EXAMINING FALSE POSITIVE IGM ANTI-HAV IN MAINE

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BACKGROUND

Acute Hepatitis A Virus (HAV) Infection
- Liver disease characterized by malaise, nausea, stomach pain, dark urine, and jaundice
- Fecal-oral transmission (person-to-person, or via contaminated food, water, and raw or undercooked shellfish)
- Incubation period 15-50 days
- Positive Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) and elevated liver function tests

HAV in Maine
- Reportable condition
- 2006-2011 median number of cases per year was 6.5
- Maine CDC follows up on all suspect acute HAV infections in order to:
  - Rapidly implement preventive measures
  - Identify sources of public health concern
  - Characterize burden of acute HAV infections in the state

Figure 1. Hepatitis A Incidence, Maine and US, 2006-2011
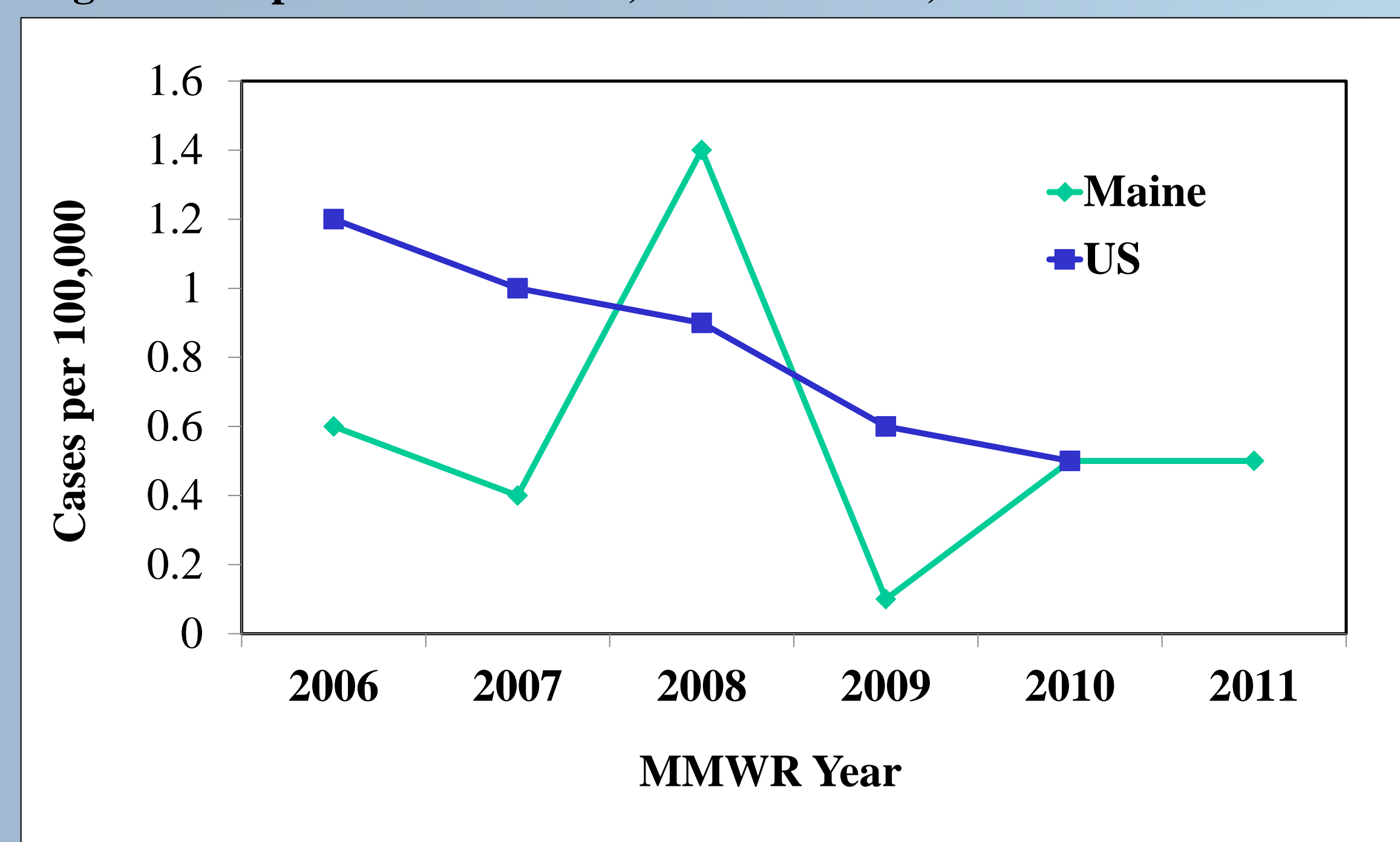
PURPOSE AND OBJECTIVES

Recent case investigations revealed a number of false positive IgM anti-HAV tests. This warranted taking a closer look to determine extent of false positive IgM anti-HAV tests in Maine.

Objectives
- Compare hepatitis A cases from 2006-2011 that met the 2011 case definition with those that had positive IgM anti-HAV without clinical or epidemiologic evidence of disease
- Describe characteristics that may explain a false positive IgM anti-HAV result

MATERIALS AND METHODS

Hepatitis A records were extracted from the National Electronic Disease Surveillance System (NEDSS). Statistical analysis software (SAS 9.3) was used to analyze records for cases of positive IgM anti-HAV that occurred in Maine between 2006 and 2011.

