

SURVEILLANCE, REPORTING AND CONTROL OF VACCINE PREVENTABLE DISEASES 2014

19th Annual Massachusetts Adult Immunization Conference May 20, 2014

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PRESENTER DISCLOSURE INFORMATION

HILLARY JOHNSON

| | |
|---|--|
| Consultant | No relevant conflicts of interest to declare or relevant conflict |
| Grant Research/Support | No relevant conflicts of interest to declare or relevant conflict |
| Speaker's Bureau | No relevant conflicts of interest to declare or relevant conflict |
| Major Stockholder | No relevant conflicts of interest to declare or relevant conflict |
| Other Financial or Material Interest | No relevant conflicts of interest to declare or relevant conflict |
| Off Label Use of Vaccines | Will be discussed, but in accordance with current ACIP recommendations |

TODAY'S TOPICS

- Vaccine-preventable disease (VPD) epidemiology in Massachusetts
 - Who we are and what we do
 - Overall trends
 - Measles update and case study
 - Hepatitis A update and case study
 - Your questions answered

WHO ARE YOU?

STAND UP/SIT DOWN

- ...if you have talked to a patient who is apprehensive about getting vaccine
- ...if you know someone who has had a vaccine-preventable disease even though they've been appropriately vaccinated
- ...if you have heard that some communicable diseases and conditions are reportable in Massachusetts
- ...if you know someone who is skeptical about the potential severity of influenza
- ...if you know someone who has ever been exposed to a communicable disease on the job
- ...if you think you can be exposed to a VPD through consumption of food

VPD EPIDEMIOLOGISTS - OUR ROLE

Hinton State Laboratory Institute (HSLI)



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



Massachusetts
Department of
Public Health

DIVISION OF EPIDEMIOLOGY AND IMMUNIZATION - EPI ON CALL

617-983-6800



MDPH IMMUNIZATION 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
- Collaborate with the LBOH to complete the official Case Report

What is reportable and by whom?

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.

| | |
|--|--|
| <ul style="list-style-type: none"> ☒ 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-Jakob 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 ☒ Hepatitis A (IgM+ only) ☒ HBsAg+ pregnant women ☒ Hepatitis syndrome, acute possibly infectious ☒ Influenza, pediatric deaths (<18 years) ☒☒ ☒ Infection due to novel influenza A viruses ☒☒ ☒ Leptospirosis ☒ Lymphocytic choriomeningitis ☒ Malaria ☒ Measles ☒☒ ☒ Meningitis, bacterial, community acquired | <ul style="list-style-type: none"> ☒ 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 ☒ Rubella ☒ Tetanus ☒ Toxic shock syndrome ☒ Trichinosis ☒ Tuberculosis ☒☒ ☒ Tularemia ☒☒ ☒ Typhoid fever ☒☒ ☒ Typhus ☒ Varicella (chickenpox) ☒ Viral hemorrhagic fevers |
|--|--|

Animal bites should be reported **immediately** to the designated local authority.

Important Note: MDPH, its authorized agents, and local boards of health have the authority to collect pertinent information on all reportable diseases, including those not listed on this page, as part of epidemiological investigations (M.G.L. c. 111, s. 7).

105 CMR 300.000 Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements, Effective December 2013
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COMMUNICABLE AND OTHER INFECTIOUS DISEASES REPORTABLE IN MASSACHUSETTS

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Report Directly to the Massachusetts Department of Public Health, Bureau of Infectious Disease
305 South Street, Jamaica Plain, MA 02130

HIV infection and AIDS: (617) 983-6560
Latent tuberculosis infection: confidential fax: (617) 983-6220
Sexually Transmitted Infections: (617) 983-6940

Isolates should be submitted to Hinton State Laboratory Institute

Reportable Diseases Primarily Ascertained Through Laboratory Testing
Please work with the laboratories you utilize to assure complete reporting.

