GLOBAL AWARENESS: Making This the Decade of Adult Immunization

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Presenter Disclosure Information Alfred DeMaria, Jr., M.D.

Consultant	No relevant conflicts of interest to declare
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Speaker's Bureau	No relevant conflicts of interest to declare
Major Stockholder	No relevant conflicts of interest to declare
Other Financial or Material Interest	No relevant conflicts of interest to declare

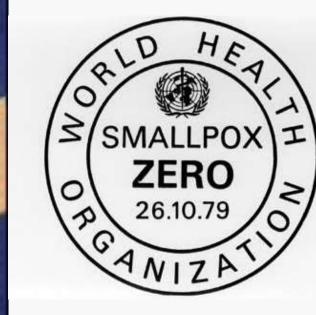


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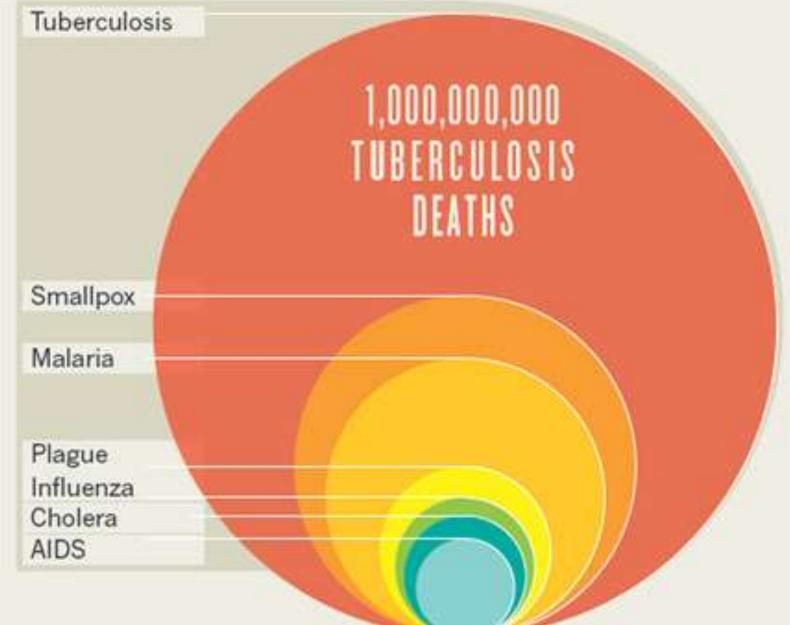








Deaths Due to Infectious Diseases Over the Past 200 Years



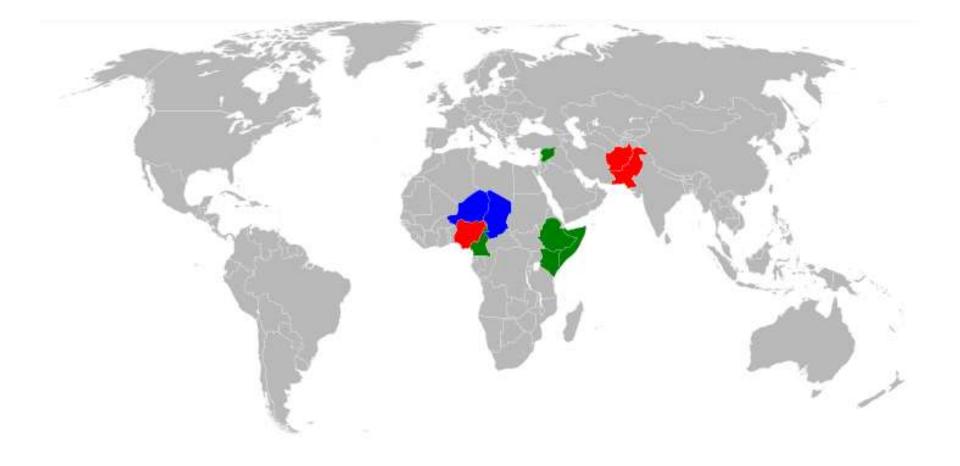


Luis Fermín Tenorio – Last case of poliomyelitis in the Americas

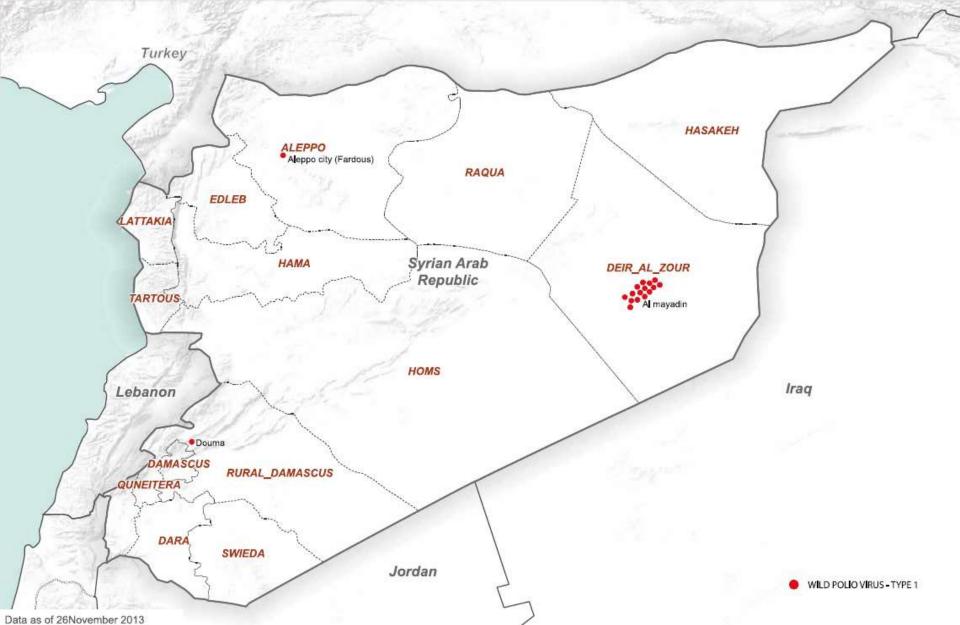
Polio Cases, as of May 14, 2014 WHO

Total cases	ases Year-to-date Year-to-date 2014 2013		Total in 2013	
Globally	77 33		416	
- in endemic countries	68 32		160	
- in non- endemic countries	9	1	256	

Polio in 2013



Polio Cases, Syria, 2013 Had Been Polio-Free Since 1999



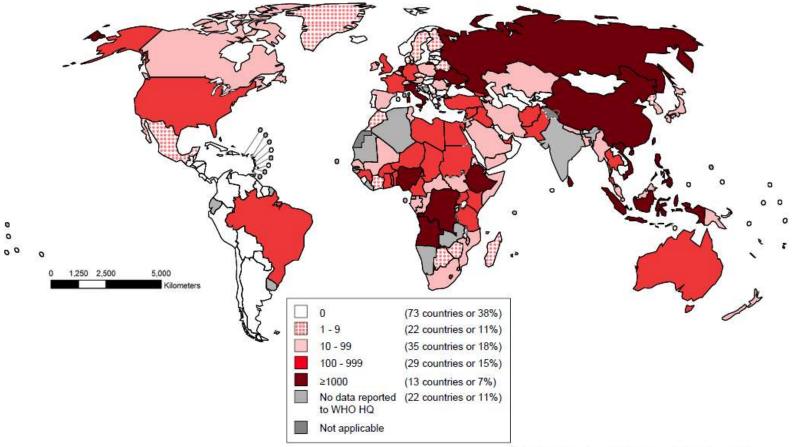








Number of Reported Measles Cases with onset date from Sep 2013 to Feb 2014 (6M period)



Data source: surveillance DEF file Data in HQ as of 7 April 2014 The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. GWHO 2014. All rights reserved.



