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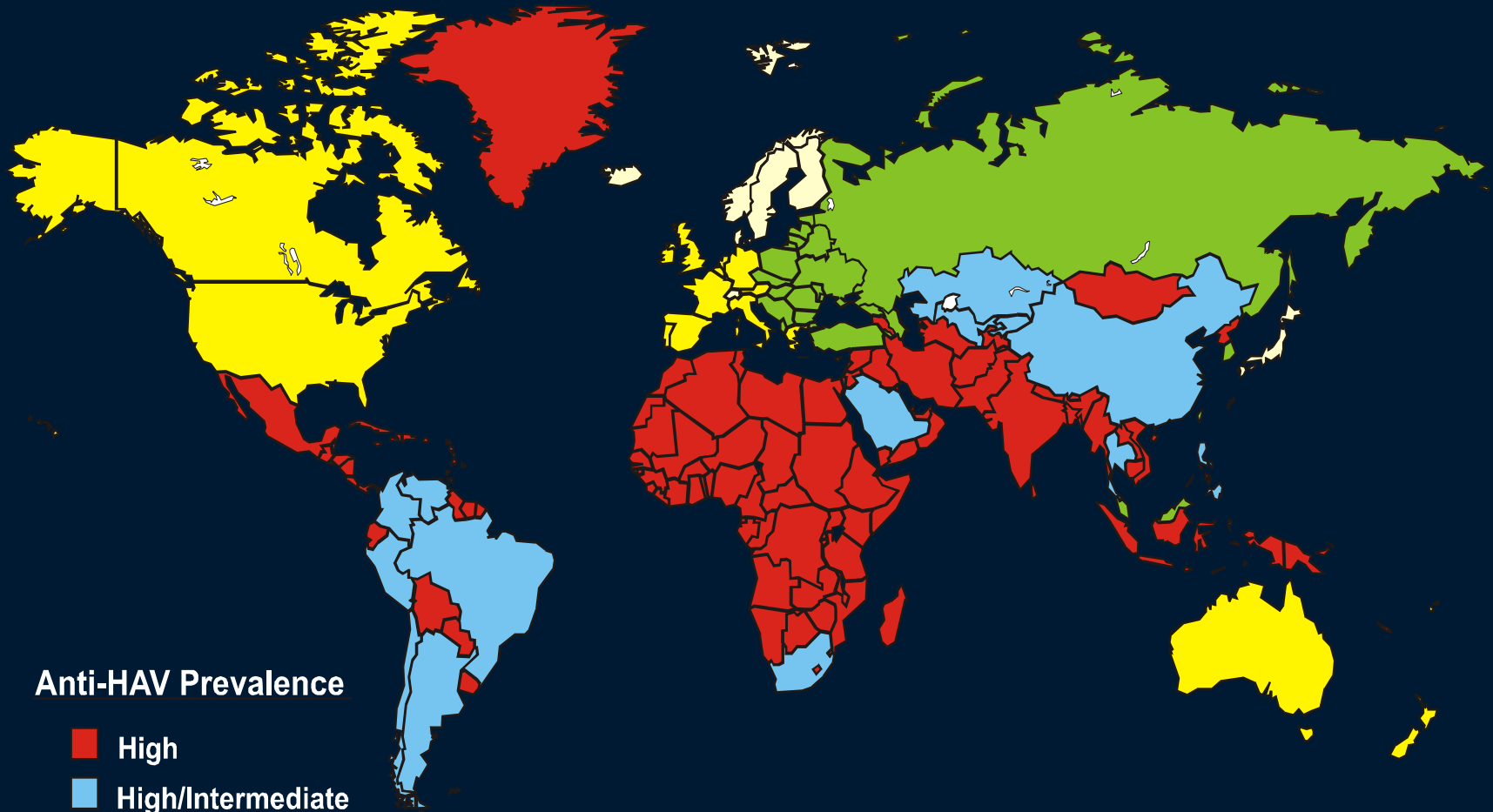
# **Epidemiology and Prevention Strategies for Adults at Increased Risk for Hepatitis A**

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# Geographic Distribution of Hepatitis A Virus Infection

