HEPATITIS A

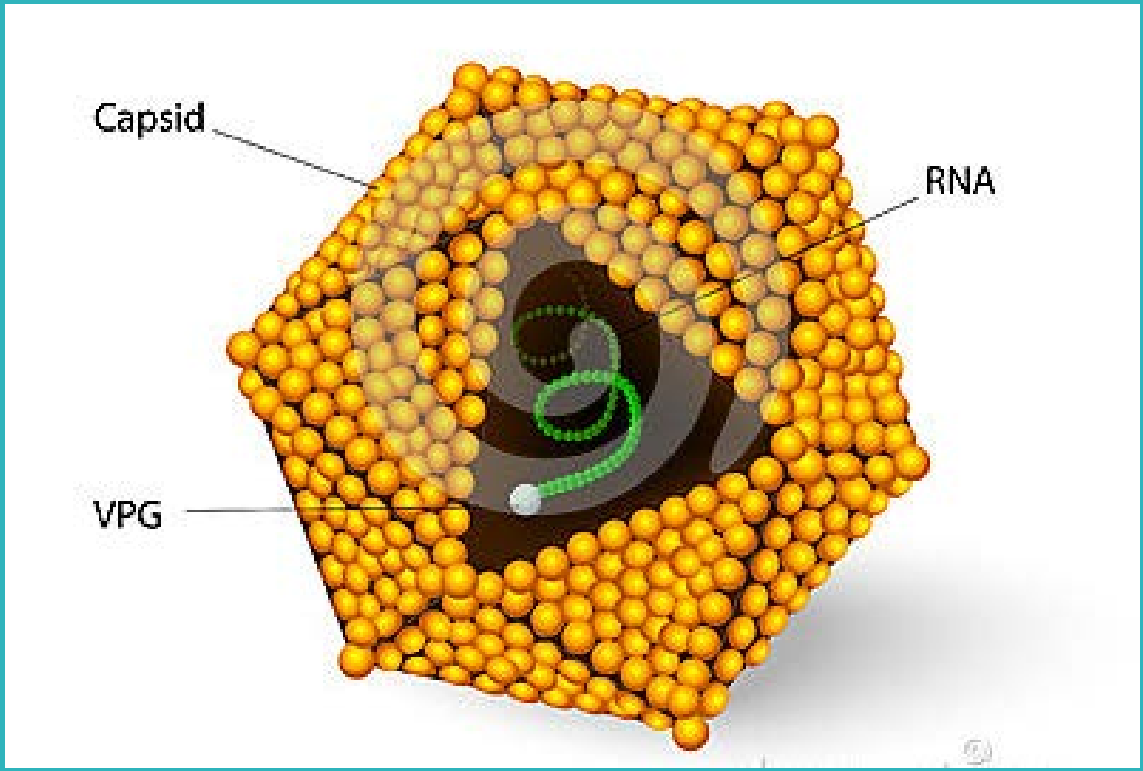
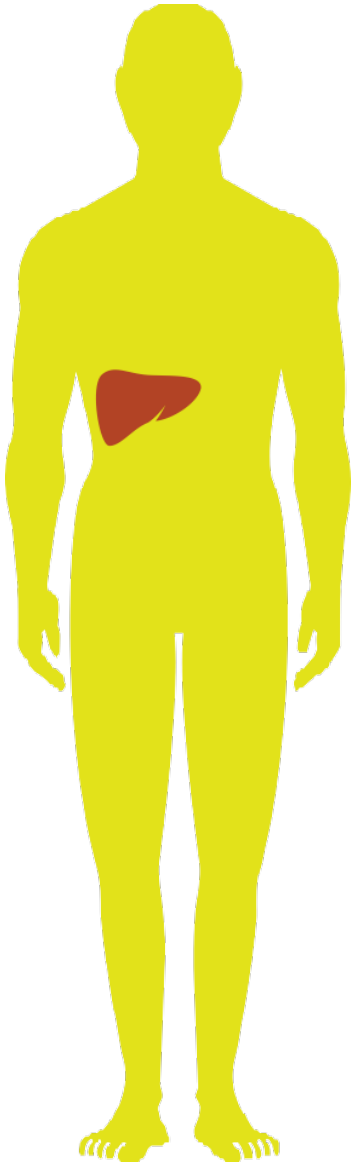


Image Credit: CDC

WHAT IS HEPATITIS?

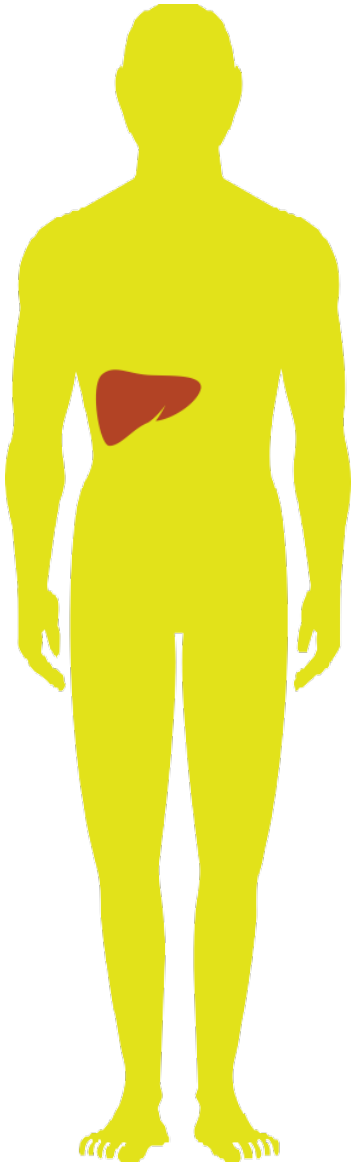
- **Hepatitis is an infection or inflammation of the liver**