| | |
|--|---|
| <ul style="list-style-type: none"> • Anaplasmosis • Amebiasis • Babesiosis • Campylobacteriosis • Cholera • Cryptococcosis • Cryptosporidiosis • Cyclosporiasis • Dengue ☒ Eastern equine encephalitis ☒☒ • Ehrlichiosis • <i>Escherichia coli</i> O157:H7, and other shiga-toxin producing <i>E. coli</i> ☒☒ • Enteroviruses (from CSF) • Giardiasis • Glanders ☒☒ ☒ Group A streptococcus, invasive ☒ <i>Haemophilus influenzae</i>, invasive ☒☒ • Group B streptococcus, invasive ☒ Hantavirus • Hepatitis B • Hepatitis C • Hepatitis D • Hepatitis E | <ul style="list-style-type: none"> • Influenza ☒☒ (if antiviral resistant) • Legionellosis ☒☒ • Listeriosis ☒☒ • Lyme disease • Melioidosis ☒☒ • Norovirus • Pneumococcal disease, invasive (<i>Streptococcus pneumoniae</i>) ☒☒ (if patient <18 years) • Pneumococcal disease, invasive, penicillin-resistant • Salmonellosis ☒☒ • Shiga toxin-producing organisms ☒☒ • Shigellosis ☒☒ • <i>Staphylococcus aureus</i>, methicillin-resistant (MRSA), invasive ☒ <i>Staphylococcus aureus</i>, vancomycin-intermediate (VISA) and vancomycin-resistant (VRSA) ☒☒ • Psittacosis • Q fever • Toxoplasmosis • Typhus • Vibriosis ☒☒ ☒ West Nile ☒☒ • Yellow fever • Yersiniosis ☒☒ |
|--|---|

105 CMR 300.000 Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements, Effective December 2013
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Collaborations in Disease Surveillance and Control

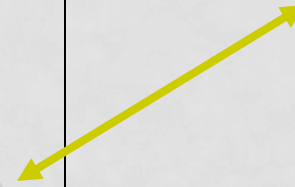
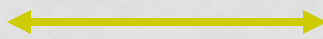
MDPH



LBOH 1



Healthcare Provider



LBOH 2



Sports team



School



Vaccine-Preventable Diseases in Massachusetts Reported, Confirmed Cases, 2004-2013*

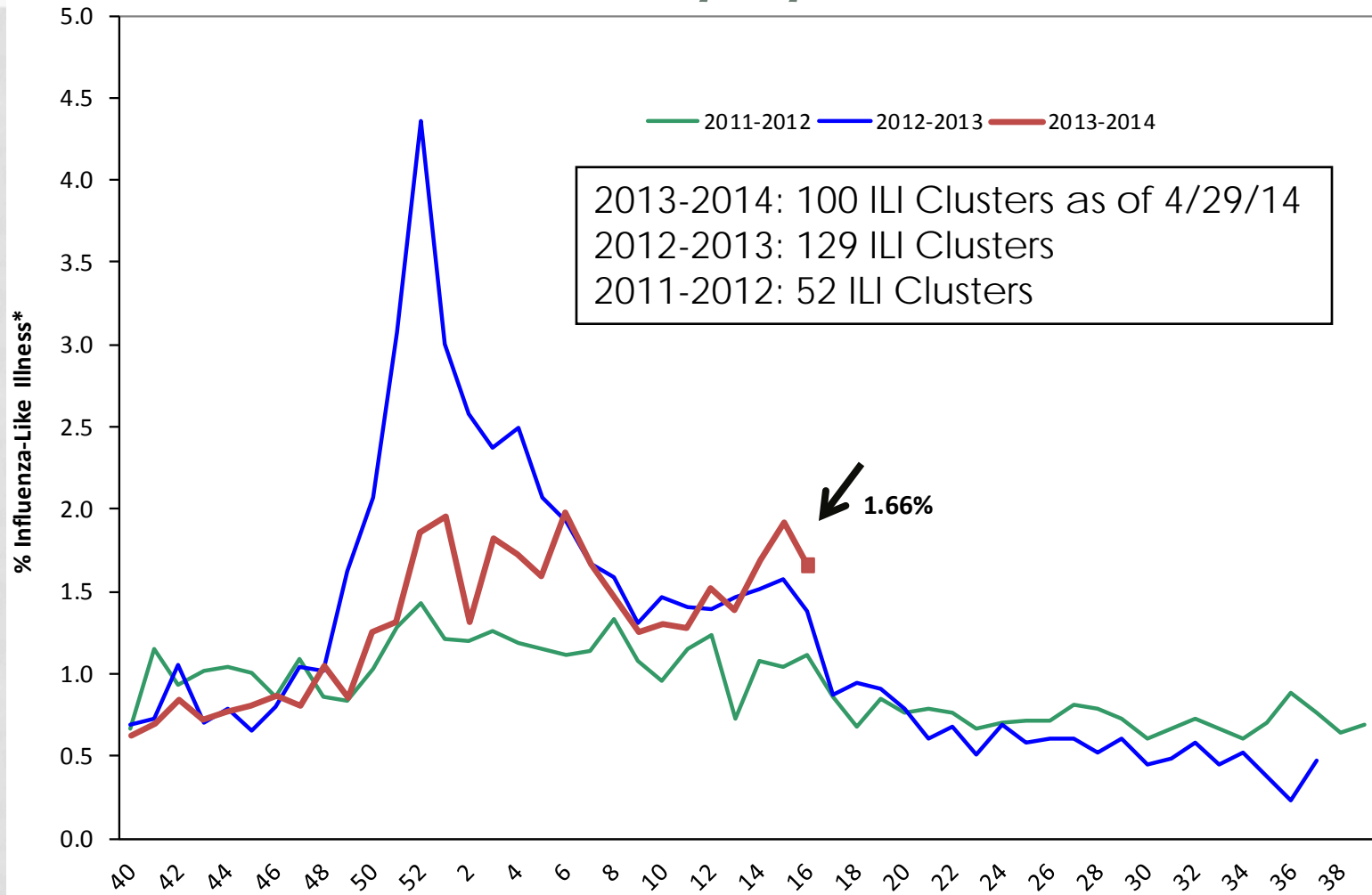
| Disease | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Measles | 2 | 0 | 19 | 1 | 2 | 2 | 3 | 24 | 0 | 1 |
| Mumps | 3 | 8 | 7 | 5 | 7 | 14 | 9 | 5 | 2 | 18 |
| Rubella | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| CRS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pertussis | 1713 | 1180 | 1199 | 1198 | 768 | 379 | 296 | 273 | 653 | 346 |
| Hib < 5 | 1 | 0 | 0 | 3 | 2 | 1 | 1 | 0 | 2 | 3 |
| 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 | 69 | 57 | 85 | 90 | 82 | 81 | 69 | 38 | 45 | 23 |
| Hepatitis A | 662 | 297 | 86 | 67 | 58 | 70 | 50 | 40 | 40 | 44 |
| Hepatitis B | 197 | 64 | 49 | 107 | 63 | 93 | 88 | 77 | 76 | 67 |
| Varicella | 2648 | 2248 | 1998 | 2256 | 1759 | 1783 | 1751 | 1702 | 1237 | 1125 |