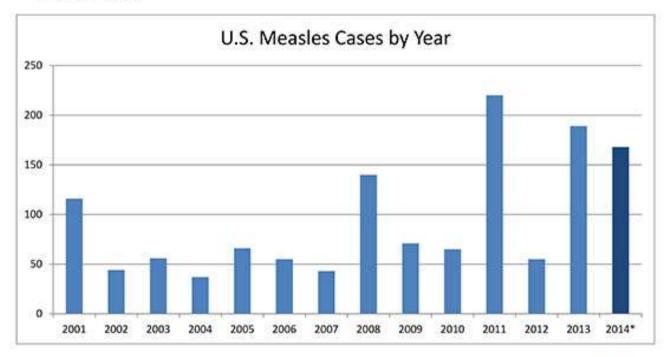
Measles Cases and Outbreaks from January 1- May 2, 2014*



reported in 15 states: Alabama, California, Connecticut, Hawaii, Illinois, Massachusetts, New Jersey, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Wisconsin, Washington

representing 68% of reported cases this year

Outbreaks



*Provisional data reported to CDC's National Center for Immunization and Respiratory Diseases



Measles

Highly infectious

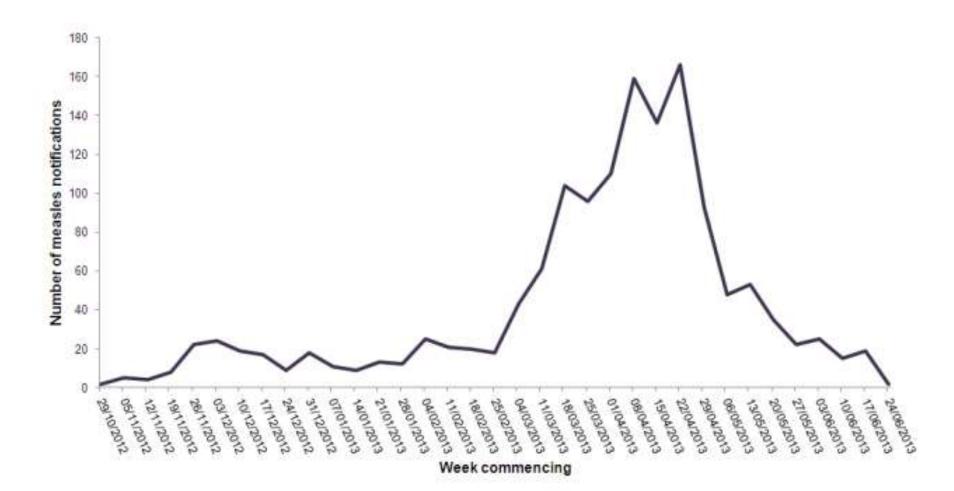
Even with 5% of the population susceptible, ongoing transmission can occur

*****Highly effective vaccine

High coverage in the U.S. and many other countries
Not so high coverage in India, Africa and Western Europe.

*Even with a worldwide drop in measles of 74%, measles killed an estimated 139,200 people in 2010

Measles in Wales



EXPOSED AND UNVACCINATED

A drop in coverage of MMR vaccine in Welsh children led to a rise in vulnerability to a measles outbreak.

Number of cases per 100,000 people November 2012 to December 2013

Vaccine uptake among 2-year olds April 2003 to March 2005

WALES

>85% 81-85% 76-80% <75%

Swansea, one of the lowest coverage was hit by the most cases. In Wrexham, where coverage is high, there were only a small number of cases.

WREXHAM

NEATH -

ABERYSTWYTH

SWANSEA .

Nature, 3/6/14, vol. 507, p. S18

CARDIFF



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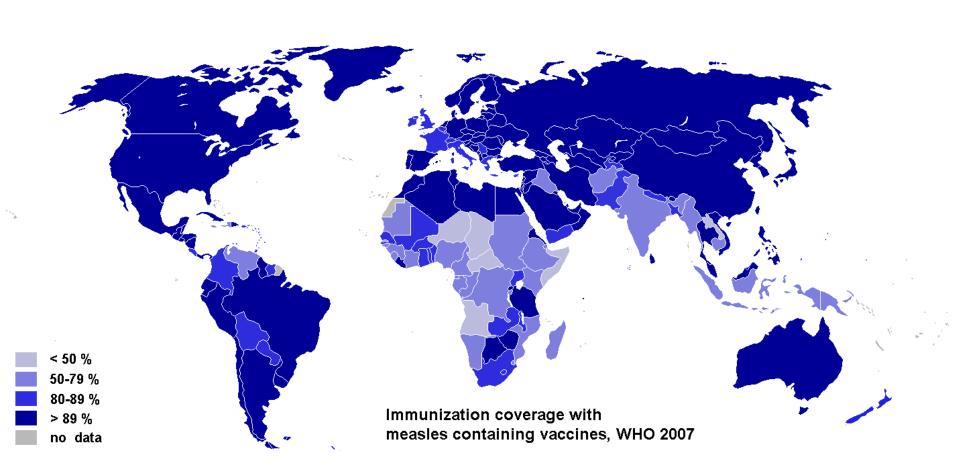


Revealed: MMR research scandal

ST investigation exposes scientist's fatal conflict of interest

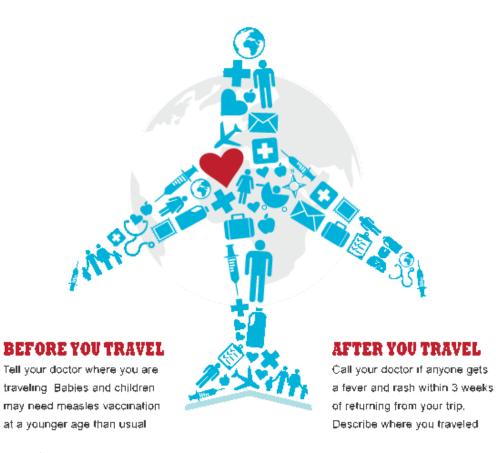
rephold-sodator hyperplania, ven-specific co ive developmental disorder la obtidren

many report





Measles is widespread in places like Europe, Africa, Asia, India, and the Philippines.



🛪 Talk with your doctor if you are planning an international trip.

For more information go to www.cdc.gov/travel

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INTERNATIONAL MEMORIAL FOR VACCINE VICTIMS

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Honoring those whose lives have been lost or forever changed by vaccination.

The Anti-Vaccination Society of America OTHERWISE

An Association of "half-mad", "misguided" people, who write, and toil, and dream, of a time to come, when it shall be lawful to retain intact, the pure body Mother Nature gave, sends GREETING to a "suspect". "Liberty cannot be given, it must be taken."

You are Invited to Join Us

Frank D Blue, Sec'y, Terre Haute, Ind. 1902 Hon L H Piehn, President Enclose 25c for certificate of membership.













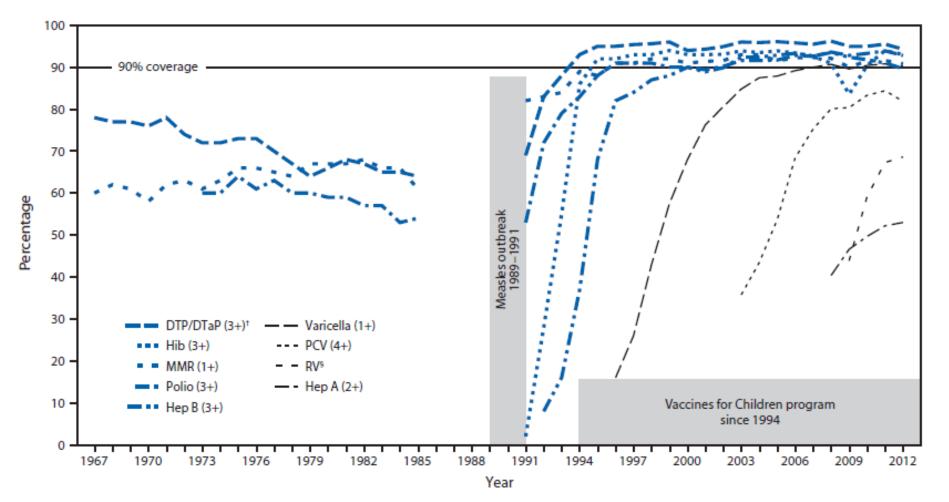




Smallpox Vaccine Significant Adverse Events

- * Encephalitis (12/million)
- * Progressive vaccinia (vaccinia gangrenosa) (2/million)
- ***** Eczema vaccinatum (40/million)
- ***** Generalized vaccinia (240/million)
- * Inadvertent inoculation (500/million)
- ***** Erythema multiforme or other rashes (160/million)
- * Congenital vaccinia
- Secondary infection

