

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:
 - Meningitis, meningococemia, pneumonia
- Signs and symptoms:
 - High fever, headache, stiff neck, confusion, rash
- 10-20% case-fatality ratio
- Up to 20% permanent sequelae
 - Cognitive deficits, hearing loss, or amputations



Cohn AC, MacNeil JR, Harrison LH, et al. Changes in *Neisseria meningitidis* disease epidemiology in the United States, 1998–2007: Implications for prevention of meningococcal disease. *Clin Infect Dis* 2010;50:184-91.

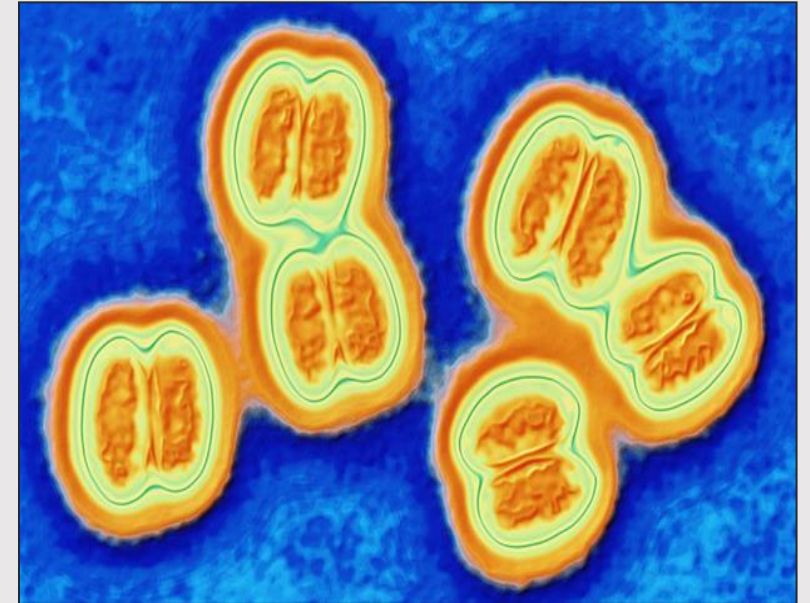
Pace D, Pollard AJ. Meningococcal disease: clinical presentation and sequelae. *Vaccine* 2012;30:B3-9.

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, MPH from the Center for Disease Control, Epidemiology Intelligence Service

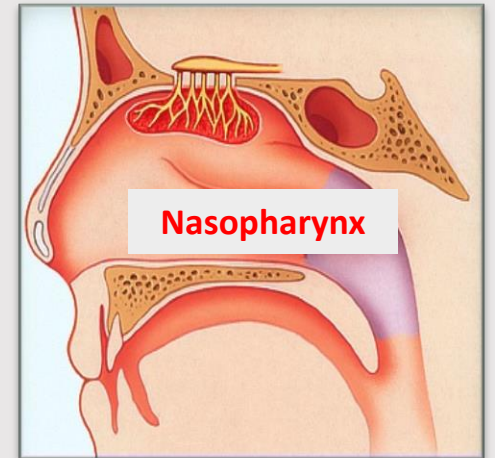
Neisseria meningitidis

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



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



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

Rosenstein NE, et al. J Infect Dis. 1999; Brundage JF, et al. Clin Infect Dis. 2002; Bruce MG, et al. JAMA; Francke EL, et al. Surg Clin North Am 1981 Miller L, et al. Ann Intern Med 2014; Stephens DS, et al. Ann Intern Med. 1995; Cartwright KA, et al., Lancet. 1991; Coen PG, et al. Int J Epidemiol 2006; Tully J, et al.. BMJ 2006;

