Hepatitis A, hepatitis B, and invasive meningococcal disease: Massachusetts epidemiology

Lindsay Bouton
Epidemiologist
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Disclosure

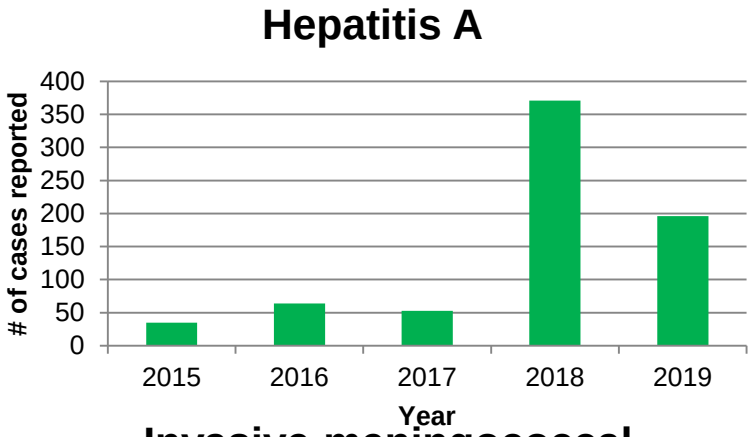
I, Lindsay Bouton, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during this presentation.

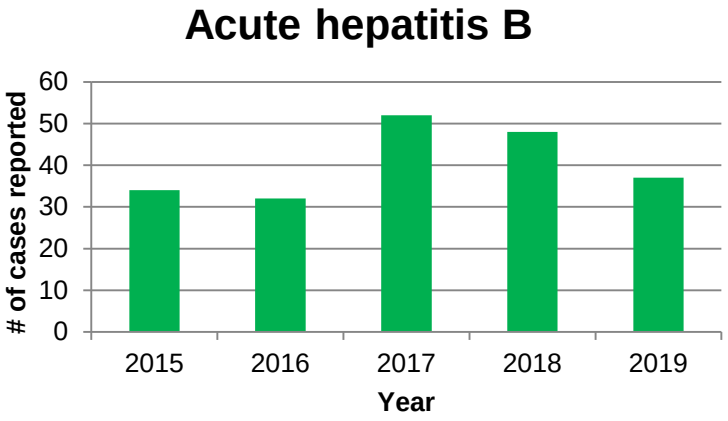
I have no relationships to disclose.

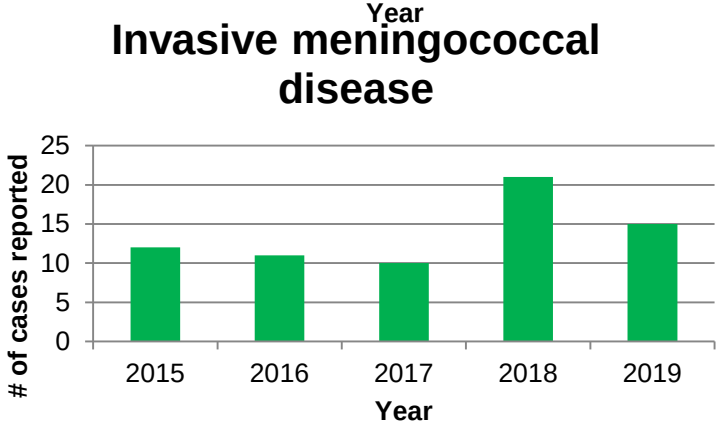
I may discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration, but in accordance with ACIP recommendations.

The last 5 years

Confirmed cases of hepatitis A, acute hepatitis B and invasive meningococcal disease, Massachusetts, 2015-2019





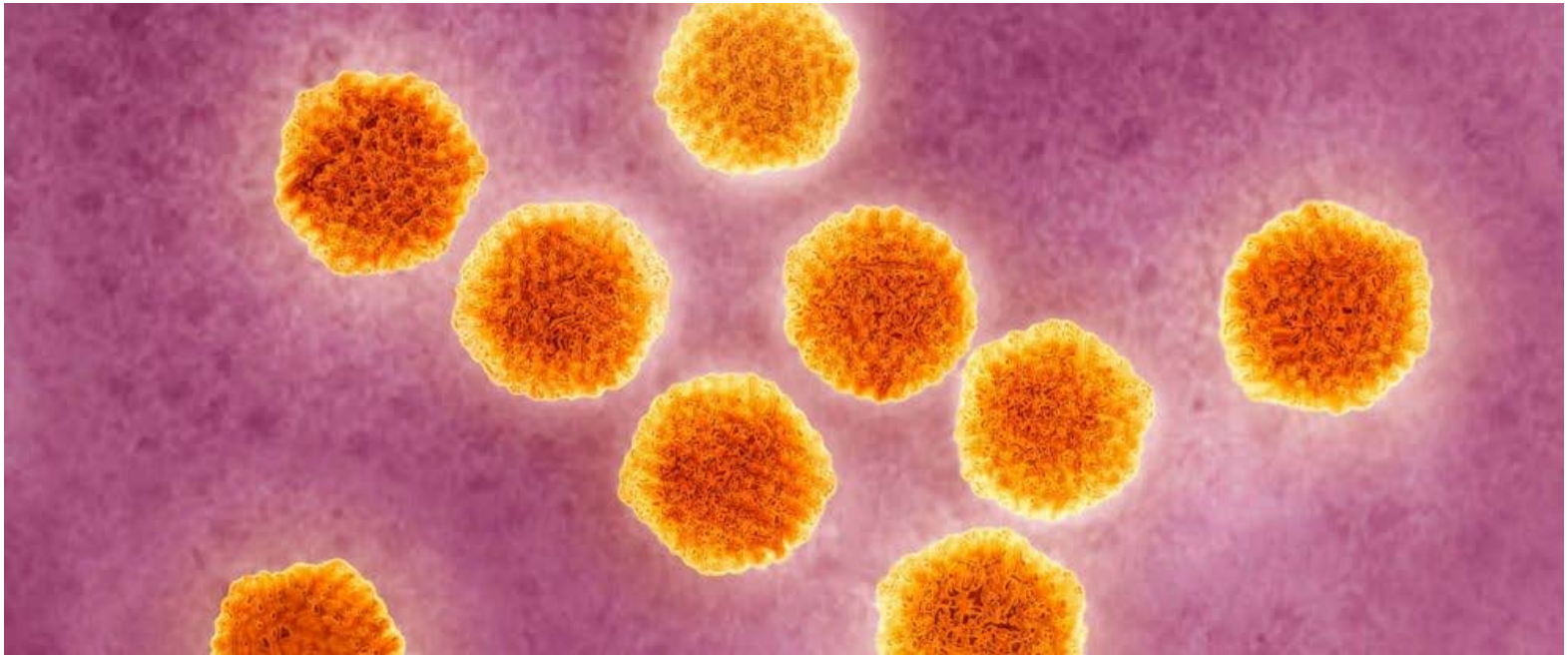


What do these diseases have in common?