Vaccine Coverage Rates Among Preschool-Aged Children United States, 1967–2012

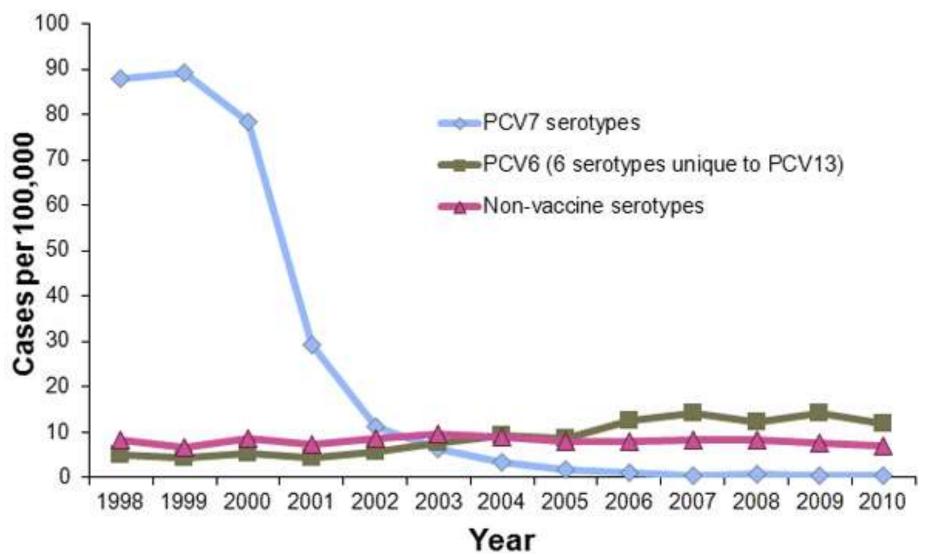


CDC

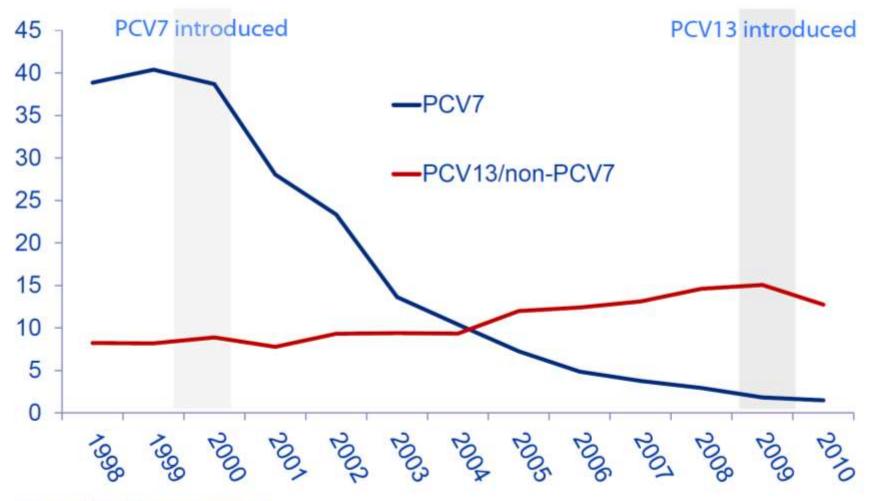
In the 20 years since the VFC program was implemented:

- *5 new vaccines (increasing the number of diseases prevented to 14)
- Vaccination coverage near or above 90% for older vaccines
- *****322 million illnesses prevented
- *****21 million hospitalizations averted
- *732,000 premature deaths prevented
 *\$1.38 trillion saved

Impact of Conjugate Pneumococcal Vaccine Among Children <5 Years Old, U.S.



Incidence of Invasive Pneumococcal Disease Among Adults <u>>65 Years by Serotype</u>, 1998-2010



ABCs unpublished data, continuous sites

Recommended Adult Immunization Schedule—United States - 2014

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 group¹

VACCINE	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years	
Influenza ^{2,*}	1 dose annually						
Tetanus, diphtheria, pertussis (Td/Tdap) ^{3,*}	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs						
Varicella ^{4,*}	2 doses						
Human papillomavirus (HPV) Female ^{5,*}	3 d	oses					
Human papillomavirus (HPV) Male ^{5,*}	3 d	oses					
Zoster ⁶					1 dose		
Measles, mumps, rubella (MMR) ^{7,*}		1 or 2 dose	es				
Pneumococcal 13-valent conjugate (PCV13) ^{8,*}	1 dose						
Pneumococcal polysaccharide (PPSV23) 9,10	1 or 2 doses 1 dose						
Meningococcal ^{11,*}	1 or more doses						
Hepatitis A ^{12,*}	2 doses						
Hepatitis B ^{13,*}	3 doses						
Haemophilus influenzae type b (Hib) 14,*	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



factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)

Recommended if some other risk

No recommendation

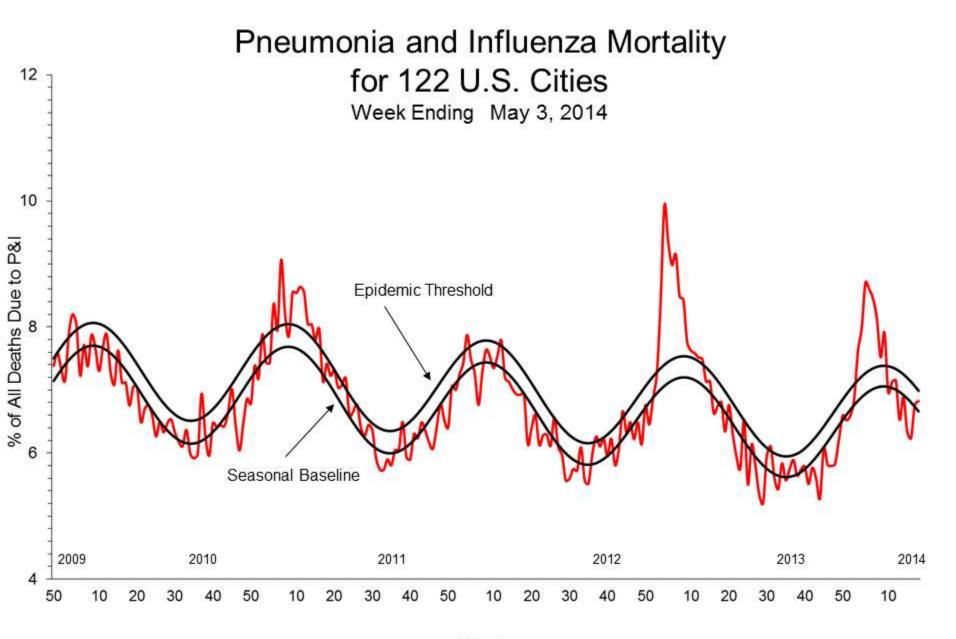
Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

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 from 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.

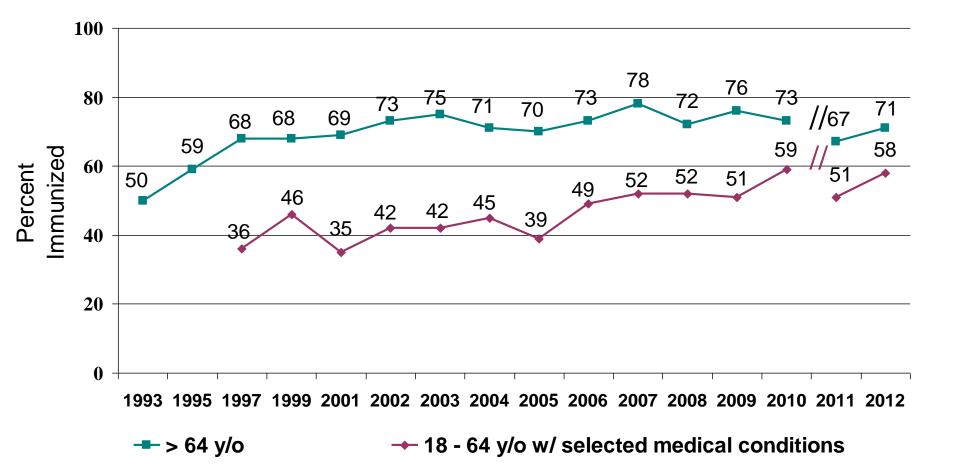
Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

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 American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).



