Adult Immunization Matters: Improving coverage rates

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Program Lunch and Learn
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Disclosures

- I have received honoraria from Pfizer, Novartis, Temptime Corp., TruMedSystems, and Sanofi Pasteur for service as a scientific consultant.
  - My honoraria is donated to the IAC
- I do NOT intend to discuss an unapproved or investigative use of a commercial product/device in my presentation.

Disclaimer

The opinions expressed in this presentation are solely those of the presenter and do not necessarily represent the official positions of the Immunization Action Coalition, or the National Adult and Influenza Immunization Summit

Outline

- Review the burden of adult vaccine-preventable diseases in the United States
- Review adult vaccination coverage in the United States
- Discuss the changing environment for adult immunization
- Describe recommended strategies for improving coverage rates

Burden of Vaccine-preventable Disease Among U.S. Adults

- Influenza
  - 3,000 to 49,000 total influenza-related deaths per year[1]
  - 80%-90% of deaths among adults 65 years and older[2]
- Invasive pneumococcal disease (IPD)[3]
  - 33,900 total cases/ 3,700 total deaths in 2013
  - 91% of IPD and nearly all IPD deaths among adults
- Pertussis in 2014[4]
  - ~24,000 cases
  - >5,000 among adults 20 years of age and older
- Hepatitis B[5]
  - 3,050 acute cases reported in 2013
  - ~19,800 estimated
- Zoster[6]
  - ~1 million cases of zoster annually U.S.

1. CDC. Estimates of Deaths Associated with Seasonal Influenza – United States, 1976-2007. MMWR. 010;59(33): 1057-1062.
2. Kostova, D., et al. Influenza Illness and Hospitalizations Averted by Influenza Vaccination in the United States, 2005–2011. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0066312
3. CDC. Active Bacterial Core Surveillance. www.cdc.gov/abcs/reports-findings/survreports/spneu13.pdf
4. CDC. 2014 Provisional Pertussis Surveillance Report. http://www.cdc.gov/pertussis/downloads/pertuss-surv-report-2014.pdf
5. CDC. Viral Hepatitis Surveillance United States.www.cdc.gov/hepatitis/statistics/2013surveillance/commentary.htm#hepatitisB
6. CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): 1-30.

Cost Burden of 4 Adult Vaccine-Preventable Diseases to the U.S. (65 years and older)*

2013 Census							
Disease	Est. Cases	Est. Medical Cost (per case)	Est. Indirect Cost (per case)	Est. Total Cost (per case)	Est. Total Medical Cost (millions)	Est. Total Indirect Cost (millions)	Est. Total Cost (millions)
Influenza	4,019,759	$1867	$201	$2068	$7503.3	$809.5	$8312.8
Pneumococcal	440,187				$3572.2	$214.9	$3787.1
Bacteremia	19,960	$25,181	$879	$26,060	$502.6	$17.6	$520.2
Meningitis	1278	$32,803	$879	$33,682	$41.9	$1.1	$43.0
NPP (inpatient)	187,982	$15,221	$641	$15,862	$2861.3	$120.4	$2981.7
NPP (outpatient)	230,968	$721	$328	$1049	$166.4	$75.8	$242.2
Zoster	555,989	$2354	$3074	$5427	$1308.5	$1708.9	$3017.4
Pertussis	207,241	$432	$593	$1026	$89.6	$122.9	$212.5
Total	5,223,176				$12,473.7	$2856.2	$15,329.9

NPP is non-bacteremic pneumococcal pneumonia caused by S. pneumoniae. 'NPP inpatient' refers to cases of NPP that require hospitalization where as 'NPP outpatient' refers to cases of NPP that do not require hospitalization

~$9 billion more in costs if you include the 50-64 year old population!

*McLaughlin, JM., Tan, L., et al. 2015. *J Prim Prev. 2015 Aug;36(4):259-73.*

Recommended Adult Vaccines

- Important for optimizing health, protecting persons vaccinated and others
  - Example: Vaccination against influenza and pertussis reduces the risk for the person vaccinated and also prevents the person from spreading these diseases

Impact of Vaccination

- Vaccine effectiveness (VE) varies by vaccine type, the disease outcome, and the age or health of the person vaccinated
  - Zoster (shingles) VE: 51% against shingles, 66% against post-herpetic neuralgia (PHN), and almost 80% against most prolonged and extreme cases of PHN[1]
  - PCV13 (pneumococcal conjugate vaccine) VE: 45% against vaccine-type pneumococcal pneumonia, and 75% against vaccine-type invasive pneumococcal disease among adults age ≥65 years[2]

1 Oxman MN, et al. NEJM 2005;352:2271-84.
2 Bonten MJ, et al. NEJM 2015;372:1114-25.

Impact of Vaccination (cont.)

