

# **2013 Multi-state Outbreak of Hepatitis A Linked to Frozen Berries**



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# Hepatitis A: basics



- RNA virus
- Fecal-oral transmission (person-to-person; contaminated food or water)
- Incubation period: 15 to 50 days, avg. of 28-30 days
- No chronic form
- Illness = lifelong immunity
- 70% of infected children <6 years asymptomatic
- Illness in older children and adults can be severe
- Resistant to heat (>185 F)

# Hepatitis A: risk factors



- Travel
- Men who have sex with men
- IDUs and non-injection illegal drugs
- Persons with clotting factor disorders
- Persons working with nonhuman primates

# Hepatitis A: signs and symptoms



When symptoms occur, they usually occur abruptly:

- Fever
- Fatigue
- Loss of appetite
- Nausea
- Vomiting
- Abdominal pain
- Dark urine
- Clay-colored bowel movements
- Joint pain
- Jaundice

# Hepatitis A: case definition (2012)



- **Clinical Description**

- An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated serum alanine aminotransferase (ALT) or aspartate aminotransferase (AST) levels.

- **Laboratory Criteria for Diagnosis**

- Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive

## Case Classification

- **Confirmed**

- A case that meets the clinical case definition and is laboratory confirmed, OR
- A case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)

# Hepatitis A IgM positive: case vs. non-case



**Table 1. Clinical and Laboratory Characteristics of Acute Hepatitis A Investigations\*, New Mexico, 2006-2007**

<b>Characteristic</b>	<b>Consistent with case definition (n=28)</b>	<b>Not consistent with case definition (n=72)</b>
Mean age (years)	31	50
Sex (%female)	43% (12/28)	60% (43/72)
Anti-HAV IgM positive	100% (28/28)	65% (47/72)
Jaundice	79% (22/28)	3% (2/72)
Median ALT	1462 (26/28)	129 (29/72)
Median AST	1240 (24/28)	109 (26/72)
Identified risk factor	46% (13/28)	7% (5/72)

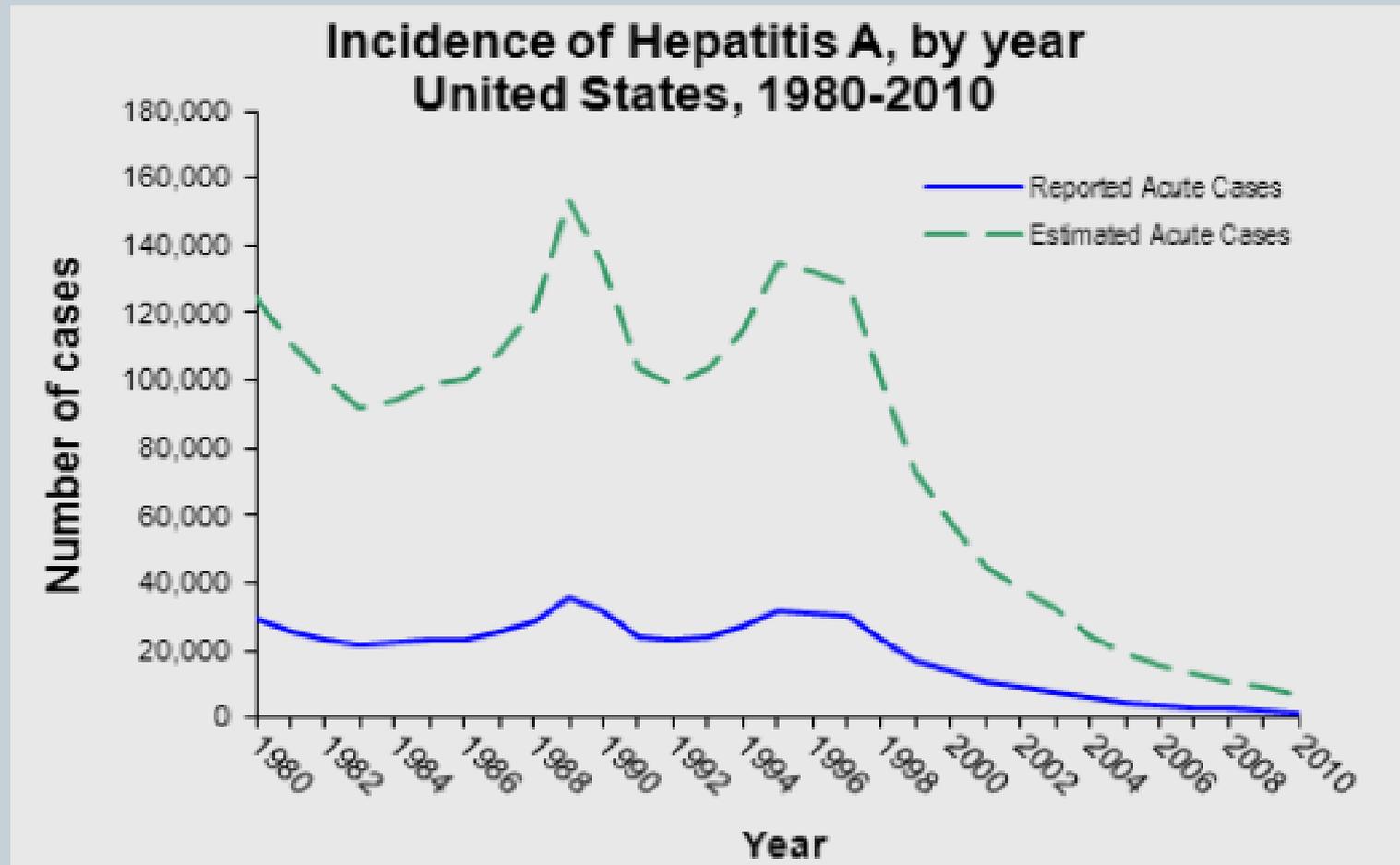
\* Data from NM-EDSS. All investigations, except for a resident of Mexico who was diagnosed in New Mexico, were included in this analysis.

