AETC AIDS Education & Training Center Program Southeast

Hepatitis A Virus:
Old Things Made New

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  - Site investigator for HIV/HCV SWITCH Registry Study
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- Carolyn Wester, MD, MPH and TN Department of Health
- www.cdc.gov
- Bennett JE, Dolin R, and Blaser MJ. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*, 8th Ed.

Objectives

- By the end of this lecture the learner will be able to:
  - Describe the epidemiology of hepatitis A virus (HAV) in the US, including recent epidemics in CA and TN;
  - Identify the method of and risk factors for HAV transmission;
  - Recognize clinical symptoms and signs of HAV;
  - Recommend appropriate prevention strategies, including immunization and post-exposure prophylaxis.

What words do you associate with hepatitis A virus (HAV)?

WORD CLOUD

Case

- Chuck is a 35 y/o homeless man who lives in Nashville, TN. He has hypertension and diabetes mellitus type 2. He uses inhaled drugs intermittently.
- He presents to the emergency department due to 2 days of fever, chills, nausea, vomiting, abdominal pain. He has noted that his urine is dark and that his stool is a light color.

Case Cont.

- Exam reveals:
  - Overt scleral icterus
  - Jaundice
  - Diffuse abdominal tenderness with palpation
- Labs reveal:
  - CBC unremarkable
  - BMP with Cre 1.1
  - AST 1800
  - ALT 2200
  - Alk Phos 250
  - T bili 8.5
- Additional diagnostics:
  - HAV
    - IgM positive
    - IgG negative
  - HBV
    - sAn negative
    - cAb positive
    - sAb positive
  - HCV
    - Ab positive
    - RNA negative
  - HIV
    - Ab/p24 antigen negative

Chuck's Questions

- What do I have?
- How did I get it?
- What does this mean for me moving forward?
- Do other people get this, and how can it be prevented?

Overview

- Definition
- Epidemiology
- Clinical Manifestations and Complications
- Diagnosis, Treatment and Prevention
- Epidemics

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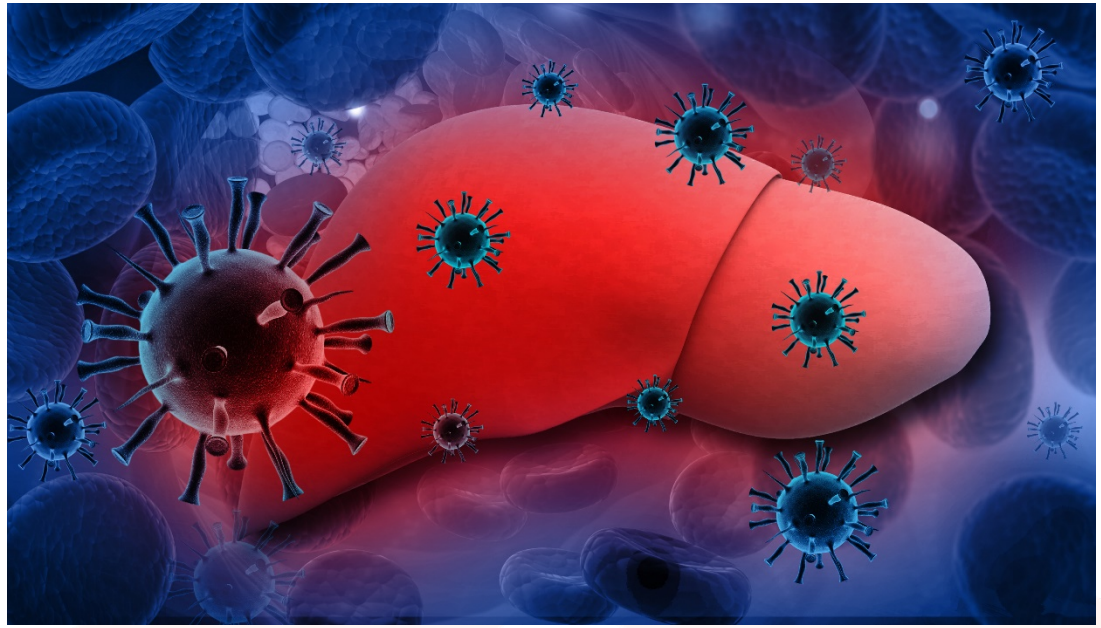
Hepatitis