- Disproportionately affecting individuals experiencing homelessness and individuals using drugs
- Vaccine-preventable!

Data as of 3/10/2020 and subject to change

Hepatitis A



Hepatitis A background

- Liver disease caused by hepatitis A virus (HAV)
- Symptoms may include fever, fatigue, loss of appetite, stomach pain, nausea, diarrhea, and jaundice
  - More severe in individuals with pre-existing liver disease
- Acute infection only
- Spread via fecal-oral route
- Average incubation period is 28 days

Hepatitis A vaccine

- Two single-antigen and one combination vaccine (all inactivated) currently licensed in US
- Routine (pre-exposure) vaccination recommended for all children and for certain adults (more on next slide…)
- Single-antigen vaccine (and IG) also used for post-exposure prophylaxis (PEP), within two weeks of exposure

Recommended adult vaccination

Routine vaccination

- **Not at risk but want protection from hepatitis A** (identification of risk factor not required): 2-dose series HepA (Havrix 6–12 months apart or Vaqta 6–18 months apart [minimum interval: 6 months]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

Special situations

- **At risk for hepatitis A virus infection**: 2-dose series HepA or 3-dose series HepA-HepB as above
  - **Chronic liver disease** (e.g., persons with hepatitis B, hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice the upper limit of normal)
  - **HIV infection**
  - **Men who have sex with men**
  - **Injection or noninjection drug use**
  - **Persons experiencing homelessness**
  - **Work with hepatitis A virus** in research laboratory or with nonhuman primates with hepatitis A virus infection
  - **Travel in countries with high or intermediate endemic hepatitis A**
  - **Close, personal contact with international adoptee** (e.g., household or regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee's arrival)
  - **Pregnancy** if at risk for infection or severe outcome from infection during pregnancy
  - **Settings for exposure, including** health care settings targeting services to injection or noninjection drug users or group homes and nonresidential day care facilities for developmentally disabled persons (individual risk factor screening not required)

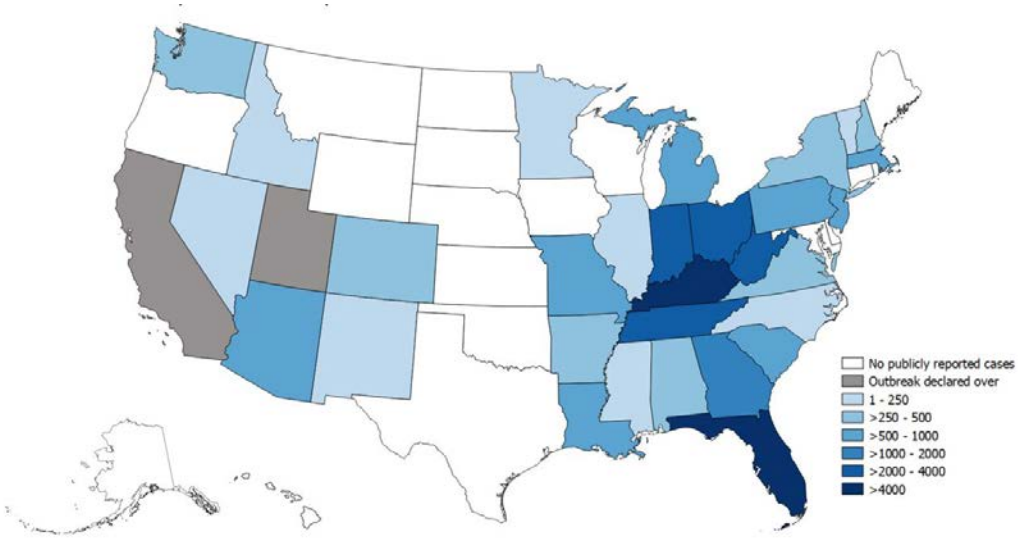
https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html

Hepatitis A in Massachusetts

- Each case investigated by local board of health (LBOH) and MDPH
  - Demographic, clinical, and risk data collected
  - Vaccination recommended for close contacts
- Typically about 50 confirmed reported cases per year
  - At least 25% associated with international travel
- 50% hospitalization rate

National outbreaks

- Since 2017, CDC has been tracking outbreaks of HAV infection across the US
  - Affecting people who use drugs and/or people who are homeless
  - Person-to-person spread

