ASTHO IMMUNIZATION RESOURCE GUIDE

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TABLE OF CONTENTS

*Note: Words in **bolded or colored text** throughout document are active hyperlinks to click for more information.*

INTRODUCTION

Vaccinations offer a wide range of benefits. They **prevent disease and disability** in a **cost-effective way** and thwart financial and emotional tolls. (For example, for each dollar spent on childhood vaccines, more than **$10.20** is saved in direct costs.)

However, best practices to develop, implement, and promote programs and policies that support immunization need to be communicated more widely. Sharing of these best practices and other relevant information is critical to maximize opportunities for success—namely, sustaining high vaccine coverage levels in children and adolescents, increasing coverage rates in adults, and incorporating new vaccines into the routinely recommended immunization schedule.

This Association of State and Territorial Health Officials (ASTHO) Immunization Resource Guide was created to collect innovative best practices and information to help our members and partners consider potential methods to increase access to vaccines and rates of vaccination. We hope this guide serves as a valuable resource to help tackle your specific challenges and needs, and encourages collaboration among you, the public health officials and advocates who work tirelessly to improve the health of our nation.

Let's work together to ensure states and territories help every person become and remain properly vaccinated.

OVERVIEW

With many vaccines, immunization rates are on the rise in the United States. CDC has noted that **vaccination coverage has remained above the national Healthy People 2020 target** of 90 percent for children for certain vaccines; 2011 vaccination coverage among **adolescents aged 13 to 17 was up from prior years**, and **nearly 70 percent of adults** over the age of 65 receive immunization against influenza.

Yet, with resource constraints, changing policies, increased burden on healthcare professionals, and more, we still face challenges in meeting goals and unlocking potential to increase vaccination rates and efficiencies. For example, the increase in **HPV coverage among adolescent females is lagging** (those protected from HPV-related cancers by the complete series ranges from 56.8 percent to as low as 15.5 percent, depending on the state). **Adult vaccination coverage remains low** for most routinely recommended vaccines and well below **Healthy People 2020** targets. And children under six years of age **do not meet 2020 goals** for inclusion in immunization information systems.

Despite these challenges, innovations across the states and territories are making marked differences in ensuring the population is immunized. For example, Hawaii public health officials have conducted **622 school-located influenza vaccination clinics** to immunize more than 53,000 school-aged children and adolescents. Rhode Island runs the **Immunize for Life** program, which has significantly increased vaccine coverage among pediatric and adult populations. And Utah has **leveraged the Meals-on-Wheels program** to engage and learn from a difficult-to-reach population. This is where we should place our focus—on examples of what's being done well that can be replicated.

VACCINE FINANCE

Several federal funding sources enable vaccine delivery to the American population. Public health officials leverage these funding streams, along with state funds, to manage immunization programs and administer and pay for vaccines critical to the health and well-being of the country.

At the federal level, CDC's **Section 317** Immunization Program allocates funding for immunization operations and infrastructure necessary to implement comprehensive immunization programs at the federal, state, and local levels. The majority of funds have been dedicated to routine childhood programs, with smaller allocations for adults and adolescents. **In 2012**, Section 317 policy was updated to reflect increasing insurance coverage of vaccines. Also federally funded is the **Vaccines for Children** (VFC) program, which provides vaccines at no cost to children 18 years or younger who are Medicaid-enrolled, have no health insurance, are American Indian or Alaska Native, or are underinsured and receive vaccines at federally qualified health centers or rural health clinics.

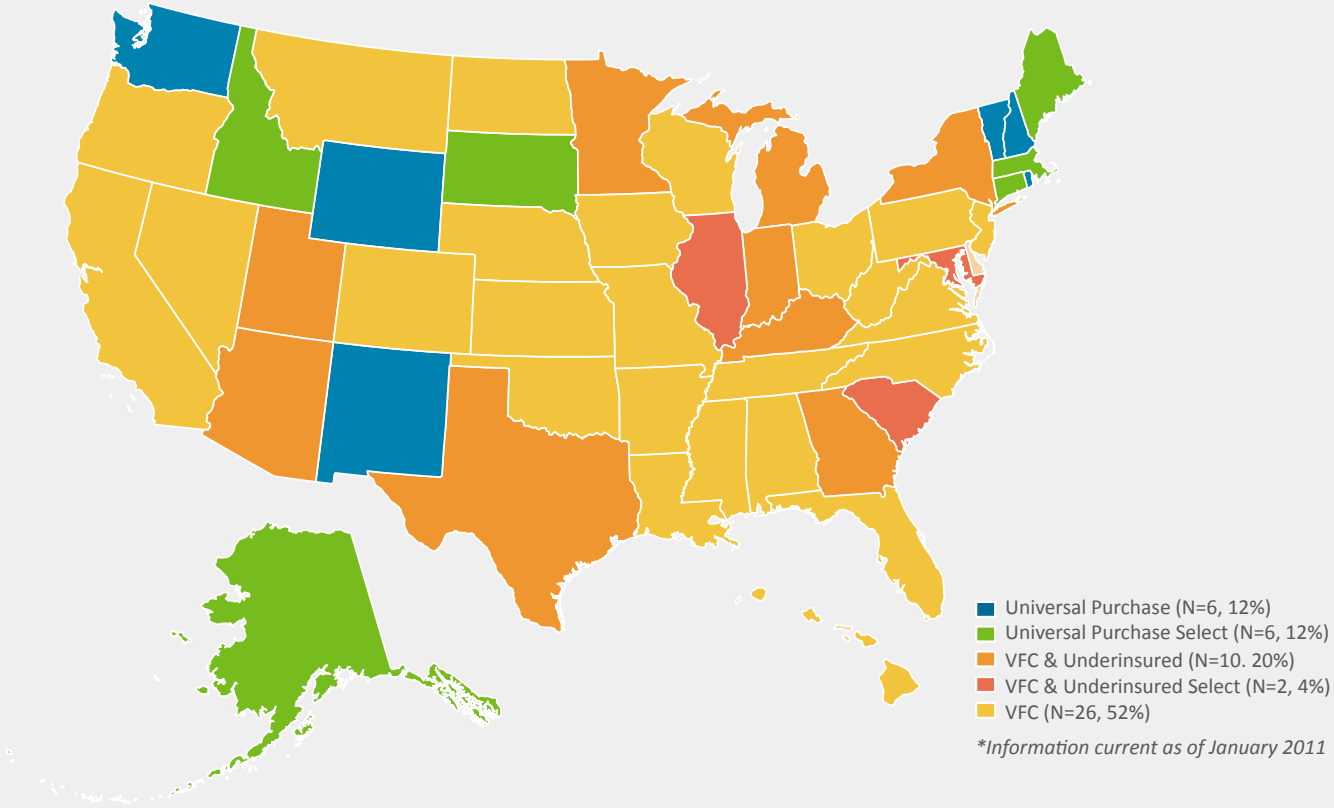
At the state level, funding practices are unique to each state. Policies range from "universal"—where all recommended routine pediatric vaccines are supplied to children regardless of insurance status—to "VFC"—where the program supplies all routinely recommended pediatric vaccines to participating private providers to vaccinate VFC-eligible children only. Other policies include varying levels of coverage for pediatric populations and the types of vaccines administered.

The best practices in this section detail innovative examples of how states are leveraging and maximizing these funding sources.

Private Provider Vaccine Supply Policies: How States Use Their Funds

Policy/Coverage	Routine Pediatric Vaccines Provided	Insurance Status Covered
Universal Purchase	All	All
Universal Purchase Select	Many	All
VFC & Under-insured	All	VFC-Eligible and Under-insured
VFC & Under-insured Select	Many	VFC-Eligible and Under-insured
VFC	All	VFC-Eligible

CHILDHOOD VACCINE FINANCING/SUPPLY POLICY FOR PRIVATE PROVIDERS



Source: *Association of Immunization Managers*

FEATURED BEST PRACTICES

Changing to a State-Supplied Vaccine Policy

(North Dakota, 2011)

In the last decade, North Dakota has seen multiple policy changes affecting immunization funding. Prior to 2004, the North Dakota Department of Health provided all vaccines recommended by the Advisory Committee on Immunization (ACIP) to enrolled public and private providers, using VFC and Section 317 funds, as part of a universal model. Due to resource challenges and increases in the number of vaccines recommended by ACIP, the state reduced coverage to immunizations listed through the VFC program. Through legislation (**SB2276**) passed in spring 2011, North Dakota returned to universal status for local public health units, while private providers remained VFC only. Provisions to bring insurance companies into the cost sharing/funding pool were eventually dismissed from the bill.

Resource constraints made policy changes inevitable. Costs to vaccinate a child from birth through 18 years of age increased dramatically, from $44.71 in 1985 and to $1,632.70 in 2011. Meanwhile, Section 317 funding decreased from $2.2 million in 2006 to less than $1 million in 2012. Common vaccine-preventable illnesses were also on the rise. **Data released in the winter of 2012/2013** showed that pertussis cases increased steadily from 2008 (25 cases) to 2011 (70 cases), while in 2012, most dramatically of all, there were 215 reported cases. Flu cases also increased from the previous flu season.

This change was not without challenges. The department of health **faced opposition** from third-party stakeholders. Extra time and resources were dedicated to advocating this policy change. But in the end, the state's return to universal status supported increased vaccination rates. According to **CDC**, the state achieved a 79.8 percent primary series vaccination rate in children aged 19 to 35 months in 2010; that jumped to **83.5 percent** in 2011.

Making State-Supplied Vaccines Available for All Children Aged 0–35 Months (Alaska, 2013)

In 2012, Alaska's Division of Public Health introduced new state-supplied vaccine guidelines that grant eligibility to all children aged 0-35 months. This was made possible in part by $4.3 million in annual funding from a state bill to purchase vaccines for underinsured children. Alaska's VacTrAK database and CDC assessment tools were valuable in sharing information critical to securing these funds. The new guidelines stressed that providers must still vaccinate every eligible child, even if parents cannot pay administration fees, and parents do not need to prove eligibility status. To roll out this policy change, the Alaska Immunization Program held weekly teleconferences for one month to discuss vaccine eligibility, maintained a helpline, and worked with stakeholders to evaluate vaccine financing through a dose-based assessment to protect even more children.

Covering Financing of Immunizations for Children and Adults (Vermont, 2009)

In 2009, Vermont introduced a pilot program that changed the way the state paid for vaccinations for both children and adults. The state created its own fund to buy vaccines directly from CDC for distribution to providers free of charge using pooled state, federal, and insurer funds. Insurers funded the pool at a level based on their market share. Vermont will evaluate the pilot program in 2014 to determine its next steps. One key learning thus far was the importance of partnering with insurers from the beginning to ensure support and buy-in. From a provider perspective, the pilot program has been helpful in reducing reimbursement paperwork and storage requirements for separation of vaccines funded by different sources, given all vaccines now came from the same funding source.

Evaluating Funding Mechanisms for Childhood Immunization Programs in New England States (New England, 2013)

As the number of recommended vaccines and the cost involved increase, states are adapting to maintain stable funding for immunizations. New Hampshire-based Kidsvax.org put together a report on childhood immunization programs in New England states to assess their funding mechanisms. Overall, New England states run either a universal supply model or universal select to provide immunizations to providers free of charge. A primary consideration when evaluating the implementation of a universal program is dividing costs equally across the payers providing or administering health benefit plans. New England states clearly delineate who the payers are and their assessed fees, among other details, to address this potential concern. This resource also includes detailed statute language.