- Influenza vaccine: varies annually based on antigenic match and also age and health of person being vaccinated – about 60–70% in younger adults and about 30% in adults 65 years and older against medically-attended influenza with a good match[1]
- Hepatitis B vaccine: 90% effectiveness after completing a 3-dose series, though lower in persons with diabetes (e.g., 90% with diabetes and age <40 years, 80% with diabetes and 41–59 years, 65% if 60–69 years and <40% if 70 years or older[2])

1. CDC. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2013–2014. MMWR 2013; 62(RR07);1-43.
2. CDC. Use of hepatitis B vaccine for adults with diabetes mellitus. MMWR 2011;60:1709-1711.

Vaccination of Pregnant Women: Two-For-One

- Influenza vaccination of pregnant women
  - Reduce risk of influenza illness in pregnant women
  - Reduce risk of influenza illness, fevers and influenza hospitalizations in infants during first 6 months of life
  - Vaccinate with inactivated flu vaccine (not live vaccine) during pregnancy[1]
- Tdap vaccination of pregnant women
  - Vaccinate in 3rd trimester to transfer antibody to infant prior to birth
  - Prevents pertussis in mom and protects infant
    - Tdap vaccination during pregnancy estimated to be 93% effective in preventing pertussis in infants <2 months old[2]
- Pregnant women should NOT routinely receive any live vaccines (e.g., live influenza vaccine, MMR, varicella or shingles vaccines)

1. CDC. MMWR 2014; 63(32); 691-697.
2. Dabrera G, et al. *Clin Infect Dis.* 2015; 60 (3): 333-337.

immunization action coalition IAC immunize.org

Yet, We are Failing to Vaccinate our Adult Population!

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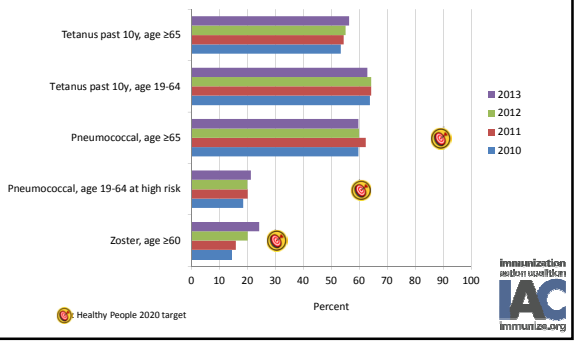
Adult Immunization Coverage Rates, National Health Interview Surveys, 2010-2013



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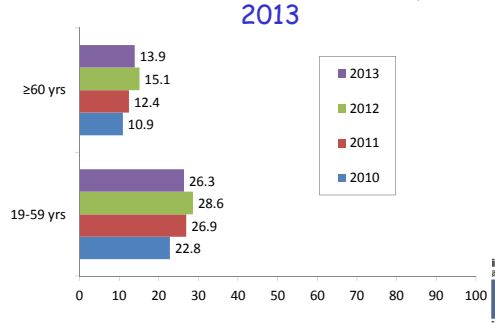
Adults with Diabetes Who Received ≥3 doses Hepatitis B Vaccine by Age, National Health Interview Surveys, 2010-2013



Influenza Vaccination Coverage Among U.S. Adults, Past Four Seasons*

Group	2011–12 (%)	2012–13 (%)	2013–14 (%)	2014–15 (%)
Persons ≥ 18 yrs	**38.8**	**41.5**	**42.4**	**43.6**
Persons 18-49 yrs, all	28.6	31.1	32.3	33.5
Persons 18-49 yrs, high risk	36.8	39.8	38.7	39.3
Persons 50-64 yrs	42.7	45.1	45.3	47.0
Persons ≥ 65 yrs	64.9	66.2	65.0	66.7

* Flu vaccination coverage estimates from the BRFSS survey were calculated using Kaplan-Meier survival analysis to determine the cumulative flu vaccination coverage (≥1 dose) July 2014 through May 2015 using monthly interview data collected September 2014 through June 2015. Only BRFSS data were used to estimate coverage for adults ≥18 years.

www.cdc.gov/flu/fluvaxview/index.htm

Why is it so hard to vaccinate adults?