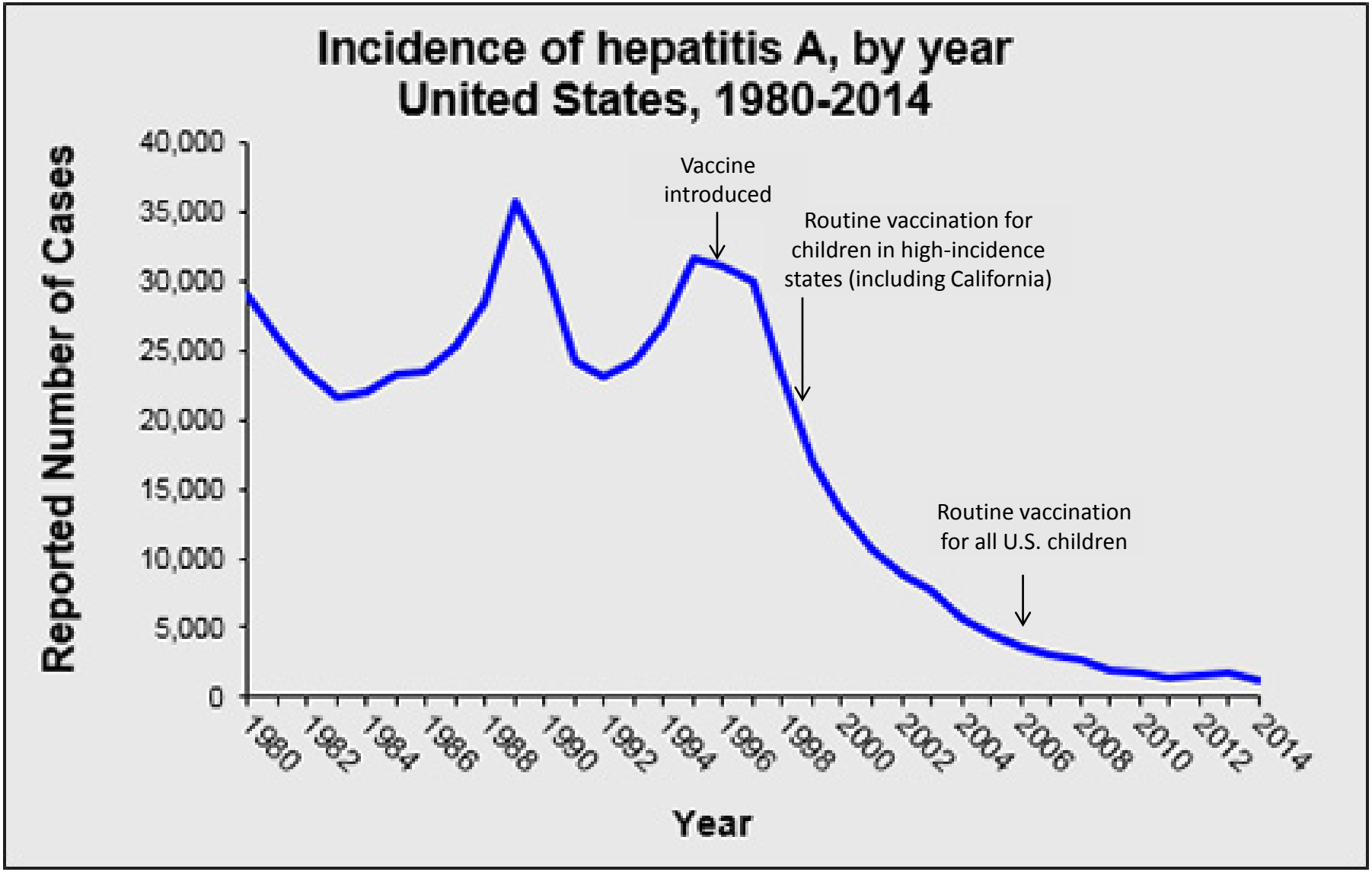
- **Can be caused by:**
  - **Viruses**
  - **Drugs**
  - **Toxins**
  - **Bacteria**
  - **Parasites**
  - **Autoimmune diseases**



VIRAL HEPATITIS

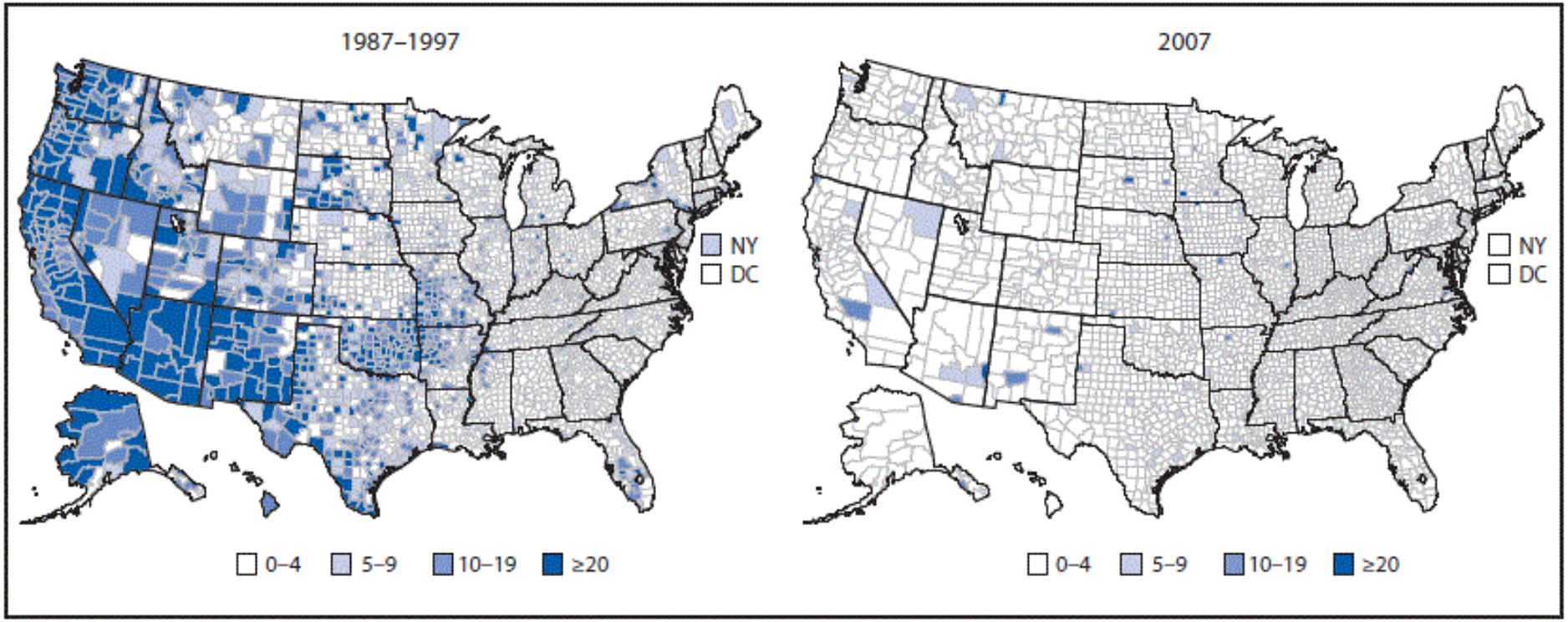
- Hepatitis A to G!
- Cytomegalovirus
- Epstein Barr virus
- Herpes simplex
- Flaviviruses (YF, dengue)
- Varicella





Source: CDC (adapted). Downloaded 3/7/17 from https://www.cdc.gov/hepatitis/hav/havfaq.htm

Incidence* of reported acute hepatitis A cases
National Notifiable Diseases Surveillance System, United States,
1987–1997† (pre-vaccine) and 2007



* Rate per 100,000 population.

† Annual average incidence.

