



Outbreak 101: Hepatitis A

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NASTAD's Viral Hepatitis Prevention and Surveillance Virtual Learning Collaborative

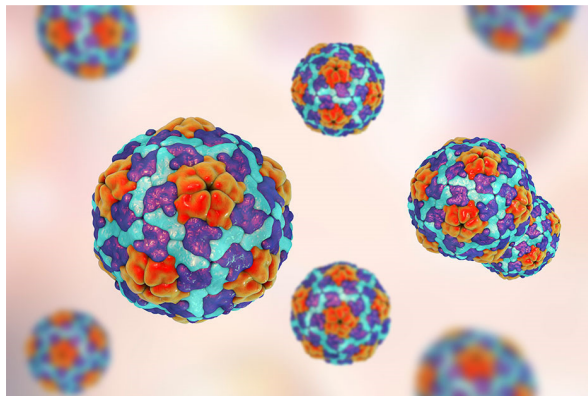
November 10, 2021

1

Clinical Features

2

Hepatitis A Virus (HAV)



- **Replicates in the liver, excreted in bile**
- **Acute illness**
- **Average incubation period: 28 days**
 - Peak infectious period: 2 weeks prior to symptom onset until 1 week after jaundice onset
- **Clinical manifestations: fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, dark urine, jaundice**
- **Transmission: fecal-oral**

Clinical Features and Natural History

- **The likelihood of symptomatic HAV infection is related to age**
 - Children <6 years old
 - 70% of infections are asymptomatic
 - Jaundice is rare
 - Older children and adults
 - Infection is typically symptomatic
 - Jaundice occurs in >70%
- **Prolonged or relapsing hepatitis A in 10-15% of symptomatic patients**
- **No chronic form**

Epidemiology

5

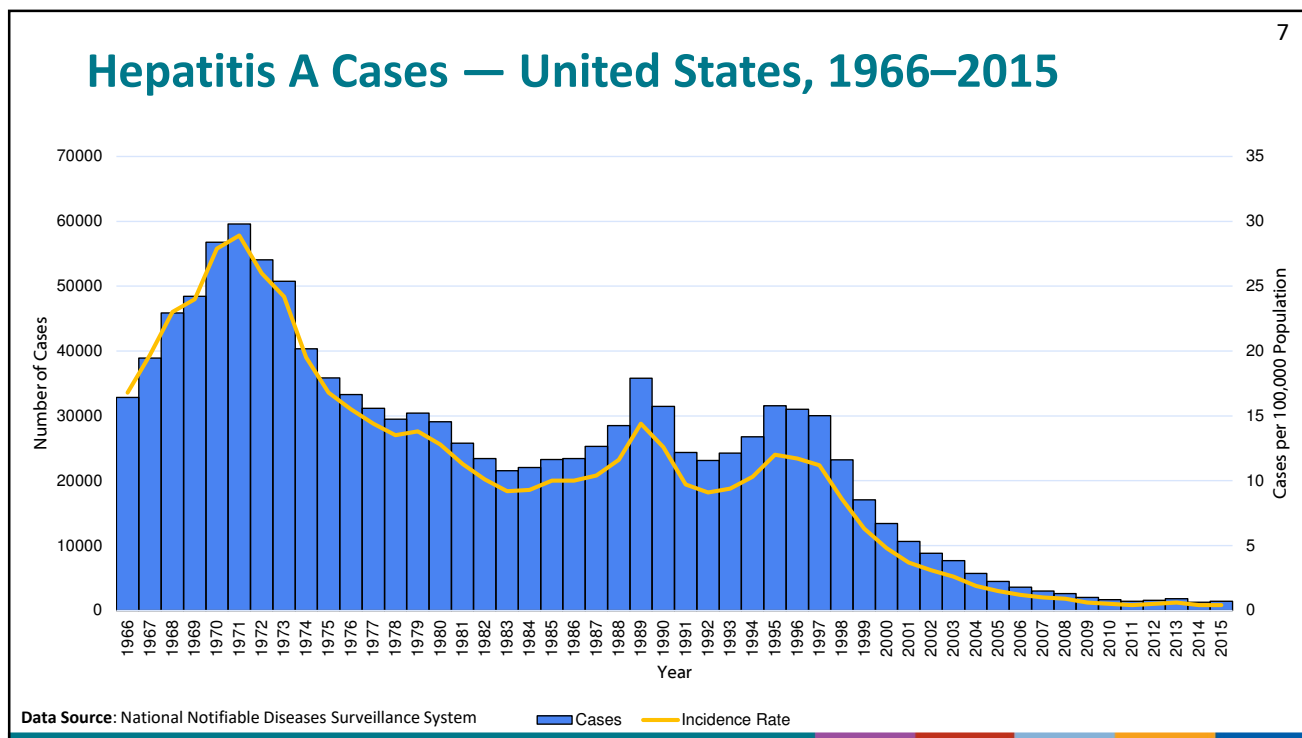
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Hepatitis A Virus Endemicity in the United States