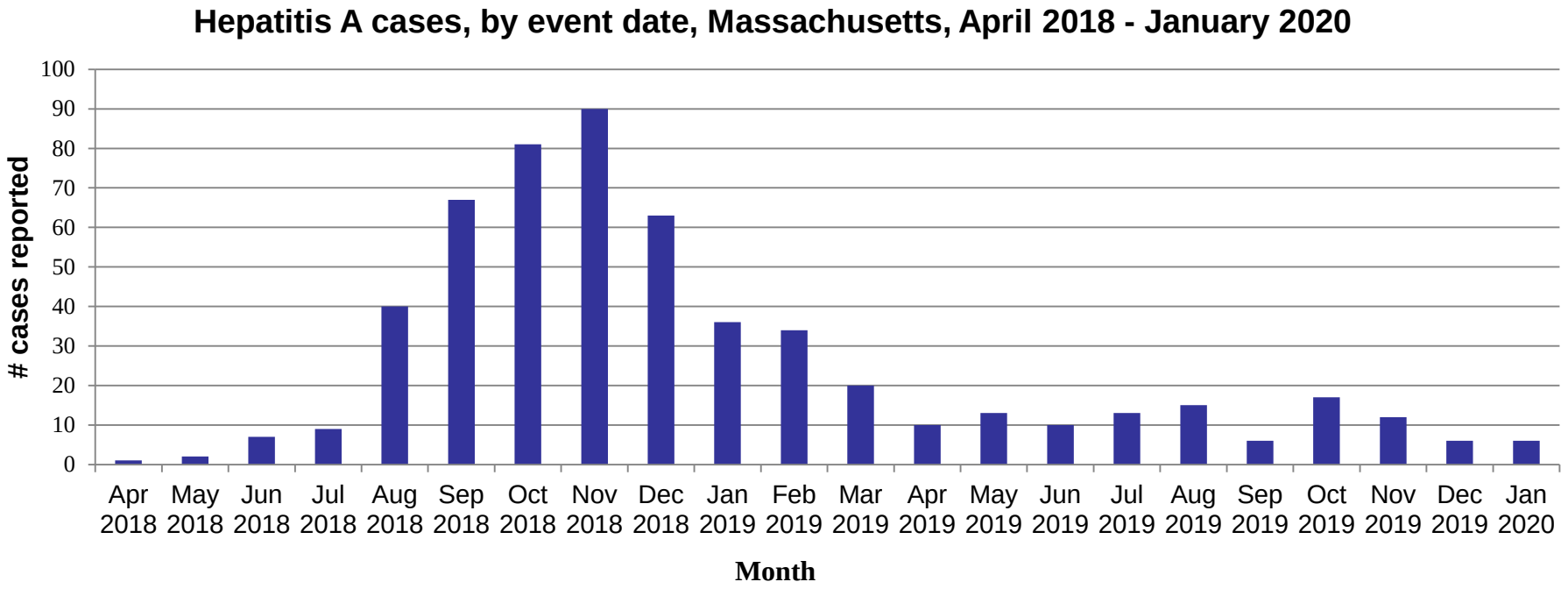


https://www.cdc.gov/hepatitis/outbreaks/2017March-HepatitisA.htm

- As of March 7, 2020: 31,801 cases reported from 32 states

Massachusetts outbreak

- Since April 2018: 558 cases, 437 hospitalizations (78%), and 9 deaths (2%)



Data for more recent weeks may be incomplete due to diagnosis and reporting delays. Data source: MDPH Bureau of Infectious Disease and Laboratory Sciences. Data as of 3/6/2020 and subject to change.

Massachusetts outbreak cases

- Predominantly white, non-Hispanic
- Median age 35 (range 6-98)
- From 12 of 14 counties
- High coinfection rates:
  - Hepatitis B: 3%
  - Hepatitis C: 46%
  - HIV: 4%
- 35% of cases experiencing homelessness or unstable housing
- 68% of cases have known illicit drug use

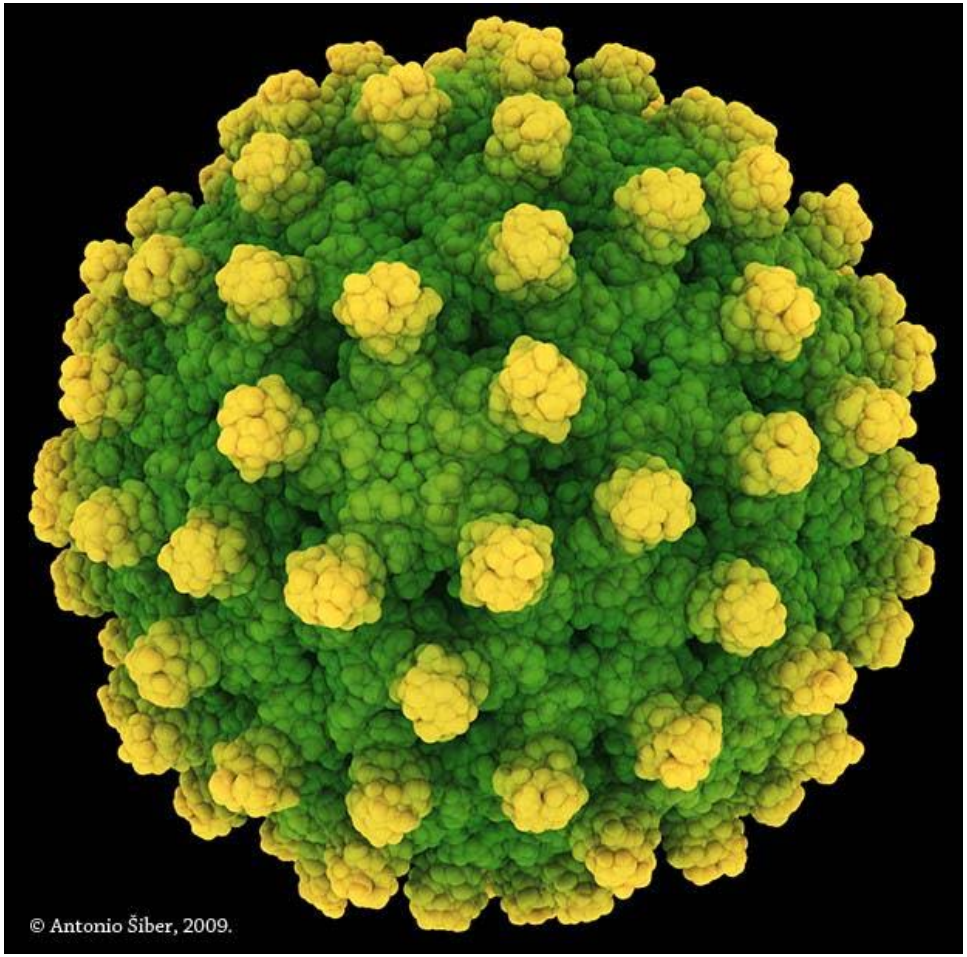
Data as of 3/6/2020 and subject to change.

All people who should be vaccinated!

Where are we now?