Barriers to Adult Immunization

- Competing social and economic demands among adults
- Competing demands for providers' time and vaccines often not integrated into adult medical care practice
- Adult vaccine schedule is complex
  - Especially for certain occupational and medical target groups
- Fewer public health resources for adult immunization
  - Pediatric purchases on federal contracts in Dec 2010-Dec 2011: $3,535 billion (including both VFC and 317 program funds)
  - Adult vaccine purchases: $44 million (317 only)
- Limited patient awareness and demand for adult vaccinations except perhaps for influenza vaccine

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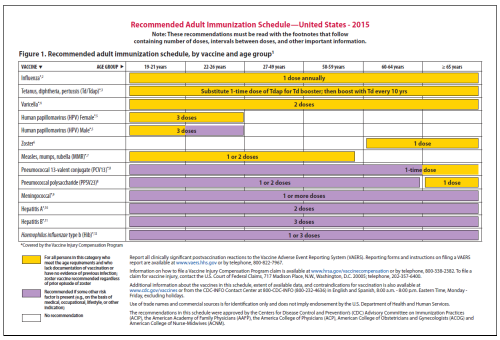
United States Adult Immunization Schedule



Recommended Adult Immunization Schedule—United States - 2015

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group[1]

VACCINE ▼ / AGE GROUP ►	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza[2,3]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)[2,4]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella[2,5]	2 doses					
Human papillomavirus (HPV) Female[2,6]	3 doses					
Human papillomavirus (HPV) Male[2,6]	3 doses					
Zoster[2,7]					1 dose	
Measles, mumps, rubella (MMR)[2,8]	1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13)[2,9]					1-time dose	
Pneumococcal polysaccharide (PPSV23)[2,9]	1 or 2 doses					1 dose
Meningococcal[2,9]	1 or more doses					
Hepatitis A[2,10]	2 doses					
Hepatitis B[2,11]	3 doses					
Haemophilus influenzae type b (Hib)[2,12]	1 or 3 doses					

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or by calling the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the America College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

www.cdc.gov/vaccines/schedules/hcp/adult.html

United States Adult Immunization Schedule

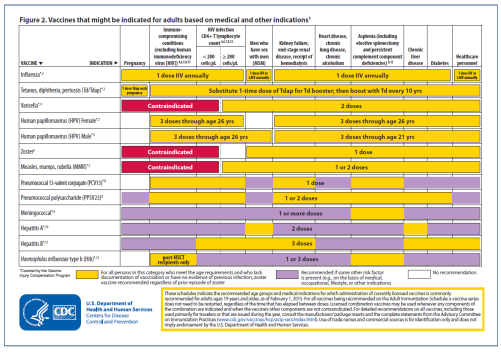


Figure 2. Vaccines that might be indicated for adults based on medical and other indications[1]

VACCINE ▼ / INDICATION ►	Pregnancy	Immune-compromising conditions (excluding human immunodeficiency virus [HIV])[13,14]	HIV infection CD4+ T lymphocyte count[13,15]	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, receipt of hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia (including elective splenectomy and persistent complement component deficiencies)[2,4]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[2,3]	1 dose HIV annually			1 dose HIV annually						1 dose HIV annually
Tetanus, diphtheria, pertussis (Td/Tdap)[2,4]	1 dose Tdap each pregnancy	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs								
Varicella[2,5]	Contraindicated	2 doses								
Human papillomavirus (HPV) Female[2,6]		3 doses through age 26 yrs			3 doses through age 26 yrs					
Human papillomavirus (HPV) Male[2,6]		3 doses through age 26 yrs			3 doses through age 21 yrs					
Zoster[2,7]	Contraindicated	1 dose								
Measles, mumps, rubella (MMR)[2,8]	Contraindicated	1 or 2 doses								
Pneumococcal 13-valent conjugate (PCV13)[2,9]		1 dose								
Pneumococcal polysaccharide (PPSV23)[2,9]		1 or 2 doses								
Meningococcal[2,9]	1 or more doses									
Hepatitis A[2,10]	2 doses									
Hepatitis B[2,11]	3 doses									
Haemophilus influenzae type b (Hib)[2,12]	post-HSCT recipients only	1 or 3 doses								

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

No recommendation

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults ages 19 years and older, as of February 1, 2015. For all vaccines having recommended on the Adult Immunization Schedule a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other constituents are not contraindicated. For additional information about vaccines licensed after publication of this schedule and used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

www.cdc.gov/vaccines/schedules/hcp/adult.html

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Are any of the following vaccines recommended for you as an adult?