- Hepatitis = inflammation of the liver

- Differential Diagnosis:
  - Hepatitis viruses
    - **Hepatitis A (HAV)**
    - **Hepatitis B (HBV)**
    - **Hepatitis C (HCV)**
  - HIV
  - Cytomegalovirus (CMV)
  - Alcohol
  - Drug and/or supplement toxicity
  - Obesity [leading to non-alcoholic fatty liver disease (NAFLD)]
  - Genetic disorders

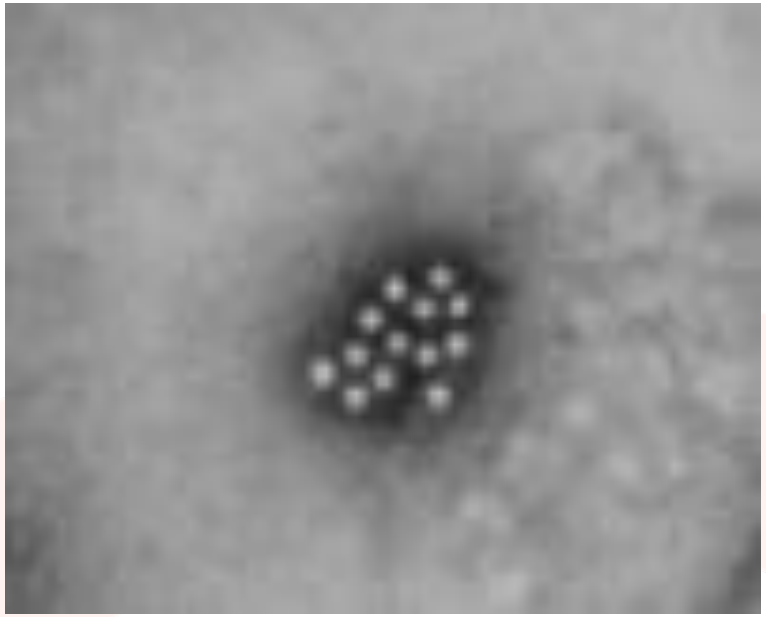


Clinical Manifestations of Hepatitis

- Acute Symptoms and Signs:
  - Fever
  - Fatigue and anorexia
  - Nausea and vomiting
  - Abdominal pain
  - Jaundice, dark urine, and clay-colored stools
  - Arthralgias
- Labs reveal elevated aminotransferase levels and bilirubin.
- HAV causes a self-limited (although potentially severe) infection.
- HBV and HCV may both cause acute and chronic infection that increase the risk of cirrhosis, end stage liver disease, and liver cancer.

Hepatitis A Virus

- Picornaviridae family
- RNA, non-enveloped virus
- Humans are natural host
- GT 1, 2, and 3 may infect humans (1 most common)
- Stable in environment for months
  - Inactivated at high temperatures and by some chemicals
  - Not inactivated by alcohol-based sanitizers



www.cdc.gov

Overview

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- **Epidemiology**
- Clinical Manifestations and Complications
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HAV Epidemiology and Risk Factors