- Outbreak not over!
  - MDPH still recommending vaccination and providing vaccine for outbreak response
- But let's think ahead…
  - Importance of adult vaccination as primary prevention

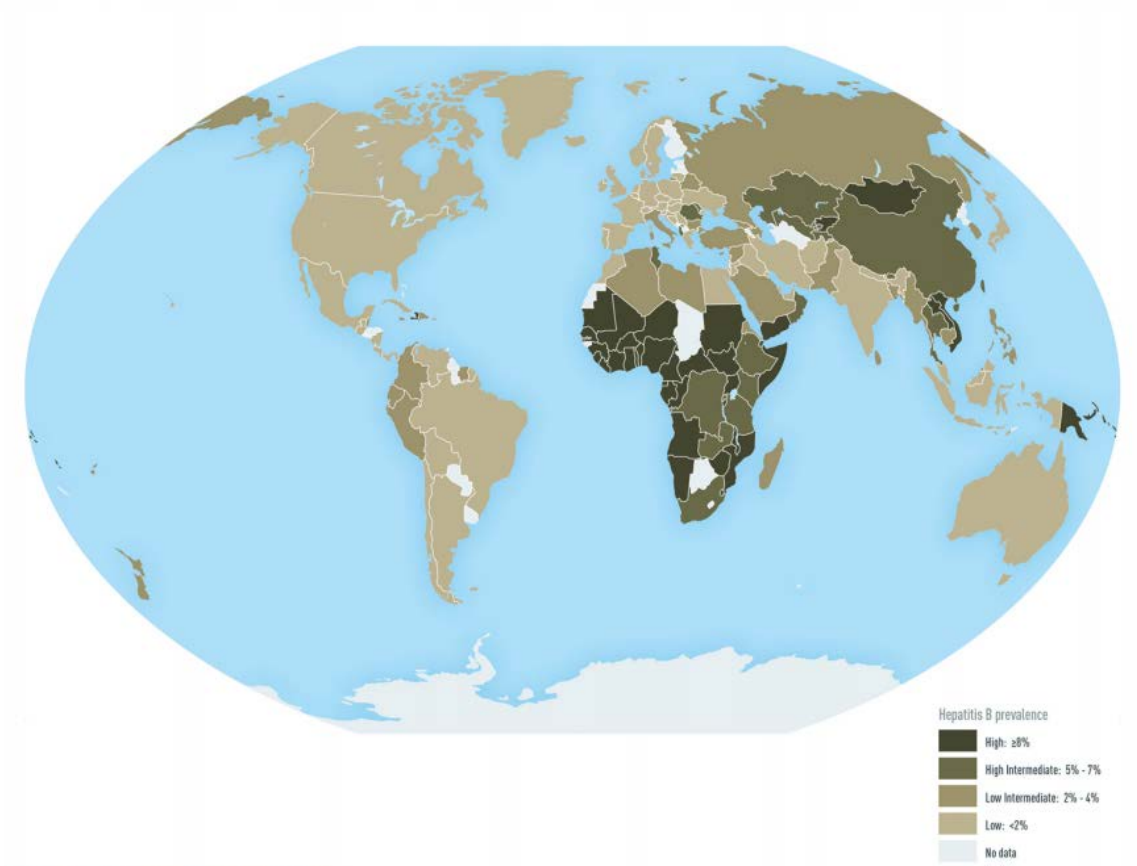
Hepatitis B



Hepatitis B background

- Liver disease caused by hepatitis B virus (HBV)
- Transmission via contact with blood or other body fluids:
  - From mother to baby at birth
  - Via sexual contact
  - Through sharing of drug-injection equipment
- Average incubation period is four months
- Symptoms of acute infection (if present) similar to symptoms of hepatitis A
- Causes acute and chronic disease
  - More likely to develop chronic infection if initially exposed at a younger age
- Can be treated, but not cured

Global burden of hepatitis B, 2015



MAP 3-4. **Prevalence of hepatitis B virus infection**

[1] Disease data source: Schweitzer A, Horn J, Mikolajczyk R, Krause G, Ott J. Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013. www.thelancet.com. 2015.Vol 386.

Hepatitis B vaccine

- Three single-antigen vaccines and three combination vaccines currently licensed in US
- Vaccination recommended for all children and for certain adults (more on next slide…)
- High vaccination rates for children
  - Universal Birth Dose 1992
- Schedule most often used is 3 doses over 6 months
  - A new formulation (Heplisav-B) is approved for 2 doses over 1 month

Recommended adult vaccination

Routine vaccination

- **Not at risk but want protection from hepatitis B** (identification of risk factor not required): 2- or 3-dose series (2-dose series Heplisav-B at least 4 weeks apart [2-dose series HepB only applies when 2 doses of Heplisav-B are used at least 4 weeks apart] or 3-dose series Engerix-B or Recombivax HB at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 8 weeks between doses 2 and 3, 16 weeks between doses 1 and 3]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