Weeks

Seasonal Influenza Vaccination Rates for Massachusetts Adults



Seasonal Influenza Vaccination Rates for 2012-2013, Massachusetts and U.S., by Race/Ethnicity (BRFSS)

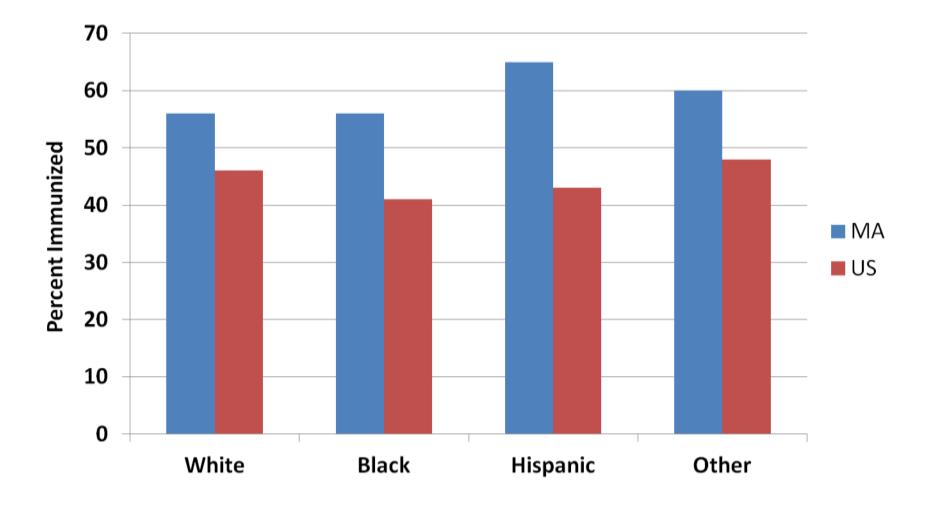
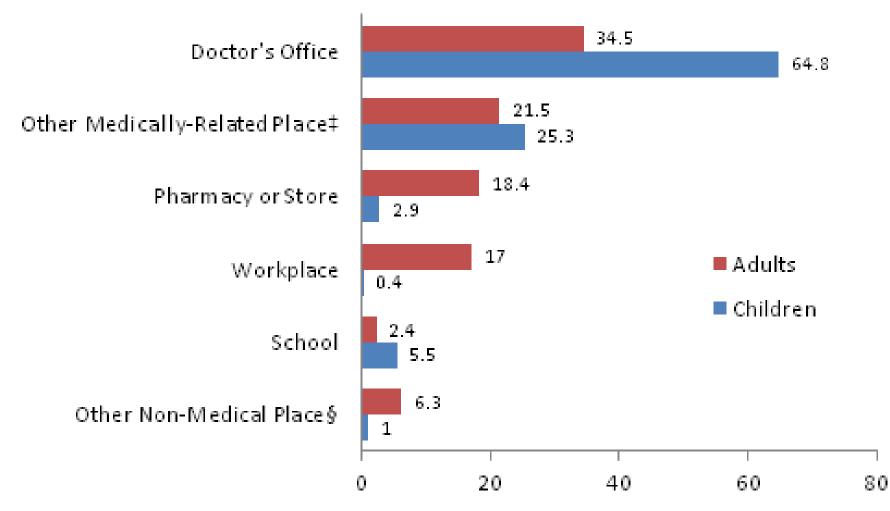
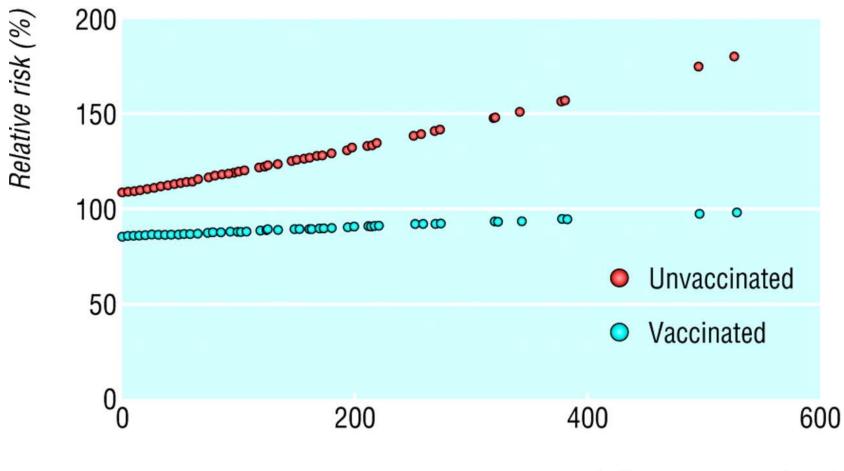


Figure 2. Place of vaccination for children and adults, early 2012-13 flu season, National Immunization Survey and National Internet Flu Survey



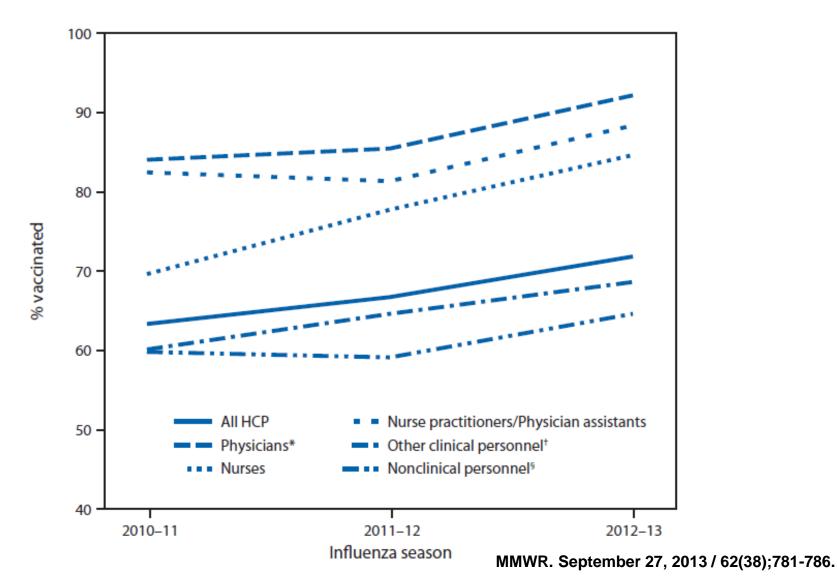
Daily Mortality, >75 y.o., U.K. Armstrong, et al. BMJ 1004; 329: 660



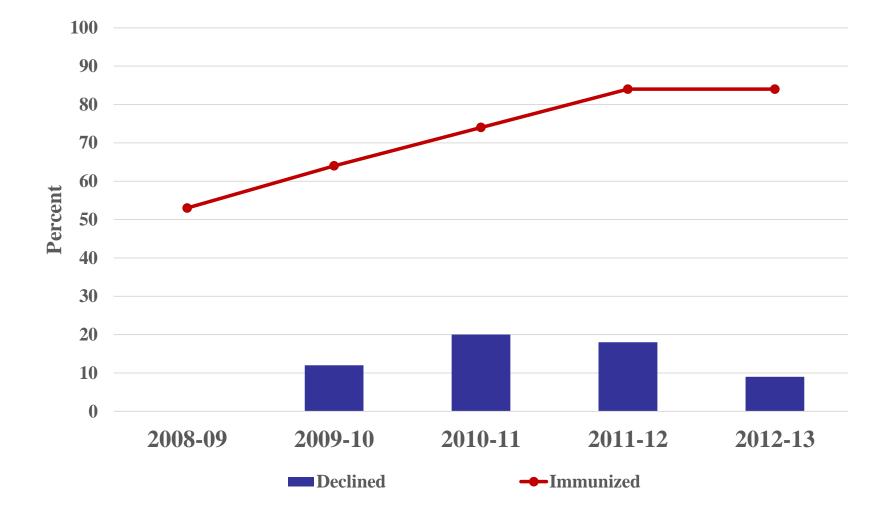
Influenza reports/week

Percentage of health-care personnel (HCP) who received influenza vaccination, by occupation type

Internet panel survey, United States, 2010–11, 2011–12, and 2012–13 influenza seasons



Mean Influenza Vaccination and Declination Rate Among Personnel in Massachusetts Acute Care Hospitals



Why Influenza Vaccination for Healthcare Personnel?