*Data preliminary as of March 2014.

CONFIRMED CASES & INVESTIGATIONS ARE NOT THE SAME THING

| | 2013 Confirmed Cases | 2013 Investigations | 2014 Confirmed Cases (Jan- April 30) | 2014 Investigations (Jan – April 30) |
|-------------|-------------------------------------|--------------------------------|---|---|
| Diphtheria | 0 | 6 | 0 | 2 |
| Hepatitis A | 44 | 167 | 8 | 69 |
| Measles | 1 | 64 | 8 | 63 |
| Mumps | 18 | 192 | 1 | 35 |
| Polio | 0 | 22 | 0 | 11 |
| Rubella | 0 | 40 | 0 | 6 |
| Pertussis | 346 | 437 | 34 | 60 |

MASSACHUSETTS INFLUENZA-LIKE ILLNESS (ILI) AS OF 4/19/2014

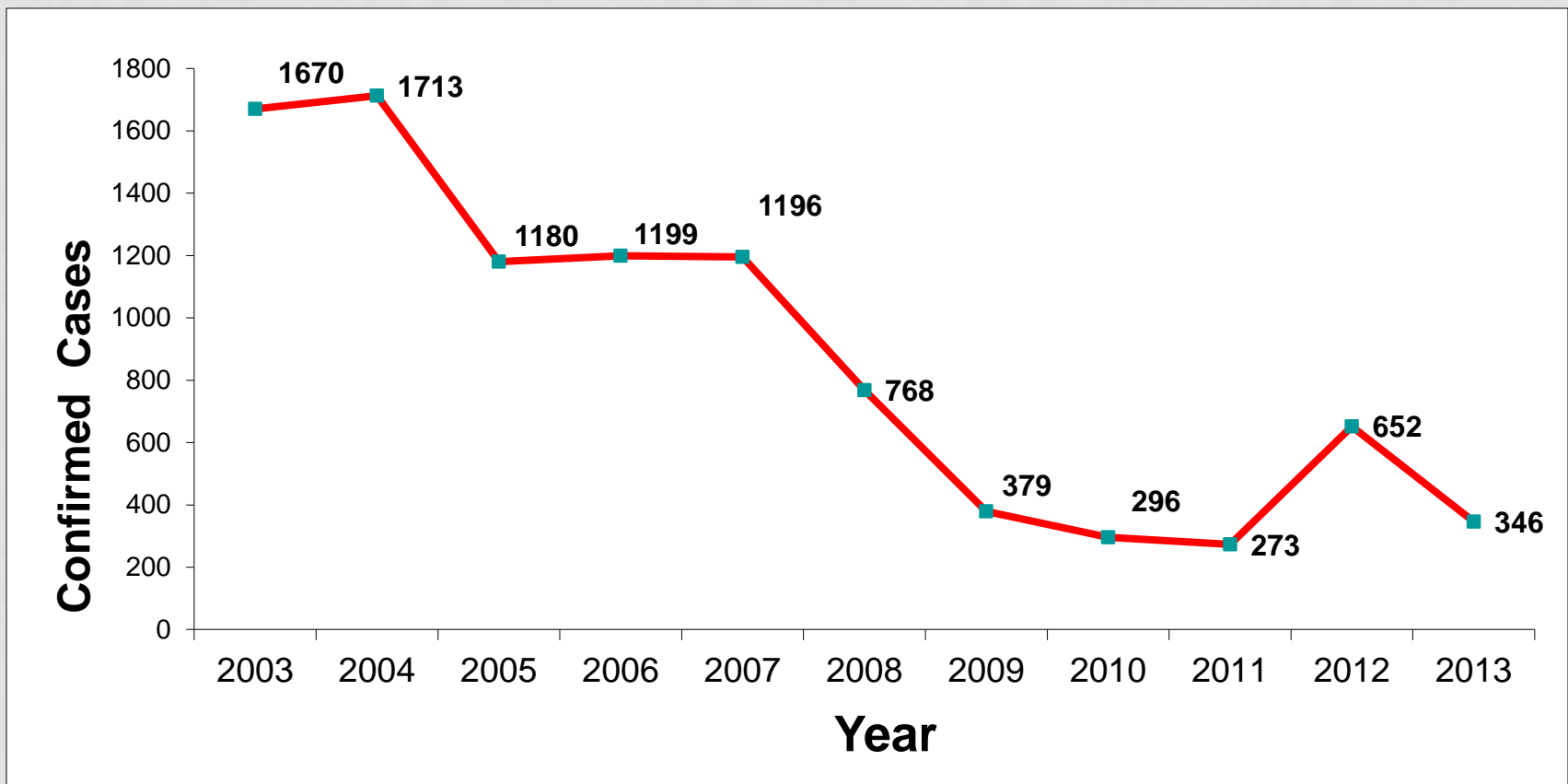


ILI CLUSTERS 2013-2014

- 100 clusters reported in LTCFs as of 4/29/14
 - 3 clusters in residential group homes and day programs for medically fragile adults with developmental delays.
- Reminder that medically fragile populations (including people with developmental delays and neuromuscular disorders) are at increased risk for medical complications.
 - Importance of vaccinating staff and residents.

PERTUSSIS IN MASSACHUSETTS - 2013

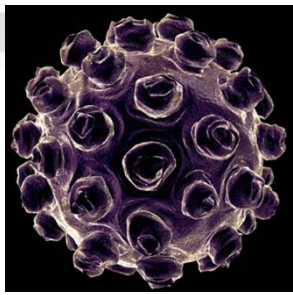
- Decrease in the number of confirmed cases compared to 2012



