

Immunizations as a Team Sport ...

And some updates about COVID-19 vaccines

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Disclosure

I, Carolyn B. Bridges, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during this presentation.

I have no financial conflicts of interest to disclose. My time to develop this talk was supported by the Idaho Immunization Coalition and University of Idaho.

I may discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration, but in accordance with ACIP recommendations.

Learning Objectives

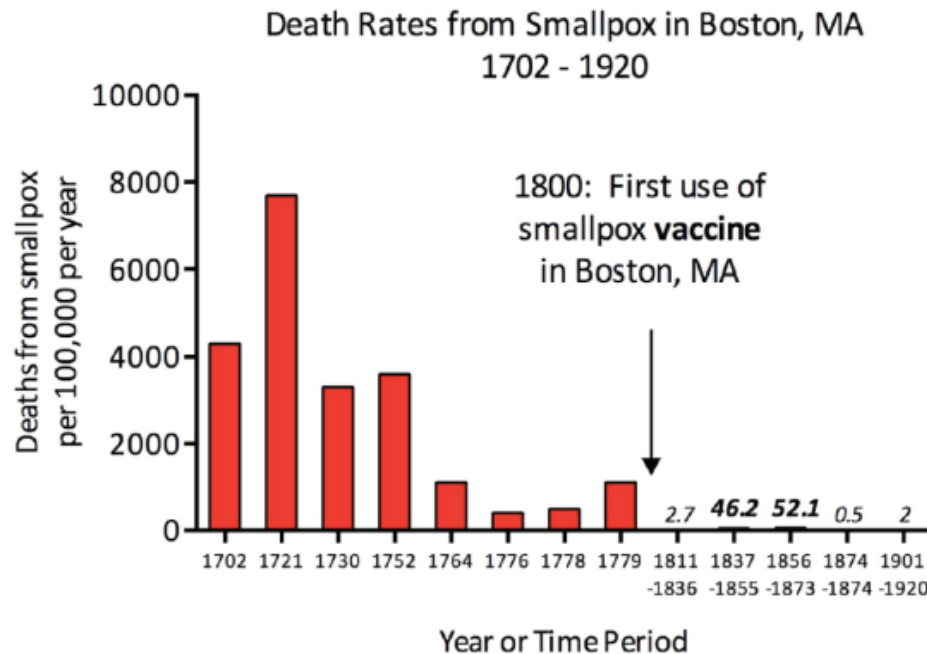
1. Review the history of vaccines and vaccines' impact
2. Provide update on selected currently recommended vaccines
3. Review selected vaccination rates in the U.S. and Idaho
4. Discuss vaccine implementation and communication
5. Review safe vaccine storage and administration guidelines
6. Highlight new COVID vaccines in development

Looking Back...

U.S. adult vaccine recommendations – a very brief history

Way Back Look...

- Vaccination against smallpox dates back before Edward Jenner in England in 1796^{1,2}
- Boston smallpox outbreak in 1721 led Cotton Mather to advocate for variolation against great community opposition
- One physician, Boylston, took up the charge, inoculating 287, 2% of whom died compared to 15% of un-inoculated.
- Development of safer vaccine against smallpox led to greater use and ultimately smallpox eradication world-wide in 1980.



[1. Matthew Niederhuber. The fight over inoculation during 1702 smallpox outbreak in Boston.](#)

<http://sitn.hms.harvard.edu/category/flash/special-edition-on-infectious-disease/>. 2. History of vaccinations by Susan Plotkin and Stanely Plotkin in Plotkin, Orenstein, Offit, Eds. Vaccines 6th Ed, Elsevier, 2013.

CDC, NCIRD Historical Comparisons of Vaccine-Preventable Disease Morbidity in the U.S.

Disease	20th Century Annual Morbidity [†]	2019 Reported Cases [†]	Percent Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	2	> 99%
Measles	530,217	1,287	> 99%
Mumps	162,344	3,509	98%
Pertussis	200,752	15,662	92%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	3	> 99%
Congenital Rubella Syndrome	152	0	100%
Tetanus	580	19	97%
Haemophilus influenzae	20,000	14*	> 99%

[†] JAMA. 2007;298(18):2155-2163

^{††} National Notifiable Disease Surveillance System, Week 52 (2019 Provisional Data), Unpublished. Atlanta, GA. CDC Division of Health Informatics and Surveillance, 2020. Accessed on January 21, 2020.

* *Haemophilus influenzae* type b (Hib) < 5 years of age. An additional 12 cases of Hib are estimated to have occurred among the 243 notifications of Hi (< 5 years of age) with unknown serotype.

CDC, NCIRD Historical Comparisons of Vaccine-Preventable Disease Morbidity in the U.S.

Disease	Pre-Vaccine Era Annual Estimate	2016 Estimate (unless otherwise specified)	Percent Decrease
Hepatitis A	117,333 †	4,000 *	97%
Hepatitis B (acute)	66,232 †	20,900 *	68%
Pneumococcus (invasive)			
all ages	63,067 †	30,400 #	52%
< 5 years of age	16,069 †	1,700 #	89%
Rotavirus (hospitalizations, < 3 years of age)	62,500 ††	30,625 ##	51%
Varicella	4,085,120 †	102,128 ###	98%

† JAMA. 2007;298(18):2155-2163

†† CDC. MMWR. February 6, 2009 / 58(RR02);1-25

* CDC. Viral Hepatitis Surveillance - United States, 2016

CDC. Unpublished, Active Bacterial Core Surveillance, 2016

New Vaccine Surveillance Network 2017 data (unpublished); U.S. rotavirus disease now has biennial pattern

CDC. Varicella Program 2017 data (unpublished)

Vaccines for Children

Protecting America's children every day

The Vaccines for Children (VFC) program helps ensure that all children have a better chance of getting their recommended vaccines. VFC has helped prevent disease and save lives.



CDC estimates that vaccination of children born between 1994 and 2018 will:

prevent **419 million** illnesses
(26.8 million hospitalizations)



more than the current population of the entire U.S.A.

help avoid **936,000** deaths



greater than the population of Seattle, WA

save nearly **\$1.9 trillion** in total societal costs
(that includes \$406 billion in direct costs)



more than \$5,000 for each American

Updated 2018 analysis using methods from "Benefits from Immunization during the Vaccines for Children Program Era—United States, 1994-2013"



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

www.cdc.gov/features/vfcprogram

Expansion of Adult Immunization Providers

- 2009 H1N1 pandemic highlighted importance of expanding number of adult vaccine providers and access to vaccines
- By 2009, all states allowed immunization-trained pharmacists to administer influenza vaccine to adults and some to children
 - Expanded rapidly to include other vaccines
- Obstetricians and gynecologists also expanded their implementation of vaccination services
 - Influenza severity among pregnant women better documented
 - 2011 Tdap vaccination during pregnancy recommendation
- Gap currently is vaccination by adult medical specialties

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger

UNITED STATES
2020

Vaccines in the Child and Adolescent Immunization Schedule*

Vaccines	Abbreviations	Trade names
Diphtheria, tetanus, and acellular pertussis vaccine	DTaP	Daptacel* Infanrix*
Diphtheria, tetanus vaccine	DT	No trade name
<i>Haemophilus influenzae</i> type b vaccine	Hib (PRP-T) Hib (PRP-OMP)	ActHIB* Hiberix* PedvaxHIB*
Hepatitis A vaccine	HepA	Havrix* Vaqta*
Hepatitis B vaccine	HepB	Engerix-B* Recombivax HB*
Human papillomavirus vaccine	HPV	Gardasil 9*
Influenza vaccine (inactivated)	IIV	Multiple
Influenza vaccine (live, attenuated)	LAIV	FluMist* Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R [®] II
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-D MenACWY-CRM	Menactra* Menveo*
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero* Trumenba*
Pneumococcal 13-valent conjugate vaccine	PCV13	Prevnar 13*
Pneumococcal 23-valent polysaccharide vaccine	PPSV23	Pneumovax [®] 23
Poliovirus vaccine (inactivated)	IPV	IPOL*
Rotavirus vaccine	RV1 RV5	Rotarix* RotaTeq*
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel* Boostrix*
Tetanus and diphtheria vaccine	Td	Tenivac* Tdva [™]
Varicella vaccine	VAR	Varivax*
Combination vaccines (use combination vaccines instead of separate injections when appropriate)		
DTaP, hepatitis B, and inactivated poliovirus vaccine	DTaP-HepB-IPV	Pediarix*
DTaP, inactivated poliovirus, and <i>Haemophilus influenzae</i> type b vaccine	DTaP-IPV/Hib	Pentacel*
DTaP and inactivated poliovirus vaccine	DTaP-IPV	Kinrix* Quadacel*
Measles, mumps, rubella, and varicella vaccine	MMRV	ProQuad*

*Administer recommended vaccines if immunization history is incomplete or unknown. Do not restart or add doses to vaccine series for extended intervals between doses. When a vaccine is not administered at the recommended age, administer at a subsequent visit. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.

How to use the child/adolescent immunization schedule

- 1** Determine recommended vaccine by age (**Table 1**)
- 2** Determine recommended interval for catch-up vaccination (**Table 2**)
- 3** Assess need for additional recommended vaccines by medical condition and other indications (**Table 3**)
- 4** Review vaccine types, frequencies, intervals, and considerations for special situations (**Notes**)

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American Academy of Pediatrics (www.aap.org), American Academy of Family Physicians (www.aafp.org), American College of Obstetricians and Gynecologists (www.acog.org), and American College of Nurse-Midwives (www.midwife.org).

Report

- Suspected cases of reportable vaccine-preventable diseases or outbreaks to your state or local health department
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or 800-822-7967



Download the CDC Vaccine Schedules App for providers at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html.

Helpful information

- Complete ACIP recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- General Best Practice Guidelines for Immunization: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Outbreak information (including case identification and outbreak response), see Manual for the Surveillance of Vaccine-Preventable Diseases: www.cdc.gov/vaccines/pubs/surv-manual



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

<https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html>.

Table 1

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2020

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars. To determine minimum intervals between doses, see the catch-up schedule (Table 2). School entry and adolescent vaccine age groups are shaded in gray.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs	
Hepatitis B (HepB)	1 st dose	2 nd dose			← 3 rd dose →													
Rotavirus (RV): RV1 (2-dose series), RVS (3-dose series)			1 st dose	2 nd dose	See Notes													
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1 st dose	2 nd dose	3 rd dose	← 4 th dose →						5 th dose						
Haemophilus influenzae type b (Hib)			1 st dose	2 nd dose	See Notes		← 3 rd or 4 th dose → See Notes											
Pneumococcal conjugate (PCV13)			1 st dose	2 nd dose	3 rd dose	← 4 th dose →												
Inactivated poliovirus (IPV <18 yrs)			1 st dose	2 nd dose	← 3 rd dose →							4 th dose						
Influenza (IIV)						Annual vaccination 1 or 2 doses							Annual vaccination 1 dose only					
Influenza (LAIV)													Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only			
Measles, mumps, rubella (MMR)					See Notes	← 1 st dose →						2 nd dose						
Varicella (VAR)						← 1 st dose →						2 nd dose						
Hepatitis A (HepA)					See Notes	2-dose series, See Notes												
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)															Tdap			
Human papillomavirus (HPV)															See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos)			See Notes												1 st dose	2 nd dose		
Meningococcal B															See Notes			
Pneumococcal polysaccharide (PPSV23)															See Notes			

Range of recommended ages for all children
Range of recommended ages for catch-up immunization
Range of recommended ages for certain high-risk groups
Recommended based on shared clinical decision-making or *can be used in this age group
No recommendation/ not applicable

Table 2**Recommended Catch-up Immunization Schedule for Children and Adolescents Who Start Late or Who are More than 1 month Behind, United States, 2020**

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. **Always use this table in conjunction with Table 1 and the notes that follow.**