- 1. High risk of exposure
- 2. Prevents illness
- 3. Keeps HCW and colleagues at work
- 4. Keeps patients healthier
- 5. Keeps family healthier
- 6. Saves costs for HCW and health care system
- 7. Provides a good example

Dispelling Myths

- * A flu shot can cause flu
 - It can't
- * The flu shot made me sick.
 - * Rare, more often coincidence
- ***** I never get sick
 - * Anyone can get flu, no special immunity
- * I am healthy, I don't have to worry about influenza
 - Anyone can have a rare complication and anyone can spread influenza to someone who is high risk
- ***** Flu shots have many side effects
 - * Adverse events occur less often than with common OTC and prescribed drugs

Side Effects of Inactivated Flu Vaccine

Nichol, et al. Arch Intern Med 1996; 156: 1546 (n=849)

	Vaccine	Placebo
Systemic complaint	34.1%	35.2%
Arm soreness	63.8%	24.1%

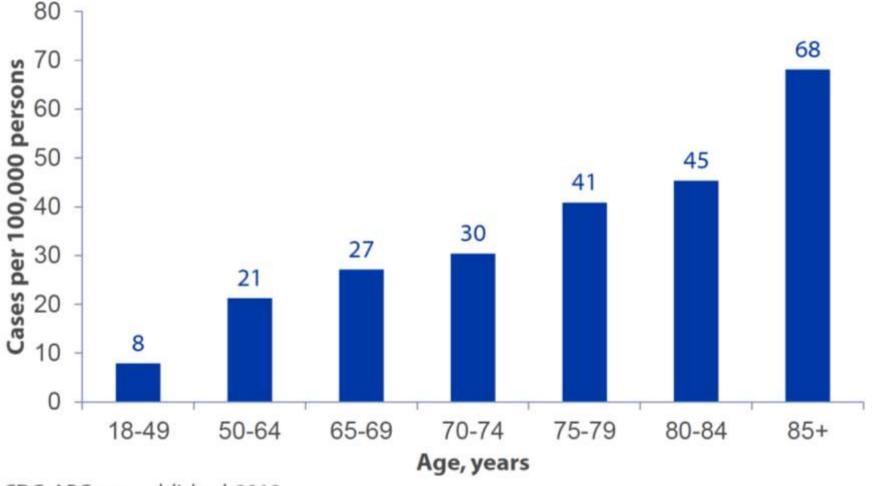
There is no logical reason for a healthcare worker not to get a flu shot, except for a valid medical contraindication.

Influenza vaccination before and during pregnancy, overall and by health-care provider recommendation and offer of influenza vaccination, among women pregnant at any time during October 2012–January 2013 MMWR. September 27, 2013 / 62(38);787-792

80 70 60 Vaccinated (%) 50. 40 30 20 10· Recommendation Overall (N = 1,702)Recommendation but no offer No and offer (n = 270)recommendation (n = 895)(n = 455)

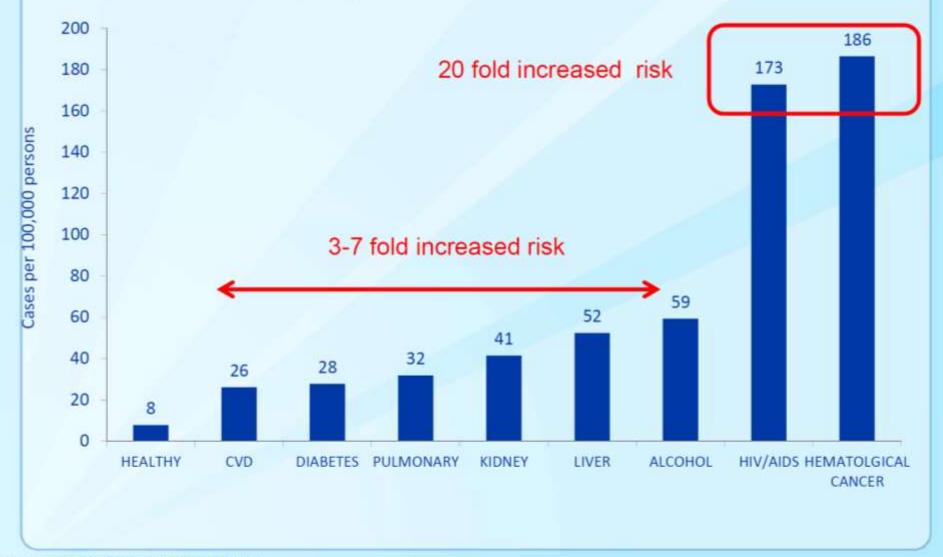
Vaccination recommendation or offer

Incidence of Invasive Pneumococcal Disease among all adults, U.S., 2009



CDC, ABCs, unpublished, 2012

Incidence of IPD in adults aged 18--64 years with selected underlying conditions, United States, 2009



Kyaw, JID 2005;192:377-86



Use of Tdap to Protect Infants 'Cocoon Strategy'

- Adults who have or who anticipate having close contact with an infant aged <12 months should receive a single dose of Tdap
 - ***** Ideally give ≥ 2 weeks before contact with the infant.
- Infants should receive DTaP on schedule
- ***** When possible, women should receive Tdap before conception
- Pregnant women should receive Tdap in the immediate postpartum period
- * "Although pregnancy is not a contraindication for receiving Tdap vaccine, health-care providers should weigh the theoretical risks and benefits before choosing to administer Tdap vaccine to a pregnant woman"

Cocooning

- Limited success in immunizing fathers and other family contacts
- *****Many contacts not identified *a priori*
- *****Delay in production of protective antibodies
- *****Effectiveness not established
- *****Still likely to provide indirect protection

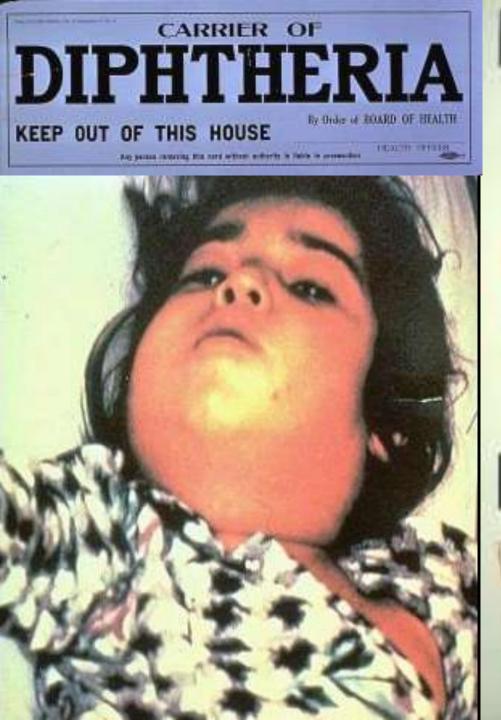
Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccine (Tdap) in Pregnant Women — Advisory Committee on Immunization Practices (ACIP), 2012

In October 2011, in an effort to reduce the burden of pertussis in infants, the Advisory Committee on Immunization Practices (ACIP) recommended that unvaccinated pregnant women receive a dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) (1). Vaccination of women with Tdap during pregnancy is expected to provide some protection to infants from pertussis until they are old enough to be vaccinated themselves. Tdap given to pregnant women will stimulate the development of maternal antipertussis antibodies, which will pass through the placenta, likely providing the newborn with protection against pertussis in early life, and will protect the mother from pertussis around the time of delivery, making her less likely to become infected and transmit pertussis to her infant (1). The 2011 Tdap recopmendation did not call for vaccinating pregnant women previously vaccinated with Tdap. On October 24, 2012, ACIP voted to recommend use of Tdap during every pregnancy. This

The United States has experienced substantial increases in reported pertussis cases over the past several years. Provisional case counts for 2012 have surpassed the last peak year, 2010, with 41,880 pertussis cases and 14 deaths in infants aged <12 months (2) (CDC, unpublished data, 2012). To reduce this burden, optimizing the current vaccination program and protecting infants who are at highest risk for death are immediate priorities. Since the 2011 ACIP vaccination recommendation, uptake of Tdap among pregnant women has been low; one survey of 1,231 women (August 2011 to April 2012) estimated that only 2.6% of women received Tdap during their recent pregnancy (3). New data indicate that maternal antipertussis antibodies are short-lived; therefore, Tdap vaccination in one pregnancy will not provide high levels of antibodies to protect newborns during subsequent pregnancies (4).