Source: CDC. Downloaded 7/1/17 from:
https://www.cdc.gov/mmwr/volumes/65/su/su6501a6.htm

HEPATITIS A

- HAV can live outside the body for months, depending on the environmental conditions
- HAV is killed by heating to >185°F (>85°C) for one minute
- HAV survives prolonged storage at 4° C or below
- Adequate chlorination of water kills HAV that enters the water supply
- Average incubation period for HAV is 28 days (range: 15–50 days)

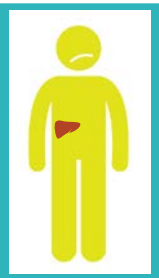
HEPATITIS A - SYMPTOMS

Fever

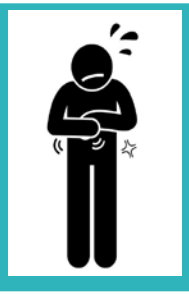
Fatigue

Nausea

Loss of Appetite



Jaundice



Stomach Pain

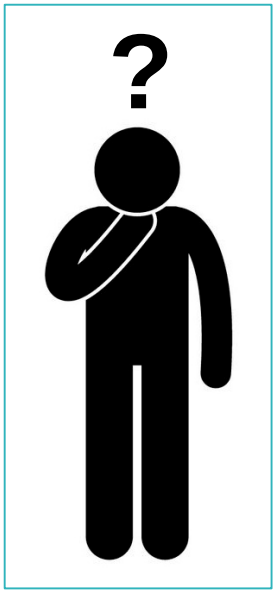
Vomiting

Dark Urine, Pale Stools and Diarrhea

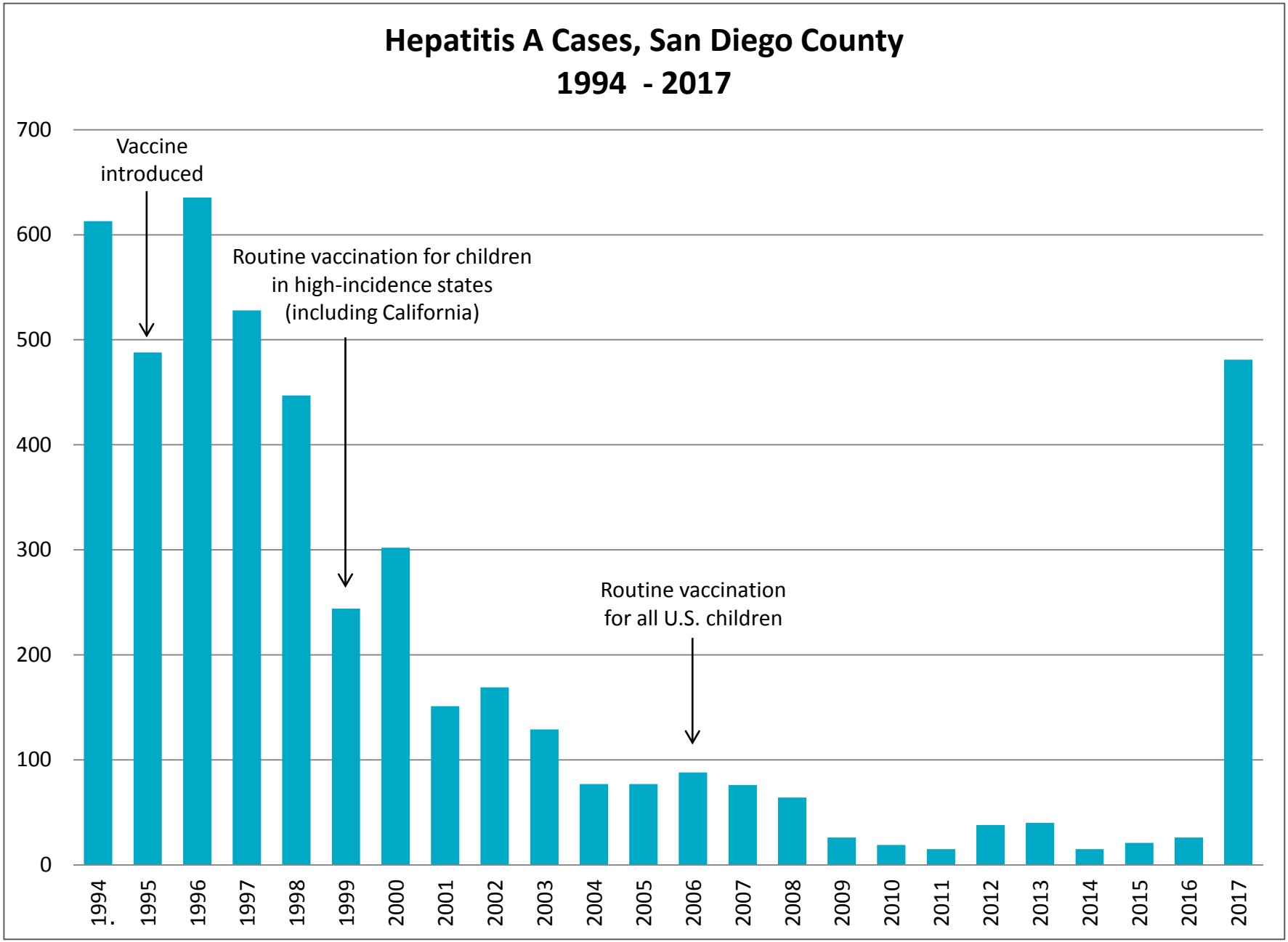
HEPATITIS A - SYMPTOMS

- **In kids <6 years, 70% of infections are asymptomatic; if illness does occur, typically no jaundice**
- **Among older children and adults, infection is typically symptomatic, with jaundice in >70%**
- **Symptoms usually last <2 months, although 10%–15% of symptomatic persons have prolonged or relapsing disease for up to 6 months**
- **Hospitalization required in about 20%, higher (>40%) in older adults**