Children age 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B	Birth	4 weeks	8 weeks and at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.		
Rotavirus	6 weeks Maximum age for first dose is 14 weeks, 6 days	4 weeks	4 weeks Maximum age for final dose is 8 months, 0 days.		
Diphtheria, tetanus, and acellular pertussis	6 weeks	4 weeks	4 weeks	6 months	6 months
Haemophilus influenzae type b	6 weeks	No further doses needed if first dose was administered at age 15 months or older. 4 weeks if first dose was administered before the 1 st birthday. 8 weeks (as final dose) if first dose was administered at age 12 through 14 months.	No further doses needed if previous dose was administered at age 15 months or older. 4 weeks if current age is younger than 12 months and first dose was administered at younger than age 7 months and at least 1 previous dose was PRP-T (ActHib, Pentacel, Hibertx) or unknown. 8 weeks and age 12 through 59 months (as final dose) if current age is younger than 12 months and first dose was administered at age 7 through 11 months; OR if current age is 12 through 59 months and first dose was administered before the 1 st birthday and second dose administered at younger than 15 months; OR if both doses were PRP-OMP (PedvaxHIB, Comvax) and were administered before the 1 st birthday.	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before the 1 st birthday.	
Pneumococcal conjugate	6 weeks	No further doses needed for healthy children if first dose was administered at age 24 months or older. 4 weeks if first dose was administered before the 1 st birthday. 8 weeks (as final dose for healthy children) if first dose was administered at the 1 st birthday or after.	No further doses needed for healthy children if previous dose administered at age 24 months or older. 4 weeks if current age is younger than 12 months and previous dose was administered at <7 months old. 8 weeks (as final dose for healthy children) if previous dose was administered between 7–11 months (wait until at least 12 months old); OR if current age is 12 months or older and at least 1 dose was given before age 12 months.	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age.	
Inactivated poliovirus	6 weeks	4 weeks	4 weeks if current age is < 4 years. 6 months (as final dose) if current age is 4 years or older.	6 months (minimum age 4 years for final dose).	
Measles, mumps, rubella	12 months	4 weeks			
Varicella	12 months	3 months			
Hepatitis A	12 months	6 months			
Meningococcal ACWY	2 months MenACWY-CRM 9 months MenACWY-D	8 weeks	See Notes	See Notes	
Children and adolescents age 7 through 18 years					
Meningococcal ACWY	Not applicable (N/A)	8 weeks			
Tetanus, diphtheria, tetanus, diphtheria, and acellular pertussis	7 years	4 weeks	4 weeks if first dose of DTaP/DT was administered before the 1 st birthday. 6 months (as final dose) if first dose of DTaP/DT or Tdap/Td was administered at or after the 1 st birthday.	6 months if first dose of DTaP/DT was administered before the 1 st birthday.	
Human papillomavirus	9 years	Routine dosing intervals are recommended.			
Hepatitis A	N/A	6 months			
Hepatitis B	N/A	4 weeks	8 weeks and at least 16 weeks after first dose.		
Inactivated poliovirus	N/A	4 weeks	6 months A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.	A fourth dose of IPV is indicated if all previous doses were administered at <4 years or if the third dose was administered <6 months after the second dose.	
Measles, mumps, rubella	N/A	4 weeks			
Varicella	N/A	3 months if younger than age 13 years. 4 weeks if age 13 years or older.			

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2020

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Influenza inactivated (IIV) or Influenza recombinant (RIV) or Influenza live, attenuated (LAIV)	1 dose annually			
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap, then Td or Tdap booster every 10 years			
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)			
Varicella (VAR)	2 doses (if born in 1980 or later)		2 doses	
Zoster recombinant (RZV) (preferred) or Zoster live (ZVL)				2 doses or 1 dose
Human papillomavirus (HPV)	2 or 3 doses depending on age at initial vaccination or condition	27 through 45 years		
Pneumococcal conjugate (PCV13)	1 dose			65 years and older
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses depending on indication			1 dose
Hepatitis A (HepA)	2 or 3 doses depending on vaccine			
Hepatitis B (HepB)	2 or 3 doses depending on vaccine			
Meningococcal A, C, W, Y (MenACWY)	1 or 2 doses depending on indication, see notes for booster recommendations			
Meningococcal B (MenB)	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
<i>Haemophilus influenzae</i> type b (Hib)	1 or 3 doses depending on indication			

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended vaccination for adults with an additional risk factor or another indication

Recommended vaccination based on shared clinical decision-making

No recommendation/Not applicable

Table 2 Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2020

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 count		Asplenia, complement deficiencies	End-stage renal disease; or on hemodialysis	Heart or lung disease, alcoholism ¹	Chronic liver disease	Diabetes	Health care personnel ²	Men who have sex with men	
			<200	≥200								
IIV or RIV <i>or</i> LAIV	1 dose annually											
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years										
MMR	NOT RECOMMENDED		1 or 2 doses depending on indication									
VAR	NOT RECOMMENDED		2 doses									
RZV (preferred) <i>or</i> ZVL	DELAY				2 doses at age ≥50 years							<i>or</i>
	NOT RECOMMENDED		1 dose at age ≥60 years									
HPV	DELAY	3 doses through age 26 years			2 or 3 doses through age 26 years							
PCV13	1 dose											
PPSV23	1, 2, or 3 doses depending on age and indication											
HepA				2 or 3 doses depending on vaccine								
HepB					2 or 3 doses depending on vaccine							
MenACWY	1 or 2 doses depending on indication, see notes for booster recommendations											
MenB	PRECAUTION	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations										
Hib		3 doses HSCT ³ recipients only		1 dose								

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

 Recommended vaccination for adults with an additional risk factor or another indication

 Precaution—vaccination might be indicated if benefit of protection outweighs risk of adverse reaction

 Delay vaccination until after pregnancy if vaccine is indicated

 Not recommended/contraindicated—vaccine should not be administered

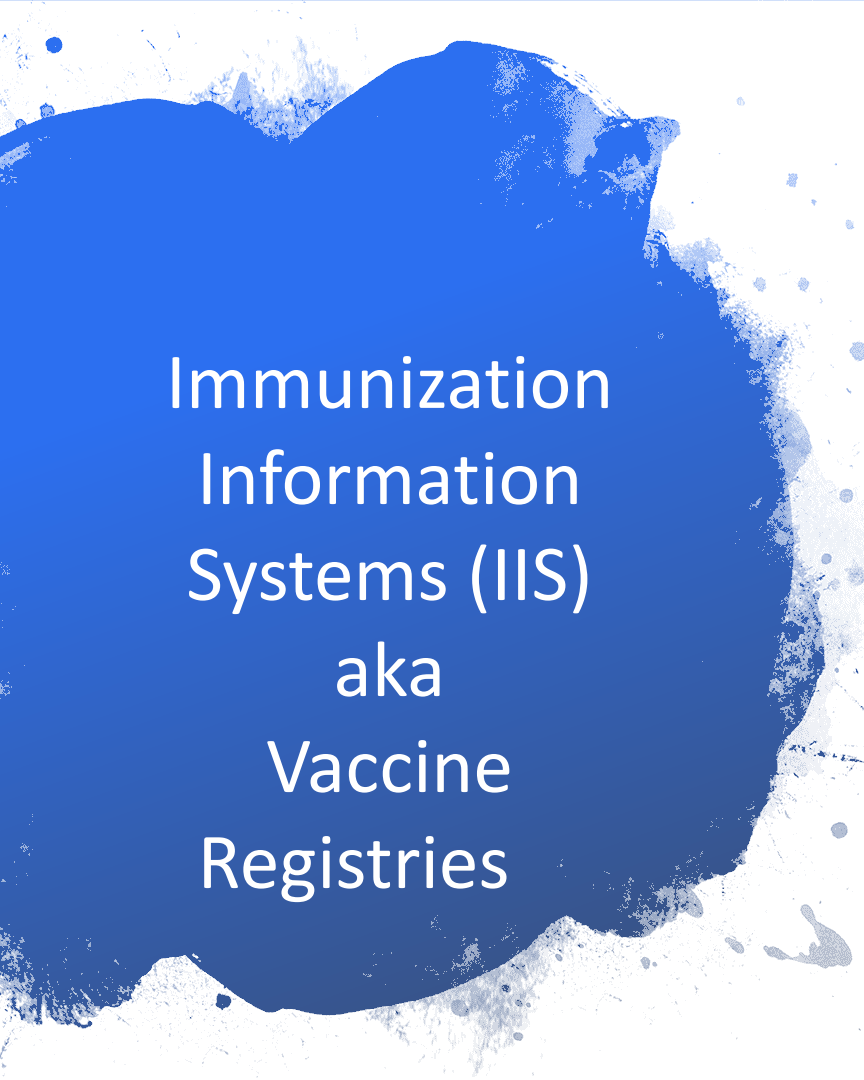
 No recommendation/Not applicable

1. Precaution for LAIV does not apply to alcoholism. 2. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. 3. Hematopoietic stem cell transplant.

The background features three overlapping light blue circles on a dark blue field. A white horizontal bar spans the middle of the image, containing the title text. Below this bar, another white horizontal bar contains the attribution text.

Idaho's Immunization Reminder Information System (IRIS)

Slides courtesy of Jennifer Baker, Idaho Department of Health and Welfare



Immunization Information Systems (IIS) aka Vaccine Registries

- Confidential, secure population-based computerized databases that record all immunization doses administered by participating providers to people residing within a geopolitical area.
- Consolidates vaccine records given by multiple providers
- Helps providers
 - Ensure patients get the right vaccine at the right time
 - Send reminders to patients about doses due
- Critical given
 - Patients often see multiple providers
 - Helps prevent over- and under-vaccinating

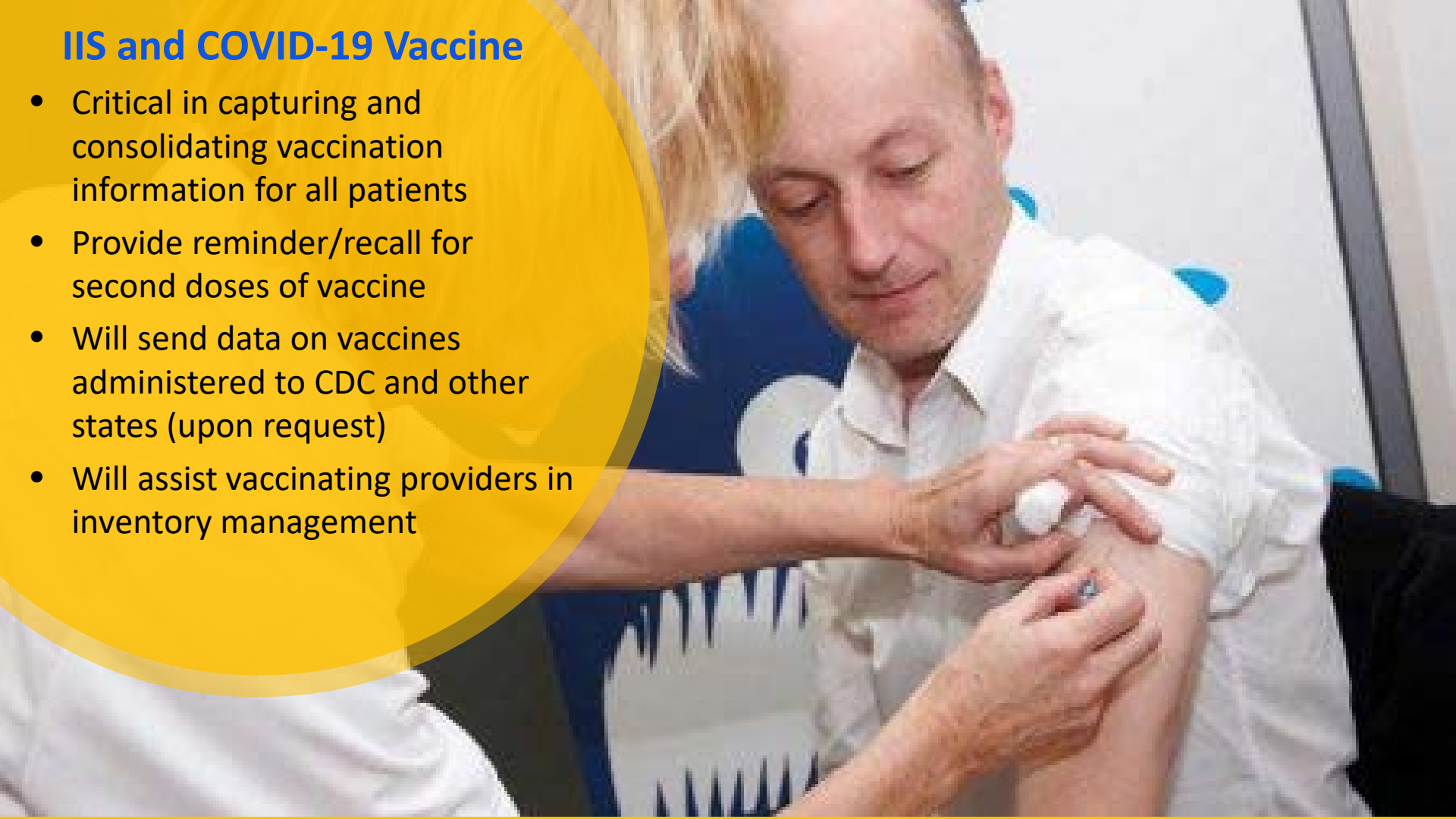
Who can have access??

