HUMAN VACCINES & IMMUNOTHERAPEUTICS
2016, VOL. 12, NO. 4, 1045–1050
http://dx.doi.org/10.1080/21645515.2015.1109756

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RESEARCH PAPER

U.S. Immunization program adult immunization activities and resources

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ABSTRACT

Adults are recommended to receive vaccines based on their age, medical conditions, prior vaccinations, occupation and lifestyle. However, adult immunization coverage is low in the United States and lags substantially below Healthy People 2020 goals. To assess activities and resources designated for adult immunization programs by state and local health department immunization programs in the United States, we analyzed 2012 and 2013 data from the Centers for Disease Control and Prevention's (CDC) Program Annual Reports and Progress Assessments (PAPA) survey of CDC-funded immunization programs. Fifty-six of 64 funded US immunization programs' responses were included in the analysis. Eighty-two percent of (n = 46) programs reported having a designated adult immunization coordinator in 2012 and 73% (n = 41) in 2013. Of the 46 coordinators reported in 2012, 30% (n = 14) spent more than 50% of their time on adult immunization activities, and only 24% (n = 10) of the 41 adult coordinators in 2013 spent more than 50% of their time on adult immunization activities. In 2012, 23% (n = 13) of the 56 programs had a separate immunization coalition for adults and 68% (n = 38) included adult issues in their overall immunization program coalition. In 2013, 25% (n = 14) had a separate adult immunization coalition while 57% (n = 32) incorporated adult immunizations into their overall immunization program coalition. The results indicate substantial variation across the US in public health infrastructure to support adult immunizations. Continued assessment of adult immunization resources and activities will be important in improving adult immunization coverage levels though program support. With many programs having limited resources dedicated to improving adult immunization rates in the in US, efforts by the health departments to collaborate with providers and other partners in their jurisdictions to increase awareness, increase the use of proven strategies to improve vaccination of adults, and implement the Standards for Adult Immunization Practice may lead to improved adult immunization coverage and fewer illnesses, hospitalizations and deaths from vaccine preventable diseases.

ARTICLE HISTORY
Received 28 May 2015
Revised 2 October 2015
Accepted 14 October 2015

KEYWORDS
adult; immunization; vaccines

Background

Thousands of illnesses, hospitalizations and deaths occur annually from diseases for which vaccines are available.[1] For example, one of the most commonly occurring vaccine-preventable diseases is influenza which results in 3,000-49,000 deaths annually with over 90% of these deaths among adults.[1] Immunizations recommended routinely in the United States currently target 17 diseases.[2] There are 12 vaccines routinely recommended for the adult population 19 years of age and older based on factors such as age, prior vaccinations, medical conditions, and other risk factors.[3] Vaccines are among the most cost-effective clinical preventive services.[4,5] However, adult vaccination coverage remains low for most routinely recommended vaccines and significantly below *Healthy People 2020* (HP2020) targets.[6,7] For example, the HP2020 target for pneumococcal vaccination coverage for 19–64 years of age with high risk conditions is 60% and the target for those 65 years of age and older is 90%.[7] The actual estimated pneumococcal vaccination coverage rates for these groups are 21% for 19-64 years of age with high risk conditions and 60% for individuals who are 65 years of age and older.[6]

In February 2014, *Public Health Reports* published the Recommendations from the National Vaccine Advisory Committee: Standards for Adult Immunization Practice. These "Standards" emphasize the importance of 1) assessing the immunization status of patients at every clinical encounter; 2) strongly recommending vaccines that patients need; 3) administering needed vaccines or, if the provider does not stock the vaccine, referring patients to a vaccine provider; and 4) documenting vaccines received by patients, including in immunization information systems (also known as vaccine registries). These standards differ from prior adult immunization practice standards in that they included standards for health departments in addition to healthcare providers. They also call for collaboration between healthcare professionals, including pharmacists, public health and medical providers in order to address the common barriers to adult vaccinations, such as limited routine vaccine needs assessment of patients by providers, lack of awareness about the need for vaccines among adult patients, and the challenges of documentation of adult immunizations to ensure patients are neither under vaccinated nor over vaccinated by entering vaccinations into state-based immunization information systems.[8] Documentation of immunizations in immunization information systems [http://www.cdc.gov/

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vaccines/programs/iis/about.html] is particularly important given that adults may obtain medical care, seek health advice, and receive vaccinations from a wide range of healthcare providers (e.g., primary medical care, specialty medical care, occupational health, pharmacists, and health departments). The complexity of the adult immunization schedule also adds to the need for documentation to help ensure patients receive the correct vaccines at the correct intervals.