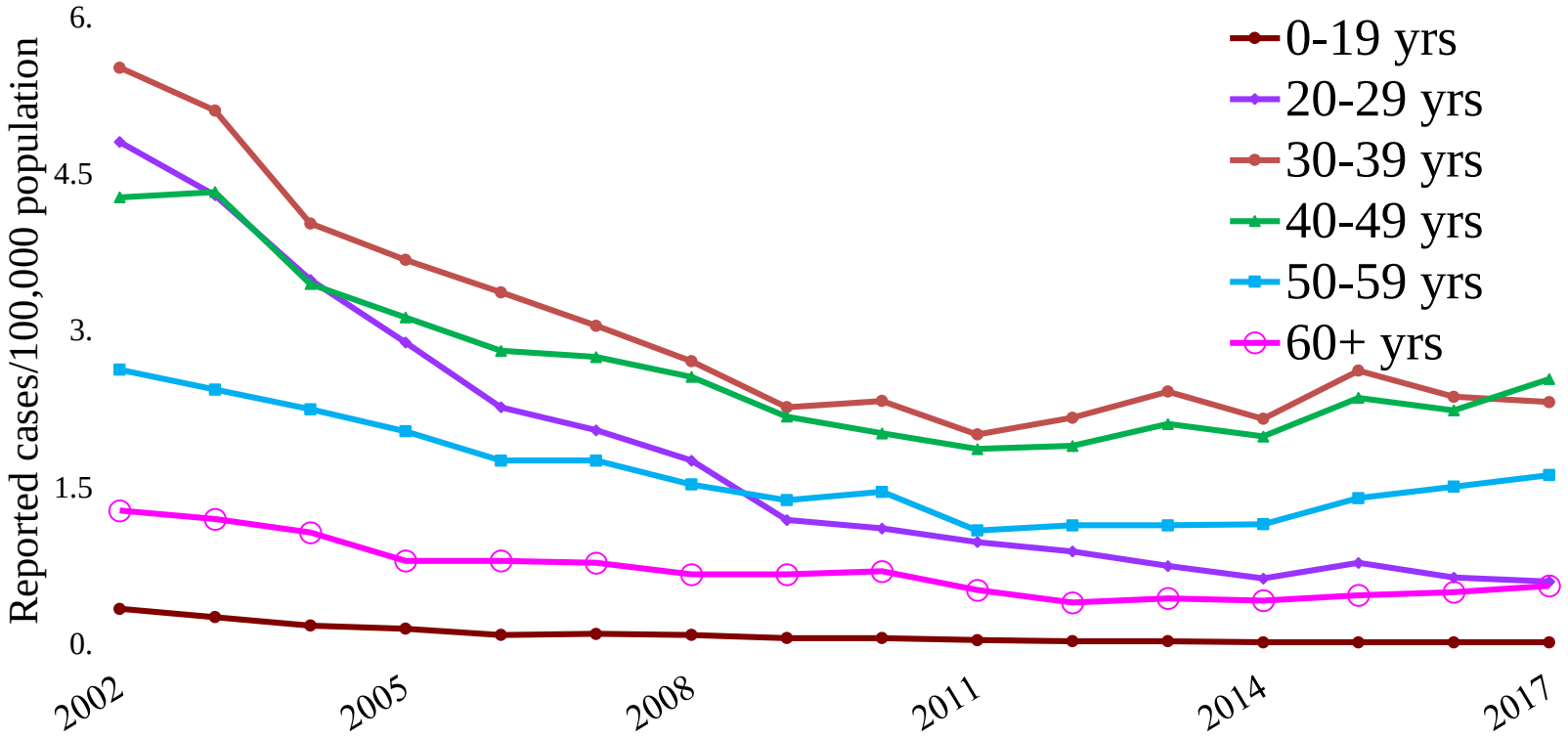
Special situations

- **At risk for hepatitis B virus infection:** 2-dose (Heplisav-B) or 3-dose (Engerix-B, Recombivax HB) series or 3-dose series HepA-HepB (Twinrix) as above
  - **Chronic liver disease** (e.g., persons with hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
  - **HIV infection**
  - **Sexual exposure risk** (e.g., sex partners of hepatitis B surface antigen [HBsAg]-positive persons; sexually active persons not in mutually monogamous relationships; persons seeking evaluation or treatment for a sexually transmitted infection; men who have sex with men)
  - **Current or recent injection drug use**
  - **Percutaneous or mucosal risk for exposure to blood** (e.g., household contacts of HBsAg-positive persons; residents and staff of facilities for developmentally disabled persons; health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids; hemodialysis, peritoneal dialysis, home dialysis, and predialysis patients; persons with diabetes mellitus age younger than 60 years and, at discretion of treating clinician, those age 60 years or older)
  - **Incarcerated persons**
  - **Travel in countries with high or intermediate endemic hepatitis B**
  - **Pregnancy** if at risk for infection or severe outcome from infection during pregnancy. Heplisav-B not currently recommended due to lack of safety data in pregnant women

https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html

Acute cases – national data

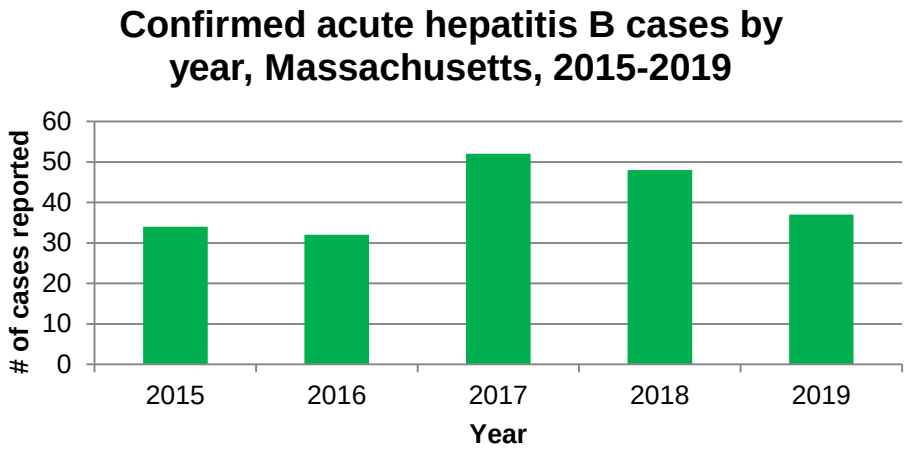
Rates of reported acute hepatitis B, by age group — United States, 2002–2017



Source: CDC, National Notifiable Diseases Surveillance System.

Acute cases - Massachusetts

- Between 30 and 55 confirmed acute cases reported each year
- Cases reported 2015-2019 (N=203);
  - 86 (42%) with known history of injection drug use (IDU)
  - 17 (8%) known to be homeless at time of diagnosis



Data as of 3/10/2020 and subject to change

Bristol County cluster

- In 2017 and 2018, MDPH investigated and responded to an outbreak of 29 acute cases associated with IDU in Bristol County

Gender	72% male
Age	Median 38, range 24-55
Race/ethnicity	Predominantly white, non-Hispanic
Risk history	76% with known recent injection drug use 100% with some drug use 14% experiencing homelessness 3% incarcerated Little data on sexual risks
Coinfection	76% with hepatitis C coinfection

All people who should be vaccinated!

Where are we now?