- In Idaho:
 - Medical Providers and hospitals rendering treatment to a patient
 - Schools
 - Licensed Childcares
 - Idaho DHW
 - Idaho Local Public Health Districts
 - Parents (through the above entities)



IIS and COVID-19 Vaccine

- Critical in capturing and consolidating vaccination information for all patients
- Provide reminder/recall for second doses of vaccine
- Will send data on vaccines administered to CDC and other states (upon request)
- Will assist vaccinating providers in inventory management





Idaho's Immunization Reminder Information System



Production Region

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Username:

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DO NOT ATTEMPT TO
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FORGOT PASSWORD

Posted on 02/16/2016

IMPORTANT INFORMATION:

All requests for IRIS accounts and new passwords must be submitted online. Requests will NOT be processed over the phone.

FORGOT YOUR PASSWORD OR ACCOUNT LOCKED TO PASSWORD RESET?

If you already have an IRIS account but need to reset it, please click on the FORGOT PASSWORD box or click here for instructions [FORGOT PASSWORD INSTRUCTIONS](#).

REQUEST AN IRIS ACCOUNT

If you are a healthcare provider, school, or childcare facility needing an IRIS account, please complete the online enrollment form by selecting the appropriate link below. Complete all of the required information and click Submit. Please allow up to 5 business days to receive your IRIS username and password.

- Healthcare Provider: [REQUEST AN IRIS ACCOUNT](#)
- School Staff: [REQUEST AN IRIS ACCOUNT](#)
- Childcare Provider: [REQUEST AN IRIS ACCOUNT](#)

<https://iris.dhw.idaho.gov/IRIS/portalInfoManager.do>

IRIS IS Voluntary



- Providers must notify parents/legal guardians that their/child's immunizations given will be entered into IRIS
- But, IRIS is voluntary. If parent/self want information out of IRIS, they must fill out an online Opt-out form provided by the Idaho Immunization Program
- Less than 2% of all patients entered into IRIS have opted out.

Impact of Selected Vaccines

Measles, Mumps and Rubella Vaccine (MMR)

- MMR vaccine – live vaccine recommended in 2-dose series
 - 12 months and 4-6 years – thus infants MOST susceptible
- Vaccine rates in U.S. dropped in response to falsified data published in Lancet by now discredited physician-researcher
 - Publication retracted by journal and authors
- Many years and billions of \$ find NO association of MMR vaccine and autism
- Decreases led to multiple large outbreaks across U.S.
 - E.g. 2014-15 Disneyland-linked outbreak
- Measles most infectious virus – $R_0=13$ compared to about 2 for coronavirus and influenza
- ~95% immunity to prevent measles outbreaks

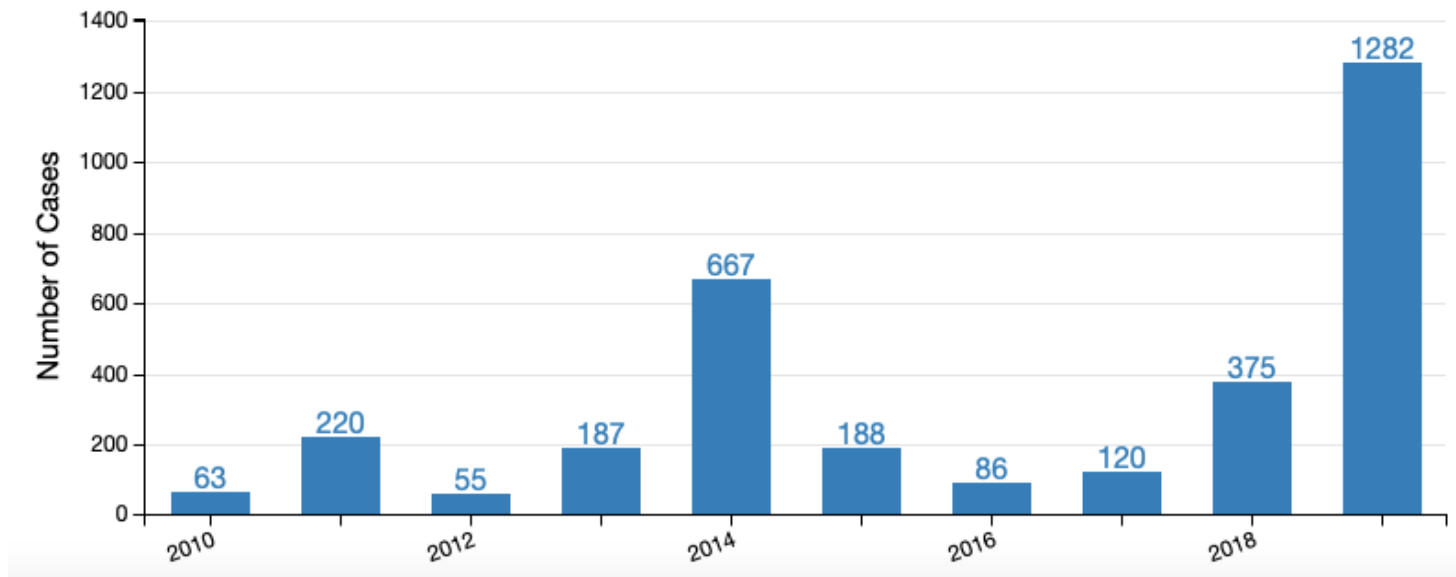


<https://www.motherjones.com/politics/2015/01/measles-outbreak-disneyland-anti-vaxxers/>

Measles, Mumps and Rubella Vaccine (MMR)

Number of Measles Cases Reported by Year

2010-2019*(as of May 7, 2020)



<https://www.cdc.gov/measles/cases-outbreaks.html>

Number of HPV-Associated Cancer Cases per Year

Cancer site	Ave. # Cancers per Year	Estimated % caused by 9vHPV	Estimated # caused by 9vHPV types
Cervix	12,015	81	9,700
Vagina	862	73	600
Vulva	4,009	63	2,500
Penis	1,303	57	700
Anus	6,810	88	6,000
Oropharynx	19,000*	66	12,600
Total Female	24,886	76	19,000
Total Male	19,113	69	13,100
TOTAL	43,999	73	32,100

<https://www.cdc.gov/cancer/hpv/statistics/cases.htm>. *82% among males.

HPV-9 (Human Papilloma Virus Vaccine)

- Recommended for age 11-12 years, ideally, as 2 doses spaced 6 months apart
- Routinely recommended through age 26 years
- Shared clinical decision making between patient and provider for persons 27-45 years
- Does not *treat* HPV-related disease (cancer or genital warts)
- Does not prevent HPV infection by strains already exposed to
- Highly effective (>95%) against HVP types among previously unexposed – 86% drop in pre-cervical cancer in U.S. teens since HPV vaccination



Herpes Zoster (Shingles) Complications

- Results from reactivation of chickenpox (Varicella virus)
- Risk of shingles and shingles complications increases with age
- Thoracic, cervical, and ophthalmic involvement are most common
- Approximately 10-25% with shingles have herpes zoster ophthalmicus
 - Can lead to permanent eye damage
- Post-herpetic neuralgia (severe pain lasting >1 month)



FIGURE 2. Case of herpes zoster ophthalmicus



Photo/MN Oxman, University of California, San Diego

Impact of Vaccination – Herpes Zoster

- Recombinant Zoster (RZV) subunit vaccine—
Recommended by ACIP/CDC January 2018 ACIP
for age 50 years and older
 - 96% (95% CI 93,98) efficacy among 50-, 60-, 70-
year olds²
 - Subsequent study 90% (95% CI 84,94)
effectiveness among ≥ 70 years³
 - Immunogenicity persists at least 5 years post-
vaccination
- Replaces live zoster vaccine which was about 50%
effective in preventing shingles



Pertussis “Whooping Cough”

- Severe illness particularly in infants leading to respiratory failure
- DTaP vaccine recommended for infants 2, 4, 6 and 15 months
- Tdap vaccine recommended age 11/12 yrs then every 10 years
- Tdap recommended for each pregnancy during weeks 27-36 gestation to protect infants from pertussis
 - Highest risk of severe illness/death during first months of life
 - Protects infants through passive immunization
 - Cocooning and post-partem vaccination (vaccinating those around the infants) less successful strategy
- Maternal Tdap vaccination 88% effectiveness preventing pertussis in infants before their first dose of DTaP

CDC Estimates of Annual Influenza Disease Burden, United States, 2010-2020

9 million–56 million
Flu illnesses



4.3 million–26 million
Flu Medical Visits



Average 132 lab-confirmed pediatric deaths/year; 189 in 2019-20

140,000–810,000
Flu-related Hospitalizations



>75% adults

12,000–61,000
Flu-related Deaths



>90% adults ≥65y

Groups at Increased Risk Severe Influenza and Comparison to COVID-19 High Risk Groups

By age: Adults 65 years and older*** (COVID hospitalization risk increases with age)
Children younger than 2 years old *infants

By chronic medical conditions:

Asthma**
Neurologic and neurodevelopment conditions*
Blood disorders (e.g. sickle cell disease, leukemia)***
Chronic lung disease (e.g. COPD and cystic fibrosis)***
Endocrine disorders (e.g. diabetes mellitus)*** Type 2, *Type 1
Heart disease (e.g. CVD, CHF)*** for serious hrt dis
Kidney diseases***
Liver disorders**
Metabolic disorders (e.g. inherited metabolic disorders)*
Weakened immune system (e.g. cancer***, HIV/AIDS*, meds**)

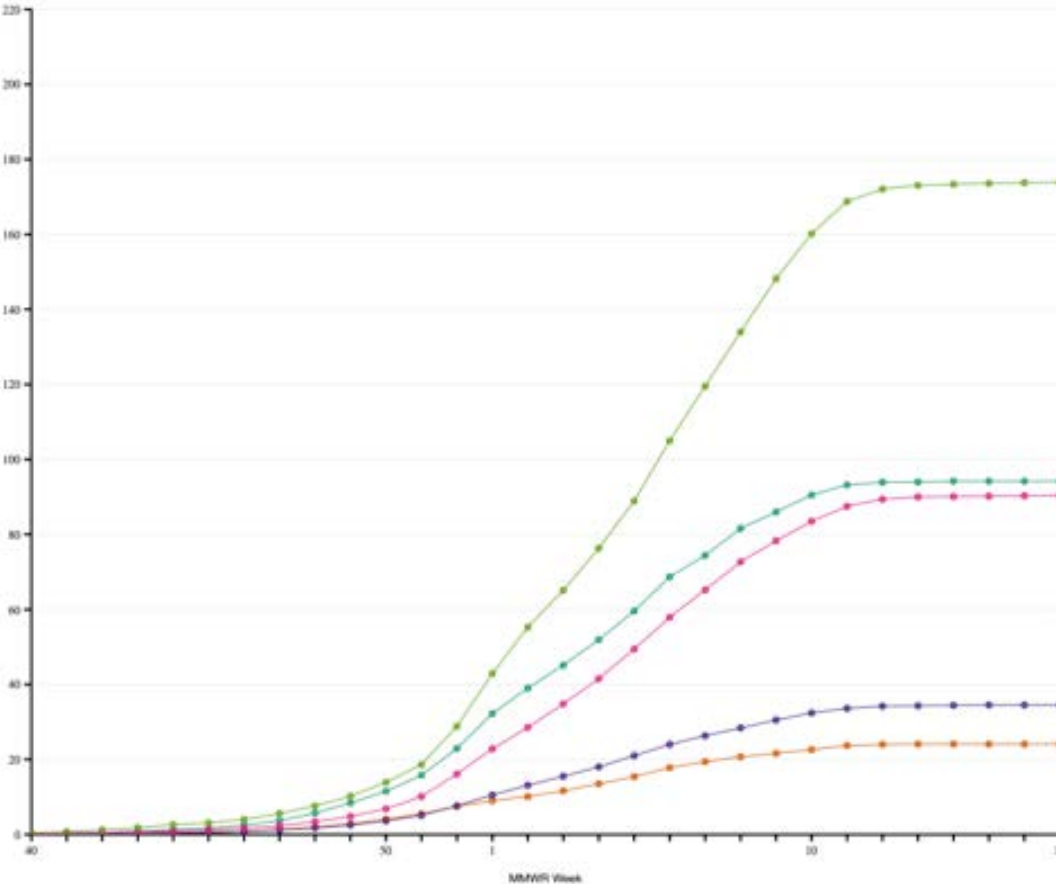
Other risk factors:

Body mass index [BMI] of 40 or higher*** (BMI 30 and higher for COVID)
People <19 yo on long-term aspirin- or salicylate-containing meds
Pregnant women **
American Indians and Alaska Natives *(and other racial/ethnic groups)
People who live in nursing homes and other LTCF***

