

SURVEILLANCE, REPORTING AND CONTROL OF VACCINE PREVENTABLE DISEASES 2016



21th Annual Massachusetts
Adult Immunization Conference
April 27, 2016

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PRESENTER DISCLOSURE INFORMATION JOYCE COHEN AND MARIJA POPSTEFANIJA

We, Joyce Cohen and Marija Popstefanija, 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 my presentations.

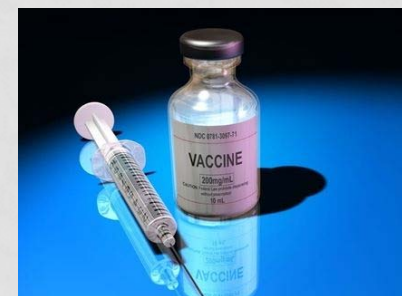
We have no relationships to disclose.

We will discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.

But in accordance with ACIP recommendations.

TODAY'S TOPICS

- **Epidemiology in a global context**
 - Who we are and what we do
 - Reporting and controlling the spread of diseases
- **Recent events in communicable disease worldwide**
- **Vaccine-preventable disease (VPD) epidemiology in Massachusetts**
 - Overall trends
 - Mumps
 - Invasive meningococcal disease
 - Influenza



IN THE AUDIENCE TODAY:

RAISE YOUR HAND

- ...if you have talked to a patient who is apprehensive about getting vaccine.
- ...if you have ever reported a suspect case of a VPD to the health dept.
- ...if you have ever had to provide evidence of immunity due to an exposure in your workplace.
- ...if you have ever flown from one continent to another, in a matter of hours.
- ...if you have ever had to utilize prophylaxis for yourself or a patient after exposure to a VPD.
- ...if you are ever concerned about how quickly illnesses can be transmitted around the globe.

EPIDEMIOLOGISTS – OUR ROLE

Massachusetts State Public Health Laboratory

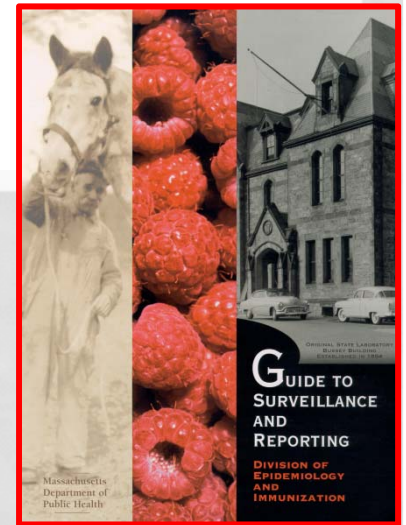


Surveillance, reporting and control of vaccine-preventable diseases, and others, to reduce associated morbidity and mortality

EPIDEMIOLOGISTS

For suspect cases, we

- Partner with local health departments
- Ensure appropriate treatment
- Help determine if the case needs to be excluded from work or school and for how long
- Help identify “close contacts”
- Make recommendations for contacts including immunization, prophylaxis, treatment, and/or exclusion from work/school as needed



HEALTHCARE PROVIDER ROLE

- Notify patient of diagnosis
- Notify the LBOH or MDPH of an infectious reportable disease
- Inform patient that the LBOH may be calling
- Educate patient about protecting their family and close contacts
- Provide key information to the LBOH to complete the official “Case Report*”

*per 105 CMR 300.000



WHAT IS REPORTABLE BY WHOM?

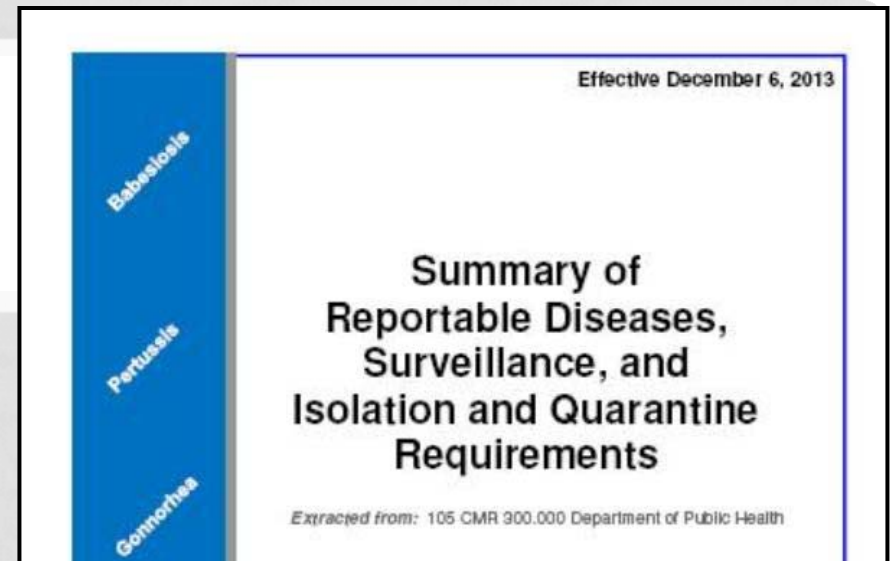
- 105 CMR 300.000
- Reportable Diseases Lists:
 1. Healthcare providers
 2. Clinical laboratories
 3. Local Boards of Health



Diseases in red are
“immediate” diseases.

- Diseases in black are reportable within 1-2 business days.

mass.gov/dph/epi – click on
“Reportable Communicable
Diseases”



**COMMUNICABLE AND OTHER INFECTIOUS DISEASES
REPORTABLE IN MASSACHUSETTS BY
HEALTHCARE PROVIDERS***

*The list of reportable diseases is not limited to those designated below. This list includes only those which are primarily reportable by clinicians. A full list of reportable diseases in Massachusetts is detailed in 105 CMR 300.100.

REPORT IMMEDIATELY BY PHONE!
This includes both suspected and confirmed cases.
All cases should be reported to your local board of health;
if unavailable, call the Massachusetts Department of Public Health:
Telephone: (617) 983-6800 Confidential Fax: (617) 983-6813.

REPORT PROMPTLY (WITHIN 1-2 BUSINESS DAYS).
This includes both suspected and confirmed cases.
Isolates should be submitted to Hinton State Laboratory Institute.

☞ Anthrax ☞ ☒ ☞ Any case of an unusual illness thought to have public health implications ☞ Any cluster/outbreak of illness, including but not limited to foodborne illness ☞ Botulism ☞ ☒ ☞ Brucellosis ☞ ☒ ☞ Cholera ☞ Creutzfeldt-Jacob disease (CJD) and variant CJD ☞ Diphtheria ☞ Encephalitis, any cause ☞ Hemolytic uremic syndrome ☞ Foodborne illness due to toxins (including mushroom toxins, ciguatera toxins, scombrototoxin, tetrodotoxin, paralytic shellfish toxin and amnesic shellfish toxin, and others) ☞ Hansen's disease (leprosy) ☞ Hemolytic uremic syndrome	☞ Meningitis, viral (aseptic), and other infectious (non-bacterial) ☞ Meningococcal disease, invasive (<i>Neisseria meningitidis</i>) ☞ ☒ ☞ Mumps ☞ ☒ ☞ Pertussis ☞ Plague ☞ ☒ ☞ Polio ☞ Pox virus infections in humans, including variola (smallpox), monkeypox, vaccinia, and other orthopox or parapox viruses ☞ Rabies in humans ☞ Respiratory infection thought to be due to any novel coronavirus including SARS and MERS ☞ Reye syndrome ☞ Rheumatic fever ☞ Rickettsialpox ☞ Rocky Mountain spotted fever
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COLLABORATIONS IN DISEASE SURVEILLANCE AND CONTROL