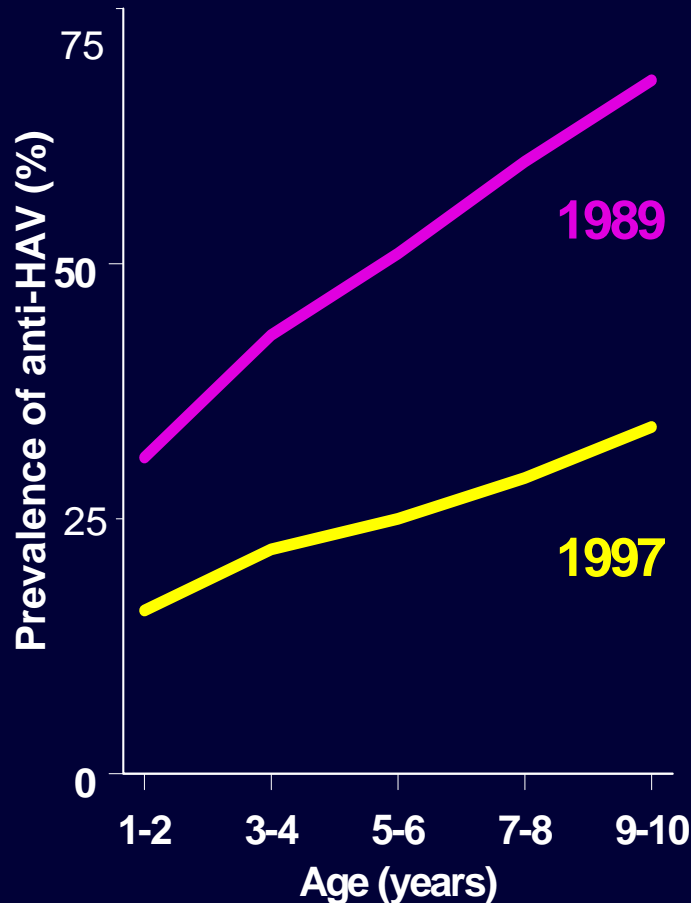


Anti-HAV Prevalence

- High
- High/Intermediate
- Intermediate
- Low
- Very Low

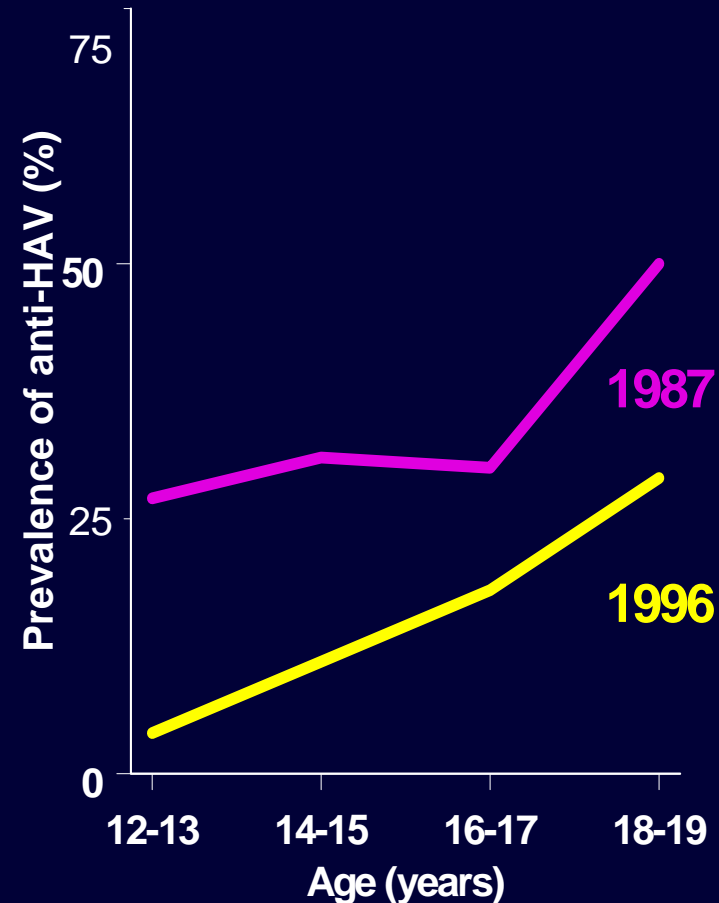
# Changes in Anti-HAV Prevalence in Two Countries Over one Decade

## Saudi Arabia Children



Source: Al-Faleh et al., 1999

## Bangkok, Thailand Adolescents



Source: Poovorawan et al., 1997



# Transition From High to Intermediate HAV Infection Endemicity

- ✦ **Prevalence of HAV infection among children decreases**
- ✦ **Average age of infection increases**
  - **Cohorts of susceptible older children, adolescents, and adults who are more likely to have clinical disease**
  - **Results in increased morbidity**
- ✦ **Outbreak potential**
  - **Variability within regions, countries and cities, and/or urban/rural or socioeconomic status**