HEPATITIS A – AT RISK

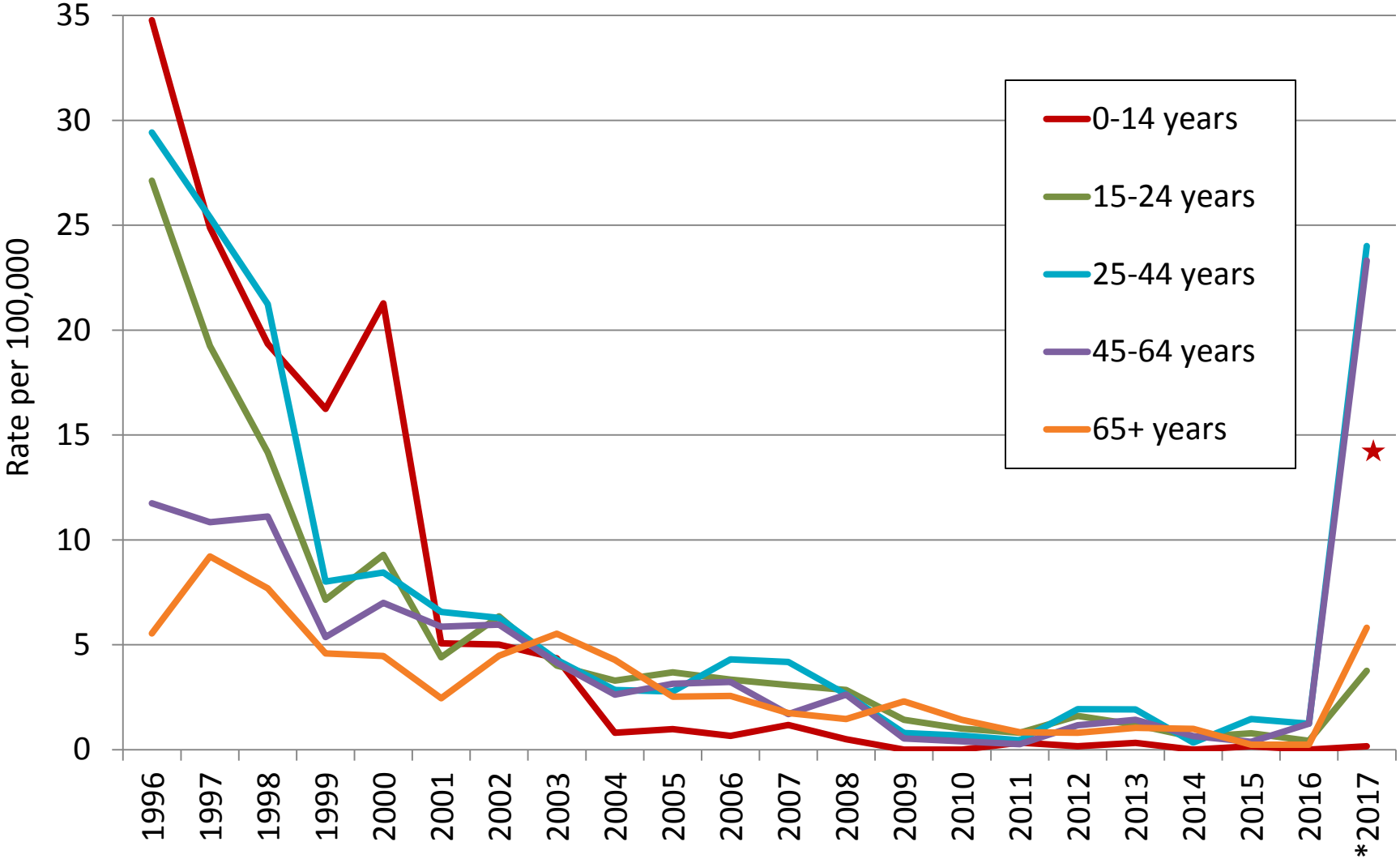


- Travelers to countries with high or intermediate endemicity of HAV infection
- Men who have sex with men
- Homeless
- Intravenous and non-intravenous illicit drug users
- People with chronic liver disease
- Persons with clotting factor disorders
- Persons working with nonhuman primates



Prepared by County of San Diego, Health & Human Services Agency, Public Health Services, Epidemiology & Immunization Services, 9/25/17

Rate of HAV Infection by Age, San Diego County 1996-2017*



*2017 year to date. Data current as of 9/5/2017. Data are provisional and subject to change as additional information becomes available.
Grouped by CDC disease years.

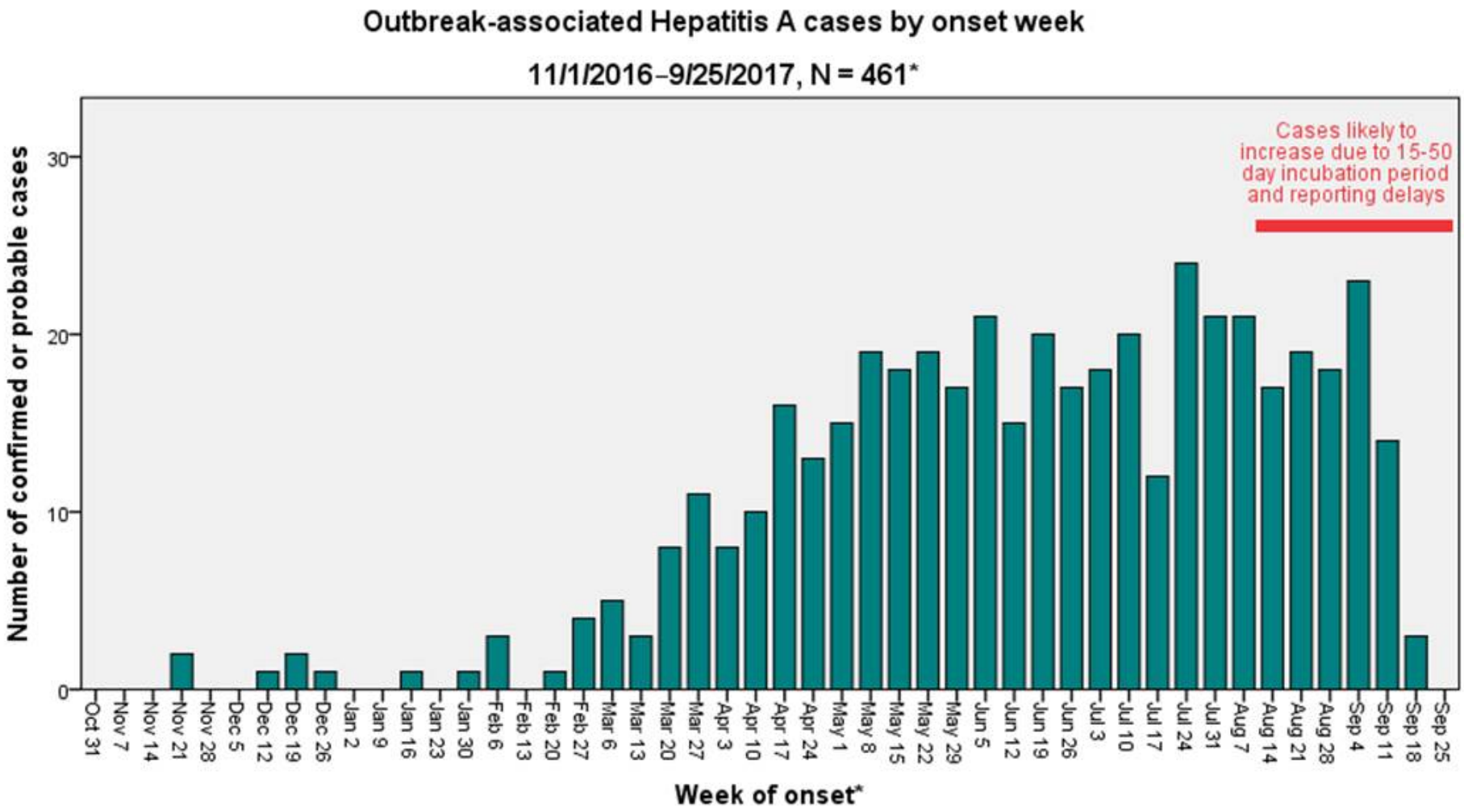
Prepared by County of San Diego, Health & Human Services Agency, Public Health Services, Epidemiology & Immunization Services, 9/18/17

