

Hepatitis A in Colorado

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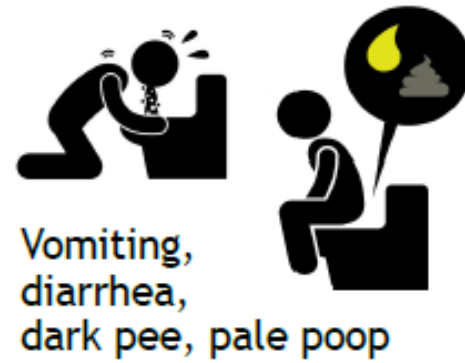


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Topics

- The Disease
- The Epidemiology
- The Outbreak
- The Role of Environmental Health



The Disease

Hepatitis A Virus (HAV)

Characteristic	Description
Agent	Picornavirus - replicates in liver and excreted in bile
Transmission	Primarily fecal-oral (foodborne, waterborne, person-to-person, environmental/object contamination); viremia as long as 30 days prior to onset to over 1 year after (~95 days, role in transmission unclear)
Incubation period	15-50 days (~28 days)
Infectious period	14 days before to 7 days after jaundice (or 14 days after if no jaundice)
Symptoms	Jaundice, dark urine, clay-colored stool, fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain; Children < 5 years often asymptomatic; Severity and mortality greatest > 50 years
Environmental persistence	Contaminated hands - several hours; Dried feces - days to weeks; Environmental surfaces - several days; Fresh or salt water - up to 1 year; Freezing - indefinitely; Inactivated at 185°F for one minute

HAV Testing

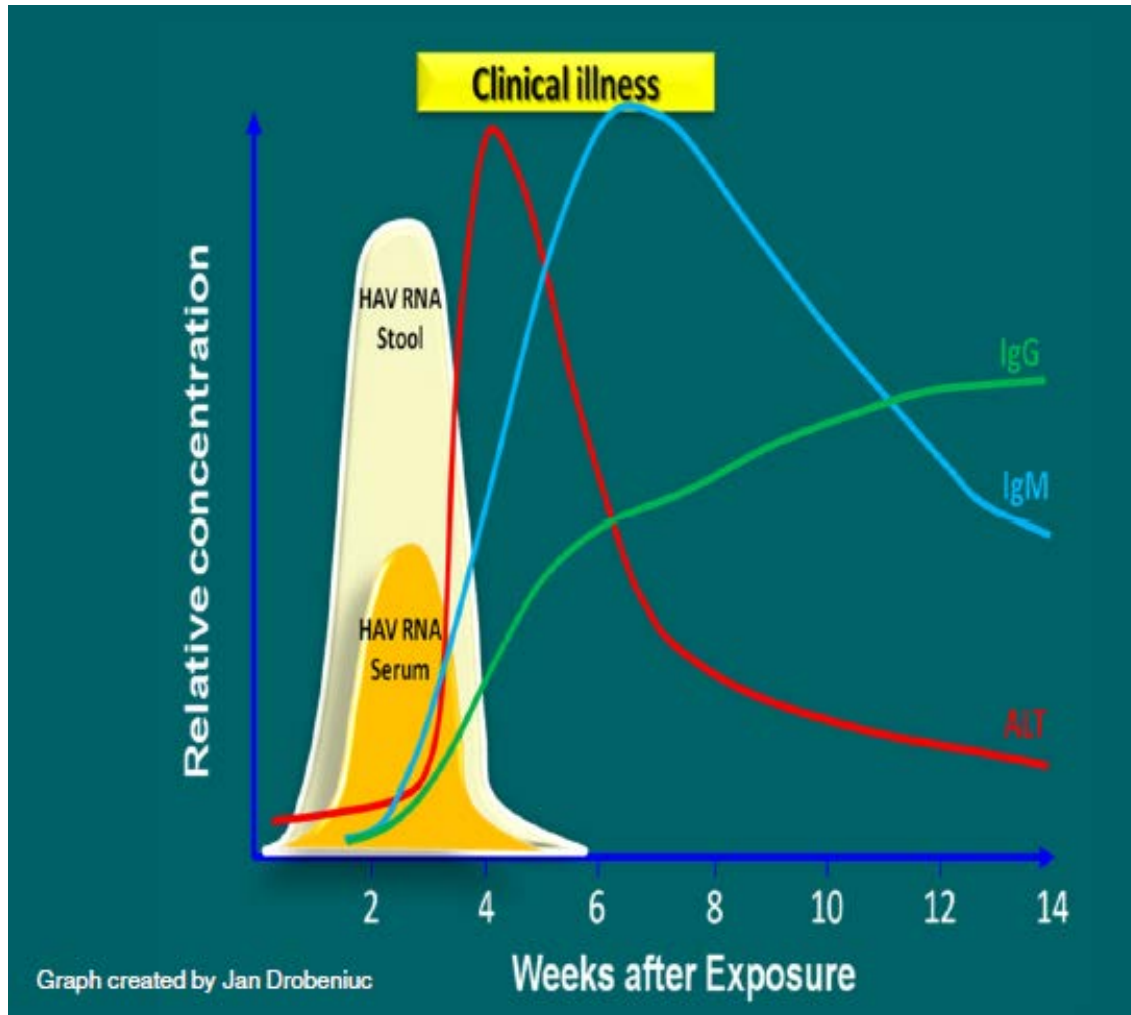
- Blood test: IgM positive test is “diagnostic” (if person tested has compatible signs and symptoms)
 - Hepatitis panel widely used (tests for HAV, HBV, HCV)
 - Total antibody (IgM and IgG) typically run first
 - If positive, reflex to IgM specific test
- Testing blood directly for virus not widely available
 - CDC can perform on select cases
- Testing stool directly for virus not widely available
- Look at liver function tests when determining if a case meets case definition (elevated ALT, AST, total bilirubin)

Test Results

Serology Result	Interpretation
Total antibody negative (IgG- IgM-)	No evidence of infection
Total antibody positive and IgM negative (IgG+, IgM-)	Prior infection with HAV (possibly years ago); currently immune, not an active case of hepatitis A, not infectious
Total antibody positive and IgM positive (IgG+, IgM+) OR Total antibody negative and IgM positive (IgG-, IgM+...not common)	May indicate recent infection; public health follow-up needed to determine if patient meets case definition

IgM equivocal results interpretation: HAV IgM antibody may or may not be present. If patient appears to have compatible symptoms, health care provider may want to retest. These cases are generally not entered into CEDRS.

HAV Clinical Course



HAV Case Definition (updated 2019)

<https://wwwn.cdc.gov/nndss/conditions/hepatitis-a-acute/case-definition/2019/>

To be counted as a confirmed case for public health surveillance:

- Discrete onset
- Compatible signs/symptoms
- Jaundice or elevated total bilirubin levels ≥ 3.0 mg/dL OR elevated serum alanine aminotransferase (ALT) levels >200 IU/L
- Absence of a more likely diagnosis
- IgM positive OR HAV RNA test positive (a person can also be a case if they meet the above criteria and are epi-linked to a lab-confirmed case)

Protect yourself from hepatitis A

Get vaccinated and
wash your hands after using
the restroom and before eating.

Call 877-462-2911 to
find out where to get a
hepatitis A vaccine.



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NOV. 2018

Adapted with permission from San Diego Health and Human Services Agency

HAV Vaccine

- Highly immunogenic and effective, all inactivated
- Duration of protection after vaccination unknown (lifelong?)
- 1996 - Vaccine introduced
- 1998 - CDPHE made HAV vaccine available to children age 2+ in 6 counties with highest incidence through VFC program
- 2000 - Expanded to all counties in CO
- 2006 - ACIP recommendation for all children at age one year
- Three vaccines: Havrix[®], Vaqta[®], Twinrix[®] (HAV and HBV - 3 doses)
 - 2 doses of HAV vaccine at least 6 months apart
- Coverage in the US in 2016:
 - Children 19-35 months: 86% at least one dose
 - Children 13-17 years: 74% at least one dose
 - Adults: around 10% with 2 doses (5% for adults over 50 years)

HAV Vaccine Recommendations

- All children at one year of age
- Children ages 2-18 years who live in high disease incidence areas
- International travel to endemic areas
- Men who have sex with men
- Users of injection and non-injection drugs
- Persons with occupational risks (work with primates)
- Persons with chronic liver disease or clotting-factor disorders
- Close contacts of children recently adopted from endemic areas
- People experiencing homelessness or unstable housing