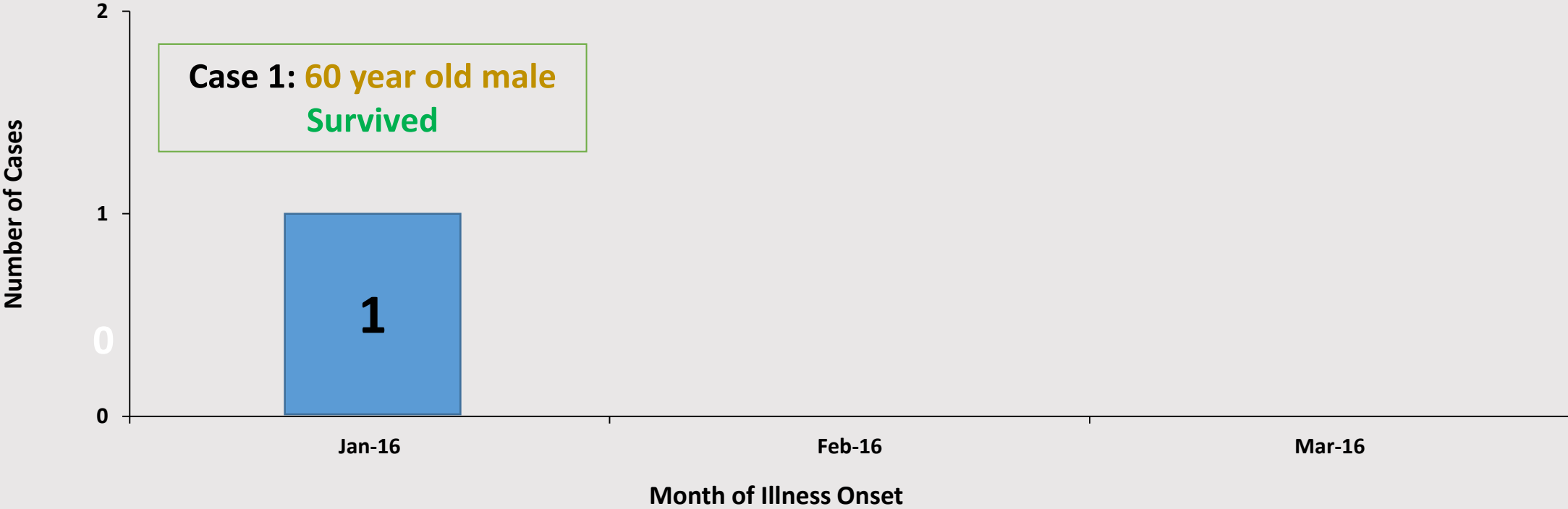
Meningococcal Conjugate Vaccine and Recommendations

- 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 \geq 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

