

# Update on Hepatitis A Disease Burden and Hepatitis A Population Protection

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**Advisory Committee on Immunization Practices  
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# Outline

- ❑ **Hepatitis A Vaccine History in the United States**
- ❑ **Epidemiology**
- ❑ **Vaccine Coverage**
- ❑ **Anti-HAV Seroprevalence**
- ❑ **Hepatitis A Outbreak, Food Associated Exposure Risk**
- ❑ **Summary**

# Hepatitis A Vaccine History in the United States

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of Viral Hepatitis



# ACIP hepatitis A vaccine recommendations

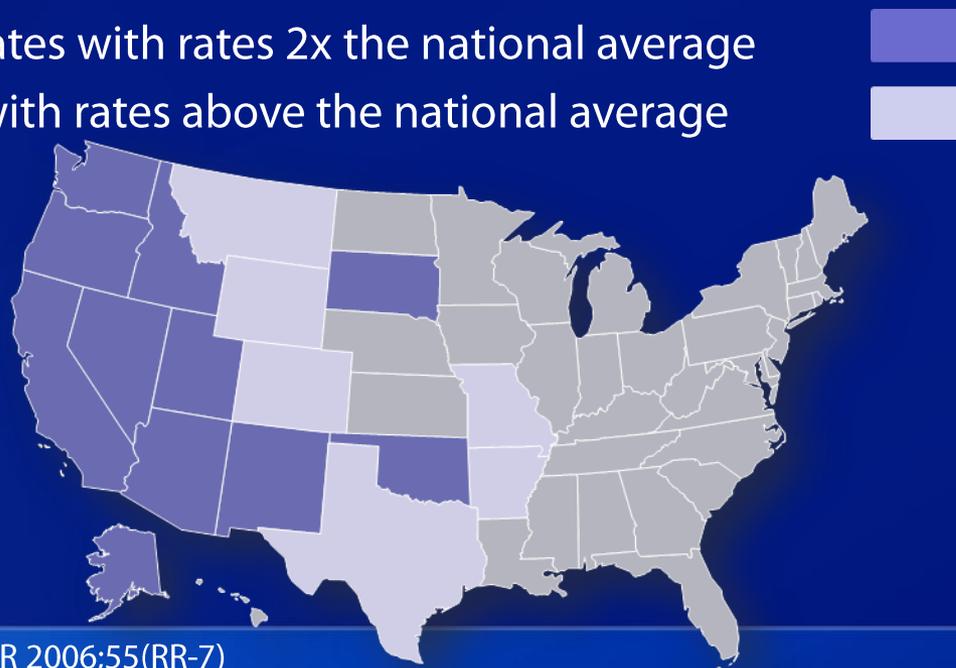
## ☐ Targeted vaccination, 1996-1999

### ■ 1996

- Children at age 2 years in communities with high rates of disease
- Children through teen years in outbreaks

### ■ 1999

- Recommended in 11 states with rates 2x the national average
- Considered in 6 states with rates above the national average



# ACIP hepatitis A vaccine recommendations-II

## □ Universal childhood vaccination, 2006

- *Recommended for use at age 12-23 months in all states*
- *Continue existing vaccination programs for ages 2-18 years*
- *Consider catch-up vaccination in outbreaks and areas with increasing disease rates*
- *Any person wishing to obtain immunity*

**Note: No routine recommendation for children ages >23 months**

# **ACIP hepatitis A vaccine recommendations-III**

## **Groups at increased risk of HAV or severe HAV disease**

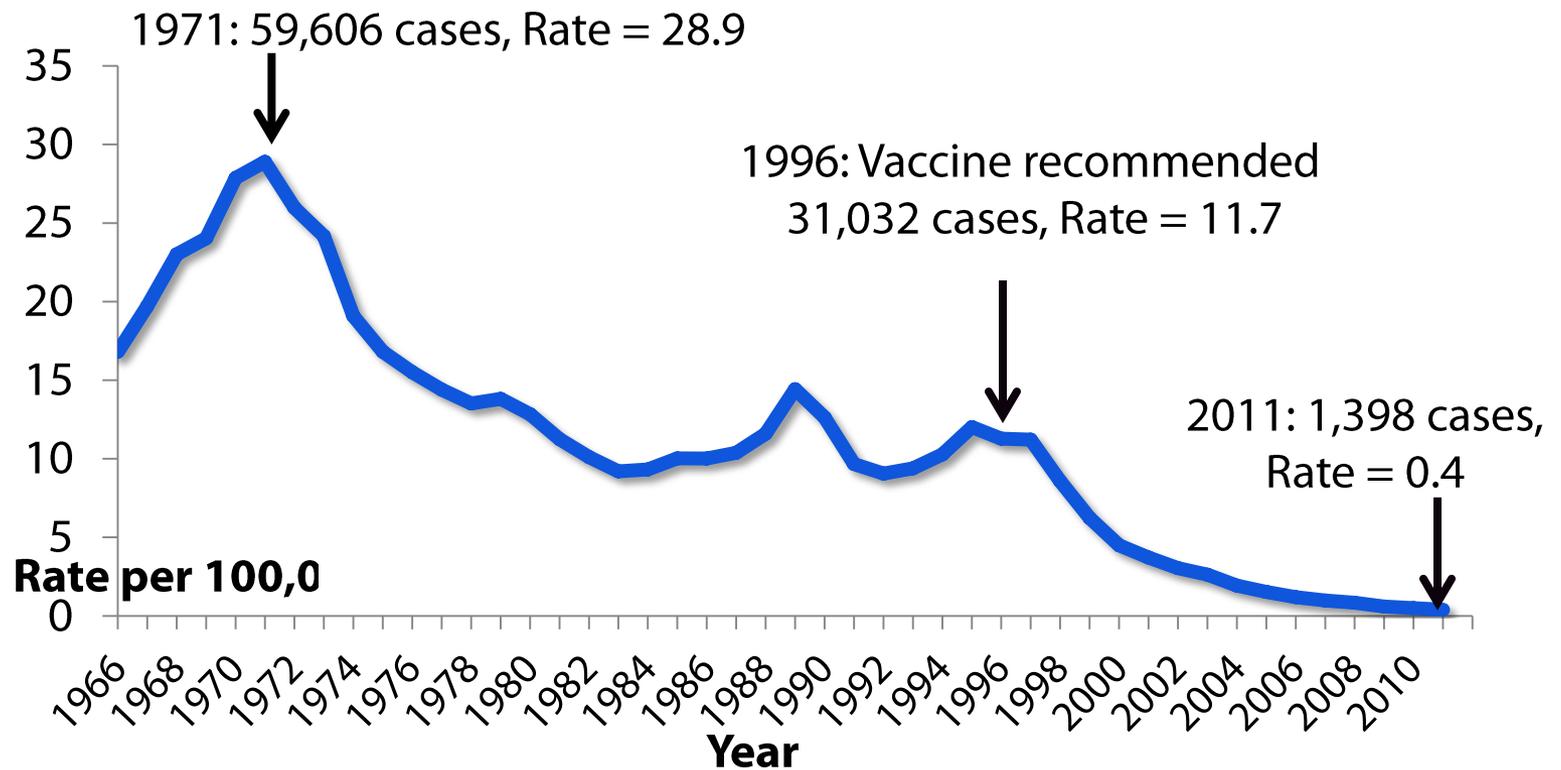
- ❑ Travelers**
- ❑ Men who have sex with men**
- ❑ Users of injection and non-injection drugs**
- ❑ Persons with clotting-factor disorders**
- ❑ Persons who work with nonhuman primates**
- ❑ Persons who anticipate close personal contact with an international adoptee**
- ❑ Persons with chronic liver disease**
- ❑ Post-exposure prophylaxis for healthy persons aged 12 months-40 years**