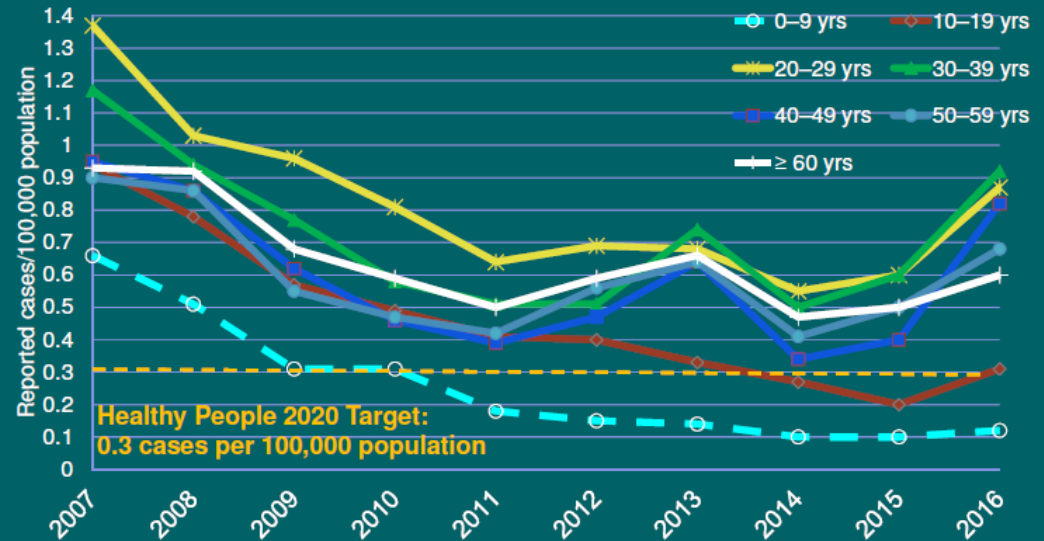
HAV Post-Exposure Prophylaxis (PEP) Recommendations (within 14 days of exposure)

Age Group	Vaccine	Immune Globulin (IG)
<1 year	Not used	Always administer IG to persons < 1 year
1-40 years	Always vaccinate unless contraindicated	Administer IG in addition to vaccine to persons with certain health conditions
>40 years	Always vaccinate unless contraindicated	Administer IG in addition to vaccine to persons with certain health conditions At the discretion of a health care provider if there are concerns about the person mounting an immune response to the vaccine alone or circumstances of exposure put that person at higher risk of infection.

Public Health Investigation

- Reportable condition - 1 working day
- Hepatitis A manual:
<https://www.colorado.gov/pacific/cdphe/communicable-disease-manual>
- Prompt investigation - main goals:
 - Meet case definition? (about half of IgM+ reports do not)
 - Occupation (food handler, other high risk)
 - Living situation/group settings
 - Source of infection
 - Risk of transmission → post-exposure prophylaxis (PEP)

Rates of Reported Acute Hepatitis A United States, 2007-2016



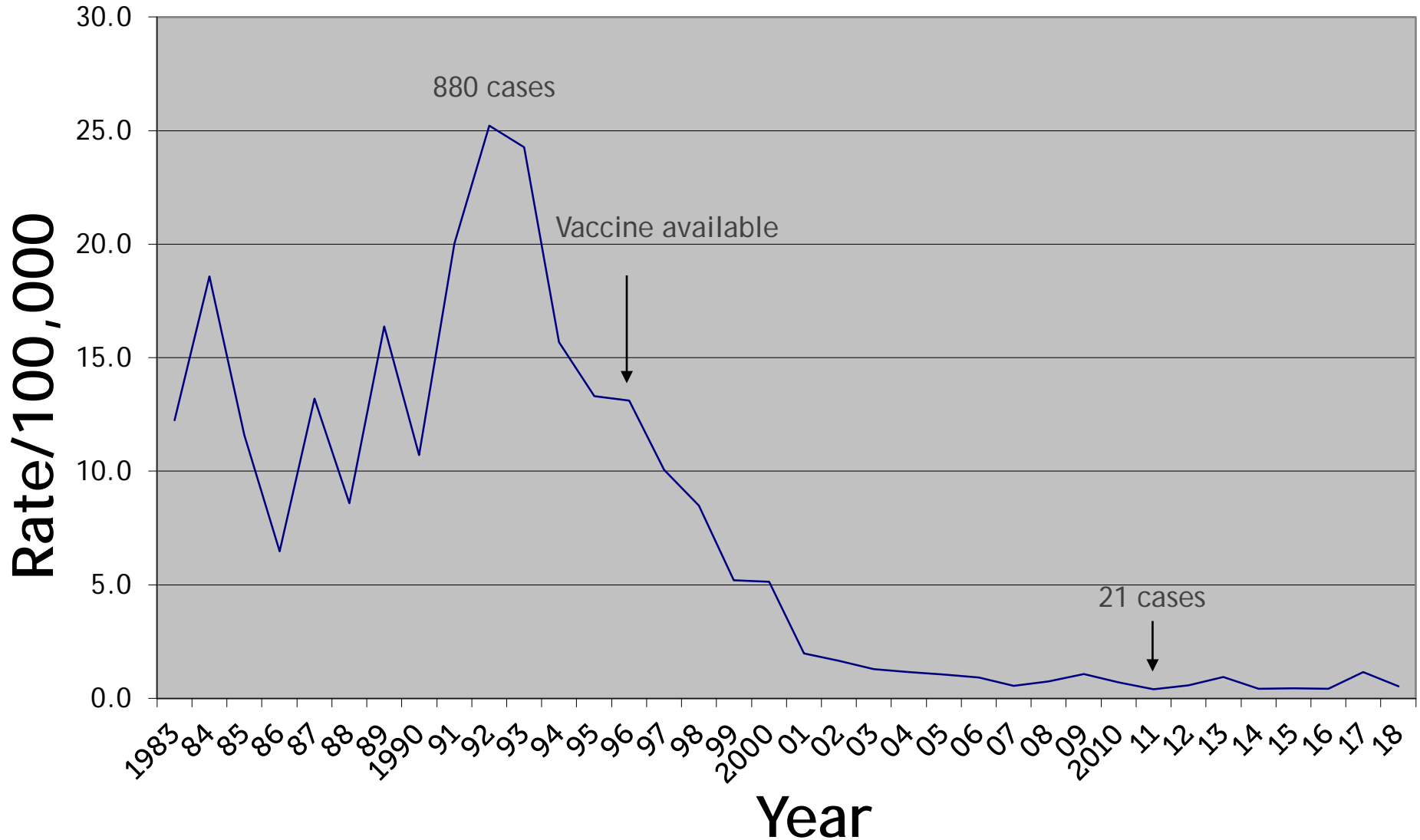
National Notifiable Diseases Surveillance System (NNDSS);
<http://www.healthypeople.gov/2020/topicsobjectives2020/pdfs/Immunization.pdf>

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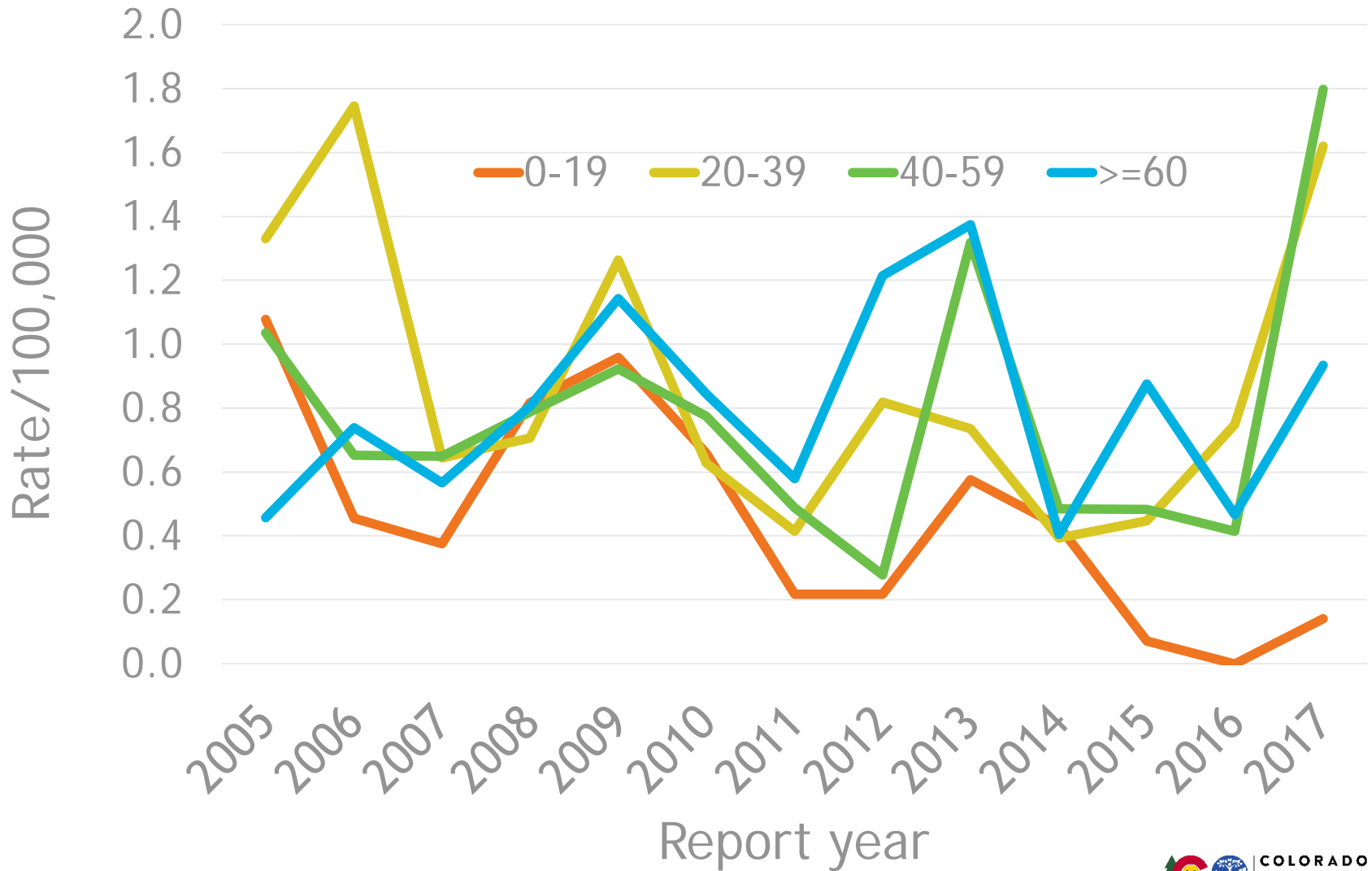
The Epidemiology