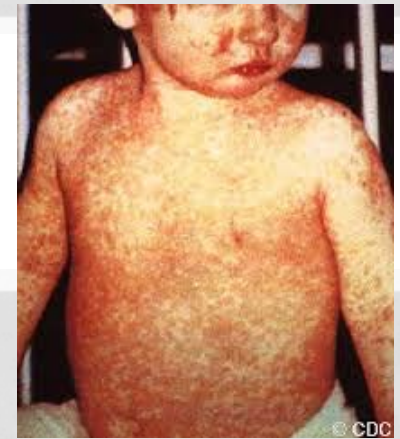
MEASLES IN MA

2013-2014 Update





MEASLES 101



- Acute viral illness
- PRODROME:
 - FEVER: (as high as 105°F) and malaise, cough, coryza, and conjunctivitis.
- RASH: maculopapular
 - Usually appears 14 days after exposure.
 - Spreads from head to trunk to lower extremities.
- POSSIBLE COMPLICATIONS:
 - pneumonia, encephalitis, and death.
 - miscarriage, stillbirth, preterm delivery.



MEASLES TRANSMISSION

- Highly Contagious: can be spread to others from four days before to four days after the rash appears.
- The virus lives in the mucus in the nose and throat of the infected person.
 - The virus can live on contaminated surfaces or in the air for up to 2 HOURS.



MEASLES IN MASSACHUSETTS 2014

Baystate Medical Center in Springfield patient infected with measles; 300 potentially exposed



News | Government

UPDATED: Samba's Patrons, Bose Employees May Have Been Exposed to Measles, Along With Trader Joe's Customers

The Massachusetts Department of Public Health confirmed a second case of measles from another MetroWest community, with associated exposures at Bose headquarters in Framingham.

