National Adult and Influenza Immunization Summit summary

 # Full meeting report

Introduction

On 13-15 May 2014, the National Adult and Influenza Immunization Summit (NAIIS) convened in Atlanta, GA. This year, the Summit attracted 321 attendees from 187 organizations, including physicians, public health officials, nurses, pharmacists, pharmaceutical executives, and others from the front lines of disease prevention. Over the past few years the event has expanded from a two-day influenza vaccine-focused meeting to a three-day meeting that also covers all aspects of adult vaccination. The US Centers for Disease Control and Prevention (CDC), National Vaccine Program Office, and Immunization Action Coalition co-sponsor the event.

The first two days of the Summit covered adult immunizations. Vaccination has been a cornerstone of pediatric practice for decades, but adult vaccinations are less well integrated into adult medical practice. Unfortunately, many adults - and even many clinicians - either don't know about adult vaccine recommendations or fail to prioritize them. As a result, vaccination rates among adults remain distressingly low, leading to thousands of preventable illnesses, hospitalizations, and deaths annually. Although influenza vaccine coverage for children has continued to improve over time, adult vaccine coverage for influenza vaccination is low and stagnant.

Many Summit attendees spent the preceding year collaborating in working groups focused on distinct aspects of adult immunization. The working groups presented their reports at the meeting and solicited suggestions for the coming year. In addition, keynote presentations and sessions describing new research and successful vaccination campaigns highlighted the most promising approaches. Question-and-answer periods, audience polling keypads, post-conference surveys, and numerous opportunities for informal conversations made the event highly interactive. At the end of the meeting, the working groups collected the audience's responses to begin another cycle of problem-solving, and immunization advocates left with a set of practical ideas for improving disease prevention in their own neighborhoods.

Adults need vaccines too

Anne Schuchat, Director of the National Center for Immunization and Respiratory Diseases at the CDC, introduced the first session and also gave the meeting a musical theme. Her amusing but accurate ditty entitled "15 ways to get your vaccines" illustrated the point that adult vaccination doesn't need to be difficult.

Howard Koh, Assistant Secretary for Health at the US Department of Health and Human Services (HHS), then used the Nat King Cole classic "Unforgettable" to underscore the

Summit's contribution to public health. "Unforgettable, that's what you are," the former Yale Glee Club president sang, before explaining that "there's no group that has more passion for prevention and public health than this group ... every time I come [to this summit] I leave more inspired."

Koh then outlined the serious challenges still facing the field of adult immunization. For example, only about 25% of adults living with an infant have been vaccinated for pertussis in the last seven years. This low coverage, in part, has contributed to numerous outbreaks of pertussis in the U.S.; in 2012, the country saw the worst pertussis season in half a century.

Unfortunately, there's no simple strategy for boosting immunization rates among adults. Unlike children, who commonly see a single pediatrician for most of their medical needs, adults often get healthcare from a wide range of physicians, nurses, and pharmacists, at work and at their doctors' offices. The landmark Affordable Care Act is giving millions of Americans new access to healthcare and placing a strong emphasis on disease prevention, but the influx of new patients is also overwhelming the ability of many practices to keep up. Meanwhile, major racial and ethnic disparities in adult vaccination rates still persist.

Walter Williams of the CDC spoke next, outlining the current recommendations for adult vaccinations and describing trends in vaccine coverage. While pediatric vaccines are usually recommended for all children above a certain age, some adult vaccine recommendations are based on age while others are tailored for specific lifestyles, health conditions, and prior vaccinations during childhood. For example, the Advisory Committee on Immunization Practices (ACIP) recommends that everyone 65 years and older receive pneumococcal polysaccharide vaccine, but people under 65 years should receive the vaccine if they have certain medical conditions or are current smokers. While such complex recommendations help maximize the benefits of vaccination, they also make adult immunization programs harder to administer.

In a 2012 survey of more than 34,000 Americans, Williams and his colleagues found a wide range of vaccination coverage rates for different populations and vaccines. Vaccinations recommended for people 65 and older were generally more likely to have higher coverage rates compared to vaccines recommended for younger adults or for adults with specific indications or chronic medical conditions. Overall immunization coverage remains far below the goals set by the HHS's Healthy People 2020 standards.

Aparna Ramakrishnan discussed the CDC's communication efforts and consumer perceptions of vaccines. Ramakrishnan's team conducted a survey and a literature review, and held focus groups in three cities to study public attitudes about vaccination. The research revealed that adults generally perceive vaccines as being important, but those who consider themselves healthy are less motivated to receive them. A recommendation from a healthcare provider was the leading factor in whether respondents got a vaccine. Based on the findings, the CDC developed a series of materials promoting immunization, tailored to different groups.

"Providing this compelling information we think is really critical in influencing the decision-making process of adult patients," said Ramakrishnan.

Payment problems

One of the biggest influences on patients' receiving recommended vaccinations is payment, and the Summit's second session covered financial barriers to adult immunizations. Laura Hurley of the University of Colorado has directed a series of studies on healthcare providers' knowledge and practices regarding vaccines and vaccine payments. "Little is actually known about the use of strategies to improve immunization by physicians, despite evidence that there are strategies that can improve immunization rates," said Hurley.

For example, the National Vaccine Advisory Committee's Standards of Adult Immunization Practice recommends assessing patients' vaccination needs at every visit and attempting to document vaccination by different healthcare providers, measures that have proven effective in previous studies. However, it's unclear how many physicians' practices actually use those techniques.