Hepatitis A Rates, Colorado, 1983-2018

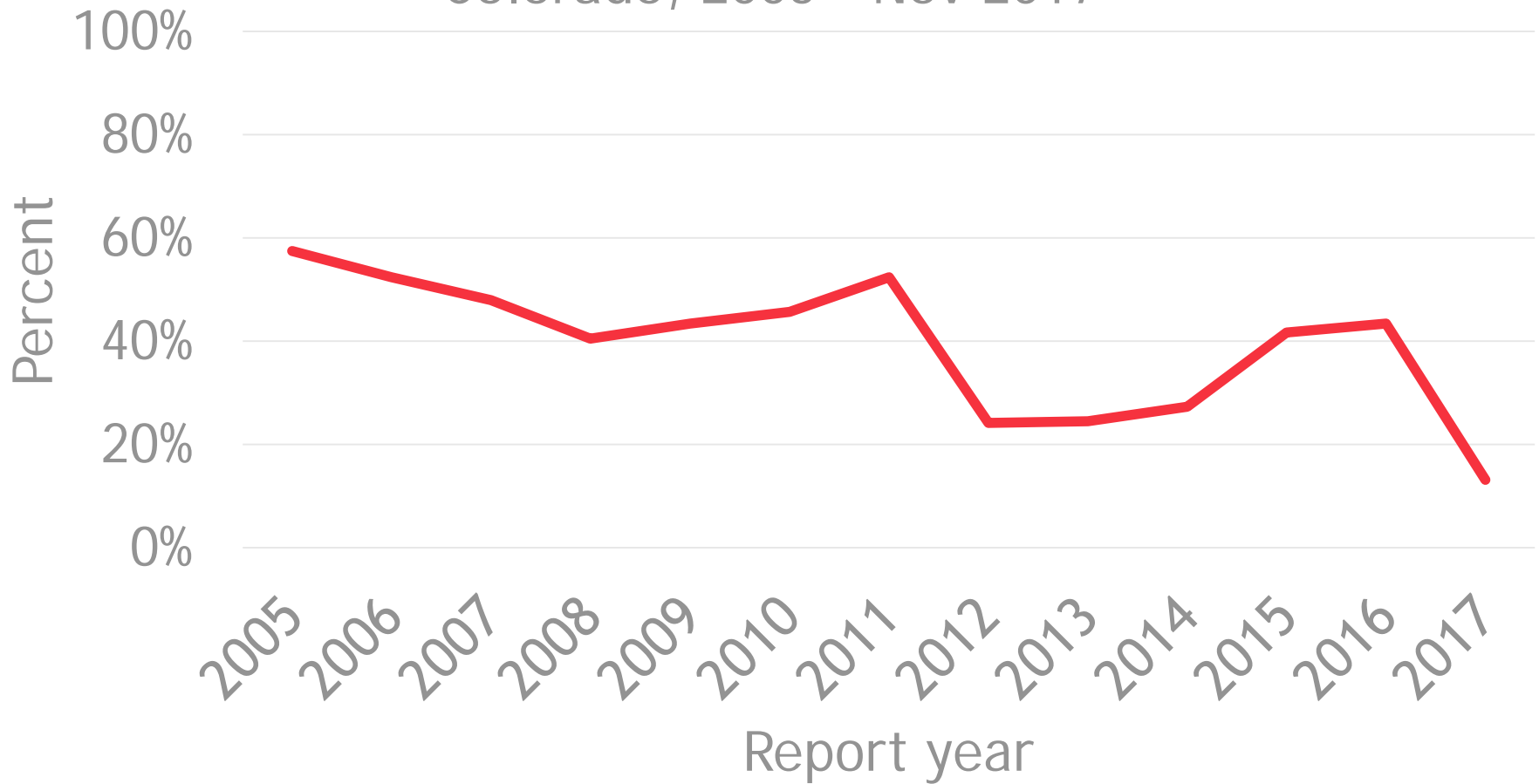
Healthy People 2020 Goal: 0.3 cases/100,000; CO has gotten to 0.4 several years



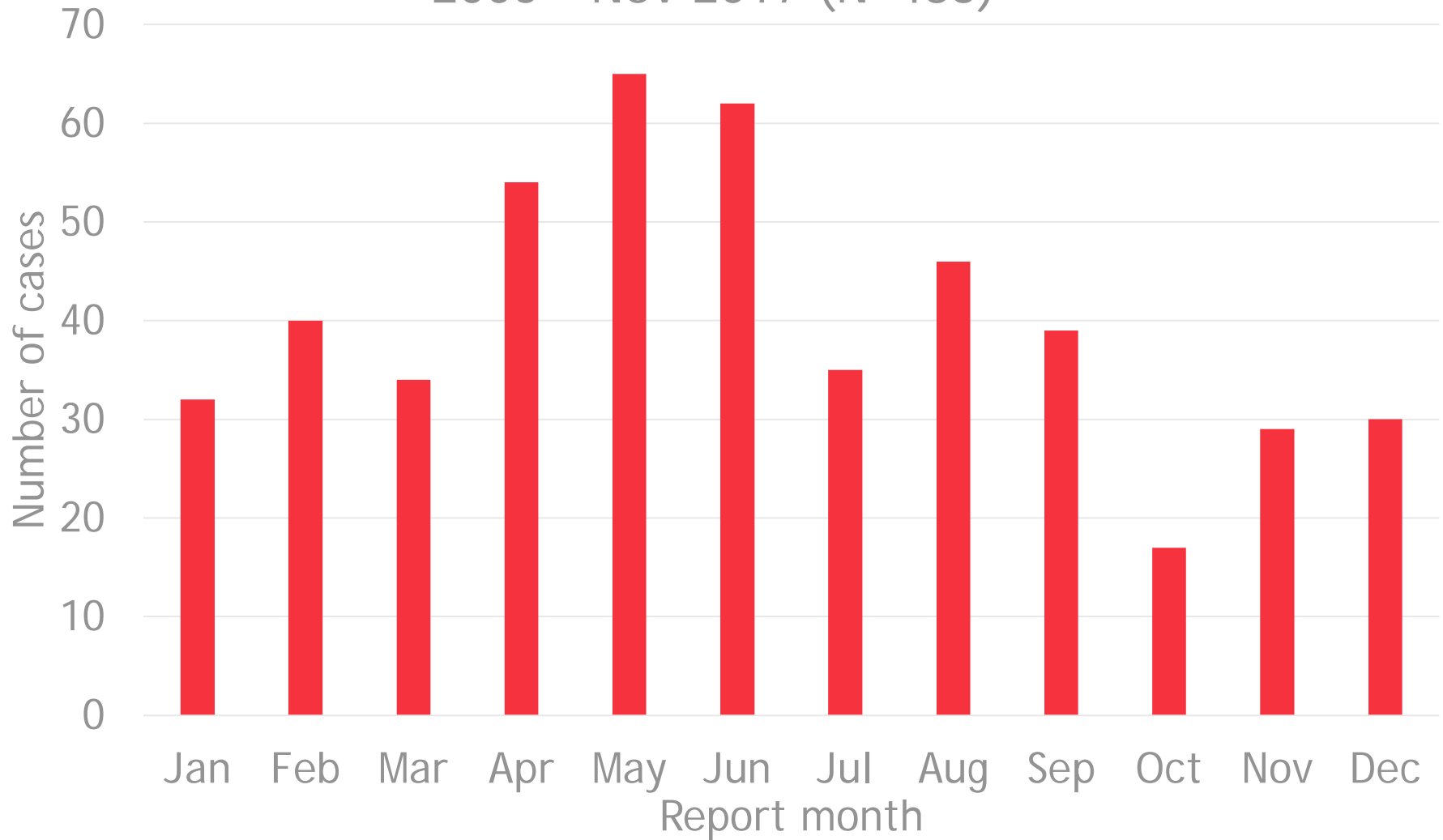
Rates of reported hepatitis A by age group, Colorado, 2005 - 2017