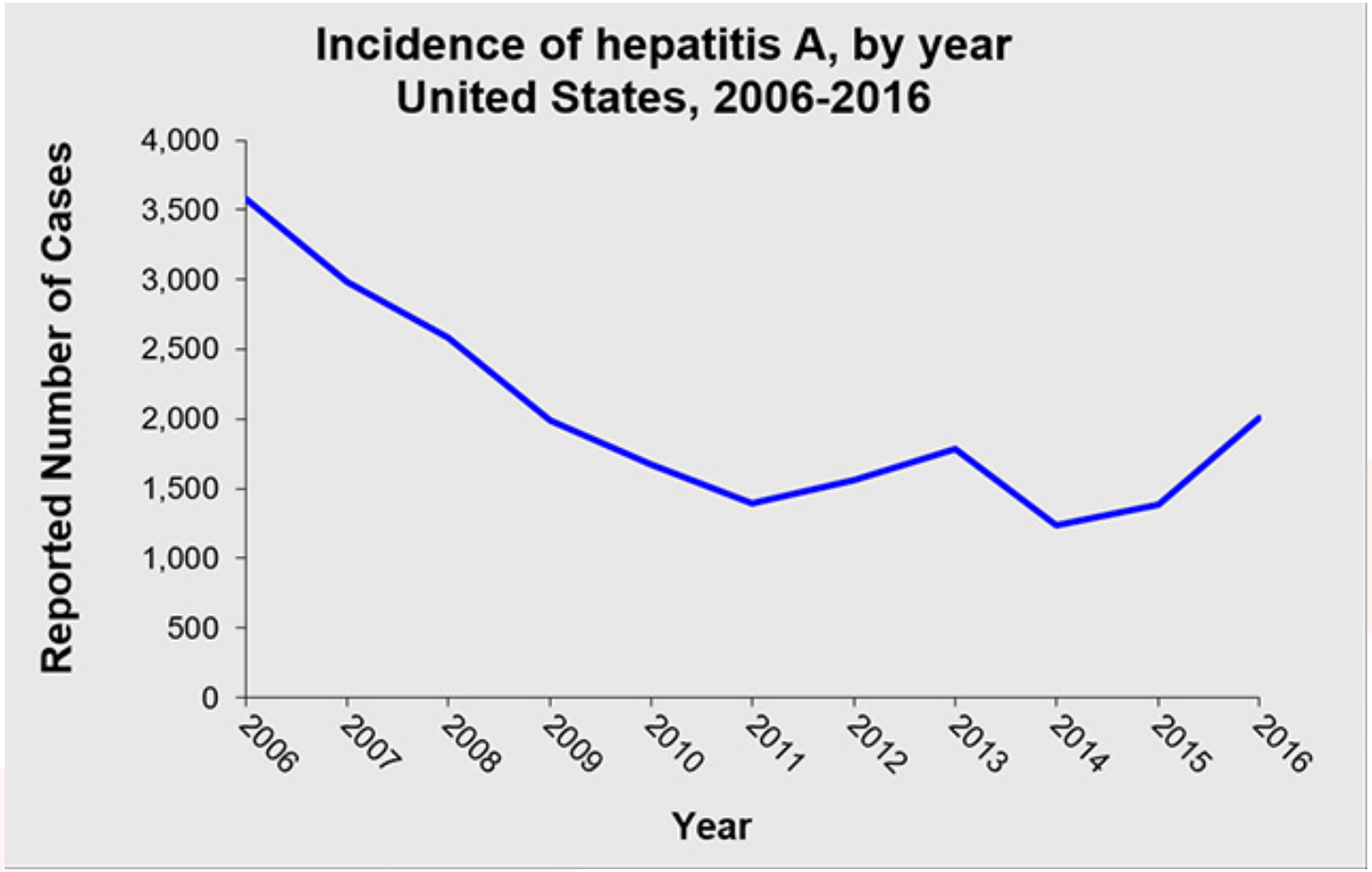
- Estimated 15,000-20,000 in the US each year
- Incubation x 1 month (15-50 days) with duration <2 months
- Transmission most common via fecal-oral route
  - Typically via contaminated food/water including undercooked/raw meat (i.e. shellfish)
  - Stool infectious for 2-3 weeks prior to symptoms (peak infectivity) and 1 weeks after onset of symptoms
  - Transmission has been documented with blood product transfusions

Who is at risk?

Although anyone can get Hepatitis A, some people are at greater risk, such as those who:

- Travel to or live in countries where Hepatitis A is common
- Have sexual contact with someone who has Hepatitis A
- Are men who have sexual encounters with other men
- Use recreational drugs, whether injected or not
- Have clotting-factor disorders, such as hemophilia
- Are household members or caregivers of a person infected with Hepatitis A

HAV US Epidemiology Trends



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Clinical Manifestations of HAV

- Fever
- Fatigue and anorexia
- Nausea and vomiting
- Abdominal pain
- Jaundice, dark urine, and clay-colored stools
- Arthralgias
- Elevated aminotransferase and bilirubin
- **20-40% of cases considered severe and require hospitalization**

True or False? (Not a Menti Question)

- Once Chuck's initial clinical symptoms related to HAV resolve, he will have no further HAV-related issues.