Laboratory-Confirmed Influenza Hospitalizations

Preliminary cumulative rates as of Aug 08, 2020

FluSurv-NET - Entire Network - 2019-20 Season - Cumulative Rate

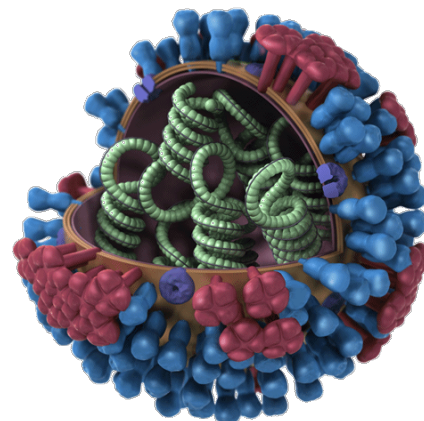


2019-2020 Season From 10 CDC's EIP Sites CA, CO, CT, GA, MD, MN, NM, NY, OR, TN Rate Per 100,000

---	65+	173.9
---	50-64	90.4
---	18-49	34.5
---	5-17	24.1
---	0-4	94.2

Influenza Vaccination

- Recommended everyone ≥ 6 months, including pregnant women
- Effectiveness varies based on antigenic match and age and health of person being vaccinated
 - ~40–60% effective when good match
 - ~30% in adults ≥ 65 years against medically attended influenza when good match¹
 - Reduces antibiotic use, medical visits, loss of workdays
 - Reduces hospitalizations and deaths, including reducing deaths in children and adults^{2,3}
 - Cost effective despite moderate effectiveness



1. CDC. Prevention and Control of Seasonal Influenza: Recommendations of the ACIP – U.S., 2016-17. MMWR 2016

2. https://www.cdc.gov/mmwr/volumes/67/wr/mm6706a1.htm?s_cid=mm6706a1_e

3. Nichol, et al. Vaccine 2018 Apr 12;36(16):2166-2175.

Influenza and Heart Disease

- Influenza vaccination effectiveness among persons with existing cardiovascular disease: Meta-analyses
 - Case control studies: 29% (95%CI 9,44) against acute MI¹
 - Randomized studies: 36% (95%CI 14,53) against major cardiac events²
- Recommended by American College of Cardiology and American Heart Association¹
 - Comparable preventive measure as:
statins (36%), anti-hypertensives (15–18%), smoking cessation (26%)

1. Barnes et al. Heart 2015;101:1738–1747

2. Udell et al. JAMA 2013;310:1711–1720.

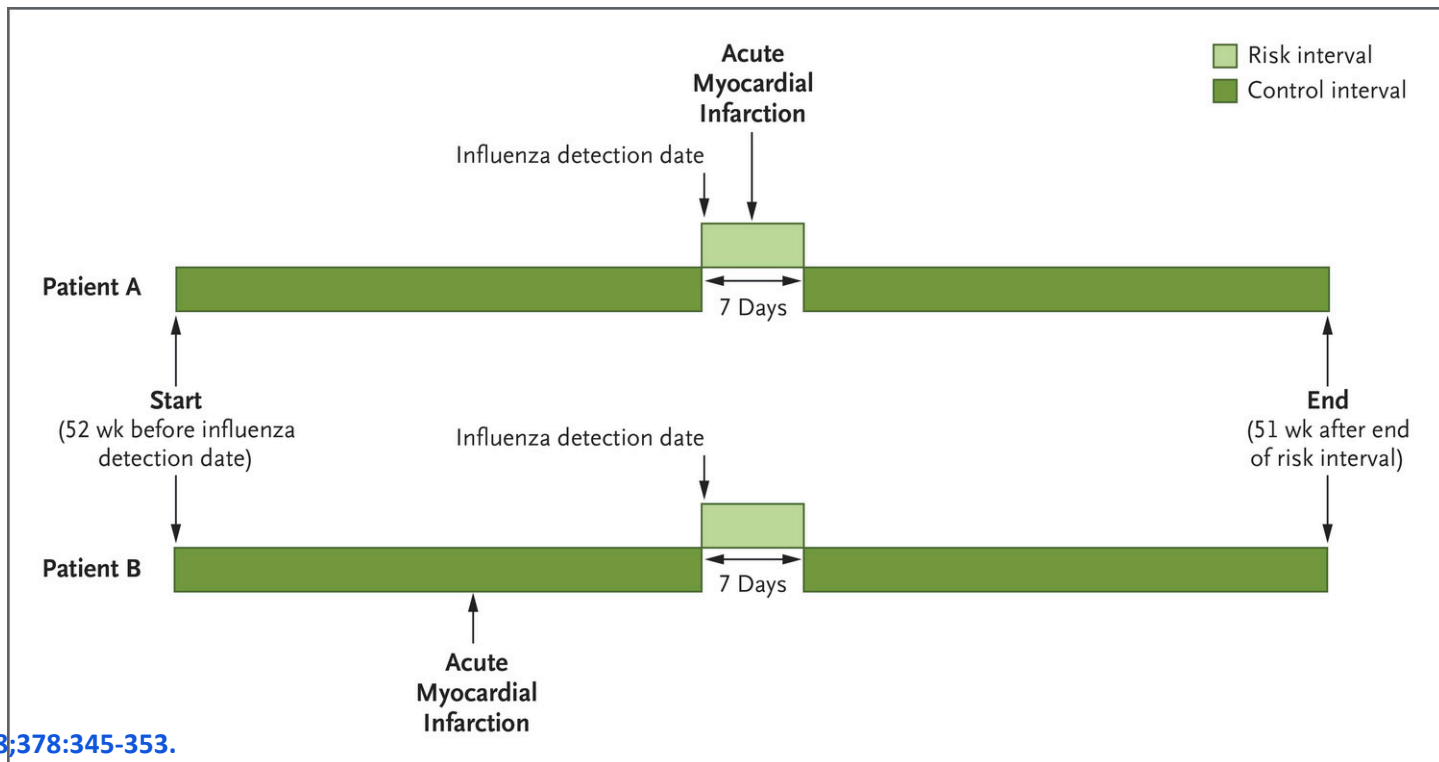
Acute Myocardial Infarction after Laboratory-Confirmed Influenza Infection

Jeffrey C. Kwong, M.D., Kevin L. Schwartz, M.D., Michael A. Campitelli, M.P.H., Hannah Chung, M.P.H., Natasha S. Crowcroft, M.D., Timothy Karnauchow, Ph.D., Kevin Katz, M.D., Dennis T. Ko, M.D., Allison J. McGeer, M.D., Dayre McNally, M.D., Ph.D., David C. Richardson, M.D., Laura C. Rosella, Ph.D., M.H.Sc., [et al.](#)

Study among persons

1. 35 yrs+,
2. tested for respiratory virus,
3. hospitalized for acute MI,
4. 2008-15

Risk window defined as 7 days after positive test



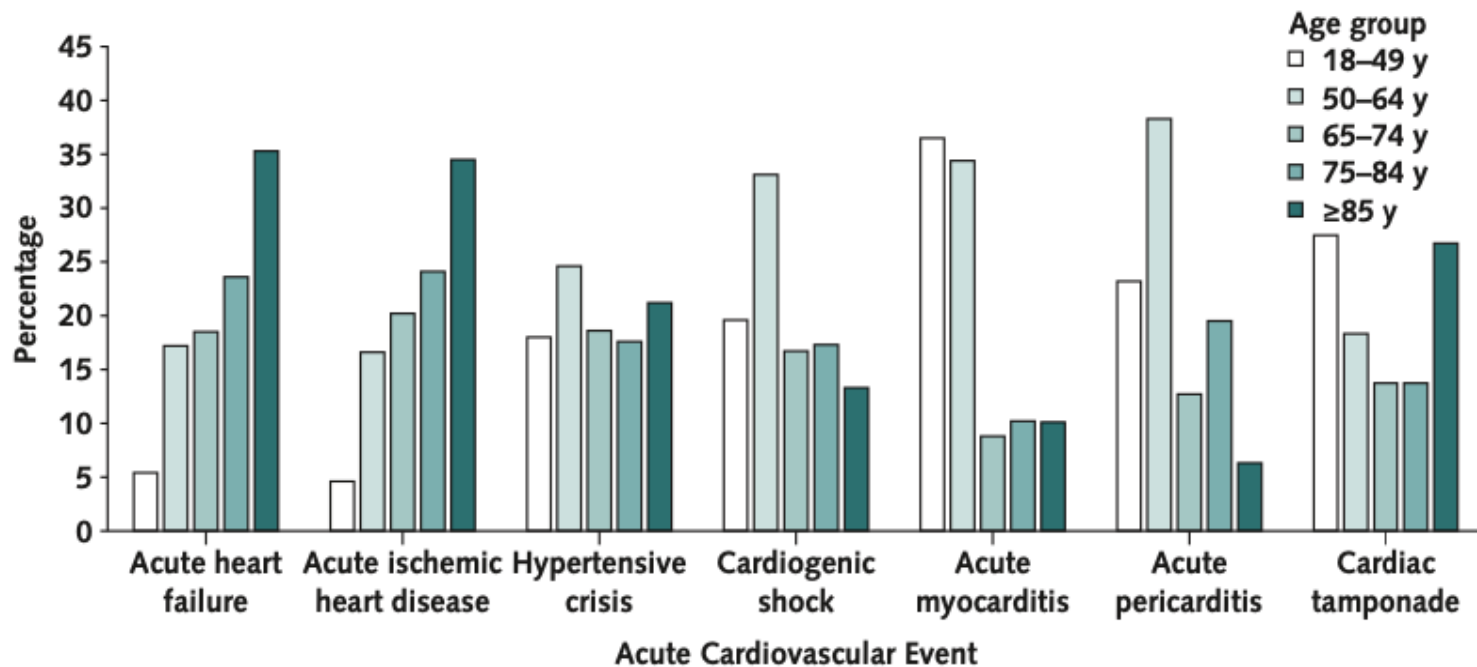
Acute Cardiovascular Events Associated With Influenza in Hospitalized Adults

A Cross-sectional Study

Eric J. Chow, MD; Melissa A. Rolfes, PhD; Alissa O'Halloran, MSPH; Evan J. Anderson, MD; Nancy M. Bennett, MD; Laurie Billing, MPH; Shua Chai, MD; Elizabeth Dufort, MD; Rachel Herlihy, MD; Sue Kim, MPH; Ruth Lynfield, MD; Chelsea McMullen, MSc-GH; Maya L. Monroe, MPH; William Schaffner, MD; Melanie Spencer, MPH; H. Keipp Talbot, MD; Ann Thomas, MD; Kimberly Yousey-Hindes, MPH; Carrie Reed, DSc; and Shikha Garg, MD

- Among 80,261 persons hospitalized who had lab-confirmed influenza, 11.7% had an acute cardiovascular event.
- Most common were acute heart failure (6.2%) and acute ischemic heart disease (5.7%).
- Older age, tobacco use, underlying cardiovascular disease, diabetes, and renal disease were significantly associated with higher risk of acute cardiac events

Figure 2. Distribution of acute cardiovascular events, by age group ($n = 9046$).



Chow EJ, et al. Acute Cardiovascular Events Associated With Influenza in Hospitalized Adults: A Cross-sectional Study Ann Intern Med. 2020 doi:10.7326/M20-1509.

Influenza severity in pregnant women and fetus

- During seasonal influenza,
 - 19.5% - 33.5% of lab-confirmed influenza hospitalizations among women 15-44 years are pregnant¹
 - Risk of influenza-related hospitalization increases with trimester²
- Fetus at increased risk of congenital defects if maternal febrile illness
- Pregnancy risks include preterm labor and birth, and small for gestational age

1. <https://gis.cdc.gov/grasp/fluview/FluHospChars.html>.

2. Neuzil KM, et al. Am J Epidemiol 1998; 148:1094–1102.

3. Memoli MJ, Harvey H, Morens DM, Taubenberger JK. Influenza Other Respir Viruses. 2013 Nov;7(6):1033-9.

4. Rasmussen SA, Jamieson DJ, Uyeki TM. Am J Obstet Gynecol. 2012 Sep;207(3 Suppl):S3-8.

5. Rasmussen, Jamieson and Bresee, Emerg Infect Dis 14:95-100, 2008



Maternal Influenza A(H1N1) Immunization During Pregnancy and Risk for Autism Spectrum Disorder in Offspring

A Cohort Study

Jonas F. Ludvigsson, MD, PhD; Henric Winell, MSc; Sven Sandin, PhD; Sven Cnattingius, MD, PhD; Olof Stephansson, MD, PhD; and Björn Pasternak, MD, PhD

- Swedish study followed infants born to mothers vaccinated with 2009 H1N1 vaccine (n=13,845) for 6 years and infants whose mothers did not receive 2009 H1N1 (n=29,293) during their first trimester
- 394 (1.0%) vaccine-exposed and 330 (1.1%) unexposed children had a diagnosis of ASD during the 6-year follow-up
- Thus, there was association between prenatal influenza vaccination and ASD.

