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Administrative Supplements for NCI-Designated Cancer Centers to Support Collaborations to Enhance HPV Vaccination in Pediatric Settings: A Summary Report

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BACKGROUND

Human papillomaviruses (HPV) cause nearly 27,000 new cancers in the United States each year and more than 600,000 cancers worldwide each year.^{1,2} These include cancers of the cervix, oropharynx (head and neck), anus, vulva, vagina, and penis. Three vaccines—Cervarix[®], Gardasil[®], and Gardasil[®] 9—are approved by the U.S. Food and Drug Administration (FDA) for prevention of several HPV-associated diseases and recommended for males and females at 11-12 years of age.³ However, despite excellent safety profiles and strong evidence of efficacy, uptake of HPV vaccines in the United States is considerably lower than that of other adolescent vaccines.⁴ In 2014, among adolescents 13 to 17 years of age, only 39.7 percent of females and 21.6 percent of males had received the recommended three doses of the HPV vaccine.

The February 2014 report of the President’s Cancer Panel called underuse of HPV vaccines “a serious but correctable threat to progress against cancer” and urged the cancer community to take several steps to ensure that all age-eligible adolescents for whom the vaccine is not contraindicated receive all three recommended doses of the vaccine series.⁵ Several barriers to initiation and completion of the HPV vaccine series have been noted by the President’s Cancer Panel,⁵ Centers for Disease Control and Prevention (CDC),⁶ and others.⁷ Addressing these barriers poses new challenges for the cancer community. HPV vaccines are the first cancer control intervention targeted specifically to adolescents, a population in which cancer is rare. Pediatricians and others who provide care to this population generally are strong proponents of vaccines against childhood diseases but have less experience with prevention of cancer. There also has been limited overlap between the cancer control and immunization communities. The slow uptake of HPV vaccines illustrates the need for coordination among all of these stakeholders. Importantly, coordinated activities likely will be most effective if they take place locally and regionally since HPV vaccine uptake rates vary geographically and among different population groups.⁴

In July 2014, the National Cancer Institute (NCI) Division of Cancer Control and Population Sciences (DCCPS) issued a funding opportunity announcement for an administrative supplement for NCI-designated cancer centers to promote collaborations between the cancer centers and state/local cancer coalitions and HPV immunization programs.* The short-term goals for the one-year supplement were to: (1) conduct an environmental scan and (2) develop/enhance linkages with existing coalitions and programs, with a focus on HPV vaccine uptake in pediatric care settings. The long-term goal is for cancer centers to utilize collaborations enhanced through the supplement to develop or expand applied research to increase HPV vaccination.

The 18 cancer centers that received the HPV vaccination supplement are listed in Table 1. This report provides an overview of the activities of the supplement recipients, including collaborations among grantees, environmental scan activities, and the formation of linkages between cancer centers and local and regional partners (e.g., immunization and cancer control coalitions). Key findings of the environmental scans also are presented, as are efforts by grantees to disseminate and build upon the work funded by the supplement.

* More information on the NCI Cancer Centers Program can be found at <http://cancercenters.cancer.gov/>.

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Table 1. Recipients of the NCI DCCPS Administrative Supplement

Institution Name	Center Name	State	Catchment Area
Albert Einstein College of Medicine	Albert Einstein Cancer Center	NY	Bronx County and communities in Southern Westchester, New York
Baylor College of Medicine	Dan L. Duncan Comprehensive Cancer Center	TX	Harris County, Texas
Case Western Reserve University	Case Comprehensive Cancer Center	OH	Cuyahoga County and Cleveland, Ohio
Medical University of South Carolina	Hollings Cancer Center	SC	State of South Carolina
Moffitt Cancer Center	Moffitt Cancer Center	FL	7-county area of southern Florida
Roswell Park Cancer Institute	Roswell Park Cancer Institute	NY	Western New York—8 counties and other areas of upstate New York
The Ohio State University	The Ohio State University Comprehensive Cancer Center – James Cancer Hospital & Solove Research Institute	OH	State of Ohio
University of Alabama at Birmingham	UAB Comprehensive Cancer Center	AL	State of Alabama
University of Hawaii at Manoa	University of Hawaii Cancer Center	HI	State of Hawaii
University of Kentucky	Markey Cancer Center	KY	Eastern Kentucky, including Appalachia
University of North Carolina, Chapel Hill	UNC Lineberger Comprehensive Cancer Center	NC	State of North Carolina
University of Southern California	USC Norris Comprehensive Cancer Center	CA	Greater Los Angeles, California
University of Texas	MD Anderson Cancer Center	TX	State of Texas
University of Utah	Huntsman Cancer Institute	UT	Utah, Idaho, Nevada, Wyoming, Montana
University of Virginia	UVA Cancer Center	VA	Central, southern, western Virginia and portions of rural West Virginia
University of Wisconsin Carbone Cancer Center	University of Wisconsin Carbone Cancer Center	WI	State of Wisconsin
Vanderbilt University	Vanderbilt-Ingram Cancer Center	TN	State of Tennessee, central state, extending into Kentucky and Alabama
Yale University School of Medicine	Yale Cancer Center	CT	State of Connecticut, especially New Haven

METHODS

At the end of the supplement funding period, grantees were asked to submit reports summarizing their environmental scan activities and results, as well as other important activities and linkages made. Final reports, as well as grantee posters presented at a November 2015 meeting at MD Anderson Cancer Center, were reviewed and results were compiled. Some grantees provided supplemental information upon request. It should be noted that there was variation among grantees in the activities and focus of the environmental scans, as well as in the level of detail provided in final reports. In addition, some

grantees had not completed the analyses of their environmental scans at the time this report was prepared. In some cases, external sources were used to supplement information provided by grantees (e.g., policy). These sources are cited throughout this report.

INTER-GRANTEE COLLABORATION

Grantees interacted and collaborated in various ways over the course of the supplement funding period. Two cancer centers hosted meetings. The first meeting was hosted by Moffitt Cancer Center in January 2015 and provided a forum for grantees and other cancer centers to discuss environmental scan methods and strategies for increasing HPV vaccine uptake.⁸ The second meeting, hosted by MD Anderson Cancer Center in November 2015, provided grantees the opportunity to share their environmental scan results and participate in small-group discussions on several topics related to HPV vaccine uptake.⁹ Cancer center representatives at the meeting, including many from cancer centers that did not receive the HPV vaccination supplement funding, also deliberated about ways in which they could collectively promote HPV vaccination in the United States and in their communities. One outcome of these discussions was a consensus statement jointly issued by all NCI-designated cancer centers in January 2016 that identifies low rates of HPV vaccination as a serious public health threat and calls for specific actions by parents/guardians, young adults, and health providers to increase vaccine uptake.¹⁰ A third meeting of NCI-designated cancer centers focused on HPV vaccine uptake will be hosted by The Ohio State University Comprehensive Cancer Center in June 2016, several months after the end of the supplement funding period, demonstrating the continued commitment of the cancer centers to working collaboratively to address the problem of inadequate HPV vaccine uptake.