Collaborations are vital to the success of public health programs, as it allows for partners to extend the efforts and outreach of public health to support various aspects of program activities where public health resources are limited.[9] The Standards recommend that public health departments address barriers to adult vaccination by conducting activities including, but not limited to, determining the vaccine needs of their communities, providing access to all Advisory Committee on Immunization Practices (ACIP) recommended vaccinations, increasing immunization information systems/vaccine registry access and use by adult vaccine providers, and partnering with immunization stakeholders, including healthcare provider groups.[8]

The Centers for Disease Control and Prevention (CDC) provides funds to 64 programs comprised of 50 states, the District of Columbia, 5 cities, 5 US territories and 3 Pacific Island awardees, to conduct immunization related activities. These funds include Section 317 discretionary funds, which are used to support immunization infrastructure and operational costs for the 64 immunization programs as well as purchase ACIP-recommended vaccines that public health departments provide to uninsured individuals, including adults.[10,11] We analyzed data from the CDC's 2012 and 2013 Program Annual Report and Progress Assessment (PAPA) surveys.

Results

Adult immunization coordinator status

Among the 56 programs included in this analysis, 82% (n = 46) reported that they had a designated adult immunization coordinator in 2012 and 73% (n = 41) in 2013. Of the 46 programs that had a designated adult immunization coordinator in 2012, 30% (n = 14) responded that their designated adult immunization coordinator spent more than 50% of their time on adult immunization activities compared to 24% (n = 10) of the 41 adult immunization coordinators in 2013 (Table 1).

Program coalition/partnership for adults

Most of the responding programs either had an immunization coalition specifically for adult immunization or included adult immunization activities in their overall immunization coalition. In 2012, 23% (n = 13) had a separate coalition for adults and 68% (n = 38) included adult immunization issues in their overall immunization program coalition. In 2013, 25% (n = 14) had a separate adult immunization coalition and 57% (n = 32) incorporated adult immunizations into their overall immunization program coalition. Overall, 9% (n = 5) in 2012 and 18% (n = 10) in 2013 did not include adult immunization issues in any of their coalition activities.

Quality improvement organization representation

In 2012 and 2013, the Centers for Medicare & Medicaid Services (CMS) managed contracts in each state and US jurisdiction with quality improvement organization (QIO) contractors. QIOs are private organizations that review medical care to improve the effectiveness, efficiency, economy, and quality of services delivered to Medicare beneficiaries.[12] QIOs were represented in 54% (n = 30) of program coalitions in 2012 and 46% (n = 26) in 2013. Fifty percent (n = 28) of programs actively collaborated with their QIOs in 2012 while 36% (n = 20) did so in 2013. These QIO and state coalition collaborations included activities related to immunizing in long-term care facilities, vaccinating health care personnel, developing resources for education and distribution, and activities to improve vaccination with influenza, pneumococcal, and Tdap vaccines.

Program purchased adult vaccine

Fifty-two percent (n = 29) of programs purchased 7 or more vaccine types for administration to adults in 2012 and 21% (n = 12) in 2013 (Table 2). The most commonly purchased vaccines included, hepatitis B, hepatitis A, Tdap, PPSV23, MMR and influenza. The types of providers that the programs provided vaccines for administration in adults were local health departments, sexually transmitted disease (STD) clinics, long-term care facilities, school located vaccine clinics, HIV clinics, hospitals, obstetricians and gynecologists, physician offices, family physicians, internal medicine physicians, department of corrections, community vaccinators, tribal health facilities, and pharmacies (Table 3).

Collaboration with other programs

The PAPA survey also inquired about collaborations between the immunization program and other public health programs in their jurisdiction and with pharmacies. The majority of the immunization programs, collaborated with one or more of the following programs in 2012 (61% (n = 34)) and in 2013 (59% (n = 33)), to promote influenza, pneumococcal or other vaccines: Diabetes Control Program, Heart Disease and Stroke Prevention Program, Asthma Control Program, and Behavioral Risk Factor Surveillance System (BRFSS).

Among the 56 immunization programs, 80% (n = 45) in 2012 and 86% (n = 48) in 2013 collaborated with pharmacies or community vaccinators. Reported barriers to working with pharmacies and community vaccinators were challenges regarding pharmacist reimbursement for vaccine administration for adults due to the pharmacies not being recognized as in-network providers by some insurance plans; legislation that limits age groups who are able to be vaccinated by pharmacists; limits on which vaccines pharmacies are able to administer; and requirements in some states and by some insurance plans to have prescriptions for specific vaccinations before the pharmacist is able to administer vaccines. Eighty percent (n = 45) in 2012 and 86% (n = 48) in 2013 reported that pharmacists are able to enter immunization data into their jurisdiction's immunization registry.