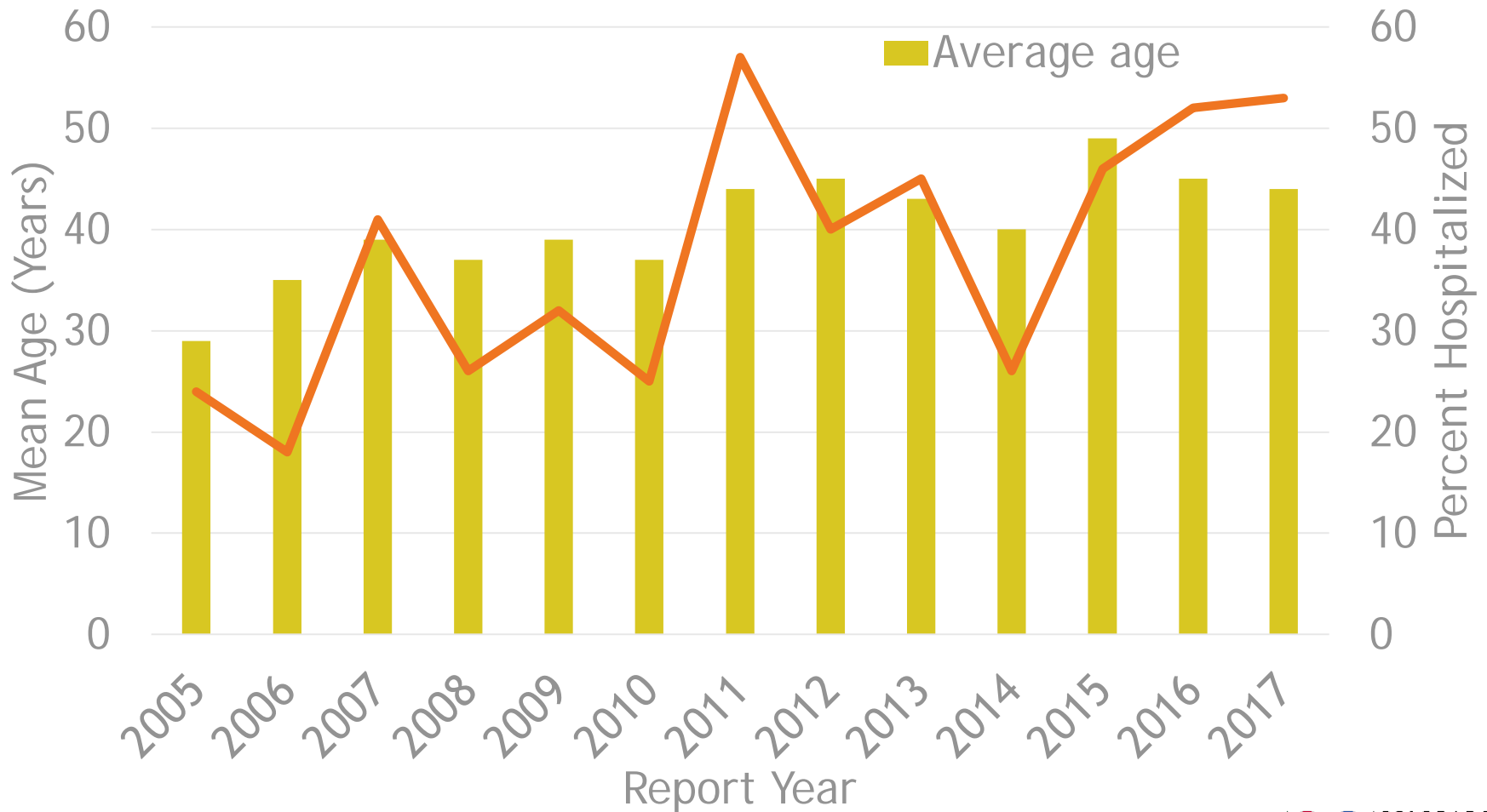
Percent of hepatitis A cases reporting international travel, Colorado, 2005 - Nov 2017



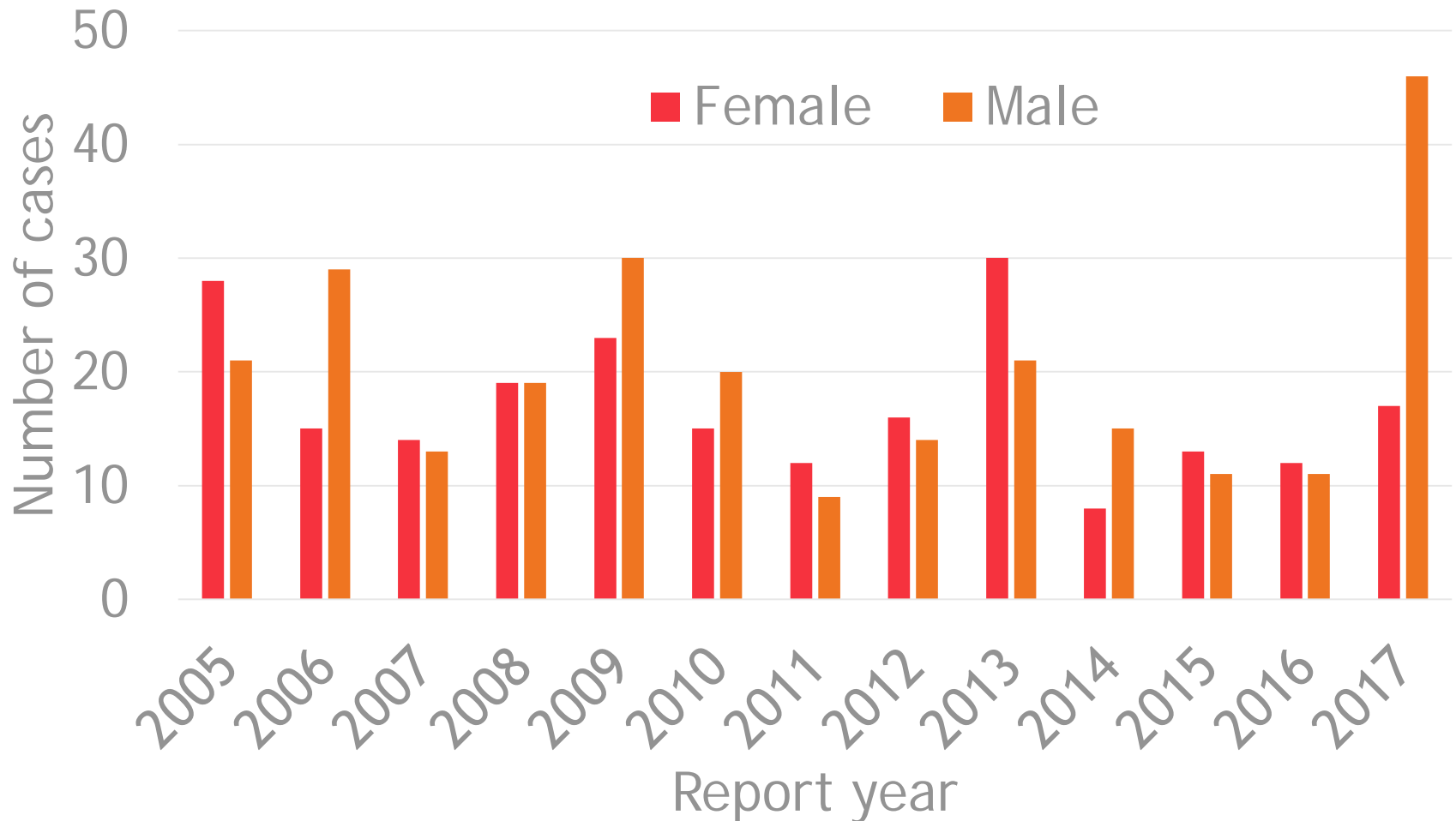
Cases of Hepatitis A by Report Month, Colorado, 2005 - Nov 2017 (N=483)



Mean age and hospitalization percentage of hepatitis A cases, Colorado, 2005 - 2017