Supplement recipients also formed the HPV Vaccine Uptake Learning Community through NCI's Research to Reality forum.¹¹ Research to Reality is an online community of practice designed to bring together cancer control practitioners and researchers to discuss ideas and solutions and share useful resources and tools.¹² Grantees used the HPV Vaccine Uptake Learning Community as a forum to discuss and share survey tools, ongoing and recent research, resources, and strategies for increasing vaccine uptake. The Learning Community remains active and has expanded to include representatives from additional NCI-designated cancer centers, the Centers for Disease Control and Prevention, the American Cancer Society, and other organizations interested in HPV vaccine uptake.

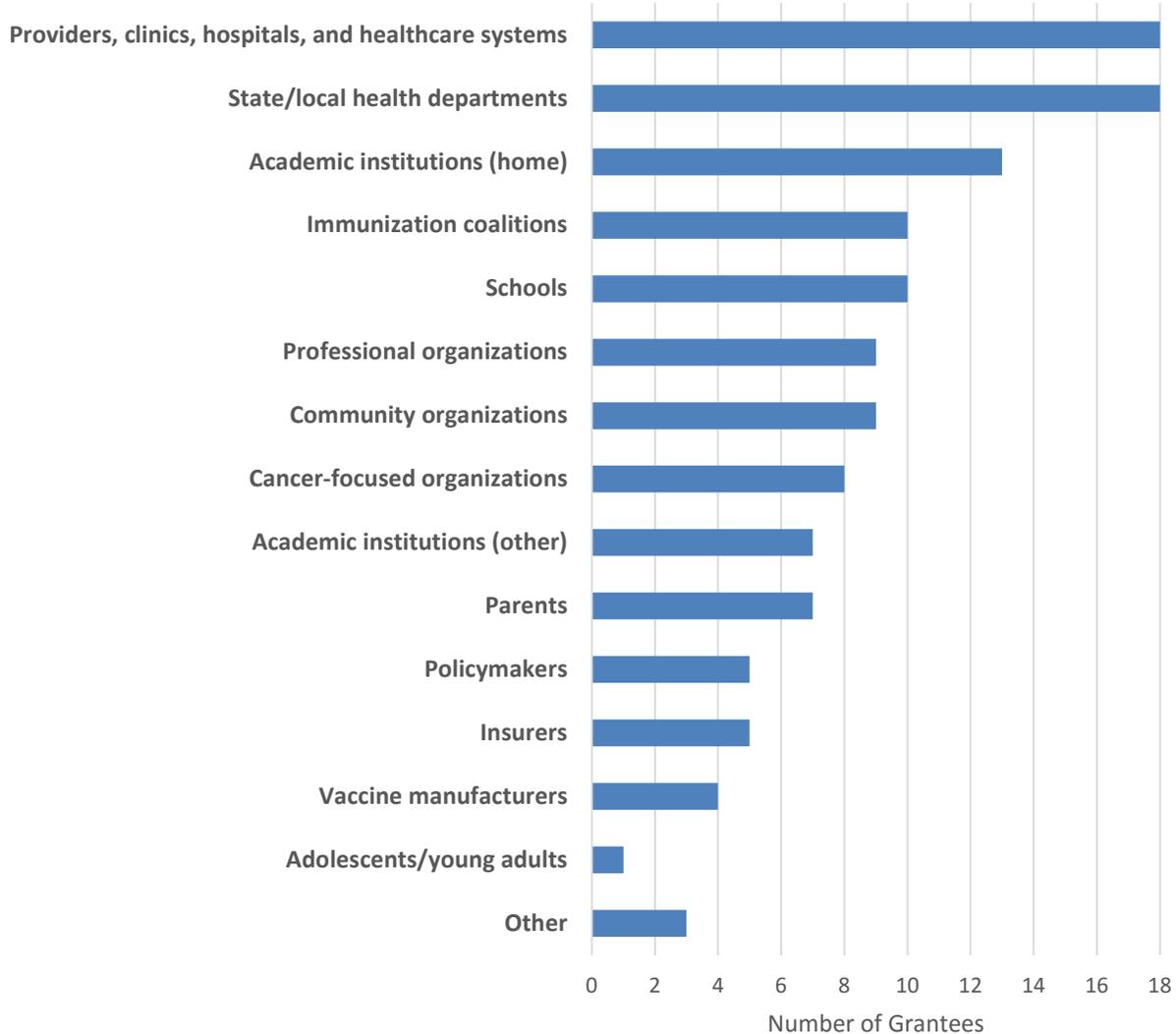
Some grantees initiated and strengthened collaborative relationships with other grantees located in the same region. Case Comprehensive Cancer Center and The Ohio State University Comprehensive Cancer Center held regular meetings and conference calls throughout the supplement funding period to inform development of their respective environmental scans. Roswell Park Cancer Institute, Albert Einstein Cancer Center, and Yale Cancer Center also reported working together.

GRANTEE LINKAGES WITH LOCAL AND REGIONAL ORGANIZATIONS

Overcoming barriers to HPV vaccine uptake likely will be best achieved through collaborative efforts among diverse local and regional stakeholders. For this reason, establishment and enhancement of linkages between grantees and local/regional stakeholders was an important goal of the supplement. It is hoped that these linkages will form the foundation for future interventions and research projects. More than 200 linkages were documented collectively by the 18 grantees. Grantees formed and expanded relationships with many types of stakeholders (Figure 1), and these stakeholders participated in one or more of a number of different activities (Figure 2).

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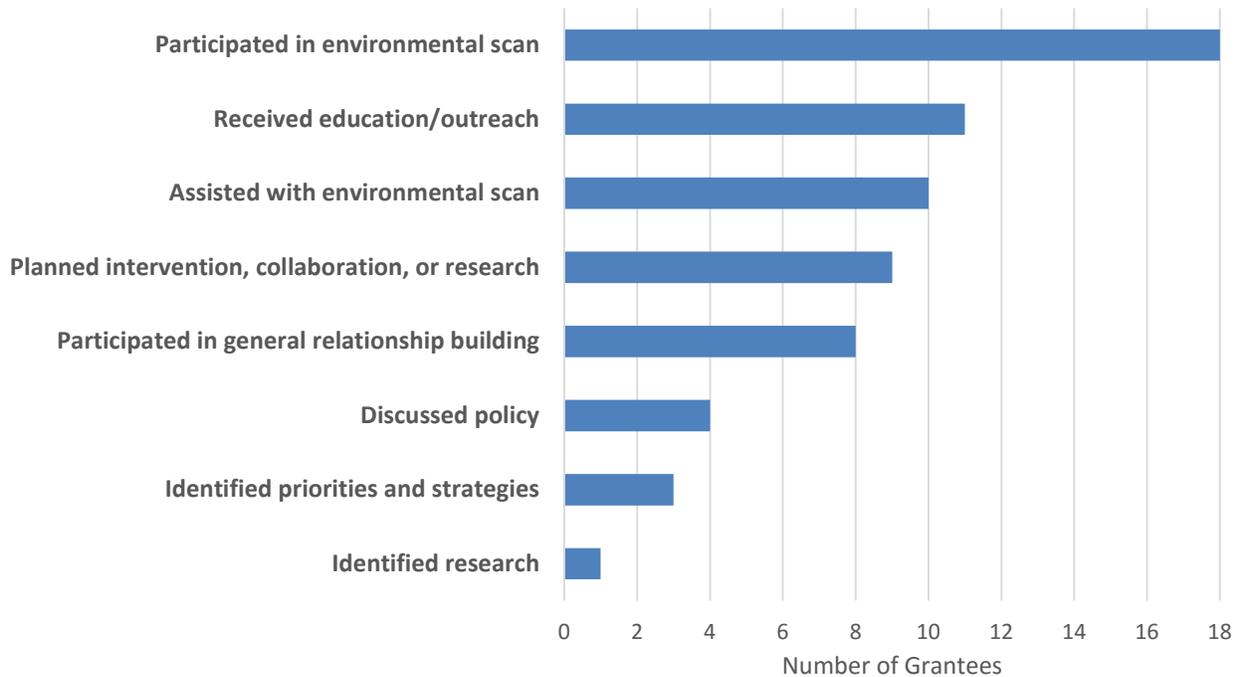
Figure 1. Grantee Linkages with State and Local Stakeholders