Promoting Key Talking Points on Paying for Vaccines (United States, 2013)

Healthy States, an initiative of the Council of State Governments, drafted talking points exploring the difference in how vaccines for children and adults are funded. While vaccines for children are funded by both private and public sources, federal and state governments play a lesser role in absorbing the cost of adult vaccinations; most are covered privately (e.g., private insurance, self-pay, vaccine manufacturers). Importantly, there is a call to action section that outlines succinct ways state legislators can help increase immunization rates. A few state programs are also highlighted, including:

- Rhode Island's legislation requiring the state health department to purchase influenza vaccine and distribute it to physicians enrolled in **Immunize for Life**.
- Vermont's distribution of free pneumonia and Tdap vaccines to healthcare providers for adult immunization.
- Oregon's use of third-party billing for child immunizations in public clinics to fund additional free vaccinations.
- North Dakota's support of local health departments to bill insurance companies to increase revenue for publicly funded adult vaccines and other immunization projects.

THE PATIENT PROTECTION AND AFFORDABLE CARE ACT

In March 2010, President Obama signed the Patient Protection and Affordable Care Act (ACA) into law. The law makes preventive care, including immunization, more accessible and affordable for many Americans.

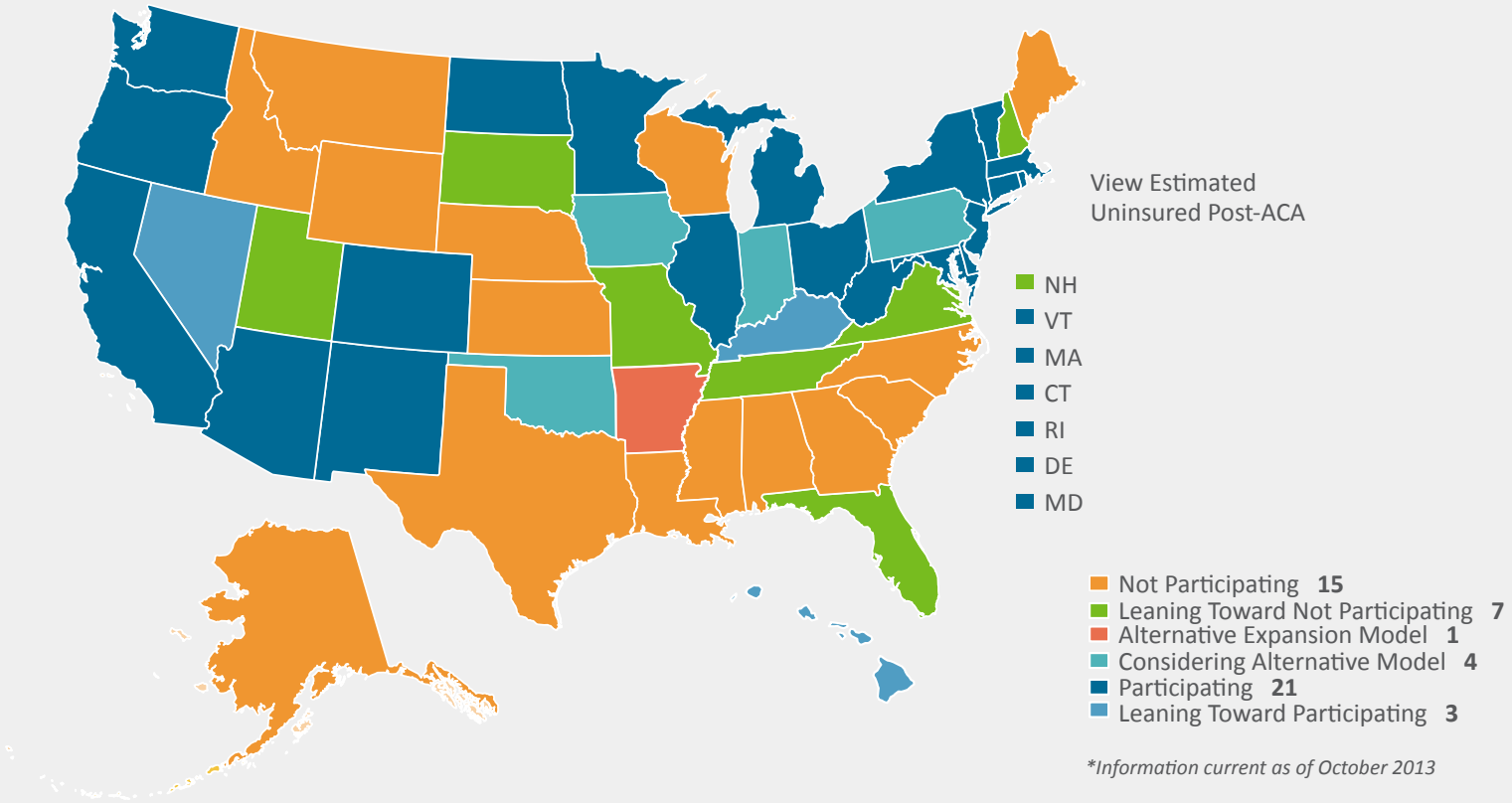
ACA includes a number of beneficial provisions for immunizations. All new (non-grandfathered) health plans are required to cover all ACIP recommended routine vaccinations as of 2010.

A major impact of ACA is expanding Medicaid, one of several important provisions that the federal government and the states jointly finance. The impact of this expansion varies **state by state**, and as such, **states** are each evaluating its potential—with 28 as of July 2013 moving toward expansion. Beginning Jan. 1, 2013, states had the opportunity to qualify for an additional percentage point in their Medicaid matching rate if the state covered preventive services recommended by the United States Preventive Services Task Force and immunizations recommended by ACIP, without charging cost-sharing for these services. ACA requires states to pay for primary care physician services, including immunization, at levels equal to at least 100 percent of Medicare Part B payment rates in 2013 and **2014**. Medicaid coverage expansions through ACA for low-income adults will result in increased immunization coverage for newly eligible enrollees.

With the anticipated increase in the number of people who have access to insurance coverage for immunizations, the CDC funded state pilot programs to explore and implement third-party billing systems to collect insurance payments for those seeking immunizations at public health clinics. There are a number of examples of these billing systems at the state and local level, made possible by the **Billables Project for Health Department Immunization Services Reimbursement**.

While it is too soon to understand the full impact of ACA, this case study on an innovative approach from Arkansas shows its potential benefit for the population.

BEYOND THE PLEDGES: WHERE THE STATES STAND ON MEDICAID (29 STATES MOVING TOWARD EXPANSION)



Source: *The Advisory Board (as of October 2013)*

FEATURED BEST PRACTICES

Enumerating the Economic Impact of ACA on Arkansas

(2013)

With ACA's passage, the RAND Corporation projected that, by 2016, 400,000 more Arkansans would have health insurance and about 1,100 fewer people would die (or as many as 2,300 fewer, including those with non-group coverage). Additionally, net federal payments to Arkansas would come to $430 million every year; the state's GDP would see a net increase of $550 million, after increased costs for Arkansas resulting from ACA are subtracted; and 6,200 more jobs would be created. As Arkansas is "one of the poorest states in the union," according to the RAND Corporation report, Medicaid expansion and insurance subsidies for lower and medium income people "disproportionately benefit" the state.

In February 2013, it was **announced** that Arkansas will cover Arkansans between zero and 138 percent of the federal poverty level, five percent above the mandated rate, giving coverage to more than 200,000 of the currently uninsured. Uniquely, the federal government will pay for Arkansas to **expand health coverage** to low-income residents through the state's insurance exchange, rather than its Medicaid program. Since Arkansas was one of the few states that would immediately benefit financially from the ACA, the compromise was reached fairly quickly. According to the ***New York Times***, other states should consider that this "approach might be somewhat more expensive," as it is also likely that private insurers will charge higher rates than Medicaid, costing federal taxpayers more money and/or reducing the amount of care given-per-dollar-spent.

Following this agreement, the U.S. Department of Health and Human Services **announced** that other states seeking to use federal funds to shift Medicaid-eligible residents into private health plans would have to obtain a waiver to do so.

Overall, healthcare coverage expansions will reduce mortality and the amount of uncompensated care ($340 million in Arkansas in 2010 alone). Choosing not to expand coverage would result in a direct net loss of $670 million. The RAND Corporation noted the economic impact in West Virginia and Mississippi are projected to be similar, with further evaluation needed in other states.

Developing Better Systems to Bill Insurers: Project RIZO

(Colorado, 2011)

The Colorado Department of Public Health and Environment's Immunization Program created the pilot Project Reimbursement Immunization Opportunity (**RIZO**) to help local public health agencies (LHPA), regardless of geography or experience, develop better systems to bill health insurance plans. Project RIZO supported the development of an infrastructure for LPHAs to bill for the vaccination of patients insured by Medicaid, Medicare, the state program Child Health Plan *Plus*, and private health plans. In the first year alone, 11 local LPHAs participated in the program, which included both billing of the vaccine itself and the administration of the vaccinations in their new systems.

Based on the program's success in the first year and an increase in funding, RIZO was able to double in size, supporting up to 28 LPHAs. Its achievements included the development of a mentoring model to transfer billing knowledge, robust data collection by jurisdiction, proof that LPHAs can bill for immunization successfully, and strengthened relationships between public health officials and payers.

Several best practices were recommended: The provider application process should be streamlined; billing 101 processes should be documented and made available **online**; and **monthly reports** help monitor progress and track results. To provide additional support, state-level mentors were designated to assist local officials.

Project RIZO and 37 similar programs in the United States obtained funding as part of the ACA's Prevention and Public Health Fund and the American Recovery and Reinvestment Act of 2009. For more information, see the CDC's **Billables Project for Health Department Immunization Services Reimbursement**.

Taking a Holistic Look to Build an Effective Billing Infrastructure: New York State Strategic Plan

(New York, 2012)

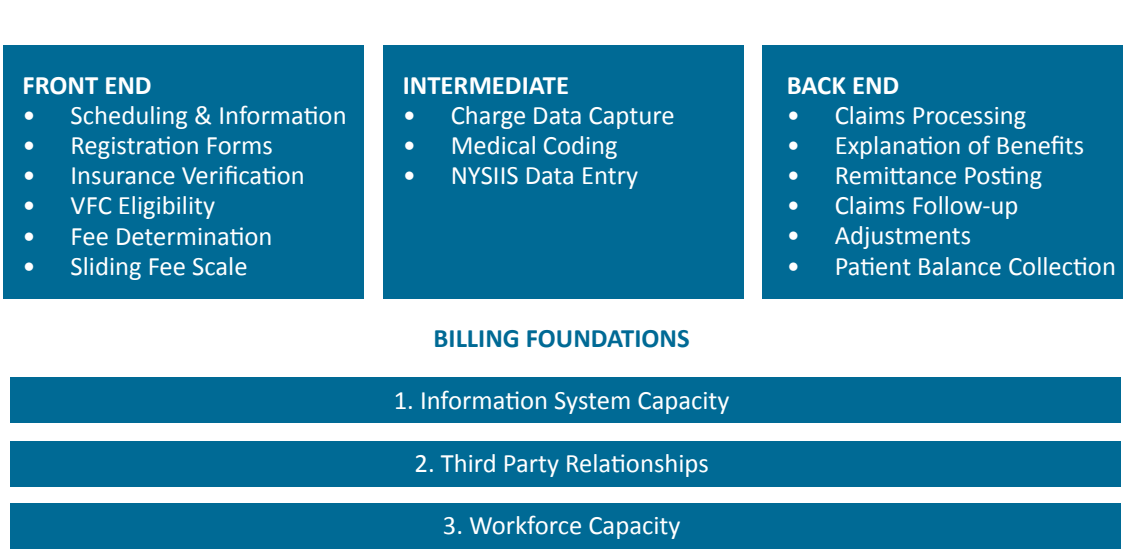
To assist 57 local health departments (LHDs) in billing third-party payers, *Immunization Billing by Local Health Departments: New York State Strategic Plan* created an approach to immunization service billing that generated additional revenue and used local public health resources efficiently. New York's LHDs provide a small, but significant, percentage of state residents' annual immunizations.