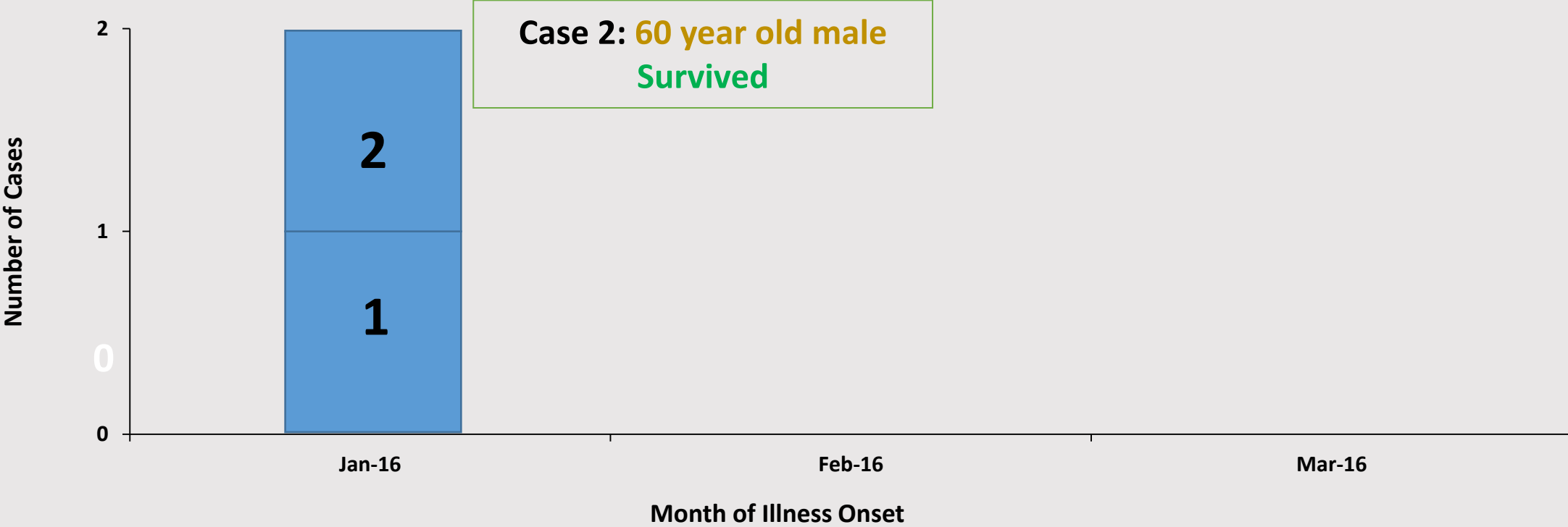


■ Serogroup C

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



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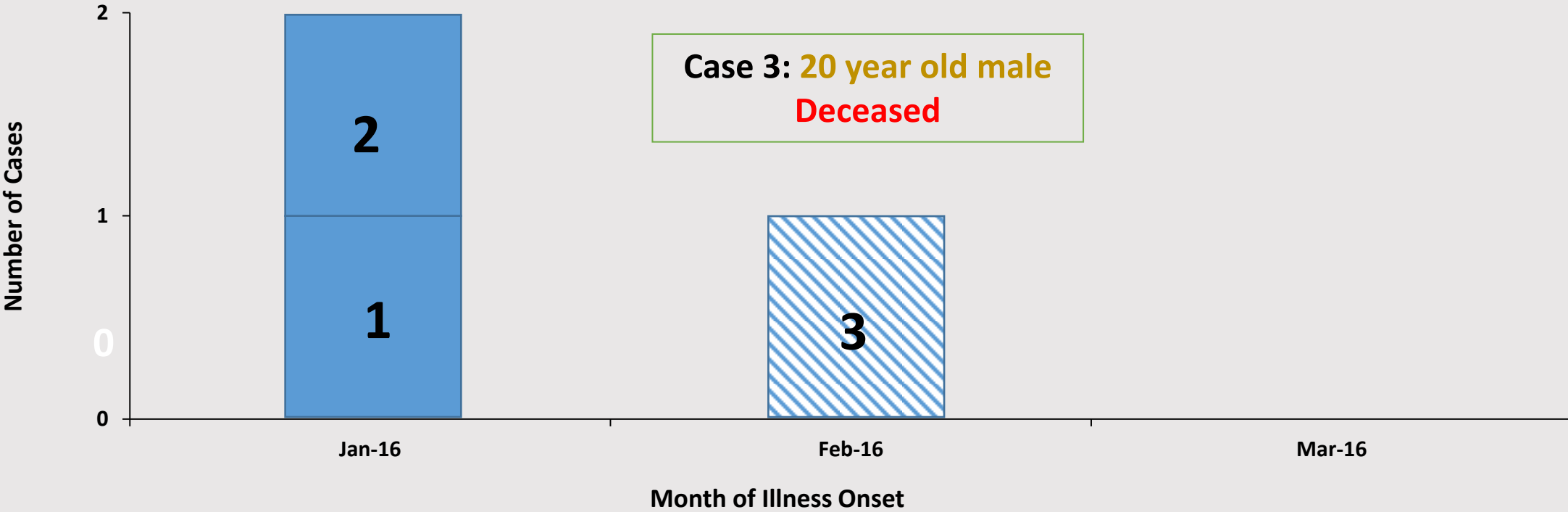