Healthcare Provider

LBOH 1



MDPH

LBOH 2



School



Sports Team



Adult Immunization Conference 2016



Recent events in communicable disease worldwide

Massachusetts Department of Public Health



YOU RECEIVE A CALL FROM A PATIENT

- Who has recently returned from Rio de Janeiro covered with mosquito bites, and has discovered that she is pregnant
- Who has recently worked for the USDA in another state, euthanizing poultry suspected of having high-path avian influenza, and is now feeling very fatigued and feverish
- Who has recently returned from the Middle East, and is short of breath and very anxious
- Who has volunteered for a clean water organization in West Africa, and upon returning from Africa has had fever, rash, and conjunctivitis

ZIKA VIRUS

- Spread by mosquito bites
- Recently introduced to Central and South America and the Caribbean
- In general causes mild viral illness; most infected with Zika are asymptomatic
- **May cause birth defects like microcephaly when infection occurs during pregnancy**

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lieutenant Governor

BUREAU OF INFECTIOUS DISEASE
AND LABORATORY SCIENCES

Clinical Advisory
Zika Virus
January 21, 2016
Updated February 5, 2016

Zika Virus

Zika virus is a mosquito-borne flavivirus (in the same family as yellow fever, dengue and West Nile virus) previously found largely in Africa and Southeast Asia. In 2007, it was found for the first time on the island of Yap and subsequently in French Polynesia. In May 2015, the World Health Organization announced the first local transmission of Zika virus in the Western Hemisphere, with locally acquired cases identified in Brazil. As of January 15, 2016, local transmission had been identified in at least 14 countries or territories in the Americas, including Puerto Rico (See <http://wwwnc.cdc.gov/travel/notices/> for information on current countries and territories in the Americas with Zika virus transmission). Further spread to other countries in the region is

MARYLOU SUDDERS



Call 617-983-6800 for questions about testing patients with recent onsets, or testing of pregnant women with travel to Zika-affected areas.

MIDDLE EAST RESPIRATORY SYNDROME (MERS)

- Incubation period ~12 days
- Fever, cough, weakness, fatigue
- Pneumonia, ARDS
- Diarrhea in many cases
- **About 3-4 out of every 10 patients reported with MERS have died.**



Call 617-983-6800 for patients in respiratory distress with recent travel to the Middle East and other affected regions or countries.

HIGHLY PATHOLOGIC AVIAN INFLUENZA (HPAI)



- A disease of birds
- Rarely transmitted to humans
- Monitoring of exposed humans out of an abundance of caution

BIDLS role: If HPAI is found in Massachusetts, we will monitor exposed poultry workers for influenza-like illness, and provide testing at MA PHL to rule out HPAI as quickly as possible.

COMMONWEALTH OF MASSACHUSETTS
HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)
MULTI-AGENCY COORDINATION AND OPERATIONS PLAN



EBOLA VIRUS

- Usually abrupt onset 3–12 days after exposure
- Nonspecific initial signs and symptoms: fever and malaise, anorexia, headache, myalgia, arthralgia, sore throat, chest or retrosternal pain, conjunctival injection, lumbosacral pain, maculopapular rash
- Gastrointestinal signs and symptoms follow in first few days: nausea, vomiting, epigastric and abdominal pain, diarrhea
- **The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.**

Our role to date:

- assisting with evaluation and testing of suspect cases
- monitoring of returning travelers for 21 days



MASSACHUSETTS MORBIDITY



24/7 urgent disease control matters: 617-983-6800

Massachusetts Department of Public Health

Bureau of Infectious Disease and Laboratory Sciences - Division of Epidemiology and Immunization

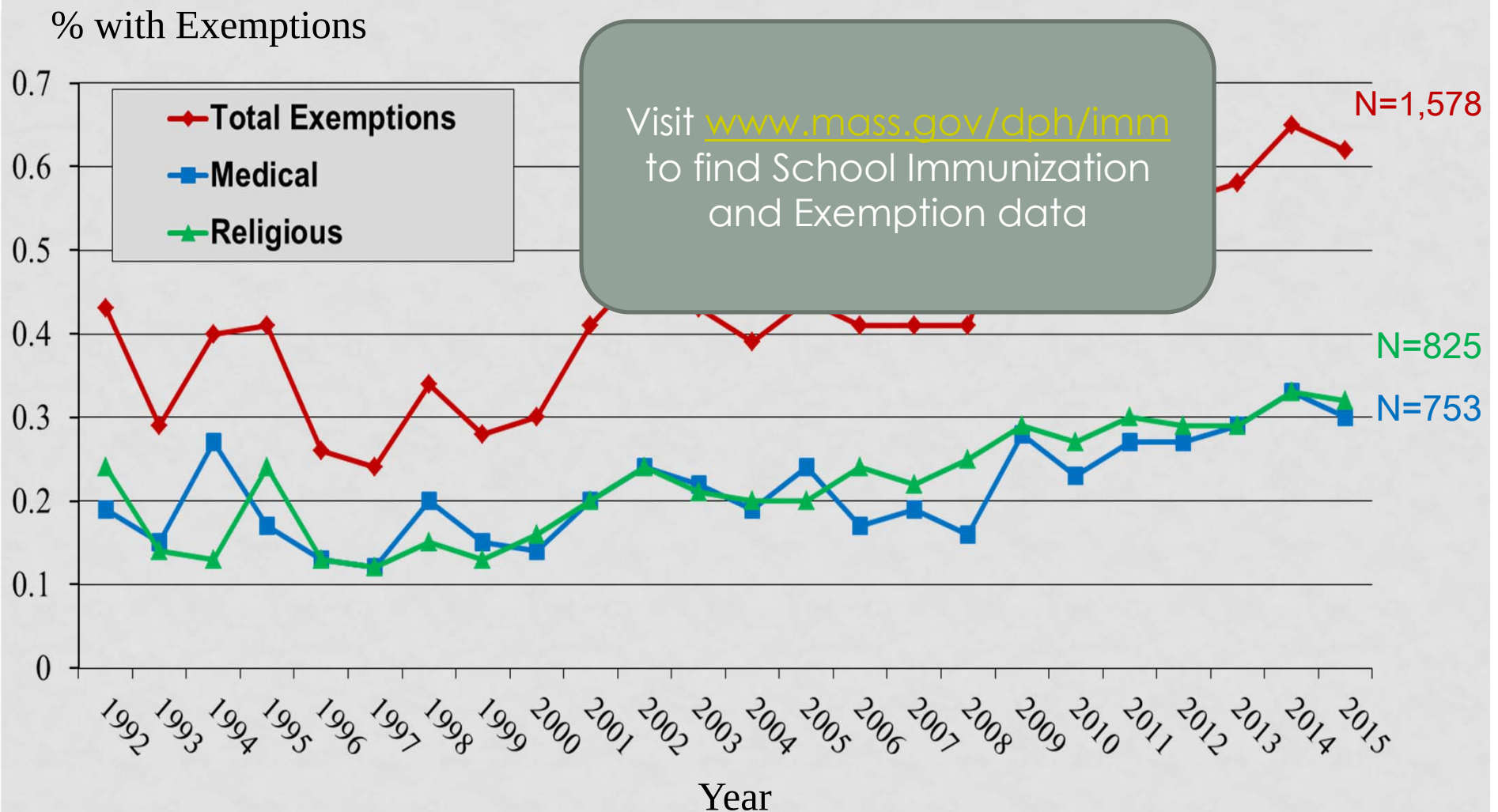
Vaccine-Preventable Diseases in Massachusetts*, 2006-2015

