



Massachusetts Department of Public Health
Bureau of Infectious Disease and Laboratory Sciences

The Keys to Success: Long Term Care Guidance on Vaccination, Infection Control, and Antibiotic Stewardship

Adult Immunization Conference
April 10, 2018

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Presenter Disclosure Information

- *We, Christina Brandeburg, Joyce Cohen and Melissa Cumming, 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 may discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.*
- *But in accordance with ACIP recommendations.*

Who is in the audience?

- From:
 - LTC Facilities?
 - Assisted Living Facilities?
 - Group homes?
 - Hospitals?
- Roles:
 - Leadership
 - Staff nurses
 - Infection control

Influenza - Can we agree?

- All health care personnel should receive an annual seasonal influenza vaccine, a crucial step in preventing influenza and reducing health care associated influenza infections.
- As a condition of licensure, DPH regulations require health care facilities, including nursing homes and rest homes to:
 - Offer free-of-charge, annual influenza vaccine to all personnel (full and part-time employees, contracted employees, volunteers, house staff and students);
 - Document receipt of influenza vaccine administered within and outside the facility or document the declination of immunization for HCP; and
 - Report information to DPH documenting compliance with the vaccination requirement, in accordance with reporting and data collection guidelines of the Commissioner (105 CMR.)



Health Care Personnel (HCP) and Influenza vaccination

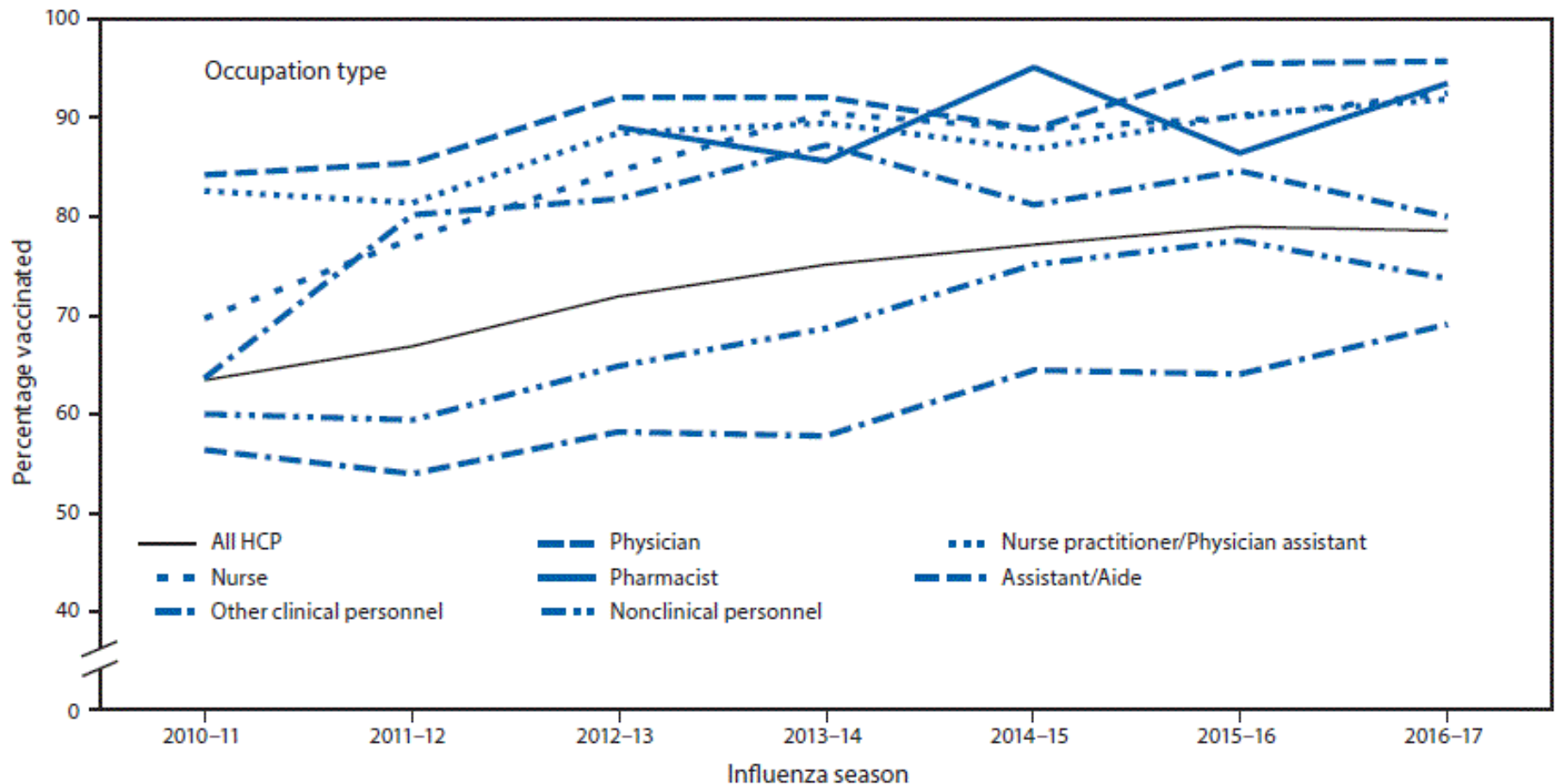
- CDC, the Advisory Committee on Immunization Practices (ACIP), and the Healthcare Infection Control Practices Advisory Committee (HICPAC) recommend that all U.S. health care workers get vaccinated annually against influenza.
- Among health care personnel (HCP) early season coverage was 68%, similar to last season at this time.
- Flu vaccination coverage was lowest among administrative and non-clinical support staff (61.0%) and assistants or aides (56.2%).
- By occupation,
 - highest among pharmacists (86.4%),
 - physicians (82.7%),
 - nurses (80.9%),
 - nurse practitioners/physician assistants (79.7%),
 - and other clinical professionals (75.1%).

Health Care Personnel (HCP) and Influenza vaccination (cont.)

- By work setting, early season flu vaccination coverage was highest among health care personnel working in hospitals (82.6%). **Flu vaccination coverage was lowest among health care personnel working in long-term care facilities (58.5%).**
- Early season flu vaccination coverage was higher among health care personnel whose employers required (88.4%) or recommended (65.1%) that they be vaccinated, compared to those whose employer did not have a policy or recommendation regarding flu vaccination (29.8%).
- Among unvaccinated health care personnel who did not intend to get the flu vaccination during this flu season, the most common reason reported for not getting vaccinated was fear of experiencing side effects or getting sick from the vaccine (22.1%).