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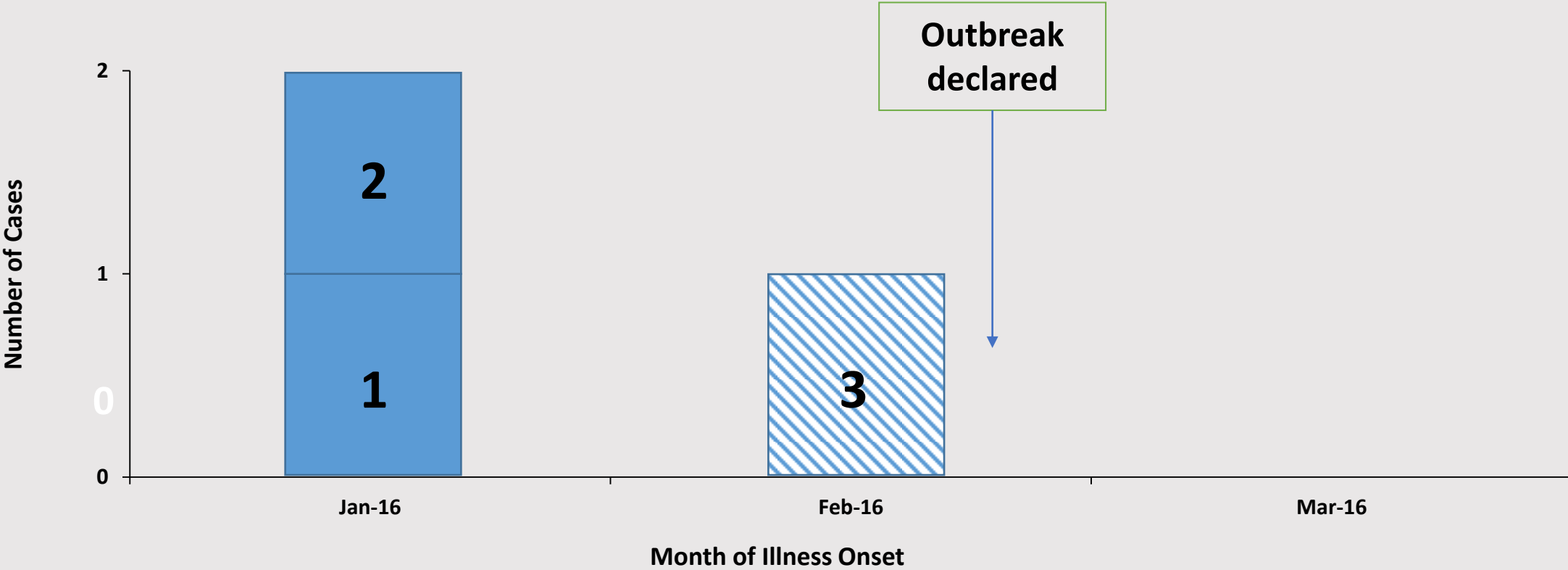


■ Serogroup C ▨ Deceased Case
□ Serogroup Y



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

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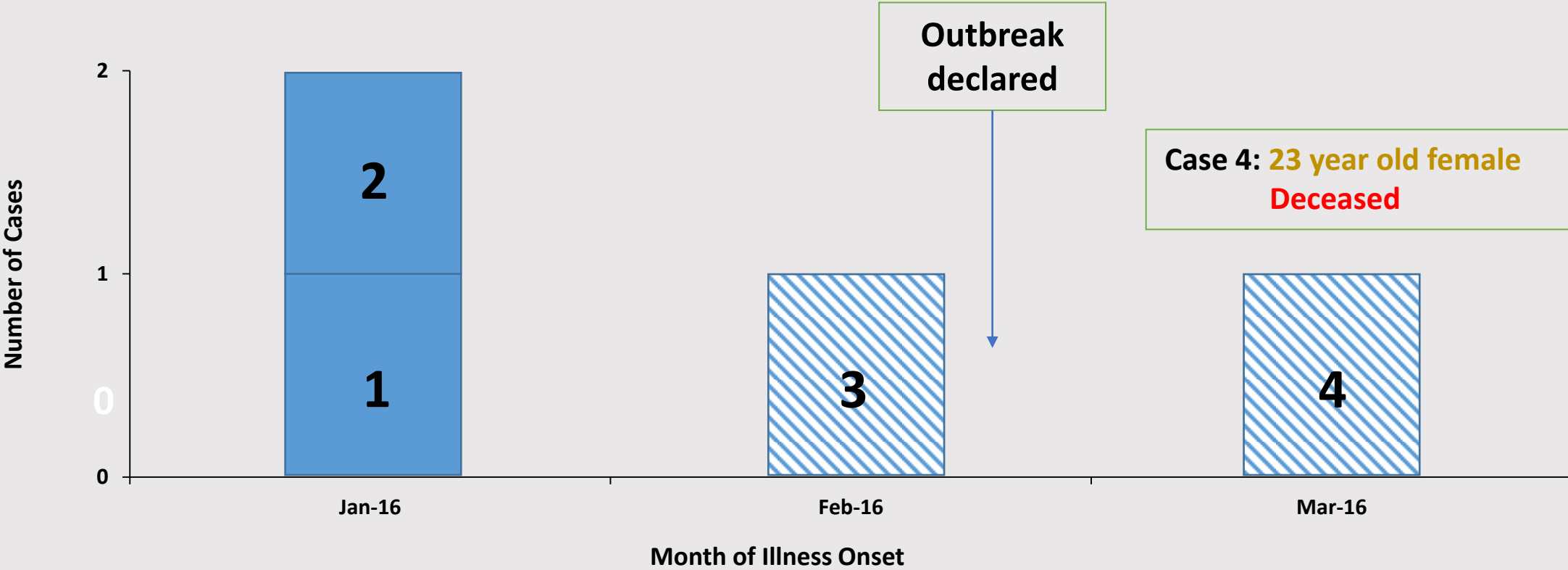