Clinical Complications of HAV

- Relapsing hepatitis
- Cholestatic hepatitis
- Acute liver failure
- Autoimmune hepatitis (rare)

Relapsing Hepatitis

- Occurs in 10% of patients (3-20% in different studies)
- Initial presentation with subsequent improvement but later worsening of LFTs with or without symptoms
- Occurs 1-12 weeks later and lasts for 3 weeks – 12 months
- Relapse usually mild

Cholestatic Hepatitis

- Occurs in 5% of patients
- Prolonged elevation of bilirubin and alkaline phosphatase (i.e. >3 months)
- Symptoms include fever, weight loss, jaundice, pruritus, and/or diarrhea

Acute Liver Failure

- <0.1% of acute HAV cases, though 4.5% of acute liver failure cases
- Severe presentation with of hepatitis with coagulopathy and hepatic encephalopathy
- Occurs within 20 weeks
- More common in older adults and those with preexisting liver disease

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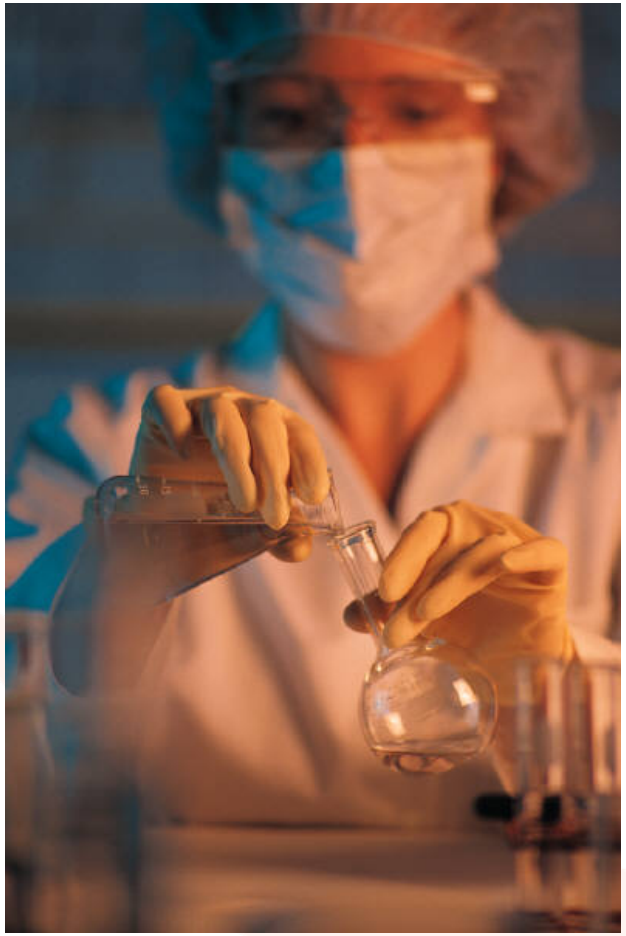
- **Diagnosis, Treatment and Prevention**
- Epidemics

HAV Diagnosis



- Clinical diagnosis definition
  - Clinically consistent illness
  - Positive serologic test (IgM antibody)
- Outbreak case definitions
  - Confirmed (i.e. RNA with genotype and/or epidemiologic data)
  - Probable (i.e. meets clinical diagnosis)
  - Suspect
  - Not outbreak case (guided by genotype and/or epidemiologic data)

HAV Treatment and Prevention

- Treatment is supportive only
- Prevention may be provided by pre-exposure immunization
- Post-exposure prophylaxis may include immunization and/or immune globulin (IG)
- Use universal precautions and good hand hygiene
- Avoid untreated water, unwashed fruits and vegetables, and raw or undercooked seafood or shellfish

Who should get vaccinated against Hepatitis A?

Vaccination is recommended for certain groups, including:

- All children at age 1 year
- Travelers to countries where Hepatitis A is common
- Family and caregivers of recent adoptees from countries where Hepatitis A is common
- Men who have sexual encounters with other men
- Users of recreational drugs, whether injected or not
- People with chronic or long-term liver disease, including Hepatitis B or Hepatitis C
- People with clotting-factor disorders

Multiple Choice

- Chuck has a 35 y/o twin brother with identical medical problems who has shared food with Chuck 10 days ago. What prophylaxis is most appropriate?