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

Internet panel survey, United States



<https://www.cdc.gov/flu/toolkit/long-term-care/coverage.htm>

2016-2017 NHSN Results: MA Nursing Homes

Mean Percent of Nursing Home HCP Vaccinated Against Influenza During the 2016-2017 Season

	Mean % Vaccinated	Range
Total Vaccinated	75%	(15-100%)
Total Exceptions*	23%	(0-78%)
Location Vaccinated		
At Place of Employment	54%	(0-100%)
Outside Place of Employment	21%	(0-83%)

N=358 Facilities Submitted Data

*Total exceptions may include declination, medical contraindication or religious exemption.

2016-2017 NHSN Results: MA Rest Homes

Mean Percent of Rest Home HCP Vaccinated Against Influenza During the 2016-2017 Season

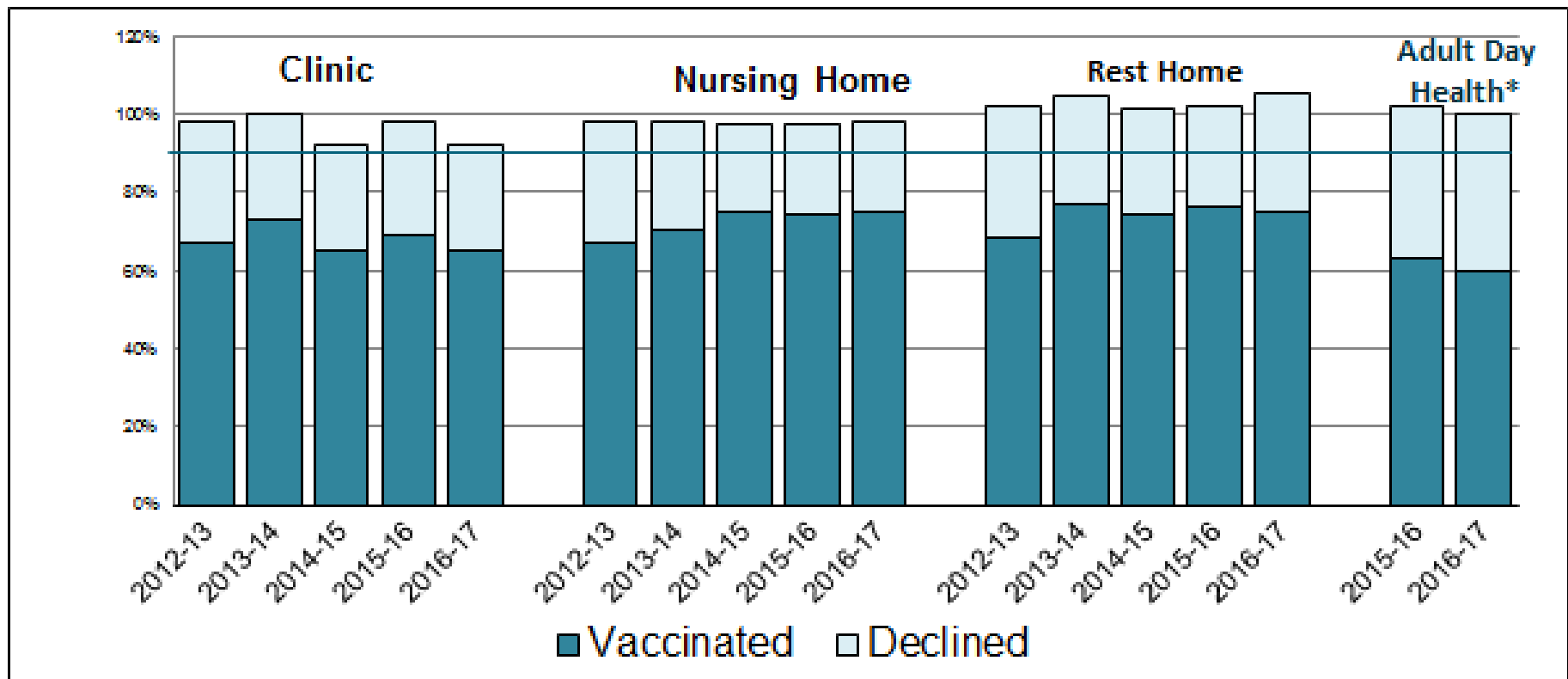
	Mean % Vaccinated	Range
Total Vaccinated	75%	(47-100%)
Total Exceptions*	30%	(0-70%)
Location Vaccinated		
At Place of Employment	35%	(0-76%)
Outside Place of Employment	40%	(6-87%)

N=20 Facilities Submitted Data

*Total exceptions may include declination, medical contraindication or religious exemption.

Trends over Time: Clinics, Nursing Homes, Rest Homes and Adult Day Health Programs

Mean Percent of HCP Influenza Vaccinations and Declinations as Reported by Massachusetts Clinic, Nursing Homes, Rest Homes and Adult Day Health Programs: 2012-2017 Seasons



*2015-2016 Season was the first year Adult Day Health Programs were required to report.

MA Flu Vaccination Rates

	MA 2015-16	MA 2016-17	US 2016-17
Everyone 6 mos+	50%	50%	47%
Children 6 mos – 17 yrs	75%	72%	59%
○ Children 6 mos – 4 yrs	85%	82%	70%
○ Children 5 – 12 yrs	79%	71%*	60%
○ Adolescents 13 – 17 yrs	63%	65%	49%
Adults 18 +	44%	45%	43%
○ Adults 18 – 64 y/o	40%	41%	38%
○ Adults HR 18 – 64 y/o	48%	49%	46%
○ Adults 50 – 64 y/o	46%	47%	45%
○ Adults 65+	60%	59%	65%