To answer that question, Hurley and her colleagues recruited a random sampling of members of the American College of Physicians and the American Academy of Family Physicians. The group's demographics matched those of a random sample of all American physicians in these specialties used in a previous study. The researchers developed a list of survey questions about when physicians assess the vaccination status of their patients, how many have standing orders for routine immunizations, and what factors influence their patients' acceptance of vaccines. 66% of the physicians in the sample responded to the survey, and 97% of the respondents said that they do deliver vaccines to adults, providing a robust statistical base.

While the results have not yet been published, Hurley said that competing demands on physicians' time seem to be the biggest barrier to immunizing adult patients. Standing orders and electronic decision support are the measures most likely to drive higher vaccination rates, but physicians' knowledge of vaccine billing and payment options remains poor.

Alexandra Stewart spoke next, with an update on the Affordable Care Act (ACA). The ACA is designed to increase the number of Americans with high quality, affordable private health insurance. It also expands the number of people eligible for government-funded Medicaid, which already insures the health of about nineteen million of the poorest adults in the country. Individual states' implementations of the ACA vary enormously; some have adopted the entire law enthusiastically, while others have declined to support specific parts such as Medicaid expansion.

Despite the patchwork coverage, many of the most populous states have chosen to expand Medicaid under the ACA. That requires those states to provide at least a basic level of

coverage. Covering all of the ACIP-recommended adult vaccines can earn a state extra Medicaid funding from the Federal government, but this bonus is entirely optional. Stewart expects that most states will have standardized their coverage for all Medicaid enrollees within the next few years.

So far, though, only fifteen states cover all of the ACIP-recommended vaccines and prohibit cost-sharing, meaning that adults in those states can get all of their immunizations at no personal expense. "It's a long way to go, and ... cost sharing is so important in this population because we know that they're very very low income," said Stewart, adding that "even a 50-cent co-pay is too much for them to bear."

Frontiers of prevention

Besides navigating the changing landscape of immunization reimbursement, physicians' offices also have to contend with the problems of vaccine storage. A 2012 report by the US Office of Inspector General found that while a majority of vaccines were stored properly, many healthcare facilities stored expired vaccines alongside current ones and kept inadequate documentation for their stocks.

As L.J Tan of the Immunization Action Coalition explained in the session on new vaccine technologies, two companies have now addressed these problems with "smart" refrigeration units for vaccine storage. The refrigerators maintain strict temperature control, and incorporate systems such as built-in barcode scanners to track supplies. Backup power supplies keep the units running during an electrical outage, and the devices can even notify office staff of electrical or temperature problems immediately by text message. The National Vaccine Advisory Committee has also been considering convening a meeting to discuss standards for vaccine vial monitors, and special labels that change color when a vial encounters inappropriate temperatures.

Pfizer's Vincenza Snow turned the focus to one particular vaccine, a 13-valent pneumococcal conjugate called Prevnar 13. The FDA granted an accelerated approval for PCV13 based on the vaccine's ability to stimulate an immune response against the targeted pneumococci. The accelerated approval stipulated that Pfizer had to follow up with a post-marketing clinical trial demonstrating the vaccine's clinical efficacy.

The result was the Community Acquired Pneumonia Immunization Trial in Adults (CAPiTA) trial, which compared Prevnar 13 to placebo in a total sample of more than 85,000 adults in Holland. Subjects were all 65 years old or older, the target population for Prevnar 13, and trial centers tracked and analyzed every case of community-acquired pneumonia in the group over the course of the study. "As you can see it was a monumental undertaking," said Snow. The results are scheduled to be published shortly, but the vaccine appears effective against pneumococcal pneumonia that matches the vaccine strains.

Corey Robertson discussed another post-marketing vaccine trial, for Sanofi Pasteur's Fluzone High Dose (HD) formulation. People 65 and older suffer 90% of the influenza-related deaths in a typical year, despite high vaccine coverage rates. Previous research suggested that this was partly due to immunosenescence, in which the immune system's response to challenges declines with age. Fluzone HD tries to overcome immunosenescence by essentially turning up the volume; the high-dose vaccine delivers four times as much hemagglutinin antigen as a conventional flu shot.

After an accelerated approval similar to Prevnar 13's, Fluzone HD underwent a post-marketing trial involving over 32,000 adults aged 65 and over in the US and Canada. The study spanned two flu seasons. "There were a lot of questions about whether or not those antibody responses would ... translate into a highly effective vaccine," said Robertson. Fluzone HD was demonstrated to be 22.4% more effective than conventional vaccine in preventing laboratory confirmed influenza illness in adults 65 and older, confirming greater effectiveness among elderly.

Carolyn Deal of the National Institute of Allergy and Infectious Diseases (NIAID) at the NIH concluded the session with an overview of recent vaccine research. Sexually transmitted infections place a huge burden on global public health, with over half a billion people infected annually with Chlamydia, Neisseria, syphilis, and Trichomonas, and a similar number catching herpes simplex virus. New laboratory tools are helping researchers understand the pathogenesis of these organisms, but much of the work on vaccine development is still at early preclinical stages.

NIAID is also helping to develop other vaccines, including vaccines against cytomegalovirus, group B Streptococcus, and hepatitis C, with a strong emphasis on practical results. "You have to think through from the very beginning not just how you'll get that one molecule, but how you're going to put it in a vaccine that an MD can give to a patient," said Deal.

After lunch, the Summit's working groups held individual sessions to discuss their topic areas and finalize their reports for the previous year's activity. The five working groups focus on provider education, quality measures, access and collaborations, patient education, and information for decision-makers.

Health plans and systems

The first day's final major session covered the immunization strategies of large health plans and health systems. Richard Martinello of the Department of Veterans Affairs (VA) led the discussion with an introduction to the VA health system. Elevated to a Cabinet-level department in the 1980s, the VA now oversees a network with more than 1,700 hospitals, clinics, and offices spread across all 50 states and the US territories.