# Hepatitis A: prevention



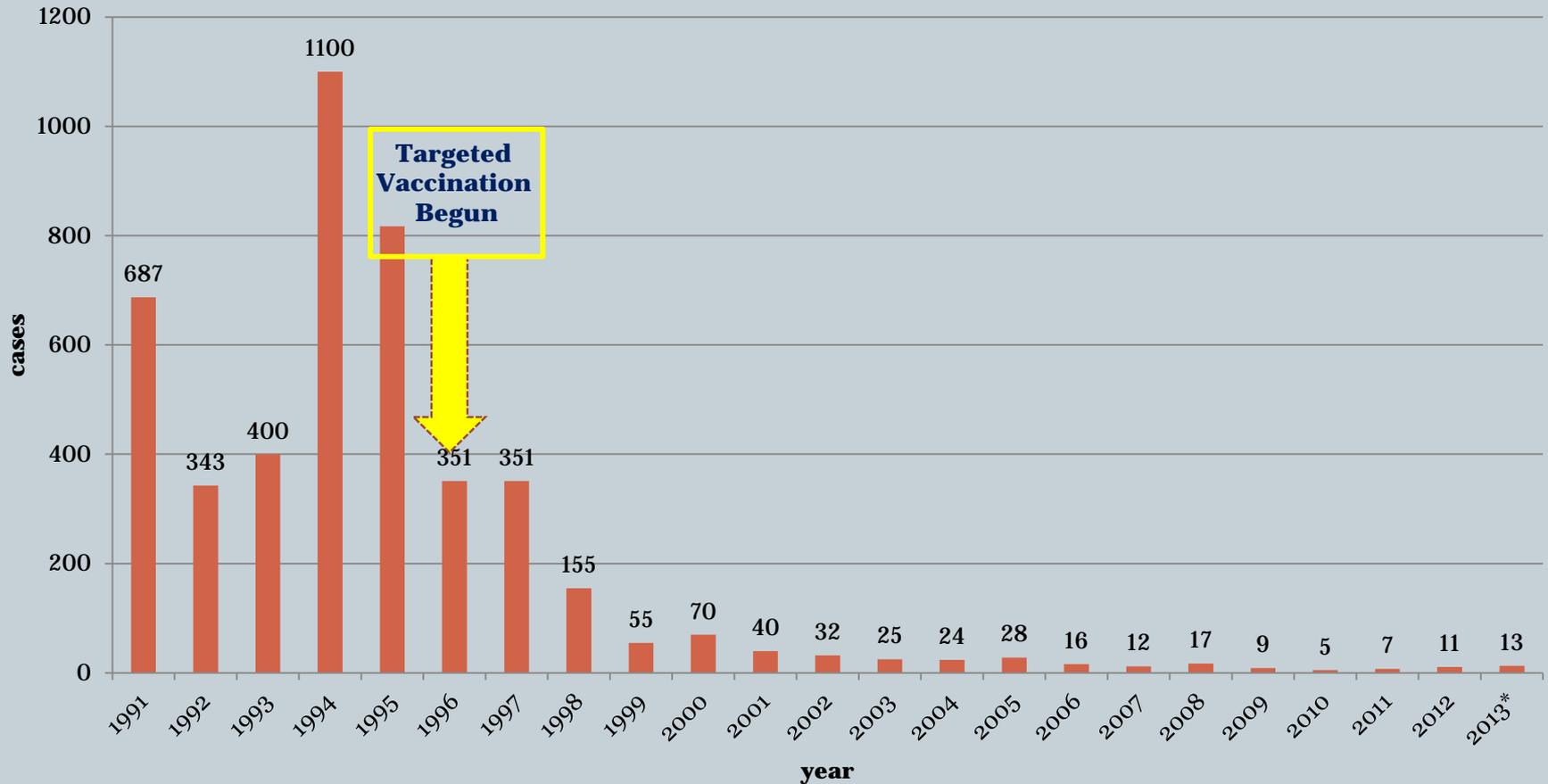
- Hepatitis A was most commonly reported vaccine-preventable disease in the pre-vaccine era
- Since 1995, hepatitis A vaccine licensed in the United States
- May be given starting at 12 months of age
- 2 dose series for children (initial and 6-12 months later); adults may get 2 dose or 3 dose hep A/hep B combined series (Twinrix)
- Highly effective vaccine (95% protected after on dose; 99% after 2 doses)

# Hepatitis A: United States



Data from CDC @ <http://www.cdc.gov/hepatitis/HAV/HAVfaq.htm>

# Hepatitis A: New Mexico incidence, 1984-2013\*



\*Data from NETSS legacy data and NM-IBIS; 2013 data are preliminary.

# 2013 hepatitis A outbreak linked to frozen mixed berries: New Mexico connection



- May 8, 2013: anti-HAV IgM positive report received
- 51 year-old Non-Hispanic, White male from Bernalillo County ; no identifiable common risk factors
- Acute onset of abdominal pain, fever, nausea, vomiting on April 25, 2012; jaundice onset on May 2, 2013
- May 2, 2013: ALT = 3804 and AST = 3259
- Met case definition
- Not hospitalized

# 2013 hepatitis A outbreak linked to frozen mixed berries: New Mexico connection



- May 13, 2013: anti-HAV IgM positive report received
- 54 year-old Non-Hispanic, White male from Bernalillo County with no identifiable common risk factors
- Acute onset of abdominal pain, fever, nausea, vomiting on May 1, 2013, 2012; jaundice onset on May 1, 2013
- May 5, 2013: ALT = 10,980 and AST = 10,234
- Met case definition
- Hospitalized
- Epidemiologist called CDC to inquire if other cases without traditional risk factors reported recently

# **2013 hepatitis A outbreak linked to frozen mixed berries: New Mexico connection**



- Both cases shopped at Costco
- Both cases consumed same frozen mixed berry product
- Cases purchased other common foods at Costco
- No common local restaurants during the incubation period
- No apparent personal or social link between cases