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Cases of Meningococcal Disease Among Adults Experiencing Homelessness in Boston, 2016

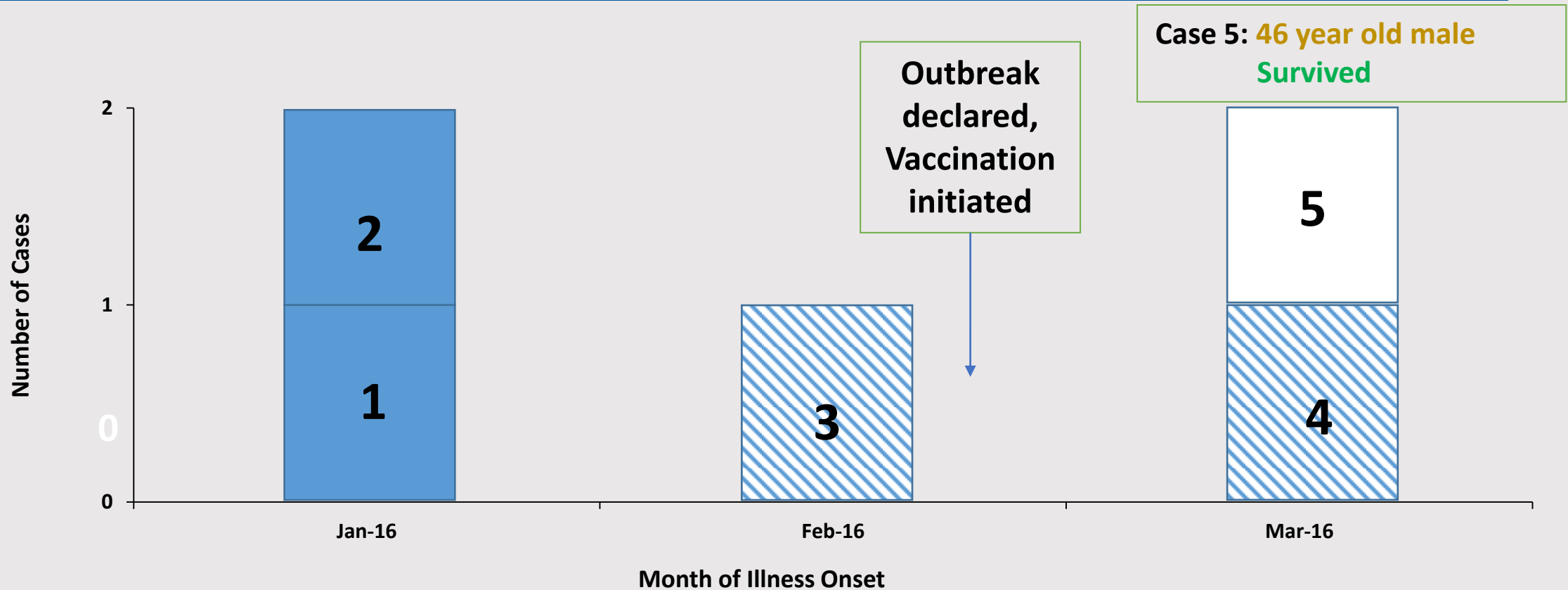


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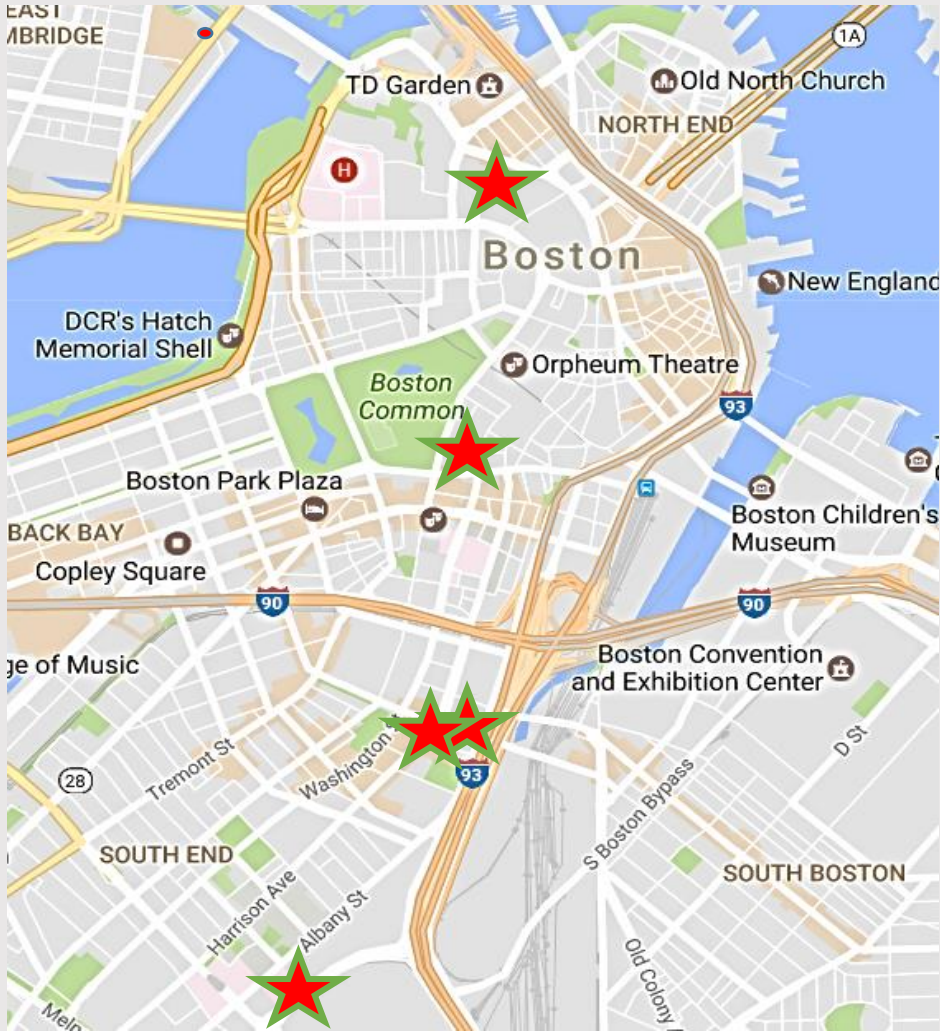
Slide courtesy of John O. Otshudiema, MD, MPH from the Center for Disease Control, Epidemiology Intelligence Service



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



■ Serogroup C ▨ Deceased Case
□ Serogroup Y



- Distribution of meningococcal disease cases among adults experiencing homelessness in Boston Metro Area, Massachusetts

Outbreak Response



Coordinated Response

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

Close Contact Investigation



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

Close Contact Investigation

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 s/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



Evaluation for Meningococcal Vaccination

Name _____

DOB _____

Allergies: _____

Date _____

Site _____

You have given me the opportunity
I have received, read and understand

I would like to have the meningococcal vaccine

Please answer the following questions:

1. Have you had a fever in the last 24 hours?