Disease	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Measles	19	1	2	2	3	24	0	1	8	0
Mumps	10	6	7	15	9	4	6	71	5	6
Rubella	2	1	1	1	0	1	1	0	0	0
CRS	0	0	0	0	0	0	0	0	0	0
Meningococcal Disease	21	21	22	14	8	14	6	11	11	12
Pertussis	1201	1198	762	362	294	273	651	348	298	252
Hib < 5	0	3	2	1	1	0	2	1	1	0
Tetanus	0	0	0	0	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	0	0	0	0
Polio	0	0	0	0	0	0	0	0	0	0
Pneumococcal Disease < 5	90	89	83	81	72	40	51	24	27	20
Varicella	**	2094	1585	1415	769	606	626	476	469	367

Data are current as of 3/11/2016 and are subject to change.

*Both confirmed and probable cases are reported for measles, mumps, rubella, and varicella to better reflect the true burden of disease. All other diseases include confirmed cases only. **Varicella surveillance prior to 2007 was conducted using different methodology and cannot be compared with subsequent years.

RELIGIOUS AND MEDICAL EXEMPTIONS AMONG MASSACHUSETTS COLLEGE STUDENTS 1992-2015



INVESTIGATIONS VS. CONFIRMED* CASES

	2014 Investigations	2014 Confirmed Cases	2015 Investigations	2015 Confirmed Cases
Diphtheria	4	0	5	0
Hepatitis A	231	39	170	34
Measles*	111	8	119	0
Mumps*	121	5	154	6
Polio	30	0	28	0
Rubella*	21	0	20	0
Pertussis	413	298	337	252
Totals	911	350	807	292

*Includes probable cases to more accurately reflect true burden of disease.

MUMPS

A systemic disease characterized by:

- *Non-specific prodrome consisting of myalgia, loss of appetite, malaise, headache, low-grade fever*
- *Swelling of one or more salivary glands, usually the parotid glands, often tender or painful, with orchitis commonly reported in males after puberty*
- ***1/3 of infections may be asymptomatic or manifest as respiratory illness***
- *Rare complications include arthritis, encephalitis, thyroiditis, mastitis, ataxia, oophoritis, hearing loss, and others*



MUMPS OUTBREAK 2016

There are now 6 confirmed cases of mumps at Harvard University

Officials have asked the students to "self-isolate" for five days.

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- Initial notification on 2/24/16
- Clinical advisory issued on 3/2/16
- Emphasis on early recognition, prompt testing and **isolation of ill patient for five days after onset** of parotitis, and vaccination
- Mumps may occur in vaccinated individuals
- Two doses 88% effective (at best) in preventing mumps

MMR rates among MA college students, 2015-16 school year

	Undergraduate es	Graduate s	Health Science
Harvard	99.8%	98.8%	100%



The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Infectious Disease and Laboratory Sciences
305 South Street, Jamaica Plain, MA 02130

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www.mass.gov/dph/imm

MARYLOU SUGGERS
Secretary
MONICA BHAREL, MD, MPH
Commissioner
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www.mass.gov/dph

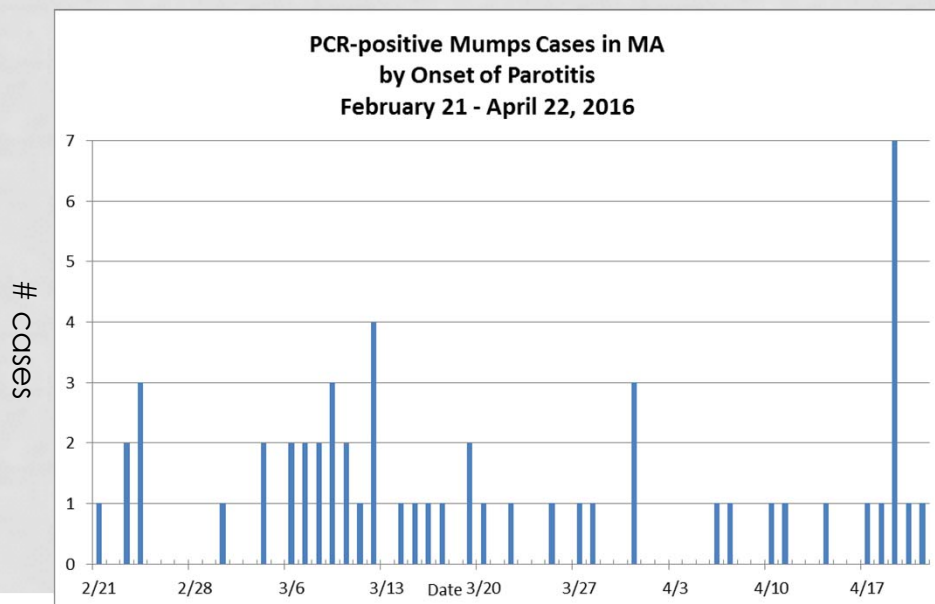
March 2, 2016

Clinical Advisory: Mumps

1. Consider a diagnosis of mumps in those with mumps symptoms, regardless of vaccination history.
2. Use droplet and standard precautions to prevent transmission.
3. Obtain appropriate clinical specimens for testing at the Massachusetts State Public Health Laboratory. A buccal swab is preferred for patients with recent onsets (within five days of onset of swelling).
4. Isolate suspected and confirmed mumps cases for five days after onset of swelling.
5. Report suspected cases to MDPH at 617-983-6800. Cases diagnosed in Boston should be reported to the Boston Public Health Commission at 617-534-5611.
6. Vaccinate those without evidence of immunity to mumps and reach out to those with medical and religious exemptions.

MUMPS OUTBREAK 2016

- 56 confirmed in MA (as of 4/25/16), all but one by PCR
 - 34 confirmed cases at Harvard
 - Cases confirmed at seven other Boston-area universities
 - Probable cases at two other universities
 - 28 M/28 F (Age range 15-50 – Median age 21)
 - Majority with two MMR doses
- >300 suspect cases investigated since 2/15/2016



Call 617-983-6800 while patient is still in your office, to ensure collection of correct specimens and testing at MA PHL.

CHALLENGES – MUMPS OUTBREAK

- Many causes of parotitis (e.g., influenza)
- Asymptomatic and mildly ill may spread mumps
- Testing
 - Buccal swab in VTM for PCR soon after onset
 - **False negative PCR results may occur (intermittent shedding)**
 - IgM testing of limited value in vaccinated population
 - Acute/convalescent IgG titer comparison can rule in and rule out cases
- Isolation of patients who feel well and/or have negative results – extremely important!
- Social distancing in a college-age cohort
- Messaging – when two doses of MMR do not protect 100% of those who receive it.