"This past year we've provided over 2 million vaccinations across our system," said Martinello. About 77% of the VA's patients over age 65 have been vaccinated against influenza, and other adult vaccines also reach large segments of veterans. To expand their coverage even further, the VA's Doug Trauner and his colleagues are now working with several large pharmacy chains to help veterans get their vaccines in more convenient retail locations.

Jamie Marxhausen of UCare Health presented a more regional view. UCare is an independent nonprofit health plan in Minnesota and Wisconsin with an ethnically diverse patient population. The plan provides free interpreters, and free transportation to medical and pharmacy programs to help its members receive effective care.

Marxhausen underscored the importance of tailoring vaccination programs to specific populations. For example, UCare discovered that the local Somali community had been misled by antivaccination advocates, and believed that immunization could cause autism. Enlisting community health workers and presenting accurate information in familiar terms helped overcome that misconception. Like the VA, UCare is also working extensively with pharmacy chains to improve access to immunizations.

Lisa Brill of Northern California Kaiser Permanente described a different approach to pharmacy management. As the nation's largest HMO, her company owns its entire pharmacy distribution system, which simplifies vaccine distribution considerably. That's especially true for annual flu vaccines that have to be distributed quickly and efficiently during the flu season. "We can monitor vaccine uptake, we can compare that to vaccine supply locally, and from the warehouse we can redistribute vaccine as necessary to avoid spot shortages," said Brill.

Based on her company's experiences, Brill recommends fostering a “culture of vaccination” in which being up to date on one’s immunization becomes as routine as other healthy behaviors. Strong, visible leadership on the issue of vaccination and simple pro-vaccine messages help drive the point home.

Recent research on vaccination campaigns suggests additional ways to reach more people. In a 2010 study, investigators analyzed the effectiveness of phone calls and postcards in getting more people immunized, and discovered that neither is as effective as a recommendation directly from a doctor. In response, William Alexander and his colleagues at Amerigroup targeted both patients and their doctors. Besides calls and mailings to members, the company sent healthcare providers individualized lists showing which patients still needed influenza vaccines. Doctors' offices also received mailings and faxes with seasonal influenza guidance from the CDC. That led to a 10% overall increase in flu vaccination from 2010 to 2013, but the vaccination rate nearly doubled for older patients and those with chronic health conditions, whom the campaign had targeted specifically.

The day concluded with a brief presentation by L.J Tan on the Summit's history. After the presentation and a reception, attendees watched a preview of the new movie "Invisible Threat," a documentary created by high school students who investigated the impact of vaccination and the tactics of the anti-vaccine movement.

Educating vaccinators

The meeting's second day began with the report from the Summit's healthcare provider working group, which has been trying to identify ways to make doctors, nurses, pharmacists, and other clinicians more enthusiastic about vaccines. Tamera Coyne-Beasley of the University of North Carolina, picking up the musical theme from the previous day, suggested a few song titles that could describe this effort: "We are the Champions," "Don't Stop Believing," and "We're Gonna Make It."

"Making vaccines a winning proposition for healthcare providers is critical as we seek to eliminate not only disparities in vaccine uptake, but also ... in vaccine-preventable diseases," said Coyne-Beasley.

Laura Lee Hall of the American College of Physicians (ACP) explained that research has already uncovered strategies that work with healthcare providers. Organizational changes, such as getting hospitals and clinics to issue standing orders for vaccines and holding separate preventive medicine clinics, have proven especially effective.

Simplifying recordkeeping can also be a big help, so the ACP has launched an online immunization registry that now covers six states and 380 practices. The organization is also helping physicians analyze the financial impact of vaccines, to demonstrate that immunization programs can be self-sustaining and even moderately profitable. "I think that's a message that many of our members actually need to hear, that it can be a part of your practice, it can be a winning proposition," said Hall.

The American College of Obstetricians and Gynecologists (ACOG) has also been looking for ways to help physicians deliver vaccines. Debra Hawks summarized the group's efforts, which have included several surveys about the financial and logistical challenges of vaccination. The majority of ACOG members see immunization as an important aspect of their practice, especially for pregnant women, but many cite low reimbursements and complicated storage requirements as major problems.

To address those issues, ACOG has developed a guide to coding immunizations for insurance reimbursement, standing guidance on incorporating vaccination into routine practice, and a series of quick-glance guides explaining vaccine recommendations. ACOG also conducted a CDC-funded training program for obstetricians and gynecologists in five states, which boosted the doctors' delivery of vaccines significantly.

Jeff Goad from the University of Southern California's School of Pharmacy wrapped up the session with a discussion of pharmacy-based vaccination. Goad reiterated a concept favored by many Summit attendees: the "immunization neighborhood." This neighborhood is the community of providers and organizations that works together to ensure patients in the community are up to date on their vaccinations.

Pharmacists, Goad explained, are relatively new to the neighborhood but enthusiastic about its goals. One major advantage of pharmacy-based vaccinations is convenience. Data from Walgreens show that many patients received vaccines at the company's stores during hours when doctors' offices were closed. Several thousand even got their shots on Christmas Day. "People get shots when they want them," said Goad, adding that "if you're open, they'll come and get shots."

Following a wide-ranging question-and-answer period, Summit attendees used their electronic polling keypads to answer a short survey about priorities for healthcare provider education. The results will help shape the healthcare provider working group's agenda for the coming year.

Educating patients

At last year's Summit, 72% of attendees said that the patient and public outreach working group should focus on identifying effective messages for boosting immunization rates. "That is where we focused our efforts for the last year - we followed our marching orders," said Laurel Wood of the Immunization Action Coalition, who delivered the working group's report.