(If yes, please defer vaccination)
2. Are you pregnant?
(Pregnancy is not a contraindication to meningococcal vaccine unless a patient has conceived within 30 days of vaccination)

I hereby certify that the foregoing information is true and correct.

Signature: _____

Vaccine Name	
Ordering Provider	
Manufacturer	
VIS Date	
Route	
Lot	
Expiration	
Site (circle)	L Deltoid R Deltoid
Dose	0.5ml

Review of close contacts of meningococcal meningitis

Name _____

DOB _____

Date _____

Surgical mask should be worn within 3 feet of patient during screening.

Symptom check:

Vaccine Name	Menactra (MCV4)
Ordering Provider	Denise De Las Nueces, MD
Manufacturer	Sanofi
VIS Date	10/14/11
Route	IM
Lot	
Expiration	
Site (circle)	L Deltoid R Deltoid
Dose	0.5ml

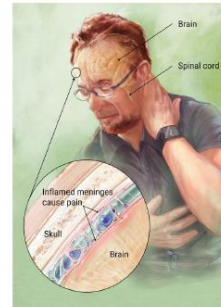
- Preferred, Cipro 500mg orally x 1, administered
- Alternative, in case of allergy: Rifampin 600mg ~~q~~ BID x 2 days

Signature _____

Meningococcal Vaccine Campaign

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

MENINGITIS ALERT



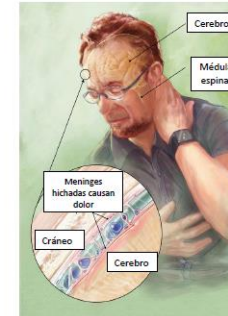
There have been a rising number of cases of meningitis among homeless individuals in Boston in recent weeks. This disease can infect the blood or the lining of the brain and spinal cord.