HEPATITIS A, SAN DIEGO

- **461 confirmed outbreak cases from 11/22/16 thru 9/11/17**
  - **315 (68%) hospitalizations, 17 (3.7%) deaths**
  - **316 (69%) male, 145 (31%) female**
  - **Age range 5-87 (median 43)**
- **Suspected Exposure Type**
  - **154 (33%) homeless and illicit drug use**
  - **78 (17%) homeless only**
  - **56 (13%) illicit drug use only**
  - **116 (25%) neither**
  - **57 (12%) unknown**

HEPATITIS A, SAN DIEGO

- **Co-infections**
  - **64/340 (20%) with hepatitis C**
  - **18/344 (5%) with hepatitis B**
- **29 non-outbreak (travel) cases not included in outbreak count**
- **49 cases under investigation**
  - **1 deaths**
- **Linked cases in other CA counties, AZ, CO, RI, UT**



*Date of specimen collection or report used if onset date unknown; dates may change as information becomes available

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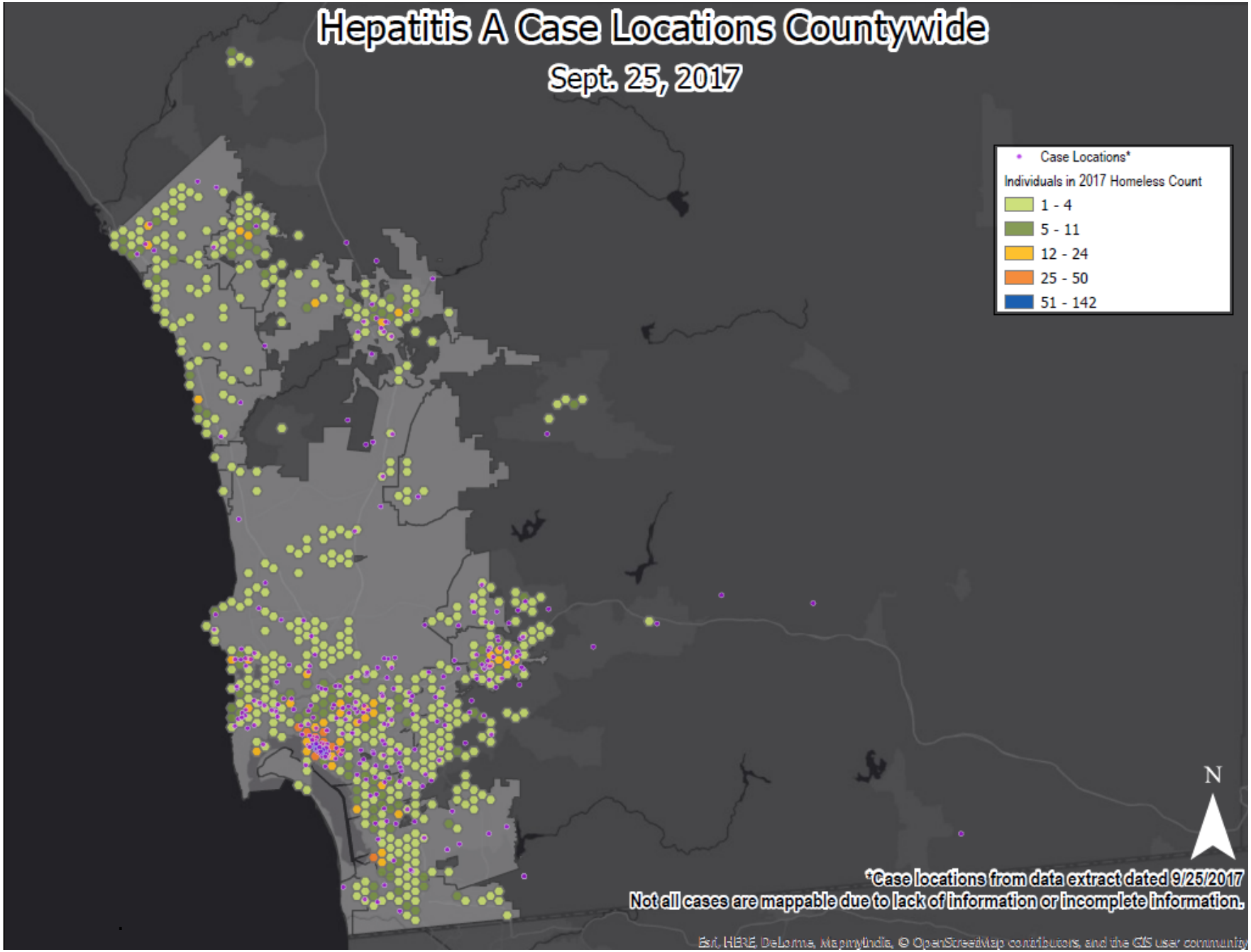
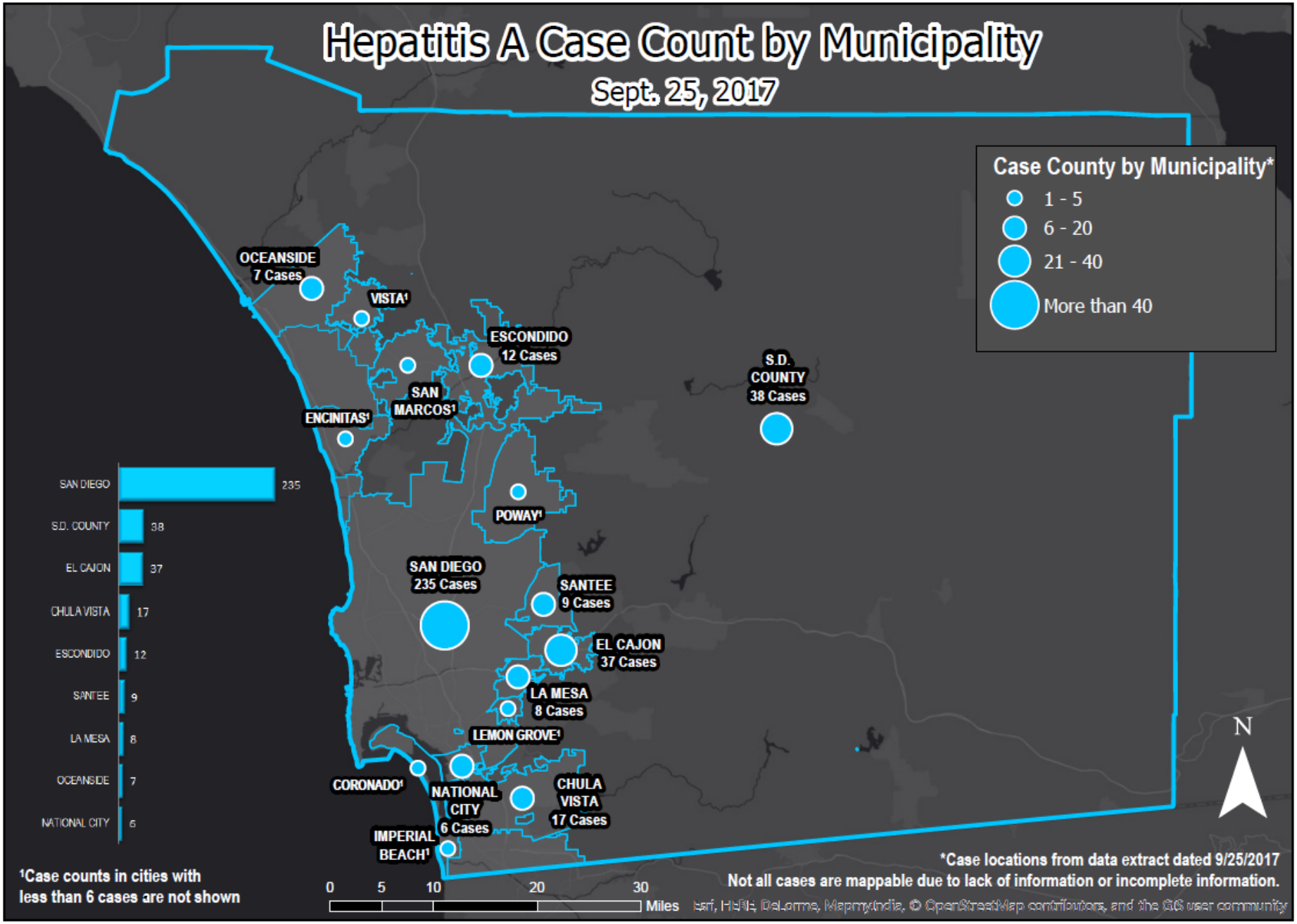