Methods

MMWR 2013 ; 62(7);131.



DIPHTHERIA is deadly-

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Diphtheria Cases in Soviet Union and Former Soviet Union

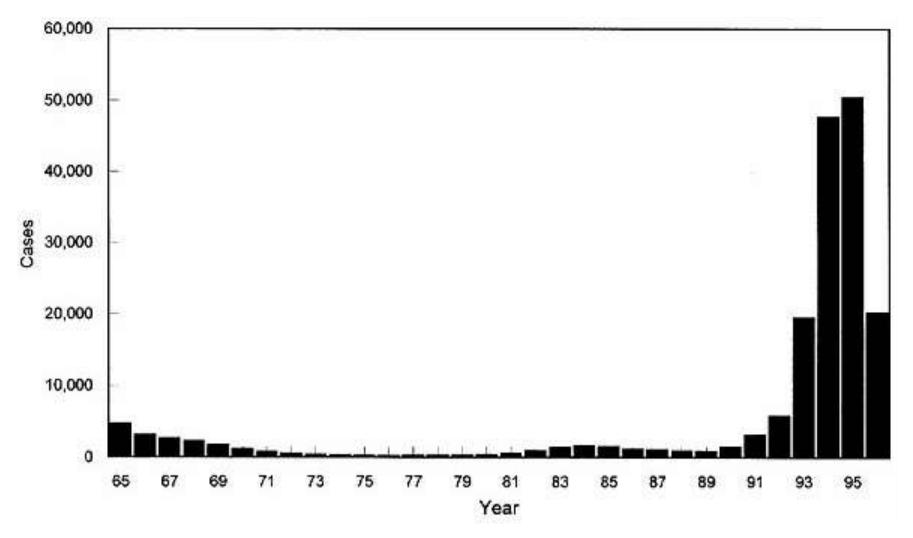
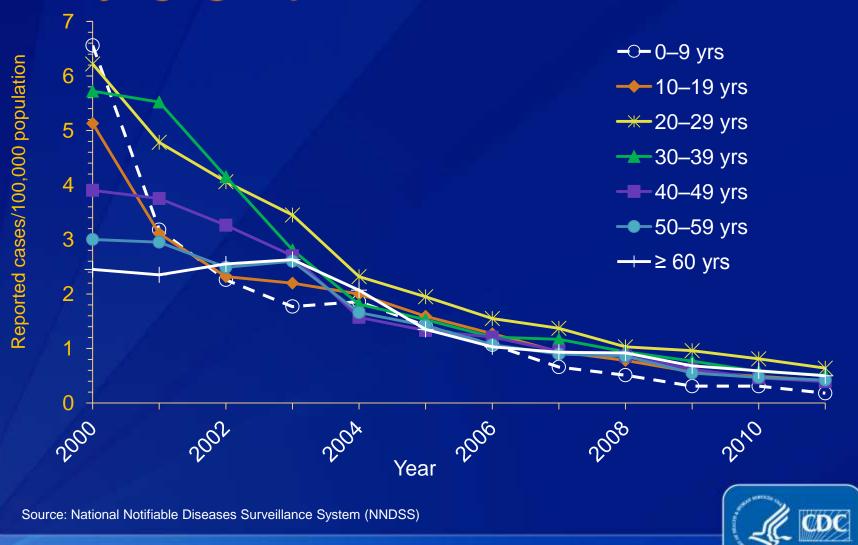
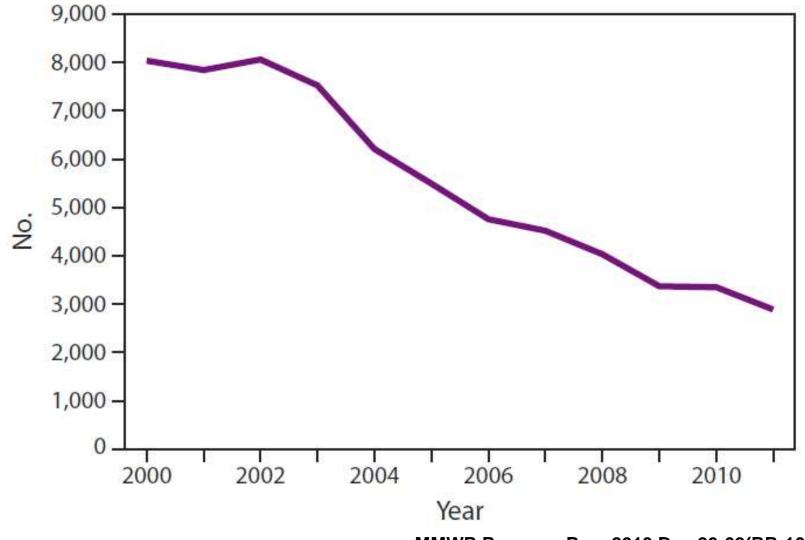


Figure 2.2. Incidence of acute hepatitis A, by age group — United States, 2000–2011



Number of Reported Acute Hepatitis B Cases

National Notifiable Diseases Surveillance System, United States, 2000–2011



MMWR Recomm Rep. 2013 Dec 20;62(RR-10):1-19.

Cost-Effectiveness of Vaccinating Adults with Diabetes

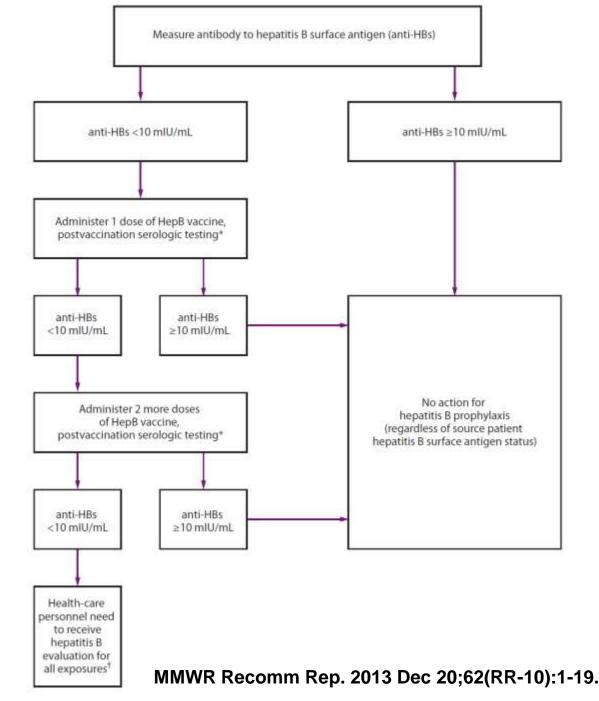
Age at Vaccination (Years)	Number Vaccinated with 10% Take-up	Cost per QALY Saved
20-59	528,047	\$75,094
60+	774,394	\$2,760,753
All (20+)	1,302,441	\$196,557

Data provided by RTI International, September 2011

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ACIP October 25, 2011, Trudy V. Murphy, MD