# 2013 hepatitis A outbreak linked to frozen mixed berries: New Mexico connection



**5/14:**  
DOH  
contacts  
CDC re:  
2 cases

**5/20:** NM  
notifies CO, AZ,  
and NV of cases

**5/23:**  
First  
multi-  
state  
call  
with  
CDC,  
FDA

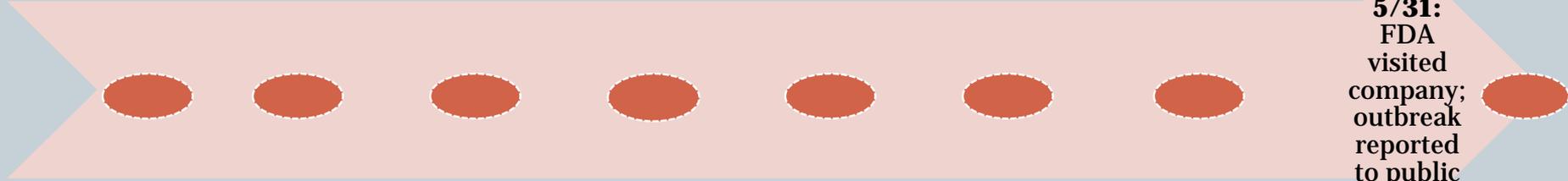
**5/29:** 2  
NM, 1  
NV case  
ate  
same  
product

**5/31:**  
FDA  
visited  
company;  
outbreak  
reported  
to public

**5/16:**  
Specimen  
to CDC for  
hepatitis  
molecular  
testing

**5/22:**  
CO  
posted  
EpiX

**5/28:** CDC confirms  
genetically identical 1B  
strain from the 2 NM  
samples



# 2013 hepatitis A outbreak linked to frozen mixed berries: New Mexico response



- Press release
- Web page developed with multiple tools for public, medical professionals and public health staff
- Outbreak and response team convened
  - Staff in all regions ready to respond, if necessary
  - 500 additional doses of hepatitis A vaccine shipped overnight
- Hepatitis A vaccine post-exposure prophylaxis clinics conducted in Albuquerque, Gallup and Farmington
- Multiple radio, television and print interviews