Posted by [Susan Petroni](#) (Editor) , February 25, 2014 at 02:49 PM

Measles warning expands in Framingham

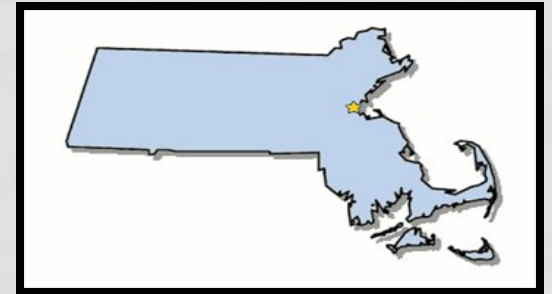
Posted: Feb 25, 2014 2:31 PM EST
Updated: Feb 26, 2014 5:22 AM EST

[Recommend](#) 132



MEASLES 2014 MASSACHUSETTS

- In MA, 8 confirmed cases so far in 2014 (0 in 2012, 1 in 2013)
 - Rash Onsets: 1/26, 2/1, 2/13, 2/14, 2/19, 2/26 (while traveling internationally), 3/2, 4/1.
 - Age Range: 2 pediatric (11 months, 13 months), 2 (21-30 yrs), 4 (>40 yrs)
- 6/8 cases had recent international travel (Europe, Middle East, India and South America).
- Vaccination status:
 - 2 cases with 2 doses (international records)
 - 1 case with a history of 1 dose
 - 2 cases with unknown history
 - 3 cases unvaccinated (two infants with missed opportunity for vaccination prior to travel; one US-born prior to 1957)
- No epidemiologic links identified between the cases, although several were temporally and geographically close to each other.



MEASLES 2014 - MASSACHUSETTS

- As a result of these cases over 2000 exposed individuals were identified.
- Exposures in multiple healthcare facilities, workplaces, stores, flights and taxis, as well as dorms
 - Hundreds of contacts exposed at healthcare facilities, dorms, and workplaces.
- No known secondary cases to date. Many suspect cases investigated.
- Contact investigation included:
 - Evaluation of immunity status
 - Implementation of control measures
 - Educational presentations and vaccination clinics facilitated by Local Boards of Health.



MEASLES TESTING

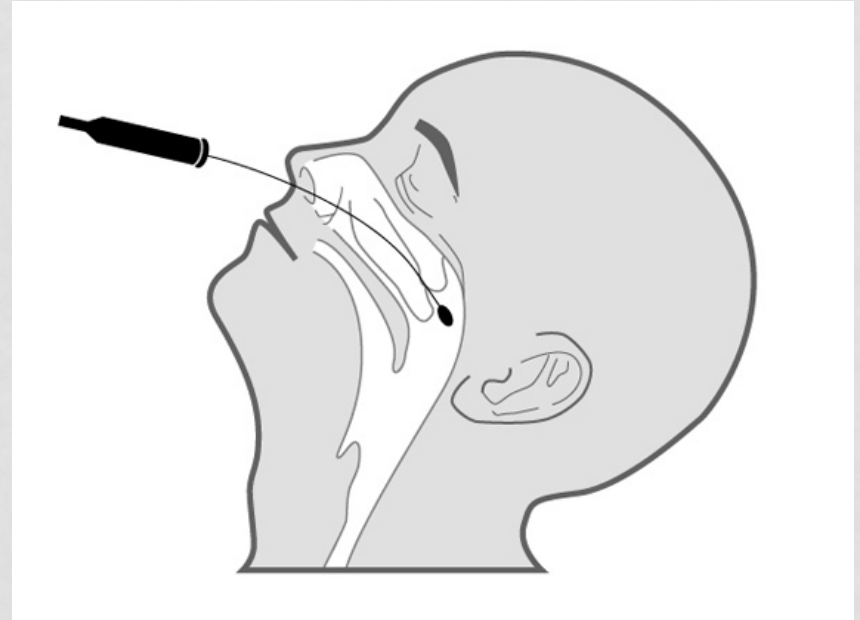
- Collection of appropriate specimens is essential to rapid and accurate diagnosis
- MDPH epidemiologists will provide guidance on specimen collection
- Testing at HSLI:

| Test | Specimen | Timing (1 st Specimen) | Timing (2 nd Specimen) | Turnaround Time | Rule Out Infection? |
|--------------------|--|-----------------------------------|-----------------------------------|-----------------|---|
| Measles IgM | Serum (red top or serum separator tube) | Acute, at time of diagnosis | Day 4 of rash or later | 1-2 days | Yes (if 2 nd specimen negative)* |
| PCR | NP swab <i>in Viral Transport Medium</i> | ASAP, no later than day 5 of rash | N/A | 1-2 days | No |
| Culture | NP/Urine | ASAP, no later than day 5 of rash | N/A | Up to 2 weeks | No |

* In certain circumstances (compelling clinical presentation, known exposure), additional testing may be necessary to rule out disease.