# Hepatitis A Epidemiology

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of Viral Hepatitis

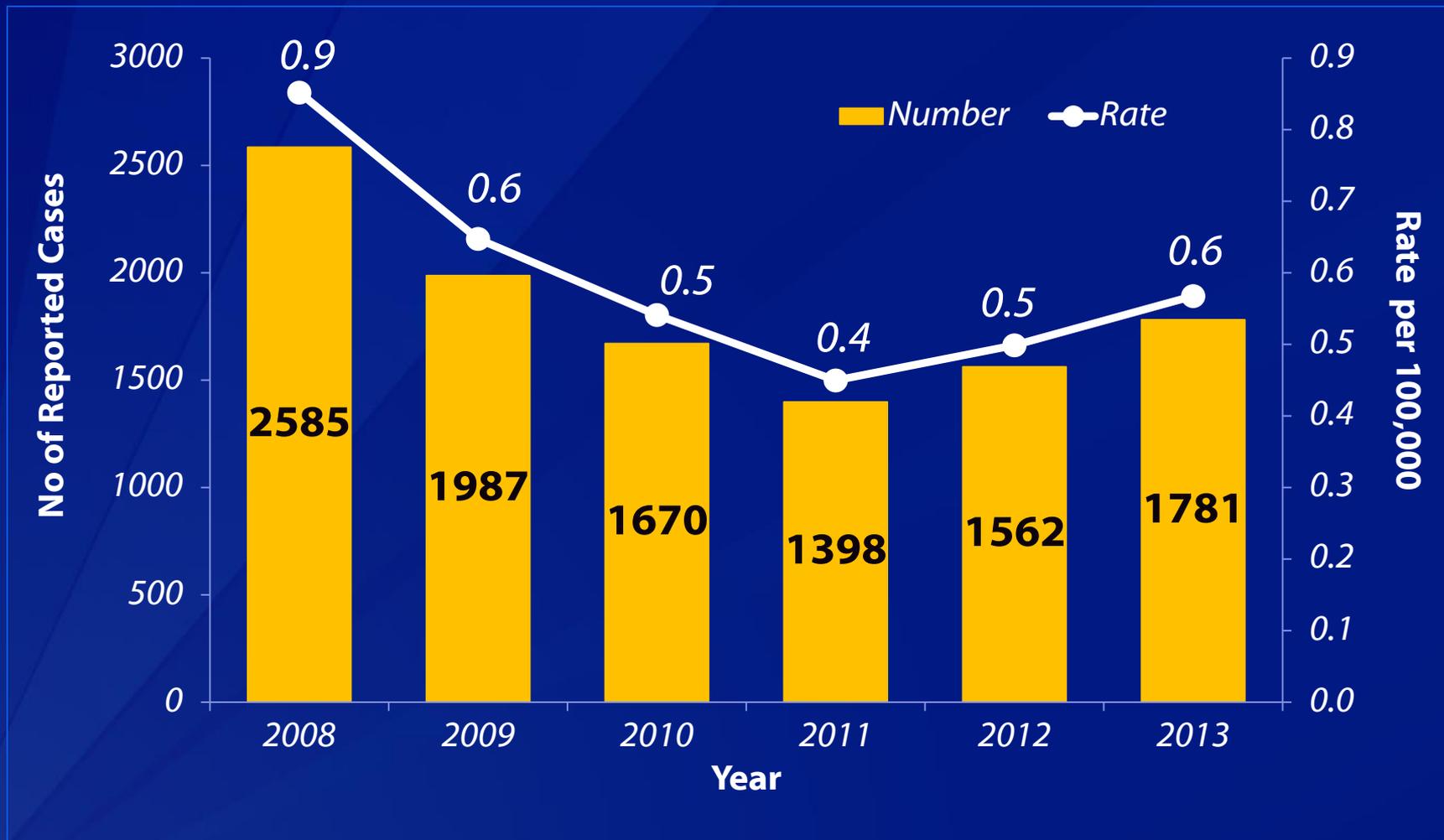


# Rates of Reported Acute Hepatitis A Cases United States, 1966-2012



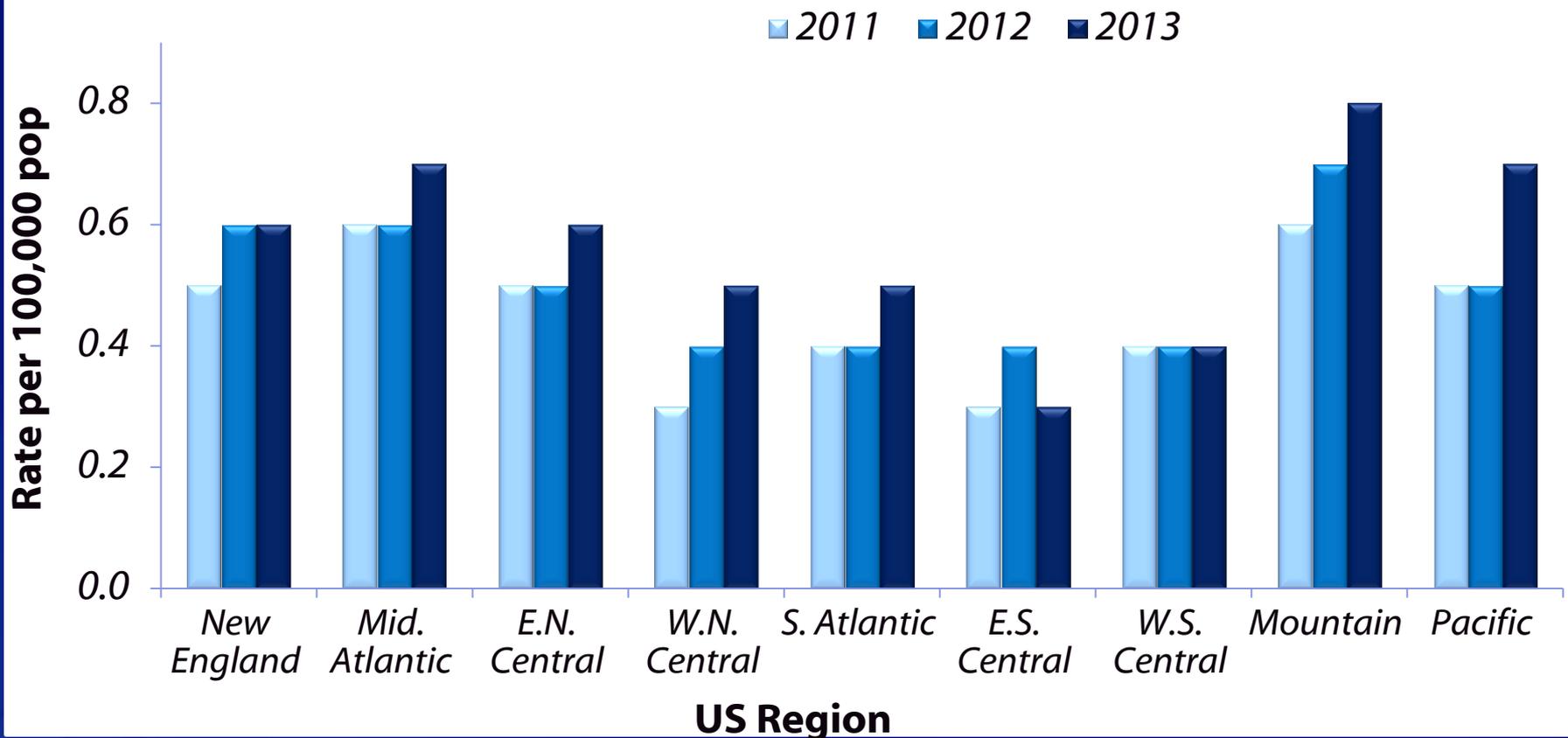
1996-2011: 95.5% decrease in reported cases