*Statistically significant

Source: 2015-16 and 2016-17 National Immunization Survey (NIS) – Flu, and BRFSS

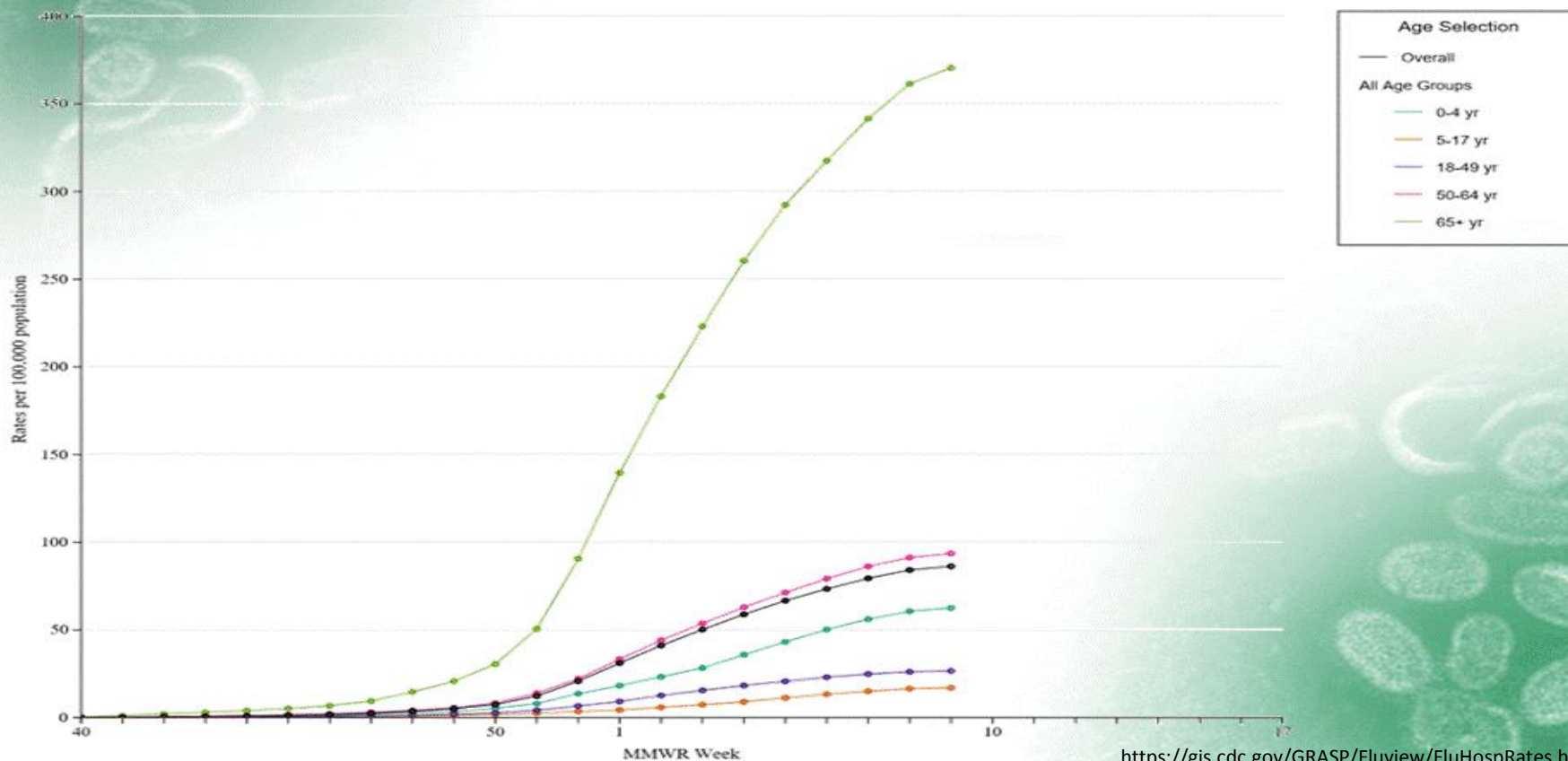
National Influenza Data

FLUVIEW

A Weekly Influenza Surveillance Report Prepared by the Influenza Division
Laboratory-Confirmed Influenza Hospitalizations



Preliminary cumulative rates as of Mar 03, 2018



Influenza Like Illness (ILI) Clusters in Massachusetts

- Clusters are typically reported from LTC Facilities, Assisted Living Facilities, Group Homes, Childcare Centers and Schools
- 2017-2018: 336 ILI Clusters (as of 3/26/18)
- 2016-2017: 261 ILI Clusters
- 2015-2016: 67 ILI Clusters
- 2014-2015: 286 ILI Clusters



*Influenza like illness is a fever of $>100^{\circ}\text{F}$ [37.8°C] AND cough or sore throat (without another known cause).

It's March 14th...

- You work at a LTC facility that has 3 different units. On one unit there are 2 residents who have Influenza-Like- Illness (ILI). On another unit there is a resident who tested positive for influenza.
- Two staff who work on the third unit are out sick.

Scenario 1

Do you:

- A. Complete a Respiratory Cluster Teleform?
- B. Implement control measures (good handwashing, signage, isolate all ill residents, restrict staff floating).
- C. Treat ill residents with antivirals.
- D. Report cluster to your LBOH and licensing agency.
- E. Consider chemoprophylaxis for all residents.
- F. Do A, B, C and D.
- G. All of the above.

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Group Question

- What else can be done?
 - Offer vaccine to unvaccinated staff and residents.
 - Staff who are unvaccinated can also be offered chemoprophylaxis.

Scenario 2

- A long term care facility has 1 staff member who is out sick with ILI. She calls you to say that she went to the doctor and she was positive for influenza.
- What are the next steps?
- What can the administration do?

Scenario 2

1. Stay calm, it's only one staff member.
2. Determine when she last worked and what unit she worked on.
3. Find out when she began feeling sick.
4. Check to see if she got the flu shot.

Scenario 2

- You find out that she last worked 6 days ago and she started feeling ill 3 days ago.
- You check your records and see that she received the flu shot at one of the clinics you had at your facility.

Scenario 2

Do you:

- A. Begin chemoprophylaxis for all residents who she cared for while last at work.
- B. Tell employee, she should not return until she is fever free without the use of fever reducing medication for 24 hours.
- C. Continue to offer flu vaccine to all residents and staff who remain unvaccinated.
- D. All of the above
- E. B & C

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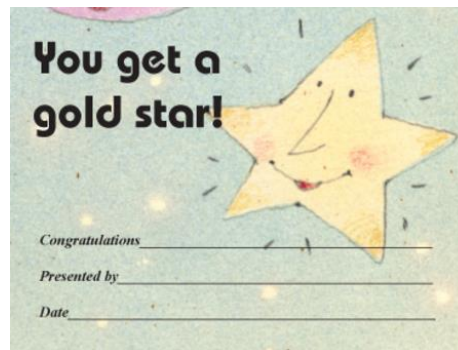
Empowering Health Care Personnel

- Empowering Health Care Personnel to Protect Themselves and Their Patients
 - One facility– Close to a 100% vaccination rate among staff
- How does she do it?



Empowering Health Care Personnel

- She meets them where they are:
 - Goes floor by floor offering vaccine.
 - Comes in at 4:00 am in the morning to vaccinate and at 9:00 pm at night!
 - And staff must wear masks 11/1 to 3/31 if not vaccinated.