CDC/CSTE case definitions for acute hepatitis A were used to determine case classification. The case definition was the same for cases from 2006-2010. A new case definition was adopted in 2011 which is similar to the previous definition with the exception of the clinical case definition. In 2011, a requirement for an aminotransferase level of at least 200 IU/L was added to the clinical case definition.

Records that satisfied the following criteria were analyzed:
- 2006-2011
- Condition code 10011 (acute hepatitis A)
- Case status = confirmed or not a case

Records were analyzed on the following variables: sex, age, symptomatic, jaundiced, alanine aminotransferase (ALT), contact of a case, county, MMWR year, reason for testing, and vaccination status.

Table 1. CDC/CSTE Case Definitions for acute hepatitis A

	2000-2010	2011
Clinical case definition	An acute illness with: • Discrete onset of symptoms and • Jaundice or elevated serum aminotransferase levels	An acute illness with: • Discrete onset of symptoms and • Jaundice, dark urine, or elevated serum aminotransferase levels (ALT) >200 IU/L
Lab criteria for diagnosis	Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive	Same as in 2000-2010
Case classification	Confirmed: meets the clinical case definition and is laboratory confirmed, or 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)	Same as in 2000-2010

Figure 2. Acute hepatitis A cases by case status and year, Maine, 2006-2011
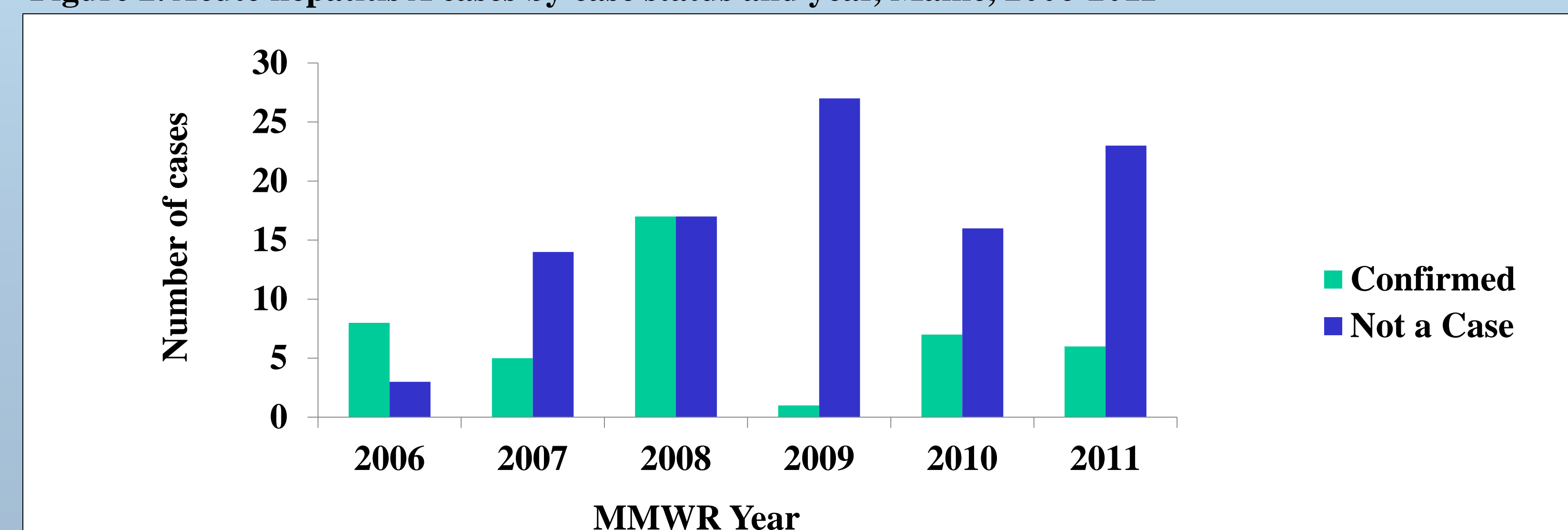
RESULTS

Between 2006 and 2011—
- 44 cases of acute hepatitis A met the case definition and
- 100 cases were reported in persons with a positive IgM anti-HAV without clinical or epidemiologic evidence of disease

The highest proportion of false positives was reported in residents of Cumberland (24%), Androscoggin (17%), and York (16%) counties.

Cases of acute HAV infection were generally younger, more often symptomatic, including jaundiced, had higher ALT levels, and were more often a contact of a known case of acute HAV infection (Figure 3)

Figure 3. Selected findings of comparison between cases and non-cases

	Cases (n=44)	Non-cases (n=100)
Median age	39 years	57 years
Symptomatic (%)	100%	14%
Jaundiced (%)	55%	6%
Elevated ALT (median value)	1293	54
Contact with known case of HAV (%)	41%	0%

CONCLUSIONS

The analysis identified the following possible reasons for a false positive IgM anti-HAV result:
- Previous HAV infection with prolonged IgM anti-HAV
- Recent hepatitis A vaccination
- Cross-reaction with other serum factors or medications

RECOMMENDATIONS

- Healthcare providers should limit use of IgM anti-HAV testing to persons with evidence of clinical hepatitis or to those who have had recent exposure to a person with an acute HAV infection
- Providers should not use IgM anti-HAV as a screening tool for asymptomatic persons or as part of testing panels for the workup of non-acute liver function abnormalities