	14.3	43.4	35.7	1.0
Lack of provider recommendation for vaccination	22.5	25.3	29.7	22.0	1.0
Lack of vaccine's availability among providers	45.6	23.1	17.6	11.0	2.8
Cost of vaccine for providers	41.8	15.9	18.1	14.8	9.3
Cost of vaccine for patients	34.1	28.0	22.0	11.5	4.4
Parent/patient concerns about safety or side effects	3.9	19.2	29.1	47.3	1.0
Parent/patient perception that girls are at low risk for cervical and other HPV-related cancers	9.3	21.4	41.2	26.4	1.7
Parent/patient perception that girls are at low risk for genital warts	9.3	23.1	39.0	25.8	2.8
Parent/patient perception that there is no need to vaccinate girls who are not sexually active	3.3	7.7	22.0	64.8	2.2

Reasons for Low Completion Rates among Males.

	Not at All	A Little	Somewhat	A Great Deal	Don't Know
	% Provider Responses				
Adolescent boys don't receive routine medical care	9.3	21.4	42.3	22.5	4.4
Lack of knowledge among providers	28.6	24.7	32.4	11.5	2.8
Lack of knowledge among parents/guardians that vaccine is a series of shots	7.7	17.6	30.8	44.0	0
Logistical barriers to returning for series of three shots	6.0	20.3	43.4	30.2	0
Lack of provider recommendation for vaccination	22.0	22.5	25.3	30.0	0.6
Lack of vaccine's availability among providers	39.6	26.4	19.2	19.3	5.5
Cost of vaccine for providers	39.0	20.9	19.8	12.6	7.7
Cost of vaccine for patients	32.4	30.8	21.4	11.5	3.9
Parent/patient concerns about safety or side effects	2.8	16.5	33.5	46.7	0.6
Parent/patient perception that boys are at low risk for cervical and other HPV-related cancers	4.4	7.7	31.9	54.4	1.2
Parent/patient perception that boys are at low risk for genital warts	6.0	13.2	33.5	45.1	2.2
Parent/patient perception that girls and women should be the ones responsible to take preventive steps against HPV-related diseases such as cervical cancer	11.5	9.9	29.7	46.7	2.2

Appendix G

In-Depth Provider Interviews-Quotes

Usually 11 year old is when I push it because that's when I see them for that 6th grade physical which I know you can go down to nine; I've had a few come in and want it at nine years of age but for the most part it's 11.

People get busy and just forget or they just have something else to do. Yeah, I think most people probably would keep their appointments if they remembered. I have a fairly poor appointment to show rate sometimes with my patients whether it's their vaccines or not.

Well I think just listening to different concerns and it's kind of educating them on the vaccine and the potential side effects and what it protects them against. I really, we just, we spend time talking to our patients and I think listening to them and explaining and going over their concerns goes a long way.

I try to say, well here's some information; if you have any questions, give us a call because a lot of times if they go to the internet or they're going to find some things that are, that may impede their likelihood of getting the vaccine.

I think some of our families here that are very religious, they don't like the connotation that; they feel like that we're promoting promiscuity sometimes in their children and I mean I try to say, no, yes that that's involved in it but number one, it's still cancer prevention more so than the... That's just like a byproduct like that's how it's transmitted but we're interested in her, your daughter or your son's health overall and so we have to consider everything. But I feel like here more so than; I did my training in Lexington, Kentucky...like here, there's been more resistance to that as far as their thoughts of the promiscuity in really religious families than I found in Lexington in the population that I had there so.

Usually the more educated parents are, the more well read and so they are more likely to internet search everything and so they I feel, my circumstances or my experience has showed that those parents are the ones that are more likely to be resistance at first.

I think here, the more roadblock would be the sexual connection, that it's an STD, it's a sexually transmitted virus and I still think that's a big flashing red light for a lot of families...

I think it's important just to approach it like you would any other vaccine talk to just offer it as a cancer prevention. Even though it's not required, just you know when you come in for your 11 or 12 year old check-up, that you just say, well here's the three vaccines that we recommend you get today and just list it with the Tdap and the Menactra instead of saying, well there's two that's required for school and there's an optional one; you don't really have to get it. But just trying to offer it in a way that, here's the three that I recommend you get today. And then if they say no, just trying to be persistent whenever you do see them to encourage them to get it."

...I say you know we want to start early before they have ever even any thoughts on any kind of sexual activities; you want to make sure that they don't have the virus.

...If they want to volunteer that, say, you know I have HPV; I've had problems; I want to make sure my daughter or son doesn't have these problems. But I've had more of the educated professionals who resist in sometimes getting the vaccine.

...if they're just in for something else, you know something else or their routine or their, talking to them about their asthma medications or something like that, you can, we try to do that.

...In eastern Kentucky in particular, you see, seems to have a fairly high incidence of cervical cancer, HPV related diseases in some of these young moms that we see and so I think it is, they do feel that it's, you know they know what that connection is, especially if they've had a family member or have experienced you know HPV related disease themselves, particularly cervical cancer.