Control of Influenza and Pneumococcal Disease in Long-Term Care Facilities (LTCFs) 2017 – 2018

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Key Recommendations

Everyone aged 6 months and older should receive flu vaccine every year. The Advisory Committee on Immunization Practices (ACIP) recommends vaccination with either the inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV). Vaccination should not be delayed to procure a specific vaccine formulation. Begin offering flu vaccine as soon as it is available. There is no preferential recommendation for any one age-appropriate inactivated flu formulation over another. Choice of which influenza vaccine formulation to use should primarily be driven by the age indication, contraindications and precautions. There is no current preference for quadrivalent vs. trivalent or high-dose vs. adjuvanted vs. standard dose.

Vaccinate staff: In Massachusetts during 2016-2017, 75% of healthcare workers in LTCFs and Rest Homes received influenza vaccine. Only 60% of healthcare workers in Adult Day Health programs received influenza vaccine. In contrast, 82% of acute care facilities in Massachusetts achieved vaccine coverage of 90% or greater among healthcare workers. MDPH encourages facilities to review current healthcare personnel influenza policies implement processes to maximize vaccination coverage. All healthcare facilities should strive to reach the goal of having 90% of healthcare personnel vaccinated annually against influenza in order to best protect patients, family members, and staff from influenza illness.

Influenza-like illness in your facility? See [page seven](#) for guidance on reporting clusters of influenza-like illness, prophylaxis of those exposed, and other control measures.

What's New for the 2017-2018 Season?

If you suspect Influenza-like Illness (ILI) in your facility

- Report your ILI Cluster using the respiratory teleform.

- Fax them to 617-983-6220



- Test promptly, treat promptly and empirically.



- Isolate/cohort ill patients.



Massachusetts Department of Public Health
Bureau of Infectious Disease
305 South Street, Room 563, Jamaica Plain, MA 02130
Phone: 617-983-6800 Confidential Fax: 617-983-6220

Received in Surveillance: ☐ / ☐ / ☐

Influenza/Respiratory Illness LTCF Cluster Reporting Form

Report Date: (mm/dd/yyyy) Facility Name: _____
Address: _____
City: _____ St: _____ ZIP: _____ Facility Type: ☐ Long Term Care ☐ Assisted Living ☐ Other
Specify: _____
Facility Contact: _____ Phone: (____) (____) - _____
Facility Census: Total Clients: _____ Total Staff: _____ Total Wings/Units: _____

VACCINE INFORMATION

Clients vaccinated against influenza: _____ Staff vaccinated against influenza: _____

CLUSTER INFORMATION

ILL Clients: _____ Symptom: All Most Some None First Onset Date: ____/____/____
ILL Staff: _____ Fever (>=100°F) ☐ ☐ ☐ ☐ Latest Onset Date: ____/____/____
Wings/Units Impacted: _____ Cough ☐ ☐ ☐ ☐
Sore Throat ☐ ☐ ☐ ☐ ---Total Clients and Staff ---
URI ☐ ☐ ☐ ☐ Died: _____ Hospitalized: _____
Vomiting ☐ ☐ ☐ ☐
Diarrhea ☐ ☐ ☐ ☐
Pneumonia ☐ ☐ ☐ ☐
Other ☐ ☐ ☐ ☐

LABORATORY INFORMATION

Has lab testing been done? ☐ Yes ☐ No ☐ Unknown If yes, what testing has been done?
Rapid Influenza Test: ☐ ☐ ☐ ☐ Result (e.g. Influenza A/B, RSV, streptococcus pneumoniae)
Influenza culture/POR: ☐ ☐ ☐ ☐
Other viral culture: ☐ ☐ ☐ ☐
Blood Culture: ☐ ☐ ☐ ☐
Legionella: ☐ ☐ ☐ ☐
Other (specify): _____

CONTROL MEASURES AND NOTIFICATION

Have control measures been implemented, as outlined in LTCF Guidelines? ☐ Yes ☐ No
Have you notified your licensing or certifying agency? ☐ Yes ☐ No Licensing Agency: ☐ DHQC ☐ Elder Affairs
Date LBOH Notified: ____/____/____ (mm/dd/yyyy)

Make solid marks that fit in the response boxes. Please use black or blue ink. Right way -> ☐ A ☐ B Wrong way -> ☐ A ☐ B

If you suspect Influenza-like Illness (ILI) in your facility

- Use standard precautions & droplet precautions when caring for patients suspected of having influenza
- Encourage/remind/educate residents and visitors on respiratory hygiene/cough etiquette
- Watch for new cases (conduct daily active surveillance)
- Use antiviral chemoprophylaxis (CDC recommends using antiviral chemoprophylaxis for all non-ill residents for outbreak control when you have a laboratory – confirmed case of flu or when 3 or more residents have ILI)

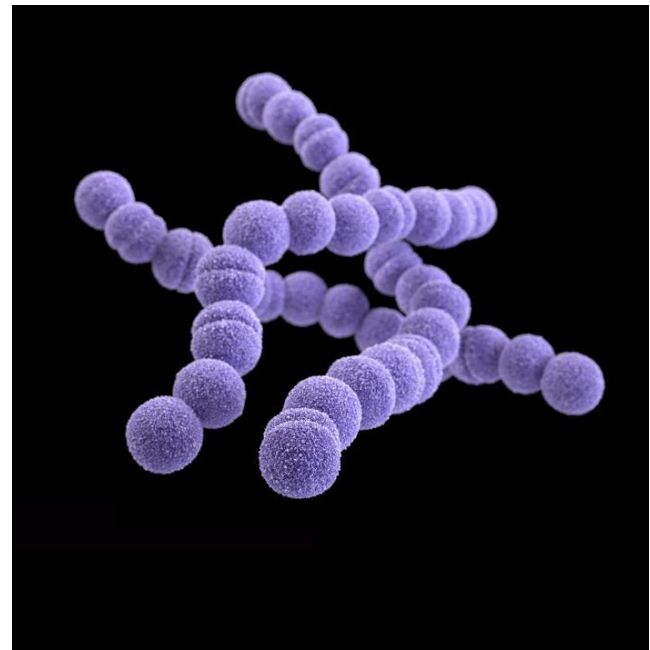


If you suspect Influenza-like Illness (ILI) in your facility

- Continue to offer vaccine to unvaccinated staff and patients.
 - Revisit vaccination with your staff throughout influenza season.
 - Flu season can sometimes last into April and even into May!
- When Influenza is circulating in your facility
 - Unvaccinated staff should be offered antiviral chemoprophylaxis as well as patients.
 - Unvaccinated staff can wear masks to help protect your patients.
 - Symptomatic staff should be excluded from work until at least 24 hours after they no longer have a fever without taking any fever reducing medication.

What is Group A Strep (GAS)?