A strategic planning process was funded by the American Recovery and Reinvestment Act to identify barriers and opportunities. Critical to the success of the plan was the engagement of a broad group of stakeholders within local and state-level government as part of a steering committee, as was assessing the capacity of LHDs to bill for immunization services—providing foundational knowledge on which to build recommendations.

Based on the research conducted, the steering committee determined that many LHDs were already billing for services, but there was room for improvement. Findings suggested three foundational pieces for a successful billing practice: information system capacity, third-party relationships, and workforce capacity and capability. In addition, five basic requirements are needed by LHDs to bill effectively: collecting insurance information from patients, determining their payer mix, establishing and implementing an out-of-pocket patient fee process, promoting medical homes, and submitting claims to public insurance programs. If requirements are met, the plan outlined five options to improve upon LHDs' billing practices, with a cost/benefit analysis included to support decision-making.

Partnership with and support from the New York State Department of Health, as well as other stakeholders such as the CDC and insurers, help LHDs successfully phase in new processes and systems.

FIGURE 3 FROM THE PLAN: ELEMENTS FOR SUCCESSFUL IMMUNIZATION BILLING PRACTICE



Centralizing Billing in Arizona: Pilot Program Delivers Cost-Effectiveness (Arizona, 2011)

Fifteen Arizona county health departments (CHDs) offer immunizations. The state decided to introduce a centralized billing system for these CHDs due to public health immunization budget cuts, the growing population, and an increasing number of publicly and privately insured children seeking immunization from CHDs. American Recovery and Reinvestment Act funds allowed for the creation of the Cost Recovery Program pilot project to create a cost-effective billing solution that would help CHDs reach more patients with more services. The pilot was implemented in Maricopa County, which had about 126,000 annual immunization visits, with 36 percent of patients on Medicaid and 56 percent of patients not covered by any health insurance. The pilot found the centralized billing system was cost effective and helped secure necessary insurance reimbursement fees, which were not collected prior to the pilot program.

Delivering Key Insights and 10-Fold Return with Public Health Billing Project (California, 2012)

Kern County, California, implemented a new immunization billing project that updated their fee schedule, initiated private insurance contracts, handled provider credentialing, enhanced insurance verification, improved coding and medical documentation, and developed better public health staff placement at clinics. Critical to success was allocating funding for Kern County's upfront costs in purchasing an electronic patient care management system and hiring staff to properly implement the system for all vaccines. After hiring an insurance specialist, the county saw a 10-fold increase in total revenue collected from one six-month period to the next. Kern County developed a **toolkit to share their learnings**, and, with the California Department of Public Health, supported zseven other counties that served as California pilot sites.

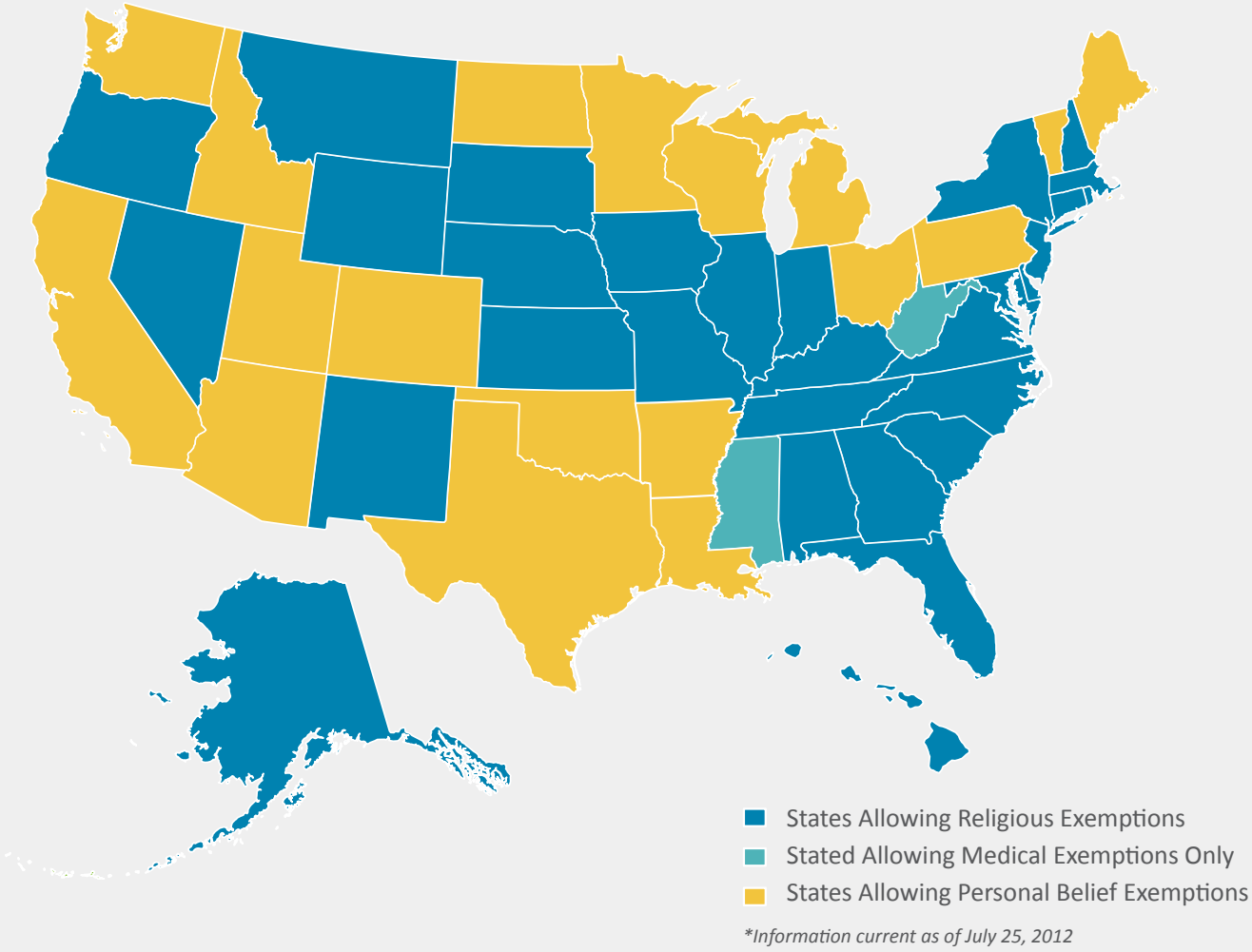
CHILDHOOD AND ADOLESCENT VACCINATION

Overall, childhood and adolescent vaccination is on the rise. For example, for **children aged 19 to 35 months**, national vaccination coverage for rotovirus increased from 59.2 percent to 67.3 percent from 2010 to 2011. Increases were also seen in the birth dose of hepatitis B, at least two doses of hepatitis A and the rotavirus vaccine. For vaccines recommended before the inception of the **National Immunization Survey** in 1994 (e.g., MMR, DTaP), coverage has remained stable since the mid-1990s. And in **adolescents**, for instance, the average annual percentage point increase from 2007 to 2010 was 12.8 for at least one dose of Tdap.

Children in the United States are required to receive a number of vaccines prior to entering school, but may receive medical, religious, or philosophic exemptions depending on state laws. In 2011, the median exemption rate was 1.8 percent for **kindergarteners**. A ***New England Journal of Medicine*** study details how the strength of the exemption policy plays a key role. As an example, nonmedical exemptions in states with easy exemption policies were 2.31 times as high as rates in states with difficult exemption policies.

The following best practices explore innovative programming to increase vaccination coverage for children and adolescents.

VACCINE EXEMPTION POLICIES



**Information current as of July 25, 2012*

Source: *Johns Hopkins Bloomberg School of Public Health*

FEATURED BEST PRACTICES

Protecting Infants from Pertussis by Activating Parents and Caregivers

(Kansas, 2011)

Pertussis, commonly known as whooping cough, is highly contagious and a particular threat to newborns up to six months of age, who accounted for approximately 25 percent of all cases from 1997 to 2000. Across age groups, cases from 1994 to 2004 rose dramatically, with parents (56 percent in 2007) serving as the largest source of infection to others, over siblings (16 percent), grandparents (6 percent), and other sources (22 percent). That is why cocooning—the process of vaccinating an infant's family and close contacts just after birth—is a valuable approach to preventing infants from contracting the disease.

Kansas launched a cocooning pilot program in four hospitals, the goals of which were to increase awareness for providers and families, to immunize 80 percent of postpartum patients during discharge, and to immunize one primary caregiver of the new mother's choice through a voucher. From January to June 2010, 208 out of 248 new mothers (83.9 percent) were vaccinated after giving birth, surpassing the goal by almost four percentage points. However, only 42 caregivers (16.9 percent) were vaccinated. Reasons for non-vaccination included time, lost vouchers, and fear of needles.

It was noted that caregivers were nearly twice as likely to have received a vaccine when fees were eliminated, no appointments were needed, and a visiting nurse was provided. When caregivers began to receive vaccinations in-hospital after June 2010, there was a dramatic rise in vaccination rates, peaking to nearly 90 percent in November. A challenge with in-hospital vaccination was patient processing, since the caregiver had to be admitted to the hospital for vaccination. Overall, this underscored the critical importance of vaccinating as soon as possible, ideally before leaving the hospital, to maximize those protected.

A **report** from the Immunize Kansas Kids program gave additional considerations, noting that cocooning alone is insufficient as a pertussis prevention strategy and recommending prenatal vaccination (after 20 weeks gestation).

Making Strides in Protecting the Community from Pertussis in Nevada

(Nevada, 2011-2012)

With incidence on the rise, Nevada launched a proactive effort to prevent pertussis, or whooping cough, in 2006; the program remains exemplary in its depth and comprehensiveness. Its holistic approach protects healthcare workers (HCWs) and residents, particularly in the birthing hospital, school, and community settings, in an effort to increase immunization and reduce illness across the state. Cocooning refers to the practice of immunizing those around at-risk populations to protect them, in this case, infants; Nevada was unique in implementing on the postpartum and antepartum levels.

To immunize HCWs, Nevada focused on hospitals with birthing facilities or emergency rooms, distributing 1,791 Tdap vaccines to 32 of 34 relevant hospitals. The protection extended to parents of newborns through a cocooning program in birthing hospitals. In fact, Renown Regional Medical Center (RRMC) was the first full-scope hospital to cocoon in the United States, and Nevada was the first state to have all birthing hospitals cocooning against pertussis. Starting in 2006, Nevada began offering Tdap vaccinations and influenza vaccines to staff and new parents and worked to enter these records into its online Nevada WebIZ immunization database, which as of August 2013 had more than 2.2 million records. RRMC, for example, saw a significant rise in Tdap doses administered compared with the number of deliveries from 2006 (2,986 doses of Tdap, 4,903 deliveries) to 2010 (3,559 doses of Tdap, 4,643 deliveries) as a result of the program.