INVASIVE MENINGOCOCCAL DISEASE

Meningococcal Meningitis

- Clinical Findings:
 - Fever
 - Headache
 - Stiff neck



Meningococcemia

- Clinical Findings:
 - Fever
 - Petechial or purpuric rash
 - Hypotension
 - Multiorgan failure
- May occur with or without meningitis

INVASIVE MENINGOCOCCAL DISEASE

- Onset typically abrupt, with fever, chills, malaise, myalgia, limb pain, prostration, and a rash that initially can be macular, maculopapular, petechial, or purpuric.
- Overall case fatality rate is 10-15% and is somewhat higher in adolescents
- Sequelae occur in 11-19% of survivors and include hearing loss, neurologic disability, digit or limb amputations, and skin scarring.
- Incubation period is 1 to 10 days, usually less than 4 days – intervention must be rapid.
- **Call 617-983-6800 immediately when you suspect invasive meningococcal disease.**

INVASIVE MENINGOCOCCAL DISEASE



BOSTON PUBLIC HEALTH COMMISSION
Communicable Disease Control Division
1010 Massachusetts Avenue · Boston, MA 02118
Phone: (617) 534-5611 · Fax: (617) 534-5905

UPDATE: Meningococcal Disease in the Boston Adult Homeless Community

Summary: The Boston Public Health Commission (BPHC) has received reports of five confirmed cases of meningococcal disease in the Boston adult homeless community since the end of January. Four cases presented with meningococemia; one presented with meningitis. Two cases developed fulminant disease and died. Close contacts of each case have been chemoprophylaxed. Serogrouping has been completed on four isolates; information on the fifth isolate is pending. Two isolates were determined to be serogroup C, and additional testing showed that they were genetically similar. Two isolates were serogroup Y. Given the number of cases, and the temporal and geographic clustering of cases in a distinct population cohort, BPHC continues to recommend vaccination against meningococcal disease for those in the Boston adult homeless community. Since February 17, 2016, the Boston Health Care for the Homeless Program (BHCHP) has vaccinated over 2,400 individuals at risk. Menactra (which covers serogroups A, C, W-135, and Y) is being used for vaccination.

INVASIVE MENINGOCOCCAL DISEASE

- Five cases in two months starting in late January among homeless people with ties to Boston – very unusual – 4 males/1 female
- Two deaths
- Antibiotic prophylaxis to close contacts
- Two serogroup C; three serogroup Y
- Large vaccination campaigns - ~4000 received vaccine
- Case-control interviews to determine risk factors

Vaccine rushed to Boston's homeless after a death



By Felice J. Freyer | GLOBE STAFF FEBRUARY 20, 2016

Boston health officials are vaccinating hundreds of homeless people against a severe bacterial infection that can kill within hours, after a homeless man died Monday from the disease.

The victim was among three homeless men who recently came down with meningococemia, which occurs when certain bacteria get into the bloodstream. The fatal case appears to be unrelated to the other two, which occurred in late January and involved a different strain of the bacteria, said Dr. Denise De Las Nueces, medical director of the Boston Health Care for

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Most Viewed Most Commented Most

Silent protest by Bill Belichick at NFL owners meetings?

HubSpot book is unflattering portrait of Cambridge company

Trump threatens to 'spill the beans' on Cruz's wife

Chang proposes starting school before Labor Day, scrapping Feb. break

Donald Trump renews call for torture after Brussels bombings, contrasting Hillary Clinton's more measured response

Blocking Garland, GOP plays another losing hand

MEASLES

An acute illness characterized by:

- Generalized, maculopapular rash lasting ≥ 3 days; **and**
- Fever $\geq 101^{\circ}\text{F}$ or 38.3°C ; **and**
- Cough, coryza, or conjunctivitis.



MEASLES IN MASSACHUSETTS 2015

- **One confirmed case in a visiting exchange student**
 - Hundreds of exposures
 - People excluded from work, daycare, and public activities
 - Reminder that school vaccination requirements apply to visiting students
- **High suspect case in unvaccinated child**
 - Recent extensive domestic travel included tourist hubs
 - Imperfections with testing (positive result required confirmatory testing)
 - High vaccination exemption rates in region
 - Full-scale response included vaccination clinics and exclusions
 - Case eventually ruled out

Measles Control in Medical Settings – Initial Steps

Patients with fever, rash and respiratory illness may have measles. Measles usually starts with a prodrome consisting of mild to moderate fever, cough, conjunctivitis and/or coryza. This is followed by fever spikes, often as high as 104-105° F, and a red maculopapular rash that typically starts at the hairline, then face, then spreads rapidly down the body.

Patients who have recently (within three weeks) been in contact with other people with measles, have been in locations with recent cases of measles, have travelled internationally, or who have visited sites popular with international visitors (tourist attractions, airports) may be at increased risk.



1. **Assess, screen and mask all patients with febrile rash illness immediately on arrival.**

Only staff with evidence of immunity to measles should attend suspect measles patients and should wear N95 or higher level of protection respirators to filter airborne particles when attending suspect measles patients if possible.

2. **Isolate:** Escort masked patients with rash illness or suspect measles to a separate waiting area or private room, preferably at negative pressure relative to other patient care areas.

3. **Ask:** Ask patient about risk factors for measles, such as international travel, known exposure to a measles case, vaccine history, and progression of rash.

4. **Report:** Immediately report the suspect case to your local board of health and to the MDPH Division of Epidemiology and Immunization at 617/983-6800. Cases diagnosed in Boston should be reported to Boston Public Health Commission at 617/534-5611.

5. **Test:** Obtain specimens including serum, and NP swab or throat swab, and urine, for testing at the Hinton State Laboratory in Jamaica Plain (call 617/983-6800).

6. **Restrict:** Do not use the room which has been occupied by a suspect case for two hours following the case's exit.

7. **Identify:** Identify all exposed patients and staff. This includes:

- Patients and families in the waiting and examination rooms up to two hours after suspect case was present;
- All staff both with and without direct patient contact (e.g., maintenance, administrative support); and
- Due to airborne route of transmission, areas of shared air space beyond those occupied by the patient may be considered exposed, potentially encompassing an entire facility.

8. **Document:** Acceptable evidence of immunity for healthcare workers:

Three options: Two doses of MMR, serologic evidence of measles immunity, or laboratory confirmation of disease.