Prepared by County of San Diego, Health & Human Services Agency, Office of Business Intelligence, 9/25/17



Prepared by County of San Diego, Health & Human Services Agency, Office of Business Intelligence, 9/25/17

PUBLIC HEALTH ACTIONS

- **Seven health alerts (recent CAHAN 8/16/17), eight news stories and webpage established**
- **Public ad campaign began in early August**
- **Local public health emergency declared on 9/1/17**
- **Continued partnering with community stakeholders to increase vaccination, awareness**
- **Working closely with DEH on possible food sources**

PUBLIC HEALTH ACTIONS

- **Case investigations, post-exposure prophylaxis, surveillance, public education ongoing**

- **Local recommendations for occupational vaccination**
  - **All food handlers in county**
  - **Healthcare workers who work with at-risk populations (includes EMS)**
  - **Sanitation workers**
  - **Public safety workers who work with at-risk**
  - **Homeless services providers and volunteers**

- **ANY person who desires immunity can get vaccinated!**

PUBLIC HEALTH ACTIONS

- >42,000 total vaccines administered across the county as of Sept 23
- 15,622 given by County staff through field events (e.g., foot teams, mobile vans, and mass vaccination clinics), jails/detention centers, public health centers, and County Psychiatric Hospital.
- 22,406 provided by health care systems, federally qualified health centers, and pharmacists.
- 682 vaccinations provided as post exposure prophylaxis.
- Unique opportunities such as vaccinating at jail intake, Emergency Departments, behavioral health institutions, with Homeless Outreach Team police

LIVE WELL
SAN DIEGO

For more information contact:

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INFECTION CONTROL

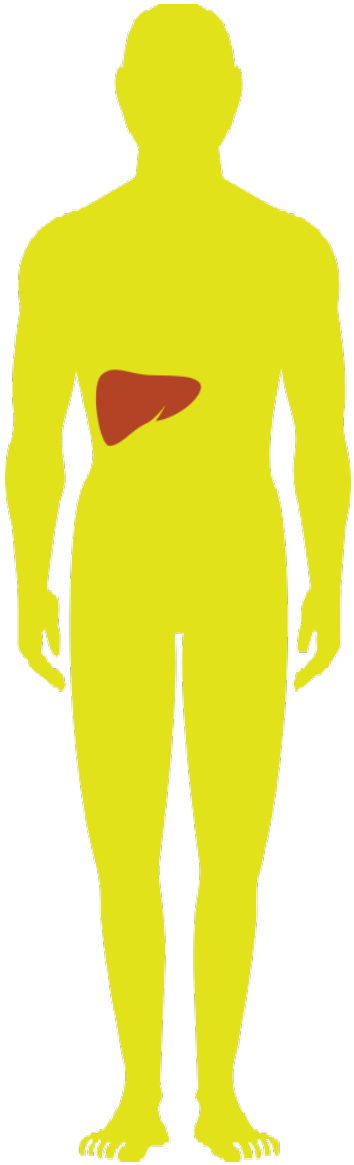
- **Wash hands with soap and running water for at least 20 seconds before eating and after using a restroom.**

- **Use employee-designated restrooms when available, and do not touch the door handle directly when exiting a restroom.**

- **Don’t use a cell phone in the restroom, don’t eat with a cellphone**

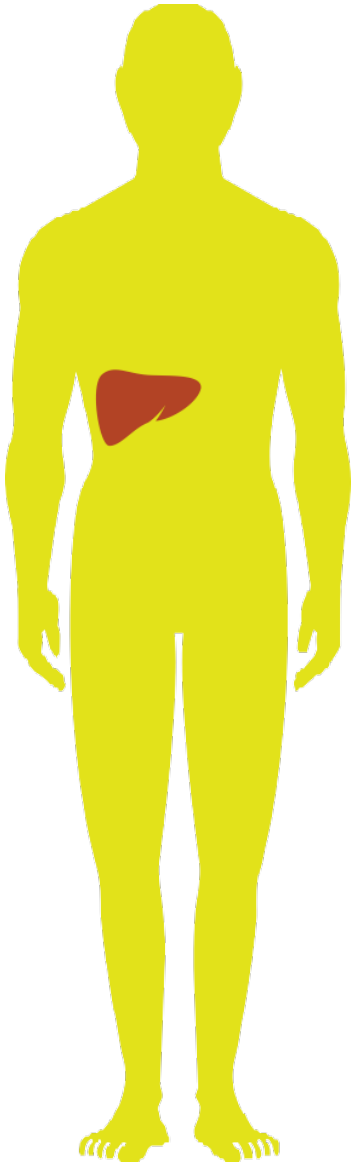
- **Perform environmental cleaning in public areas with bleach products or other products effective against norovirus.**