- Continued case investigation
- Continued monitoring for geographic or other clusters
- But let’s think ahead…
  - Importance of adult vaccination as primary prevention

Invasive meningococcal disease (IMD)

IMD background

- Acute, potentially severe illness caused by bacterium *Neisseria meningitidis* (meningococcus)
- Clinical manifestations include meningitis, bacteremia, pneumonia, and arthritis
- Five main serotypes: A, B, C, W and Y
- Transmitted primarily person-to-person via direct contact with oral/nasal secretions
- Incubation period 1-10 days

Meningococcal vaccine

- Two types of meningococcal vaccines licensed in the US:
  - Meningococcal conjugate vaccines (MenACWY)
  - Serogroup B meningococcal vaccines (MenB)
- Vaccination routinely recommended for adolescents
  - MenACWY for all 11 to 12 years olds (booster at 16)
  - MenB for certain adolescents and young adults
    - Those at increased risk because of an outbreak or with certain medical conditions
- Also recommended for children and adults at increased risk (more on next slide…)

https://www.cdc.gov/vaccines/vpd/mening/hcp/who-vaccinate-hcp.html

Meningococcal vaccine - adults

- MenACWY
  - Complement component deficiency
  - Complement inhibitor use (e.g., eculizumab, ravulizumab)
  - Functional or anatomic asplenia
  - Living with HIV
  - Microbiologist routinely exposed to *N. meningitidis*
  - Traveling or residing in countries in which the disease is common
  - Part of a population at increased risk because of a serogroup A, C, W or Y outbreak
  - First-year college student living in a residence hall
  - Military recruit

https://www.cdc.gov/vaccines/vpd/mening/hcp/who-vaccinate-hcp.html

Meningococcal vaccine - adults

- MenB
  - Complement component deficiency
  - Complement inhibitor use (e.g., eculizumab, ravulizumab)
  - Functional or anatomic asplenia
  - Microbiologist routinely exposed to *N. meningitidis*
  - Part of a population at increased risk because of a serogroup B outbreak

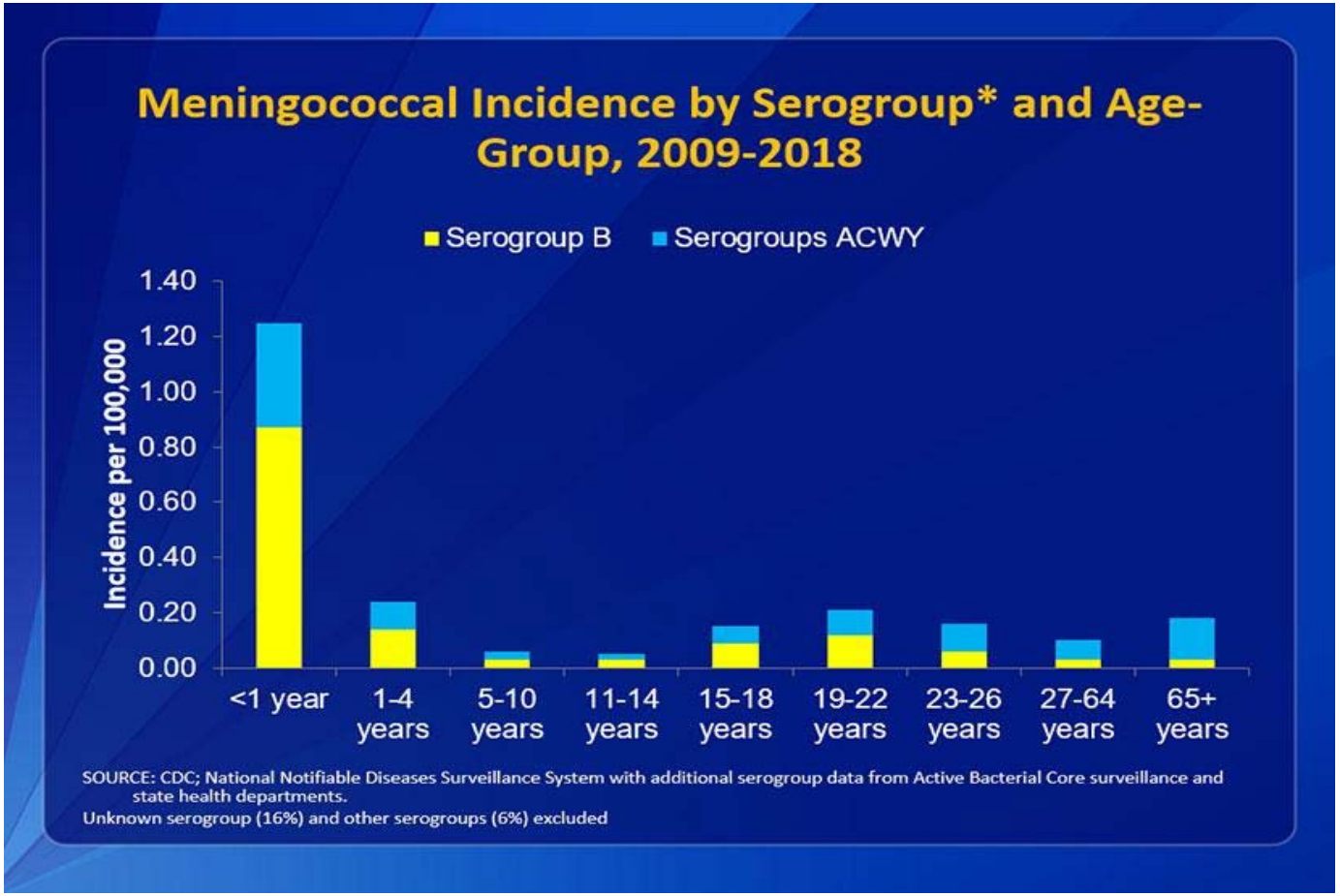
https://www.cdc.gov/vaccines/vpd/mening/hcp/who-vaccinate-hcp.html