Turning first to the research literature, the group quickly discovered that very few published studies had examined public relations messages for immunization. Fortunately, a CDC project was underway using focus groups and interviews with healthcare providers and patients to identify effective messaging on adult immunizations, so the working group decided to wait on those results while pursuing a more general plan.

The plan that emerged was based on the old saying that it's better to teach a man to fish than to give him a fish. Rather than trying to develop specific communication plans for every circumstance, the working group created a succinct tutorial explaining how to come up with an appropriate message. Vaccinators working with different audiences can now use the tutorial to create their own advertising campaigns.

Erin Kennedy from the CDC then demonstrated how to put the group's tutorial to use, with a focus on National Immunization Awareness Month (NIAM). Sponsored by the National Public Health Information Coalition, NIAM occurs in August and emphasizes a different vaccine-related topic each week. The final week is about adult vaccines. Kennedy explained that NIAM is a perfect opportunity for Summit participants to coordinate their public relations campaigns and reinforce each other’s messages.

To develop a message, immunization campaigners should identify their primary audience, determine the best ways to reach them, and then create messages that will work best with that audience and medium. The message should always end with an "ask," inviting the individual to get vaccinated and providing a simple way to do so. Kennedy emphasized that the message doesn't have to be developed from scratch: the CDC offers everything from posters and web banners to pre-made radio announcements, all of which can be used directly or adapted to particular audiences.

ACOG's Debra Hawks took the podium again, this time to discuss her organization's public relations research and outreach efforts. A survey of ACOG members found that 96% of obstetricians and gynecologists had used the organization's guidelines in the preceding five years, and 61% said the guidelines had changed their medical practice within the last two years. ACOG also uses an editorial board and medical writers to create web pages for patients.

Those efforts have paid off. The ACOG immunization page is now the top Google result for searches related to immunization and women, and traffic patterns show that the page is especially popular during flu season. Traffic to the site also spikes every time the organization sends out a bulletin about vaccination.

As vaccine guidelines change and new data reveal additional gaps in coverage, ACOG updates its materials. For example, when the ACIP recommended that all pregnant women receive a booster shot of the Tdap vaccine, ACOG immediately distributed the new guidelines to all 35,000 practicing obstetricians and gynecologists in the US.

Measuring quality

In the next session, Patrick Liedtka provided an overview of the activities of the quality working group. Quality improvement has become an important emphasis for healthcare in recent years, but in order to improve quality one must first measure it, a task that has proven quite hard. For vaccines in particular, outcomes, such as reduction in a specific disease, are often impossible to assess, so most measures of immunization quality focus on vaccination rates or vaccine delivery processes.

Despite the difficulties, healthcare organizations are working to develop quality measures for vaccines. The Affordable Care Act and other recent legislative efforts have established a set of incentives and penalties for improving healthcare quality, including immunization.

Based on feedback from last year's Summit, the working group studied ways to consolidate existing quality measures, combine preventive services such as immunization and screening into composite measures, test the new measures, and assure that they align with other healthcare quality standards. In audience polling, Summit attendees this year overwhelmingly

agreed that health information technology could have the biggest impact on adult vaccination quality.

Jane Kim and Amy Groom of the Department of Veterans Affairs and Indian Health Service (IHS), respectively, spoke next. The two Federal programs collaborated last year on a large study of quality measurement for adult vaccines. The project evaluated the potential use of a composite measure to see how effective each program was at delivering certain ACIP-recommended adult immunizations to patients. The measurement was designed to be pass/fail, only scoring a success if a patient received all of the selected vaccines.

Though both the VA and IHS use electronic health records, calculating the quality scores required more than a simple button press. The VA doesn't use consistent coding for immunizations across its databases, so the coverage rates varied depending on which data the researchers examined. Vaccine coverage in the VA and IHS populations differed somewhat from CDC statistics on vaccination, probably because the new work relied on actual patient records rather than self-reports.

Megan Lindley of the CDC described the National Quality Forum's work on measuring immunization program quality. In a project funded by HHS, the Forum recruited numerous partners involved in vaccination, identified existing quality measures, discussed new measures that could be considered to fill identified gaps, and identified a variety of challenges in measuring vaccination quality. The team has now winnowed the information down to a final set of priorities, with an emphasis on measuring a few critical vaccines initially, then expanding to incorporate composite measures for other ACIP-recommended vaccines within the next two to four years.

Ernest Moy finished the session with a description of a digital "dashboard" for national immunization coverage. This dashboard provides a graphic representation of immunization data reported to HHS, representing the nation's progress toward the Healthy People 2020 goals. The dashboard can also display the data by sub-population, revealing how well immunizers are doing at eliminating racial and ethnic disparities in vaccine coverage. Moy then polled the audience about possible changes to the dashboard design. A majority of Summit attendees favored only minor changes to the display.

Summit awards

The Summit's traditional Immunization Excellence Awards luncheon featured short presentations describing all of the prize-winning projects. First, however, Summit co-chair L.J Tan presented a special award to Mitch Rothholz of the American Pharmacists Association, for his extraordinary support of the meeting over the years.

The Immunization Excellence Award recipients were:

* Healthcare Personnel Campaign: Da Vita Healthcare Partners
    * Honorable mention: Partnership for Quality care

* Immunization Neighborhood: Hispanic Institute for Blindness Prevention
    * Honorable mention: Osterhaus Pharmacy

* Overall 2013-2014 Influenza Season: Immunize Nevada, and Universal Kidney Foundation
    * Honorable mention: National Foundation for Infectious Diseases

* Adult Immunization Champion: American College of Obstetricians and Gynecologists, and Eric Crumbaugh
    * Honorable mention: Jenny S. Arnold

* Corporate Campaign: Safeway Pharmacy
    * Honorable Mention: Sanofi Pasteur and March of Dimes, and Walgreens

Improving access and collaboration

After the awards luncheon, Mitch Rothholz described the mission for the access and collaboration working group: "We want to make sure patients get the right vaccine at the right time, increase connectivity and communication among providers ... support potential measures of performance ... and increase readiness."