Table 1. Results from Immunization Programs 2012 and 2013 CDC Program Annual Reports and Progress Assessment Survey on Adult Vaccine Issues.

	Adult Immunization Coordinator Status (Y or N)		Includes Adults in Immunization Coalition (Y or N)		# of Vaccine Types* Purchased by Program		# Facility Types Receiving Program Purchased Vaccine	
Awardee	2012	2013	2012	2013	2012	2013	2012	2013
Alabama	No	No	No	No	1	1	0	1
Alaska	Yes	Yes	No	No	8	6	5	9
Arizona	Yes	Yes	No	No	6	0	6	6
Arkansas	Yes	Yes	No	No	8	6	4	2
California	Yes	Yes	No	Yes	5	2	2	3
Chicago	No	Yes	Yes	Yes	4	1	5	11
Colorado	Yes	Yes	Yes	Yes	10	8	3	3
Connecticut	Yes	Yes	Yes	Yes	4	0	6	8
Delaware	No	No	No	No	3	3	2	2
District of Columbia	Yes	Yes	No	No	11	0	4	6
Florida	Yes	Yes	No	No	0	0	0	1
Georgia	Yes	Yes	Yes	Yes	9	0	2	2
Hawaii	No	No	No	No	7	1	2	3
Houston	Yes	Yes	No	No	10	10	2	2
Idaho	Yes	Yes	No	No	8	0	3	2
Illinois	No	No	No	Yes	1	0	0	0
Indiana	No	No	No	No	9	0	7	4
Iowa	Yes	Yes	No	No	2	0	3	0
Kansas	Yes	No	No	No	5	0	5	4
Kentucky	Yes	Yes	No	No	8	9	4	5
Louisiana	Yes	No	No	No	9	3	3	4
Maine	Yes	Yes	No	No	4	1	8	7
Maryland	Yes	Yes	Yes	No	3	0	3	6
Massachusetts	Yes	Yes	Yes	Yes	8	9	4	9
Michigan	Yes	Yes	No	No	5	5	4	7
Minnesota	Yes	Yes	Yes	Yes	11	5	7	10
Mississippi	Yes	No	No	No	10	9	3	1
Missouri	Yes	Yes	No	No	4	0	2	1
Montana	Yes	Yes	No	No	6	0	1	3
Nebraska	Yes	No	Yes	No	1	0	2	2
Nevada	Yes	Yes	No	No	5	1	6	6
New Hampshire	Yes	Yes	No	No	9	0	8	7
New Jersey	No	No	No	No	10	0	4	6
New Mexico	No	No	No	No	4	7	2	8
New York City	Yes	Yes	Yes	Yes	10	6	4	9
New York State	Yes	Yes	Yes	Yes	6	4	5	8
North Carolina	Yes	Yes	No	No	5	0	3	4
North Dakota	Yes	No	No	No	3	2	12	8
Ohio	Yes	No	No	No	5	6	2	2
Oklahoma	Yes	Yes	No	No	9	7	2	2
Oregon	Yes	Yes	No	No	5	11	3	8
Pennsylvania	Yes	Yes	No	No	11	0	8	5
Philadelphia	Yes	Yes	No	No	10	0	0	13
Rhode Island	No	No	Yes	Yes	10	6	10	13
San Antonio	Yes	Yes	No	No	11	10	2	4
South Carolina	Yes	Yes	Yes	Yes	8	2	9	2
South Dakota	Yes	Yes	No	No	1	0	0	0
Tennessee	Yes	Yes	No	No	9	12	2	1
Texas	Yes	Yes	No	No	10	7	5	8
Utah	Yes	Yes	Yes	Yes	2	6	6	5
Vermont	Yes	Yes	No	No	9	10	6	8
Virginia	Yes	Yes	No	No	11	5	5	5
Washington	Yes	Yes	No	No	1	0	7	10
West Virginia	No	No	No	Yes	5	3	2	2
Wisconsin	Yes	Yes	No	No	9	0	5	5
Wyoming	Yes	Yes	No	No	10	2	2	2
Summary:	46 (82%) Y 10 (18) N	41 (73%) Y 15 (27%) N	13 (23%) Y 43 (77%) N	14 (25%) Y 42 (75%) N	Avg. # Vaccine Types 6.6	Avg. # Facility Types 3.3	Avg. # Facility Types 4	Avg. # Facility Types 4.9

* Vaccine types listed in Table 2.
† Provider types listed in Table 3.