- Bacteria (gram+ cocci) found in throat and on skin
- Can colonize without causing symptoms
 - Carriage can be as high as 15%
- Non-invasive disease is most common
 - Strep throat, impetigo



How does GAS spread?

- Spread by direct contact with nose and throat discharges of an infected individual or with infected skin lesions
- The risk of spread is greatest when an individual is symptomatic, such as with strep throat or an infected wound
- Individuals who carry the bacteria but have no symptoms (colonized) are much less contagious



Incubation Period

- The incubation period for GAS pharyngitis is usually short: 1–5 days (rarely longer)
- The incubation period for invasive GAS disease is variable and depends on the type of infection and host factors

How does GAS spread?

- Infectious Period
 - In untreated, uncomplicated GAS disease, the infectious period starts several days before onset of symptoms and lasts from 10–21 days
 - If purulent discharge is present, the infectious period may be extended from weeks to months
 - Persons with untreated GAS pharyngitis may carry and transmit the bacteria for weeks or months, with contagiousness sharply decreasing 2–3 weeks after onset of the illness
- Treatment
 - Appropriate antibiotic treatment for at least 24 hours is sufficient to end the patient's infectious period



Invasive GAS

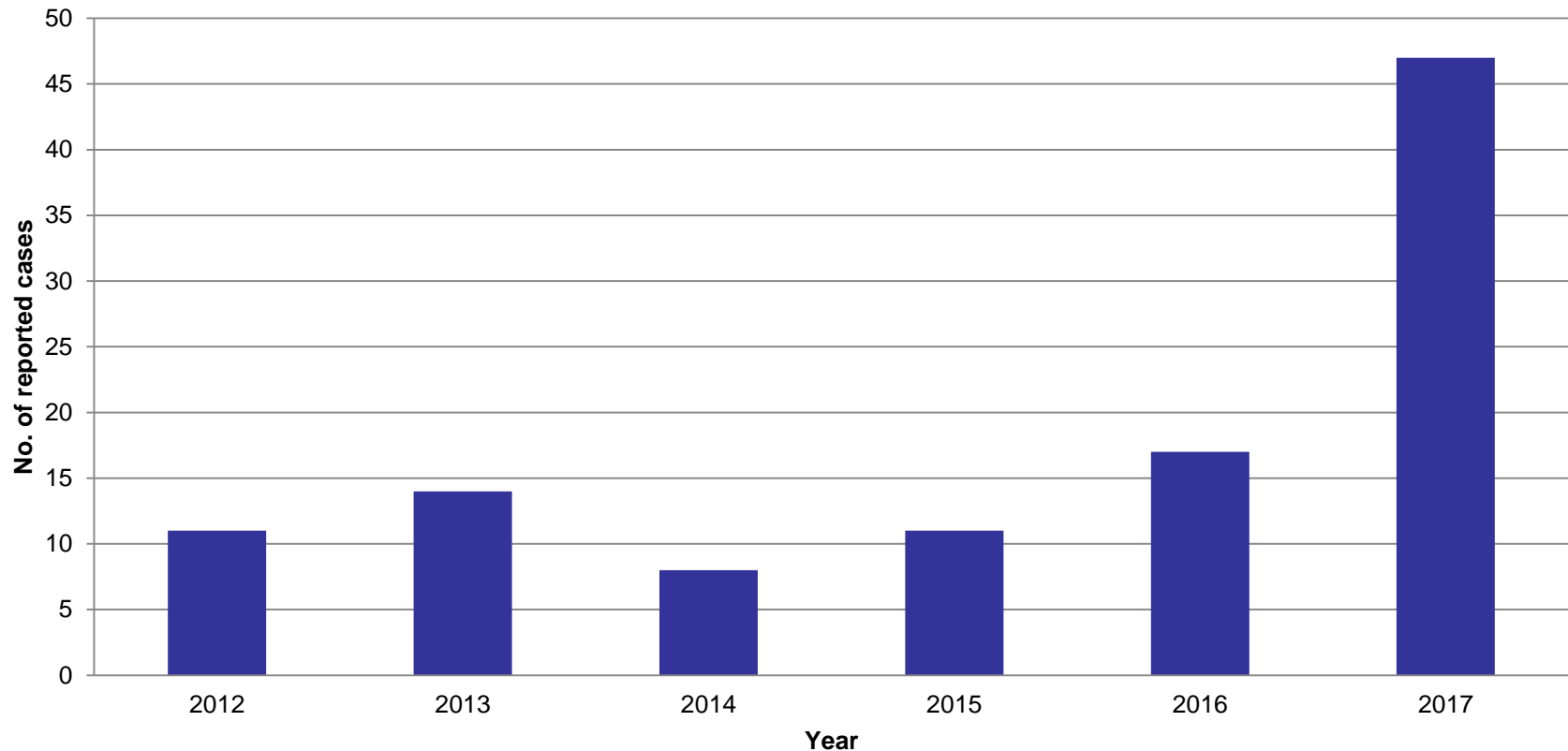
- Occurs when bacteria get past defenses and have invaded parts of the body, such as the blood, deep muscle, fat tissue, or the lungs
- Infection may occur when a person has sores or other breaks in the skin (such as cuts, chicken pox, or surgical wounds) that allow the bacteria to get into the tissue
- Although healthy people can get invasive GAS disease, people with chronic illnesses such as cancer, diabetes, end stage renal disease, and those who use medications such as steroids, are at higher risk
- 11,000-13,000 cases of invasive disease occur each year in US
 - Translates to ~ 3.4-4.8 cases/100,000 population
- Death occurs in 10%-13% of all invasive cases, 45% of streptococcal toxic shock syndrome (STSS) and 25% of necrotizing fasciitis (NF) cases
 - Organ system failure can occur in cases with STSS
 - Amputation may be necessary in cases of NF