The working group focused its efforts around the National Vaccine Advisory Committee's new Adult Immunization Practice Standards, which outlines what vaccine providers, non-vaccine providers, health departments, professional organizations, health systems and payers should aim to accomplish in adult immunization. For providers, the standards include assessing the immunization status of each patient at every visit, recommending necessary vaccines, administering immunizations or referring patients to someone who can, and documenting each vaccination. In addition to the standards, the working group worked with collaborators from healthmap.org to encourage participation in the website to increase access to vaccines, and continued evaluating the need for new billing codes for vaccine counseling services.

Gary Urquhart took up the subject of vaccine documentation, with an overview of immunization information systems (IISs) around the country. Urquhart and his colleagues at the CDC found that 47 of the 50 states now have IISs encompassing adult as well as pediatric vaccines.

While an IIS should make it easier for healthcare providers to determine which vaccines a patient needs, the databases still need some work. Urquhart highlighted several new efforts, including using barcodes on vaccine vials to ease data entry, standardizing the rules built into electronic health records for vaccines, and coding immunizations geographically to identify areas with poor vaccine coverage.

John Billington and Trini Mathew of the Infectious Diseases Society of America spoke about another IIS project, which sought to understand why internists and family practitioners continue to lag behind pediatricians in IIS use. They surveyed a sample of IIS programs in nine state health departments to understand potential barriers for adult providers.

The interviews revealed that while seven of the nine states had laws explicitly authorizing adult inclusion in IISs, only two offered patients direct online access to their own records, and only one state had an assigned adult immunization coordinator. "In other words, adult immunizations are not given much of a priority," said Mathew. Meanwhile, IIS staff pointed to multiple barriers to expanding their systems, including healthcare providers' lack of time, problems identifying duplicate records, and the public's association of immunization with pediatrics.

Jason Rubin from Walgreens summarized his company's work to meet the practice standards. Beginning two years ago, Walgreens created an immunization assessment form to help pharmacists talk to adult patients about vaccines. While the form led to the submission of nine million vaccination records to various state IISs, patients found the form somewhat annoying to fill out, and pharmacists were uneasy with sounding like salesmen in offering additional vaccines. The pharmacy chain is now moving the system into an electronic format to help address those problems.

Rothholz closed the session with an audience poll to set the working group's priorities for the coming year. Summit attendees identified the top barriers to IIS implementation as low participation by healthcare providers and poor integration with electronic health records.

State of the states

The meeting's next session covered state-level programs for adult immunization. According to LaDora Woods from Carter Consulting, the CDC's Immunization Services Division oversees two major funding systems for state vaccination programs: Vaccines for Children and a budget item called Section 317. The former covers only childhood vaccines, but the latter also covers adult vaccines, with a focus on underinsured and uninsured populations. Each funded program has to submit an annual progress report, and Woods summarized the results of the 2012 reports.

On average, US immunization programs spent 27% of their vaccine purchase budgets on adult vaccines in 2012, with hepatitis B, Tdap, and hepatitis A being the most popular adult vaccines. A majority of programs also promoted the use of standing orders and reminders for immunizations.

Kathy Talkington of the Association of State and Territorial Health Officials (ASTHO), and Claire Hannan from the Association of Immunization Managers, gave a combined presentation

about state and local health departments. These departments are currently scrambling to implement the Affordable Care Act, which raises both opportunities and challenges for vaccination programs. "Defining and redefining the roles of public health and partnerships is critical in this sort of turbulent time," said Talkington.

To help health officials adapt, ASTHO has created a toolkit explaining the best methods for working with other organizations, such as workplace health departments and faith-based organizations. Meanwhile, Hannan's organization surveyed health departments to identify the main hurdles for immunization.

By far the biggest challenge is funding, which has declined dramatically in recent years. For example, Michigan saw a 74% decline in its share of CDC Section 317 funding since 2010, which has prevented the state from expanding its vaccination programs to adults. Similarly, New York City won't have any money for flu vaccines for uninsured adults in the 2014-15 season, and Colorado has had to stop offering free zoster vaccines for the uninsured.

The news isn't all gloomy, though. Many states now have adult immunization coordinators, and health departments are working hard to establish new collaborations with media organizations and community vaccinators to reach more adults.

The Washington State Department of Health's Marci Getz, and Julie Morita of the Chicago Department of Health, split the final presentation of the session. Both women discussed strategies in which small financial investments in partnerships yielded major increases in vaccination rates. In Washington, Getz and her colleagues worked closely with pharmacists to develop new training materials about the state's immunization registry. The effort tripled the number of pharmacies participating in the registry and more than quadrupled the number of vaccine doses entered into the system.

In Chicago, Morita's team used funding from the CDC to promote "Vaccinate Illinois Week." Because the money wasn't going to be sustained, the project focused on implementing new systems to streamline vaccine delivery. The group was able to get many community health centers' electronic medical record systems modified and connected to the state's vaccine registry. "I think that we've learned a lot through the process, and we've hopefully made a difference in terms of some small steps ... that will be sustained," said Morita.

Working with decision makers

Kelly Cappio of the Biotechnology Industry Organization introduced the final session of the adult immunization portion of the Summit, which covered the activities of the decision makers working group. This group compiled state-level data about adult immunization, promoted the idea of the immunization neighborhood to insurers, worked with members of Congress on legislation to improve adult immunization, and set up a repository for advocacy and policy documents.