The effort met some obstacles along the way. These challenges revolved around getting nursing, pharmacy, and infection control leadership buy-in to support the increased workload, obtaining stakeholders' Agreement to Participate for use of Section 317 funds, conducting site visits, and educating participants about the CDC's recommendations for safe vaccine storage and handling.

The extremely successful program won one of three **2012 AIM Bull's-Eye Awards for Innovation and Excellence in Immunization**. The **budget** for 2012 was just under $800,000 for Tdap doses and program management. In July 2013, Nevada's governor announced an additional $1 million in state funding. It was noted that Nevada's pertussis incidence rate was 4.08/100,000, compared with 13.4/100,000 nationally.

Implementing one of the Nation's First School-Located Influenza Clinics

(Hawaii, 2011)

In response to new ACIP guidelines calling for all U.S. children aged five to 18 years to receive an annual influenza vaccine, the state of Hawaii set up school-based clinics for K-8 students. This Stop Flu at School program originated from a three-school pilot in 2006-2007. Spanning four school years from 2007 to 2011 in its statewide mode, the program administered more than 265,000 student vaccinations and more than 85,000 faculty vaccinations, with 88 to 91 percent of schools participating each year. Expenses from the first year (more than $3.33 million) were higher due to upfront costs for materials and procedure development; total program costs were more than $8.83 million across four years, with primary support (in the range of 80 to 90 percent) from federal grants.

While the effort fell slightly short of the goal of a 50 percent student vaccination rate, rates of 49 percent in the first two years and 48 percent in the third and fourth years were increases from years prior (44 percent). Data going back to 1999 suggests that there were fewer flu cases from 2007 to 2010 than in the previous three-year intervals, suggesting a potential causal link with Stop Flu at School. The 2007-2010 flu-like trends ranged from more than 1 percent to under 3 percent, while in other years the range was from about 1 percent to about 6 percent.

Researchers conducting **a preliminary case study** determined that, to achieve the same number of vaccinations as the program in just its first year, 42,532 visits to physicians' offices would have been necessary—assuming the existing health infrastructure was capable of handling the volume. In addition, the convenience of in-school vaccinations saved the indirect costs of parents' time away from work to transport their children to physicians' offices. Research suggests that the cost per vaccine is also lower in mass clinics than in an individual physician's office setting. Researchers noted the program may not be easily transferable to states with larger populations, though it did offer other valuable benefits, such as building infrastructure and procedures to manage outbreaks (such as H1N1 in 2009).

A school-based vaccination program's "effectiveness extends to the household, and … a high-efficiency immunization program that requires minimal time from parents provides economic benefit."

Health Affairs

Determining Factors Associated with Tdap and Meningococcal Vaccination Coverage Among Middle School Students

(North Dakota, 2010)

Meningococcal meningitis is a serious disease that is fatal in 10 to 14 percent of cases. In the United States, cases of pertussis, or whooping cough, are on the rise, with 17,000 reported in 2009. Both diseases are vaccine-preventable.

In 2005 and 2006, ACIP recommended the meningococcal vaccine, MCV4, and the pertussis vaccine, Tdap, for all pre-adolescents aged 11 to 12 years. As a result, North Dakota required both vaccines for middle school entry; state law instructed school officials to exclude students who declined vaccinations and were unable to demonstrate proof of vaccination within 30 days of enrollment. Despite the mandates, many North Dakota students attended school without the required vaccinations. In 2009, only 66 percent of 13 to 17 year olds received MCV4 and 72 percent received Tdap.

To explore what factors affected middle school immunization rates, the annual school immunization survey added three new questions in 2010: Is there a school nurse assigned to the school? What is the school's policy regarding students who are not up to date with required immunizations? Who in the school determines which students are up to date?

Eighty-eight percent of middle schools responded, approximately 67 percent of which were rural and 88 percent of which were public. Half had a state-law-compliant policy, and 28 percent reported having a school nurse. The highest MCV coverage appeared in rural middle schools, schools that have a state-law-compliant policy, and schools that have a nurse to determine up-to-date status. Simply having a nurse in the school, however, did not imply higher MCV4 or Tdap coverage rates.

While key insights were gleaned from the new survey questions to improve middle school immunization rates, there is still room for improvement. According to the 2012 survey, only 66.42 percent of seventh graders received the MCV4 vaccine and 68.20 percent received Tdap. For additional information, see the **2012 North Dakota School Immunization Survey Results**.

Evaluating AFIX to Increase Immunization Rates

(North Carolina, 2012)

In 2011, North Carolina assessed its adolescent **AFIX** (Assessment, Feedback, Incentive, and eXchange) program to determine whether it was more effective to conduct adolescent AFIX visits via webinar or in person. It was the first time the North Carolina Immunization Program (NCIP) conducted a formal program analysis, and the first time AFIX visits, of any type, were conducted via webinar.

To be part of the assessment, a family or pediatric practice had to be an active member of NCIP and the North Carolina Immunization Registry and service at least 200 adolescents aged 11-18; local health departments were not included in the study. Eligible practices were put into one of three groups: in-person AFIX visits, webinar visits, and a no-visit control group. The goal for these assessment visits was to increase awareness and utilization of adolescent vaccines and improve the state's adolescent vaccination rates.

The evaluation concluded that the adolescent AFIX program was effective at raising vaccination rates and that webinars were a "cost-effective and efficient" method for implementing visits. The webinar group proved to be slightly more effective in improving adolescent rates, with an 8.7 percent change in percentage between the baseline and follow-up, as compared with the in-person group's 7.5 percent improvement in rates. The control group improved just 3.8 percentage points. In addition, webinars were less expensive per visit ($50.35 vs. $75.52 in person). Overall, program delivery and management were straightforward; the biggest challenge was scheduling (and rescheduling) the webinars.

Implementing State Requirements for Adolescent Vaccines: Lessons Learned (Indiana, 2011)

Indiana law required the Indiana State Department of Health to adopt rules mandating that school-age children younger than 19 receive additional immunizations against meningitis, varicella, and pertussis. For the 2010-2011 school year, Tdap, MCV4, and varicella vaccines were required for all students in grades 6-12. In 2010, local Indiana health departments administered 1,355 doses of varicella, 2,284 of Tdap, and 2,283 of MCV4, supported by the state health department. The best practices identified included collaborating through a multicounty immunization task force; making the most of walk-in clinic days by extending hours of operation, especially prior to the school year start; utilizing volunteer staff, student nurses, and other health department staff to manage traffic flow during busy periods; and photocopying immunization records as back up. An important lesson learned was that parents did not make getting their child immunized a priority until the possibility that they couldn't attend school became real. While there were challenges overall, the prior year's H1N1 epidemic and funding from the federal, state, and local levels helped ensure maximum preparedness with resources and capacity/management expertise.

Building Physician Support for Vaccination of Adolescents in Schools: A Survey of Colorado Pediatricians and Family Physicians (Colorado, 2011)

In 2011, a survey of Colorado family physicians and pediatricians measured physician support for school-located adolescent vaccinations. The research noted that while the majority of adolescent vaccines were administered by primary care providers, financial barriers were making it difficult for those healthcare professionals to administer all needed vaccinations Prior research and survey data suggested making vaccinations available at local schools to address this growing problem. Overall, 80 percent of surveyed physicians believed that school-located vaccinations would increase vaccination rates. However, 50 percent of physicians also believed that if their patients received school-located vaccinations, it could result in increased difficulty ordering vaccines and negative financial impact, either from wasted vaccines or patients not attending well-child visits. The majority (71 percent) also believed the practice would make it difficult to maintain accurate patient records. Increased efforts to understand and address physician concerns surrounding school-located vaccinations could result in great physician participation in future programs. This was seen as a critical component for success, given the link between physician participation and sustainability in school-located vaccination programs.

Building a Cross-Channel Adolescent Immunization Platform in Michigan (Michigan, 2011)

The Michigan Department of Community Health (MDCH) made a focused effort to increase the **vaccination of adolescents** by requiring all sixth-grade students receive the Tdap and meningococcal vaccines beginning in 2010, as well as through a cross-channel engagement program. Elements included a website and poster aimed at adolescents and parents, and a provider toolkit. While there was solid, varied awareness and use of each material by each audience, an overwhelming 90.2 percent of adolescents who participated in a survey got information about vaccines from MDCH, demonstrating the impact and authority of public health officials. Research also showed the greatest barrier to getting vaccinated remained patients' and parents' lack of knowledge of diseases and vaccines. Other key insights also emerged: targeted messages are critical to reaching different audiences effectively; audiences should be diverse, including parents, adolescents, and supporters; partnerships can support increased success; and healthcare providers should serve as role models and immunization advocates.

Improving Adolescent Immunization Rates with Friendly Competition (North Carolina, 2011)

The North Carolina Community Health Center Association provided an overview of the Adolescent Immunization Competition held to increase meningococcal vaccination rates. Community health centers across the state participated through the AFIX process of assessment reports for initial and follow-up rates, feedback through data, incentives, and exchange of best practices. Recruitment was done through an informational webinar, clinical newsletters, and followup via email. Adolescent immunization rates improved 26 percent overall during the month of April. Success was credited to the AFIX process on the provider side, as well as direct followup with parents, including letters and front-desk-initiated phone calls.

Getting Vaccinated to Prevent Cancer (South Dakota, 2011)

The South Dakota Department of Health created a parent- and adolescent-friendly information summary outlining the signs and symptoms of human papillomavirus (HPV) and urging boys and girls aged 11 to 26 years to get vaccinated. The brief, yet impactful report provided a detailed look at the toll of cancer in South Dakota; seven percent of all cancers diagnosed in South Dakota, and 526 cancer-related deaths from 2001 to 2008, may have been caused by HPV. If HPV was prevented, significant numbers of cancer diagnoses and deaths in South Dakota could potentially be avoided.

Spreading the Word, Not the Disease: An Online and Community-Based Program (Ohio, 2011)

With Ohio's adolescent immunization rates below the national average across the Tdap, MCV4, and HPV vaccines, and significant population gaps in coverage, the "Spread the Word, Not the Disease. Get Vaccinated" campaign set out to raise teens' and parents' immunization awareness and provide continuing education to healthcare providers. The department **utilized social media** and posters embedded with a QR code to reach teens and parents; a **mobile site** and microsite were built to provide in-depth information and downloadable information sheets for parents and providers. The digital components were supported by a PSA and a locker magnet with a built-in immunization schedule. At the time of reporting, the PSA had received more than 60 million views, and there was a steady increase in "likes" and followers on Facebook and Twitter, respectively. The Ohio Department of Health noted that all materials were easily customizable, which was beneficial to the program. Obstacles that others may face in running a similar program were also noted, including internal policies regarding social media, technology, and staffing limitations.

Providing Guidance on School-Based Vaccination Clinics (New York, 2009)

CDC and the New York State Department of Health (NYSDOH) were concerned that the 2009 H1N1 influenza virus could result in a particularly widespread and severe influenza season. In response, the New York State Education Department and NYSDOH's Bureau of Immunization compiled a guide on school-based vaccination clinics to provide information for schools partnering with vaccination providers to conduct H1N1 influenza vaccination clinics. Coordinating vaccination of students with schools improved efficiency and reduced costs from a public health perspective, increased access to students to provide more vaccinations, decreased burden on local healthcare providers, and reduced school absenteeism for both vaccinated and unvaccinated students. The report details practical steps on acquiring consent forms, providing education materials, and managing a vaccination day, to support effective implementation.