# Hepatitis A Vaccination for High Risk Populations in the United States

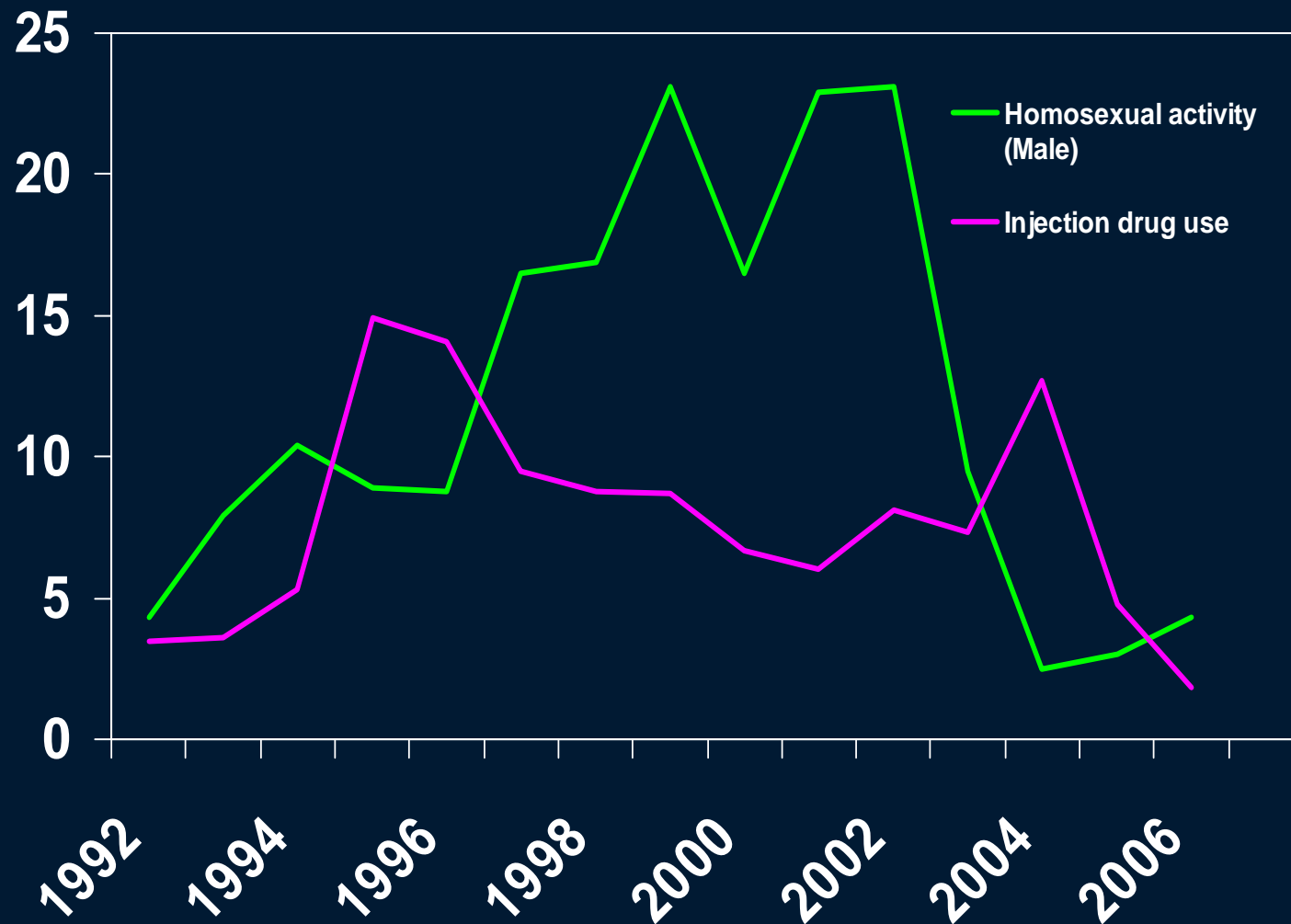
- **U.S. vaccine first licensed in 1996**
- **Recommended for high risk populations including**
  - **Men who have sex with men (MSM)**
  - **Illicit drug users including drug injectors**
  - **Travelers to high/intermediate endemic countries**
  - **Persons with chronic liver disease**
  - **Other**
    - Occupational risks
    - Clotting disorders
- **Similar recommendations in Europe, Canada, Australia**

# Hepatitis A Outbreaks Among MSM and Drug Users

- ✦ Numerous reports from N. Amer., Europe, Australia
- ✦ Characteristics
  - Cyclical
  - Often of sustained duration (months to years)
  - Contribute to large community outbreaks\*
    - 53-90% of cases
    - >200% increase in annual case reporting

\*AJPH 1997;87:2039-41. MMWR 1998;47:708-11. AJE 2000; 152:186-92. JID 2003;187:1235-1240. Eur J Gastroenterol Hepatol 2003;15:901-06. JID 2004;189:471-82. JHepatol 2005;43: 958-64. Vaccine 2005;23:1021-28.