All grantees interacted with healthcare providers, clinics, hospitals, and/or healthcare systems. Healthcare providers included physicians (e.g., pediatricians, family physicians, obstetricians/gynecologists), nurses, nurse practitioners, and physician assistants. These providers practiced in a variety of settings, including private offices, pediatric hospitals, federally qualified health centers, large health systems, and schools. The majority of these interactions were through environmental scan surveys or interviews, but six grantees also reported that they worked with healthcare providers, often through an advisory board or newly formed working group (see sidebar on page 6), to identify priorities for increasing HPV vaccine uptake and plan future interventions, collaborations, or research projects. Nine grantees also formed relationships with professional organizations, including local chapters of the American Academy of Pediatrics (AAP) and American Academy of Family Physicians (AAFP), state pharmacist associations, and other local and regional medical societies. These organizations assisted with environmental scan planning and dissemination, helped identify priorities and strategies for increasing HPV vaccination, and worked with grantees to plan future interventions and/or research projects.

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Figure 2. Activities of State and Local Stakeholders with Which Grantees Formed Linkages



All of the grantees also formed or continued relationships with state and/or local public health agencies, including representatives from immunization and adolescent health offices and divisions. Public health professionals participated in several of the environmental scans, providing information on local/regional programs, as well as immunization data. Public health representatives also helped identify priorities and strategies for increasing HPV vaccine uptake and helped developed plans for future interventions.

Grantees (n=13) created many new linkages with departments and working groups within their own institutions. Many of these partnerships were cross-disciplinary: home institution partners were from departments/divisions focused on pharmacy, pediatrics, family medicine, obstetrics/gynecology, immunization, communications, health services research, and community outreach. Some grantees (n=7) also worked with stakeholders from other academic institutions in the region.

Grantees also made contacts within immunization coalitions (n=10), cancer-focused organizations (n=8), and/or other community organizations (n=9). In addition to providing insight into local activities related to HPV vaccination through the environmental scans, these organizations worked with grantees to identify priorities and strategies and to plan future interventions and research projects, as well as to conduct education and outreach activities related to HPV vaccination.

Ten grantees reached out to schools in some capacity. This included school-based health centers, school nurses, health educators, and school board members from local school districts, as well as a college health association. Many school representatives participated in environmental scan activities, while some served on advisory boards and participated in identifying priorities and planning future work on HPV vaccination.

Seven grantees interacted with parents. Of these, five interviewed or surveyed parents as part of their environmental scans. Two grantees included parents on their advisory boards. One grantee conducted educational sessions for parents about HPV and HPV vaccination, including presentations at meetings of parent-teacher organizations at area schools and a worksite parent group at the cancer center. One grantee reached out to young adults by hosting a screening of the documentary *Someone You Love: the HPV Epidemic* on a local college campus.

Five grantees worked with state and/or local policymakers. Policymakers participated in environmental scan activities and, in one case, participated on a local coalition formed to address HPV vaccine uptake. In another case, a state representative helped promote a screening of the documentary *Someone You Love: the HPV Epidemic*.

Grantees also engaged public and private insurance providers. Insurers primarily participated through the environmental scans, although in Alabama the state Medicaid agency participated in the newly formed statewide coalition focused on HPV vaccination. Four grantees also formed relationships with representatives of companies that manufacture HPV vaccines. In one case, a Merck representative participated in an advisory group meeting and provided information on Merck programs available to support providers and patients. Other types of stakeholders with which grantees formed linkages included a state department of juvenile justice and two Area Health Education Centers.

Grantees Created Advisory Boards, Working Groups, and Coalitions

Seven grantees formed multi-stakeholder advisory boards. Advisory board members assisted in environmental scan planning, facilitated connections to key stakeholders, provided insights on local and regional factors influencing HPV vaccine uptake, and discussed and prioritized strategies for increasing HPV vaccine uptake. At least one advisory board plans to continue to meet after the end of the supplement funding period.

Six grantees helped establish working groups or coalitions to address HPV vaccine uptake in their regions. One of these groups, the HPV Working Group at Yale, is housed within the grantee's institution. The Vaccine-Preventable Cancers Workgroup created by the University of Hawaii is a working group of the Hawaii Comprehensive Cancer Control Plan. The remaining four newly established coalitions are standalone state or regional groups. These include the Intermountain West HPV Vaccination Coalition, the Partnership to Immunize Teens and Children Against HPV, the Ohio HPV Vaccine Workgroup, and the Alabama HPV Vaccination Coalition.

ENVIRONMENTAL SCAN ACTIVITIES

Grantees conducted a variety of activities to learn about the HPV vaccination landscape in their catchment areas. In general, the richest information was obtained by engaging directly with stakeholders using one or more data collection tools. Grantees also analyzed HPV vaccination rates in their institutions, states, or regions, and many also collected information about state policies relevant to HPV vaccination. Other environmental scan activities included literature reviews, identification of research activities, and media/social media scans.