Clinical Presentations of Invasive GAS Infections

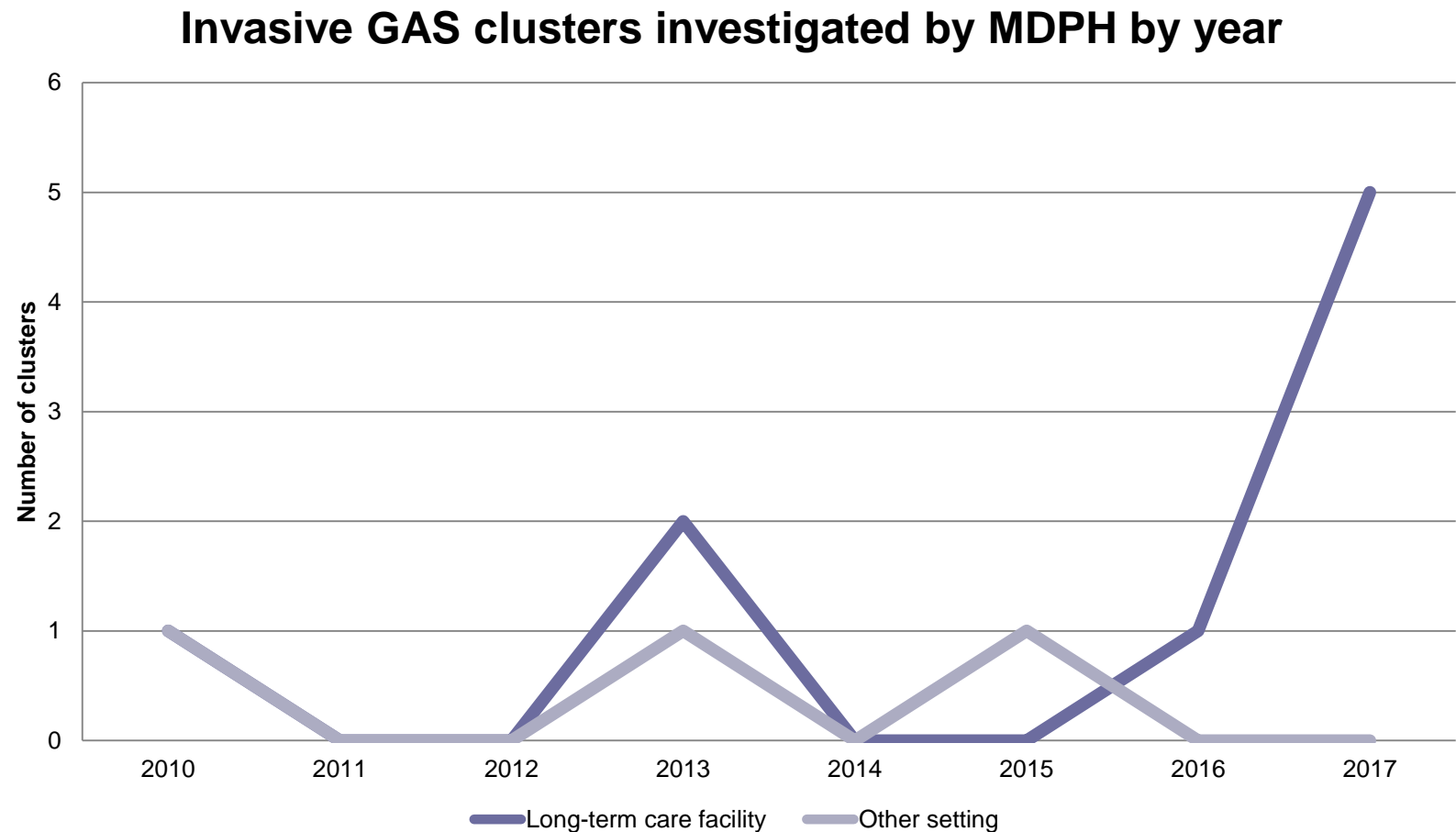
- Invasive GAS infection may manifest as any of several clinical syndromes, including:
 - Pneumonia
 - Bacteremia
 - Necrotizing Fasciitis
 - Peritonitis
 - Osteomyelitis
 - Septic Arthritis
 - Toxic Shock Syndrome
 - Post-partum Sepsis

Individual cases of invasive GAS in Long-Term Care

Number of cases of invasive GAS residing in a LTCF in MA



Clusters of Confirmed Invasive GAS in LTCFs



* Data as of February 27, 2018 and is subject to change

Invasive GAS in LTCF

- **1 case of invasive GAS in LTCF**
 - Determine if there have been additional cases of invasive or non-invasive GAS in the facility (among other residents or staff)
 - Recommend retrospective review of medical charts and lab results to determine if there have been any other cases of invasive or non-invasive GAS infection among residents or staff (providing direct patient care) within the previous 6 months
 - If any staff or residents have symptoms such as sore throat, tonsillar inflammation, cervical lymphadenopathy or skin infections including pyoderma and impetigo, then obtain appropriate cultures
 - If any cultures are positive then treat as appropriate or prescribed by a health care professional
 - Recommend enhanced surveillance for next 6 months
 - Reinforce rigorous hand washing



CHARLES D. BAKER
Governor

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Secretary

MONICA BHAREL, MD, MPH
Commissioner

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To: Medical and Nursing Directors
Massachusetts' Long-Term Care Facilities

From: Eric Sheehan, JD
Director, Bureau of Health Care Safety and Quality
Massachusetts Department of Public Health

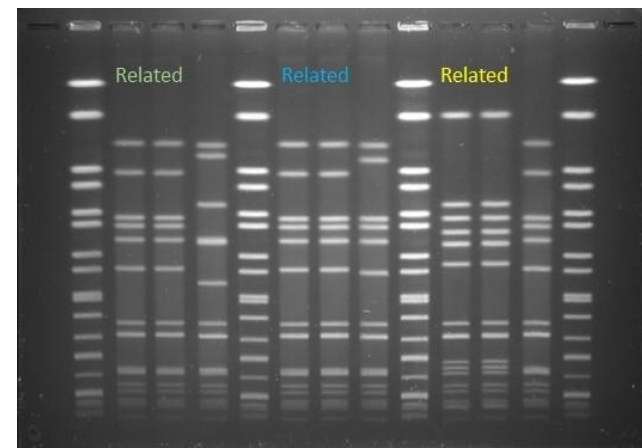
Alfred DeMaria, Jr., M.D.
Medical Director, State Epidemiologist
Bureau of Infectious Disease and Laboratory Sciences

Date: October 3, 2017

RE: Invasive group A streptococcal infections

Invasive GAS in LTCF (Continued)

- **2 or more cases of invasive GAS in a LTCF within 6 months**
 - Intensive follow up is indicated
 - Consists of identifying the exposed group (both residents and HCWs) and screening those exposed regardless of symptom status
 - Positive cultures should be treated appropriately
 - Staff members with indistinguishable PFGE results should continue treatment and follow-up cultures should be obtained 7-10 days after completion of therapy
- If follow-up cultures in staff members with indistinguishable PFGE results remain positive after completion of therapy, culturing household contacts of the colonized staff member may be indicated



Infection Control Recommendations

Infection Control—Staff Education and Monitoring Includes Employees *and* Contracted Staff

- Report any cases of invasive group A *streptococcus* (GAS) infection to MDPH by calling 617-983-6800 24/7
- Place residents who have GAS infection on the appropriate precautions, as follows
 - Standard precautions for skin or wound infection if a dressing covers and contains drainage
 - Standard, contact, and droplet precautions if no dressing is present or the dressing does not adequately contain drainage
 - Droplet and standard precautions for pharyngitis or pneumonia (through the first 24 hours of antimicrobial therapy)
 - Droplet and standard precautions for invasive disease (through the first 24 hours of antimicrobial therapy)
- *Monitor compliance* with hand hygiene, respiratory etiquette, standard and transmission-based precautions, personal protective equipment, usage, and cleaning practices.