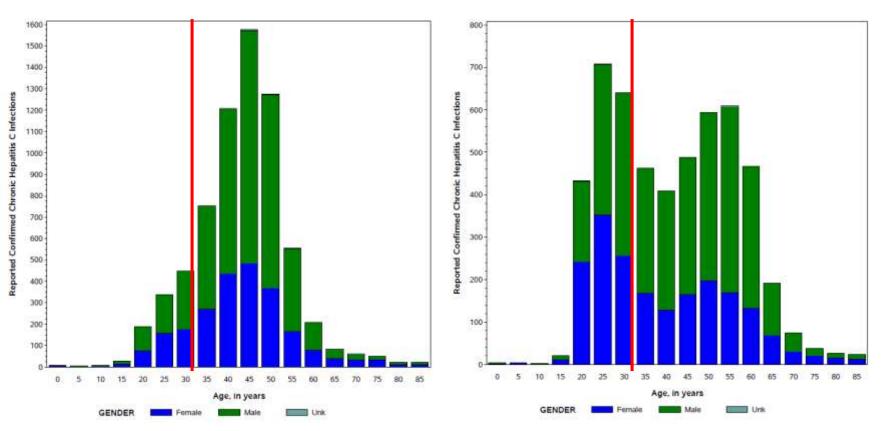
Pre-exposure Evaluation for Health-care Personnel Previously Vaccinated With Complete, ≥3-dose Hepatitis B Vaccine Series Who Have Not Had Post-Vaccination Serologic Testing



Age Distribution of Confirmed Hepatitis C by Age Group

2002

2012



EIP Network: HPV vaccine impact on HPV 16/18-related CIN2+

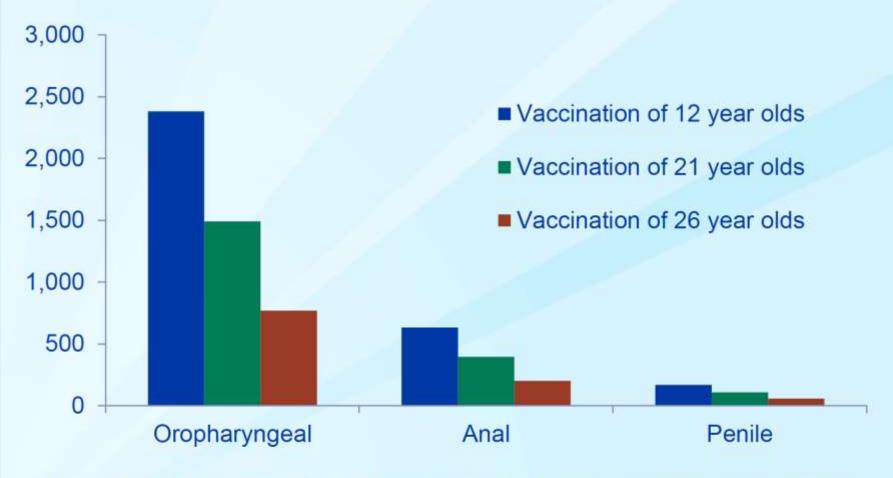
Diagnosis/Timing of vaccine initiation	N	HPV 16/18 N (%)	PR (95% Cl)	aPR* (95% CI)
CIN 2+		1.5		
Not vaccinated	682	382 (56.0)	ref	ref
On/after trigger Pap	300	174 (58.0)	.98 (.88 – 1.10)	.95 (.85 – 1.07)
1-12 months before trigger Pap	95	53 (55.8)	1.00 (.82 – 1.21)	.93 (.77 – 1.13)
13-24 months before trigger Pap	96	50 (52.1)	.93 (.76 – 1.14)	.90 (.74 – 1.10)
> 24 months before trigger Pap	53	21 (39.6)	.71(.50 – .99)	.67 (.48 – .94)

PR - prevalence ratio *adjusted for race and site

Markowitz, Advisory Committee on Immunization Practices, June 19, 2013

Powell, et al. Vaccine 2012

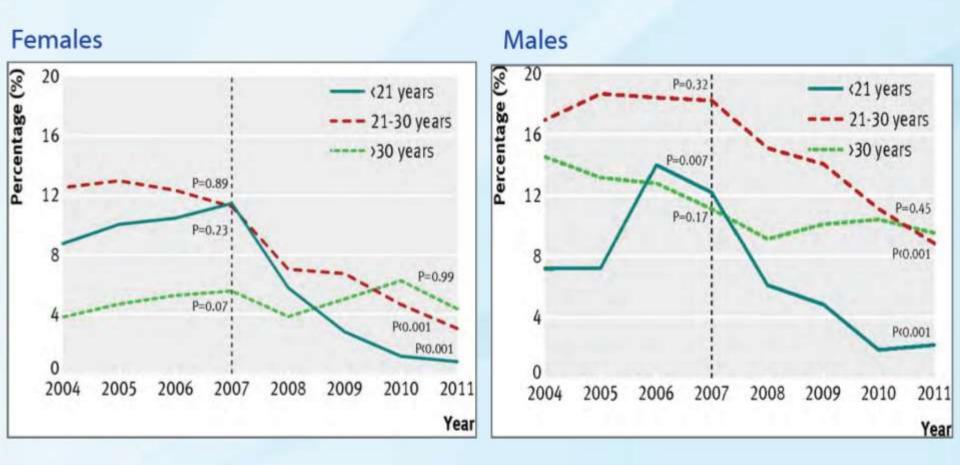
Number of lifetime cancer cases averted by vaccinating 1 million males in a birth cohort



Excludes indirect effects (herd immunity). Outcomes are not discounted. Results obtained from Chesson et al model, Vaccine 2011. Vaccine efficacy was assumed to be 90% against HPV 6/11 genital warts and 75% against HPV 16/18 cancers in males.

Impact of HPV vaccination in Australia

Proportion of Australian born females and males diagnosed as having genital warts at first visit, by age group, 2004-11



Markowitz, Advisory Committee on Immunization Practices, June 19, 2013

Ali, et al. BMJ 2013

Top 5 reasons for not vaccinating daughter, among parents with no intention to vaccinate in the next 12 months, NIS-Teen 2011

Reason	%
Not sexually active	19.5%
Lack of knowledge	15.2%

Response categories are not mutually exclusive

2011 NIS-Teen available at http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteen

Too many vaccines?

NO!

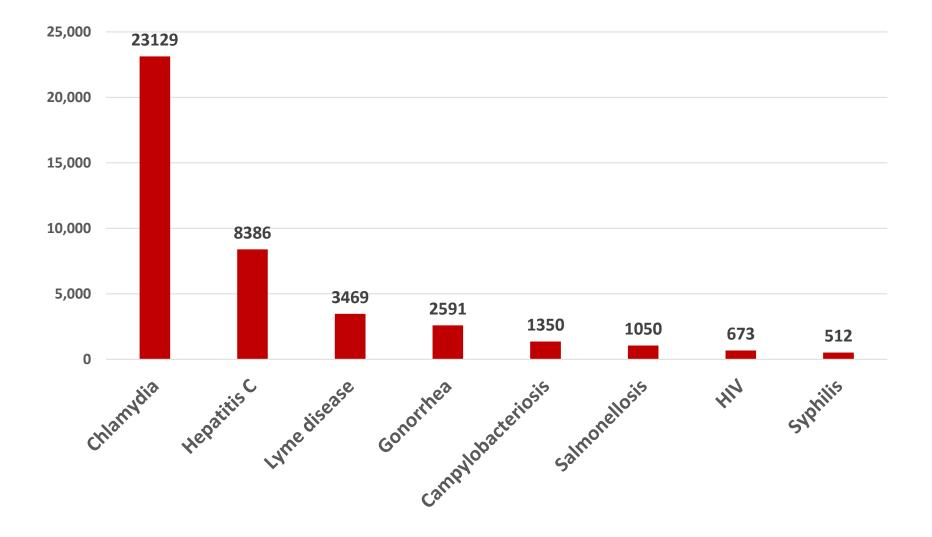
Not Enough

We Need More New Vaccines

- * HIV
- * Hepatitis C
- * Tuberculosis
- * Malaria
- & Lyme disease
- * Gonorrhea
- * Chlamydia infection
- *** RSV** infection
- Group B streptococcal infection