A. HAV vaccine
B. HAV IG
C. HAV vaccine + IG
D. No post-exposure prophylaxis

HAV Vaccines

- Two hepatitis A inactivated whole-virus vaccine
  - One combined hepatitis A/B vaccine
- Immunogenicity 95% in adults after 1st dose of HAV vaccine
- Vast majority (near 100%) of adults seroconvert after 2nd dose
  - Seroconversion lower in liver disease, advanced immunosuppression, and some other conditions
- >90% protected for life

HAV Post-exposure prophylaxis (PEP)

- Recommended within 2 weeks of contact with confirmed case
- Includes both immunization as well as immune globulin (IG) depending on demographic and risk factors:
  - Age 1-40: HAV vaccine
  - Age >40: IG +/- vaccine; use vaccine if IG not available
  - Age <12 mo, immunosuppressed, liver disease, vaccine allergy: IG

NOTE: Recent immune globulin PEP recommendations in San Diego outbreak included dosing at 0.1 ml/kg (5x higher than prior doses) due to lower concentration of anti-HAV immunoglobulins in donors.

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San Diego, CA Epidemic: Description

- Occurred in 2017
- Associated with drug use and homelessness
- Common coinfection with HBV and HCV

Jurisdiction	Cases	Hospitalizations	Deaths
San Diego	587	402	20
Santa Cruz	76	33	1
Los Angeles	12	8	0
Monterey	12	10	0
Other	17	8	0
Total	704	461	21