# Number and rate of reported cases of hepatitis A (2008-2013)

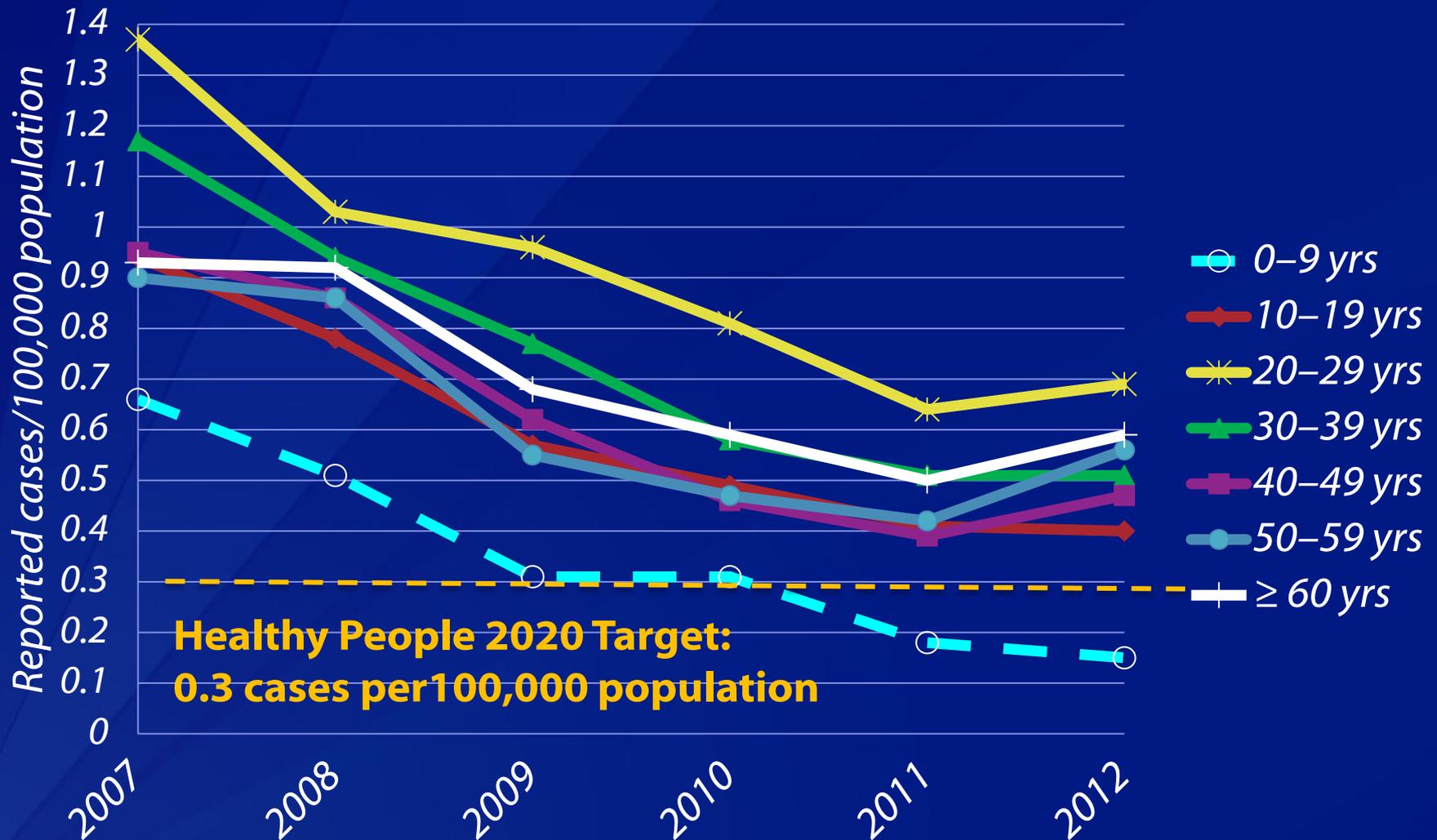


National Notifiable Diseases Surveillance System (NNDSS); DVH Surveillance report (2008-2012);  
Noninfluenza vaccination coverage among adults - United States, 2012. MMWR. 2014 Feb 7;63(5):95-102.

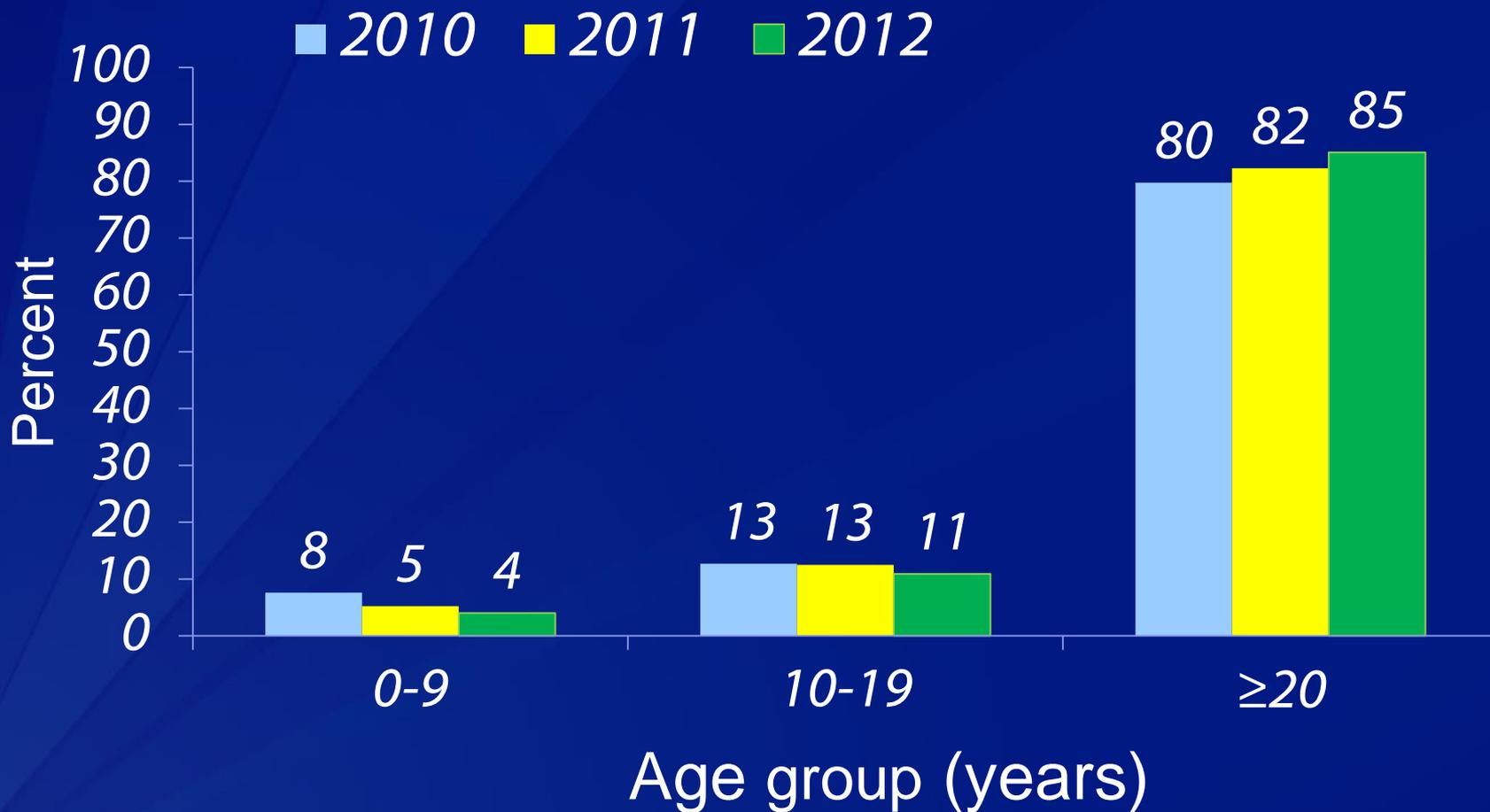
# Rate of hepatitis A by US region (2011-2013)



# Rates of reported acute hepatitis A United States, 2007-2012

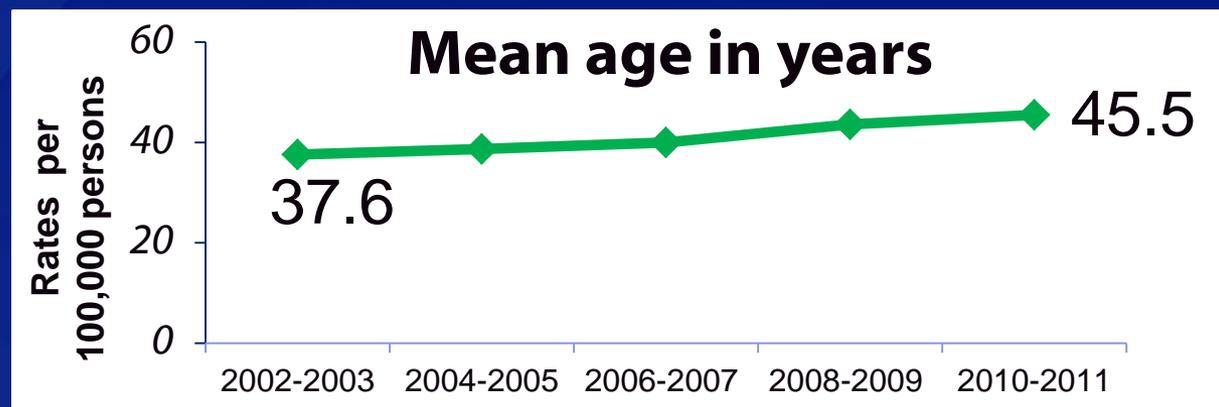


## Percent of cases by year in age groups (0-9, 10-19, $\geq 20$ )



# Hepatitis A hospitalization trends, 2002-2011

- ❑ **National Inpatient Sample (Healthcare Utilization Project or HCUP)**
  - *Primary discharge diagnosis of hepatitis A*
- ❑ **Mean age of persons hospitalized for hepatitis A has increased significantly over the study time period (mean age 37.6 years in 2002-2003 compared to 45.5 years in 2010-2011)**