BACK UP SLIDES

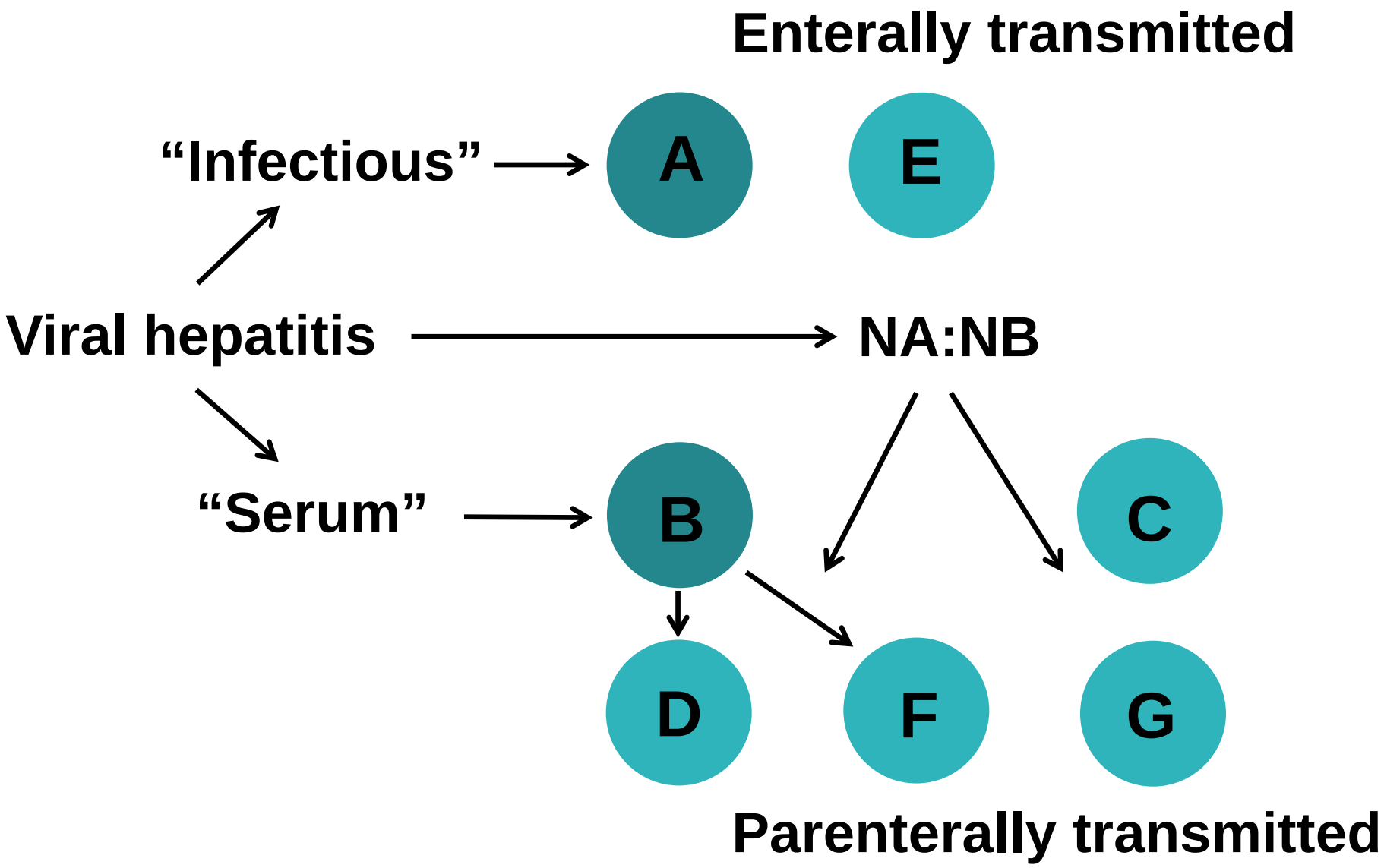


VIRAL HEPATITIS

- **Hepatitis A – picornavirus (1973)**
- **Hepatitis B – hepadnavirus (1970)**
- **Hepatitis C – flavivirus (1988)**
- **Hepatitis D – unassigned (1977)**
- **Hepatitis E – hepevirus (1983)**
- **Hepatitis F – mutant of HBV**
- **Hepatitis G – flavivirus (1995) (GBV-C)**