Training Presentation by the State of Hawaii on Immunization and Examination Requirements for School Entry (Hawaii, 2013)

To reduce illness and the spread of disease, Hawaii requires physical exams, tuberculosis exams, and immunizations for all incoming school-aged students. The only exemptions for these requirements are medical or religious, neither of which apply to the tuberculosis exam. The report, created in an effort to maximize student compliance, details more specific requirements, forms that need to be completed—including what to look for to ensure accuracy and completeness—and reporting processes.

ADULT VACCINATION

While vaccinations are recommended throughout the lifespan, adult vaccination coverage remains low for most routinely recommended vaccines and well below Healthy People 2020 **targets**. For example, only 16.6 percent of high-risk persons aged 18 to 64 in 2009 had ever received a pneumococcal vaccination; the Healthy People 2020 target is 60 percent. Creative approaches to adult immunization are necessary to change the current trend. The examples in this section aim to share programming successes in reaching the adult population.

To see the CDC's *Recommended Immunizations for Adults* by age, visit **http://www.cdc.gov/vaccines/schedules/downloads/adult/adult-schedule-easy-read.pdf**

FEATURED BEST PRACTICES

Assessing the Zoster, Pneumococcal, and Influenza Vaccines with Meals-on-Wheels Recipients

(Utah, 2011)

In 2007, a subcommittee of the Utah Adult Immunization Coalition was formed to promote use of the zoster and pneumococcal vaccines. The subcommittee partnered with Utah's Meals-on-Wheels program to engage and understand a homebound population that was mostly elderly, low income, and likely to be at high risk for health complications. To reach this population, the subcommittee leveraged an existing survey, adding information about the zoster and pneumococcal vaccines. Aging service directors were invited to participate in reviewing survey outcomes, as were regional immunization program coordinators, who were asked to support follow-up vaccination of respondents.

Over the course of two years, the number of districts participating increased by 50 percent, with 100 percent participation by 2010. The survey return rate also increased from 24 percent to 32 percent. The data showed that 82 percent of Meals-on-Wheels respondents received the flu vaccine during the 2007-2008 flu season, which decreased to 76 percent during the 2009-2010 season. A similar decrease was seen with the pneumococcal vaccine, with a 72 percent immunization rate in 2008, compared with 68 percent in 2010. Zoster rates were low at 7 percent in 2008 and 9 percent in 2010.

Refining survey questions to hone in on the best results presented a challenge, as did securing the participation of aging directors and immunization coordinators statewide. Logistics of survey distribution and collection, as well as vaccination followup, especially in urban areas, also strained resources. But, the overall effort was worthwhile: The cost was minimal (printing and postage), the survey design was refined to be more effective, and the efforts provided a baseline for awareness and vaccination rates in the high-risk group.

Highlighting Demonstrated and Promising Practices that Improve Older Adult Vaccination Rates (United States, 2012)

The **National Adult Vaccination Program**, led by the Gerontological Society of America, has focused on improving the immunization rates of older adults. This population is at risk for impaired immune response, medical comorbidities, and more, which can make them more vulnerable to vaccine-preventable diseases. A **paper** in *Policy Aging Report* identified four key interventions to improve rates: those that target access, consumer demand, provider systems change, and policy. By focusing on these strategies, supported by a well-planned quality improvement approach and systematic reviews to measure effectiveness, stakeholders can make a marked difference. The paper provided more detailed recommendations as well, such as rewarding providers for increasing their immunization rates and encouraging the elderly to get immunized at places they already frequent (e.g., the pharmacy).

Harnessing Collective Resources to Increase Influenza Vaccination Rates in High-Risk Adults (Massachusetts, 2013)

During the 2011-2012 influenza season, the Massachusetts Adult Immunization Coalition worked to increase the influenza vaccination rates of high-risk adults aged 18 to 64. Coalition members engaged the community through public service announcements, postcards, e-newsletters, education classes, and other key awareness efforts. While each stakeholder (insurers, public health officials, and associations) created its own engagement activity, the efforts of the six members made a marked collective impact. As a result, influenza vaccination rates for high-risk adults increased four percentage points, from 53 percent in 2010-2011 to 57 percent during the 2012-2013 season.

Seeking to Vaccinate Uninsured and Underinsured Adults—and Succeeding (Minnesota, 2013)

With no federal program to cover uninsured and underinsured adults, the Minnesota Department of Health (MDH) set out to stabilize vaccine availability for adults by awarding vaccines to selected facilities through a three-year program, from January 2011 to September 2013. Section 317 discretionary funds were used to purchase the vaccine. They received more than 160 applications requesting a total of $10 million of vaccines; 109 clinics (156 total sites) were awarded approximately $1.5 million worth of vaccine. In year one (2011), hepatitis A, hepatitis B, HPV, MCV4, MMR, PPSV23, Td, Tdap, and Varicella were offered. In years two and three, influenza and zoster were added, respectively. Five key MDH program elements were developed to amplify vaccine uptake: a needs assessment, patient and provider educational resources, resources for the Minnesota Immunization Information Connection, an adult assessment report, and a reminder-recall pilot project.

Increasing Influenza Vaccination Among Pregnant Women (Rhode Island, 2011)

Pregnant women are at increased risk of complications related to influenza. CDC recommends that pregnant women get vaccinated during influenza season; however, the coverage rate is still low. During the

2009-2010 influenza season, the Rhode Island Department of Health explored influenza vaccine coverage among pregnant women within the state to identify barriers and facilitators of vaccination during pregnancy. After analyzing Pregnancy Risk Assessment Monitoring System data from 2004-2010, the state found a dramatic increase in vaccination among pregnant women, from 22 percent in 2004 to 66 percent in 2010, with the biggest increases occurring in the 2009-10 season. Seventy-three percent of women who were vaccinated received a healthcare provider's recommendation. Thirty-three percent noted that they did not get vaccinated because they were concerned about vaccine safety for their babies, and 29 percent were worried about their own safety. To encourage women to get vaccinated, the report recommended educating concerned women about the benefits of vaccination.

Reaching Out to Pharmacists Results in Increased Use of Registries (Washington, 2011)

In January 2012, the Washington State Department of Health set out to expand the role of pharmacies in providing adult vaccines, partnering with the Washington State Pharmacy Association (WSPA). They received funding from the Adult Immunization Prevention and Public Health Fund Grant, and, with those funds, focused on achieving their goal by increasing pharmacists' use of the Washington State Immunization Information System. Program coordinators from the health department engaged pharmacists directly, increasing education and awareness efforts about benefits of the registry. Ongoing communication and education were key, with WSPA staff reaching out to pharmacy leadership, sending out emails, faxes, and other materials, and providing education to individual pharmacists. At the time of the report, the number of pharmacy user agreements for vaccinations had gone from 10 to 27 (chains and local), representing 59 percent of all community pharmacies in Washington. Within six months of program implementation, one large chain went from 828 immunizations to 147,055. As for smaller pharmacies, 42 percent of community pharmacies are now reporting their immunizations to the registry.

Partnering to Increase Adult Immunization (Pennsylvania, 2011)

To increase adult immunizations, the Pennsylvania Department of Health's Division of Immunizations created an adult immunization referral program with the Pennsylvania Pharmacists Association and the Pennsylvania Academy of Family Physicians. The program identified and created a list of all pharmacists in Pennsylvania licensed to immunize. The list was sent to physicians who, if they did not provide vaccines themselves, could send adults to the pharmacy with prescriptions to be vaccinated. The program's benefits included an increased number of adults getting vaccinated, utilizing pharmacists as alternative vaccinators and ensuring the maintenance of pharmacists' skills. Pennsylvania noted this program can be easily used by other states, one obstacle

possibly being a lack of third-party reimbursement for vaccines and the administration fees. However, Pennsylvania was able to resolve this issue through collaboration with their state insurance department.

Increasing Immunization Rates Through OB/GYN Practices (United States, 2013)

The American College of Obstetricians and Gynecologists, in partnership with CDC and ASTHO, launched an effort to inspire OB/GYN members to recommend vaccinations for women. Their action plan included development of a **website** that provides toolkits, immunization alerts, facts, and vaccine safety information, as well as direct mailings to 35,000 OB/GYNs on the seasonal influenza and Tdap vaccines. Through the efforts of this program, 19 percent of OB/GYNs were giving more vaccine doses, 86 percent of practices identified a vaccine coordinator, and 41 percent were actively working on an office vaccine program.

Using Emergency Resources to Prevent the Spread of Whooping Cough (Washington, 2012)

Washington state declared a pertussis epidemic in April 2012. The number of cases had skyrocketed from about 100 in 2011 to more than 1,100 in 2012, the worst outbreak in Washington since the 1940s. Then Gov. Chris Gregoire stressed the need for both children and adults to be vaccinated, as the disease is most commonly passed on by infected adults whose vaccinations are not up to date. To address the epidemic, the state put $300,000 toward increased public awareness and outreach efforts and increased vaccine supply. Provider education focused on recognition of clinical presentation, appropriate testing, treatment, and prevention. **In addition**, the health department established an incident command center to coordinate surveillance and response activities. Overall, 140 percent more adults were vaccinated compared with the prior year (82,453 vs. 34,171 doses).

Maximizing the Workplace as an Opportunity for Immunization (Minnesota, 2013)

To understand the needs and opportunities to vaccinate Minnesotans in the workplace setting, the Minnesota Department of Health convened an advisory group, conducted a literature review, and reviewed results of two surveys—one with small businesses (fewer than 250 employees) and one with larger companies. The surveys showed that a majority of all businesses offered the influenza vaccine (54 percent of small businesses and 87 percent of large businesses), but only 8 percent of small companies and 32 percent of their larger counterparts offered Tdap. Primary barriers for small employers were employees on varying shifts and some rarely at the worksite; large employers found time and effort, coordination of logistics, and employee downtime as key detractors.

HEALTHCARE PROVIDER VACCINATION

Healthcare Provider Vaccination

Immunization policies, mandates, and exemptions for healthcare workers vary from state to state. For example, 18 states have no immunization requirements for **hospital employees**. Of states that do, the hepatitis B vaccine is most often offered or required; three states have full influenza mandates. In addition, seven states outline specific exemption policies for hospital employees for medical, religious, and philosophical reasons. Twenty states have no requirements for **ambulatory care** healthcare professionals; among states that have requirements, five states specify exemption policies.

Successful healthcare provider vaccination programs protect individuals who are critical to improving the health of the population across the United States and its territories. Importantly, successful healthcare provider vaccination programs protect patients, as well as individuals who are critical to improving the health of the population across the United States and its territories. This section details some of the most effective examples.

FEATURED BEST PRACTICES

Sharing What Works with Vaccination Clinics for State Employees

(Arkansas, Arizona, Indiana, Utah, 2010)

Vaccination clinics are critical in protecting the health of state employees and the public they serve. The practices of four states in implementing H1N1 clinics in January 2010 were studied; their methods differed greatly depending on their resources and needs.