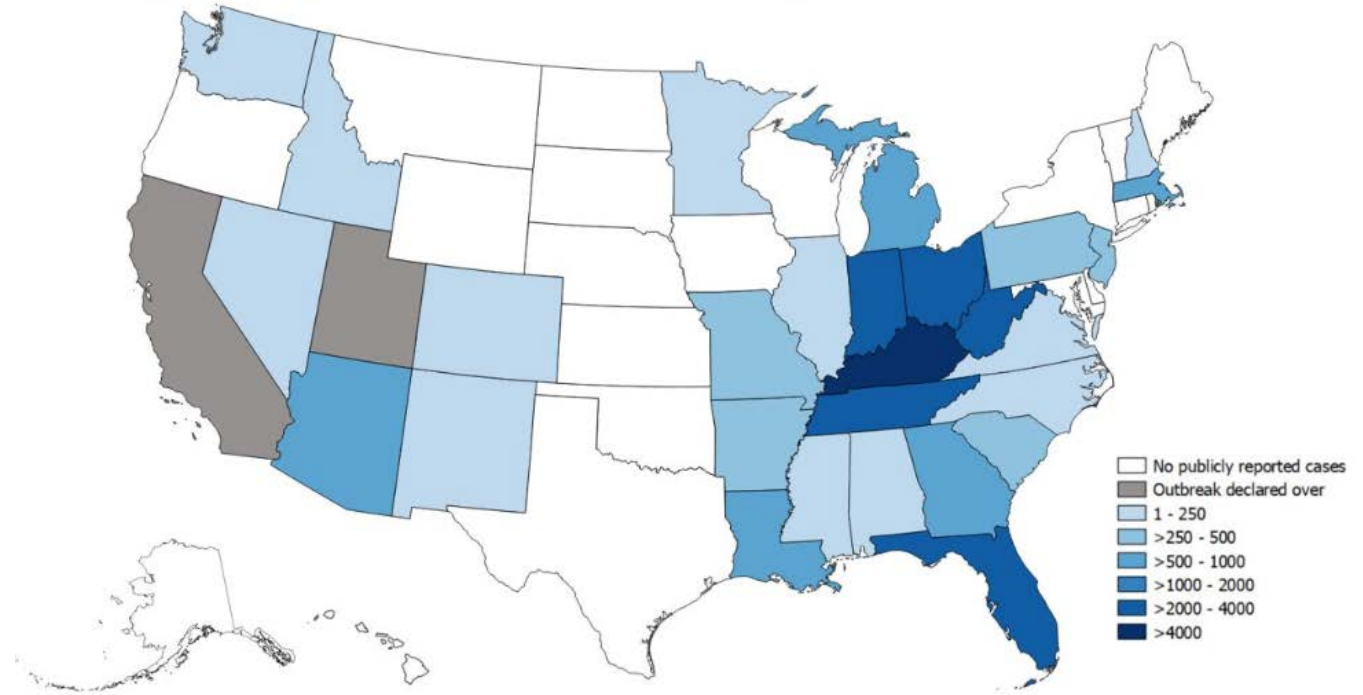


Hepatitis A cases by sex, Colorado, 2005 - 2017 (N=481)



National Trends

- Shifting epidemiology
 - Past outbreaks associated with asymptomatic children
 - Most adults not immune to hepatitis A and vaccine uptake low in adults
 - Older individuals more likely to experience severe disease and adverse outcomes
 - Foodborne outbreaks more often seen with imported, commercially distributed contaminated foods (eg, frozen berries)
 - International travel to endemic countries still a risk factor



The Outbreak

2017 Hepatitis A Outbreak - Colorado

63 CO cases -- 32 (51%) hospitalized and 1 death

Primarily Front Range counties

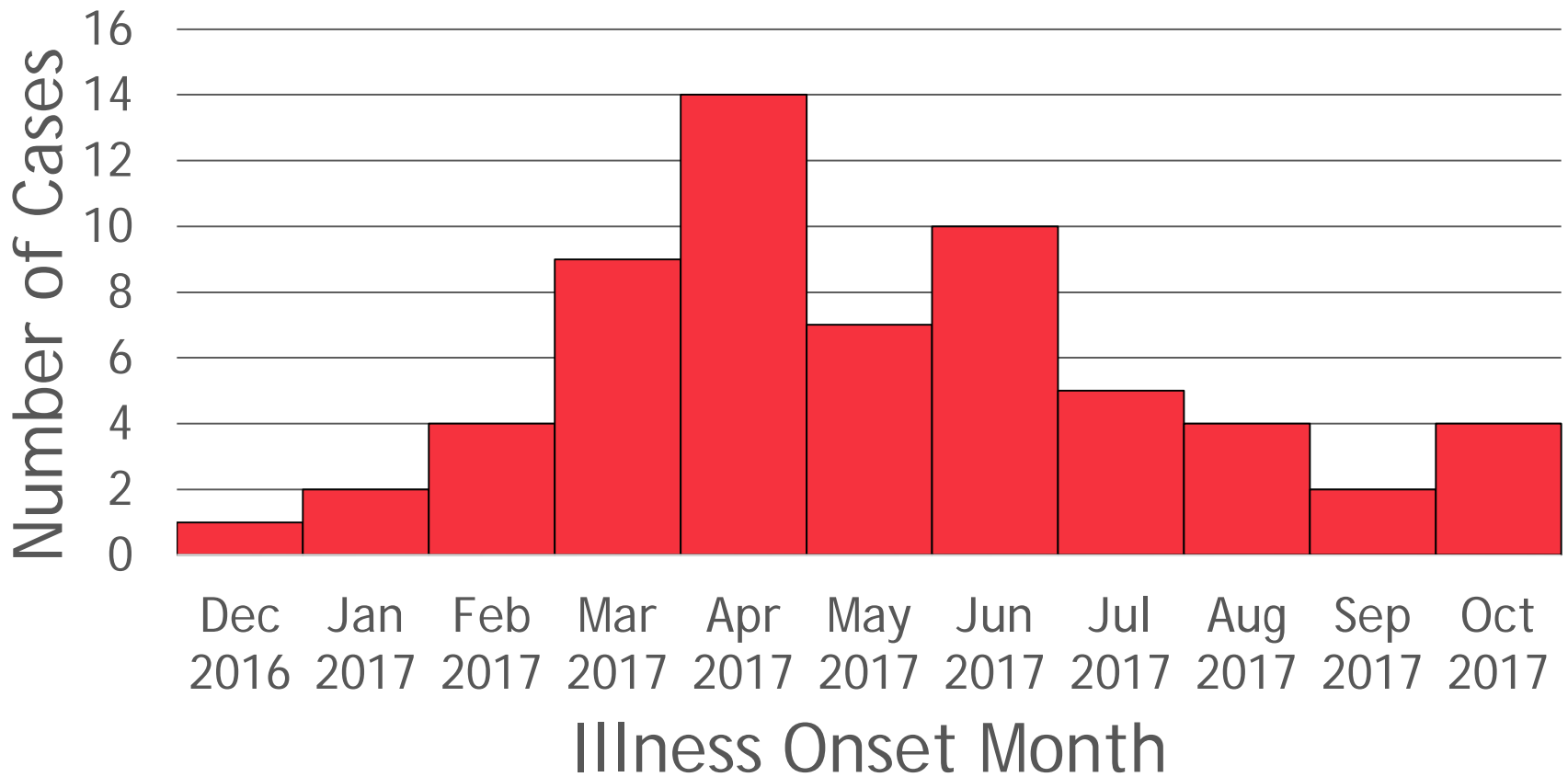
45 (62% male)

19 - 83 years (median 44 years)

Identified risk factors/exposures: (some cases had multiple)

- 2 homeless
- 2 attend same gym (consumed smoothies)
- 3 IVDU
- 8 potential secondary cases
- 9 international travel
- 20 MSM (some with anonymous partners at adult video stores and meeting through web/phone apps)

Hepatitis A Outbreak Cases by Month of Illness Onset, Colorado, 2017 (N=62)