Infection Control Recommendations

Surveillance to Identify Additional Cases

- Perform retrospective review of all resident cultures for the previous month for culture-confirmed infections.
- Maintain active symptom surveillance for invasive and noninvasive cases for six months after the onset of the most recent infection.
 - Check residents daily for symptoms of GAS infection and order a culture for anyone who is symptomatic
 - Survey staff for symptoms of GAS and order a culture for any staff member who is symptomatic; refer staff with positive cultures to a physician for treatment
- Provide staff education on recognition of GAS infections, the importance of basic hygiene, and not working while ill.

Identification of Potential Carriers

- In consultation with the MDPH, you may be asked to order cultures for staff and other patients who come into close contact with residents who have GAS infections.

CRE and CP-CRE: What are they and why should I be concerned about them?

- **Enterobacteriaceae:** a family of bacteria normally found in human intestines; can become carbapenem-resistant; can cause serious infection when spread outside the gut
- **Carbapenem:** a class of broad-spectrum antibiotics used to treat severe infections; antibiotics of last resort when other antibiotics are not available (e.g., imipenem, meropenem, doripenem, ertapenem)
- **Carbapenemase:** enzymes that break down (inactivate) carbapenem antibiotics, causing resistance
- **CRE:** Carbapenemase-Resistant Enterobacteriaceae, a family of bacteria that are difficult to treat because they are highly resistant to antibiotics



Why are CRE epidemiologically important?

- Cause infections with high mortality rates (up to 50%)
- Carry genes with high levels of resistance to many antimicrobials, limiting treatment options
 - Genes can be exchanged between different bacteria on plasmids
- Spread rapidly and require the most rigorous infection control measures
- Have spread throughout many areas of the U.S. and can spread more widely

Enterobacteriaceae can become resistant to carbapenems by:

- **The transmission of resistance genes from one bacterium to another**
- **The production of enzymes that inactivate carbapenems (i.e., carbapenemases)**

Transmission and Types of Infection

- Person to person
 - via contact with infected or colonized individuals
 - via hands of healthcare personnel
 - via contaminated medical equipment
- Contact with stool or wounds
- Contact with contaminated environmental surfaces
 - (e.g., bed rails)

CP-CRE can cause:

- Bloodstream infections
- Ventilator-associated pneumonia
- Surgical site infections
- Intra-abdominal abscesses
- Urinary tract infections
- *Asymptomatic colonization*

States with CP-CRE in 2006



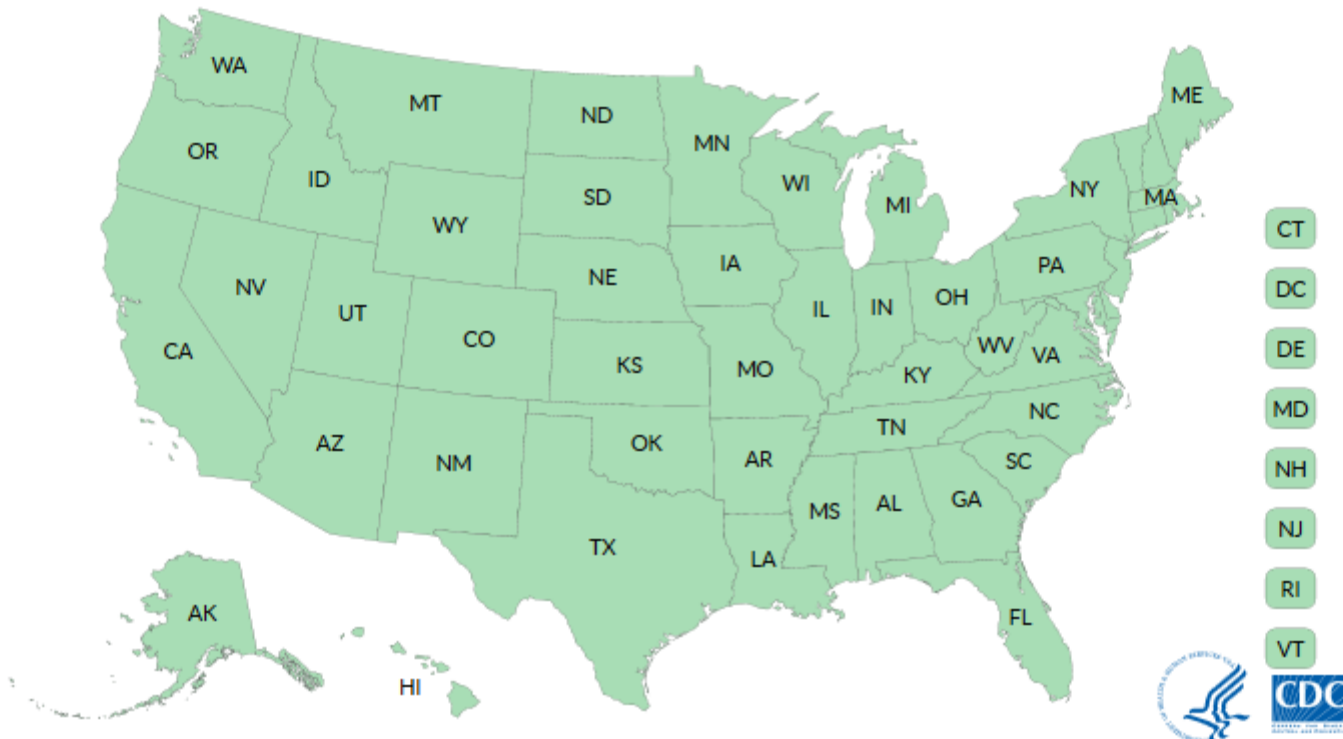
Current States with CP-CRE

Patients with KPC-producing *Carbapenem-resistant Enterobacteriaceae* (CRE) reported to the Centers for Disease Control and Prevention (CDC) as of December 2017, by state

KPC enzyme

☐ None

■ Reported



Risk Factors

- Healthcare outside of the US
- Exposure to acute care or long-term care facilities
- Exposure to an ICU
- Presence of other medical conditions
- Compromised immune system
- Invasive devices (e.g., ventilators, central venous catheters, or urinary catheters)
- Invasive procedures (e.g., endoscopic procedures)
- History of extensive antibiotic use