# Reported risk factors OF MSM and IDU for acute hepatitis A, United States, 1995-2005



# Modes of Transmission Among A Outbreaks Among MSM and Drug Users

## ✦ MSM

- Household or other non-sexual contact
- Sexual contact
  - Anal sexual contact
  - No./ type of partner
- Food
- Transmission modes may vary across outbreaks

## ✦ Drug users

- Household or sexual contact
- Drug preparation and use
- Contaminated drug
- Drug injection
  - Parenteral exposure
  - Shared needles and works
- Transmission mode may vary across outbreaks



# Vaccination Strategies

## ✦ Outbreak Response

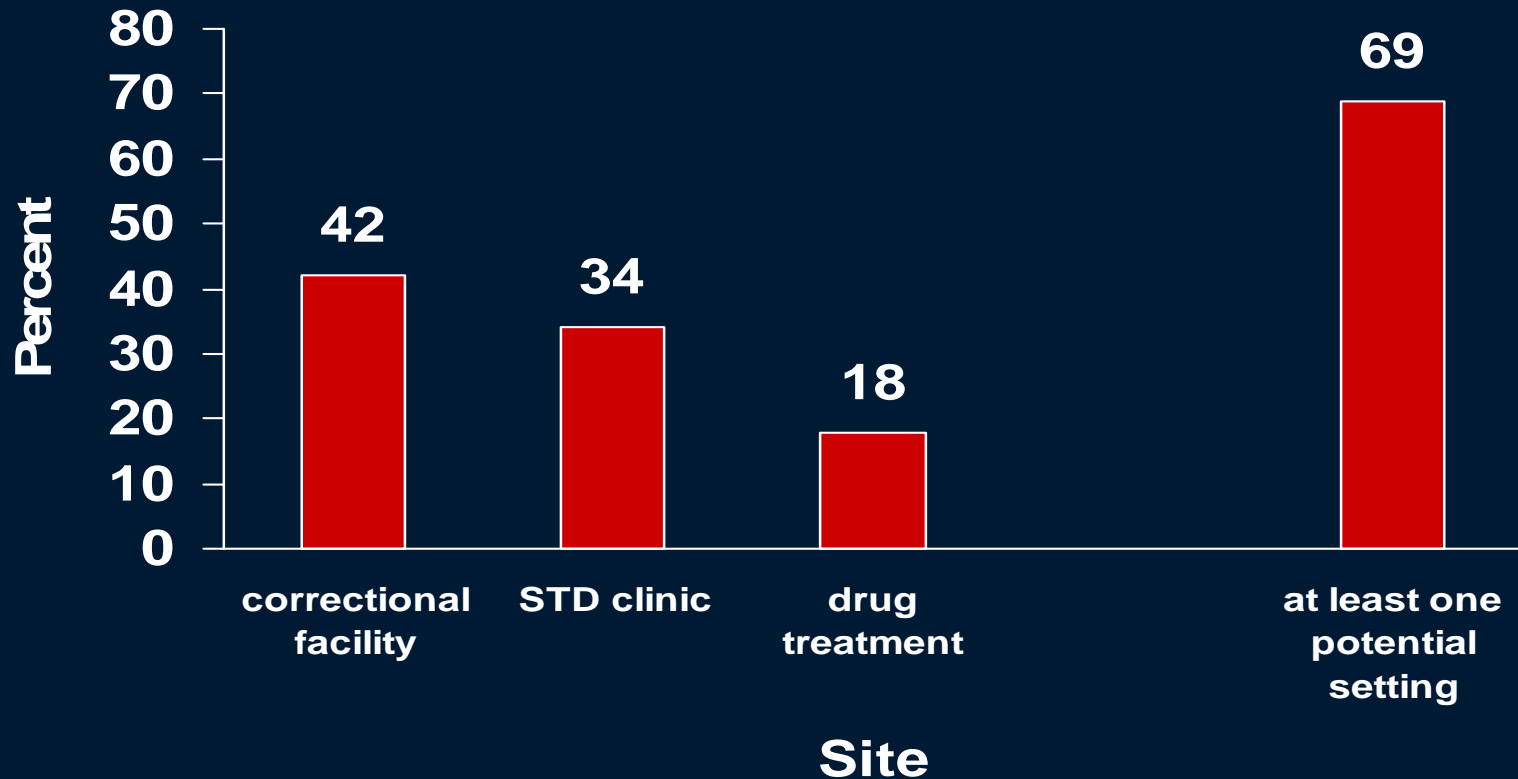
- **Goal: Limit spread in risk population and general community**
- **Outcome: variable and difficult to quantify**
- **Success factors**
  - **Early initiation of vaccination**
  - **Size of target population**
  - **Sites such as jails to target IDUs**

## ✦ Routine vaccination

- **Goal: Prevent outbreaks among high risk adults**
- **Vaccination coverage is low in most settings (10%-23%) \***

\*Sex Trans Dis 2003;30:427-32. CID 2004;38: 1478-84.Eur J Epidemiol 2006; 21:545-9..