	Yes (%)	No (%)	Don't Know (%)
Influenza	71.8	15.1	13.0
Hepatitis A	14.3	42.4	43.3
Hepatitis B	20.1	39.9	40.0
Pneumococcal	26.4	34.9	38.7
Tdap	11.9	39.0	49.0

FallStyles (September-October, 2012).
http://www.cdc.gov/vaccines/acip/meetings/downloads/slides-feb-2013/03-Adult-Sheedy.pdf

Factors Associated with Low Vaccination Among Adults

Patient factors
- May not have regular health care provider or only see specialists
- Inconvenient access, competing social and economic demands
- Many underinsured adults 18-64 years of age

Provider factors
- Many other health issues compete with preventive services
- Lack of provider recommendation
- Lack of effective reminders to offer vaccinations

System factors
- Fewer requirements for vaccination (e.g. by employers)
- State regulations differ on who can vaccinate and types of vaccine allowed (e.g. pharmacists, visiting nurse associations)

Complex adult vaccine schedule

Some Adult Immunization Facts

•Challenges
- Vaccine coverage among adults is unacceptably low
- Limited patient awareness about need for vaccines among adults
- Adult vaccinations less integrated into clinical practice

• Opportunities
- Most patients willing to get vaccinated when recommended by medical providers
- Primary care providers believe that immunizations are an important part of the services they provide to patients
- Systematic offering (e.g., through standing orders) and recommendations from clinicians result in higher uptake

The new National Vaccine Advisory Committee Standards for Adult Immunization Practice (the "Standards")

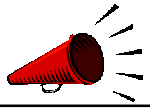
Fundamental Paradigm Shift in Adult IZ

- Adult immunization standards should be applied to all providers of care to adults, those who do and do not vaccinate
- New standards recognize the importance of the healthcare provider recommendation for patients to receive needed vaccines
- Highlights the current low vaccination rates among U.S. adults
- Reflects the changed environment within which adult vaccines are now given

Fundamental Paradigm Shift in Adult IZ

ALL providers of health care to adults are to:

1. ASSESS patient's status for all recommended vaccines at each clinical encounter;
2. Educate and counsel the patient on the recommended vaccines and strongly RECOMMEND needed vaccines; and,
3. VACCINATE at the same visit, OR for providers that do not stock the recommended vaccine, REFER the patient to a vaccinating provider.
4. DOCUMENT the receipt of vaccine by the patient



Even if you don't vaccinate, you still need to recommend vaccines to your patients

Ultimate Goal of the new Standards - "Immunization Neighborhood"

- Purpose:
  - Collaboration, Coordination and Communication among immunization stakeholders dedicated to meeting the immunization needs of the patient and protecting the community from vaccine preventable diseases.
- To see all supporting organizations and other resources: http://www.izsummitpartners.org/adult-immunization-standards/
- Also find tools to support implementation, eg. speaker slide deck.

Proven Strategies for Improving Adult Immunizations Rates

Group 1: Strategies to Enhance Access to Vaccines

Intervention	Status of Task Force Review
Home visits to increase vaccinations	Recommended (Strong evidence)
Reducing client out-of-pocket costs for vaccinations	Recommended (Strong evidence)

http://www.thecommunityguide.org/vaccines/universally/ndex.html

Group 2: Strategies to Increase Community Demand for Vaccines

Intervention	Status of Task Force Review
Client or family incentives	Recommended (Sufficient evidence)
Client reminder/recall systems	Recommended (Strong evidence)
Client-held paper immunization records	Insufficient evidence
Clinic-based client education when used alone	Insufficient evidence
Community-wide education when used alone	Insufficient evidence
Community-based interventions when implemented in combination	Recommended (Strong evidence)