Working group members have also been trying to enlist the aid of employers, who have a major influence on adults' access to vaccines. One barrier to convincing employers of adult immunization's importance is a paucity of economic data on the impact of vaccines on productivity. Cappio said the working group is now conducting a literature review of health economics studies, and Summit organizer L.J Tan has also coauthored a paper on the financial burden of vaccine-preventable diseases.

In audience polling after Capio's presentation, Summit attendees asked the group to emphasize the importance of Section 317 funding for vaccines, and try to expand insurance companies' networks of immunizers. The audience said the group should target its messages to insurers, Congress, employers, and Federal agencies, in that order.

Nar Ramkissoon of UPP Technologies is already focusing on insurers, by trying to gain in-network status with insurers for health departments that deliver vaccines. It's a big job. "Every single health department is unique, there are no two health departments that are alike, [and] the same thing kind of happens on the payers' side too, each of the payers is going to have their own set of requirements," said Ramkissoon. To connect these disparate systems, Ramkissoon and his colleagues build customized tasks, timelines, and checklists that help both types of organizations keep track of the information and remove obstacles to coverage.

Mitch Rothholz from the American Pharmacists' Association talked about getting insurance coverage for another important group of vaccinators: pharmacists. Insurers often have difficulty working with pharmacists because states vary widely in what they allow pharmacists to do. Nationwide insurers often balk at this inconsistency, preferring to focus on vaccinators who can provide the same level of service everywhere. However, pharmacies have a much wider reach than physicians' offices and public health clinics, and also tend to have extended hours. "That's a plus for a lot of the plans that we're talking to, because it helps them with their patient satisfaction metrics," said Rothholz.

Jennifer Tinney brought a personal understanding of the challenges of establishing a billing program; she and her colleagues at The Arizona Partnership for Immunization (TAPI) began such a program six years ago for county health departments in Arizona. The effort required changing some state laws and negotiating with numerous payers, but the results were worth it. The county health departments now make about 10% above the cost of each vaccine, which has allowed them to remain open even in the face of massive cuts in other funding sources.

The adult immunization portion of the Summit ended with an open discussion about the working groups' plans for the coming year, and other steps Summit participants can take. "It is incredible how hard all this is ... yet there is progress, there is unbelievable passion," said

Bruce Gellin of the National Vaccine Program Office. Gellin added that "the time is right to improve adult immunizations."

Influenza Season Recap

The meeting's third day was the influenza portion of the Summit, which started with a panel of speakers from the CDC. Sandra Dos Santos Chaves set the tone with an overview of the 2013-2014 flu season. The CDC maintains several surveillance systems to track influenza, including ILINet for medically attended influenza-like illness, FluSurv-NET for flu cases that require hospitalization, and tracking of pediatric mortality from influenza in 122 selected cities. Virological surveillance adds information about which strains of influenza circulate during the season.

In 2013, the 2009 H1N1 influenza A strain predominated nationwide, but late in the season an influenza B strain became the most commonly identified virus. Both of these dominant strains were good matches to the 2013-14 vaccine. ILINet, FluSurv-NET, and pediatric mortality data revealed that the flu season was moderate by historical standards, but with a higher than average rate of hospitalizations and deaths among infants and young adults.

Lisa Grohskopf summarized the current round of ACIP discussions regarding influenza recommendations. One major topic for the committee has been the mounting evidence that live attenuated influenza vaccine may be more effective than inactivated vaccine for younger children.

To assess the data, ACIP members are using a method called Grading of Recommendations, Assessment, Development, and Evaluation (GRADE). GRADE analysis follows a defined procedure for identifying relevant studies, evaluating the quality of the reported results, and incorporating other considerations for each outcome. The analysis appears to favor recommending live attenuated influenza vaccine for children, and Grohskopf expects ACIP to reach a final decision on the issue at its late June meeting.

Erin Kennedy presented an overview of last season's influenza vaccine coverage and vaccine distribution. A total of 134.5 million doses of flu vaccine reached patients in 2013-14, with about 40 percent delivered to adults and 60 percent to children. "It looks like perhaps children this year were being vaccinated sooner than they were in the previous year, but it looks like it's flattening out, so there might not be any changes in actual coverage once we get to the end of May," said Kennedy. Results for pregnant women and healthcare providers also remained similar to previous years, but Kennedy stressed that the numbers are still preliminary.

Brendan Flannery discussed results of recent influenza vaccine effectiveness studies. The US Flu VE Network project estimates how effective vaccination is at preventing lab-confirmed influenza-related healthcare visits. The Network involves five medical systems and covers

both children and adults with medically-attended respiratory illness. Using a modified case-control design, the study assessed 2,319 subjects with flu-like symptoms, tested to see how many were infected with influenza, then looked at their vaccination status. Overall, vaccination seemed to reduce the chance of testing positive for influenza by about half. Flannery also summarized several other studies on vaccine effectiveness, which consistently demonstrate that the vaccine works especially well at preventing severe outcomes of influenza illness resulting in hospitalization.

Special populations

David Nace of the University of Pittsburgh began the panel discussion on special populations with a presentation about influenza vaccination in long-term care facilities. Long term care, which includes nursing homes and assisted living facilities, currently houses more than two million Americans. "This population is important to reach, these are frail individuals, they are at risk for complications of flu," said Nace.

While the median flu vaccination rate for long-term care residents is 72%, workers' coverage rates are only around 52%, and deadly influenza outbreaks remain common in these facilities. High staff turnover is a major cause of the low worker vaccination rate, so Nace and his colleagues designed a new flu vaccination program centered on facilities' pharmacies, which generally have more consistent staffing. The program improved worker immunization rates significantly.

