Shelter-based
Meningococcal Disease Outbreak: Working together to treat and vaccinate

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Boston Health Care for the Homeless Program

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Outline

• Background
• Outbreak
• Response
• Discussion
Boston Health Care for the Homeless Program: Delivering Care Since 1985

- Founded 30+ years ago by the Robert Wood Johnson Foundation and Pew Charitable Trusts
- Maintains strong partnerships with the Boston medical community, homeless service organizations, and city and state government
- Provides care to more than 11,000 homeless men, women and children every year
Our Services

• Medical and nursing care
• Substance use and mental health services
• Oral health care
• HIV education and treatment
• Medical respite care
• Family case management services
• Street outreach
• Housing support outreach
Outreach-Based Services

• More than 40 direct care clinics at outreach sites throughout Boston, including most Boston-based shelters
• Integrated clinic at Massachusetts General Hospital
• Street Team
• Family Team
• Home visits for formerly homeless patients
Meningococcal Disease
Meningococcal Disease

• Rare, vaccine-preventable disease

• Most common clinical presentations:
  o Meningitis, meningococcemia, pneumonia

• Signs and symptoms:
  o High fever, headache, stiff neck, confusion, rash

• 10-20% case-fatality ratio

• Up to 20% permanent sequelae
  o Cognitive deficits, hearing loss, or amputations

Photo by D. Scott Smith, MD, taken at Stanford University Hospital (http://emedicine.Medscape.com/article/221473-clinical)

Slide courtesy of John O. Otshudiema, MD from the Center for Disease Control, Epidemiology Intelligence Service
Neisseria meningitidis

- Gram-negative diplococcus
- Meningococci
  - Polysaccharide capsule (serogroup)
- 12 serogroups
  - A, B, C, W, X, and Y cause disease

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Meningococcal Transmission

- Humans are only reservoir
- Asymptomatic nasopharyngeal carriage of the bacteria
- Spread through close contact
  - Respiratory or oral secretions
  - Ill or asymptomatic carriers
- Incubation period
  - Within 4 days after exposure, range 1-10 days
- Infectious period
  - 7 days before onset of disease until 24 hours after initiation of appropriate antibiotic therapy

Image from: http://www.webmd.com/cancer/nasopharyngeal-cancer

Slide courtesy of John O. Otshudiema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service
Historic Risk Factors for Meningococcal Disease

- Age
  - Infants and children <5 years, adolescents and young adults 16–21 years, adults ≥65 years
- Crowded living conditions
- Certain medical conditions
  - Asplenia, complement component deficiencies, HIV
  - Eculizumab use
- Recent upper respiratory infections
- Certain behaviors
  - Smoke exposure, >1 kissing partners
Meningococcal Conjugate Vaccine and Recommendations

- Meningococcal conjugate vaccines (Menactra and Menveo)
  - Conjugate vaccine introduced in 2005
  - Protection is serogroup-specific
    - Specific for 4 serogroups (A, C, W, Y) - MenACWY
- MenACWY routine recommendations:
  - Adolescents aged 11-18 years
  - All persons ≥ 2 months of age at increased risk
    - HIV
    - Complement deficiency/ use of eculizumab
    - Asplenia
    - Travel to endemic region
    - Occupational exposure
    - Outbreak
Outbreak Declared in Boston Homeless Shelters
Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

Case 1: 60 year old male, Survived

Number of Cases

Month of Illness Onset

Jan-16
Feb-16
Mar-16

Serogroup C

Slide courtesy of John O. Otshudiema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service
Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

Case 2: 60 year old male
Survived

Number of Cases

Month of Illness Onset

Jan-16
Feb-16
Mar-16

Serogroup C

Slide courtesy of John O. Otshudiema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service
Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

Case 3: 20 year old male
Deceased

Number of Cases

Month of Illness Onset

Jan-16
Feb-16
Mar-16

Serogroup C
Deceased
Serogroup Y
Case

Slide courtesy of John O. Otshudiema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service
Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

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Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