Stakeholder Engagement

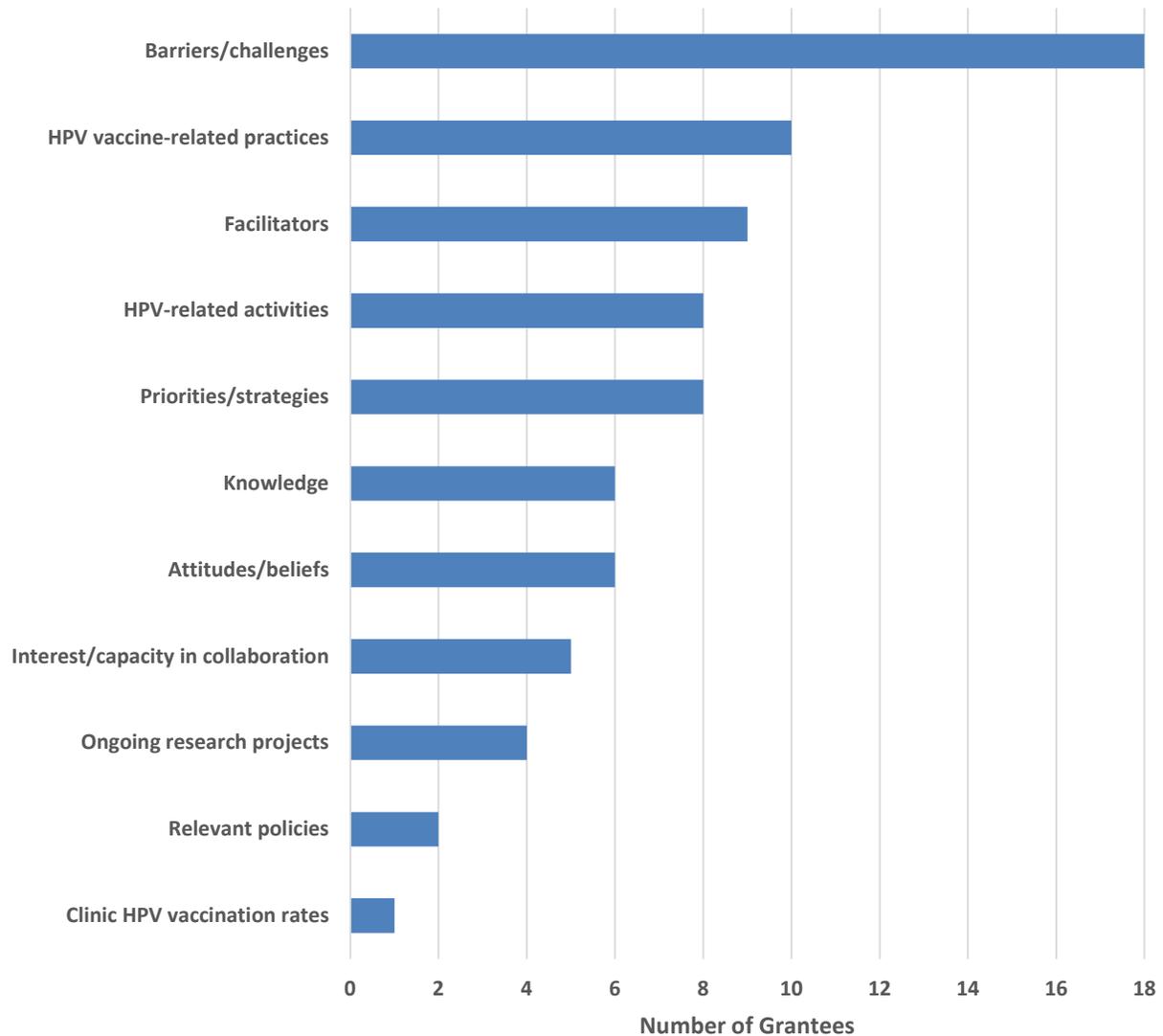
Grantees utilized a number of approaches—including interviews (n=18), surveys (n=14), focus groups (n=4), and meetings (n=3)—to learn about the HPV vaccination landscape directly from local and

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regional stakeholders. Every grantee conducted either a survey or interviews, and most grantees (n=14) conducted more than one activity (e.g., survey and interviews).

Grantees sought to gain insight into many local and regional factors influencing HPV vaccine uptake (Figure 3). All grantees collected data about barriers and challenges to HPV vaccine uptake, including parent, provider, and system barriers. Stakeholders provided information on HPV vaccine-related practices in clinical settings (e.g., provider recommendation, reminder/recall, inventory management), as well as facilitators to HPV vaccination. Stakeholders also were asked to provide information on local and regional activities promoting HPV vaccination, such as education and outreach activities. Surveys, interviews, and focus groups were used to assess knowledge of and attitudes toward HPV vaccination among parents and providers. Stakeholders also were asked to help identify priorities and strategies for increasing HPV vaccine uptake in local and regional areas, as well as indicate their interest in and/or capacity for collaborating on HPV vaccine-related efforts. Some grantees asked stakeholders for information on ongoing relevant research, relevant policies, and/or clinic-level HPV vaccination rates; other grantees assessed these areas using other sources (see below).

Figure 3. Types of Information Collected from Stakeholders through Environmental Scans



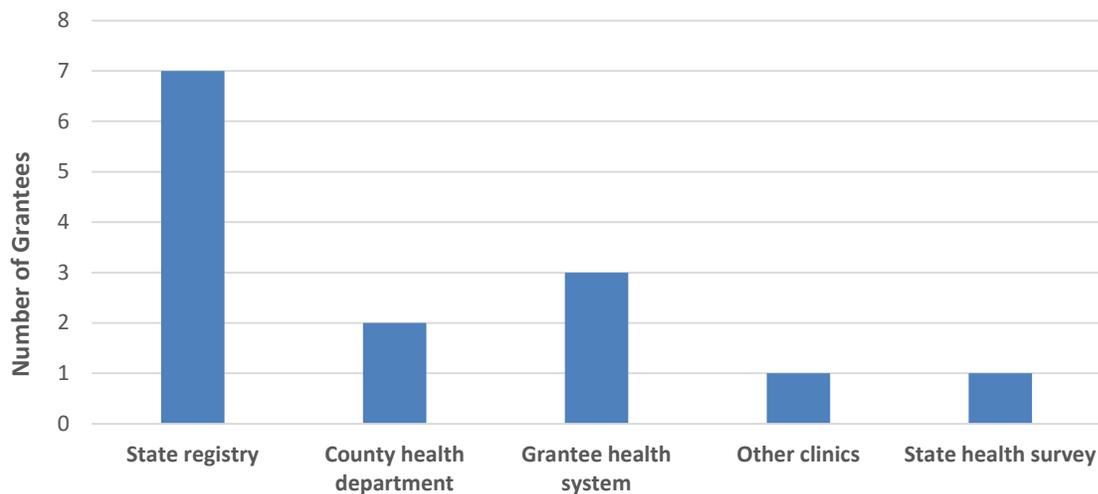
HPV Vaccination Rate Analyses

Data from CDC’s National Immunization Survey-Teen (NIS-Teen) are used to monitor vaccination rates among U.S. adolescents. NIS-Teen provides critical information on national and state vaccination trends; however, due to sampling methods and sample size constraints, NIS-Teen provides vaccination coverage estimates only for a few local areas and territories.^{13†} Data on local vaccination rates and factors are important both for tailoring interventions and for measuring the local impact of these interventions. Twelve grantees analyzed HPV vaccination rate data from one or more state, county, or local sources. These included state immunization registries, county health department databases, grantee institution/health system databases, data from individual clinics, and statewide health survey results (Figure 4).