Location was a key driving factor for Arkansas and Arizona. The majority of the Arkansas state employee immunization clinics were centralized in government buildings in Pulaski County, home to the state capital of Little Rock. Arizona aimed for a broader reach, reaching various government buildings across the entire state through a partnership with Benefit Options Wellness, a health insurance and wellness program provider.

The other states specifically targeted employees in certain areas of the government. The first clinics held in Indiana focused on members of the Indiana General Assembly and the health department. Subsequently, state legislators and the health department had their own clinics to expand the offering to a broader group of state employees. Utah held two H1N1 clinics for its state employees, the first of which was held for health department employees and their families, with proof of insurance.

Regardless of approach, the vaccination clinics attracted large numbers of state employees, potentially due to their central locations, accessibility within or near employees' workplaces, and willingness to vaccinate family members. In Utah, for example, more than 1,900 employees and their family members were vaccinated through these programs.

Learning From a Strong Healthcare Personnel Immunization Effort

(Maryland, 2011)

The Maryland Healthcare Personnel Immunization Initiative (MHCPII), a partnership between the Maryland Partnership for Prevention and the Maryland Department of Health and Mental Hygiene's Center for Immunization, was created to increase heathcare personnel immunization rates for recommended vaccines. Funded by both organizations, the initiative provides grants, technical assistance, and resources to support campaigns and collects data on facility-specific vaccination rates. The grants funded a variety of projects, including purchasing vaccines, creating educational materials, and employing additional staff members. Grantees and program participants include local health departments, long-term-care facilities, private medical providers, assisted living facilities, and colleges and universities.

Among other programs, MHCPII developed a toolkit and implemented the Best Practices Challenge, a yearlong effort offering grants to identify best practices in healthcare personnel vaccinations. A six-year review of program activities showed that the most successful facilities had common factors, including free vaccinations onsite, standing vaccine orders, declination forms to be signed by vaccine refusers, more than two methods for administering vaccinations, more than three methods for promoting them, and incentive programs.

The challenge helped Maryland public health officials understand that most healthcare professionals know that vaccinations work. And with a yearlong program garnering support from senior-most staff and peer-to-peer champions, combined with incentives (large or small), grants, and technical assistance, public health officials could build stronger programs to ensure more healthcare personnel were successfully vaccinated.

Providing Data, Examples, Templates, and More: Maryland Healthcare Personnel Immunization Initiative Toolkit (Maryland, 2010-2011)

In 2011, the Maryland Partnership for Prevention and the Maryland Department of Health and Mental Hygiene co-sponsored the Maryland Healthcare Personnel Immunization Initiative toolkit, which aimed to raise awareness, both locally and nationally, about the importance of vaccination among healthcare professionals. The toolkit, produced annually since 2005, highlighted several campaigns that have successfully boosted vaccination among healthcare professionals and provided a check list of components utilized by some of those programs. These included sponsoring a kick-off event, making vaccines available to employees on all shifts, offering free vaccines to employees, and administering vaccines under a standard order protocol (which includes requesting staff who decline vaccination sign a declination form that includes their reason for not getting vaccinated)—all to increase awareness and vaccination rates.

Succeeding with Mandatory Immunization Programs in a Healthcare Setting

(Pennsylvania, 2012)

In 2011, the Pennsylvania Department of Health released a series of case studies reporting the positive results of several mandatory vaccination programs for healthcare employees, in an effort to help others learn from successes with immunization mandates. The Children's Hospital of Philadelphia's mandated influenza vaccination program, during the 2009-2010 season, achieved 100 percent participation from its 9,500-person community. Presented as a safety imperative, the program succeeded because the hospital defined its target population early and clearly publicized the vaccinations. The local managers provided followup, action plans, and a robust tracking system to make sure every employee was up to date.

The Hospital of the University of Pennsylvania adopted a mandated influenza vaccination program in 2011 and saw vaccination rates nearly double from 54 percent in 2008-2009 to 99.3 percent post-mandate. The program was established as a condition of employment and included all employees, volunteers, students, and vendors. The hospital provided a myriad of opportunities to receive vaccines, making them available in all inpatient units, clinics, and nonclinical sites, as well as a walk-in clinic. Adding to the success were a detailed exemption process and a strong tracking system. In addition, employees who received vaccinations were given stickers verifying their status, which were worn with pride.

Similar successes in significantly increasing vaccination participation through mandates are detailed for the Main Line Health System, the Abington Memorial Hospital, and the Geisinger Health System as well.

UNIVERSITY OF PENNSYLVANIA HOSPITAL WORKERS

90% FEEL OBLIGATED TO BECOME VACCINATED

85% THINK VACCINATION SHOULD BE MANDATORY

Facilitating Mandates to Immunize Healthcare Personnel

(Rhode Island, 2013)

The Rhode Island Flu Task Force formed in August 2011 with approximately 50 members, including epidemiologists, physicians, nurses, public health professionals, pharmacists, college and university personnel, and healthcare facility administrators. The healthcare worker influenza vaccination rate in Rhode Island was 65 percent when the group was formed, which sparked a focus on ensuring those who administer vaccinations were up to date themselves.

The resulting initiative, launched in October 2012, was called "**one of the country's broadest, most ambitious measures**" to vaccinate healthcare workers by the 2013 Immunization Excellence Awards. The task force drafted regulations requiring that all healthcare workers be vaccinated, unless they had a medical exemption. Later, the rules were amended to add that those not vaccinated were required to wear surgical masks when working with patients.

Some obstacles arose during this process, including a **lawsuit** from two unions, SEIU and ACLU. According to the ACLU website, the union believed the requirement would "actually do very little to promote patient healthcare," while significantly undermining "notions of informed consent" and eroding "the use of other and more effective infection control practices." **SEIU dropped its lawsuit** in March 2013, after the widespread influenza season was declared over. In a ***Providence Journal*** article, SEIU noted "the [state health] department agreed to continue to meet with us to study the issue further and work towards a compromise. Our hope is to reach a resolution that helps to increase vaccination rates while also protecting healthcare workers' rights." That resolution centered on the requirement of surgical masks for those not vaccinated.

Despite the roadblocks, the Rhode Island Department of Health reported positive results from the mandate, with a 22 percent increase in the healthcare worker immunization rate from the previous season (from 65 percent to 87 percent) and a 10 percent increase in the general public's immunization rate from the previous season.

Educating Child Care Providers Gets Results

(Washington, 2011)

In 2011, the Immunization Action Coalition of Washington partnered with the Snohomish Health District to create a curriculum and provide a free distance learning course for child care providers titled "Immunizations: Protecting Child Care Providers and Children."

The coursework included information on how immunizations work, vaccine-preventable diseases, vaccine safety, and requirements in the child care setting. Course completion earned

participants two free continuing education credits, feedback on their course assignment, and a certificate of completion.

The course dramatically changed some people's views and actions and doubled attendance to 574 participants by its second year. Of the 460 participants who completed evaluations, 16.5 percent said they were going to get an influenza shot for the first time specifically because of what they learned in the course. Overall, 70.4 percent reported they would get an influenza shot.

The most popular response to an open-ended question about what participants liked best about the training was what they learned about vaccine-preventable diseases and immunizations. Approximately 98 percent of respondents said they would recommend the training to someone else.

Understanding and Addressing Why Healthcare Professionals Don't Get Vaccinated (California, 2011)

In March 2011, the California Department of Public Health's Healthcare Associated Infections Program initiated a review to increase the vaccination rate of healthcare professionals across the state. The group explored the reasoning behind low influenza vaccination rates, which included access, cost, perceived risk of infection, and perceived low efficacy. The group provided several strategies to boost influenza vaccinations among healthcare providers, such as making vaccines free and widely accessible; mandating education about the risk of severe illness to healthcare providers, patients, and their families; providing a live-attenuated influenza vaccine option; and offering incentives. Of note, mandatory signed declination, identified as a strategy that is growing in popularity, was found to have modest success (from 2007 to 2010) in increasing influenza vaccination among healthcare professionals. Most studies found that mandatory signed declination may not be effective as a stand-alone strategy.

Tripling Staff Immunization Rates: An Approach (Texas, 2012)

Nix Health is a hospital system located in San Antonio, Texas. Many Nix Health employees did not get vaccinated against influenza because of fears of contracting the virus. Education and outreach initiatives led by a registered nurse focused on dispelling that myth and quelling the fears associated with it. Nurses provided vaccine to employees using immunization carts that traveled throughout the facility. The program resulted in an increase of employee vaccinations from 35 percent in 2005 to 76 percent in 2010. The number of sick employees dropped by 85 percent within the same timeframe. In 2012, Nix Health achieved an immunization rate of 99 percent.

INFRASTRUCTURE

State health agencies' ability to quickly detect and respond to infectious diseases depends on having a **strong infrastructure** in place. Infrastructure is the foundation for planning, delivering, and evaluating public health. State health agencies require effective and efficient systems for preventing infectious disease morbidity and mortality, ensuring control of outbreaks and vigilance against diminishing diseases, and preventing and responding to reemerging and emerging infectious disease threats. **Advisory committees have been effective** in developing infrastructure policies to support such systems.

Immunizations are provided and administered by a broad range of stakeholders, from state and local health departments to community health centers, private providers, and pharmacists. The use of private providers, public health, community health centers, and pharmacies for vaccines can vary greatly state by state. **For adults**, the doctor's office is the most common place to receive the influenza vaccine (as seen in 2010-2011), with stores (e.g., supermarkets, drug stores) and workplaces the next most common.

Given the significant amount of collaboration required, creating an infrastructure to manage this environment is a true undertaking.

This section details examples of how states built programs to maximize the delivery of critical services within funding parameters.

Investing in local health departments leads to enormous ‘bang for the buck’ now and in the future.

Michigan Association for Local Public Health

FEATURED BEST PRACTICES

Proving the Return on Investment of Vaccination

(Michigan, 2013)

A 2013 report by the Michigan Association for Local Public Health (MALPH) explored key health investments and the value of public health services. The report discussed the vital role immunizations play in keeping the community safe and healthy, as well as the role of local public health departments in educating the public on vaccinations, tracking and reporting the number of people vaccinated, and distributing vaccinations for emergency outbreaks. Public health officials' crucial responsibilities in fighting and eradicating deadly infectious diseases included public education, administration, technical support, and surveillance and reporting for childhood vaccinations, influenza vaccinations, and emergency H1N1 vaccinations.

The data showed immunization to be of significant value. MALPH found that the ROI for childhood immunizations was $22 for every $1, with a total savings of $88 million in 2009 for the state; influenza vaccinations had an $11 to $1 ROI, with $91 to $141 saved per vaccination in direct medical costs. In Michigan, more than 487,990 doses of these vaccines were administered by local health departments in 2012. Importantly, these local health departments recorded childhood immunizations in the state registry, so that children who had not received the necessary vaccinations could be easily identified.

The report also discussed the local health departments' speedy and efficient emergency administration of H1N1 vaccinations during the 2009 outbreak. More than 1,483,000 people in Michigan received the H1N1 vaccine. To pay for the vaccines, local health departments received $19 million in federal emergency funds. Each vaccination cost an average of $13. According to the study, "In 2009, every dollar local health departments spent on H1N1 vaccinations provided up to $11 dollars in direct and indirect savings."