# Potential Vaccination Settings Visited by Persons with Hepatitis A Prior to Infection\*



\*Sentinel County Study, 2001-2004

# Barriers to Hepatitis A Vaccination in Adults

- ✦ **Patient acceptance**
  - Knowledge of vaccine
  - Perception of risk
  - Convenience
- ✦ **Provider practices**
  - Awareness/priority
  - Clinical procedures
  - Time constraints
- ✦ **Environmental**
  - Cost of vaccine
  - Reimbursement for supply and delivery
  - Vaccination registries

# Integration of Hepatitis A Vaccination Programs in Settings Serving Adults at Risk Can Improve Vaccination Coverage



**CDC demonstration projects supported vaccine purchase and staff**

✦ **Results**

- Increased number of sites offering vaccination
- Yielded 60%-85% acceptance rate
- Increased number of persons vaccinated

✦ **Compiled in *Public Health Reports* 2007; 122 (Suppl 2).**

# Travel related Hepatitis A

## ✦ Risk population

- Susceptible travelers from low endemic areas to intermediate or highly endemic regions
- Large and : ~ 50% of 63M travelers from US visit intermed./high endemic regions per year
- Includes children and visitors to friends and relatives

## ✦ Represent an increasing proportion of reported cases in US

Proportion of acute hepatitis A cases reported with international travel risk, 1995-2005



# Pre-travel Health Visit and Hepatitis A Vaccination for Travelers to Intermed./Highly Endemic Areas for Hep A

	<b>Sweden*</b> <b>N=957</b>	<b>Western Europe +</b> <b>N=5,465</b>	<b>United States+</b> <b>N=404</b>	<b>Asia Pacific+</b> <b>N=2101</b>
<b>Sought health advice, (from travel clinic)</b>	<b>60% (30%)</b>	<b>52% (35%)</b>	<b>36% (10%)</b>	<b>32% (12%)</b>
<b>Considered travel high risk for hepatitis A</b>	<b>42%</b>	<b>29%</b>	<b>17%</b>	<b>31%</b>
<b>Hepatitis A vaccinated/immune</b>	<b>40%</b>	<b>25%</b>	<b>24%</b>	<b>22%</b>

\* Scand J Infect Dis 2006; 38:1074-1080; + J Travel Med 2004;11:3-7; 9-13; 23-6;

# Hepatitis A Vaccination and/or Immunoglobulin to Prevent Travel-Related Hepatitis A

- ✦ All susceptible persons should receive Hep A vaccination or immunoglobulin before departure
- ✦ Pre-exposure prophylaxis
  - Hepatitis A vaccine at any time before departure for persons 1-40 years of age
  - Vaccine plus IG for selected populations departing  $\leq$  2 weeks
    - Older persons
    - Immunocompromised
    - Chronic liver disease
  - IG alone for others (i.e. <1 yr old, allergic)