Vaccination Rates for Selected Vaccines

Vaccination coverage estimates using an age-appropriate adult vaccination composite measure, by age group — National Health Interview Survey, United States, 2017*

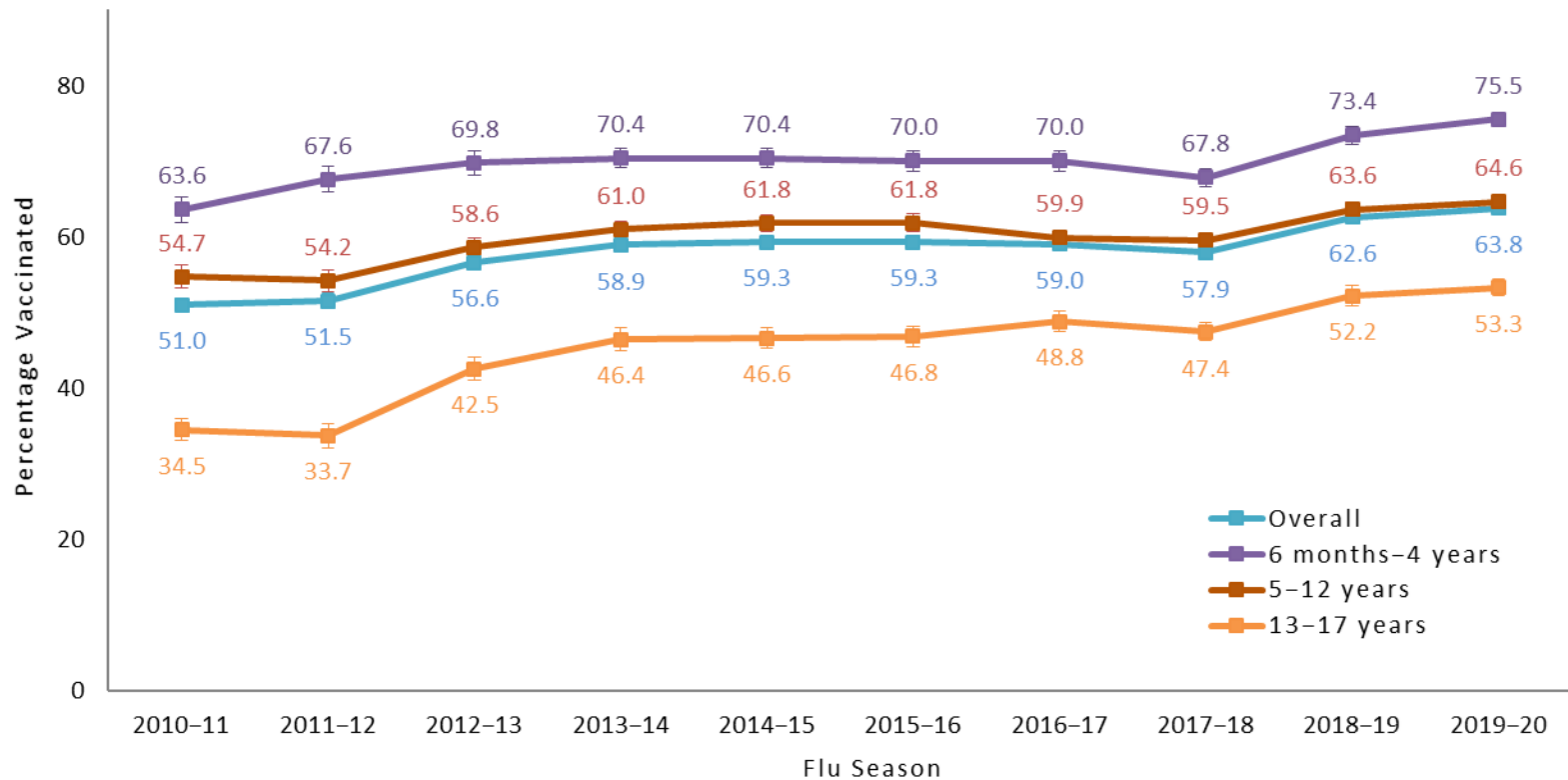
Age group	≥19 years	19-59 years	60-64 years	≥65 years
		(n [†] =26,430)	(n [†] =16,651)	(n [†] =2,445)
Coverage	25.2	26.7	14.5	24.3
	(24.4-26.1) [¶]	(25.8-27.7)	(12.9-16.2)	(22.9-25.8)

*Estimates for tetanus toxoid-containing, pneumococcal, herpes zoster, and influenza vaccines. Td/Tdap vaccination was “receipt in the past 10 years”. Pneumococcal and zoster vaccination were “ever received” at least one dose. Influenza vaccination in past 12 months.

U.S. compared to Idaho Vaccination Coverage – Selected Vaccines

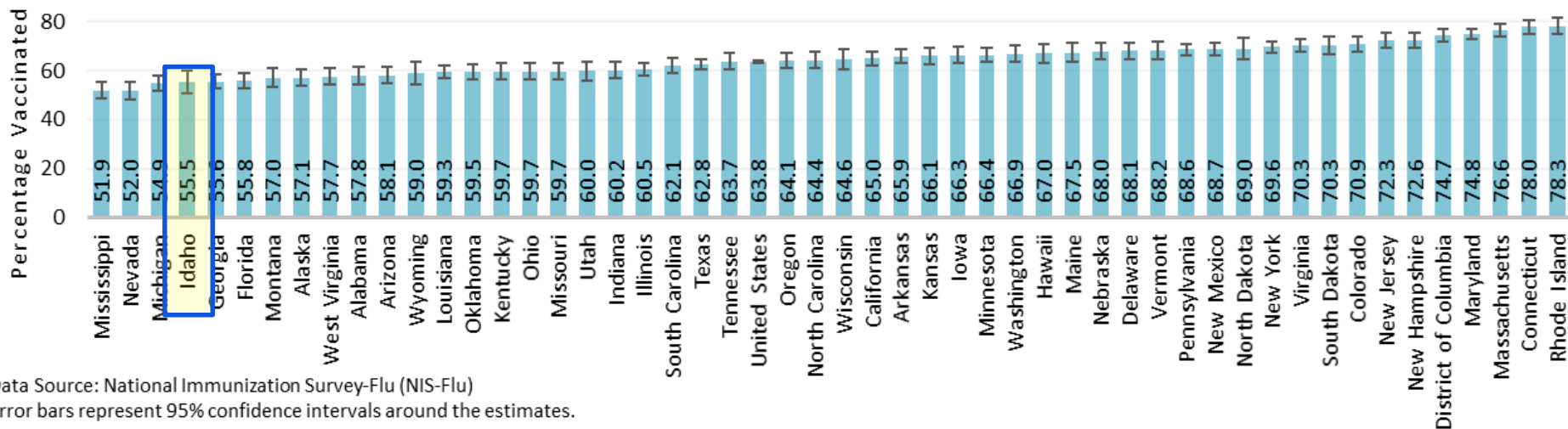
Vaccine	Data Source	US Estimate	Idaho Estimate
Up-to-date series	19-35 months National Immunization Survey, 2017	73.2%	72.5%
DTaP/DT	Same as above	83.0%	82.3%
1+ MMR	Same as above	91.5%	92.2%
HPV – females	13-18 yrs. NIS Teen Survey, 2017	39.3%	45.0%
HPV - males	Same as above	30.4%	30.8%

**Figure 1. Flu Vaccination Coverage by Age Group,
Children 6 months–17 years, United States, 2010–2020**



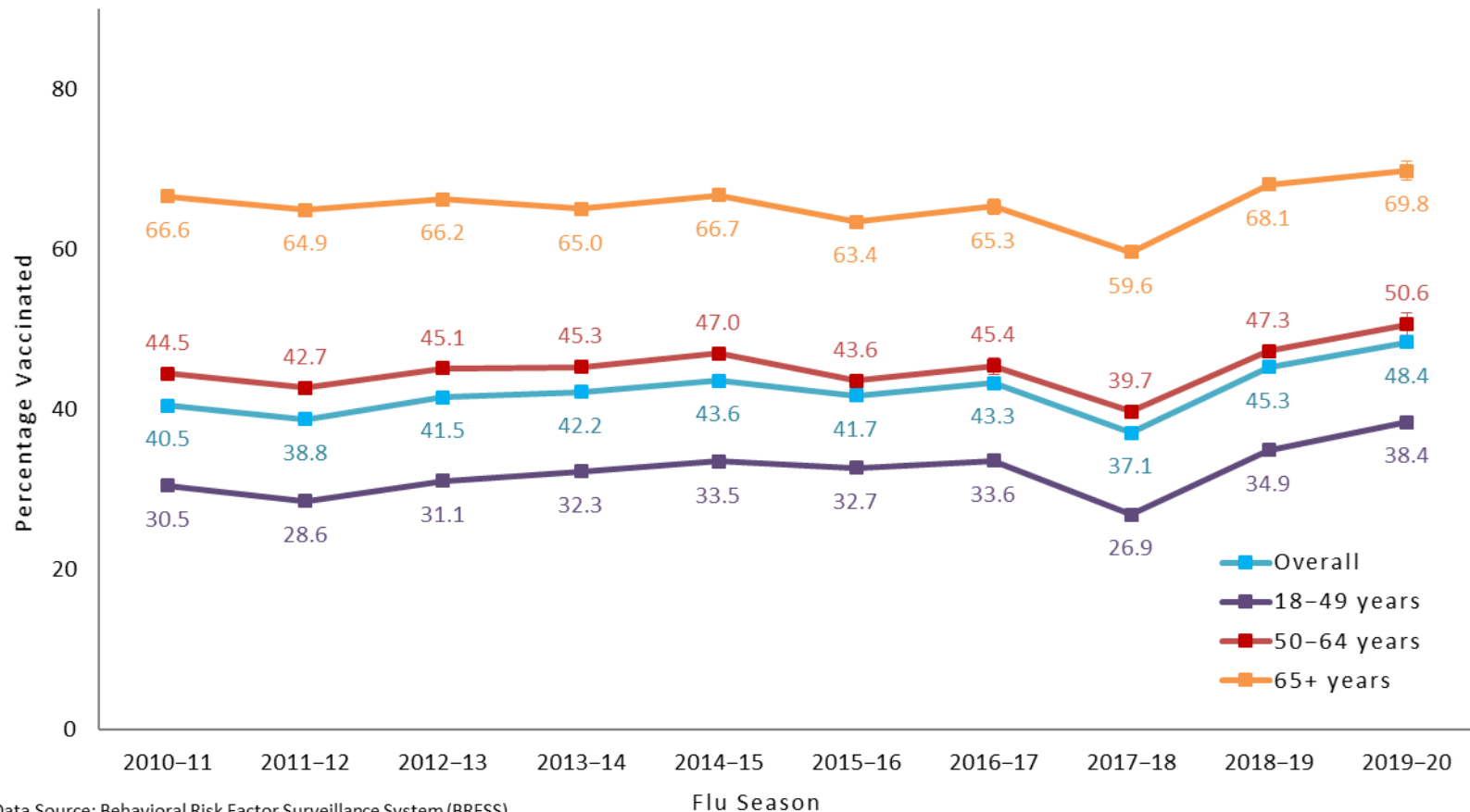
Data Source: National Immunization Survey-Flu (NIS-Flu)
Error bars represent 95% confidence intervals around the estimates.