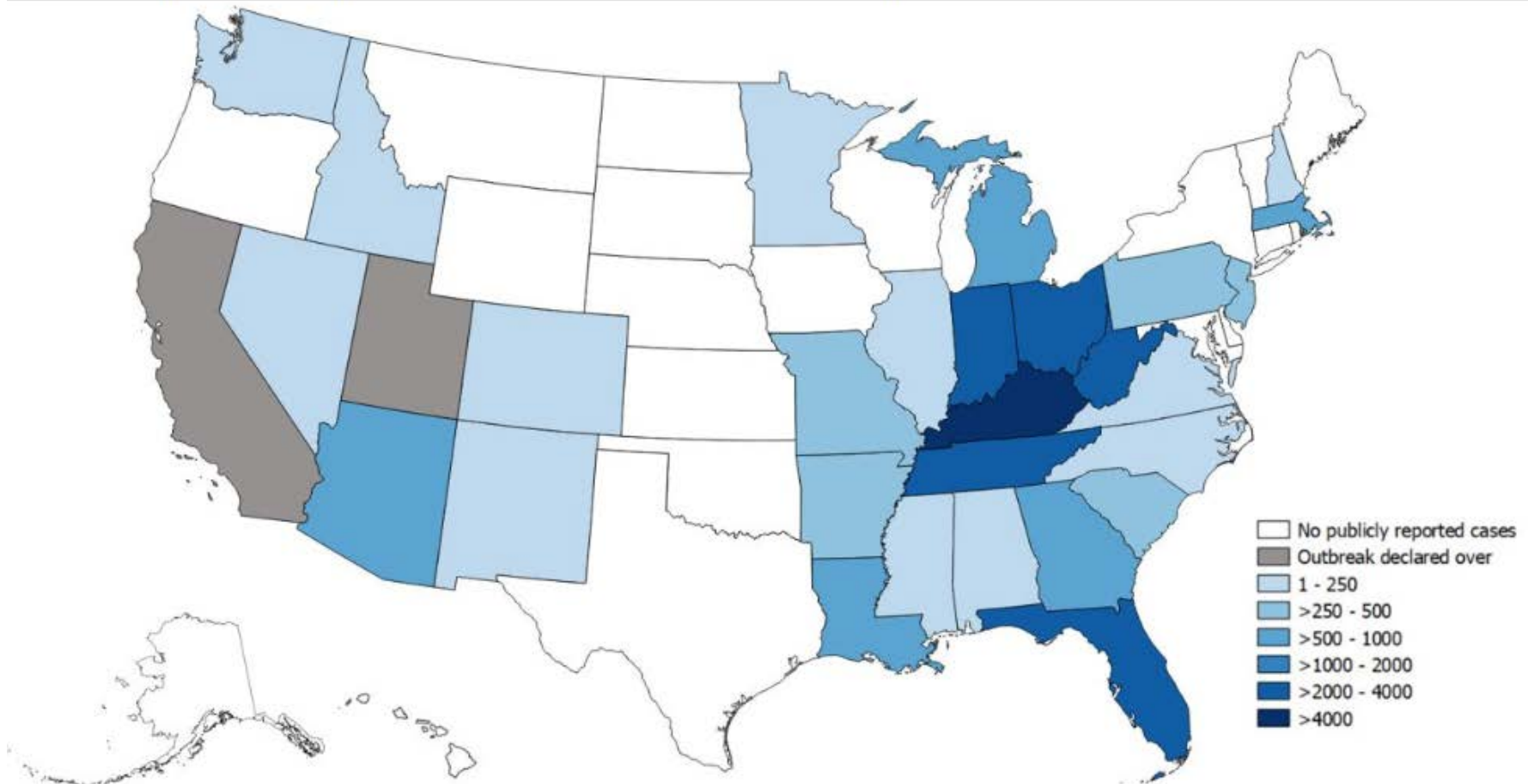


Recent US Outbreaks

Since late 2016, at least 30 states have reported outbreaks among people experiencing homelessness, substance use issues, and/or incarceration

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

State-Reported Hepatitis A Outbreak Cases as of September 13, 2019



Why These Risk Groups?

- Crowded living conditions
- Reduced access to restrooms
- Reduced opportunity for handwashing
- Shared food and other items (e.g., drug works)
- Sexual transmission
- Incarceration
- Bloodborne transmission and transmission via contaminated drugs thought to be low

Colorado Outbreak Case Definition

A Colorado resident who meets the CSTE hepatitis A case definition with onset on or after October 1, 2018 who:

Reports at least one of the following risk factors during the exposure period (15-50 days prior to onset):

drug use*, homelessness, incarceration, spent time in an area currently experiencing an outbreak of hepatitis A among people experiencing homelessness or people with substance use issues.

OR

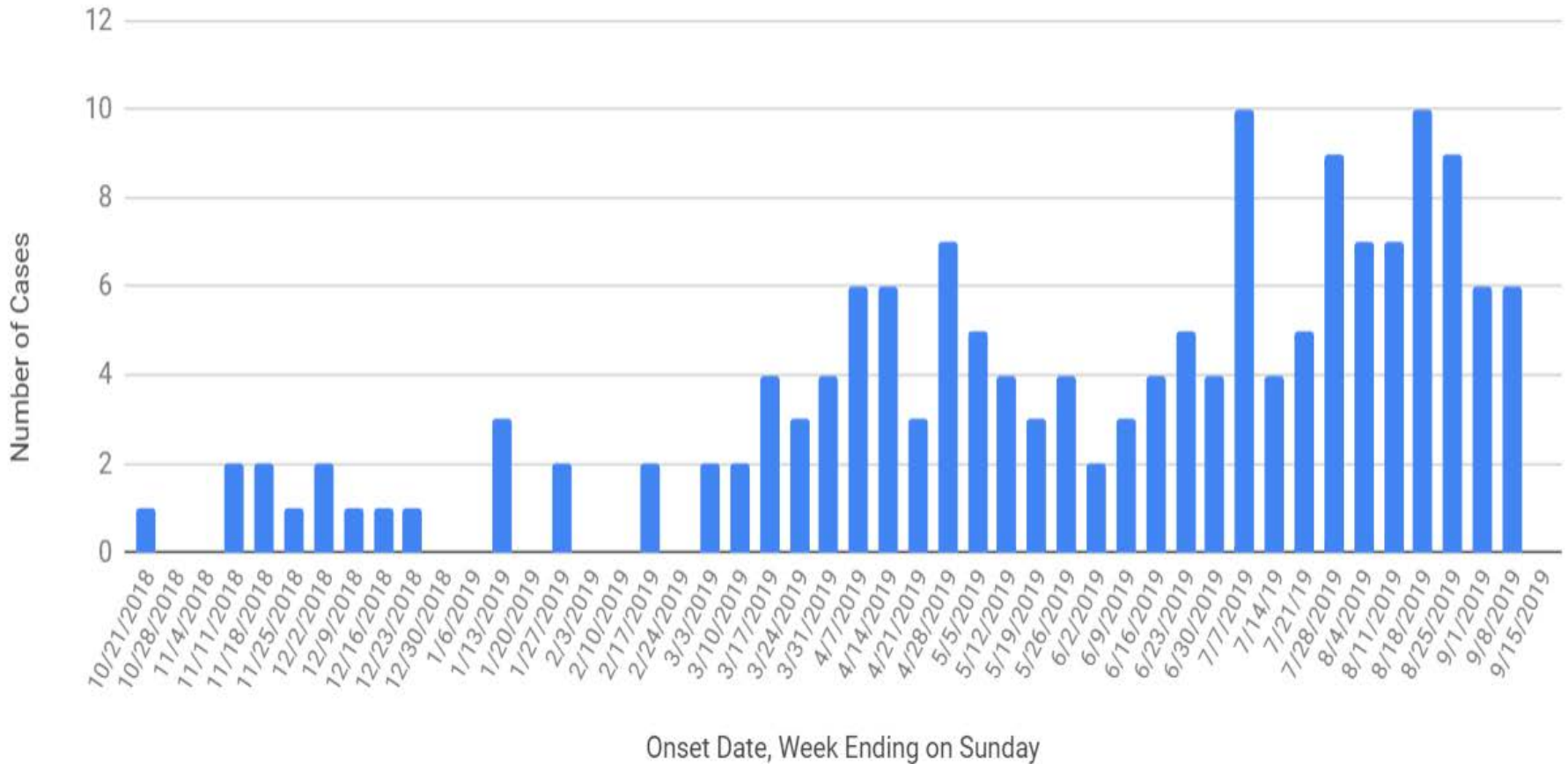
Has a hepatitis A genotype that matches a genotype predominant in a recent or current US hepatitis A outbreak (predominantly genotype 1B).