Number of Cases

Month of Illness Onset

Jan-16 | Feb-16 | Mar-16

1. Case 4: 23 year old female
   Deceased

Outbreak declared

Slide courtesy of John O. Otshudiema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service
Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

Outbreak declared, Vaccination initiated

Case 5: 46 year old male Survived

Number of Cases

Month of Illness Onset

Serogroup C

Deceased

Serogroup Y

Case

Jan-16
Feb-16
Mar-16

2
1
3
5
4

Slide courtesy of John O. Otshudinema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service
• Distribution of meningococcal disease cases among adults experiencing homelessness in Boston Metro Area, Massachusetts
Coordinated Response

• Massachusetts Department of Public Health (MDPH), Boston Public Health Commission (BPHC), and Boston Health Care for the Homeless Program (BHCHP):
  o Performed contact investigations and provided antibiotic prophylaxis to close contacts
  o Initiated a mass vaccination campaign with MenACWY vaccine to adults experiencing homelessness and shelter staff in Boston
BHCHP clinical leadership notified by BPHC about case

BHCHP leadership contacted affected shelter and BHCHP clinicians at shelter clinic

BHCHP obtained electronic bed roster to determine patient’s bed assignments during infectious period

Close contacts (defined as shelter clients who slept within 4-bed-perimeter of index patient for each case) identified
Shelter directors notified to help locate close contacts, to place alert at point of shelter entry, and to help direct close contacts to shelter clinic.

Pop-up alert placed in BHCHP EMR

Pharmacy leadership contacted to secure needed supply of antibiotics for prophylaxis

Patients screened by shelter clinicians, prophylaxis and vaccination administered if asymptomatic, patients referred to ER if red flag sx present.
Meningococcal Vaccine Campaign

- Core clinical champions identified
- Vaccine supply secured
- Strategy to facilitate delivery of vaccine to patients developed
  - Standing order authorizing RNs to administer vaccine without need for direct presence of MD/NP/PA
  - Standardized screening form
**Menactra (MCV4)**

**Denise De Las Nueces, MD**

**Vaccine Name**

**Ordering Provider**

**Site (circle)**

**Route**

**Manufacturer**

**Dose**

**Expiration**

**Lot**

**VIS Date**

**Man.**

**Date**

**DOB**

**Name**

**Date**

**DOB**

**Name**

**Date**

**DOB**

**Name**

**Date**

**DOB**

**Signature**

- Preferred: Copro 500mg orally x 4, administered
- Alternative: In case of allergy: Rifampin 600mg QD 1x2 days

**Symptom check:** Surgical mask should be worn within 3 feet of patient during screening.

[Image of form with red lines indicating edits or notes.]
Meningococcal Vaccine Campaign

- Key stakeholders to whom to target communication identified
  - Consumers
  - Shelter partners
  - BHCHP staff
  - Shelter staff
- Stakeholder communication strategy developed
Meningococcal Vaccine Campaign

- Vaccine Clinics held at several sites
  - Nursing-led
  - Flexible hours
  - Scheduled and as requested by shelters
  - Messaging to shelter clients and staff
- Data-informed
  - Targeted messaging and outreach to populations at adult shelters in Boston
  - Vaccine campaign held at total of 8 shelter sites
Discussion
Outcome of Response

- 307 close contacts were screened for the 5 cases, with 286 close contacts prophylaxed successfully.

- Reaching vaccine saturation
  - From 2/16/16 to 4/6/2016, a total of 3621 vaccines administered
  - More than total number of flu vaccines given during entire 2015-2016 flu season

- Halting meningococcal-related mortality
  - No more patient deaths after first 2 cases
What factors led to success

• Partnerships
• Relationships
• Dedicated staff
“The established, trusting relationships with our patients, as well as with the Public Health Commission, Mass DPH and our shelter partners, were the elements that enabled us to be successful.”

Barb Giles, MSN, RN,
Director of Nursing and Interim Chief Operating Officer at BHCHP
Thank you

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Thank you

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