You know we're not looking to make a profit off anyone with vaccines; we want everybody to be vaccinated and everybody to be able to afford it. But we do refer some patients over to the health department. If they have a really high deductible or no, just a high deductible on their vaccines; like they've got a \$1,000.00 deductible for well child care, they're obviously not going to meet that so that would be out of their pocket and if they can't, or they can't or they don't want to pay that, then we don't give it because we can't eat the cost of that.

You have a lot of kind of itinerant clergy that will get a position in their head and everyone that they speak to, they get that message that it's punishment; if they're not doing anything wrong, they shouldn't have to worry about that. That's what we get some I mean and that's their belief system and it's sad that they do that with their kids.

If parents choose not to give their kids the required vaccines, we don't see them here.

My child doesn't do that; they don't need this vaccine. That's, I get that and I go, well you know your child's nine so hopefully your child is not doing, having that behavior but your child will be 25 one day...And they probably will be married or have somebody that they do that with so...You know it's not for right now; it's for young adulthood is when this vaccine is where we're trying to get the effect.

And then I think definitely the vaccine coverage would be an exceptional thing. Of all the things the government spends money on that are wasteful, if, you know they should have free universal vaccination for all kids. I mean that would be a tremendous thing. It would help out the providers in that we're not having to put out a huge amount of overhead. There's a large amount of overhead in purchasing vaccines; they're extremely expensive.

We give them an appointment card and then two months goes by and if they didn't come in, then we call them and let them know and we know try to schedule that appointment with them.

So I said, 'Unless you can pinpoint down the exact date when your child is going to become sexually active so that you can make sure that you start this you know six months beforehand, you know you really need to make sure you get this done as soon as possible just so that you make sure that it's already in place when that day comes.'

NCI Cancer Centers' Consensus Statement

NCI-designated Cancer Centers Urge HPV Vaccination for the Prevention of Cancer

Approximately 79 million people in the United States are currently infected with a human papillomavirus (HPV) according to the Centers for Disease Control and Prevention (CDC), and 14 million new infections occur each year. Several types of high-risk HPV are responsible for the vast majority of cervical, anal, oropharyngeal (middle throat) and other genital cancers. The CDC also reports that each year in the U.S., 27,000 men and women are diagnosed with an HPV-related cancer, which amounts to a new case every 20 minutes. Even though many of these HPV-related cancers are preventable with a safe and effective vaccine, HPV vaccination rates across the U.S. remain low.

Together we, the National Cancer Institute (NCI)-designated Cancer Centers, recognize these low rates of HPV vaccination as a serious public health threat. HPV vaccination represents a rare opportunity to prevent many cases of cancer that is tragically underused. As national leaders in cancer research and clinical care, we are compelled to jointly issue this call to action.

According to a 2015 CDC report, only 40 percent of girls and 21 percent of boys in the U.S. are receiving the recommended three doses of the HPV vaccine. This falls far short of the goal of 80 percent by the end of this decade, set forth by the U.S. Department of Health and Human Service's Healthy People 2020 mission. Furthermore, U.S. rates are significantly lower than those of countries such as Australia (75 percent), the United Kingdom (84-92 percent) and Rwanda (93 percent), which have shown that high vaccination rates are currently achievable.

The HPV vaccines, like all vaccines used in the U.S., passed extensive safety testing before and after being approved by the U.S. Food and Drug Administration (FDA). The vaccines have a safety profile similar to that of other vaccines approved for adolescents in the U.S. Internationally, the safety of HPV vaccines has been tested and approved by the World Health Organization's Global Advisory Committee on Vaccine Safety.

CDC recommends that boys and girls receive three doses of HPV vaccine at ages 11 or 12 years. The HPV vaccine series can be started in preteens as early as age 9 and should be completed before the 13th birthday. The HPV vaccine is more effective the earlier it is given; however, it is also recommended for young women until age 26 and young men until age 21.

The low vaccination rates are alarming given our current ability to safely and effectively save lives by preventing HPV infection and its associated cancers. Therefore, the 69 NCI-designated Cancer Centers urge parents and health care providers to protect the health of our children through a number of actions:

- We encourage all parents and guardians to have their sons and daughters complete the 3-dose HPV vaccine series before the 13th birthday, and complete the series as soon as possible in children aged 13 to 17. Parents and guardians should talk to their health care provider to learn more about HPV vaccines and their benefits.
- We encourage young men (up to age 21) and young women (up to age 26), who were not vaccinated as preteens or teens, to complete the 3-dose HPV vaccine series to protect themselves against HPV.
- We encourage all health care providers to be advocates for cancer prevention by making strong recommendations for childhood HPV vaccination. We ask providers to join forces to educate parents/guardians and colleagues about the importance and benefits of HPV vaccination.

HPV vaccination is our best defense in stopping HPV infection in our youth and preventing HPV-related cancers in our communities. The HPV vaccine is CANCER PREVENTION. More information is available from the [CDC](http://www.cdc.gov).