Eight grantees representing six states noted significant limitations with their state immunization registries. All of these grantees reported inconsistent entry of HPV vaccinations in immunization registries due to the fact that HPV vaccine reporting is not mandated in the state (some states indicate that reporting of adolescent vaccines is not required, and at least one state has an opt-in registry for all vaccines). Other limitations included lack of historical data, inability of providers to retrieve data from the state immunization registry, failure to merge records, and challenges associated with provider data entry (e.g., time consuming, difficult to correct records).

Two grantees, including one that analyzed state immunization registry data, reported that improvements are being made to their states’ immunization registries that should enable more accurate assessment of HPV vaccination rates in the future.

Figure 4. Sources Used for HPV Vaccination Rate Analyses



Policy Analyses and Related Activities

Six grantees reported conducting formal policy analyses, and several other grantees provided at least some information about relevant policies in their catchment areas. Two grantees reported providing information and/or testimony to state or local representatives regarding HPV vaccination. Grantees

[†] In 2015, local areas sampled separately by NIS-Teen included Washington, DC; Chicago, IL; New York, NY; Philadelphia County, PA; Bexar County, TX; Houston, TX; El Paso County, TX; Hidalgo County, TX; Guam; Puerto Rico; and the U.S. Virgin Islands.

discussed current state laws and policies, as well as pending state legislation. Grantees frequently discussed policies related to school mandates and pharmacists' authority to administer the HPV vaccine. Other relevant policies relate to educational outreach, provision of HPV vaccines through state or local programs, strategic planning to reduce HPV-related cancers, and immunization registries. A comprehensive and up-to-date list of state actions and introduced legislation directly related to HPV vaccination can be found on the National Conference of State Legislatures (NCSL) [HPV Vaccine Policies](#) website.¹⁴

School Policies

Many states have enacted or are considering ways to promote HPV vaccination through schools. Three jurisdictions—Virginia, Rhode Island, and the District of Columbia—currently require HPV vaccination for school attendance. The University of Virginia reported that Virginia's school mandate policy is under threat of appeal and also has broad opt-out provisions that limit its efficacy. Legislators in at least three states—including the home states of two grantees—have introduced legislation in 2015-2016 requiring HPV vaccination for school attendance.[‡] Several grantees noted that key stakeholders in their catchment areas feel that school mandates would be an effective strategy for increasing HPV vaccination rates. A comprehensive summary of school mandates, as well as past and current introduced legislation related to school mandates, is available on the [NCSL HPV Vaccine Policies](#) website.¹⁴

Pharmacist-Administered Vaccinations

The President's Cancer Panel and others have recommended increasing access to HPV vaccines by allowing pharmacists to administer them. State laws regarding pharmacist authority to administer vaccines vary widely. In some states, pharmacists can administer vaccines without a physician prescription, while in other states a prescription or standing order is required. Many states impose age limits on pharmacist-administered vaccines, which can prevent pharmacists from providing the HPV vaccine to the recommended age groups. States also may restrict the types of vaccines that pharmacists can provide. Multiple grantees reported state laws and/or introduced legislation that facilitate or would facilitate pharmacist administration of HPV vaccines to eligible adolescents and young adults. The American Pharmacists Association (APhA) and the National Alliance of State Pharmacy Associations (NASPA) regularly conduct a survey of state laws and rules related to pharmacist vaccine administration, the results of which are available on the [APhA website](#).¹⁵ As of August 2015, all but three states allow pharmacists to administer the HPV vaccine, but many states do not allow pharmacists to administer the vaccine to younger adolescents or require younger adolescents to have a physician prescription in order to be vaccinated by a pharmacist.¹⁶

Other Relevant Policies

Multiple states, including the home states of some grantees,[§] have enacted or introduced legislation requiring state health departments to develop informational materials on HPV and HPV vaccines. Some legislation calls for states to require or encourage these promotional materials to be distributed to parents by schools. Some states have attempted to increase access to HPV vaccines by providing the vaccines for free through state programs. The state of Texas is considering legislation that would require its Department of State Health Services to develop a strategic plan for reducing morbidity and mortality related to HPV-associated cancers. Texas also is considering legislation that would change its state immunization registry from an opt-in to an opt-out system, a change that is expected to result in a more accurate and comprehensive database.

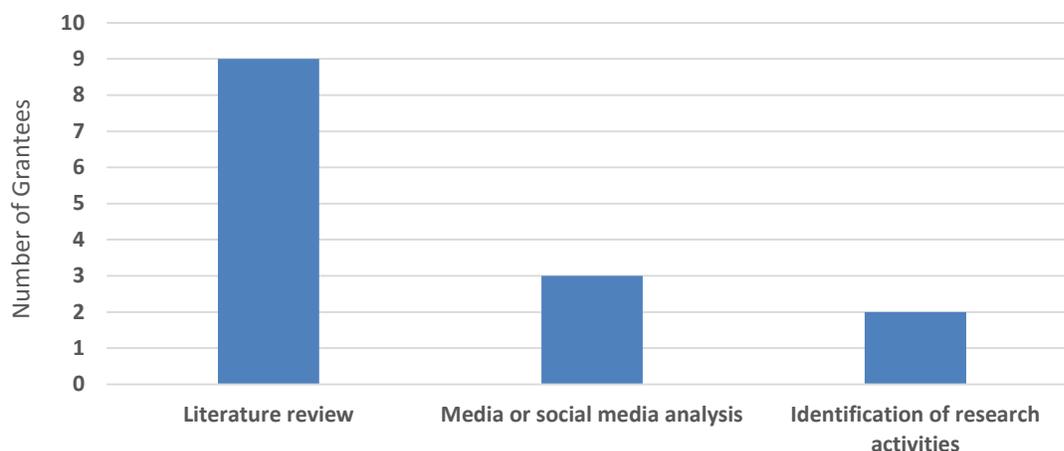
[‡] Hawaii, New Jersey, and New York

[§] North Carolina, Hawaii, New York, and South Carolina

Other Environmental Scan Activities

Other environmental scan activities conducted by grantees included literature reviews, media/social media scans, and identification of research activities (Figure 5). Literature reviews were utilized to gain insight into national and regional factors influencing HPV vaccine uptake, relevant local activities, and potential interventions. Three grantees scanned local media or social media outlets to assess whether and how HPV and HPV vaccination were discussed in these forums. Two grantees conducted analyses to identify HPV-related research activities within their institutions or catchment areas.

Figure 5. Other Environmental Scan Activities



ENVIRONMENTAL SCAN FINDINGS

Although the 18 environmental scans conducted by grantees varied in their methods and focus, each yielded insights into the factors influencing HPV vaccination within local and regional catchment areas, as well as opportunities to increase HPV vaccine uptake and address unmet research needs.