Standing orders, reminders, and AFIX

A vaccine administration standing order authorizes designated healthcare personnel who are not physicians to administer vaccines according to guidelines set by an institution or physician-approved protocol, without a physician's exam or direct order being necessary. Standing orders have been recommended by the ACIP and the US Preventive Services Task Force (USPSTF) as an effective intervention to improve vaccination coverage rates among adults.[13] In addition, the Community Preventive Services Task Force found that there was strong evidence supporting the effectiveness of client reminder and recall in

Table 2. Number of Programs that Purchased Vaccine for Administration in Adults by Vaccine Type.

Vaccine Types Purchased by Immunization Programs for Administration in Adults	# of Programs That Purchased Each Vaccine for Administration in Adults	
	2012	2013
Influenza	32	26
Td	29	10
Tdap	47	25
Zoster	15	9
PPSV23	36	19
PCV13	2	5
Hep A	41	20
Hep B	49	23
HPV	29	11
MCV	25	10
MMR	35	16
Varicella	28	12

improving vaccination coverage to improve adult vaccination.[13] In 2012, 63% (n = 35) and in 2013 61% (n = 34) of programs reported that they have worked to develop, implement, or promote the implementation of standing orders in adult clinical settings. Forty-five percent (n = 25) in 2012 and 34% (n = 19) in 2013 reported that their program had worked to develop, implement or promote the implementation of patient reminders in adult clinical settings while 27% (n = 15) of programs in 2012 and 23% (n = 13) in 2013 have worked to develop, implement or promote the implementation of provider reminders in adult clinical settings.

Discussion

Health departments are a key partner in increasing adult immunizations and can act as a champion for engaging healthcare providers, partners, and the public in improving awareness of adult vaccination recommendations. Health departments can also assist with improving the implementation of the Standards for Adult Immunization Practice. Low vaccination coverage rates among US adults leave many adults at increased risk of common infections and their complications, including influenza, pneumococcal pneumonia and invasive pneumococcal infections, shingles, tetanus, pertussis, and hepatitis A and B.[6,14] Efforts by public health immunization programs to improve awareness among the adult populations in their communities, and among providers and health systems through collaboration and communication are needed to improve adult vaccination and decrease the burden of vaccine preventable diseases in adults. The designation of an adult immunization champion to lead such efforts is critical to success.[15] Unfortunately, compared to 2012, there was a decline in the number of immunization programs that had a designated adult immunization coordinator in 2013 and a decline in the percent of time spent on adult immunization activities among those with an adult immunization coordinator.

Table 3. Number of Programs Providing Vaccines for Administration in Adults to Facilities by Type.

Facility Types Receiving Vaccines Purchased by Immunization Programs for Administration in Adults	# of Programs That Provided Vaccine for Administration in Adults to Each Facility Type	
	2012	2013
Local Health Departments	45	49
STD Clinics	27	28
Long-term Care Facilities	21	*
School Located Vaccine Clinics	21	9
HIV Clinics	19	21
Hospitals	17	16
OBGYNs	12	14
Family Physicians	11	15
Department of Corrections	11	21
Internal Medicine	7	10
Community Vaccinators	6	8
Pharmacies	3	4
Community Health Centers	*	31
Drug Treatment Facilities	*	15
Tribal Medical Facilities	*	16

*Data regarding vaccines for these locations not collected for the specified year.

Adults are much more likely to be vaccinated when vaccines are recommended by their healthcare provider.[16,17] However, lack of knowledge about vaccinations needed for adults among the general population and lingering misinformation about vaccines are barriers for adult vaccination.[16] Efforts by health departments to encourage routine assessment of vaccination needs of adult patients and provider recommendations for vaccines are needed.