## Hospitalizations in reported cases of hepatitis A — United States, 2009-2012

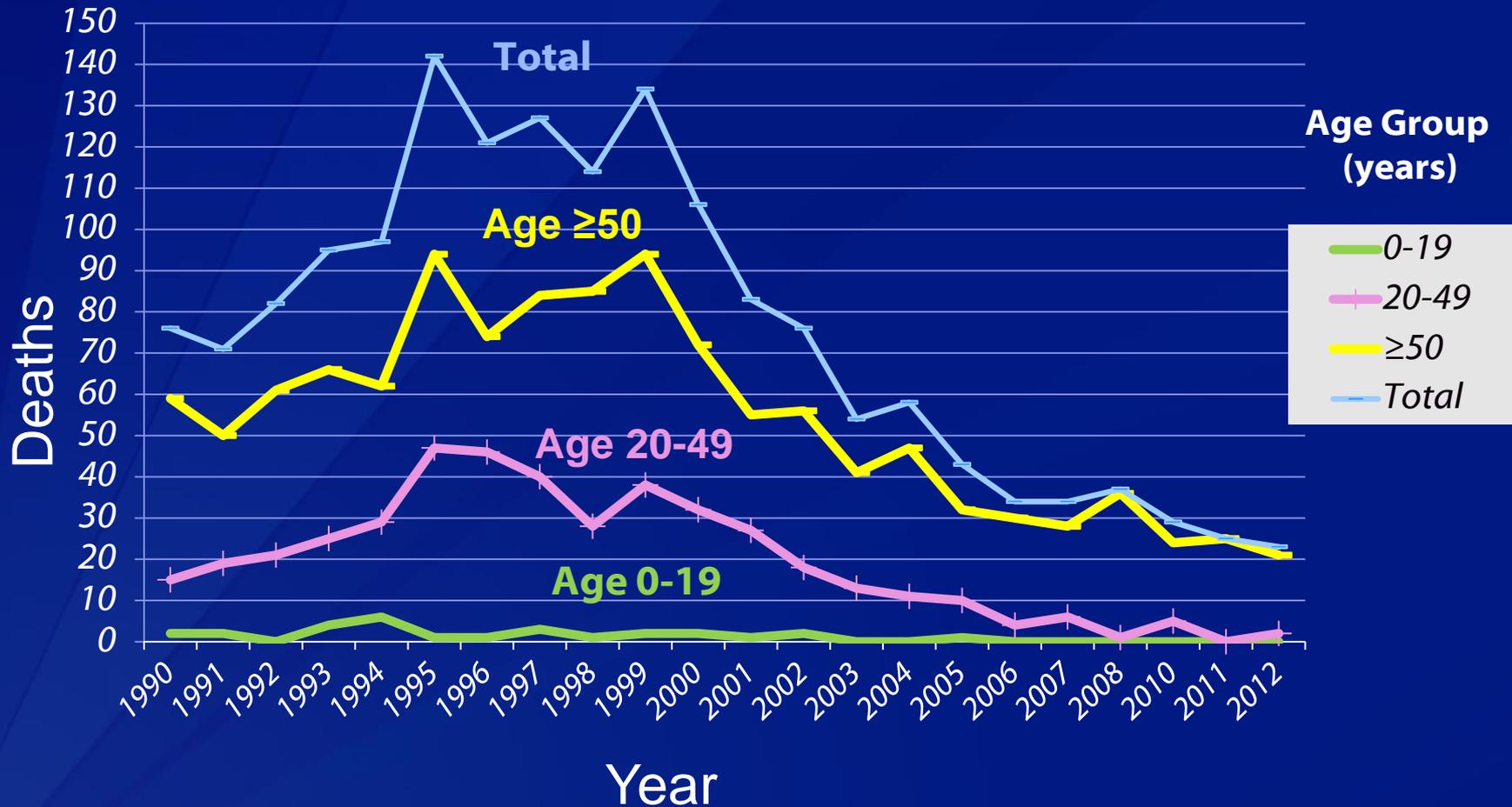
Year	Hepatitis A cases reported	Availability of valid data <sup>†</sup> for hospitalization		Cases hospitalized <sup>§</sup>	
		No.	No.	%	No.
2009	1,987	1,182	59.5	464	39.3
2010	1,670	1,020	61.1	433	42.5
2011	1,398	798	57.1	343	43.0
2012	1,562	1,022	65.4	468	45.8