Implementing Vaccine Accountability: A Comprehensive Effort (Washington, 2012)

Washington is a universal vaccine purchase state, utilizing state, Vaccines for Children Program, and Section 317 funds to provide free vaccines to all children under the age of 19. In receiving publicly funded vaccines, providers sign an agreement stating they will abide by state and federal accountability requirements. To monitor progress, state and local health department staff require monthly reporting from providers and conduct site visits to ensure compliance and offer resources to aid in meeting standards. This model document details different aspects of the state's accountability program, including annual training requirements for fraud and abuse, data tools to ensure immunization of eligible children, and procedures to vaccine returns for excise credits.

Instituting a New Approach: Vaccine Purchasing Pool Pilot Program (Vermont, 2011)

Vermont launched its Vaccine Purchasing Pool pilot program in 2009 to provide universal access to recommended immunizations. The pool allows the health department to buy both adult and pediatric vaccines at the lowest possible price, administered to anyone who gets care in Vermont from Vermont-licensed providers. Very detailed **implementation procedures** on such topics as healthcare practice participation, immunization registry, and insurer participation and fee assessment are presented for providers, Vermont's immunization registry, and insurers. To fund the program, Vermont collects money from insurance companies based on the share of Vermont residents they cover. This has reduced overall costs for vaccines, lessened administrative burdens for providers, and made it easier for people to get vaccinated, no matter their insurance status.

Approaching an Infrastructure at the Statewide Level: Nevada 2013 - 2017 Five Year Strategic Plan (Nevada, 2013)

The Nevada State Immunization Program, funded by CDC, has four sections: VFC, Special Projects, Perinatal Hepatitis B Prevention, and Nevada WebIZ, the statewide immunization registry. Ranked 40th among all states in the immunization of children aged 19 to 35 months, the program developed a strategic plan to bring rates for this population to at least the national average, to improve adolescent immunization rates, and to improve adult rates for influenza and Tdap vaccinations. The program's approach focused on prioritizing children aged 19 to 35 months, looking at strategic plans of other VFC states, recruiting more VFC providers, identifying an immunization champion, partnering with other public health programs, obtaining a CDC public health advisor, and encouraging health plans to promote vaccinations to their members. In addition, parent and provider focus groups provided insightful recommendations for the plan, from creating a public vaccination record portal for parents to improving the insurance companies' vaccination reimbursement.

IMMUNIZATION INFORMATION SYSTEMS AND MEANINGFUL USE

Doctors' and hospitals' use of health information technology has more than doubled since 2012. As of **June 2013**, more than 309,000 healthcare providers received payment for participating in the Medicare and Medicaid Electronic Health Record Incentive Programs. This means **more than half** of those eligible to participate have demonstrated meaningful use of electronic health records.

Specific to vaccinations, an immunization information system (IIS) collects and consolidates vaccination data from provider sites, providing important tools and information to design and sustain effective immunization strategies at the program and provider levels. Use of IIS is on the rise. For example, **19.2 million U.S. children under the age of six** (84 percent) had data entered into an IIS in 2011. That number drops to **53 percent for adolescents and 24 percent for adults**. The **policy environment supports** the use of an IIS, with 27 states authorizing an IIS and 14 mandating reporting.

The following best practices demonstrate ways states have achieved successful uptake of electronic health records and IIS.

FEATURED BEST PRACTICES

Improving Data Quality with the Arizona State Immunization Information System (ASIIS)

(Arizona, 2011)

Since 1998, Arizona has required reporting of all vaccines administered to children from birth to 18 years of age through ASIIS. ASIIS operates on input from about 1,100 provider sites, with 4.3 million records, using a variety of reporting methods. Faced with out-of-date records, duplications, and incomplete records, the Arizona Department of Health Services focused a pilot on its Sentinel Site, seven counties comprised of 185,000 children under age 18, to improve data quality statewide.

The Sentinel Site region is a predominantly rural area, with little patient changeover due to limited provider options, and many paper reporting sites that do not enter data into ASIIS or track the MOGE (Moved or Gone Elsewhere) status of their clients. After finding a significant amount of potentially "non-active" clients (4,500) through a visit to one pilot site, the ASIIS staff organized the large client list of that site into smaller, more manageable lists; children under 36 months of age were targeted first. This approach was critical to success, and ASIIS staff's offer to code records for the provider site further facilitated cooperation. In less than three months, duplicate records were identified and corrections made. MOGE coding also supported better completion rates.

To identify duplicate records, ASIIS took multiple approaches, building off of its already robust algorithm. Looking for probable matches, criteria such as name, guardian name, mother's maiden name, and address were used. Searching smaller date of birth ranges made outputs more digestible. And, looking at factors such as Social Security numbers and baby identifiers not only helped reduce duplication, but also yielded valuable

opportunities to clean data and ensure birth dose Hepatitis B vaccine records were up to date, respectively. While the process is time consuming process, limiting lists to a manageable size was a success factor in de-duplication. Other lessons learned included the need to automate the generation of tracking reports and the importance of working with reports most likely to match first.

Implementing Dose-Level Accountability: Opportunities and Challenges

(Colorado, 2012)

Colorado's Immunization Information System (CIIS) tracks vaccinations across 1,600 clinics, hospitals, schools, and health plans. CIIS administrators set out to improve data reporting and dose-level accountability for Vaccines for Children providers, who had 70 percent participation rates, compared with 100 percent participation from public and community health providers. Dose-level accountability was defined as VFC eligibility of the patient and the funding source used to pay for vaccination at the time of the vaccination.

CIIS administrators issued a benchmarking survey to providers and conducted a data review to determine completeness of the data. They found that only 12 out of 126 VFC providers interested in using CIIS for benchmarking had sufficient data.

Program challenges included migrating data from the older systems to the new CIIS system, especially information regarding payor source in relation to eligibility/funding sources, and a disconnect between the CIIS and VFC sites. This was further compounded by electronic reporting issues, such as electronic health records that did not capture the funding source or VFC eligibility, or disconnects between provider records and clinic workflow.

While challenging, the review of the processes and systems led to overall process improvement, greater program integration, a formalized evaluation process, and more open dialogue. Moving forward, CIIS learned that at the very start of entering and integrating data into CIIS, dose-level accountability needs to be defined and IIS training for VFC staff must occur. In addition, benchmarking data and potential programmatic issues need to be examined early, IIS data need to be comprehended prior to provider outreach, communications materials should be crafted jointly by CIIS and provider representatives to support understanding, and there should be general acceptance of a long, iterative process. To support a stronger system, CIIS managers recommended inventory management training, greater proactive engagement with providers, and adding electronic health record questions into doctor-patient visits.

IMMUNIZATION INFORMATION SYSTEMS AND MEANINGFUL USE

Valuing Data in a Disaster: Louisiana Immunization Network for Kids Statewide

(Louisiana, 2012)

The Louisiana Health Care Quality Forum (LHCQF), a private nonprofit, was formed in the wake of Hurricanes Katrina and Rita to address the healthcare issues that arose after the storms. LHCQF received funds from the Office of the National Coordinator for Health Information Technology to become both a source and a repository for Louisiana health information technology, as well as to develop a health information exchange (HIE).

Before LHCQF existed, the Louisiana Immunization Network for Kids Statewide (LINKS) was already in place. LINKS used a simple web-based system to input data, with potential to extend its scope to service all Louisiana residents, not just children. This program remained functional after Katrina, due to backup servers, and was used to help access data for displaced persons all over the country, saving time, money, and needless vaccinations. Additional functionality was developed in the years after Katrina to handle vaccine inventories, ordering, immunization data from school nurses, and mass events (e.g., the H1N1 pandemic).

LHCQF worked to integrate LINKS to other provider electronic systems **by July 2012**. A hub was developed to link LINKS with the statewide HIE, giving providers the option of submitting data to LINKS directly or through the HIE. Ongoing collaboration from a broad range of stakeholders ensured engagement, uniformity of message, and forward progress. Efforts are ongoing to raise further awareness of LINKS and the opportunities it presents for more efficient data management. The program demonstrates why integrated electronic health records are preferred over older information systems.

Reducing Vaccine-Preventable Disease Through Immunization Registries

(Michigan, 2012)

The Michigan Department of Community Health's Division of Immunization sponsors the Michigan Care Improvement Registry (MCIR), created in 1998 to collect reliable immunization information and make it accessible to authorized users online. The online database brings together immunization records from multiple providers, helping to prevent vaccine-preventable diseases and over- and under-vaccination, while ensuring providers have access to current patient information.

IMMUNIZATION INFORMATION SYSTEMS AND MEANINGFUL USE

As a partner, Michigan's Health Information Technology Regional Extension Center (M-CEITA) coordinates and assists with provider upgrades to electronic health records to facilitate increased use of electronic recordkeeping. A collaboration of MCIR, Medicaid and M-CEITA ensures providers achieve **Meaningful Use** Stage 1.

To streamline data collection and increase submissions, MCIR and Medicaid set up a one-stop shop **website** for providers to test their ability to submit data for any of the three public health measures (electronic lab reporting, syndromic surveillance data, and immunization data). The site was funded by the state Medicaid health IT plan, with additional support from the state's health information exchange and CDC. As of spring 2012, approximately 2,167 providers had tested immunization data submission.

MCIR credits strong relationships with the vendor and provider communities as key to ensuring success. The intra-state organizational cooperation has helped ensure consistent and effective messaging, and proactive communication with vendors and providers facilitated participation in MCIR.

"Overall, education, having the right message, and getting it out to the provider and vendor community are the most important," to ensure the successful achievement of Meaningful Use Stage 1.

MCIR

IMMUNIZATION INFORMATION SYSTEMS AND MEANINGFUL USE

Using Barcode Scanning Technology to Improve Data Quality and Efficiency During Mass Vaccination Events (Wyoming, 2012)

The Wyoming Immunization Section (WIS) received a CDC grant to enhance the integration of its barcode scanning functionality into the Wyoming Immunization Registry to improve data quality and the efficiency of patient-level data during mass vaccination events. WIS partnered with the Wyoming Department of Transportation to access the two-dimensional barcodes on drivers' licenses and obtain demographic data that could be easily cross-referenced in the database or used to create a new patient record. A broad range of healthcare providers tested the functionality, with public health officials advising, training, monitoring, and evaluating along the way. At the time of the report, no other state had implemented this technology in a clinical setting. Benefits included:

- Reduced costs by saving time on data entry (one provider estimated time was reduced by two-thirds).
- Reduced the burden on staffing resources.
- Improved accuracy of patient records.
- Discovery of other methods to improve effectiveness and efficiency.

Benefitting New York State Health Plans with IIS Data (New York, 2011)

The New York State Immunization Information System (NYSIIS) has been statewide since 2008, with the exception of New York City. The New York State Department of Health conducted a survey to evaluate its performance; 11 health plans participated that were not using the system directly (only analyzing data extracted from it). NYSIIS found the following key benefits may be helpful to communicate when garnering support and increased participation:

- A high level of ease in matching clients whose immunization data sets were supplied by health plans.
- Facilitation of outreach of members, management of care, in-house analysis of rates of coverage, and finding gaps in care.
- Complementary to a pay-for-performance program.
- Saving time and money.

Supporting Better Identification and Management of Perinatal Hepatitis B Cases (Georgia, 2011)

The Georgia Department of Public Health created a perinatal hepatitis B case management system to improve the identification of hepatitis B infected women and the case management of exposed infants. Prior to 2011, hepatitis B lab reports were

IMMUNIZATION INFORMATION SYSTEMS AND MEANINGFUL USE

entered manually, pregnancy was determined through a separate call to the provider, and then case managers followed up. A new system was created to link mothers' and infants' electronic records. Now, infant records, including electronic birth certificate information, are located in the state electronic notifiable disease surveillance system (SendSS). The web-based perinatal module allows for a paperless system with real-time data exchange from vital records and Georgia's Immunization Registry (GRITS), thus reducing burden related to data entry, redundancy, and transcription errors. Additionally, local health departments can access the system and document their case management activities, and state and local departments can jointly view case status.