- The United States is considered to have very low HAV endemicity levels
- Cyclic increases occurred every 10–15 years
- The number of reported cases in the pre-vaccine era was $\geq 21,000$ annually

Jacobsen KH and Wiersma ST. *Vaccine* 2010.; Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006.; Klevens RM, et al. *American Journal of Public Health* 2014.

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7

Outbreaks of Hepatitis A – United States, 2016–2021

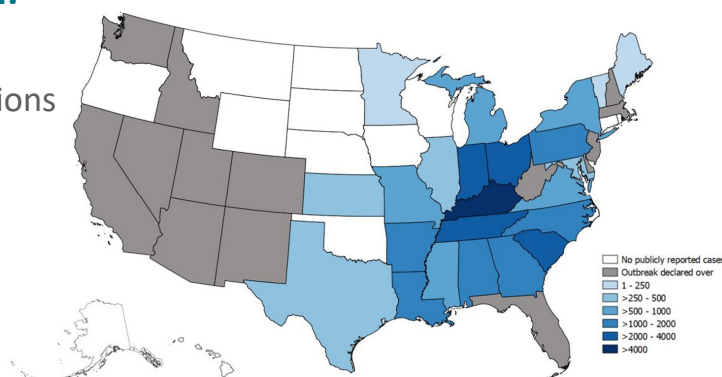
- **CDC has assisted in multiple outbreaks of hepatitis A since July 1, 2016**
 - Foodborne Transmission
 - Hawaii – Frozen Scallops
 - Multistate – Frozen Strawberries
 - Person-to-Person Transmission
 - People who use drugs (injection/non-injection) and people experiencing homelessness
 - Men who have sex with men (MSM)

8

Person-to-Person Hepatitis A Outbreaks: Summary Statistics

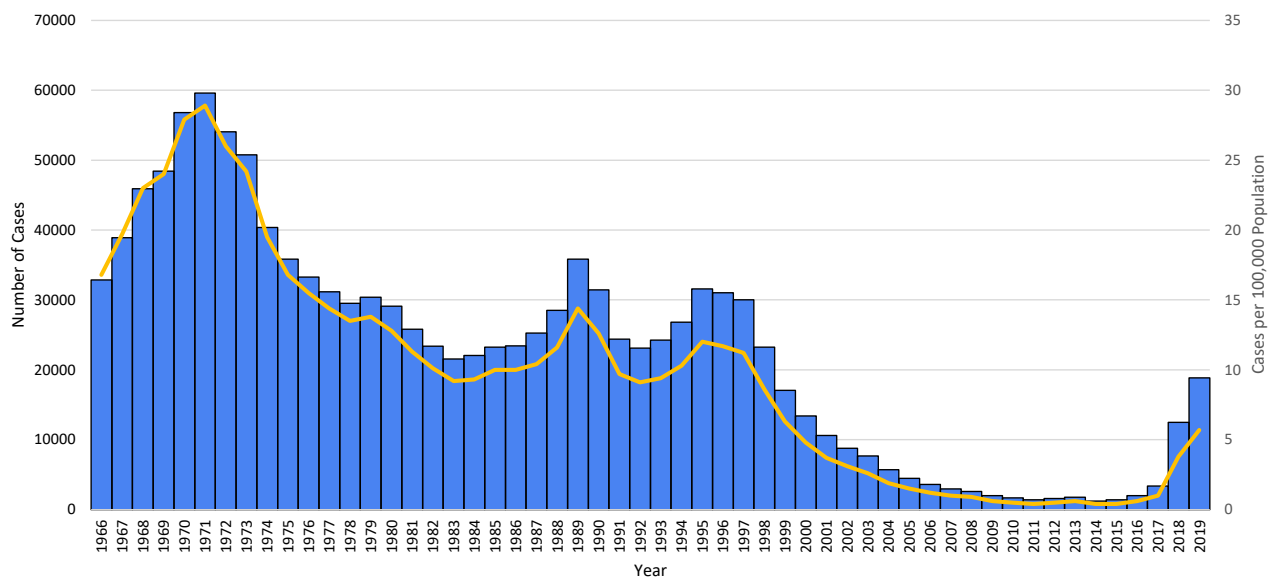
As of November 5th, 2021:

- >42,850 cases
- >26,050 (61%) hospitalizations
- >400 deaths



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

Hepatitis A Cases — United States, 1966–2019



Data Source: National Notifiable Diseases Surveillance System

■ Cases — Incidence Rate

Shifting Hepatitis A Virus Epidemiology

- **Past outbreaks were driven by asymptomatic children**
- **A large proportion of adults are not immune to hepatitis A virus**
 - During 2015-2016, 72.8% of US adults ≥20 years old were susceptible to HAV infection
 - In 2018, reported hepatitis A vaccination coverage (≥2 doses) was 11.9% for adults ≥19 years
- **Older individuals are more likely to experience severe disease and adverse outcomes**
- **Vaccination uptake among at-risk adults is low**

Collier MG, et al. *Hepatology* 2015.; Ly KN and Klevens RM. *JID* 2015.; Epton EE, et al. *Public Health* 2015.; Murphy TV, et al.; Yin S, et al. *CID* 2020; Peng-Jun L, et al. *MMWR Surveill Summ* 2021.

Increased Morbidity and Mortality during 2016–2021

- **Hepatitis A-related hospitalizations were increasing prior to 2016**
- **Hospitalizations for cases during 2016-2021 outbreaks range from 46% - 88%**
- **Case mortality in California and Michigan outbreaks approximately 3%**
- **Coinfections with hepatitis B and hepatitis C**

Ly KN, et al. *Journal of Infectious Diseases* 2015.; <https://www.cdc.gov/hepatitis/statistics/2015surveillance/pdfs/2015HepSurveillanceRpt.pdf>.; Foster MA, et al. *MMWR* 2018.

Hepatitis A Vaccination for Outbreak Control

- Vaccination is the cornerstone of controlling community outbreaks
- Post-exposure prophylaxis alone may not effectively control outbreaks
- Targeted vaccination to the groups at highest risk is the best way to control disease spread
- Primary prevention with adequate vaccination of at-risk groups is needed

McMahon BJ, et al. *Archives of Pediatrics and Adolescent Medicine* 1996.; Craig AS, et al. *Clinical Infectious Diseases* 1998.

Outbreak-specific Vaccination Recommendations

- Offer Vaccination to the Following Groups to Prevent or Control an Outbreak
 - People who use drugs (injection or non-injection)
 - People experiencing homelessness
 - Men who have sex with men (MSM)
 - People who are, or were recently, incarcerated
 - People with chronic liver disease, including cirrhosis, hepatitis B, or hepatitis C

Update: Widespread Outbreaks of Hepatitis A among People Who Use Drugs and People Experiencing Homelessness across the United States



Distributed via the CDC Health Alert Network
March 25, 2019 1330 ET (1:30 PM ET)
CDCHAN-00418



<https://emergency.cdc.gov/han/han00418.asp>

Conducting a Hepatitis A Outbreak Investigation

15

16

Hepatitis A Outbreak Investigation

- **No systematic, national, molecular surveillance system**
- **Typical methods of detection**
 - Routine case surveillance
 - Observations from astute health department staff or healthcare providers
 - During case interviews or contact tracing investigations
- **Confirmation process can be prolonged**

16

17

When to Suspect an Outbreak: Hepatitis A Community/Person-to-Person

- Anytime there is an increase in reported hepatitis A cases within a jurisdiction above baseline over a 4-week period.
- Anytime two or more hepatitis A cases are reported during a 50-day time period among people from similar geographic regions with common epidemiological exposures (e.g., drug use, homelessness, men who have sex with men, time spent in the same facility [jail, substance abuse treatment, group home, etc.]).