Meningococcal B updates

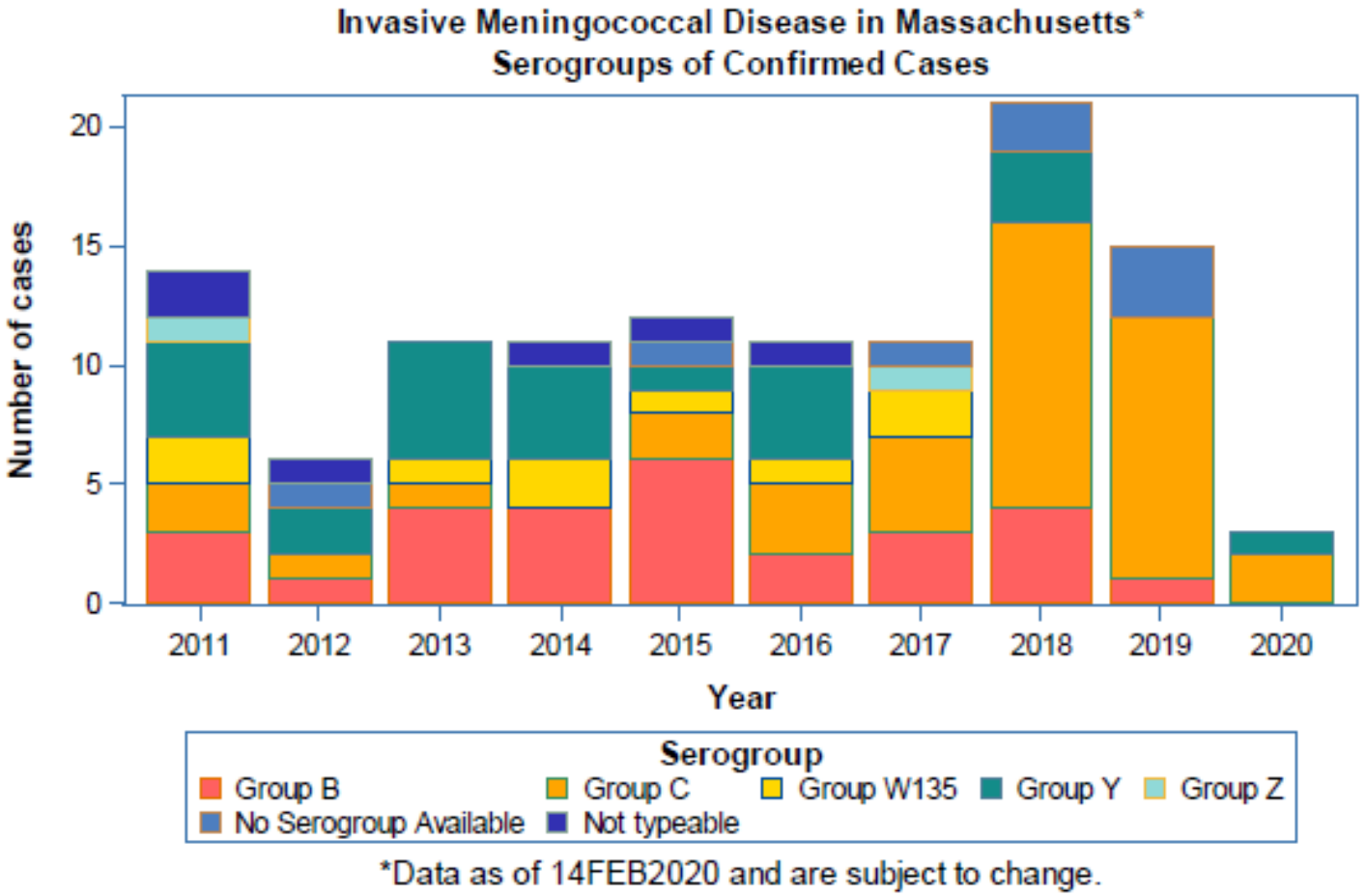
- Persons ≥10 years with complement deficiency, complement inhibitor use, or asplenia or who are microbiologists should receive a MenB booster dose 1 year following completion of a MenB primary series
  - MenB booster doses every 2–3 years thereafter, for as long as the increased risk remains
- For persons ≥10 years determined by public health officials to be at increased risk during an outbreak, ACIP recommends a one-time booster dose if it has been ≥1 year since completion of a MenB primary series
  - A booster dose interval of ≥6 months may be considered by public health officials depending on the specific outbreak, vaccination strategy, and projected duration of elevated risk
- Adolescents and young adults 16-23 years (16-18 years preferred) not at increased risk for meningococcal disease may be vaccinated based on shared clinical decision-making

https://www.cdc.gov/vaccines/schedules/downloads/adult/adult-combined-schedule.pdf
https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf
https://www.cdc.gov/vaccines/acip/recommendations.html
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html

National data



Massachusetts data



IMD and homelessness

- 70 cases reported in Massachusetts from 2015 to 2019
- 18 (26%) homeless-associated cases
  - 14 experiencing homelessness at time of diagnosis
  - 4 stably housed, but with connections to homeless community
- Homeless-associated cases primarily serogroup C
- Previously referred to as “an outbreak”
- Sequencing of Massachusetts serogroup C isolates shows homeless-associated cases no more closely related to each other than to other serogroup C cases
  - Is this really an outbreak?
- Based on high incidence, MDPH still recommends vaccination for this high-risk community

Where are we now?

- Continued case investigation
- Continued monitoring for geographic or other clusters
- But let’s think ahead…
  - Importance of adult vaccination as primary prevention

Adult Vaccination as Primary Prevention: High Risk Adult Vaccination Project

Amy Sgueglia, MSN, RN
Consultant
JSI Research & Training, Inc.

Disclosure

I, Amy Sgueglia, 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 this presentation.

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What is the High Risk Adult Vaccination Project?

- Initiative to increase routine vaccination of high risk adults against:
  - Hepatitis A
  - Hepatitis B
  - Invasive Meningococcal Disease (IMD) - MenACWY

Who is “High Risk”?

- Persons with substance use disorders
- Persons who are experiencing homelessness
- Persons who are incarcerated

Current Project Activities

- Work with partner agencies to implement or expand current vaccine services
- Creating patient facing and non-clinical provider facing materials to communicate the importance for vaccinating against Hep A, Hep B, and IMD
- Increasing vaccination in jails

Who are we working with?

- Five MDPH Office of HIV/AIDS contracted agencies
  - 2 community health centers
  - 3 community based agencies
- Agencies chosen because they provide mobile services
- Goal: Create sustainable programs to vaccinate outside of an outbreak

What is needed to vaccinate patients?

- Vaccines
- Vaccine Storage & Handling
- Clinical staff
- Billing infrastructure
- Standing orders/medical director

Educational Materials

- Educational materials in development for patients, non-clinical providers
- Development process
  - stakeholder interviews
  - intercept interviews
  - creative testing w/ stakeholders and target audience

Corrections

- Focus on county jails
- Assessment interviews
- Health Service Administrators meeting agenda

What is next for the project?