GENERAL TRENDS AND INSIGHTS INTO HEALTH INFORMATION EXCHANGE

Identifying the Landscape and Path Forward for the Health Information Exchange Roadmap (United States, 2012)

In April 2012, the National eHealth Collaborative released the Health Information Exchange Roadmap to provide a "**landscape and path forward**" for increased HIE adoption. Although HIE is still in its infancy, it has the potential to change and improve the way healthcare is administered and managed. This was brought to life through nine different programs exchanging health information online, including **HealthBridge**, which uses standards-based HIE as an intermediary for immunization reporting from HealthBridge participants to CDC. These programs demonstrated key lessons:

- The guiding principle in achieving widespread HIE use should be to focus on what is best for the patient.
- Building trust with stakeholders and ongoing alignment is necessary to delivery.
- There is no one-size-fits-all approach; determine what model works based on local market characteristics and community needs.
- Government funds should not be depended on to sustain a program; budget and project how funding will be utilized.
- Value-based (as opposed to volume-based) care models require widespread, robust HIE.
- Key areas for development include business models for sustainability, quantifiable measures of success, best practices for phasing HIE services, and governance and stakeholder engagement.

Revealing Secrets of Heath Information Exchange Success (United States, 2011)

In 2011, the National eHealth Collaborative conducted a study of 12 enterprises that were seen as leading in the HIE space. In addition to providing profiles on each enterprise, the study identified overarching themes and solution trends that have led to HIE success, including aligning stakeholders with HIE priorities; maintaining a consistent brand identity and role as a trusted, neutral entity; and valuing an understanding of clinical workflows

and managing change. The report also identified several keys to future success. Ensuring growth potential was paramount, with the report noting that all 12 successful enterprises were poised to grow in and outside of their respective markets. The strategy for success was summarized as "innovation, continuous learning, and business discipline with the end goal of improving quality, care coordination, and cost effectiveness of healthcare."

Breaking Down the Barriers with Health Information Exchange (United States, 2010)

An April 2010 article in The Wall Street Journal profiled an initiative from three Colorado health systems to create an electronic health record exchange program for the exchange of medical records and data of more than a million Colorado residents. Although it was noted that programs such as these have consistently improved patient care, at the time of the article, their adoption rate was very low, with 10 percent of hospitals nationwide and less than 7 percent of physicians' offices utilizing full-fledged electronic records. Stephen Lieber, CEO of the Healthcare Information and Management Systems Society, said that by 2015, "Americans ought to be able to expect there will be a relatively widespread exchange of health information in a safe and secure way." Privacy concerns and interoperability were named as two hurdles for nationwide adoption of health information exchange. Companies that have succeeded in implementing these programs named standardized legal practices and operating systems across partners as essential components of an effective HIE initiative.

Delivering Better Care Through Sharing Electronic Medical Records (United States, 2012)

The *Health Affairs Blog* featured the one-year anniversary of the Care Connectivity Consortium, a partnership of five top health systems (Intermountain Healthcare, Geisinger Health System, Group Health Cooperative, Kaiser Permanente, and Mayo Clinic) aimed at increasing access to and efficiency of electronic patient information. The initiative, described by the blog as a "landmark collaboration," was said to be significant because of its goal to secure sharing of patient information regardless of the vendor used to create the electronic medical records (referred to as "vendor-agnostic modalities"). The consortium was praised for its willingness to test data sharing across proprietary systems with its own funds. The article noted that all five members view the funding as an investment because increased access to electronic medical records resulted in better patient care, lower overall costs, and fewer medical mistakes.

COMMUNICATION

Communication is a critical component to ensuring the public understands the importance of vaccination and takes action to protect themselves and their loved ones. With the number of information sources expanding exponentially due to the explosion of online resources and social media, the rising influence of peer-to-peer communication, and a 24/7 dialogue representing all points of view, the communications environment has never been more challenging.

In addition to **ASTHO's communications toolkit**, the examples in this section cut through the communications clutter to reach their target audience effectively and increase vaccination rates.

Delivering on Communication Strategies and Partnerships During California's Pertussis Epidemic (California, 2011)

The California Immunization Coalition, a statewide nonprofit engaged in advocacy and education, presented its communications strategies from the 2010 California pertussis outbreak, where there were 9,477 confirmed, probable, and suspect cases. The coalition set out to educate drivers of public opinion, legislative staffers, providers, and media, as well as to support public health officials' media and marketing efforts. Traditional and social media were both used, which supported the enactment of a mandatory vaccination law for students in grades seven to 12 for 2011; since 2012, the mandate has been narrowed to seventh graders. Success in reaching target audiences was credited to consistent messaging, statewide media events during the school year in collaboration with the department of education, multichannel outputs (e.g., PSAs, web banners, billboards), and working with professional associations.

Using CDC Content: Low-Tech, Quick-to-Implement Tools for Web Sites (United States, 2011)

CDC has noted that it is far easier for state and local health professionals to utilize free CDC resources, especially

web-based communications, than to develop separate materials and tools with their own limited resources. CDC's materials are simple to use and can easily be integrated into existing resources. In particular, CDC presents all its **resources and instructions** in very user-friendly language, to leverage on an organization's own web site. This content syndication is already being used and tested in 47 states, including content to inform the public about immunization options, guide health professionals on reaching their audiences, and facilitate website development (e.g., web buttons, RSS feeds, widgets).

Showing How to Succeed at Social Media (United States, 2011)

The Immunization Action Coalition created a "Real Guys Immunize" campaign in 24 hours to encourage discussion around the role of men in their family's health. The topic was determined after a crowdsourcing exercise with health communication professionals from the California Department of Public Health, Immunization Branch, GAVI Alliance, Colorado Children's Immunization Coalition and BC/DC Ideas. The social media awareness campaign took place just before Father's Day and the World Cup and delivered engagement across multiple platforms. Facebook fans went up 224 percent, Twitter followers 138 percent; content received 800 YouTube views and 5,461 webpage views. The coalition credits its results to several key learnings:

- Enable easy file sharing among the team with a central email account.
- Hold a facilitated brainstorm session(s) to map out strategy and execution.
- Maximize productivity with smaller, focused teams and clear roles.
- Be creative and unique with a fun and catchy platform/tagline.
- Focus on achievable goals with a collaborative group.
- Track results and manage centrally with existing digital tools.

Delivering Plain Talk on Complex Topics (Washington, 2011)

The Washington State Department of Health shared best practice communication tips based on its experience engaging with the public. This was brought to life with examples of effective and ineffective word choices commonly used related to immunization, such as "germ" vs. "pathogen" or "tracking and monitoring" vs. "surveillance." The department emphasized several key tips in both developing programs and drafting content:

- Partner with an in-house communications expert.
- Leverage relationships with relevant people and organizations.
- Plan early and seek ongoing peer and target audience feedback.
- Be aware of your audience.
- Be concise in your message (think sound bites and elevator speeches).

- Imagine you are speaking to the reader when writing.
- Be careful with your word choice, favoring simpler and fewer words.

Talking to Parents About Vaccines: Communications Tips (California, 2012)

In January 2012, the Los Angeles County Department of Public Health released a set of guidelines to help healthcare providers discuss vaccinations with parents, particularly those considering not vaccinating their children. The guidelines, part of the county's Immunization program, identified "effective, empathetic communication" as a critical component in engaging unsure parents. The resource provided seven tips for healthcare professionals to create an open and honest dialogue with parents, including "take time to listen," "solicit and answer questions," and "use a mix of science and personal experience." Model supporting resources listed included those from the **American Academy of Pediatrics**, the **California Immunization Coalition**, **The Children's Hospital of Philadelphia**, **CDC**, **Every Child By Two**, and the **Immunization Action Coalition**.

Implementing a School-Based Flu Clinic: Promotional Toolkit (New Hampshire, 2013)

The New Hampshire Immunization Program's Vaccinate for Life! campaign compiled the 2013 School-Based Flu Clinic Promotional Toolkit, made available on the New Hampshire Department of Health and Human Services' website, for schools to utilize in their communication efforts. The toolkit's objectives were to help schools prepare for and organize school-based influenza clinics, inform parents and students about the benefits of school-based clinics, and clearly state the importance of vaccinating children against influenza. Materials ranged from recruitment and announcement letters to promotional posters and signage and a frequently asked questions document. The toolkit's documents are customizable and printable, so that users can insert relevant information about their school, partners, and clinic dates.

Reaching and Engaging Diverse Communities: Flu Vaccine for Everyone! (Massachusetts, 2011)

The Massachusetts Department of Public Health created the Flu Vaccine for Everyone! Flu Outreach Guide to help public health officials reach racial, ethnic, and linguistic groups that are commonly difficult to access. Many of these groups are underserved and have greater vaccination needs compared with the general population. To be effective, the guide encourages public health officials to tailor specific communications and work with the community organizations and leaders who regularly reach these populations. These include libraries, local politicians, spiritual leaders, business owners/leaders, local community groups and social workers, and mentors (e.g., coaches, PTA leaders). A supporting strategy recommends holding large public events and leaving assumptions about these groups behind when engaging (which is why

engaging community leaders is so important). The guide also included communications templates and helpful partners' contact information.

Providing a Range of Tools/Publications on Immunization Services (Massachusetts, 2005-2012)

Masspro, a private company that focuses on promoting healthcare quality, provides a variety of immunization tools and publications to facilitate adult immunization in community, hospital, home health, nursing home, and physician practice settings, as well as underserved populations. Topics range from the informational (e.g., vaccine-preventable diseases) to the actionable (e.g., how to set up clinics). There are more than 40 resources, including presentations from past events, toolkits, and education and training resources. Funding to develop these materials came from the Centers for Medicare and Medicaid Services, the Massachusetts Department of Public Health, and educational grants from pharmaceutical firms.

Reaching Adolescents: Preteen Vaccine Week Campaign Kit (California, 2012)

To promote vaccination against pertussis, California holds an annual **Preteen Vaccine Week** in February. The California Department of Public Health recommends that all Californians aged 10 and older get Tdap; state law requires all incoming seventh graders receive the shot before starting school. Preteen Vaccine Week resources were created to engage tweens directly, including an **interactive website** with educational games, videos and an immunization rap song, along with supporting educational materials for parents. The Preteen Vaccine Week Kit also includes immunization factoids, promotional tools, and classroom activities for sixth and seventh grade teachers. It is estimated that the 2011 Preteen Vaccine Week efforts helped to support the immunization of 3 million students during the 2011-2012 school year.

Informing Providers and Patients: HPV Resource Guide (Oregon, 2013)

The Oregon Immunization Program created an HPV Resource Guide for providers and patients that centralized information and resources on HPV and cervical cancer. Its depth of information—from basic overviews to Q&As, audience-specific resources, and calls to action—leveraged existing resources from organizations such as CDC and HHS and the Oregon Immunization Program's own content. By ensuring materials would address a broad audience, including both men and women, with some content in Spanish as well as English, the guide was created for the broadest set of patients, with private and public providers, schools, and community clinics in mind.

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