OR

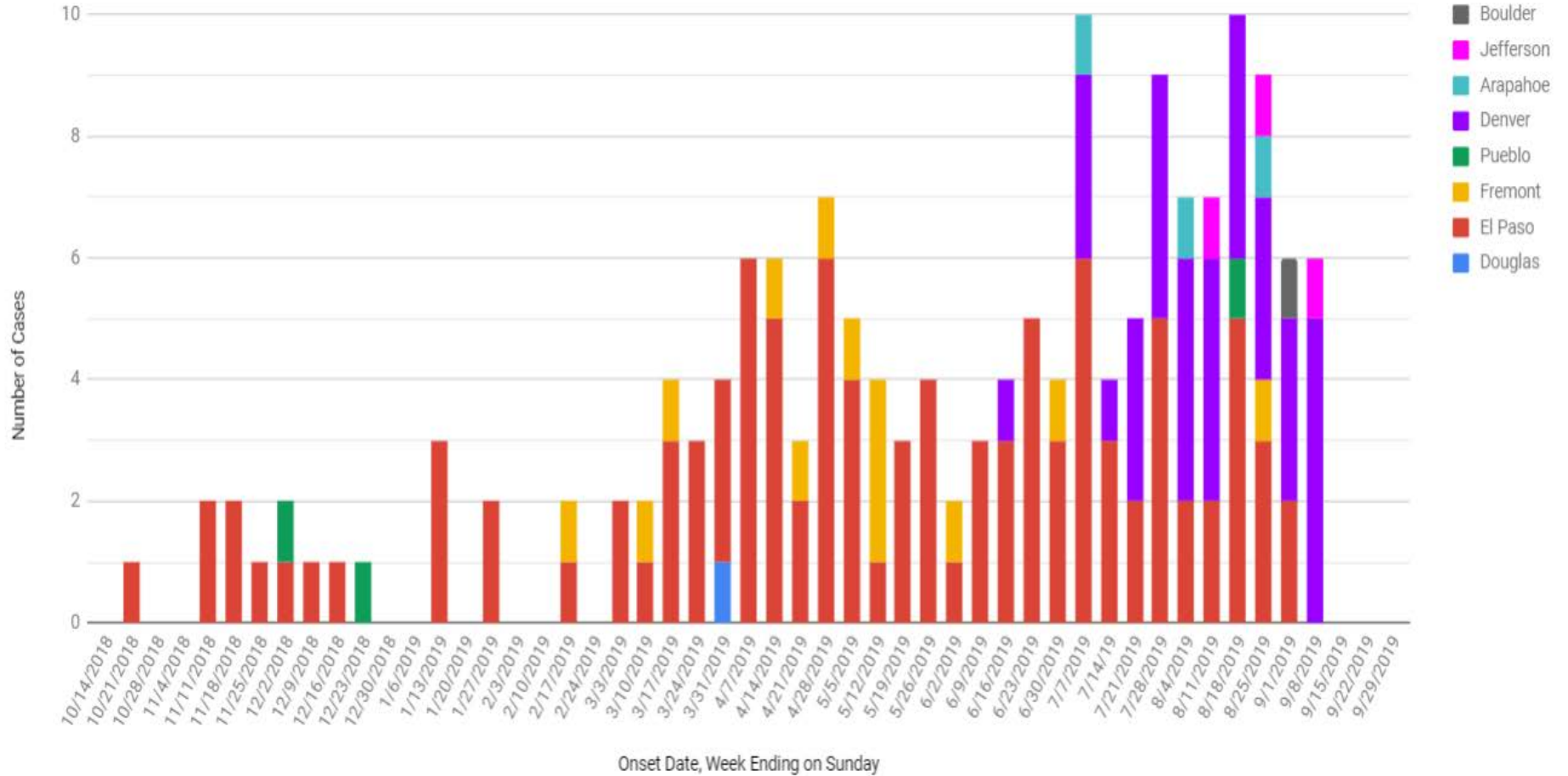
Is epidemiologically linked to a case of hepatitis A who meets one of the above criteria (such as a household contact, drug partner, sexual partner).

* Drug use includes use of methamphetamine, opioids, marijuana (recreational or medical), or other drugs.

Outbreak-Associated Hepatitis A Cases in Colorado by Onset Week*, October 2018 - September 2019 (N=161**)



Outbreak-Associated Hepatitis A Cases in Colorado by County and Onset Week*, October 2018 - September 2019 (N=161**)



Outbreak Case Characteristics

		Number	Percentage
Total cases	as of 9/11/19	163	
Sex	F	47	29%
	M	116	71%
Age (years)	Mean	40.0	
	Median	39.0	
	Minimum	22	
	Maximum	76	
Hospitalized	N	43	26%
	Y	120	74%
County	Denver	35	22%
	Douglas*	1	<1%
	El Paso	104	64%
	Fremont	13	8%
	Pueblo*	3	2%
	Arapahoe*	3	2%
	Jefferson*	3	2%
	Boulder*	1	<1%

1 death

71% experiencing homelessness

90% any drug use

25% incarcerated during exposure or infectious period

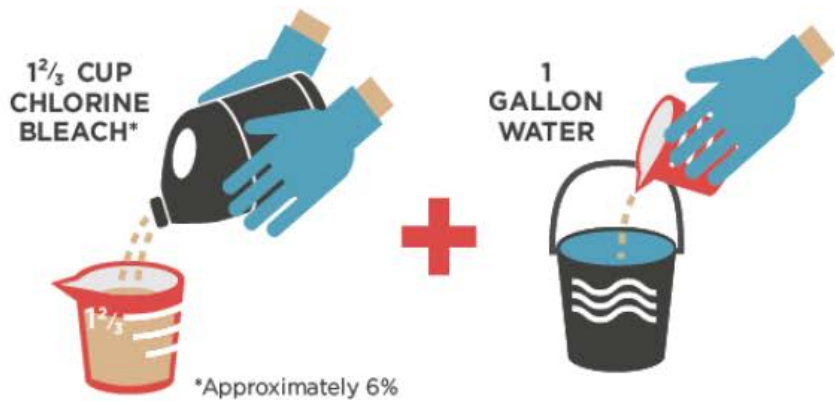
* Cases likely exposed in other counties, but reside in this county

Colorado's Response

- LPHAs are leading efforts locally
- CDPHE coordinating statewide planning/response efforts, providing vaccine
- Plan/Prepare -- Focus on community organization partnerships to reach at-risk populations, especially preventive vaccine (over 8000 doses provided to at-risk groups so far)
- Case Investigation -- prompt and thorough; conducted by LPHAs; providing PEP is a priority
- Outbreak Response -- increase vaccination and education efforts

Outbreak and Foodhandlers

- No Colorado outbreak cases have been employed as foodhandlers (several contacts have)
 - Monitor contacts for symptoms, implement restrictions based on situation
- Nationwide: ~3-5% of cases are foodhandlers
 - Most states report no known transmission from ill foodhandlers
 - No evidence to support universal foodhandler vaccination
 - Resources need to be directed to at-risk populations



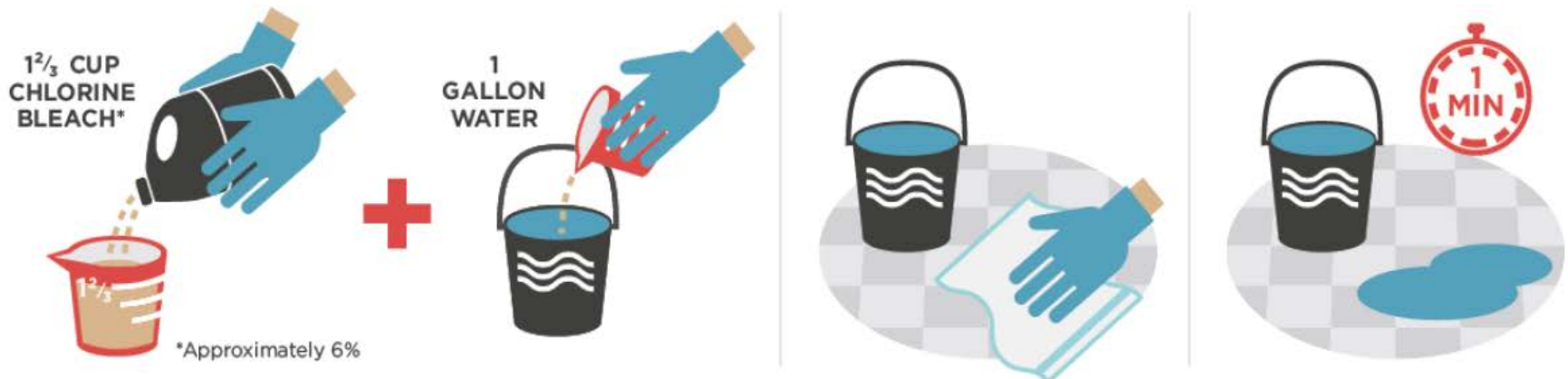
The Role of EH

EH and the Outbreak

- Roles vary based on LPHA structure and resources
- EH often consulted on:
 - Ill foodhandler or contact of a case who is a foodhandler
 - Disinfection guidance
 - Environmental measures to control spread
 - Hygiene advice (handwashing) and disease control

Hepatitis A Disinfection

- 5000 ppm bleach solution with 1 minute contact time
- Unknown role of disinfecting outside environments (eg, “bleaching the streets”)



Hygiene and Disease Control

- Handwashing
- Isolate ill people as much as possible while infectious
 - No food preparation
 - If possible, designate a bathroom for case to use
 - No sexual contact
- Cleaning/disinfecting potentially contaminated surfaces
- Post-exposure prophylaxis for contacts