# **The Product: Townsend Farms Antioxidant Organic Mixed Berry Blend**

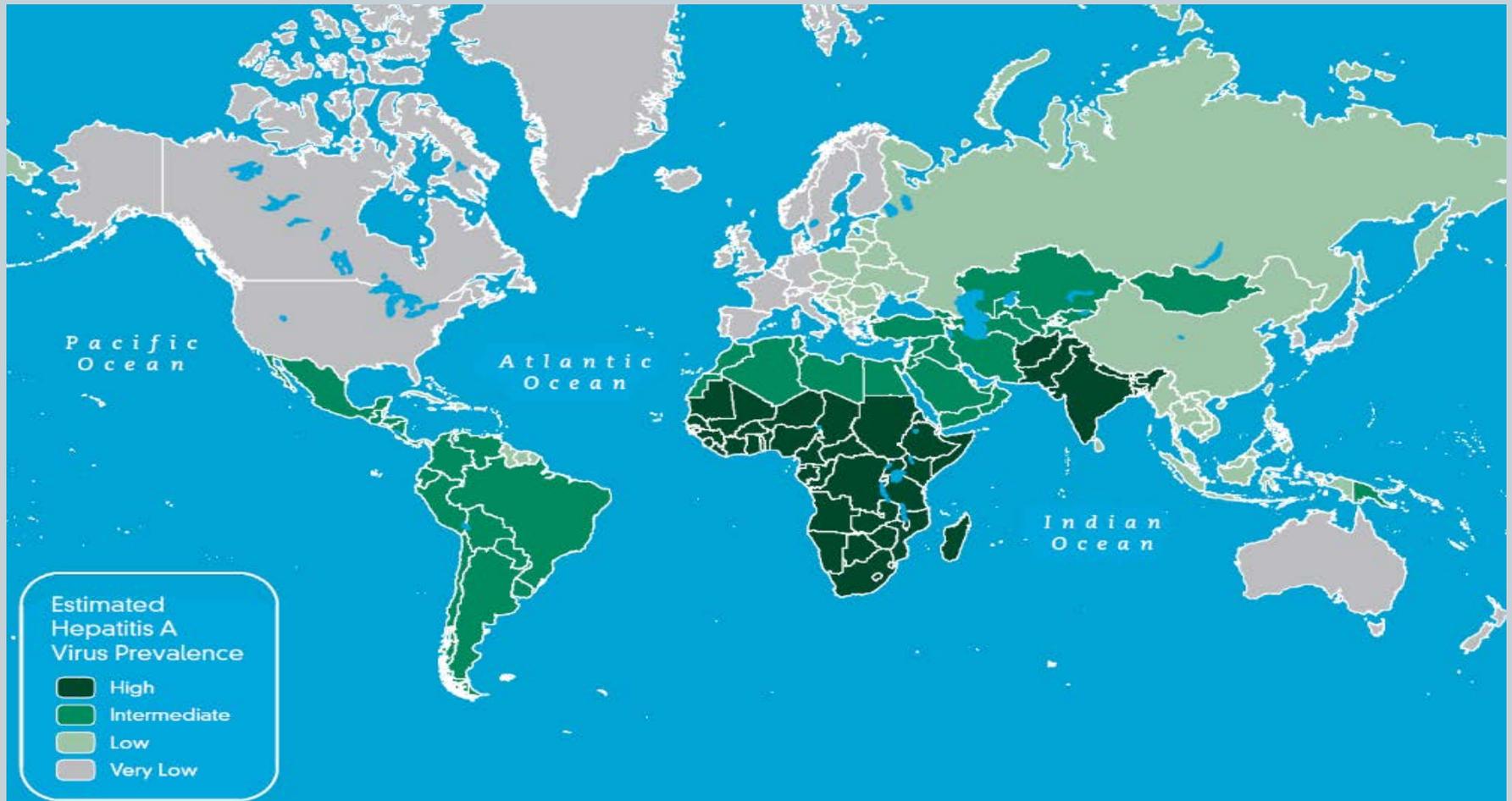


- **Townsend Farms (located in Oregon)**
- **Product consists of:**
  - Blueberries from United States
  - Raspberries from United States
  - Strawberries from Argentina
  - Cherries from Chile
  - Pomegranate arils from Turkey

# Do you know where your food comes from?



# Hepatitis A virus prevalence



# FDA traceback and traceforward



- FDA's traceback + CDC's epidemiological data = pomegranate seeds from Goknur Foodstuffs Import Export Trading of Turkey most likely source.
  - FDA detained shipments of pomegranate seeds from Goknur
  - Goknur pomegranate seeds also used by Townsend Farms to make the Townsend Farms and Harris Teeter Organic Antioxidant Blends and by Scenic Fruit Company to make the Woodstock Frozen Organic Pomegranate Kernels
  - FDA ensures that all recipients of these seeds are notified