→ Hospitalizations of HAV cases has increased since 2009

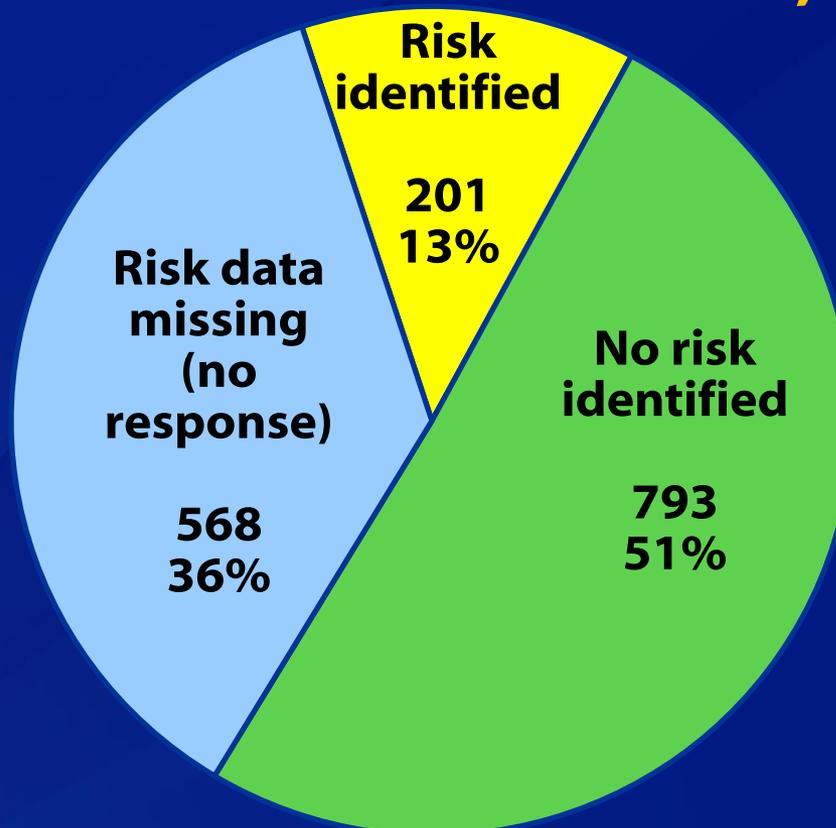
<sup>†</sup>Case reports for which questions regarding hospitalization were answered with "yes" or "no."

<sup>§</sup>Numbers and percentages represent only cases with data regarding hospitalization; numbers likely are underestimates

# Hepatitis A deaths, 1990-2012



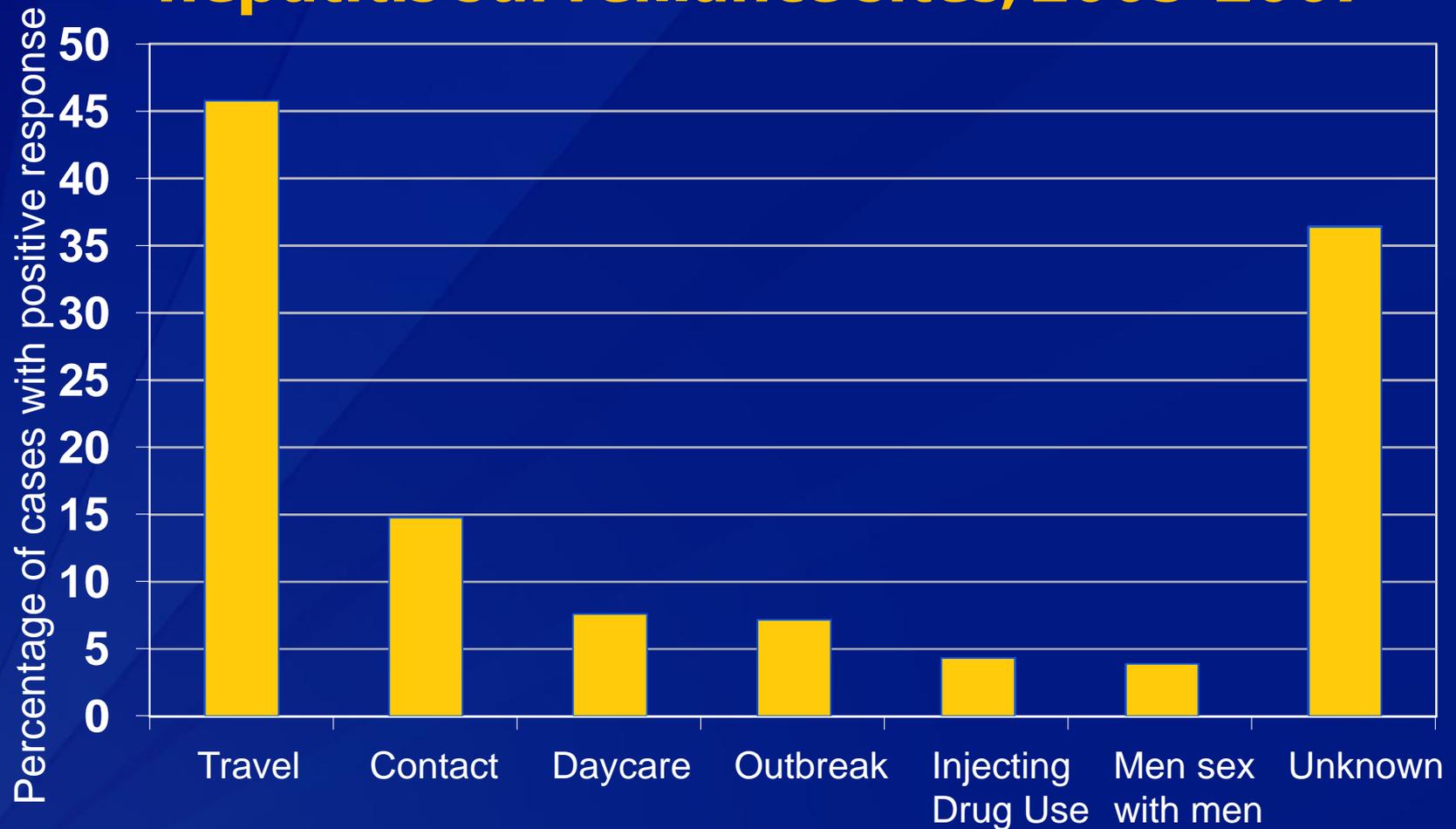
# Availability of information on risk behaviors/ exposures associated with acute hepatitis A – United States, 2012



*Includes case reports indicating the presence of at least one of the following risks 2–6 weeks prior to onset of acute, symptomatic hepatitis A: 1) having traveled to hepatitis A-endemic regions of Mexico, South/Central America, Africa, Asia/South Pacific, or the Middle East; 2) having sexual/household or other contact with suspected/confirmed hepatitis A patient; 3) being a child/employee in day care center/nursery/preschool or having had contact with such persons; 4) being involved in a foodborne/waterborne outbreak; 5) being a man who has sex with men; and 6) using injection drugs.*



# Potential source of infection or risk factor for hepatitis A, Emerging Infections Program (EIP) hepatitis surveillance sites, 2005-2007