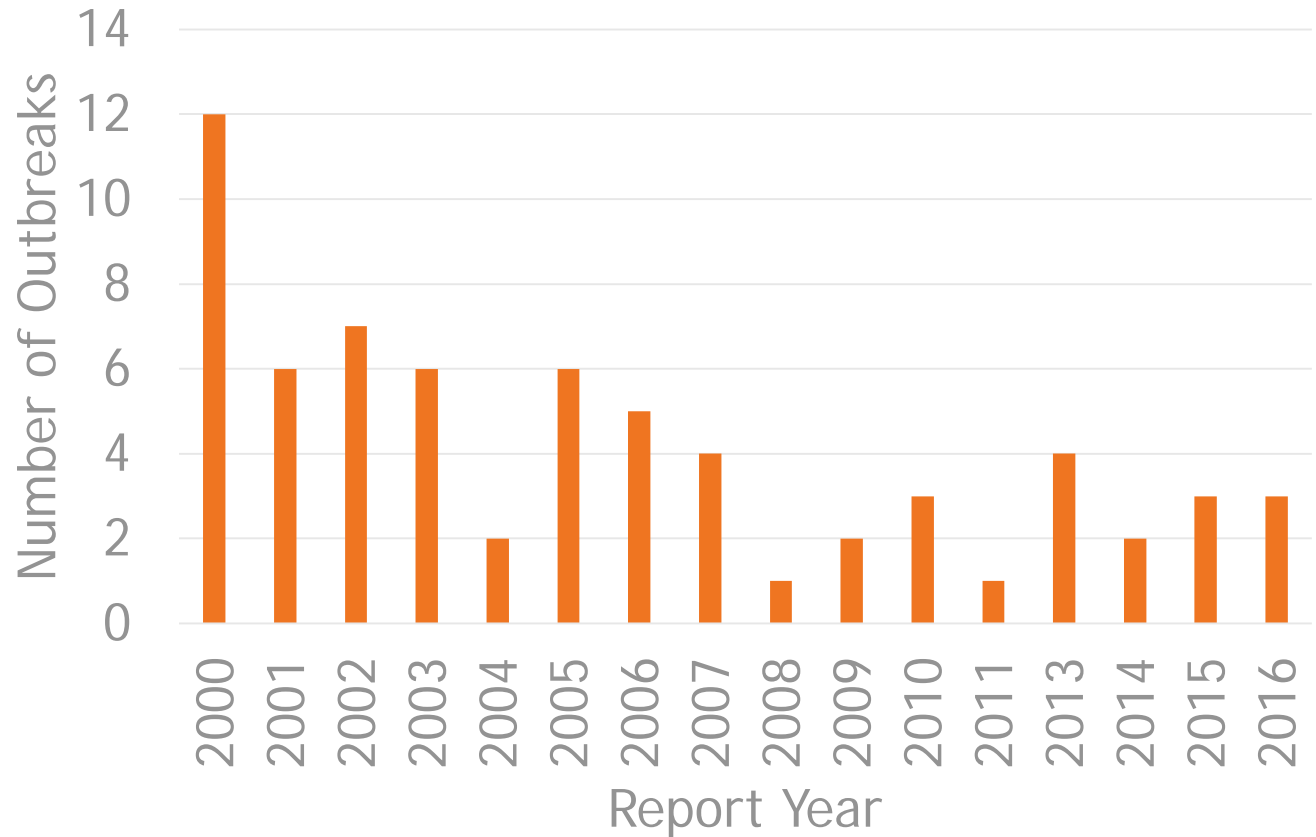
Hepatitis A Foodborne Outbreaks

- Uncommon
- Contamination can occur at any point
 - Cultivation → harvesting → processing → distribution → preparation
- Public health recognition of foodborne transmission challenging
 - Long incubation period = recall bias
 - Exposed persons may be immune (vaccine or previous disease)
 - Cases in multiple jurisdictions (commercially distributed products)
- Historically: infected food handlers at retail food establishments
- Recently: widely distributed contaminated food products (and food handlers)
- Foodhandlers NOT at increased risk for HAV because of their occupation
- Majority of food handlers infected with HAV do not transmit it



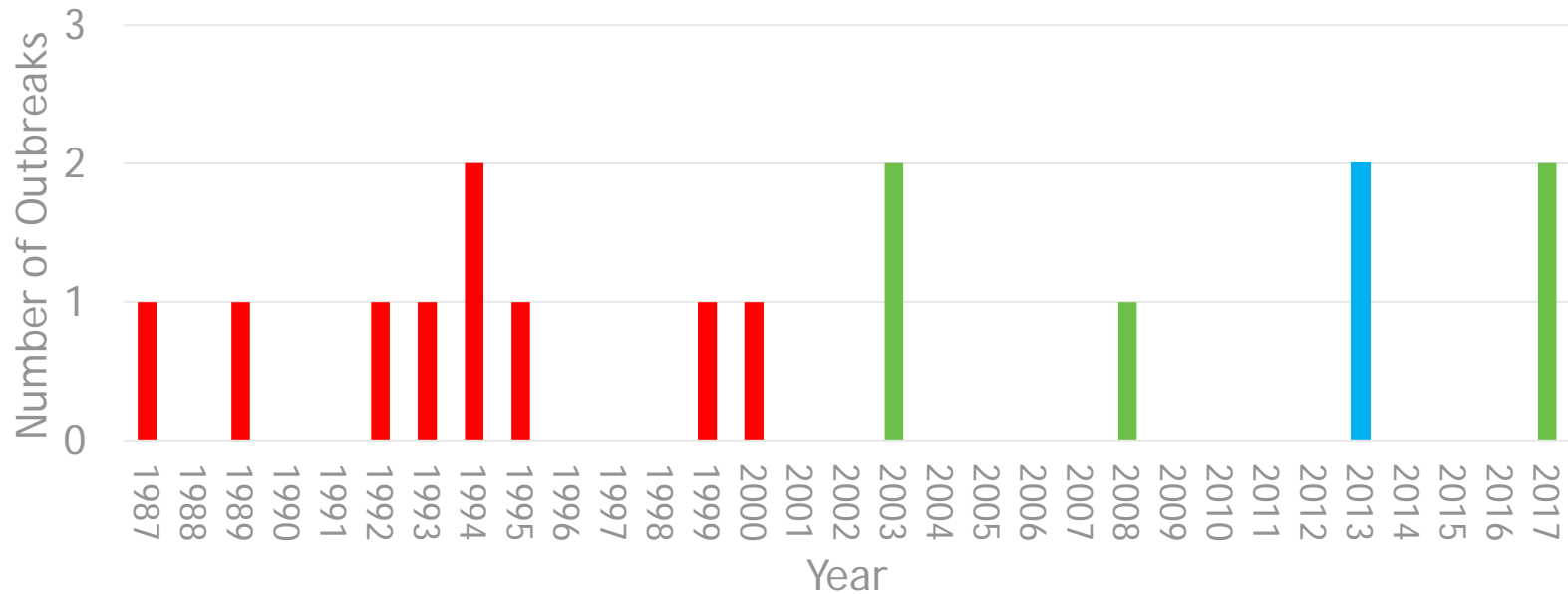
Foodborne outbreaks of hepatitis A, US, 2000-2016 (N=67)

Data source: CDC FOOD Tool
<https://www.cdc.gov/foodborneoutbreaks/>



Average number of ill persons per outbreak: 33 (range 2 - 935, median 40)

Hepatitis A outbreaks and transmission mode, CO, 1987-2017 (N=17)



- Other or Unknown
- Contaminated commercially distributed food product
- Ill food handler

Food handler diagnosed with HAV: Public health response

- Confirm the diagnosis!!!
- Timely interview and response
- Investigate suspected cases that occur in food handlers
- Joint involvement of EH and Epi

Food handler diagnosed with HAV:

8 steps

- 1) Exclude from work immediately, and for 7 days after jaundice onset (or 14 days after symptom onset if no jaundice)
- 2) Environmental assessment at facility/ies where case works
- 3) Complete worksheet for EH Assessment (see Hepatitis A Manual)
- 4) Administer PEP to other food handlers at the establishment who are NOT previously vaccinated or who do NOT have a history of disease
- 5) Educate food establishment employees about the disease
- 6) Set up monitoring at facility for additional employee (and patron) cases for 50 days from the end of the transmission risk period
- 7) Other employees with symptoms or concerning laboratory tests are excluded until public health can assess the employee
- 8) Periodic EH visits over transmission risk period

Assessing Transmission to Patrons



Prevention of Hepatitis A Through Active or Passive Immunization

Recommendations of the Advisory Committee on Immunization Practices (ACIP)



- Based on findings of case investigation and environmental assessment
- PEP may be offered to patrons if the following 3 conditions are met:
 - Infected food handler had poor hygiene OR worked with diarrhea
 - Infected food handler handled high-risk foods with bare hands
 - It has been 14 days or less since potentially contaminated foods were served

Source:

<https://www.cdc.gov/mmwr/pdf/rr/rr5507.pdf>

Notifying patrons

- Sample messaging/press release in Hepatitis A Manual
- Message needs to be very specific:
 - Characterize risk
 - Specific dates/times persons could have been exposed
 - Specific risky food items
 - Who gets IG vs vaccine
 - Time limitations around getting PEP

Questions?

- Nicole Comstock - 303-692-2676, Nicole.Comstock@state.co.us
- CDPHE Communicable Disease Branch 303-692-2700
- Hepatitis A Manual
<https://www.colorado.gov/pacific/cdphe/communicable-disease-manual>