Infection Control Measures

- Facility-level prevention
- Hand hygiene
- Contact precautions (may be modified for non-acute setting)
- Minimize use of indwelling devices
- Antimicrobial stewardship
- Environmental cleaning
- Patient and staff cohorting

**Guidance for Control of
Carbapenem Resistant *Enterobacteriaceae*
(CRE)**

Toolkit for Acute and Long-Term Care Settings



Division of Epidemiology and Immunization
Massachusetts Department of Public Health
Phone: 617-983-6800
Fax: 617-983-6813
www.mass.gov/dph
December 8, 2017_ver 1.0

Communication and Surveillance

Communication

- Healthcare personnel education
- Laboratory notification
- Interfacility notification

Surveillance

- Colonization screening of contacts

Antimicrobial Stewardship in Long-term Care

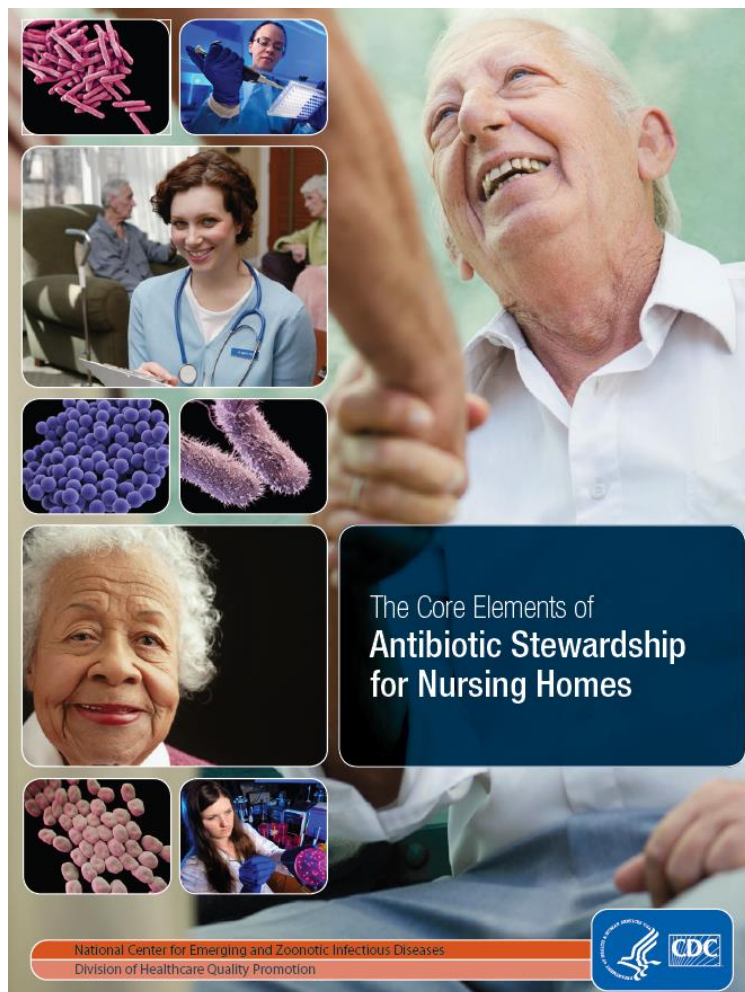
- 50-75% of Long Term Care (LTC) Residents in the US get at least 1 antibiotic prescription each year
- An estimated 25-75% of all systemic antibiotic prescriptions and 60% of topical antibiotic prescriptions in LTC are inappropriate or unnecessary

Challenges

- Workflow Related
 - Physicians have limited time to evaluate multiple patients and are not always readily available nights/ weekends
 - Many LTCFs lack institutional prescribing guidelines, access to contemporary references, or prescribing oversight
 - Limited access to ID specialists or specialized diagnostics
- Culture Related
 - Patients who seems frail with “no room for error”
 - Family who is demanding
 - Institutional fear of litigation

What can be done?

Core Elements for LTC



Leadership commitment

Demonstrate support and commitment to safe and appropriate antibiotic use in your facility



Accountability

Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities in your facility



Drug expertise

Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility



Action

Implement **at least one** policy or practice to improve antibiotic use



Tracking

Monitor **at least one process** measure of antibiotic use and **at least one outcome** from antibiotic use in your facility



Reporting

Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff



Education

Provide resources to clinicians, nursing staff, residents and families about antibiotic resistance and opportunities for improving antibiotic use

Long term care facility administrators can

- Establish multidisciplinary teams to address antibiotic stewardship and optimal drug use
- Have protocols that outline the appropriate circumstances for use of antibiotics
- Review antibiotic culture data for trends suggesting a worsening resistance problem
- Have protocols ensuring that cultures are checked and antibiotics adjusted according to culture results
- Establish programs for periodic review of antibiotic utilization

Long term care facility nurses can

- Be familiar with current protocols for testing and treatment of presumed bacterial infections
- Educate families and residents that many respiratory infections are caused by viruses and do not require antibiotics
- Educate families and residents about the appropriate indications for testing for and treating suspected UTIs
- Identify advanced directives for limited treatment
- Follow up with referring facility regarding pending lab results

Long term care facility prescribers can

- Encourage use of screening tools and protocols to decrease the use of unnecessary antibiotics.
- Educate fellow clinicians, staff and family members on appropriate use of antibiotics
- Implement measures to reduce the need for treating with antibiotics (avoidance of indwelling urinary catheters, maximizing immunization levels, decubitus ulcer prevention, etc.)

Long term care facility pharmacists can

- Review antibiotic utilization and, where possible, appropriateness; identify opportunities for improved prescribing and discuss at QI meetings.
- Educate physicians and nursing staff about targeted antibiotic use, using a narrow spectrum antibiotic based on culture results.
- Prepare updated and easily accessible protocols
- Apply pharmacokinetic principles to vancomycin dosing and monitoring
 - avoid administration of divalent cations (Fe, Mg, Ca, Zn) within 6 hours before or 2 hours after fluoroquinolones
- Ensure prescriptions are compatible with allergy history
- Encourage use of oral route for highly orally bioavailable drugs

What facilities can do together

- Develop communication tools to share critical information between acute and long term facilities when patients are transferred
 - Culture results
 - Pending results
 - Treatments initiated (what, when, indication, stop date)
 - Precautions
 - Immunizations
 - History of C. difficile
- Ensure contact information is provided for follow up on patient history and pending test results
- Establish cross-facility teams to address infection prevention and antibiotic stewardship.



Thank You!

Questions?