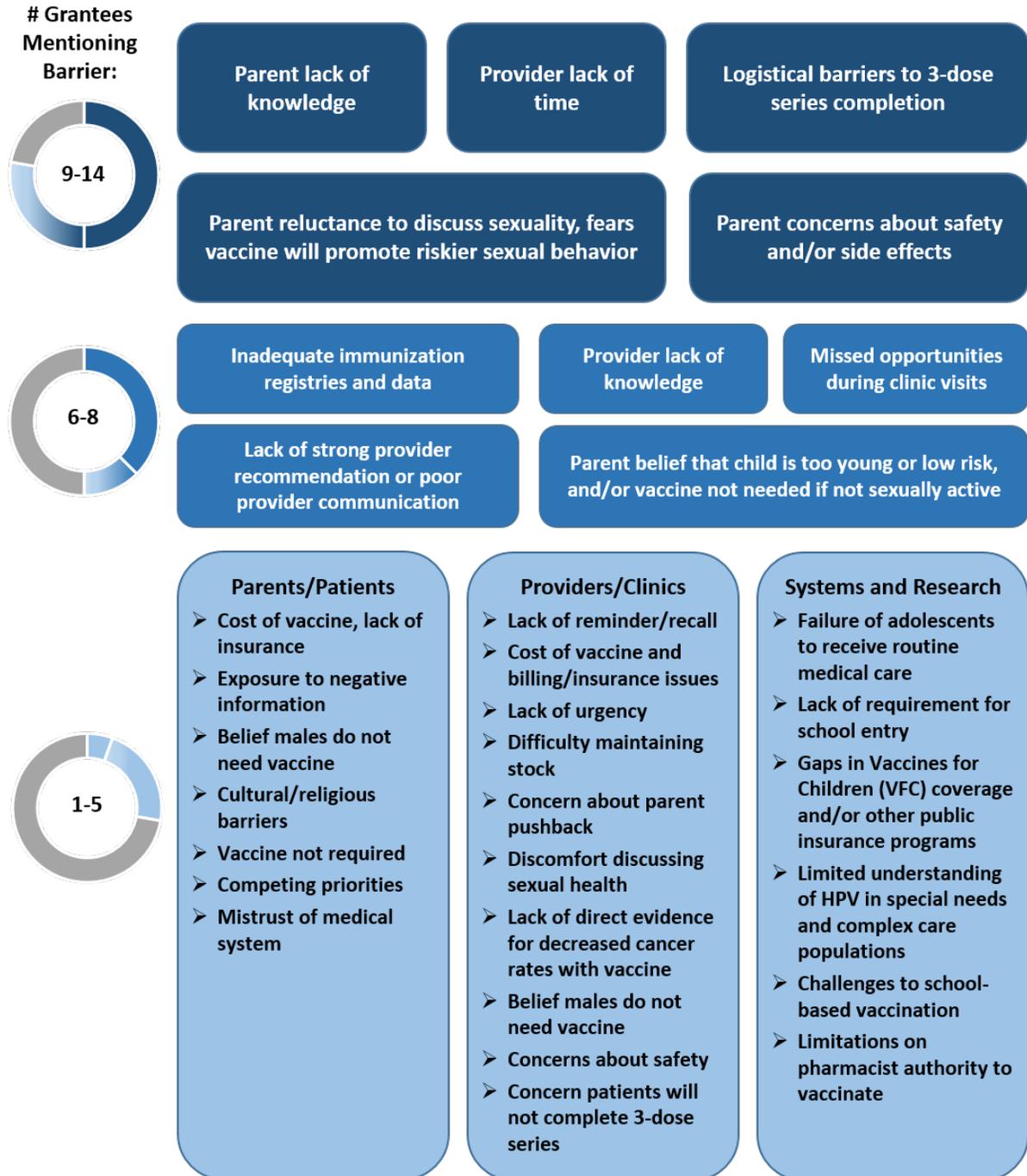
Barriers identified by grantees are summarized in Figure 6. Although each region is unique, several barriers and opportunities were identified by multiple grantees. More than half of grantees identified parents' lack of knowledge, provider lack of time, logistical barriers to three-dose series completion, parents' concerns about safety and/or side effects, and parents' reluctance to discuss sexuality and/or fear that vaccination will promote riskier sexual behavior as important barriers. More than one-third of grantees identified inadequacies in immunization registries; provider lack of knowledge; missed clinical opportunities; lack of strong provider recommendation; and parents' belief that the child is too young or at low risk for HPV-related diseases, or that the vaccine is not needed if the child is not sexually active. Additional barriers for parents and patients, providers and clinics, and systems and research also were identified by grantees. It is important to note that citation of barriers by more grantees does not necessarily mean they are more important or more prevalent than other barriers and that different barriers may be more or less important in different communities. Limitations of the analysis of barriers include variation in the focus of environmental scans and the level of detail provided in grantee final reports.

Grantees also identified several opportunities to increase HPV vaccine uptake (Figure 7). Many grantees recognized the need to continue to work with a variety of local and state organizations to develop and implement strategies focused on HPV vaccination. Grantees noted several ways in which providers and practices could promote HPV vaccination among their patients, as well as the need for training, support, and incentives for providers. Other opportunities involve education and outreach for parents and

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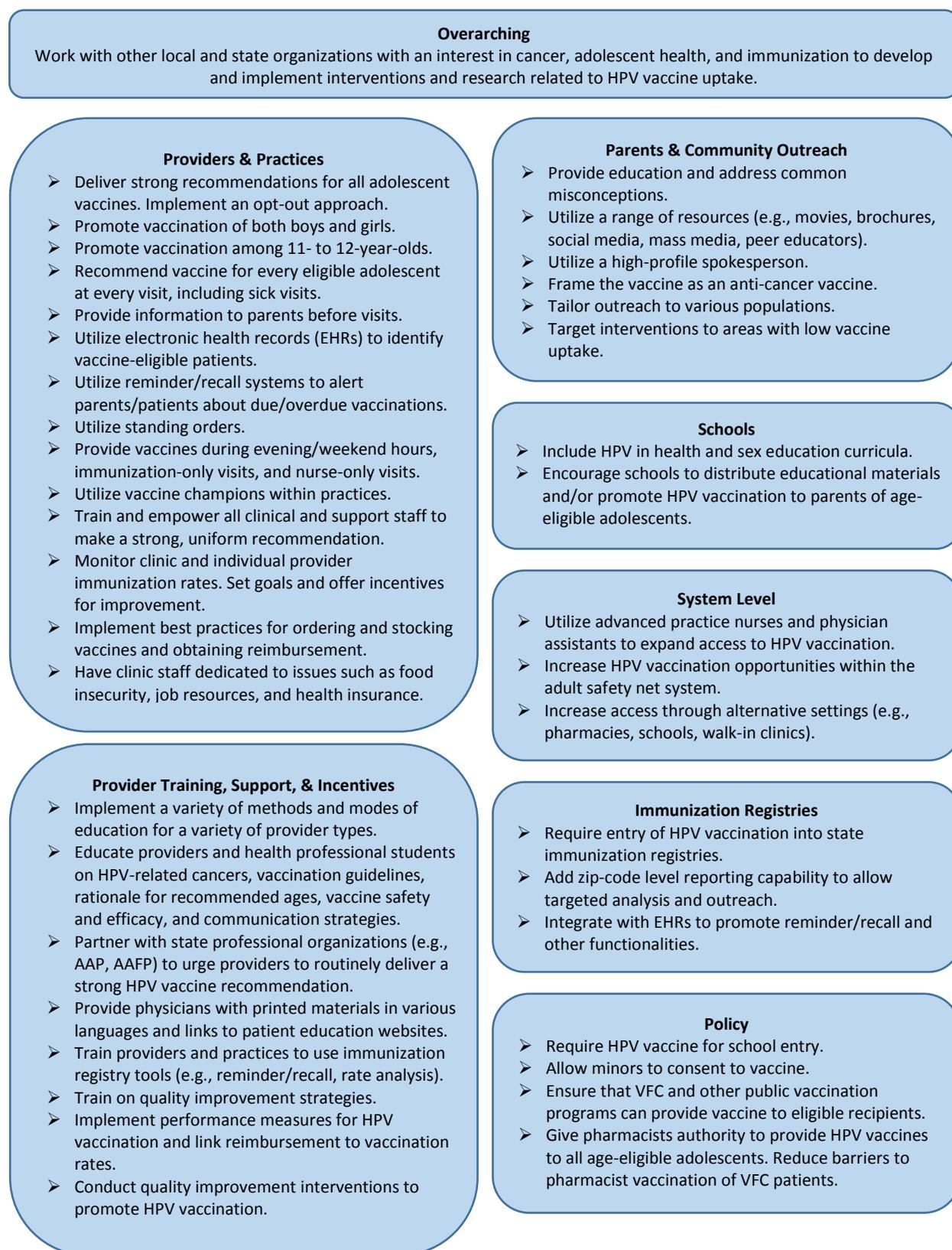
communities, system-level changes to increase access to HPV vaccines, improvements to immunization registries, policies to encourage or increase access to HPV vaccines, and partnering with schools to increase knowledge of and access to HPV vaccines.