Robi Goswami from Piedmont Heart focused on a population that doesn't often come to mind in discussions of flu vaccine: heart disease patients. Goswami explained that cardiologists tend to think in terms of preventing adverse events, usually with interventions such as lifestyle changes, aspirin, and statin drugs. However, some data indicate that the inflammatory response to an infection might speed the rupture of atherosclerotic plaques, suggesting that flu prevention could also be a useful intervention.

Goswami summarized two major randomized trials and a meta-analysis that all demonstrated a significant reduction in cardiovascular events in patients who had received a flu vaccine within the past year. Indeed, for the highest-risk patients, the benefit of a flu shot exceeded that of most other cardiological interventions.

Emory University's Mimi Kiser described several efforts to reach vulnerable populations through faith-based organizations. In collaboration with the HHS Center for Faith Based and Neighborhood Partnerships, Kiser and her colleagues have set up immunization efforts at ten sites around the country. The programs now reach thousands of people each year, and the number has risen steadily since 2010.

"Religion is very local and often very unstructured," said Kiser, so part of the effort included understanding and describing the different types of religious organizations vaccinators might

encounter. Those descriptions, and a set of model practices and core concepts, now form a toolkit that other public health outreach efforts can use to develop similar programs. Kiser emphasized that such projects should focus on building long-term relationships around preventive healthcare, rather than single-season sprints to distribute flu vaccines.

Dennis Murray of the Children's Hospital of Georgia discussed the challenges of vaccinating children. Overwhelming evidence shows that children are at high risk of complications from influenza, and almost half of the children who die of flu have no other risk factors besides age. However, surveys reveal that most parents still don't consider influenza a serious threat to healthy children.

Besides educating parents, Murray advocates mandatory vaccination for daycare attendees; in one state that enacted such a mandate, children's flu vaccination rates leapt from 68% to 84%. While pediatricians usually offer flu vaccines, Murray recommends a more assertive approach, with standing orders to vaccinate any child who comes into the office during flu season.

The global view

CDC Director Tom Frieden gave the influenza meeting's keynote address. "There's nothing that has the potential to do as much damage as quickly as a pandemic of influenza," said Frieden, adding that while current flu vaccines aren't as effective as public health workers would like, they remain the best weapons against this disease. According to CDC data, influenza vaccination prevented over 6 million illnesses and 79,000 hospitalizations in the 2012-13 season. Frieden argued that besides finding new ways to improve vaccine coverage, researchers need to improve flu immunization efficacy and develop new technologies to track pandemics as they emerge.

Underscoring the pandemic theme, Summit regular Ab Osterhaus was unable to attend because he was busy with the Middle East Respiratory Syndrome (MERS) outbreak response. In his stead, Arnold Monto of the University of Michigan summarized influenza vaccination activities in Europe.

The European Scientific Working Group on Influenza (ESWI) organizes an annual European Summit that mirrors the NAIIS. ESWI has been trying to rebuild public confidence in vaccines in the wake of the 2009 H1N1 pandemic. While Americans were largely supportive of their government's response to H1N1, Europeans had the opposite reaction. ESWI is also working to improve pandemic surveillance systems, which vary widely across Europe.

Pandemic preparedness

The next session covered US pandemic preparedness, which has improved dramatically in the past decade. As HHS's Rick Bright explained, influenza vaccine production ten years ago was a

very limited, strictly seasonal activity. Manufacturers used the same egg-based production system developed in the 1940s, and produced flu vaccines only during a six-month window from January to June. A failure at a single facility cut seasonal influenza vaccine production drastically in 2004, highlighting the system's weakness. "We had a limited domestic manufacturing capacity, and we had even more limited capacity globally to respond to an emerging event," said Bright.

To address that, HHS established a set of guidelines for pandemic preparedness, including establishment and maintenance of stockpiles of vaccines against likely pandemic viruses. The guidelines also emphasized the need for new vaccine production technologies and improved manufacturing efficiency, with a goal of delivering vaccines to the entire US population within six months of a pandemic declaration.

The vaccine industry took the assignment seriously. HHS now has stockpiles of vaccines against H5N1 and H7N9 influenza, two influenza A viruses that many experts see as having pandemic potential. Meanwhile, manufacturers have also developed and licensed new influenza vaccines produced in cell culture instead of eggs, and simultaneously expanded their production capacity for egg-based vaccines. While these measures all increase the nation's readiness for pandemics, they also improve seasonal influenza vaccination. Patients and their doctors can now choose from a half-dozen different formulations of flu vaccines.

Sam Graitcer of the CDC gave a public health perspective on pandemic readiness. In April of 2009, the emergence of a novel strain of H1N1 flu in Mexico highlighted the challenges in rapidly developing, manufacturing, and administering large quantities of influenza vaccine in response to a new pandemic virus.

Since then, the CDC has focused on addressing the challenges that 2009 H1N1 revealed. The government continues to stockpile vaccines for likely pandemic flu strains, and simultaneously works with manufacturers and distributors to ensure quick development and delivery of vaccines against novel strains. In the event of a pandemic, Graitcer explained that the bulk of flu vaccine doses would likely be purchased by the federal government and distributed to states on the basis of population. In order to get the vaccine, healthcare providers would need to register with their states' immunization programs. "Providers and provider groups should be familiar with how to contact their state immunization programs so they can be ready to register as soon as possible," said Graitcer.

Entering vaccine dose administration information into immunization registries is likely to be a requirement from health departments for providers who want to offer pandemic influenza vaccination in their practices. In addition, all patients may need two doses of pandemic influenza vaccine 21 or more days apart. Entering vaccinations into an IIS can help ensure patients get the right numbers of doses at the right time. A pandemic vaccine may also have to be mixed with an adjuvant in order to increase its effectiveness and stretch supplies, so healthcare providers will need to ensure that this gets done properly. Finally, Graitcer

emphasized that physicians, nurses, pharmacists, and other vaccinators should begin their pandemic planning now, instead of waiting until the next pandemic.