State and local health departments can play a key role in their communities as a source of immunization services for uninsured adults as well as for insured adults whose providers do not stock adult vaccines. A 2013 survey of internal medicine and family medicine physicians found that many providers do not stock vaccines for adults. For example 10-16% did not stock influenza vaccine, 14–15% did not stock pneumococcal polysaccharide vaccine, 19–20% did not stock Td, 14–19% did not stock Tdap, 35-38% did not stock hepatitis B vaccine, and 47–54% did not stock zoster vaccine.[18] Top barriers for adult immunization reported by internal and family medicine physicians included lack of adequate reimbursement for vaccine purchase, difficulty determining if a patient's insurance will reimburse for a vaccine, patients not having insurance coverage for vaccines, lack of adequate reimbursement for vaccine administration, upfront costs of buying vaccines, acute problems taking precedence over vaccinating, patients refusing vaccines for financial reasons, and patients refusing vaccines because they do not think they need them.[18] Many health departments have in place or are working on developing billing capabilities so that they can provide vaccine services to insured adults when those services are not provided elsewhere. Development of billing capabilities in health departments can also help public health recover costs and maintain services.[19]

Most immunization programs reported collaborations with pharmacists. Pharmacists are an increasingly important provider for vaccine services and expand access to vaccination services, including increasing numbers of locations and expanded hours.[20] Approximately 20% of influenza vaccinations provided to adults are given in pharmacy or retail settings.[21] The large number of patient encounters in

pharmacies provides an opportunity to inform the public about adult immunizations, including patients who may not have a primary care provider or whose provider does not routinely assess for vaccination needs. A survey conducted by the American Immunization Registry Association (AIRA) in 2014 found that pharmacies in 36 jurisdictions reported administered vaccine doses to vaccine registries with 22 of these jurisdictions requiring pharmacies to report to the registry.[22] Ensuring that adult vaccinations administered by pharmacists are included in registries is critical to improve communication and awareness among providers regarding patient vaccination histories so that patients are neither under vaccinated nor receive unnecessary vaccinations.

Some key recommendations to assist immunization programs in increasing adult immunization rates in their jurisdictions include designating an adult immunization champion, encouraging routine assessment of vaccine needs in adults, developing billing capabilities, partnering with other vaccine providers in their communities, and documenting adult immunizations in the registry. Designated personnel in health departments can also promote the implementation of proven strategies to increase vaccination among providers and health care systems such as standing orders, reminder recall systems, and reporting to vaccine registries.[13] Considering that many immunization programs have little funding to assist with implementing adult immunization efforts, the National Adult Immunization Coordinators' Partnership, which is comprised of immunization program adult immunizations coordinators, has developed a list of low cost strategies to improve awareness and raise vaccination rates.[23] Immunization programs should also review policies and/or regulations in their jurisdictions that might be resulting in barriers for immunizing adult patients.[8] Health departments are encouraged to review the Standards for Adult Immunizations Practice for other strategies that can be implemented to increase adult vaccination.

Summary

While state and local health programs have a critical role to play, they cannot raise adult immunization awareness and vaccination rates on their own, especially given limited resources. Prioritizing resources and collaborating with groups or organizations can assist with extending the reach of public health adult vaccination efforts. Adult vaccine providers and their involvement in the community is vital to help raise awareness of low vaccination coverage, the health impact of vaccine preventable diseases in adults, and the critical role of the healthcare provider recommendation. Health departments can play a key role in facilitating the outreach and education around adult immunizations. This includes engaging community organizations and stakeholders to reduce disparities in vaccination rates.[6] and encouraging providers to routinely assess patients' vaccination needs, recommend needed vaccines, vaccinate or refer to a vaccinating provider, and enter vaccinations into their state vaccine registries where available.[8] Utilizing some of these best practices will help to increase adult vaccination coverage rates and reduce the burden of vaccine preventable diseases.

Methods

Since 2001, 64 state, city, or territory immunization program awardees have been asked to complete the Program Annual Reports and Progress Assessments survey (PAPA). The survey is administered in the first half of the year immediately following the year for which data is collected. The PAPA consists of 10 sections used to assess the programs' progress in key immunization activities: American Indians and Alaska Natives, Vaccines for Children Program, Vaccine Safety, Pandemic Influenza Preparedness, Immunization Information Systems, Surveillance for Vaccine Preventable Diseases, Perinatal Hepatitis B, Adolescent Immunizations, WIC, and Adult Immunizations. This report describes results from the Adult Immunizations section of the 2012 and 2013 PAPA. This project did not require IRB review.

Sixty-one awardees responded to the adult immunization section of the PAPA on activities conducted in 2012 and 2013. Due to the differences in the funding structure and vaccine program infrastructures, 5 islands and 3 US territories were excluded from the following analysis. Analyses of the survey results of the remaining 56 programs (50 states, DC, and 5 cities – Chicago, Houston, New York City, Philadelphia, and San Antonio) are reported in this paper.

Disclosure of potential conflicts of interest

No potential conflicts of interest were disclosed.

Acknowledgment

Anna K. Dean, MPH, Oak Ridge Institute for Science and Education (ORISE).

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