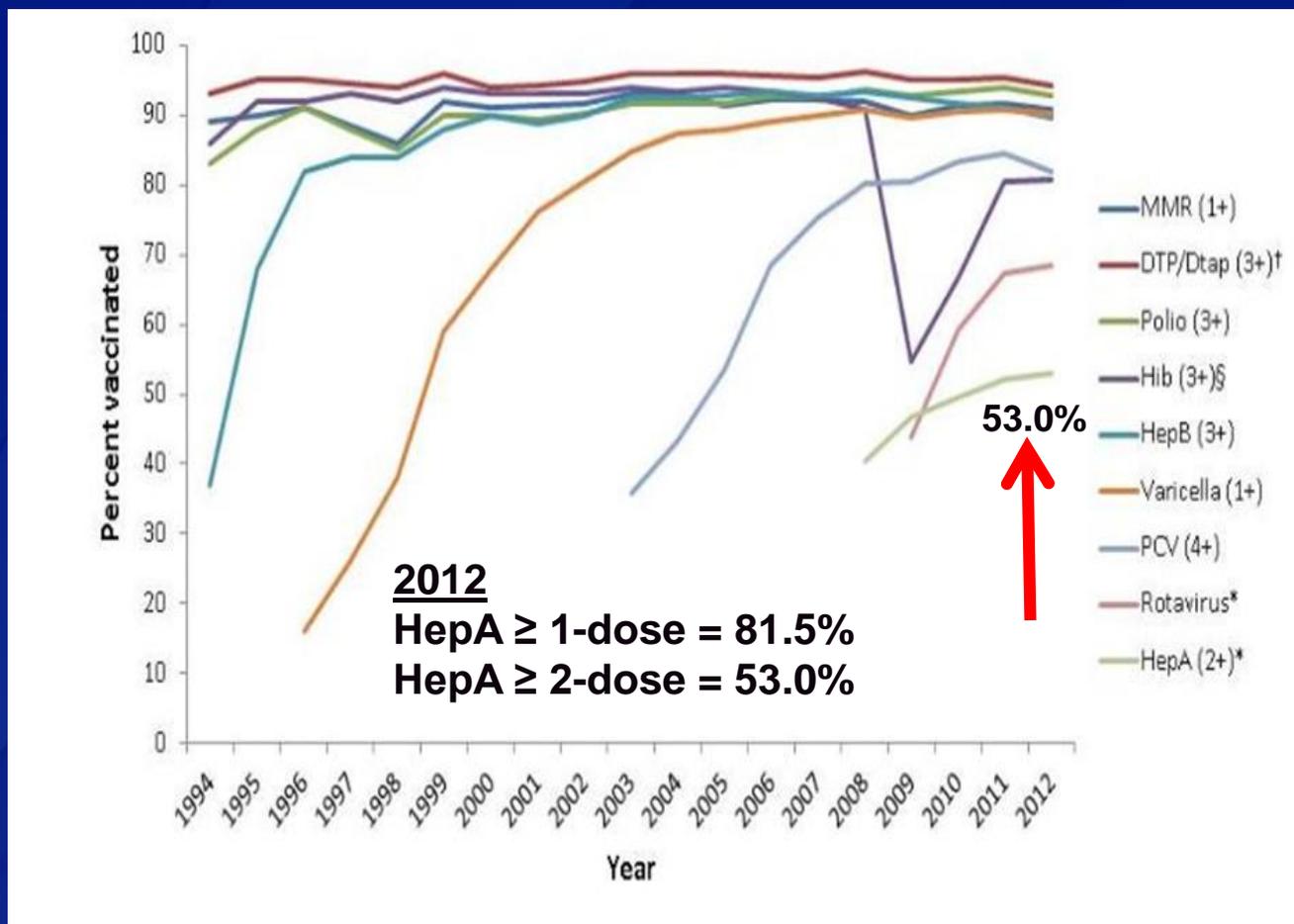


# Hepatitis A Vaccine Coverage

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of Viral Hepatitis

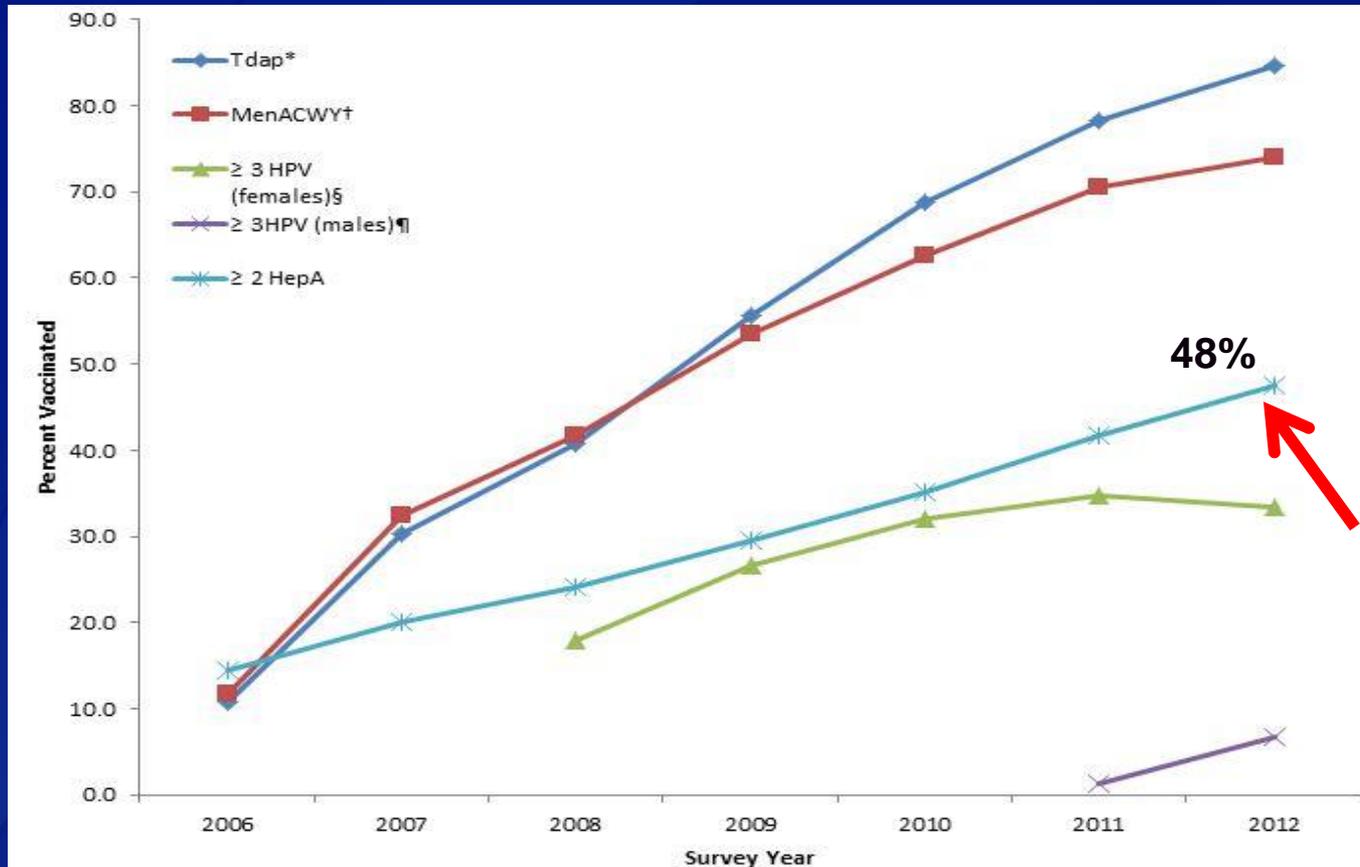


# Vaccine-specific coverage among children aged 19-35 months, National Immunization Survey, 1994-2012



Healthy People 2020 target for hepatitis A: 85% 2-dose coverage

# Estimated vaccination coverage among Adolescents 13-17 years, NIS Teen, 2006-2012



\* ≥1 dose Tdap vaccine on or after age 10 years.

† ≥1 dose MenACWY vaccine.