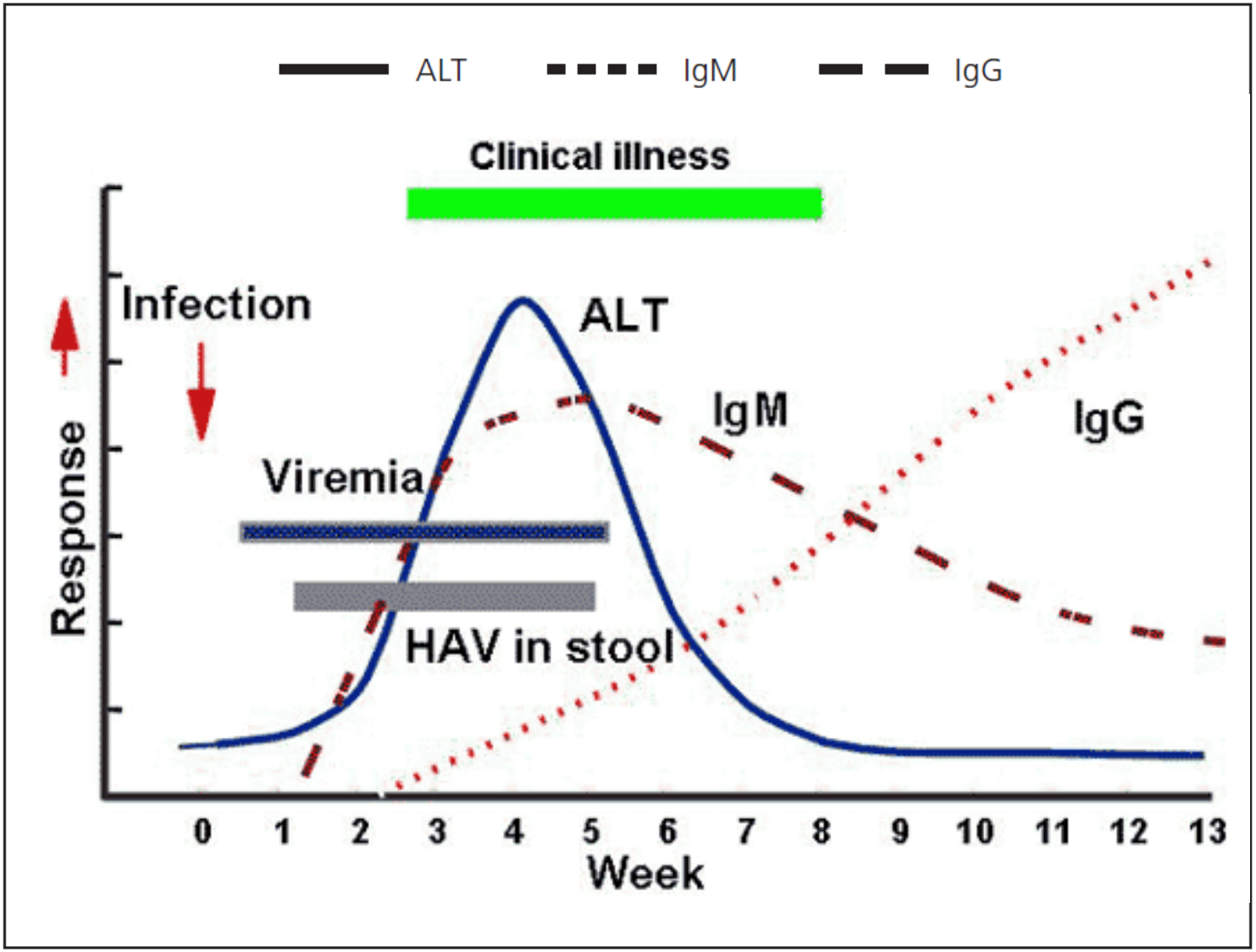
VIRAL HEPATITIS



VIRAL HEPATITIS

	A	B	C	D	E
Source	Feces	Blood Body fluids	Blood Body Fluids	Blood Body fluids	Feces
Route	Feco-oral	Percutaneous Permucosal	Percutaneous Permucosal	Percutaneous Permucosal	Feco-oral
Chronic	No	Yes	Yes	Yes	No
Prevention	Immunization Hygiene	Immunization Blood donor screening	Blood donor screening	Immunization	Safe water Hygiene

Timeline for hepatitis A manifestations.
(ALT = alanine transaminase; HAV = hepatitis A virus; Ig = immunoglobulin.)



Source: CDC. MMWR 2004;53(RR-4):17

HEPATITIS A – DX, RX

- **Hepatitis IgM is part of most hospital "viral hepatitis panels"**
- **IgM is sensitive, but not specific (lots of cross-reactivity with other acute viral illnesses)**
- **IgM test may exhibit interference collected when from someone consuming supplements with a high dose of biotin (vitamin B7 or B8, vitamin H, or coenzyme R)**
- **Do not order IgM/IgG before vaccination – not useful for determining presence of immunity to HAV from either past HAV infection or vaccination against HAV**
- **Treatment is supportive**

HEPATITIS A – COMPLICATIONS

- **Relapsing hepatitis – up to 10% have relapse in the 6 months after acute illness**
  - Duration of clinical relapse is generally less than 3 weeks, although biochemical relapse may last as long as 12 months.
  - Cause unknown, no predisposing factors identified
  - Clinical course usually consists of apparent clinical recovery after acute infection with near normalization of the serum aminotransferases, followed by biochemical (and, in some cases, clinical) relapse
  - Clinical manifestations of relapse are often milder than the initial episode, **but they are infectious again**!
  - Multiple relapses can occur.

HEPATITIS A – COMPLICATIONS

- **Cholestatic hepatitis – reported in 5%**
  - Prolonged cholestasis is characterized by a protracted period of jaundice (lasting >3 months
  - Course usually characterized by marked jaundice, pruritus, fever, weight loss, diarrhea, and malaise
  - Laboratory findings include markedly elevated serum bilirubin (often >10 mg/dL) and alk phos, modest elevation of serum aminotransferases, and elevated serum cholesterol; peak bilirubin levels may be reached in 8th week or later.
  - Resolves spontaneously with no sequelae; recognition is important to avoid unnecessary testing. US appropriate to exclude biliary obstruction; cholangiography, liver biopsy are usually not needed

HEPATITIS A – COMPLICATIONS

- **Fulminant hepatic failure – less than 0.1%**
  - Development of severe acute liver injury with encephalopathy and impaired synthetic function (international normalized ratio [INR] ≥1.5)
  - Occurs most commonly in individuals >50 years of age and individuals with other liver diseases such as hepatitis B or C

- **Autoimmune hepatitis – rare**
  - HAV infection may serve as a trigger for development of autoimmune hepatitis in susceptible individuals
  - Chronic hepatitis characterized by hyperglobulinemia, presence of circulating autoantibodies (such as anti-nuclear, anti-smooth muscle, and/or anti-actin antibodies), & inflammatory changes on liver histology

HEPATITIS A – PRE-EXPOSURE PROPHYLAXIS

Vaccine	Age	Dose	# of doses	Schedule
Havrix	12 months to 18 years	720 ELISA units per 0.5cc	2	0* and 6 to 12 months
	18 years and older	1,440 ELISA units per cc	2	0* and 6 to 12 months
Vaqta	12 months to 18 years	25 U per 0.5cc	2	0* and 6 to 18 months
	18 years and older	50 U per cc	2	0 and 6 to 18 months
Twinrix	18 years and older, regular schedule	720 ELISA units/20 mcg per cc	3	0*,1, and 6 months
	18 years and older, accelerated schedule	720 ELISA units/20 mcg per cc	4	Days 0*,7, and 21 to 30, with a booster at 12 months

ELISA = enzyme-linked immunosorbent assay.
* - 0 represents initial dose.

HEPATITIS A – POST EXPOSURE PROPHYLAXIS

- **Susceptible people exposed to hepatitis A virus (HAV) should receive a dose of single-antigen HAV vaccine or intramuscular (IM) immune globulin (IG) (0.1 mL/kg) or both as soon as possible within 2 weeks of last exposure.**

- **The efficacy of combined HAV/Hepatitis B virus (HBV) vaccine for PEP has not been evaluated, so it is not recommended for PEP.**

- **Detailed information on PEP may be found on the CDPH Hepatitis A Postexposure Prophylaxis Guidance Quicksheet (updated August 2016).**

CDPH Hepatitis A Postexposure Prophylaxis Guidance Quicksheet

Age/years	<1*	1-40	41-59	60-74*	75+
Healthy	IG	Vaccine preferred	Vaccine and/or IG	IG; vaccine if IG is in short supply	IG
Other†	IG	IG	IG	IG	IG
	Consider vaccine + IG for possible longer-term protection				

*When IG is unavailable or in short supply, single-antigen HAV vaccine may be used for PEP in healthy people 60-74 years of age and in infants >6 months of age.

† Examples: persons with chronic liver disease (e.g., cirrhosis); immune compromised persons, including persons with HIV/AIDS; people undergoing hemodialysis; those who have received solid organ, bone marrow or stem cell transplants; patients receiving high dose steroids (>2mg/kg/day); those receiving chemotherapy, immunomodulators and/or biologic medications; and persons who are otherwise less capable of developing a normal response to immunization

INFECTION CONTROL

- **HAV, like norovirus, is a non-enveloped virus, and it may be similarly difficult to inactivate in the environment.**

- **Alcohol-based hand rubs and typically-used surface disinfectants may not be effective.**

- **WASH YOUR HANDS!**