Figure 6. Barriers to HPV Vaccine Uptake Identified by Grantees



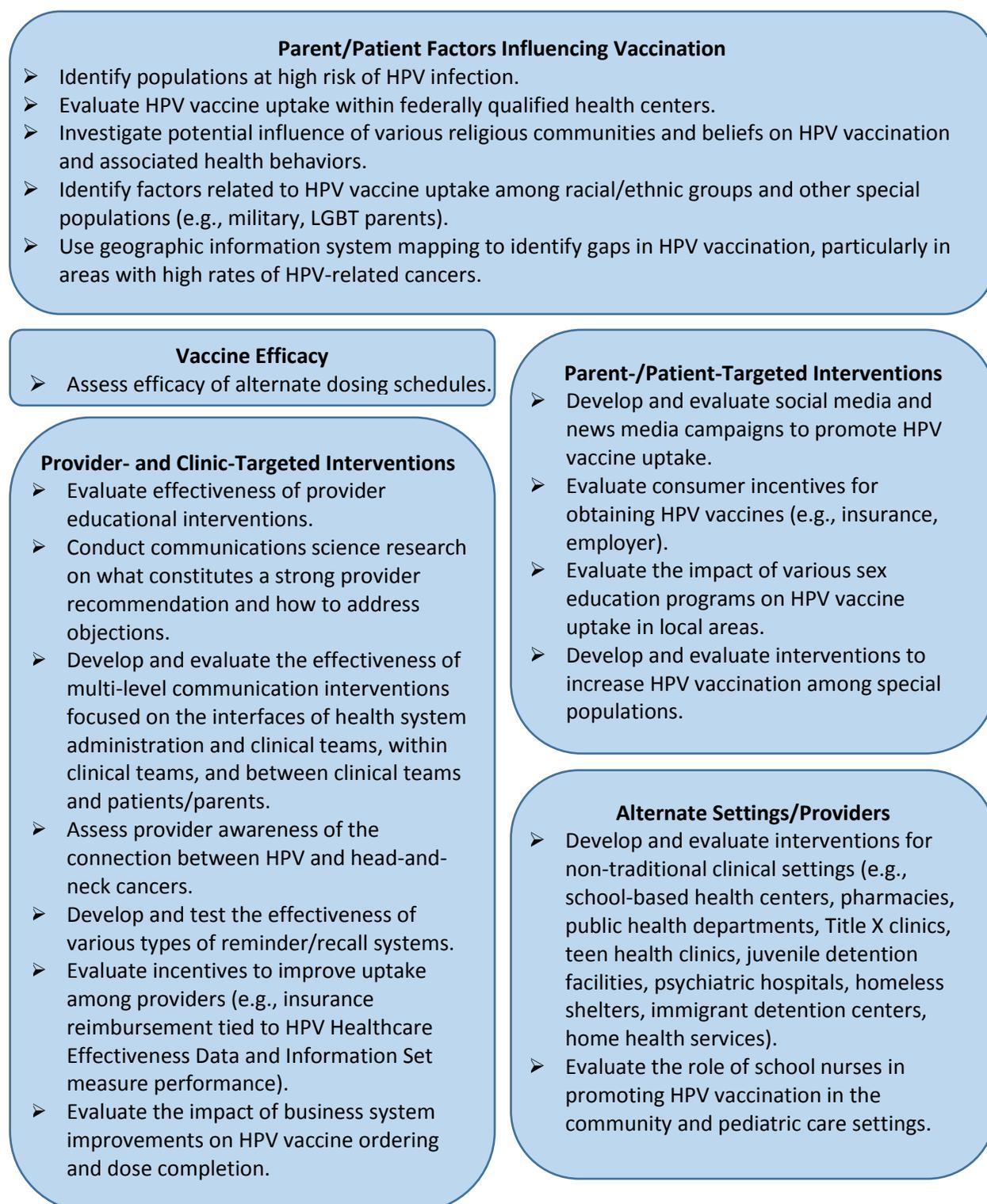
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Figure 7. Opportunities to Increase HPV Vaccine Uptake Identified by Grantees



The environmental scans also identified a number of research needs and opportunities related to HPV vaccines (Figure 8), including the need to identify factors influencing vaccination decisions within subpopulations and the need to develop and evaluate provider- and parent-targeted interventions, as well as interventions in alternative settings. Finally, research is needed to explore alternative HPV vaccine dosing schedules (e.g., number of doses, timing of doses).

Figure 8. Research Needs and Opportunities Identified by Grantees



NEXT STEPS FOR GRANTEES

Dissemination

Several grantees have disseminated or plan to disseminate the results of their environmental scans to local regional stakeholders, including those involved in comprehensive cancer control planning. Grantees also are disseminating their findings regionally and nationally. Nine grantees reported they have published, have submitted, or are in the process of preparing one or more manuscripts describing environmental scan results in peer-reviewed journals. In addition, 11 grantees have given or are scheduled to give presentations at one or more national, state/regional, or institutional conferences or meetings.