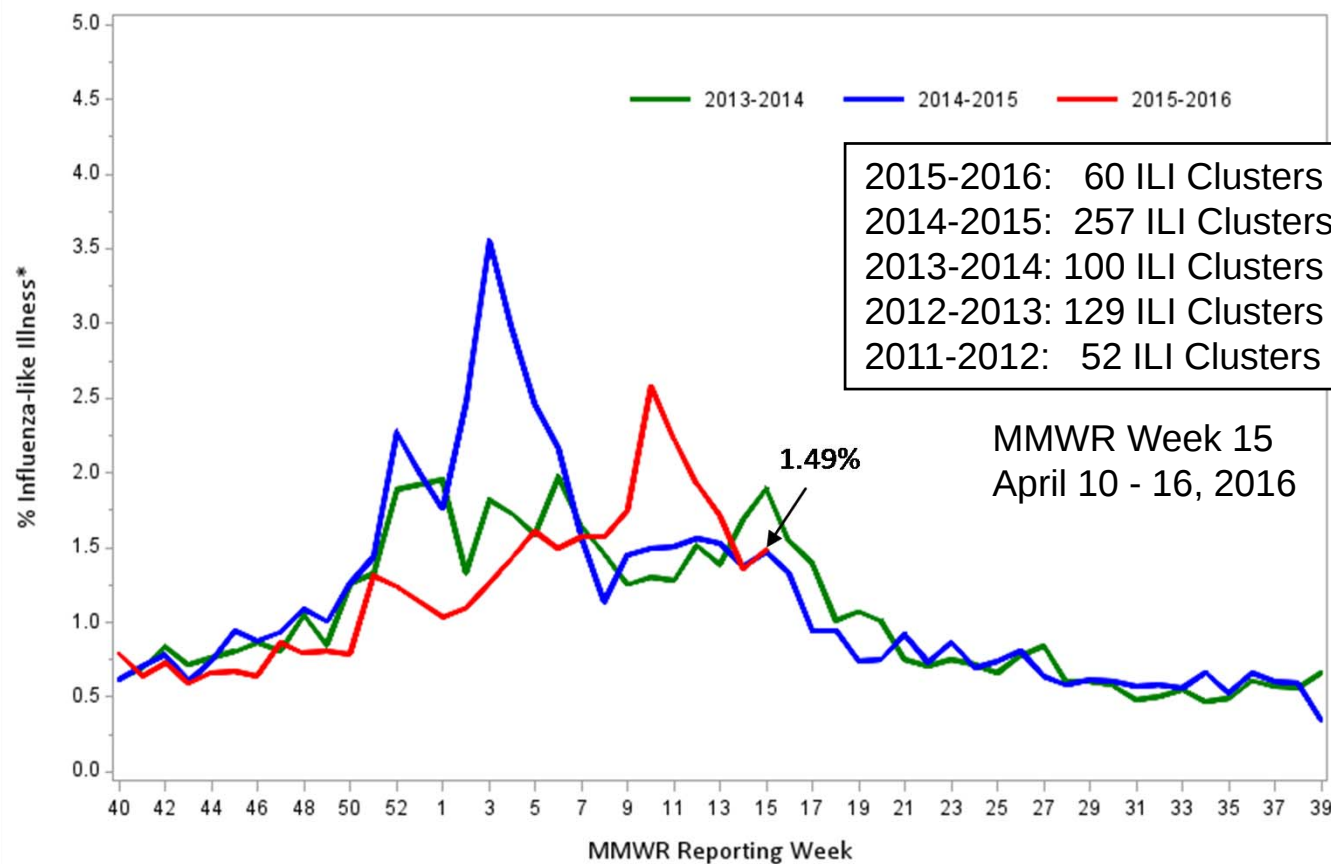
Depending on test results and index of suspicion, next steps may include:

Notify patients quickly and offer MMR or immune globulin: MMR within 72 hours of exposure may prevent illness. Beyond 72 hours it is usually still recommended, to provide protection against exposure to future cases of measles. For high-risk susceptibles and those ineligible for vaccination, IG ≤6 days after exposure may modify or prevent illness.

Exclusions: Your local health department and/or MDPH will provide assistance with quarantine requirements if exclusions are necessary. In general, susceptible individuals exposed to measles who are not appropriately vaccinated within 72 hours of the exposure may need to be excluded from all public activities from day 5 through day 21 after the exposure. In high-risk healthcare settings exclusion criteria may be more rigorous.

MASSACHUSETTS INFLUENZA-LIKE ILLNESS (ILI) AS OF 4/16/2016

Figure 1: Percentage of ILI visits reported by sentinel provider sites

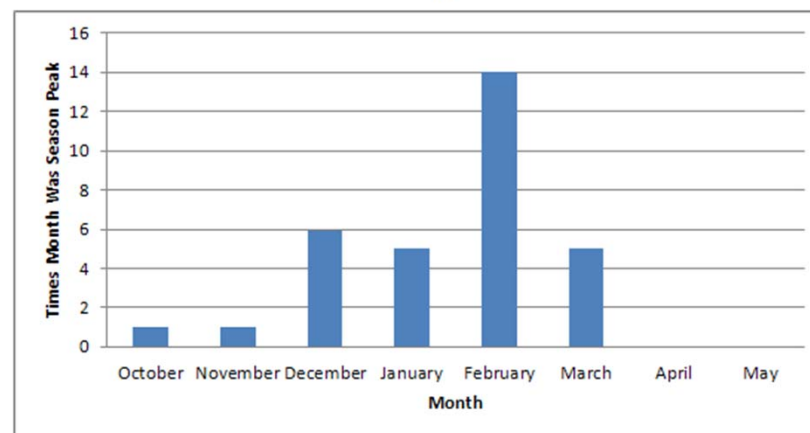


*Influenza-like illness (ILI, defined by fever >100F and cough and/or sore throat), as reported by Massachusetts sentinel surveillance sites

2015-2016 INFLUENZA SEASON

- Relatively mild season relative to other recent seasons.
- Peak in early to mid March
- 2009 influenza A (H1N1) predominated.
- Two pediatric deaths in MA
- Circulating strains appeared to be a good match with the vaccine.
- Other respiratory pathogens circulated and caused respiratory illness: human rhino/entero, RSV, parainfluenza virus, human metapneumovirus, adenovirus, and human coronavirus.

Peak Month of Flu Activity
1982-83 through 2013-14



**During 2008-2009, flu activity peaked twice because of the 2009 H1N1 pandemic. Activity in the United States peaked once in February due to seasonal influenza activity and then again in the Spring (June), with the first wave of 2009 H1N1 viruses. A second, larger peak of 2009 H1N1 activity occurred in October, the peak of the 2009-2010 season.*

<http://www.cdc.gov/flu/about/season/flu-season.htm>

ADULT VACCINATION

Recommended Adult Immunization Schedule—United States - 2016

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 immunization schedule for adults aged 19 years or older, by vaccine and age group¹

VACCINE ▼	AGE GROUP ►	19-21 years
Influenza ^{*,2}		
Tetanus, diphtheria, pertussis (Td/Tdap) ^{*,3}		
Varicella ^{*,4}		
Human papillomavirus (HPV) Female ^{*,5}		
Human papillomavirus (HPV) Male ^{*,5}		
Zoster ⁶		
Measles, mumps, rubella (MMR) ^{*,7}		
Pneumococcal 13-valent conjugate (PCV13) ^{*,8}		
Pneumococcal 23-valent polysaccharide (PPSV23) ⁸		
Hepatitis A ^{*,9}		
Hepatitis B ^{*,10}		
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4) ^{*,11}		
Meningococcal B (MenB) ¹¹		
<i>Haemophilus influenzae</i> type b (Hib) ^{*,12}		

*Covered by the Vaccine Injury Compensation Program

	Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster
	Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)
	No recommendation

Report all clinical forms and instructions to the CDC, N.W., Washington, D.C. Additional information is also available at www.cdc.gov and Spanish, 800-458-5231. Use of trade names of Health and Human Services. The recommendations of the Advisory Committee on Immunization Practices (ACIP) and the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Midwives (ACNM).

Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications¹

VACCINE ▼	INDICATION ►	Pregnancy	Immuno-compromising conditions (excluding HIV infection) ^{4,6,7,8,13}	HIV infection CD4+ count (cells/μL) ^{4,6,7,8,13}	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia and persistent complement component deficiencies ^{8,11,12}	Chronic liver disease	Diabetes	Healthcare personnel
Influenza ^{*,2}				< 200	≥ 200						
Tetanus, diphtheria, pertussis (Td/Tdap) ^{*,3}		1 dose Tdap each pregnancy									
Varicella ^{*,4}		Contraindicated									
Human papillomavirus (HPV) Female ^{*,5}											
Human papillomavirus (HPV) Male ^{*,5}											
Zoster ⁶		Contraindicated									
Measles, mumps, rubella (MMR) ^{*,7}		Contraindicated									
Pneumococcal 13-valent conjugate (PCV13) ^{*,8}											
Pneumococcal polysaccharide (PPSV23) ⁸											
Hepatitis A ^{*,9}											
Hepatitis B ^{*,10}											
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4) ^{*,11}											
Meningococcal B (MenB) ¹¹											
<i>Haemophilus influenzae</i> type b (Hib) ^{*,12}											

*Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults aged ≥19 years, as of February 2016. For all vaccines being 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 components are not contraindicated. For detailed recommendations on all vaccines, including those 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.



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

HEALTHCARE WORKERS AND VACCINATION

Adult Occupational Immunizations Massachusetts Recommendations and Requirements for 2015

Recommended Immunizations For Health Care Personnel (HCP)	
Vaccine	Recommendation
Influenza	1 dose of flu vaccine every flu season.
Tdap/Td (Tetanus, diphtheria, pertussis)	1 dose of Tdap as soon as possible, then Td boosters every 10 years.
MMR (Measles, mumps, rubella)	2 doses of MMR, ≥ 28 days apart or documented immunity to measles and mumps and rubella.
Varicella	2 doses of varicella vaccine, or serologic evidence of immunity.
Hepatitis B	3-dose series (see footnote).
Meningococcal	1 dose of quadrivalent meningococcal vaccine to <i>N. meningitidis</i> isolates.

Health care personnel (HCP) include full- and part-time staff with or without direct patient contact, including physicians, students, and volunteers who work in inpatient, outpatient and home-care settings. See Immunization of Health-Care Personnel - Recommendations of the ACIP. www.cdc.gov/mmwr/pdf/r/r6007.pdf

Influenza: All HCP should receive annual flu vaccine. Give inactivated flu vaccine (IIV) to any HCP. Give live, attenuated influenza vaccine (LAIV) to non-pregnant healthy HCP ≥ 49 years of age. IIV is preferred over LAIV for HCP in close contact with severely immunosuppressed persons when patients require a protective environment.

Tetanus/Diphtheria/Pertussis (Td/Tdap): All HCP, regardless of age, should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap, and regardless of the interval since last Td dose.

Measles, Mumps, Rubella (MMR): All HCP should be immune to measles, mumps, and rubella. Documentation of immunity: a) 2 doses of MMR on or after the 1st birthday, and at least 1 month apart; or b) laboratory evidence of immunity to measles and mumps and rubella or laboratory confirmation of each disease (Consider HCP with "indeterminate" or "equivocal" immunity as susceptible). **Varicella:** All HCP should be immune to varicella. Evidence of immunity to varicella for HCP includes documentation of 2 doses of vaccine, ≥ 4 weeks apart.

These guidelines are based on the recommendations of the Advisory Committee on Immunization Practices (ACIP). For specific ACIP recommendations, refer to the full statements at www.cdc.gov/mmwr. Visit the MDPH website at www.mass.gov/dph/imm, or call MDPH 817-3100.

Information on Vaccines for

Visit www.cdc.gov/travel/default.aspx or call the CDC

Centers for Disease Control and Prevention
MMWR

Recommendations and Reports / Vol. 60 / No. 7

Morbidity and Mortality Weekly Report

November 25, 2011

Immunization of Health-Care Personnel Recommendations of the Advisory Committee on Immunization Practices (ACIP)



Continuing Education Examination available at <http://www.cdc.gov>

Effective December 1, 2011

Summary of Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements

Extracted from: 105 CMR 900.000 Department of Public Health

Babesiosis

Pertussis

Gonorrhea

HEALTHCARE WORKERS: PRESUMPTIVE EVIDENCE OF IMMUNITY

- Written verification of two appropriately-timed doses of vaccine (MMR, varicella)
- Lab evidence of disease
- Serologic evidence of immunity
- For varicella, year of birth (prior to 1980) or healthcare verification of varicella disease may be considered presumptive evidence of immunity in some low-risk medical settings

During an outbreak, healthcare workers may face exclusion if they do not have presumptive evidence of immunity.

CAUTION
QUARANTINE
AREA

CLINICALLY SIGNIFICANT *N. MENINGITIDIS* SEROGROUPS

Serogroup

Characteristics

A

leading cause of meningitis worldwide
most prevalent serogroup in Africa & China
rare in Europe and the Americas

B

major cause of endemic disease in Europe, the Americas

C

major cause of endemic disease in Europe, the Americas

Y

associated with pneumonia; increasing in U.S.

W-135

small percentage of infections worldwide
outbreaks associated with Hajj pilgrims

SIX MENINGOCOCCAL VACCINES

Trade Name	Type of Vaccine	Serogroups	Year Licensed	Approved Ages
Menomune	polysaccharide	A,C,W,Y	1981	≥2 yrs
Menactra	conjugate	A,C,W,Y	2005	9 mo-55 yrs
Menveo	conjugate	A,C,W,Y	2010	2 mo-55 yrs
MenHibrix	conjugate	C,Y & Hib	2012	6 wk-18 mo
Trumenba	protein	B	2014	10-25 yrs
Bexsero	protein	B	2015	10-25 yrs