# CDC viral hepatitis laboratory data



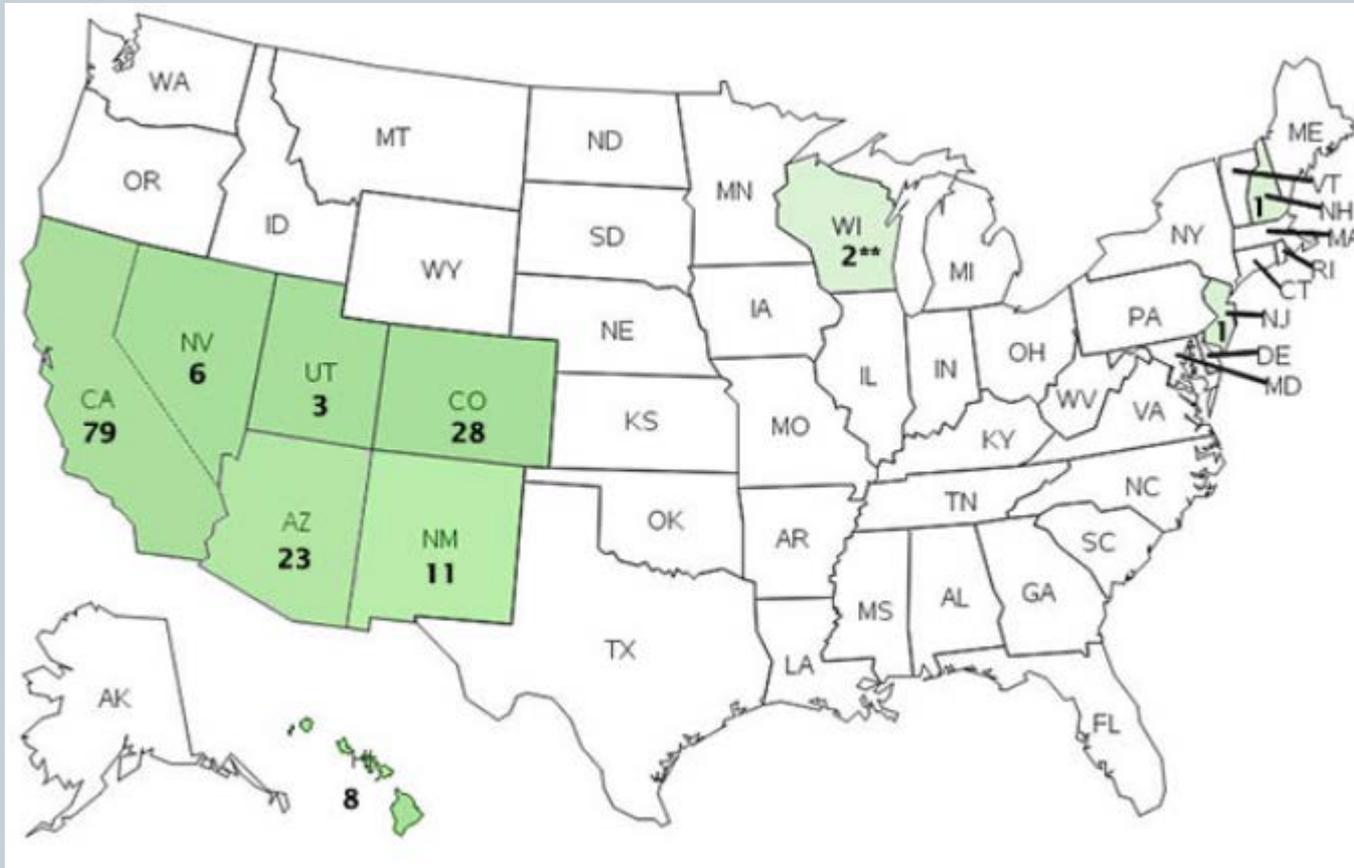
- New Mexico cases 1 and 2: HAV type 1B (genetically identical)
- 9 additional New Mexico cases; onsets from April 28<sup>th</sup> to Sept 1, 2013; all HAV genotype 1B; all genetically identical
- HAV genotype 1B is rare in the US, Argentina and Chile, but frequently seen in Middle East and North Africa