Group 3: Healthcare Provider- or System-Based Strategies

Intervention	Status of Task Force Review
Provider reminder systems when used alone	Recommended (Strong evidence)
Provider assessment and feedback	Recommended (Strong evidence)
Standing orders	Recommended (Strong evidence)
Provider education when used alone	Insufficient evidence
Health care-based interventions when implemented in combination	Recommended (Strong evidence)

Meta-Analysis of Interventions to Increase Use of Adult Immunization

Intervention	Odds Ratio*
Organizational change (e.g., standing orders, separate clinics devoted to prevention)	16.0
Provider reminder	3.8
Provider education	3.2
Patient financial incentive	3.4
Patient reminder	2.5
Patient education	1.3

*Compared to usual care or control group, adjusted for all remaining interventions

Stone E. Ann Intern Med 136:641-51, 2002

Worksite Interventions to Promote Seasonal Influenza Vaccinations among Healthcare Personnel (HCP)

Intervention0	Status of Task Force Review
Interventions with on-site, free, actively promoted vaccinations	Recommended
Interventions with actively promoted, off-site vaccinations	Insufficient Evidence

Worksite Interventions to Promote Seasonal Influenza Vaccinations among Non-HCP

Intervention	Status of Task Force Review
Interventions with on-site, reduced-cost, actively promoted vaccinations	Recommended
Interventions with actively promoted, off-site vaccinations	Insufficient Evidence

Summary: Effective Strategies to Increase Adult Vaccination Coverage

Intervention	Population
Reducing client out-of-pocket costs for vaccinations	Adults
Client reminder/recall systems	Adults
Community-based interventions when implemented in combination	Adults
Provider reminder systems when used alone	Adults
Provider assessment and feedback	Adults
Standing orders	Adults
Health care-based interventions when implemented in combination	Adults
Worksite interventions with on-site, reduced-cost, actively promoted influenza vaccinations	Adults, healthcare personnel

Some Concluding Thoughts

- The landscape for improving adult immunizations is far better today than it was 5 years ago
  - In the US, adult vaccines are still predominantly a private sector enterprise
    - Innovation by states to procure and provide adult vaccines
  - If cost is not an issue due to federal or provincial coverage, then we "just" need to develop a supporting delivery infrastructure
    - Political will? What data do we need?
- Transition to integrated delivery networks (IDNs) – movement from volume to value

Some Concluding Thoughts

- How do we incentivize the infrastructure?
  - Change the environment, what is the value proposition to integrated delivery networks?
  - Drive adult IZ through quality measurement
    - What gets measured gets done
    - What needs to get done requires a delivery system…
  - Increase access points for getting vaccinated
    - All providers of care for adults have a responsibility to assess, counsel, recommend, and if feasible, deliver the vaccine
    - Break down barriers that reduce access
      - In- versus out-of-network providers
      - Improve collaboration and understanding among all providers

Some Concluding Thoughts

- Improve awareness among public and providers
  - We are reaching a tipping point with influenza vaccination where it is becoming a social norm
  - Piggy back other adult vaccines onto influenza delivery system
  - Vaccine eligibility cards to help patients know which vaccines are paid for by their insurance
  - Help employers understand the ROI on a protected workforce!

Some Concluding Thoughts

- Think about the systems-based interventions that work and innovate around them
  - Decision systems based upon a patient's prescription record
- The U.S. must improve documentation of adult vaccinations
  - Diverse adult population with diverse providers
  - Lifespan immunization information systems are critical
  - Yet they are under-utilized
  - Opt-out versus opt-in; facilitate the public benefit
  - Make IIS and EHRs integrated with practice management. Eg. Vaccine inventory
- Integrating adult IZ into preventive health is fine but will fail without a preventive health infrastructure!

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- Visit our websites!
  - www.immunize.org
  - www.vaccineinformation.org
  - www.standingorders.org
  - www.izcoalitions.org
  - www.izsummitpartners.org (Summit)
- Stay ahead of the game! Subscribe to our updates!
  - http://www.immunize.org/subscribe/

Thank You!

Type your question in the chat window to the right

After the presentation, questions may be sent to:

Molly Howell	**mahowell@nd.gov**
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Amy Schwartz	**amschwartz@nd.gov**
Miranda Baumgartner	**mlbaumgartner@nd.gov**
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Mary Woinarowicz	**mary.woinarowicz@nd.gov**
Dominick Fitzsimmons	**dfitzsimmons@nd.gov**

Immunization Program :
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