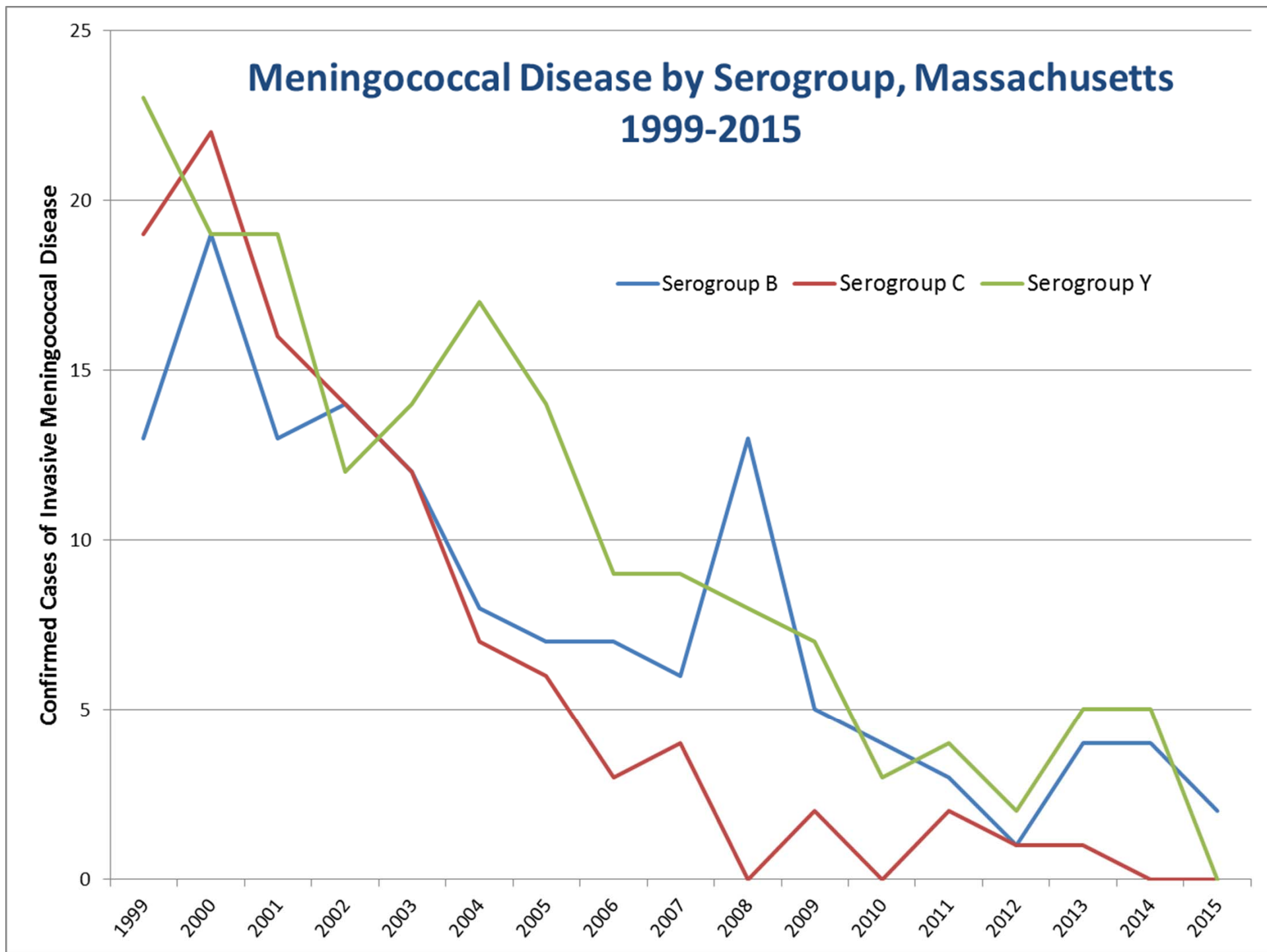
Meningococcal Disease by Serogroup, Massachusetts 1999-2015

Confirmed Cases of Invasive Meningococcal Disease

Serogroup B Serogroup C Serogroup Y

25
20
15
10
5
0

1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015



MENINGOCOCCAL B VACCINE

Two formulations now available for vaccination of those **at increased risk**

- Includes outbreaks caused by group B meningococcal disease

“Permissive use” for certain others

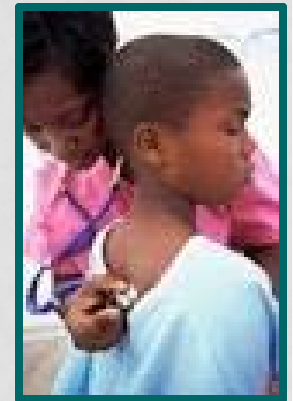


GROUPS AT INCREASED RISK OF MENINGOCOCCAL B DISEASE



High risk medical conditions:

- Persistent complement component deficiencies
- Functional or anatomic asplenia (including sickle cell)



Microbiologists who work with organism

Outbreaks

- Historically rare, causing 2-3% of all US meningococcal cases
- 200-1,400 fold increased risk in students during serogroup B outbreaks
- 6 serogroup B outbreaks 2006-2014
- 2 serogroup B outbreaks in 2015
- Sporadic cases of cases in college students



MENINGOCOCCAL B VACCINATION: PERMISSIVE USE

‘Permissive’ recommendation for MenB vaccine (Category B)

- “Young adults aged 16–23 years (preferred age 16–18 years) **may be vaccinated to provide short-term** protection against most strains of MenB disease.”

Recommended Adult Immunization Schedule—United States - 2
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 immunization schedule for adults aged 19 years or older, by vaccine and age group

VACCINE ▼	AGE GROUP ►	19-21 years	22-26 years	27-49 years	50-59 years
Influenza ^{*,2}		1 dose annually			
Tetanus, diphtheria, pertussis (Td/Tdap) ^{*,3}		Substitute Tdap for Td once, then Td booster every			
Varicella ^{*,4}		2 doses			
Human papillomavirus (HPV) Female ^{*,5}		3 doses			
Human papillomavirus (HPV) Male ^{*,5}		3 doses			
Zoster ⁶					
Measles, mumps, rubella (MMR) ^{*,7}		1 or 2 doses depending on indication			
Pneumococcal 13-valent conjugate (PCV13) ^{*,8}					
Pneumococcal 23-valent polysaccharide (PPSV23) ⁸				1 or 2 doses depending on indication	
Hepatitis A ^{*,9}				2 or 3 doses depending on vaccine	
Hepatitis B ^{*,10}				3 doses	
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4) ^{*,11}				1 or more doses depending on indication	
Meningococcal B (MenB) ¹¹				2 or 3 doses depending on vaccine	
Haemophilus influenzae type b (Hib) ^{*,12}				1 or 3 doses depending on indication	

New Row with Purple Bar.

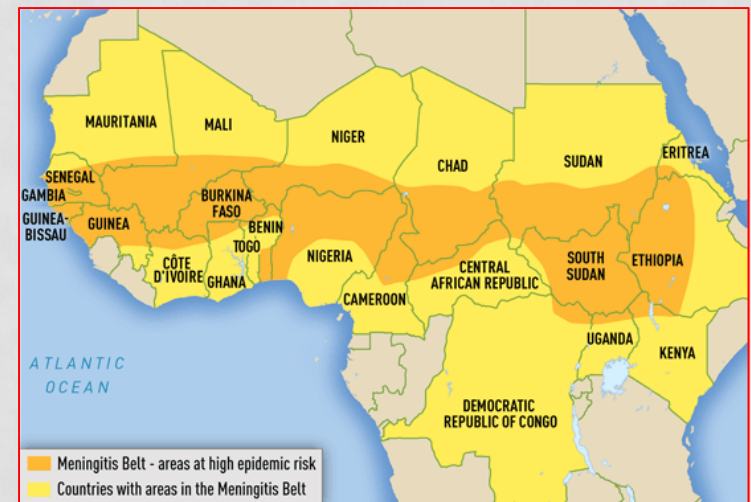
CDC. MMWR 2016;65:86-87.
and CDC. MMWR
2016;65:88-90.

WHO IS AT INCREASED RISK FOR WHICH SEROGROUPS?