The infection can be deadly, but it is preventable.

GET VACCINATED TODAY

ALERTA DE MENINGITIS



Han habido varios casos de meningitis entre las personas sin hogar en Boston en las últimas semanas. Esta enfermedad puede infectar la sangre, el cerebro y la médula espinal.

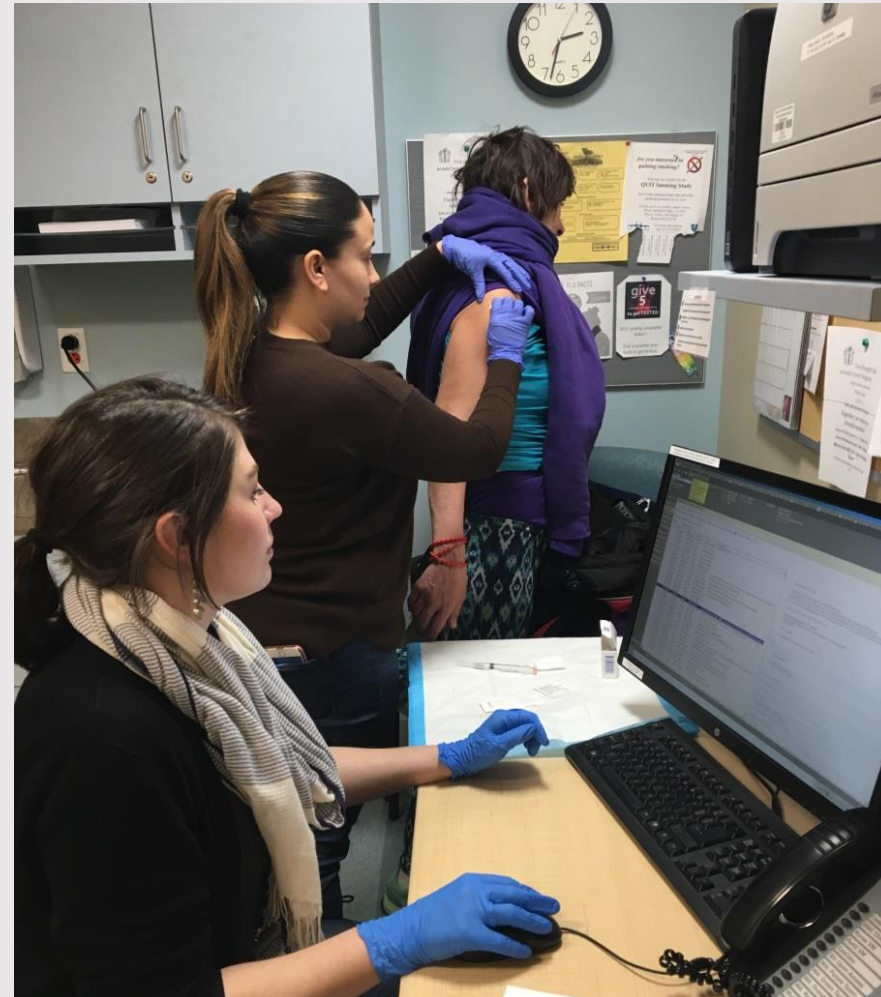


La infección puede ser fatal, pero se puede prevenir.

VACÚNESE HOY

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

- **Centers for Disease Control and Prevention**
 - John Otshudiema
 - Anna Acosta
 - Jessica MacNeil
 - Monica Patton
 - Negar Aliabadi
 - Nelli Westercamp
- **Boston Public Health Commission**
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 - Monica Bharel
 - Susan Lett

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 - Casey Leon
 - Barry Bock
 - Jessie Gaeta
 - Jim O'Connell
 - Nurses, clinicians, patients and staff
- **Boston Shelter Partners and patients**



Thank you

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