# Hepatitis A Linked to International Adoptees and their Contacts

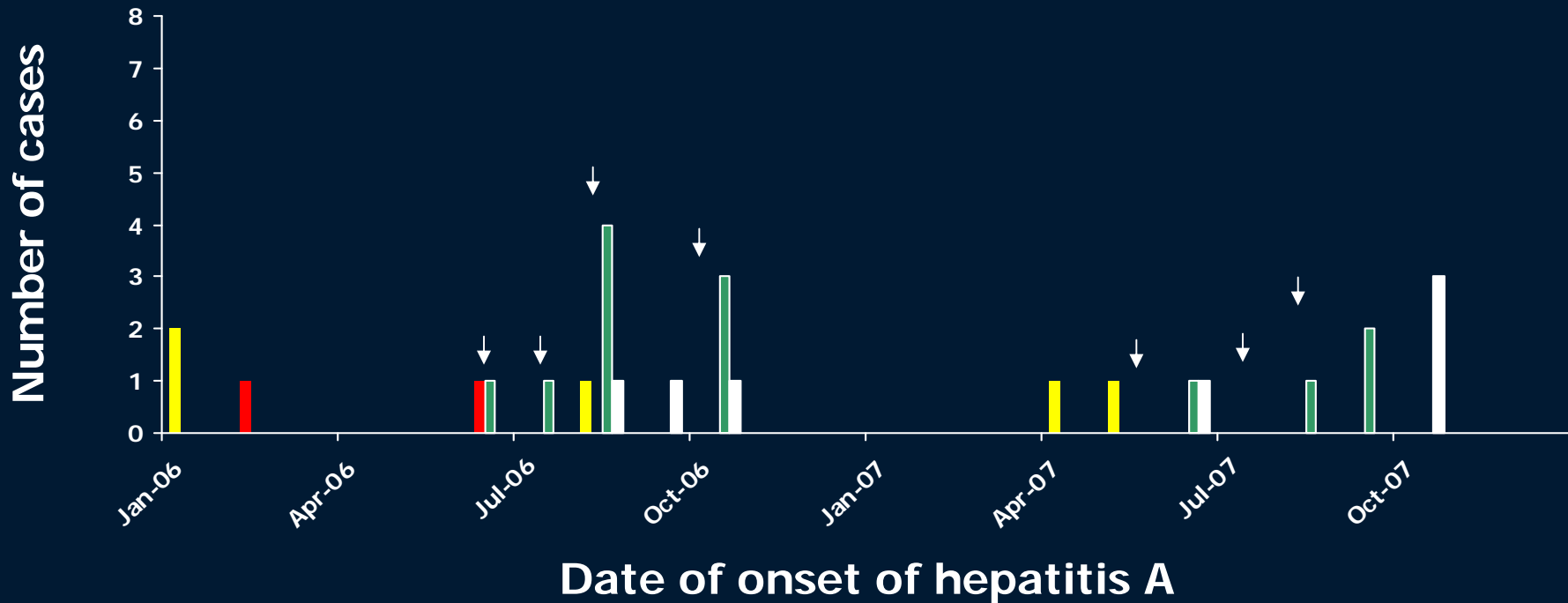
## ✦ Case report

- In June 2007, 51 year-old woman presented with fever, jaundice, encephalopathy and ALT of 4119 IU/L
- IgM anti-HAV-positive
- Had 6 days of contact with 1 year-old twin adoptee grandchildren one month prior to symptom onset, soon after they arrived from Ethiopia
- Twins were asymptomatic
  - IgM anti-HAV-positive
  - Spent 2 months in centralized foster care before adoption





# Hepatitis A Linked to International Adoptees and their Contacts--2007



- Adoptee
- Traveled, contact with adoptee
- No travel, contact with adoptee
- No travel, no contact with adoptee, contact with secondary case

# Adults with Chronic Liver Disease and Hepatitis A

- ✦ **Persons with hepatitis A and chronic liver disease have more severe disease and higher mortality**
- ✦ **Reported coverage is low**
  - **Of 1,193 patients diagnosed with chronic HCV\***
    - **27% of susceptible patients vaccinated**
    - **3 cases of acute hepatitis A among susceptibles; one death**
- ✦ **Since 1999, 45 % of hepatitis A deaths were associated with CLD\*\***

\*Hepatology 2005;42: 688-95

\*\*CDC, unpublished data

# Conclusions

- ✦ In low endemic countries, certain adults are at increased risk for hepatitis A infection or severe disease
- ✦ Hepatitis A vaccination is an effective but often under utilized intervention
- ✦ Implementation of immunization programs and evidence-based strategies can improve vaccination coverage
- ✦ Adults risk populations might emerge as HAV seropositivity falls
- ✦ Countries can conduct public health surveillance to detect risk populations and guide vaccine policy development

**Table 4. Changes in Seroprevalence Rates of Hepatitis A Virus Infection in Children and Adolescents During Two Decades in Different Regions in Korea<sup>†</sup>**

Age (yrs)	1979 Seoul and Kyonggi Province	1988 Chinju City	1989 Chonbuk Province	1995 Seoul City	1996 Daejun City	1996 Chinju City	1996 Kyonggi Province
1-19	63.8% (141/221)*	42.3% (169/400)	50.3% (85/169)	11.7% (42/359)	8.5% (22/256)	9.5% (36/398)	4.6% (15/323)
Ref.	8	11	9	3	4	11	Authors