California Department of Public Health

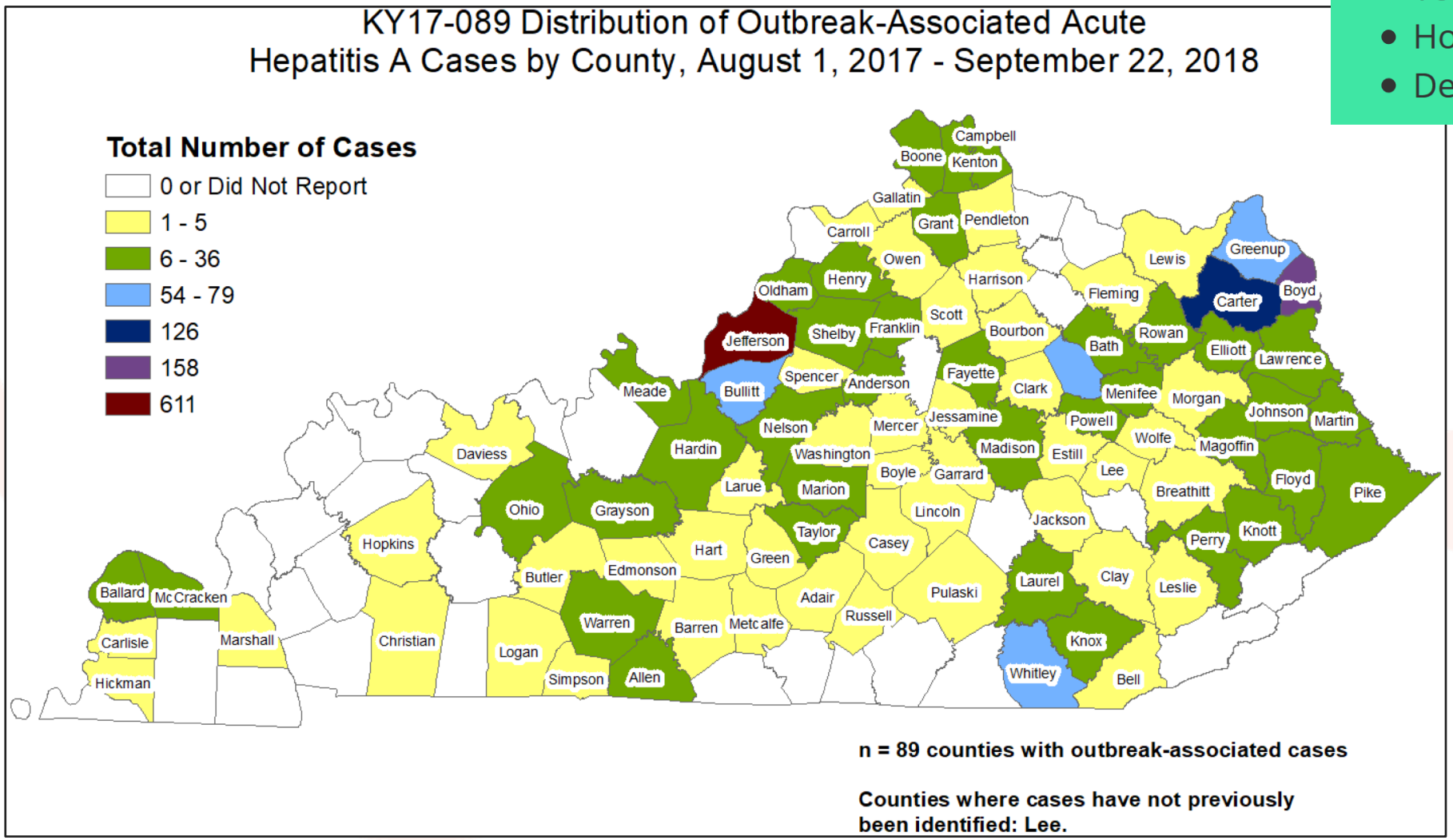
San Diego, CA Epidemic: Interventions

- >160,000 vaccinations administered
  - Most (>80%) delivered to high-risk individuals
  - Novel distribution including mass vaccination events, foot teams, mobile vans, and local institutional support
- Sanitation campaign
  - Power-spraying sidewalks
  - Temporary housing tents with bathrooms and showers
- Indication for vaccine expanded beyond traditional risk factors
  - Food service workers
  - Healthcare workers
  - Sanitation workers
  - Public safety workers
  - Homeless service providers

Kentucky HAV Epidemic

Counts as of September 22, 2018:

- Total Outbreak: **1,851**
- Hospitalizations: **1029**
- Deaths: **14**

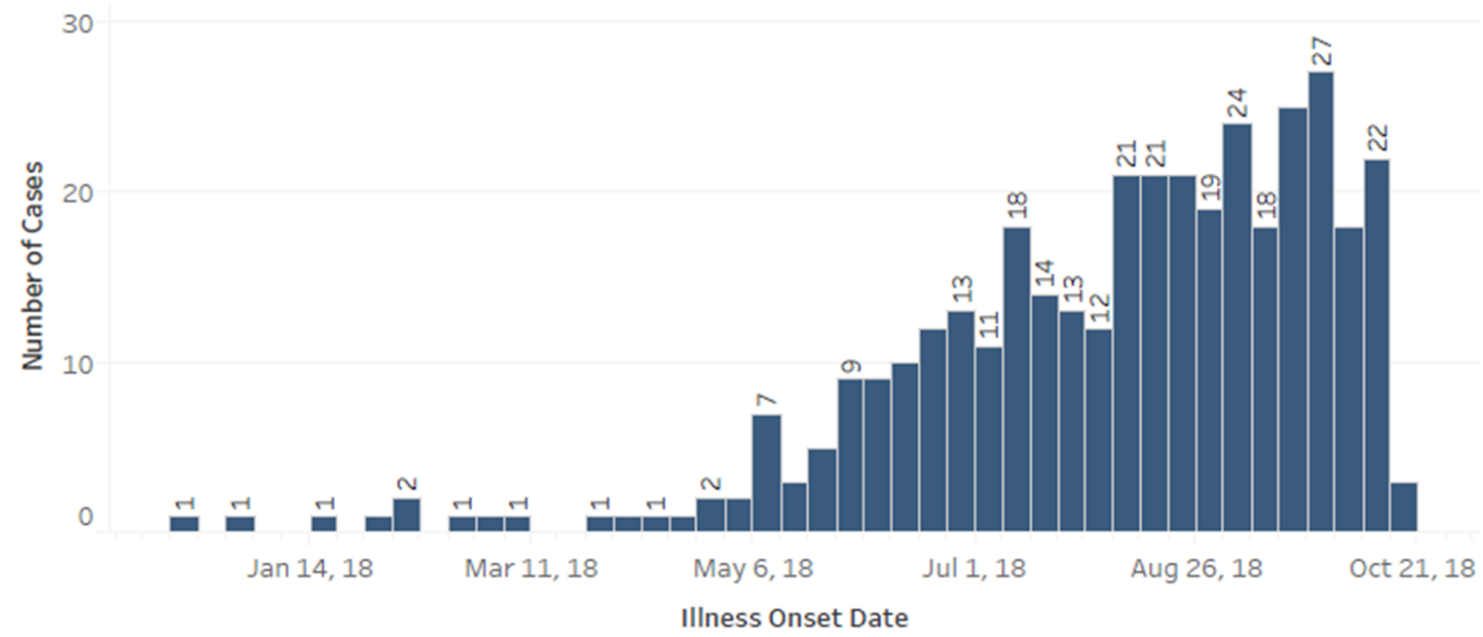


- Associated with recreational drug use and homelessness

Hepatitis A Outbreak in TN

Confirmed cases of Hepatitis A in Tennessee

December 01, 2017 – October 26, 2018



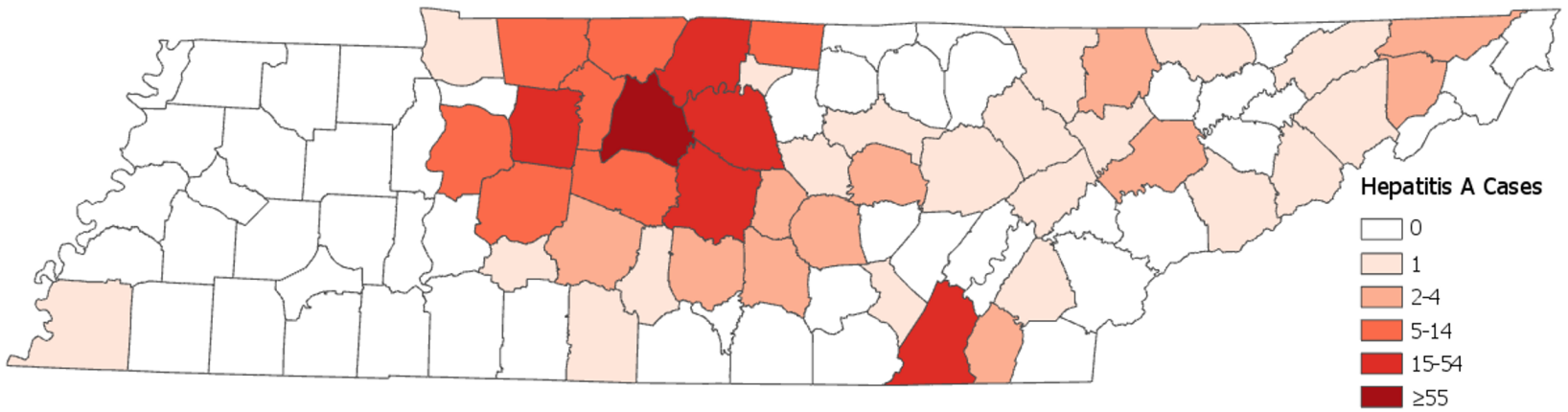
Hospitalizations: 238/394 (60%)

In Jail: 68/394 (17%)

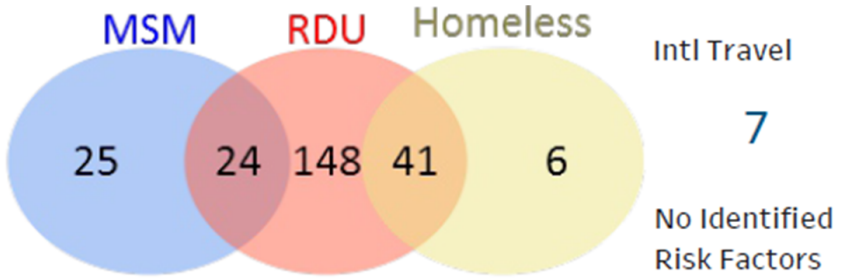
Deaths: 1

Hepatitis A Outbreak in TN: Distribution & Risk Factors

Confirmed cases of Hepatitis A in Tennessee by County
December 01, 2017 – October 26, 2018



Confirmed cases of Hepatitis A in Tennessee by Risk Factor
December 01, 2017 – October 26, 2018



Intl Travel
7

No Identified Risk Factors
143

MSM: men who have sex with men
RDU: recreational drug use

Hepatitis A Outbreak in TN: Collaborations

- **Immunizations**
  - Overall leadership engagement with multiple partners
- **Emergency Preparedness**
  - Coordination, logistics, procurement
- **HIV/STD/VH**
  - Implementation (jails, prison intake facilities, STD clinics)
  - Education (MSM task force, social media)
  - Co-infection reports (HAV, HBV, HCV, HIV)
- **CDC**
  - SME
  - Multi-state calls
  - Genotyping

Slides courtesy of Carolyn Wester, Tennessee Department of Health

What Can You Do?

- Be aware!
- Assess for HAV risk.
- Immunize!

Questions?

THANK YOU