MEASLES TESTING

- Nasopharyngeal (NP) swabs are VERY IMPORTANT for virus isolation & detecting measles RNA.
 - MAKE SURE swab is in Viral transport medium (VTM).
 - It must be immersed in 1-3ml liquid. Dry swabs cannot be tested.



Most successful when samples are collected on the first day of rash through the 3 days following onset of rash.

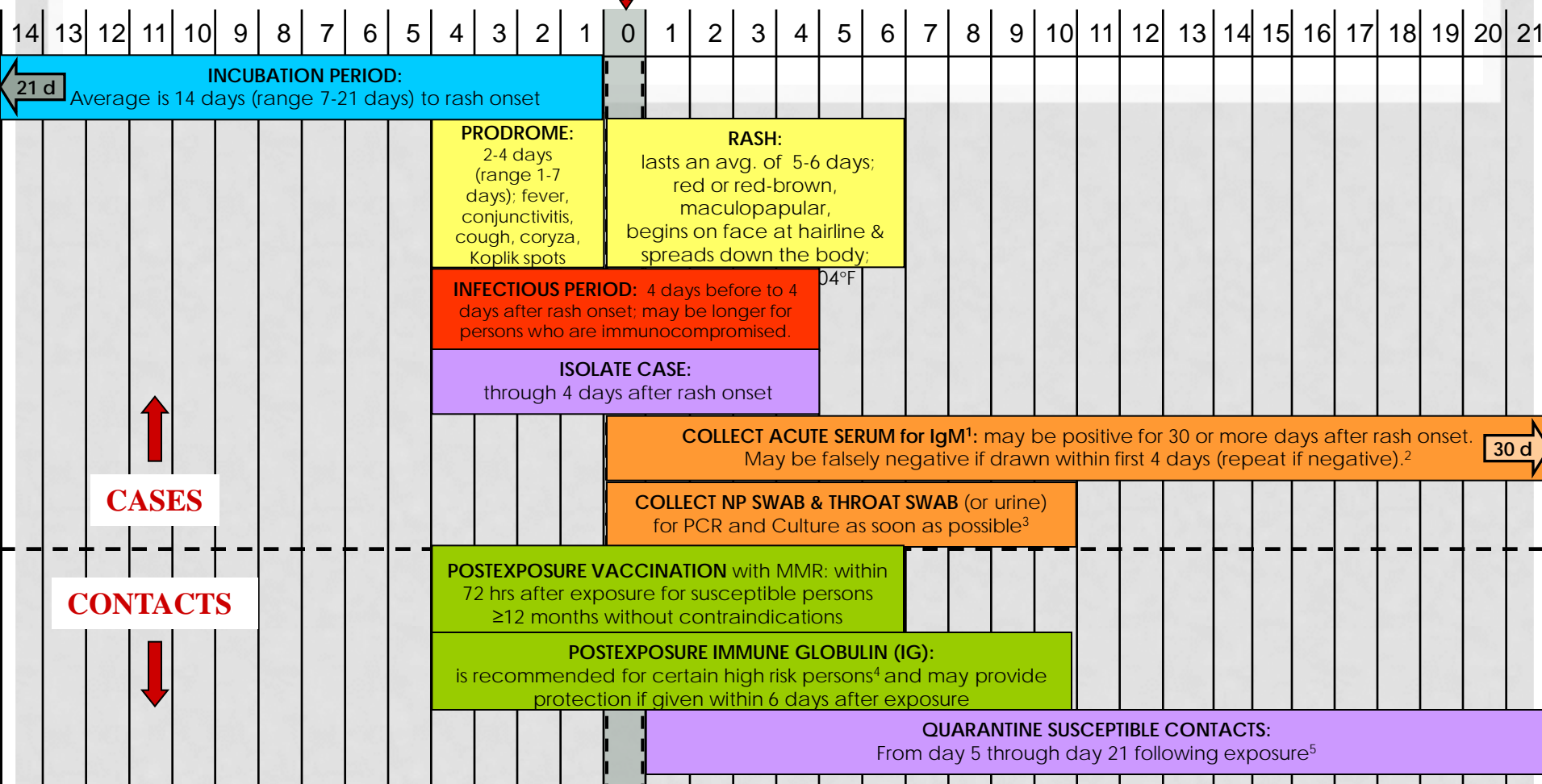
MDPH Immunization Program Measles Management Timeline

Adapted from Colorado Department of Public Health and Environment

Report all suspect cases immediately to your local board of health and to MDPH at 617/983-6800.