Research

Several grantees plan to continue or expand their environmental scan activities to further characterize the HPV vaccine landscape in their catchment areas. Grantees also outlined plans for future research projects based on environmental scan results and/or as a result of enhanced linkages with partners. These include plans to develop and/or test practice-based interventions, such as provider training, app-based educational tools for parents, and nurse walk-in visits for second and third doses of the vaccine. One grantee also described plans to observe several high- and low-performing clinics and use the results to develop a tool kit to help clinics increase their HPV vaccination rates. Parent and adolescent awareness and understanding of HPV vaccination will be the target of a social media campaign by one grantee, and another grantee plans to work with the community to develop research projects related to HPV vaccination. Some grantees plan to partner with school-based health clinics or pharmacies to facilitate vaccine initiation and completion, and one grantee plans to explore the possibility of working with dentists and dental hygienists to promote the vaccines.

Multiple grantees plan to submit grant proposals for HPV vaccine-related research. Funding organizations that have or will be targeted include NCI, the National Institute on Minority Health and Health Disparities, and the American Cancer Society. One grantee has secured funding from its home institution to continue work on HPV vaccine uptake in its catchment area.

Other Activities

Grantees also reported plans to continue or conduct a variety of non-research activities after the conclusion of the supplement funding. Several plan to continue working with local, regional, and national partners, in some cases through newly established coalitions focused solely or in part on HPV vaccination. At least one grantee is involved in an effort to develop a statewide action plan to increase HPV vaccine uptake, and multiple grantees plan to promote relevant state legislative activities. Several grantees are working to develop and/or implement interventions focused on provider education and quality improvement. Education and outreach activities focused on parents, adolescents, and young adults also are being planned.

CONCLUSIONS

A one-year supplemental grant helped NCI-designated cancer centers establish and strengthen linkages with a variety of local, state, and regional stakeholders with an interest in HPV vaccination. Many of these linkages—such as those with pediatricians, primary care providers, and immunization coalitions—were with stakeholders with which the cancer community has not traditionally partnered. Engagement with these groups, as well as with cancer control coalitions, public health professionals, community organizations, parents, and others, provided grantees with insights into factors influencing HPV vaccine uptake in their catchment areas, including parent-, provider-, and system-level barriers. Grantees also worked with new and existing partners to identify priorities and develop strategies for increasing HPV vaccination. Another outcome of the supplements is the establishment of institutional working groups and/or state/regional coalitions that will continue to promote HPV vaccination.

In addition to establishing relationships with local stakeholders, several cancer centers, including many that did not receive the HPV vaccine supplements, began working with one another to discuss research methods and develop strategies for promoting HPV vaccination locally and nationally. These interactions will continue at a third meeting of NCI-designated cancer centers focused on HPV vaccine uptake, which will be hosted by The Ohio State University Comprehensive Cancer Center in June 2016. The data collected through the environmental scans and the new local, regional, and national partnerships forged will form the foundation for projects related to HPV and HPV vaccination. Many grantees are in the process of designing studies and applying for research funding, as well as exploring other ways to promote HPV vaccination in their communities.

REFERENCES

1. de Martel C, Ferlay J, Franceschi S, Vignat J, Bray F, Forman D, et al. Global burden of cancers attributable to infections in 2008: a review and synthetic analysis. *Lancet Oncol*. 2012;13(6):607-15.
2. Centers for Disease Control and Prevention. How many cancers are linked with HPV each year? [Internet]. Atlanta (GA): CDC; [updated 2014 Jun 23; cited 2016 Mar 9]. Available from: <http://www.cdc.gov/cancer/hpv/statistics/cases.htm>
3. National Cancer Institute. Human papillomavirus (HPV) vaccines [Internet]. Bethesda (MD): NCI; [updated 2015 Feb 19; cited 2016 Mar 9]. Available from: <http://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-vaccine-fact-sheet#q5>
4. Reagan-Steiner S, Yankey D, Jeyarajah J, Elam-Evans LD, Singleton JA, Curtis CR, et al. National, regional, state, and selected local area vaccination coverage among adolescents aged 13-17 years: United States, 2014. *Morb Mortal Wkly Rep*. 2015;64(29):784-92.
5. President's Cancer Panel. Accelerating HPV vaccine uptake: urgency for action to prevent cancer. A report to the President of the United States from the President's Cancer Panel. Bethesda (MD): National Cancer Institute; 2014. Available from: <http://deainfo.nci.nih.gov/advisory/pcp/annualReports/HPV/index.htm#sthash.q4mwEDFS.dpbs>
6. Holman DM, Benard V, Roland KB, Watson M, Liddon N, Stokley S. Barriers to human papillomavirus vaccination among US adolescents: a systematic review of the literature. *JAMA Pediatr*. 2014;168(1):76-82.
7. Beavis AL, Levinson KL. Preventing cervical cancer in the United States: barriers and resolutions for HPV vaccination. *Front Oncol*. 2016;6:19.
8. Tillman J. Health officials: HPV vaccine is about stopping cancer, not promoting sex. *Tampa Bay Times* [Internet]. St. Petersburg (FL): Tampa Bay Times; 2015 Jan 15 [cited 2016 Mar 25]. Available from: <http://www.tampabay.com/news/health/moffitt-hosting-national-conference-on-hpv-this-week/2213651>
9. Increasing HPV Vaccination in the U.S.: A Collaboration of NCI-designated Cancer Centers Summit [Internet]. Houston (TX): The University of Texas MD Anderson Cancer Center; [cited 2016 Mar 25]. Available from: <http://www.texascancer.info/hpvcollab15/index.html>
10. NCI-designated cancer centers urge HPV vaccination for the prevention of cancer [Internet]. Houston (TX): The University of Texas MD Anderson Cancer Center; 2016 Jan 27 [cited 2016 March 10]. Available from: https://www.mdanderson.org/content/dam/mdanderson/documents/prevention-and-screening/NCI_HP_Vaccine_Consensus_Statement_012716.pdf
11. National Cancer Institute. Research to Reality: HPV Vaccine Uptake Learning Community [Internet]. Bethesda (MD): NCI; [cited 2016 Mar 25]. Available from: <https://researchtoreality.cancer.gov/learning-communities/hpv>
12. National Cancer Institute. Research to Reality [Internet]. Bethesda (MD): NCI; [cited 2016 Mar 10]. Available from: <https://researchtoreality.cancer.gov/>
13. Centers for Disease Control and Prevention. Questions and answers about vaccination coverage in the U.S. [Internet]. Atlanta (GA): CDC; [updated 2015 Aug 27; cited 2016 Mar 28]. Available from: <http://www.cdc.gov/vaccines/imz-managers/coverage/nis/teen/ga-faqs.html>
14. National Conference of State Legislatures. HPV vaccine policies [Internet]. Washington (DC): NCSL; [cited 2016 Mar 28]. Available from: <http://www.ncsl.org/research/health/hpv-vaccine-state-legislation-and-statutes.aspx>
15. American Pharmacists Association. Home page [Internet]. Washington (DC): APhA; [cited 2016 Mar 28]. Available from: <http://www.pharmacist.com/>
16. American Pharmacists Association. Pharmacist administered vaccines. Washington (DC): APhA; 2015 Aug. Available from: <https://www.pharmacist.com/sites/default/files/files/Pharmacist%20authority%20to%20immunize%20-%20by%20type%20of%20immunization.pdf>