- Distribute educational materials
- Vaccination in jails
- Provider education
- Develop best practices

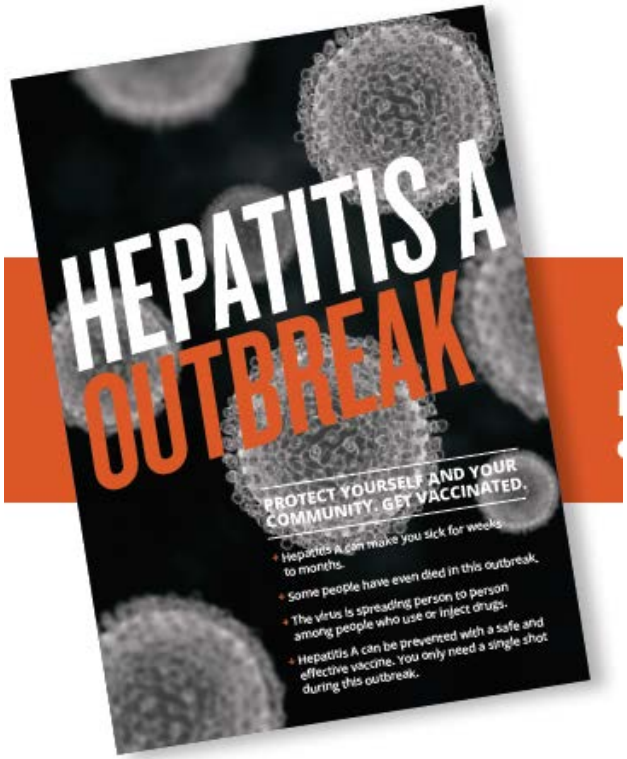
Are there other agencies that would like to learn more about implementing a vaccine program?

Strategies for Vaccinating High Risk Adults

What are the challenges of vaccinating these groups?

- Lack of knowledge of infectious diseases/vaccines
- Lack of access (transportation, location convenience)
- Competing priorities
- Lack of trust in medical system/ healthcare providers
- Fear of needles
- Timing of vaccinating in correctional facilities

Vaccine Counseling Guide



- Basic Knowledge
- Perceptions of risk
- Symptoms and perceptions of severity
- Vaccine concerns/ Medical history
- Post Exposure Prophylaxis

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

https://www.dhhs.nh.gov/dphs/cdcs/hepatitisa/documents/cdc-vaccine-heisitancy-guide.pdf

Basic Knowledge

Proactive messages:

- *I'd like to explain why we want to vaccinate you against hepatitis A. There is an outbreak of hepatitis A in this community, and we want to make sure you are protected and don't get sick. We have already had [X] cases in [this location].*
- *Here's an information sheet on hepatitis A.*

Client statement or beliefs	Potential responses
I've never heard of hepatitis A.	Many people haven't heard of hepatitis A. It is a virus that can hurt your liver and make you very sick. Some people have died from the infection. There is an outbreak of hepatitis A in this community, and we want to make sure you are protected and don't get sick.

https://www.dhhs.nh.gov/dphs/cdcs/hepatitisa/documents/cdc-vaccine-heisitancy-guide.pdf

Perceptions of risk

Proactive messages:

- *There is an outbreak of hepatitis A in your community. We want to protect you from being infected by giving you this vaccine.*
- *Last year, we had only [X] number of cases of hepatitis A for the entire year. This year, we have [X] cases and, unfortunately, [X] people have died.*

Client statement or beliefs	Potential responses
I'm healthy. I don't need to be vaccinated.	Hepatitis A can affect anyone, including healthy people. Let's keep you healthy by giving you the vaccine. We also want to make sure you protect your family and your community. If you get sick, you could spread the virus to others.
I don't hang out with people who use drugs.	You don't have to hang out with people who use drugs to get sick. The virus can easily spread if a person you do hang out with is sick and doesn't wash his/her hands thoroughly after going to the bathroom.

https://www.dhhs.nh.gov/dphs/cdcs/hepatitisa/documents/cdc-vaccine-heisitancy-guide.pdf

Symptoms and Perceptions of Severity

Proactive messages:

- *Getting infected with the hepatitis A virus can make you sick for weeks and even months. Did you know that some people have died from getting hepatitis A? The vaccine can prevent you from getting sick.*

Client statement or beliefs	Potential responses
I don't have any symptoms.	We want to keep it that way. The shot can prevent you from becoming sick and getting symptoms. Getting hepatitis A can make you sick for weeks and even months.
I don't care if I get sick.	I care if you get sick, and I bet many of your friends and family care too.

https://www.dhhs.nh.gov/dphs/cdcs/hepatitisa/documents/cdc-vaccine-heisitancy-guide.pdf

Vaccine concerns/Medical history

Proactive messages:

- *I'd like to vaccinate you against hepatitis A because there is an outbreak occurring in the community. Only one shot is needed to protect you from getting infected in this outbreak.*

Client statement or beliefs	Potential responses
I'm afraid of needles.	I'm sorry; many people feel that way. This vaccine can prevent you from getting sick and spreading the virus to others. One quick stick can save your life and protect your family, friends, and community.
How do I know the vaccine is safe?	We know from years of giving the vaccine to people that the vaccine is safe and effective and does not make people sick. Hepatitis A can make you very sick.

https://www.dhhs.nh.gov/dphs/cdcs/hepatitisa/documents/cdc-vaccine-heisitancy-guide.pdf

Post Exposure Prophylaxis

Client statement or beliefs	Potential responses
I've been around someone with hepatitis A. Will the vaccine protect me from getting hepatitis A?	Giving the vaccine within 2 weeks of someone being exposed to the virus can protect them from getting sick. But the vaccine only works if it is given in this time frame. If you have been exposed to someone with hepatitis A in the last 2 weeks, then getting the vaccine can help you from getting infected. If you have been exposed to someone with hepatitis A and it happened more than 2 weeks ago, it's too late for the vaccine to prevent you from getting sick.

https://www.dhhs.nh.gov/dphs/cdcs/hepatitisa/documents/cdc-vaccine-heisitancy-guide.pdf

Effective methods to motivate/increase vaccination

- Reminding patients to care for one's health and avoid illness or death
- Offering transparent, culturally competent communication and education
  - Educating patients on the routes of transmission and risk factors
  - Educating patients about why the vaccine is needed, what to expect if they receive the vaccine, and vaccine safety
- Offering vaccine by a trusted source
- Making vaccinations easy, convenient, and low-cost
- Offering incentives
- Multicomponent interventions work!

Questions?

amy_sgueglia@jsi.com
lindsay.bouton@state.ma.us