**Figure 2. Flu Vaccination Coverage by State,
Children 6 months—17 years, United States, 2019–20 Season**



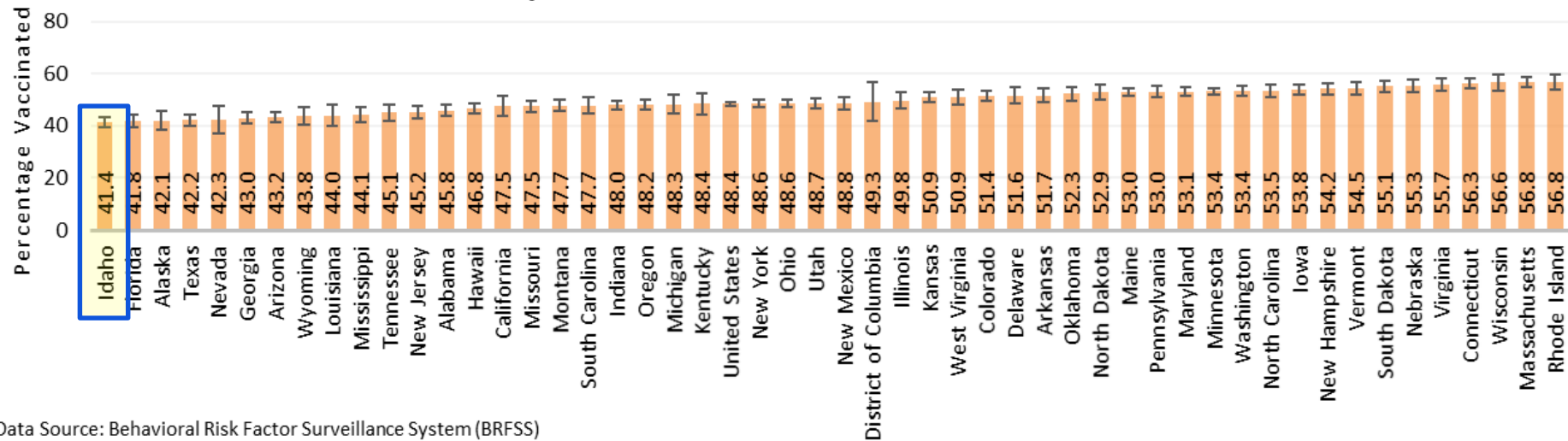
Source: <https://www.cdc.gov/flu/weekly/fluviewinteractive.htm>.

Figure 4. Flu Vaccination Coverage by Age Group, Adults 18 years and older, United States, 2010–2020



Data Source: Behavioral Risk Factor Surveillance System (BRFSS)
 Error bars represent 95% confidence intervals around the estimates.

**Figure 5. Flu Vaccination Coverage by State,
Adults 18 years and older, United States, 2019–20 Season***



Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

Error bars represent 95% confidence intervals around the estimates.

* Includes flu vaccinations received July 2019 through May 2020, except for the District of Columbia, for which only vaccinations through November 2019 were included (see Methods).

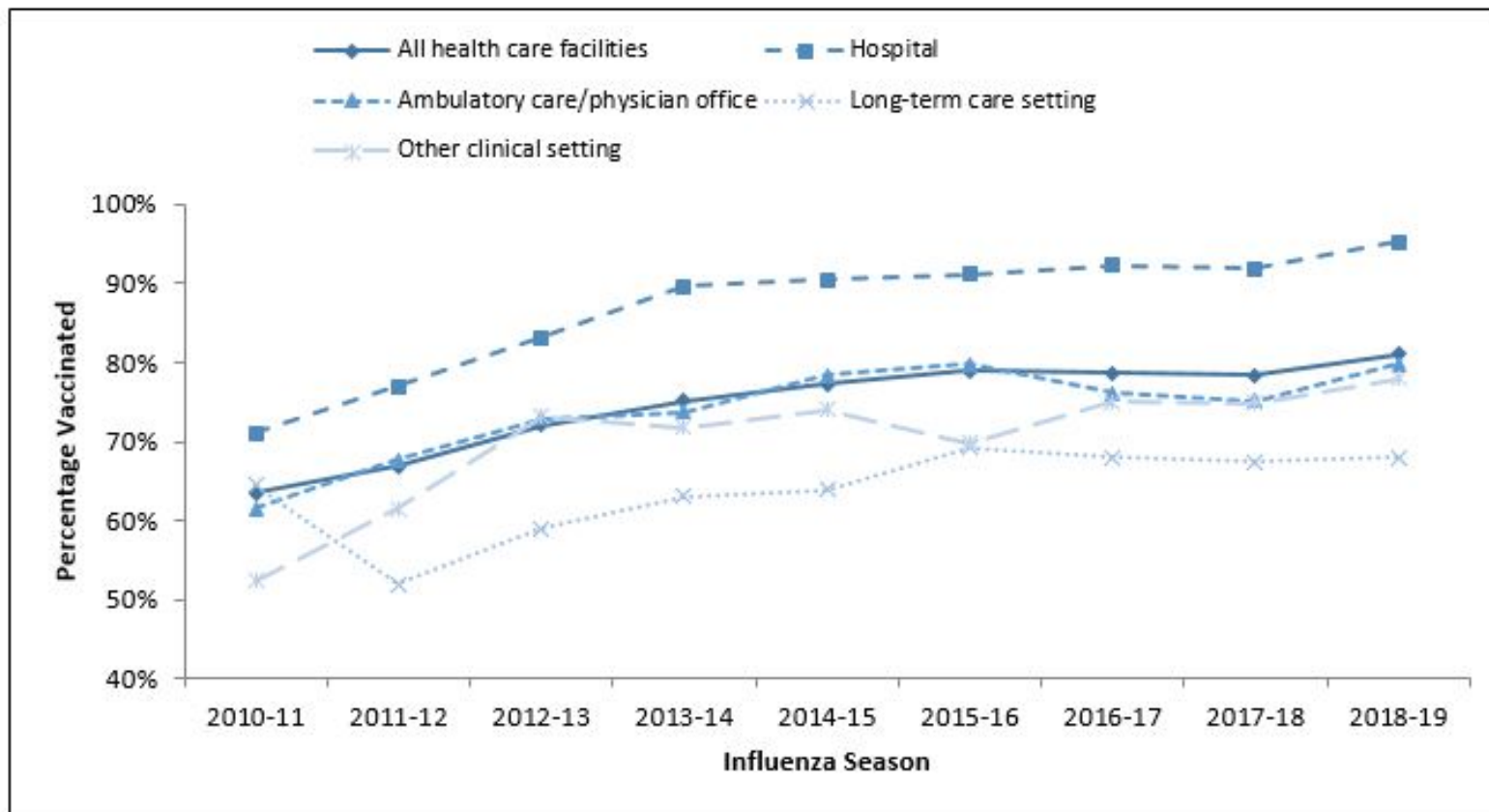
Influenza and Tdap Vaccination Coverage Among Pregnant Women — United States, April 2020
Weekly / October 2, 2020 / 69(39);1391–1397

Characteristic	Influenza	Tdap [†]	Both Tdap and Influenza
	% vaccinated	% vaccinated	% vaccinated
Total	61.2	56.6	40.3
Recommendation			
Offered or referred	75.2	72.7	57.8
Recommended, no offer or referral	50.2	Sample size <30; Estimate unstable	13.9
No recommendation	20.6	1.9	0

Influenza Vaccination Coverage Among Healthcare Personnel, 2019-20 Season, Internet Panel Survey, CDC

Occupation	2018-19	2019-20	Difference
Physician	96.7	98.0	1.3
Nurse practitioner/Physician assistant	91.0	88.8	-2.2
Nurse	91.8	92.0	0.2
Pharmacist	91.5	90.6	-0.9
Assistant/Aide	72.5	72.4	-0.1
Other clinical personnel	85.8	81.7	-4.1
Non-clinical personnel	75.5	76.7	1.2

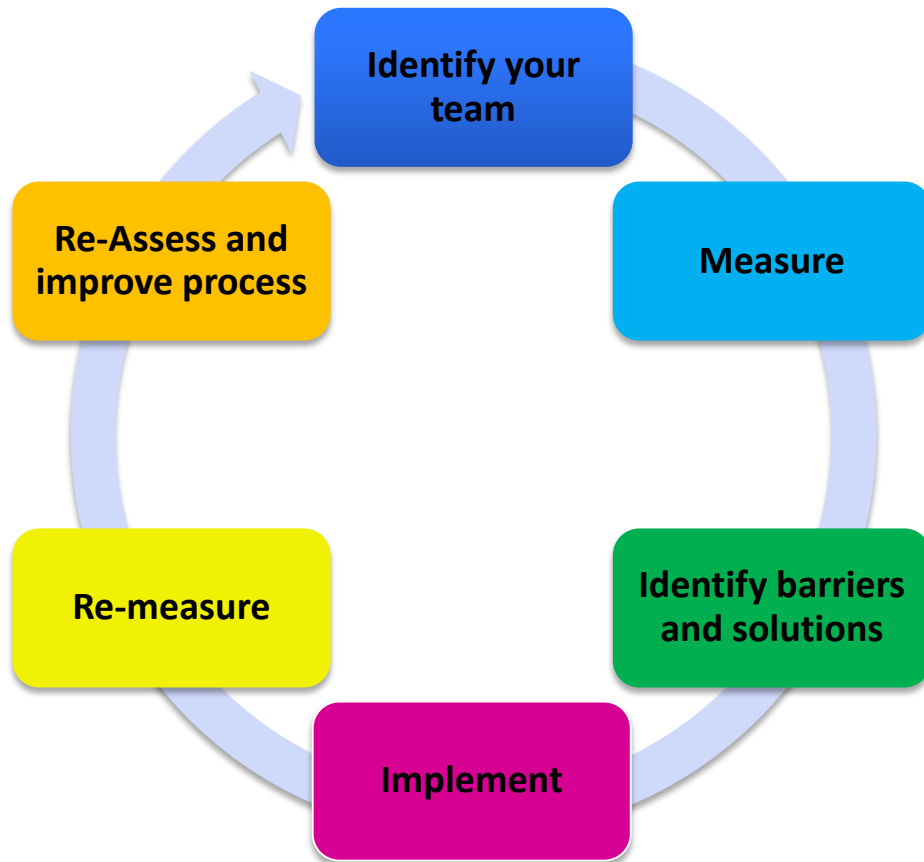
Influenza Vaccination Coverage Among Healthcare Personnel, 2019-20 Season, Internet Panel Survey, CDC



https://www.cdc.gov/flu/fluview/hcp-coverage_1920estimates.htm

Implementing and Communicating Vaccine Recommendations...

Components of Implementation Success



- Have support from all levels of organization
- Establish Chief Vaccination Officer
- Identify team members from physicians, nursing, pharmacy, IT/EMR, billing/coding, reception
- Assess and optimize patient flow
- Review claims rejections and how to prevent vaccination, billing and coding errors
- Use MIIS for vaccine assessment and reduce over vaccination

<https://www.izsummitpartners.org/content/uploads/2017/06/making-preventative-priority-becker-hospital-review-2017.pdf>

BECKER'S
HOSPITAL REVIEW



Making Prevention the Priority – How to Boost Adult Immunization Rates

Communicating Vaccine Recommendations*

- Ensure your whole team is on the same page
 - Avoid mixed messages from staff to patients
- Decision-making about vaccinating children starts during pregnancy
- Similar messages from multiple different sources helpful to reinforce vaccine recommendations
- Protecting one's family is more motivating than protecting the community



Communicating with Patients About Vaccines

- HCP recommendation is number one reported factor in influencing vaccination decisions, but adults perceive receiving few recommendations for vaccines from HCPs
- Give clear unambiguous recommendation
- Among parents/adults with questions about safety, effectiveness or cost, provide accurate information
 - If you do not know, tell them you will find out
 - Make sure patients know about accurate sources of information

Hesitant Patients

- Question the value or necessity of the recommended vaccination schedule or specific vaccines
- Want information to make the best choice
- BUT may not identify themselves as vaccine-hesitant
- Engage in active listening and answer questions
- Consider using SHARE to help answer questions and concerns

Refusal

Hesitant

Acceptance



S.H.A.R.E Strategy for Influenza Vaccine Communication

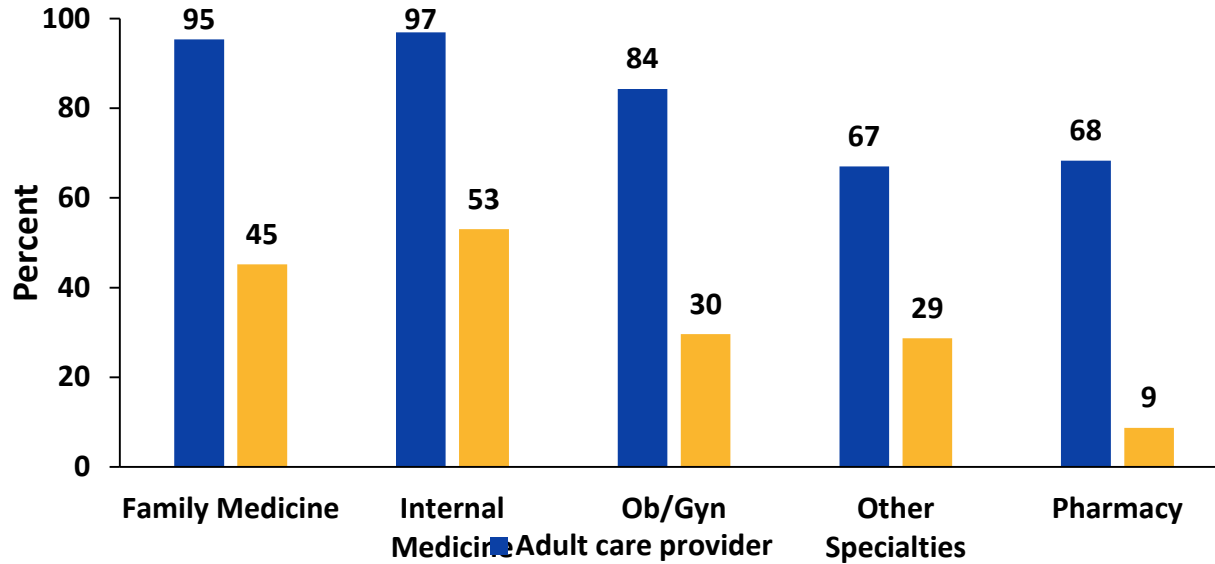
- **SHARE** reasons why influenza vaccine is right for the patient given his or her age, health status, lifestyle, occupation, or other risk factors.
- **HIGHLIGHT** positive experiences with influenza vaccines (personal or in your practice), as appropriate, to reinforce the benefits and strengthen confidence in influenza vaccination.
- **ADDRESS** patients' questions and concerns about the influenza vaccine, including safety, and effectiveness in plain and understandable language.
- **REMIND** patients that influenza vaccines protect them and their loved ones from serious influenza illness and influenza-related complications.
- **EXPLAIN** potential costs of getting influenza, including serious health effects, time lost (e.g. from work or family), and financial costs.