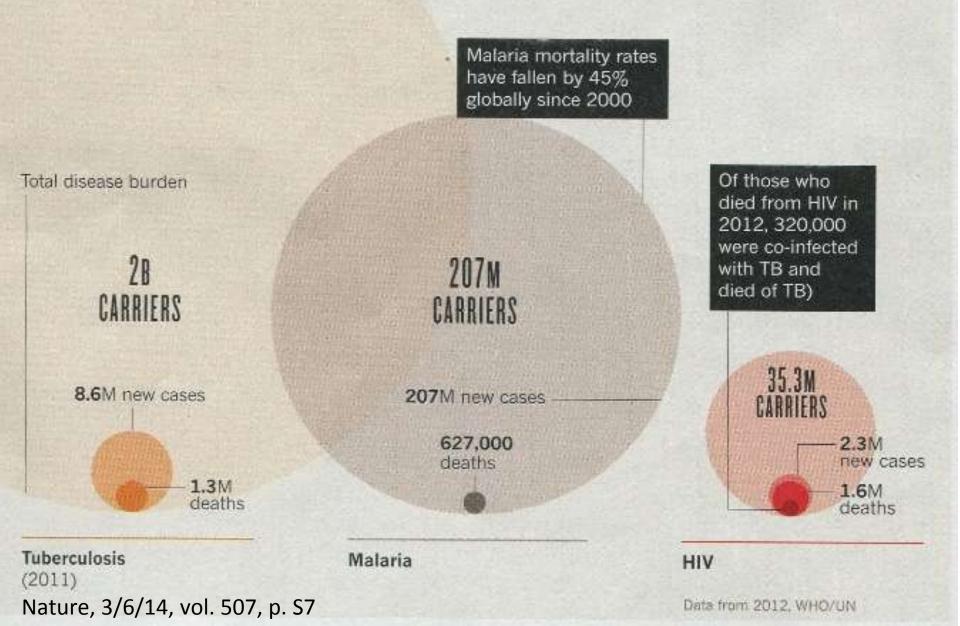
- Group A streptococcal infection
- Clostridium difficile infection
- More for infant diarrheal illness
- For other infections, including expanding and emerging arboviruses
- For non-infectious diseases

Number of Cases Reported in Massachusetts in 2012



PATHOGENS ON THE RAMPAGE

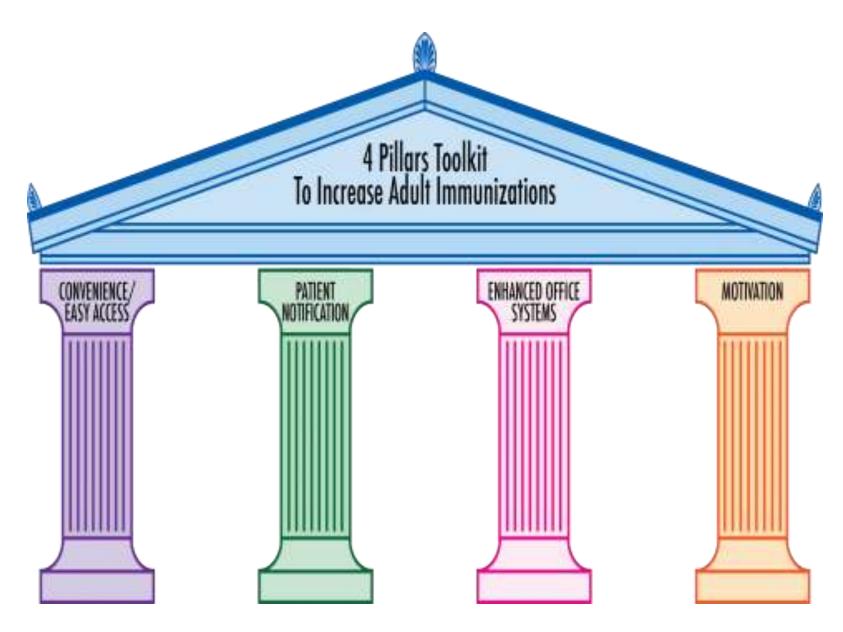
Three of the deadliest diseases on Earth still lack effective vaccines.



We Need Better Vaccines

- **Better and/or broader :**
- Influenza vaccine
- *****Pertussis vaccine
- *****Meningococcal inclusive of serogroup B
- Cross-reactive vaccines for pneumococcal infection, HPV, etc.
- Continued development of more immunogenic, less reactogenic vaccines





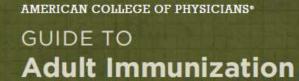
http://www.immunizationed.pitt.edu/book/export/html/1

Strategies That Work to Improve Adult Immunization

- Standing Orders
- Computerized
 Record Reminder
- Chart Reminder
- Performance Feedback
- Home Visits
- Mailed/Telephoned Reminders

- Expanding Access in Clinical Settings
- Patient Education
- Personal Health Records
- Measuring and Tracking Rates





4TH EDITION: A TEAM-BASED MANUAL

UPDATED MARCH 2012



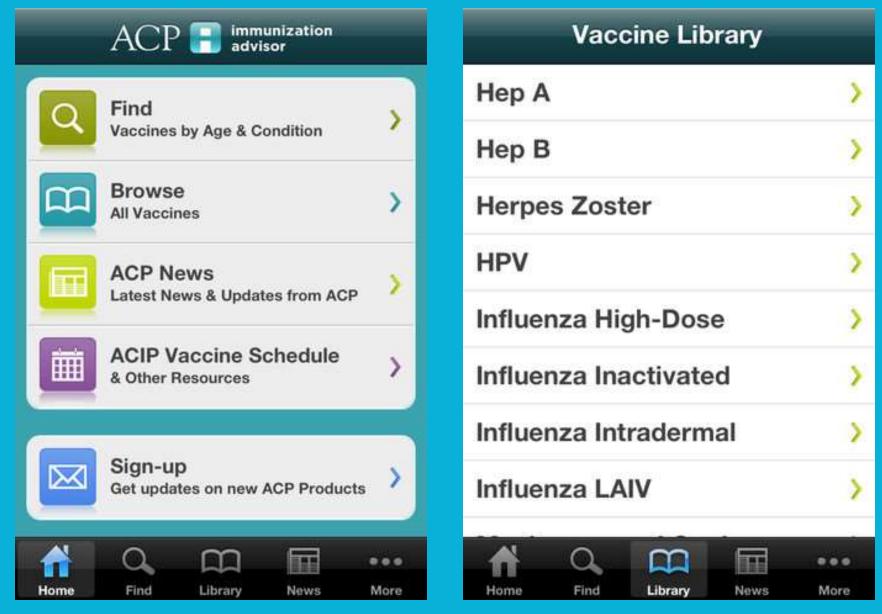


http://www.cdc.gov/vaccines/recs/Scheduler/AdultScheduler.htm



AMERICAN COLLEGE OF PHYSICIANS Immunization Portal





Recommendations from the National Vaccine Advisory Committee: Standards for Adult Immunization Practice

NATIONAL VACCINE ADVISORY Committee The Advisory Committee on Immunization Practices (ACIP) makes recommendations for routine vaccination of adults in the United States.¹ Standards for implementing the ACIP recommendations for adults were published by the National Vaccine Advisory Committee (NVAC) in 2003² and by the Infectious Diseases Society of America in 2009.³ In addition, NVAC published a report in 2012 outlining a pathway for improving adult immunization rates.⁴ While most of these documents included guidelines for immunization practice, recent changes in the practice climate for adult immunization necessitated an update of existing adult immunization standards. Some of these changes include expansion of vaccination services offered by pharmacists and other community immunization

What is Needed?

- *****Accurate information
- *****Evidence-based practices
- *Commitment
- *****Political will
- *****Persistence

What is to be Done?

- *****Disease is bad; vaccines are good
- Never miss an opportunity to promote or administer adult vaccines
 - Consider vaccines at every visit
 - Put in place mechanisms to maximize immunization
 - *****Provide education
- *****Refute myths and misrepresentations
- *****Get fully vaccinated yourself

A health care provider recommendation is the single most important determinant of whether or not someone gets vaccinated.