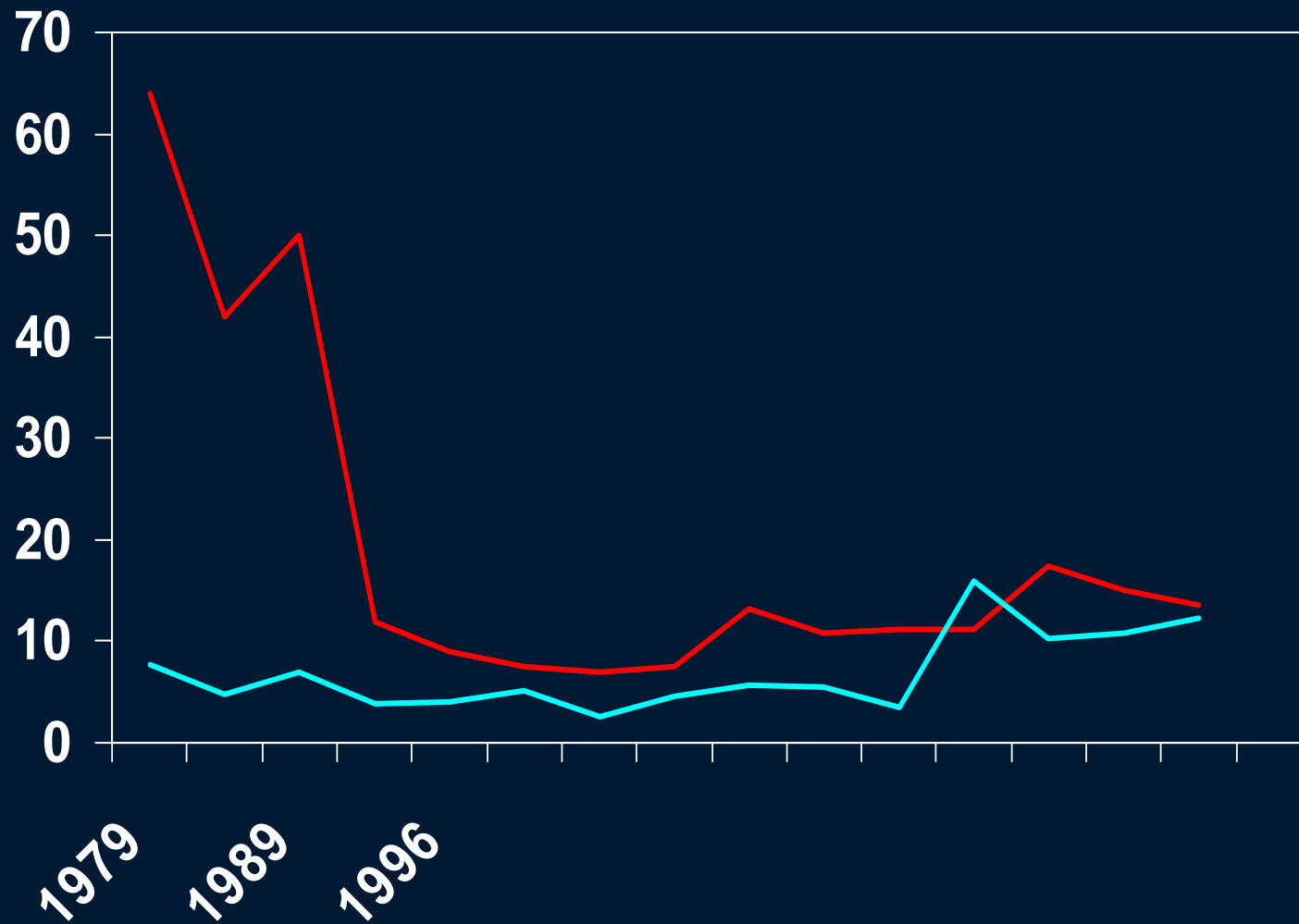
\* No. positive/No. tested.

<sup>†</sup> Tap water supply rate was 42% in 1974 and increased to 82.9% nationwide in 1996. However, the urban area of Seoul was 99.9%.

GNP was \$1,647 in 1979 and increased to \$10,543 in 1996.

Sohn, Y-M, Yonsei Med J 2000; 41: 34-39.