17

18

Defining an Outbreak: Hepatitis A Community/Person-to-Person

Appendix A. Total number of hepatitis A cases reported to CDC through NNDSS by state per year for 2011–2015 and threshold for considering a person-to-person outbreak

State	2011	2012	2013	2014	2015	Average Monthly Cases, 2011–2015	Standard Deviation (Average Monthly Cases, 2011–2015)	Threshold for Monthly Cases: Start of Person-to-Person Outbreak (3SD above baseline*, rounded up to nearest whole number)
Georgia	27	46	36	24	30	2.72	0.73	5

NNDSS, National Notifiable Diseases Surveillance System

18

Defining the End of an Outbreak: Hepatitis A Community/Person-to-Person

Appendix A. Total number of hepatitis A cases reported to CDC through NNDSS by state per year for 2011–2015 and threshold for considering a person-to-person outbreak

State	2011	2012	2013	2014	2015	Average Monthly Cases, 2011–2015	Standard Deviation (Average Monthly Cases, 2011–2015)	Threshold for Monthly Cases: Start of Person-to-Person Outbreak (3SD above baseline*, rounded up to nearest whole number)
Georgia	27	46	36	24	30	2.72	0.73	5

Return to baseline lasting for ≥ 3 consecutive four-week periods

NNDSS, National Notifiable Diseases Surveillance System

When to Suspect an Outbreak: Hepatitis A Community/Person-to-Person

Exclusions

- In the absence of known risk factors, any case that occurs in a patient who reports travel to a country or US territory with endemic hepatitis A during their exposure period
- Any case that is linked to a hepatitis A foodborne outbreak by related sequencing
- In the absence of known risk factors, any case that is epi-linked to a hepatitis A foodborne outbreak
- Any case with a specimen collected within 4 weeks of symptom onset that is negative for HAV RNA

Case Investigation

- **Clinical Data**
 - Signs and symptoms, including jaundice
 - Date of earliest symptom onset
- **Risk Factors for Transmission**
 - Drug use, homelessness, international travel, incarceration, contact with a hepatitis A case, MSM
- **Diagnostic Tests**
 - IgM anti-HAV
 - ALT, total bilirubin
 - HAV nucleic acid amplification test (NAAT)
- **Occupation**
 - Food handler
- **Vaccine History**

Acknowledgments

- **Division of Viral Hepatitis, CDC**
 - Laura Cooley
 - Monique Foster
 - Neil Gupta
 - Martha Montgomery
 - Noele Nelson
 - Philip Spradling
 - Eyasu Teshale
 - Mark Weng
 - Shaoman Yin
- **Immunization Services Division, CDC**
- **State and Local Health Jurisdictions**
 - Alabama Department of Public Health
 - Arizona Department of Health Services
 - Arkansas Department of Health
 - California Department of Public Health
 - Colorado Department of Public Health & Environment
 - County of San Diego Health and Human Services Agency
 - Delaware Department of Health and Social Services
 - Florida Department of Health
 - Georgia Department of Public Health
 - Idaho Department of Health & Welfare
 - Illinois Department of Public Health
 - Indiana State Department of Health
- **State and Local Health Jurisdictions (cont.)**
 - Kansas Department of Health & Environment
 - Kentucky Department for Public Health
 - Louisiana Department of Health
 - Maryland Department of Health
 - Massachusetts Department of Public Health
 - Michigan Department of Health & Human Services
 - Minnesota Department of Health
 - Mississippi Department of Health
 - Missouri Department of Health & Senior Services
 - Nevada Department of Health and Human Services
 - New Hampshire Department of Health and Human Services
 - New Jersey Department of Health
 - New Mexico Department of Health
 - New York Department of Health
 - North Carolina Department of Health and Human Services
 - Ohio Department of Health
 - Pennsylvania Department of Health
 - South Carolina Department of Health and Environmental Control
 - Tennessee Department of Health
 - Texas Department of State Health Services
 - Utah Department of Health
 - Vermont Department of Health
 - Virginia Department of Health
 - Washington Department of Health
 - West Virginia Department of Health & Human Resources

Thank you.

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For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