Getting the word out

The CDC's Yvonne Garcia introduced the session on influenza vaccine communications with an overview of last year's public relations campaigns and her team's plans for this year. The goals of the CDC's publicity push in the 2013-14 flu season included increasing public awareness of influenza vaccines, inspiring more people to get their flu vaccines, and addressing ongoing racial and ethnic disparities in influenza vaccination coverage among adults.

Toward those ends, Garcia and her colleagues held a series of carefully timed events in the Fall, including a press conference in late September and a radio media tour immediately afterward. During National Influenza Vaccination Week in early December, the CDC ramped up the campaign with a media teleconference, a Twitter chat, online advertising, and other events. This year, Garcia's team plans to follow a similar pattern, but with a special emphasis on reaching healthy adults, who have the lowest flu vaccination rate of any group.

Amelia Burke-Garcia of the Center for Digital Strategy and Research described the major online efforts of Summit partners during the flu season. Eighty-Eight percent of the group's public communication efforts last Fall and during National Influenza Vaccination Week were digital, reflecting the enormous importance of online and social media marketing. "Social [media] for the first time really allows for the quick dissemination of information, but through a multi-pronged and multidirectional conversation," said Burke-Garcia.

Twitter campaigns are especially amenable to collaboration, as multiple partners can contribute simply by using the same hashtag. Networks of influential Twitter users also help the CDC and other organizations get pro-vaccination messages out quickly and cheaply. The "#vaxwithme" hashtag, for example, reached 7.5 million impressions on Twitter, with more than 300 unique usernames participating in the campaign.

Carlos Velasquez from HMA Associates reprised the musical theme from the beginning of the Summit, with a list of Donna Summer songs that might describe the viewpoints of an influenza virus, the vaccine, and a patient. Velasquez's point was that different perspectives can stimulate different interpretations of a song or story. In order to communicate the importance of immunization, vaccinators need to understand their audiences and tell the right stories to reach them.

As an example, Velasquez described a campaign entitled "Un Amor Perdido," (A Lost Love) in which a pregnant woman dies of influenza, leaving her husband to raise their daughter alone. The culturally grounded story helped reach Latino populations with historically low vaccination rates. "Ultimately storytelling can help save lives," said Velasquez.

Helen Butler, from the National Influenza Vaccination Disparities Partnership, ended the session with a talk about bringing vaccination messages "to the streets." Butler's effort focuses on reaching communities in rural Georgia, an area where broadband internet connections and smartphones are less common. Instead, Butler's team works through local community leaders. "We're there for a project, but we get leaders who are there always and consistently," said Butler.

Working through established leaders gives the effort credibility. In one area, a local pastor went door-to-door to bring members of his congregation in for flu shots. In other areas, campaigners reach immigrant populations in their own languages, with trusted community leaders encouraging vaccination. Butler emphasized that such efforts have to plan with local communities rather than for them.

Meeting the makers

The final session of the Summit featured presentations from influenza vaccine manufacturers and distributors, who discussed their plans for the upcoming season. According to Josh Babb of the Health Industry Distributors Association, his organization's members distributed 134.5 million doses of flu vaccine last year, and are on track to match that number in 2014-15. Distribution involves far more than simply delivering the vaccine, though - distributors also help healthcare providers diagnose and track influenza. "Distributors [are] more than guys that just drive trucks, they are folks that certainly try to help push the supply chain to do more," said Babb.

Catia Ferreira from Glaxo Smith Kline described some of the steps her company takes to fight flu. With nine manufacturing and filling operations, ongoing research on cell culture-based vaccines, and antiviral drugs such as zanamavir, GSK tries to give doctors and patients as many options as possible.

Judith Wolf of BioCSL explained that her company focuses entirely on influenza, manufacturing a trivalent inactivated flu vaccine called Afluria, which CDC recommends be used for children 9 years and older. BioCSL delivered eleven million doses of Afluria to the US market last year, beginning in early August and finishing before the end of September.
Jay Barber summarized the work his colleagues have been doing at Sanofi Pasteur, which makes about half of the entire US supply of influenza vaccine each year. "Our responsibility to the neighborhood is not just about producing vaccine, though, it's also about working with all of you ... to support you with materials and things that you need in order to be successful," said Barber.

Speaking for Novartis, Clem Lewin described how his company delivered over 31 million doses of flu vaccine last year, with no shortfalls. Novartis offers Fluvirin, a traditional egg-based vaccine for anyone 4 years of age and older. For patients 18 years and older, the company

also offers Flucelvax, which was the first cell culture-based influenza vaccine licensed in the US.

Heather Richmond from Medimmune talked about her company's quadrivalent live attenuated influenza vaccine, Flumist. The vaccine is approved for people between two and 49 years old, and is the only flu vaccine delivered nasally. Medimmune plans to ship 18 million doses of Flumist to US customers in the coming year. Richmond also discussed the company's replacement program, which replaces vaccine doses that are past their four-month shelf life at no charge.

Wayne Hachey of Protein Sciences ended the session with a description of Flublok, a synthetic, egg-free flu vaccine made by expressing only the key viral antigens in a cell culture system. Flublok is the only influenza vaccine specifically recommended by ACIP for people with any severity of egg allergies, as its manufacture does not involve any poultry products at all.

The meeting ended with a brief summary and discussion led by IAC's L.J Tan, but the mood of the group had already been captured by Howard Koh in his keynote presentation. "We all want to work toward a world where everyone can live a vibrant life free from vaccine preventable illness," said Koh, adding "all of you are tremendous partners in this journey."