Standards for Adult Immunization Practice

The Standards were revised to emphasize the responsibility of all HCP who treat adults to:

- Conduct routine **assessments** of a patient's vaccination needs during every clinical encounter
- Strongly **recommend** vaccines that patients need
- **Administer** needed vaccines or **refer** patients for vaccination
- **Document** administered vaccinations in IIS (IRIS for Idaho)

Adult vaccination assessments reported by HCPs and reported by general adult population, United States, 2016



CDC, unpublished data, 2017

Preventing Shoulder Injury Related To Vaccine Administration (SIRVA)

- SIRVA caused by vaccine injection into shoulder capsule rather than deltoid muscle
 - damage to structures including the bursae, tendons, and ligaments
 - Inflammation, pain, decreased range of motion
 - Most common vaccine administration error resulting in vaccine injury compensation
- Prevented through ensuring proper landmarking and injection technique.
- Ensure provider and patient are on same level
 - E.g. avoid provider standing while patient sits, and vice versa
- Vaccination associated bursitis estimated in 7 per million influenza vaccination doses given.

Bancsi , et al . Shoulder injury related to vaccine administration and other injection site events. Can Fam Physician. 2019 Jan; 65(1): 40–42. PMID: 30674513

Hesse EM, et al. <https://doi.org/10.7326/M19-3176>

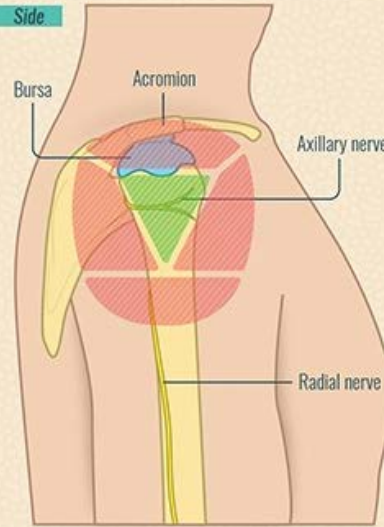
Tips:

- Be at same level as your patient
- Use your landmarks
- Insert needle at 90° angle to skin
- Completely expose the shoulder
- Make sure you are in a good position to have a clear view and correct positioning

FROM: Bancsi , et al . Shoulder injury related to vaccine administration and other injection site events. Can Fam Physician. 2019 Jan; 65(1): 40–42. PMID: 30674513

SIRVA

Shoulder Injury Related to Vaccine Administration



What to watch for when landmarking:

Too High*

*Most reported cause of injury

- Risk of injecting into shoulder joint or bursa
- Can cause inflammation leading to bursitis, frozen shoulder syndrome, and other complications
- Watch for prolonged shoulder pain, weakness, and decreased range of motion
- Symptoms begin within hours to days
- Without treatment, symptoms last months and may never resolve

Too Far to Side

Too Low

- Can inject into axillary nerve
- Can inject into radial nerve
- Can cause paralysis and/or neuropathy
- Watch for burning, shooting pain during injection
- Symptoms start immediately

What happens when:

Needle Too Short

Can inject into subcutaneous tissue

- More painful for patient
- Risk of skin reaction
- Vaccine may be less effective

Needle Too Long

Can hit bone or nerve

Tips to Avoid SIRVA

Landmark, don't "eyeball"

Always sit to inject a seated patient

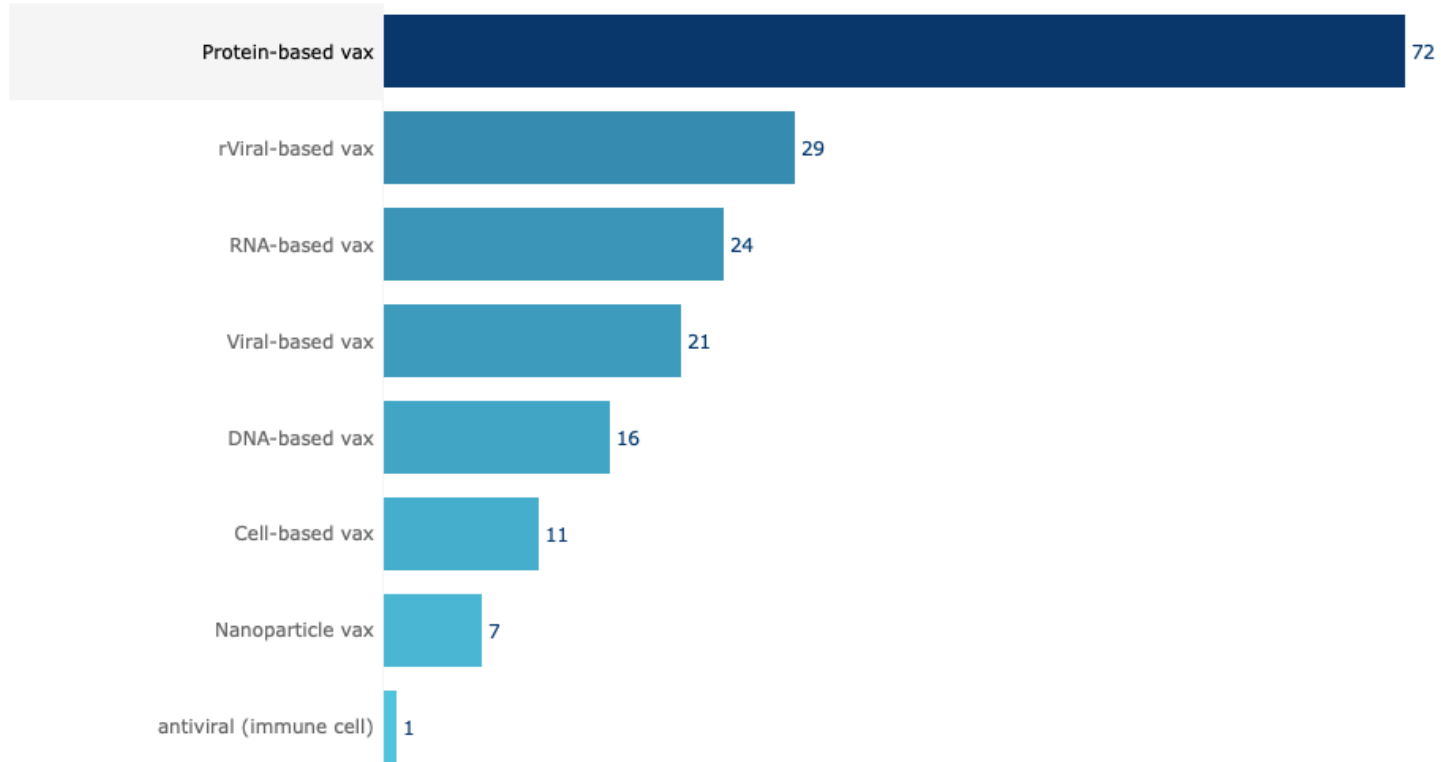
Expose the shoulder completely

When a shirt can't be removed, roll the sleeve up, don't pull the shirt's neck over the shoulder

Looking Forward...

Multiple (>180) Vaccines in Development for SARS-CoV-2

Numerous Ways to Target COVID-19: Top Strategies



Process for Evaluating Safety and Effectiveness of COVID-19 Vaccines

Multiple layers of safety and effectiveness evaluation for new vaccines

- Study protocols first reviewed by FDA and ethics committees (IRBs)
 - Rules set in advance about potential triggers to halt a study
- Each study has Data Safety Monitoring Board (DSMB) that includes a statistician and other experts – can view unblinded data during study, if needed
- Review by FDA and FDA’s outside advisory group “Vaccines and Related Biological Products Advisory Committee”
- Review by CDC and CDC’s Advisory Committee on Immunization Practices (ACIP)

How a new vaccine is developed, approved and manufactured

The Food and Drug Administration (FDA) sets rules for the three phases of clinical trials to ensure the safety of the volunteers. Researchers test vaccines with adults first.

PHASE 1



**20-100
healthy volunteers**

- Is this vaccine safe?
- Does this vaccine seem to work?
- Are there any serious side effects?
- How is the size of the dose related to side effects?

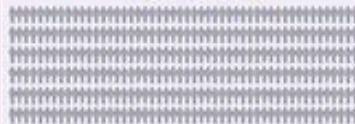
PHASE 2



**several hundred
volunteers**

- What are the most common short-term side effects?
- How are the volunteers' immune systems responding to the vaccine?

PHASE 3



**hundreds or thousands
of volunteers**

- How do people who get the vaccine and people who do not get the vaccine compare?
- Is the vaccine safe?
- Is the vaccine effective?
- What are the most common side effects?

FDA licenses the vaccine only if:

- It's safe and effective
- Benefits outweigh risks

Vaccines are made in batches called lots.



Manufacturers must test all lots to make sure they are safe, pure and potent. The lots can only be released once FDA reviews their safety and quality.

The FDA inspects manufacturing facilities regularly to ensure quality and safety.



FOR MORE INFORMATION, VISIT [HTTPS://WWW.FDA.GOV/CBER](https://www.fda.gov/cber)

www.cdc.gov/vaccines

- ACIP considers safety, effectiveness, risk of severe disease with and without vaccination, difference by age group and medical conditions, feasibility, and other issues
- Weighting of risk and benefits of a vaccine recommendation conducted in formal process.
- ACIP meetings plus votes are broadcast live.
- ACIP recommendations are reviewed by the CDC Director and become official when published.



- CDC's ACIP also developing recommendations regarding COVID vaccine prioritization