# 2013 hepatitis A outbreak linked to frozen mixed berries: update



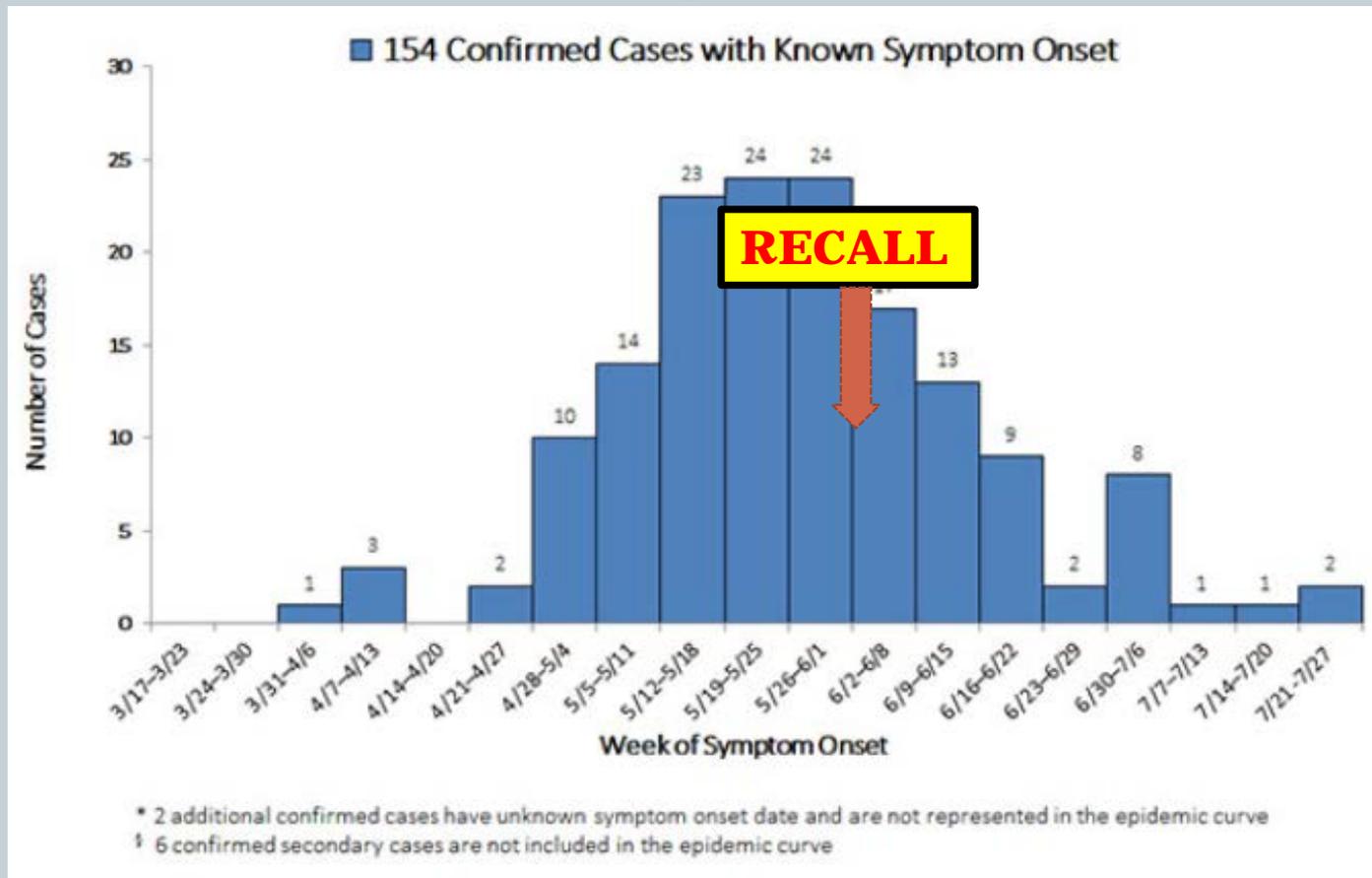
- As of September 20, 2013: 162 people in 10 states (AZ, CA, CO, HI, NH, NJ, NM, NV, UT and WI) positive for the major outbreak genotype 1B strain of hepatitis A virus
- 71 hospitalizations; no deaths
- 1B genotype also identified in:
  - 2013 outbreak of hepatitis A virus infections in Europe (frozen berries)
  - 2012 outbreak in British Columbia (frozen berry blend with pomegranate seeds from Egypt)
  - no evidence at this time that these outbreaks are related to the ongoing U. S. outbreak

# Case count map as of September 20, 2013



Map from CDC @ <http://www.cdc.gov/hepatitis/Outbreaks/2013/A1b-03-31/map.html>

# Epi curve by date of symptom onset as of August 1, 2013



# Atypical foodborne outbreak



- Multiple states/health jurisdictions
- Very long incubation between infection and illness (2-7 weeks)
- Potential for continuing common source (frozen product)
- Unlike bacterial foodborne outbreaks, no clear method for isolation of HAV from food
- Need for post-exposure vaccine prophylaxis

# Additional outbreak studies



- CDC PEP study
- CDC severity and economic impact study

# Thanks!



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