KEY:

| | | | | | |
|-------------------|------------------|-------------------|------------------------|---------------|-------------|
| Incubation Period | Signs & Symptoms | Infectious Period | Isolation & Quarantine | Lab Specimens | Prophylaxis |
|-------------------|------------------|-------------------|------------------------|---------------|-------------|



¹Serologic tests may be falsely positive, so positive commercial IgM tests should be confirmed at the HSLI.

²If acute serum for IgM is negative, and the clinical picture continues to point to measles, the acute serum and a convalescent serum drawn ≥14 days from the acute serum should be tested simultaneously for IgG.

³For best results with viral culture, collect specimens ≤3 days after rash onset. Diagnostic yield is low for specimens collected >10 days after rash onset.

⁴IG should be considered for immunocompromised patients (unless they have recent serologic proof of immunity), and any susceptibles with contraindications to measles-containing vaccine, particularly pregnant women and infants <12 months of age.

⁵Contacts do not need to be quarantined for the full 21 days if evidence of immunity is shown by titer or 2 dose vaccine history.

MEASLES CASE STUDY

MEASLES CASE STUDY - SCENARIO

- 28 year old female presents to health center on Saturday, February 1st with 2 days of fever of 100°F, malaise, and injected eyes. Sent home with URI diagnosis (not tested).
- Returns to HC on Sunday with fever of 102°F. Mild sinus congestion. Patient insists she should be tested for Coronavirus and measles, as she just traveled internationally.

If you saw this patient, what additional questions would you ask?
What would you test for?

MEASLES CASE STUDY – SCENARIO

- Where and when did you travel?
- What makes you concerned about Coronavirus/measles?
- Have you been around anyone else who was sick?
- What do you do for work?
- Are you vaccinated?

MEASLES CASE STUDY - SCENARIO

- **Sunday** – sent via taxi from Health Center to local hospital ER with URI diagnosis (dehydration & high fever).
- While waiting in the ER, spots appear on her hairline. Patient temp increases to 103°F.
- Eventually admitted to hospital for dehydration and fever. Put in room on airborne precautions.
- **Monday** – Maculopapular on her forehead, ears, and chest & back appears. Some exudate in her throat.

If you saw this patient, what additional questions would you ask? What would you test for?

MEASLES CASE STUDY - SCENARIO

- **Travel:** Was traveling for the last month in UAE, England, Belgium, and Spain. Returned Friday to US.
- **Country of Birth:** Patient grew up in Poland.
- **Vaccination:** Has 2 childhood doses of what appears to be MMR on record from Poland. (14 months & 16 months)
- **Recent Sick Contacts:** Was staying with/visited friend in the hospital in London who she believes was diagnosed with measles.

SUSPECT CASES OF MEASLES: INITIAL STEPS

- Notify your local board of health and MDPH at **617-983-6800** when measles is first suspected – an epidemiologist can walk you through what to do
- This includes:
 - Specimen collection and testing at the Hinton State Lab Institute (HSLI)
 - Control recommendations for patients, exposed staff

MEASLES CASE STUDY - FIRST STEPS

- Health Center & ER begin to identify exposed patients and staff and evaluate staff evidence of immunity
 - Entire HC/ER exposed from time of patient arrival through two hours after departure
 - Office should close to new arrivals to minimize additional exposures (if applicable & in 2 hr window)

Case is confirmed by IgM and PCR testing at HSLI on Tuesday. PCR specimens sent to CDC for genotyping.

MEASLES EXPOSURES: NEXT STEPS

- Identify all close contacts among staff and patients exposed to the suspect case.
- Assess all exposed individuals – both staff and patients - for acceptable evidence of immunity, as outlined in the next slide.
- Vaccinate all susceptible individuals.
- Exclude all susceptible contacts from work from day 5 through day 21 after exposure.
- Surveillance for early identification of secondary cases through two incubation periods after rash onset.

MDPH RECOMMENDATIONS FOR HEALTHCARE WORKERS & YOUR PATIENTS

- Healthcare workers
 - Need 2 doses of MMR or serology – regardless of year of birth.
- Review the immunization status of all children and adults.
 - Exemptions: Re-evaluate the status of those with medical or religious exemptions and offer vaccine, if indicated or appropriate.
 - Make sure all are age- appropriately immunized.
 - Travelers
 - Everyone ≥ 12 months of age should have 2 doses of MMR at least 28 days apart.
 - Children 6 to 11 months of age **should** receive 1 dose of MMR. Since the immune response to doses given before 12 months of age is variable, these children must receive a normal 2-dose series starting at age 12 months.