MenACWY	MenB
Complement deficiency	Complement deficiency
Anatomic/Functional asplenia	Anatomic/Functional asplenia
Outbreak setting	Outbreak setting
Microbiologist	Microbiologist
Traveler to hyperendemic area	
First year college student	
Military Recruit	

VACCINES FOR TRAVEL

- **CDC “Destinations” web site:**
<http://wwwnc.cdc.gov/travel/destinations/list/>
- **CDC Yellow Book:**
<http://wwwnc.cdc.gov/travel/page/yellowbook-home-2014>
- **Travel notices (CDC):**
<http://wwwnc.cdc.gov/travel/notices>



Warning Level 3, Avoid Nonessential Travel

Alert Level 2, Practice Enhanced Precautions

Watch Level 1, Practice Usual Precautions

RESOURCES

Massachusetts Immunization Program

- 1-617-983-6800
- 1-888-658-2850
- Website
<http://www.mass.gov/dph/imm>

CDC/NIP

- English and Spanish
- 1-800-232-INFO
- 1-800-232-4636
- TTY 888-232-6348
- Website
<http://www.cdc.gov/vaccines>

Massachusetts Department of Public Health (MDPH)
Immunization Program

State-Supplied Adult Vaccine Availability Table -- Effective April 1, 2015 --

Eligibility:

- MDPH does not provide vaccines for adults seen at private provider sites. The only exception to this is tetanus-diphtheria (Td) vaccine, which MDPH continues to provide for all Massachusetts residents, regardless of where they receive care.
- Except where otherwise noted, MDPH provides a very limited supply of vaccines listed below only for adults who are uninsured and seen in public sector sites.
Employees of public sector sites are not eligible for state-supplied vaccine.
- Sites with billing capacity should purchase vaccine and seek reimbursement from health insurers.

(Please note that all new changes appear in bold and italics.)

Private and Public Sectors	
Vaccine	Adults (19 years of age and older) Eligible for State-Supplied Vaccine Administered in the Private and Public Sectors
Td	• All adults as recommended by the ACIP.
Public Sector ¹	
Vaccine	Adults Eligible for State-Supplied Vaccine Administered in the Public Sector
Hep A	• <i>Only for uninsured</i> adults in ACIP-recommended groups ² seen at public sites. ¹
Hep B	• <i>Only for uninsured</i> adults in ACIP-recommended groups ² seen at public sites. ¹ <i>Please Note:</i> Employers covered by federal OSHA regulations are responsible for supplying hepatitis B vaccine to their employees. State-supplied vaccine is not available for this group.
Influenza Vaccine	• <i>Only for uninsured</i> adults who are seen at public sites. ¹
HPV	• MDPH-supplied HPV vaccine is not available for adults. • Sites may consider using the Merck Vaccine Assistance Program (www.merck.com/merck/vaccine/vaccines/home.html) to receive free doses of HPV for eligible uninsured adults.
MMR	• <i>Only for uninsured</i> adults in ACIP-recommended groups ² seen at public sites. ¹ • Sites using state-supplied MMR should take advantage of the Merck Vaccine Assistance Program (www.merck.com/merck/vaccine/vaccines/home.html) to receive free doses of M-M-R [®] II to replace state-supplied doses administered to eligible uninsured adults.
Pneumococcal	• <i>Only for uninsured</i> adults in ACIP-recommended groups ² seen at public sites. ¹

adult-vaccine-availability-table-4-15

MDPH April 2015

MORE RESOURCES FOR PATIENTS AND PROVIDERS

CDC Home
Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People.™

A-Z Index **A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #**

Provider Resources for Vaccine Conversations with Parents

Vaccines Home
Vaccines & Immunizations

Conversations Home
Talking to Parents about Vaccines
Understanding Vaccines and Vaccine Safety
Vaccine-preventable Diseases
About Vaccine Conversations with Parents
Provider Resources Web Tools

Related Links
Immunization Schedules
NIW Educational Resources
For Parents: Vaccines for Your Children

Vaccines Home
Making time to talk with parents about vaccines during a visit may be challenging.
Here's some help: CDC, AAP, and AAP created these materials to help you assess parents' needs, identify the role they play in making decisions for their child's health, and then communicate ways that meet their needs. These resources are collected in the **Provider Resources for Vaccine Conversations with Parents**.

For You and Your Practice
Help strengthen communication between you and parents, and get information about:
• Talking to parents about vaccines
• Understanding vaccines and vaccine safety
• Vaccine-preventable diseases
• Immunization schedules

CHOP Home > Specialties and Services > Vaccine Education Center > Vaccine Safety - FAQs

The Children's Hospital of Philadelphia
Hope lives here.

Vaccine Education Center

Vaccine Safety FAQs
Are vaccines safe?
• Is the hepatitis B vaccine safe?
• Was the old pertussis vaccine safe?
• Is the pneumococcal vaccine safe?
• Is the rotavirus vaccine safe?
Who licenses, recommends, and requires vaccines?
Do vaccines overwhelm the immune system?
Do vaccines weaken the immune system?
Can children who are sick receive vaccines?
Can we give vaccines by a method other than shots?
Why do we still need vaccines?
Are children too young to get vaccines?
Can children manage so many different vaccines at the same time?
Why are some vaccines given as a single dose and others as multiple doses?

Are vaccines safe?
The first definition of the word safe is "harmless." This definition would imply that any negative consequence of a vaccine would make the vaccine unsafe. Using this definition, no vaccine is 100 percent safe. Almost all vaccines can cause pain, redness or tenderness at the site of injection, and some vaccines cause more severe side effects. For example, the pertussis (or whooping cough) vaccine can cause persistent, inconsolable crying, high fever or seizures associated with fever. Although none of these severe symptoms result in permanent damage, they can be quite frightening to parents.

Contact Us
We would like to hear from you. Please use our online form to contact us with questions or comments.
• Contact Us Online

Vaccines: Separating Fact from Fear
Watch **Vaccines: Separating Fact from Fear** to find answers to the most commonly asked questions about vaccines.

Vaccine Facts Q&A
The Facts About Childhood Vaccines Q&A Sheetlet (PDF)

Related Specialties and Services

Clear Answers & Smart Advice About Your Baby's Shots
By Ari Brown, MD, FAAP

Dr. Brown received her medical degree from Baylor College of Medicine in Houston, Texas; she did her pediatric residency at Harvard Medical School/Boston Children's Hospital. In private practice since 1995, Dr. Brown is perhaps best known as the coauthor of the #1 parenting book series — *Expecting 411: Clear Answers and Smart Advice for Your Pregnancy, Baby 411, and Toddler 411* (Windsor Peak Press).

In response to the recent media attention given to vaccines, autism, and other controversies concerning vaccines, the Immunization Action Coalition (IAC) has reprinted a special excerpt from *Baby 411* that answers these questions and more. IAC thanks Dr. Brown for this clearly written information, but mostly, we are grateful for her continued advocacy for safe and effective vaccines.

Vaccines, Autism, Controversy. As a new parent, you may have heard a lot of talk about the great debate in parenting: "What's best for my child?" If not, what causes autism?

Q: I have a friend whose child has autism. She said he was "perfectly normal" until he was about 18 months old. Does this happen?

A small minority of ASD children have completely normal milestones. "Late onset autism," or "atypical autism," is a diagnosis usually occurs in their second year of life.

den may have little interest in playing with toys. Or they may play in an odd way—such as using a phone as a comfort object.

Bottom line: Children with autism have autism long before their first birthdays, even though their "official" diagnosis usually occurs in their second year of life.

Q&A
The Facts About Childhood Vaccines
Vaccine Safety - FAQs

- Links to CDC, Children's Hospital of Philadelphia (CHOP), American Academy of Pediatrics (AAP), Immunization Action Coalition (IAC)
- <http://www.mass.gov/dph/imm>, click on "Vaccine Safety"

QUESTIONS?