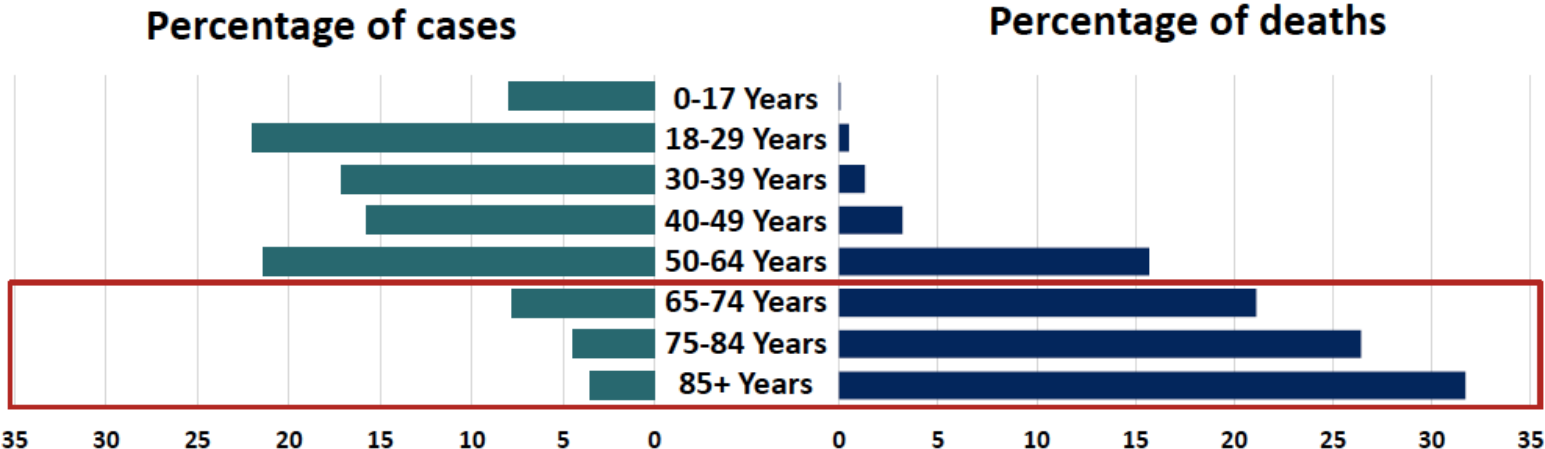


Selected COVID-19 Vaccines Most Likely for U.S. Market

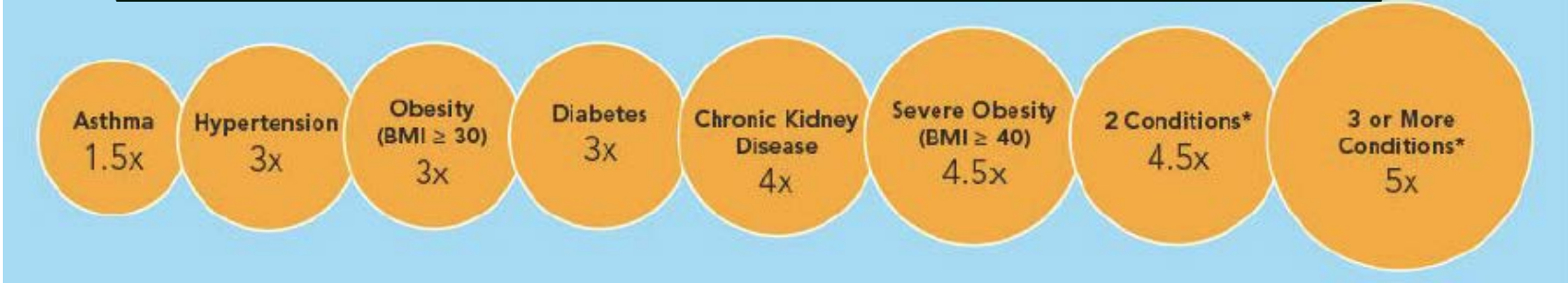
	Univ. of Oxford (Jenner Institute) with AstraZeneca	ModernaTX USA	BioNTech with Pfizer	Johnson & Johnson (Janssen Vaccines)	Novavax	Sanofi Pasteur with GlaxoSmithKline
Vax candidate/ type	ChAdOx1 Adenovirus vector	mRNA-1273	BNT162-b2 mRNA	Ad26.COVS2-S or S.PP Adenovirus vector	NVX-CoV2373 Subunit protein with Matrix-M	Subunit protein with ASO3 adjuvant
Dosing	Single dose or Days 0 + 28-42	Days 0 + 28	Days 0 + 21	Single dose or Days 0 + 56	Days 0 + 21	Not available
Storage	2-8°C	Ship @ -20°C. 2-8°C 1 week; 6 hours to use one 10-dose vial once first dose removed	Ship w/ dry ice. POC dry ice. 2-8°C 5 days; use 5-dose vial within 6 hours of reconstitution	2-8°C	2-8°C	2-8°C Mix antigen w/ adjuvant prior to vaccination.
Clinical Trial Status	Phase 2/3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 1
Ages Studied (y)	18-55, 5-12	18+	18-85	18+	18-59	18+

*Publicly reported information. Subject to change.

In the United States, adults aged 65 years or older represent 16% of COVID-19 cases, but nearly 80% of COVID-19 deaths



Chronic Conditions Increased risk of being hospitalized with COVID




Likely Recommended Early Groups for Prioritization of Vaccine

- Healthcare personnel – any paid or unpaid persons working in healthcare serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials

Healthcare Personnel within COVID-NET

March 1 to July 11, 2020

Healthcare Personnel Type: N=512

- Respiratory Therapist: 3 (<1%)
- Physician: 23 (5%)
- Nurse: 125 (24%)
- Other: 276 (54%) 
- Not specified: 85 (17%)

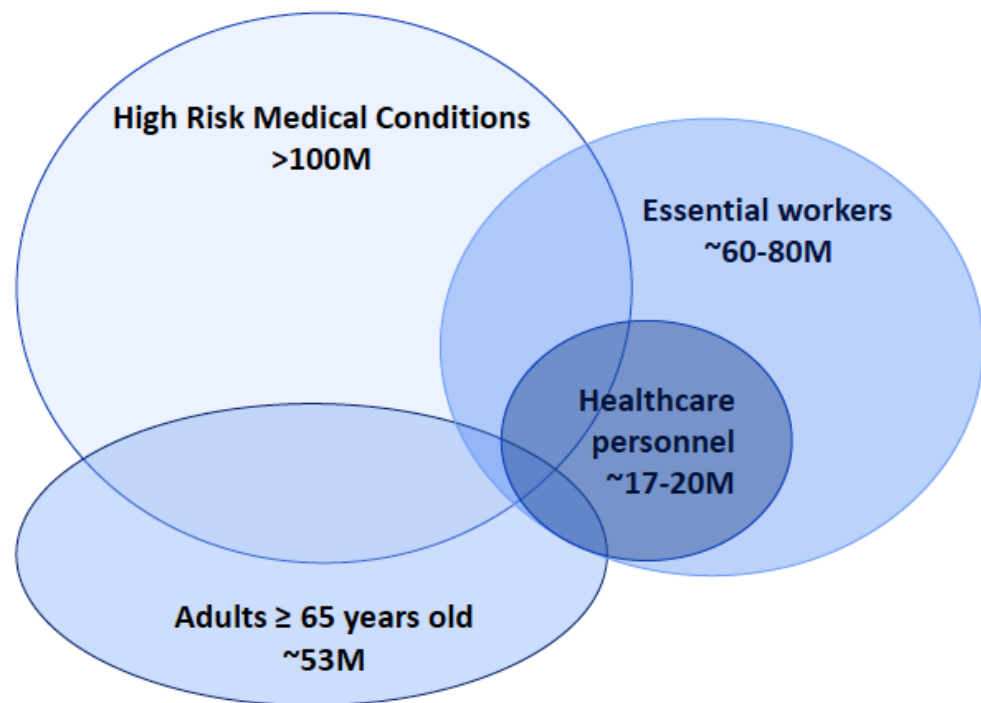
Hospital-based patient care support (e.g. nursing assistant)	73
Other patient care	21
Housekeeping/Environmental Services	20
Other nursing home/LTCF staff	17
Technicians	15
Management	12
Home health worker	12
Emergency medical personnel	10
Social work/counselor	10
Pharmacy	9
Food Services	8
Dentistry	6
Laboratory	6
Other	57

Critical Infrastructure Sectors

- Non-HCP Critical Infrastructure Personnel Highlighted by ACIP
 - Corrections
 - Food processing
- Other Critical Infrastructure Sectors
 - Education – includes daycare
 - Chemical
 - Commercial facilities
 - Communications
 - Critical Manufacturing
 - Dams
- Other CI, con't
 - Defense industrial base
 - Emergency Services (law enforcement, child protective services, etc.)
 - Energy
 - Financial services
 - Government
 - Information technology
 - Nuclear reactors, materials, and waste
 - Transportation systems
 - Water and wastewater systems

Summary: Groups for early phase vaccination

- Overlapping
- Significant heterogeneity
- Accounts for > half of U.S. adults
- Need for additional sub-grouping



COVID-19 Vaccine Planning Assumptions

- Vaccine supply in 2020 will be limited
 - Prioritization and probably sub-prioritization of vaccine groups needed
- Acceptance of vaccination unknown – surveys estimate about 50% of population interested
- For 2-dose vaccines, both doses must be same COVID vaccine brand
- Tracking of doses administered critical
 - Reporting of each dose administered required for providers that agree to administer COVID vaccine
- Ensuring vaccine cold-chain **at all times** to prevent vaccine wasting

Summary

Protect yourself and your loved ones.
www.cdc.gov/vaccines/adults



**DON'T WAIT.
VACCINATE!**

Learn More

Conclusions

- Vaccinations are recommended throughout the age span and effectively reduce the burden of disease
- Ensuring patients are up to date is especially important in the pandemic
- Although vaccine recommendations can be complex, multiple tools are available to help
- Team work is key among all providers
 - Everyone needs to assess patients for vaccines they need and make a clear recommendations
 - Communications by all team members needs to be consistent and clear
 - Enter all vaccinations into IRIS
- Everyone's role to ensure adherence to correct vaccine temperature storage and administration

Thank you!

Questions about this presentation?

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carolyn@bridges-family.com



Resources For Assessment

- Patient check-in vaccine questionnaire to be used at clinics: <http://www.cdc.gov/vaccines/hcp/patient-ed/adults/downloads/patient-intake-form.pdf>.
- Patient on-line quiz – direct patients to complete the quiz before coming to their appointment – gives them and you a starting point for talking about which vaccines they might need. <http://www2.cdc.gov/nip/adultimmsched/>.
- CDC adult vaccine schedule app at: <http://www.cdc.gov/vaccines/schedules/hcp/schedule-app.html>.
- Massachusetts Immunization Information System (MIIS)

Adolescent and Adult Vaccine Quiz

What Vaccines do **YOU** need?

Did you know that certain vaccines are recommended for adults and adolescents for people age 11 years and older.

Instructions:


1. Complete the quiz.
2. Get a list of vaccines you may need (this list may include vaccines you already have received.)
3. Discuss the vaccines with your doctor or healthcare professional.

Part One, About You

1. Are you
 Female Male
2. For women only (Some vaccines can affect pregnancy.)
 I could become pregnant I am pregnant now

Please take a moment to fill out the questionnaire below to help us determine which vaccines may be recommended for you based on your specific health status, age, and lifestyle. Keep in mind that this list may not include every vaccine you need.

Check all that apply to you	Let's discuss these recommended vaccines
<input type="checkbox"/> I am 19 years or older	<ul style="list-style-type: none">• Seasonal flu (influenza) vaccine every year• Tetanus (Td) vaccine every 10 years• One-time dose of whooping cough (Tdap) vaccine for all adults who have never received Tdap vaccine RECOMMENDED FOR WOMEN ONLY (SEE RECOMMENDATIONS FOR PREGNANCY)
<input type="checkbox"/> I am 60 years or older	<ul style="list-style-type: none">• Shingles (Zostavax) vaccine*
<input type="checkbox"/> I am 65 years or older	<ul style="list-style-type: none">• Fourth type of pneumococcal vaccine (for anyone at risk for this one dose of pneumococcal 6+12 months later)
<input type="checkbox"/> I didn't receive the human papillomavirus (HPV) vaccine series as a child	<ul style="list-style-type: none">• HPV vaccine series (3 dose series)• Female age 26 or younger• Male age 21 or younger• Male age 22-26 who have not had sex, who have a new sexual partner, or who have anal sex
<input type="checkbox"/> I was born in the US in 1917 or after and don't have immunity against measles, mumps, and rubella	<ul style="list-style-type: none">• Measles, mumps, rubella (MMR) vaccine** (one dose)
<input type="checkbox"/> I was born in the US in 1960 or after and don't have immunity against chickenpox	<ul style="list-style-type: none">• Varicella (chickenpox) vaccine*
<input type="checkbox"/> I am a health care worker	<ul style="list-style-type: none">• Hepatitis B vaccine series• Measles, mumps, rubella (MMR) vaccine*• Varicella (chickenpox) vaccine*
<input type="checkbox"/> I have heart disease, asthma or chronic lung disease	<ul style="list-style-type: none">• Pneumococcal polysaccharide vaccine

 U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Disease Control and Prevention

Vaccine Administration Resources

- **CDC General Immunization Training**
www.cdc.gov/vaccines/ed/courses.htm
- **Immunization Skills Self-Assessment**
www.immunize.org/catg.d/p7010.pdf
- **Storage and Handling**
www.cdc.gov/vaccines/recs/storage
- **Dose and Route Chart**
www.immunize.org/catg.d/p3084.pdf
- **Vaccine Information Statements (VIS)**
www.cdc.gov/vaccines/hcp/vis
- **Guide to Infection Prevention for Outpatient Care**
www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html
- **Chart of Medical Management of Vaccine Reactions in Patients**
www.immunize.org/catg.d/p3082.pdf

Resources and How to Get Questions Answered

- ACP
 - Clinical resources hub for immunizations: www.acponline.org/clinical-information/clinical-resources-products/adult-immunization.
- CDC
 - Providers, parents and patients can email www.cdc.gov/cdcinfo.
 - Website www.cdc.gov/vaccines.
 - Influenza www.cdc.gov/flu.
 - Vaccine Safety. www.cdc.gov/vaccinesafety
- Immunization Action Coalition
 - Website: www.immunize.org.
 - National Adult and Influenza Immunization Summit website: www.izsummitpartners.org.
 - Vaccines billing and coding guide: www.izsummitpartners.org/naiis-workgroups/access-provider-workgroup/coding-and-billing/.