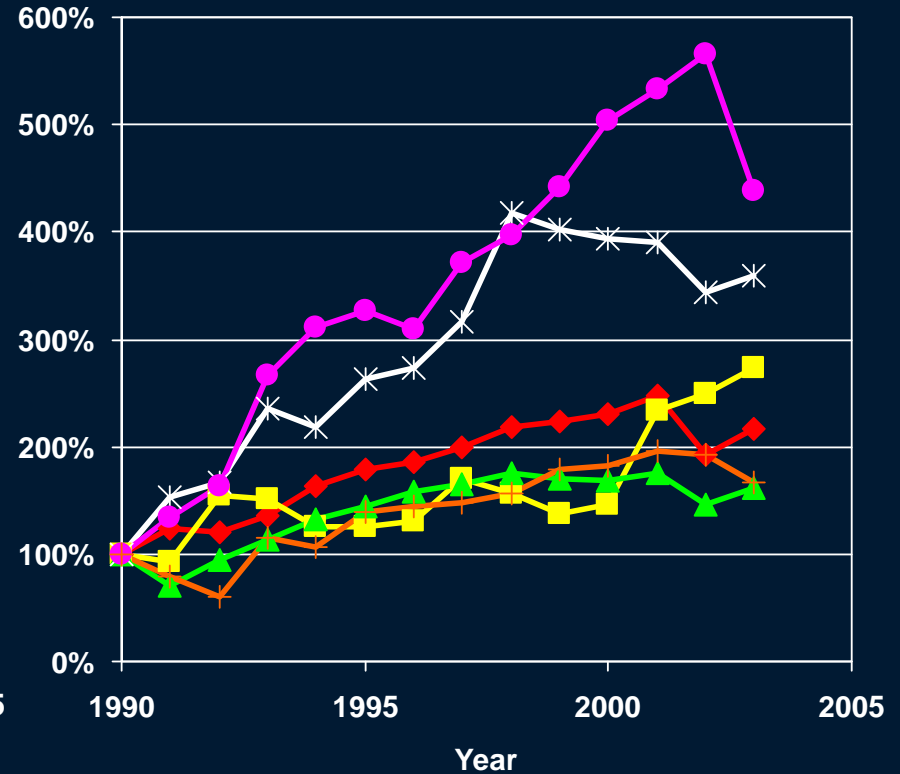
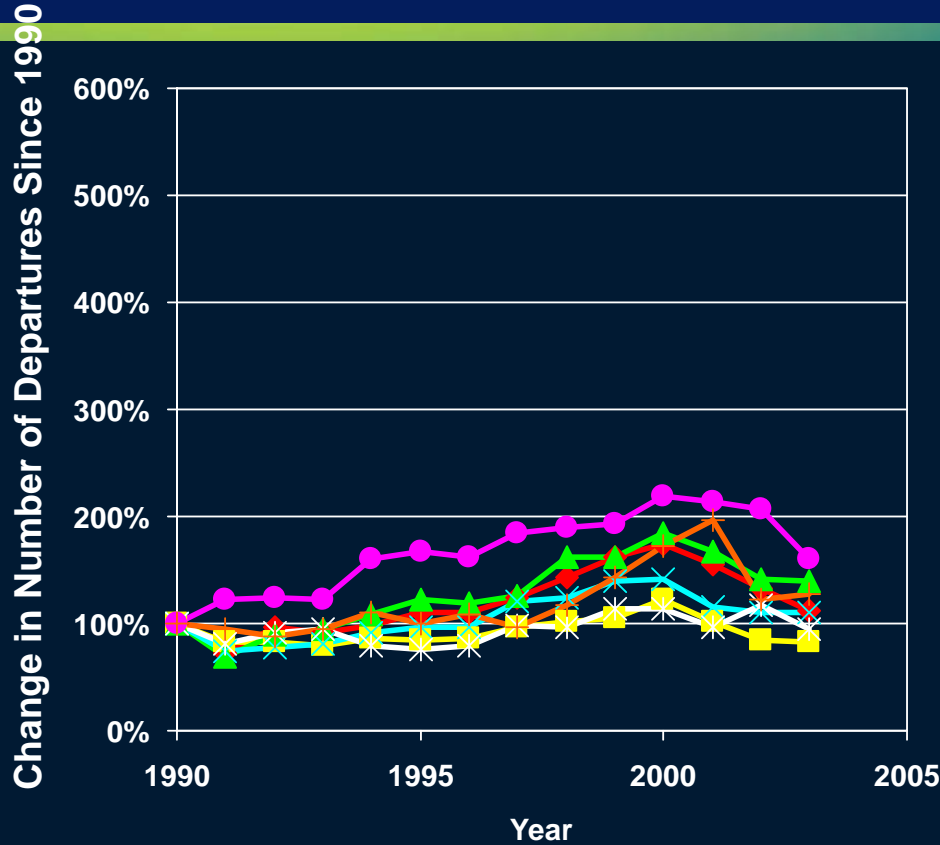
# Reported risk factors for acute hepatitis A, 1995-2005



# Global Patterns of Hepatitis A Virus Transmission

<u>Endemicity</u>	<u>Disease Rate</u>	<u>Age at Infection</u>	<u>Transmission patterns</u>
High	Low to high	Early childhood	Person to person; outbreaks uncommon
Intermediate	High	Late childhood/ young adults	Person to person; food and waterborne outbreaks
Low	Low	Late childhood/ young adults	Person to person; food and waterborne outbreaks
Very low	Very low	Adults	Travelers; outbreaks uncommon

# Outbound U.S. Travelers – Selected Destinations



- ◆ France
- Germany
- ▲ Italy
- ✕ United Kingdom
- \* Japan
- Republic of China (Taiwan)
- + Australia + NZ

- ◆ South America
- Central America
- ▲ Africa
- \* India
- People's Republic of China
- + Thailand

# Hepatitis A Incidence, United States, 1980-2006