MEASLES CASE STUDY - HEALTHCARE EXPOSURES

- Saturday & Sunday Health Center exposures
 - Who was there up to 2 hours after patient left?
 - Healthcare workers include non-clinical staff (reception, janitorial, etc.)
 - Patients in the waiting room? In appointments up to two hours after the index patient left?
- Staff members without evidence of immunity – exclusion begins 5 days after exposure & continues through 21 days after exposure.

Who are we missing from this exposure?

MEASLES CASE STUDY - HEALTHCARE EXPOSURES

All exposed patients must be notified about exposure - even if we know they have documented immunity.

Why is this?

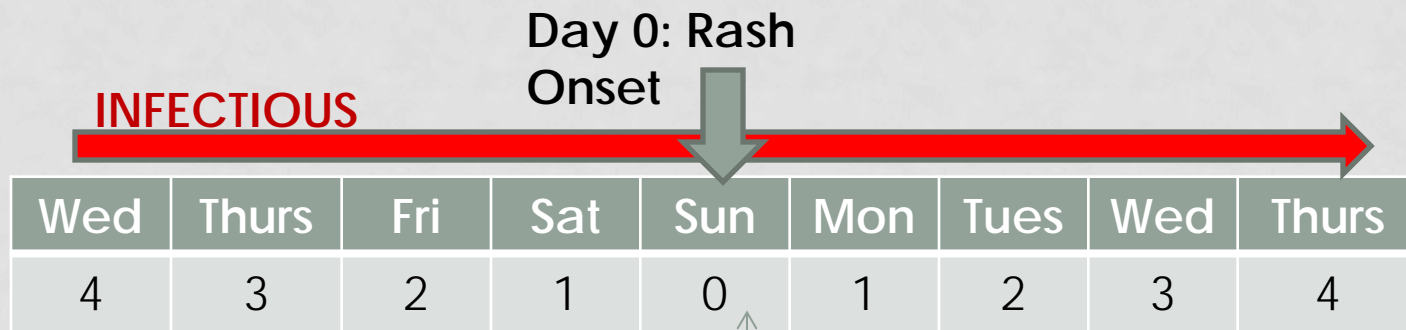
Companions
(people who accompanied patients)

Speed is important:

- Post-exposure vaccination can help within 72 hours of exposure & can prevent exclusion.
 - IG can help within 6 days of exposure.

DEFINING THE INFECTIOUS PERIOD

- Measles is infectious 4 days before through 4 days after rash onset.



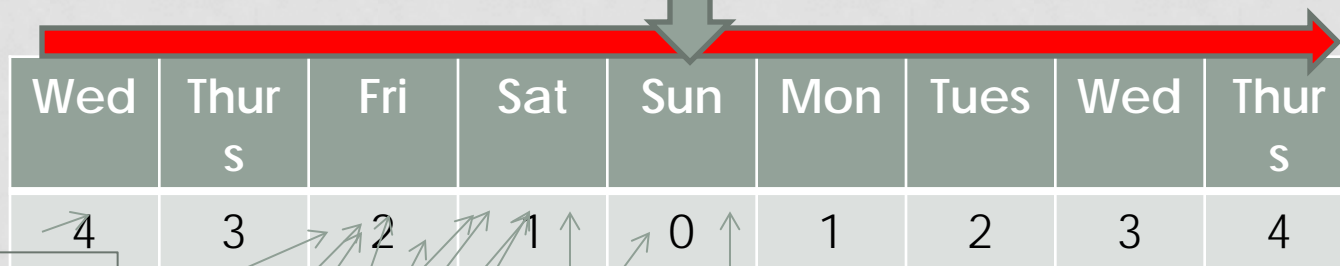
Health Center Exposures

Hospital Exposures

In the event of an exposure, could you quickly determine who among your staff was susceptible?

LBOH IS VITAL IN ASSISTING WITH THESE EXPOSURES:

Day 0: Rash Onset



International Flights

Logan Airport

Taxi Cabs

Grocery Stores

Friends

Apartment Building

Hospital Exposures

Health Center Exposures

DO YOU KNOW THESE IMPORTANT ANSWERS REGARDING YOUR PATIENTS?

- What does your patient do for work?
 - Where do they go to school?
- Who does your patient live with?
 - Children at home? Ages?
- Did they travel recently? Where?
- Any visitors recently?
- Have they been around sick contacts?
- What is their vaccination history?

DO YOU KNOW THESE IMPORTANT ANSWERS REGARDING YOUR STAFF?

- What is their vaccination history?
- Who is up to date with documented evidence of immunity?

QUESTIONS?