§ HPV vaccine, either bivalent or quadrivalent, among females.

ACIP recommends either bivalent or quadrivalent vaccine for females.

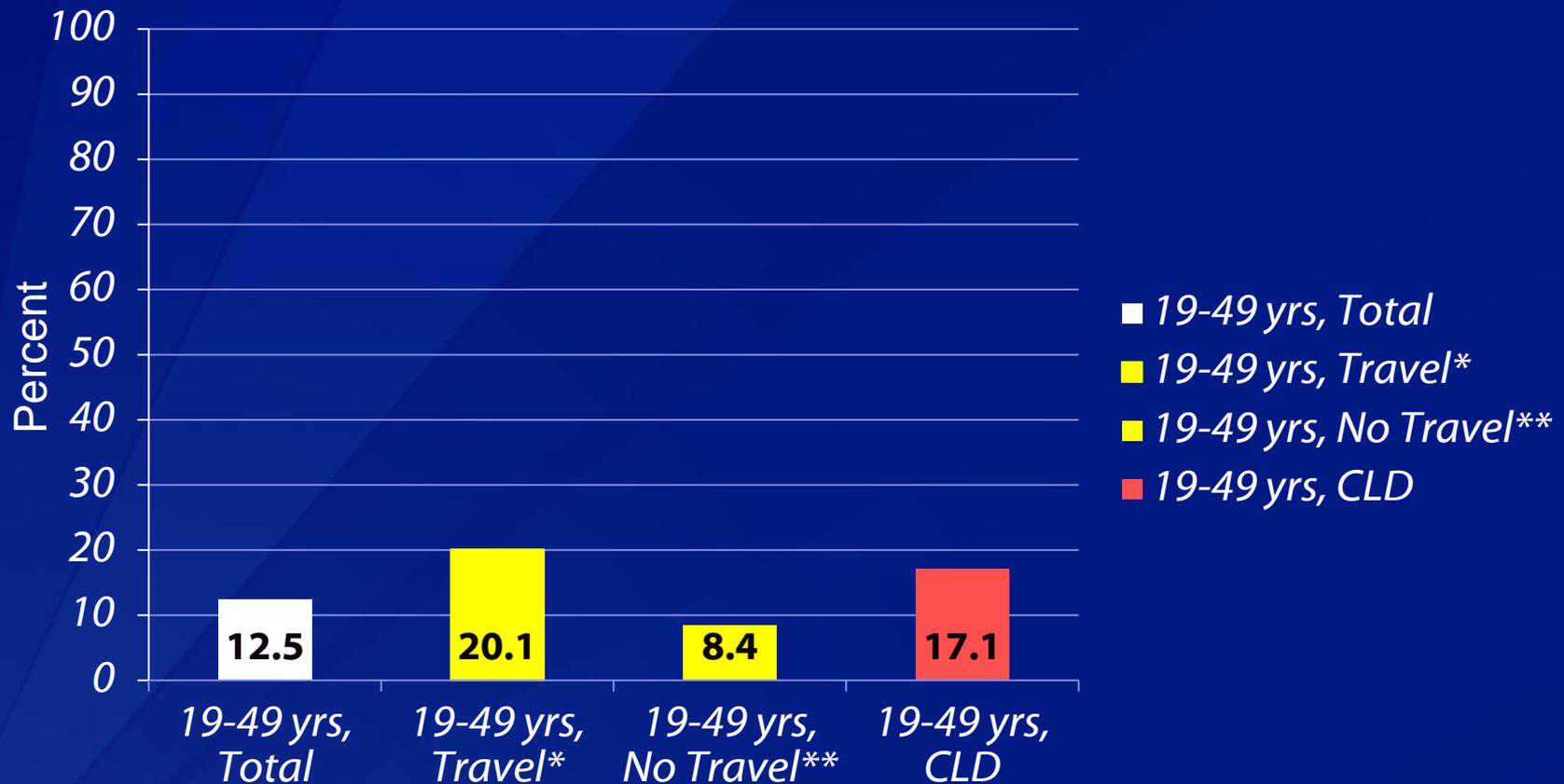
¶ HPV vaccine quadrivalent, among males. ACIP recommends the quadrivalent vaccine for males; however, some males might have received bivalent vaccine

**2012 Preliminary Data**

**HepA ≥ 1-dose = ~60%**

**HepA ≥ 2-dose = ~48%**

# Hepatitis A vaccine $\geq 2$ -dose coverage for ages 19-49 years, National Health Interview Survey (NHIS), 2011, overall and two risk groups



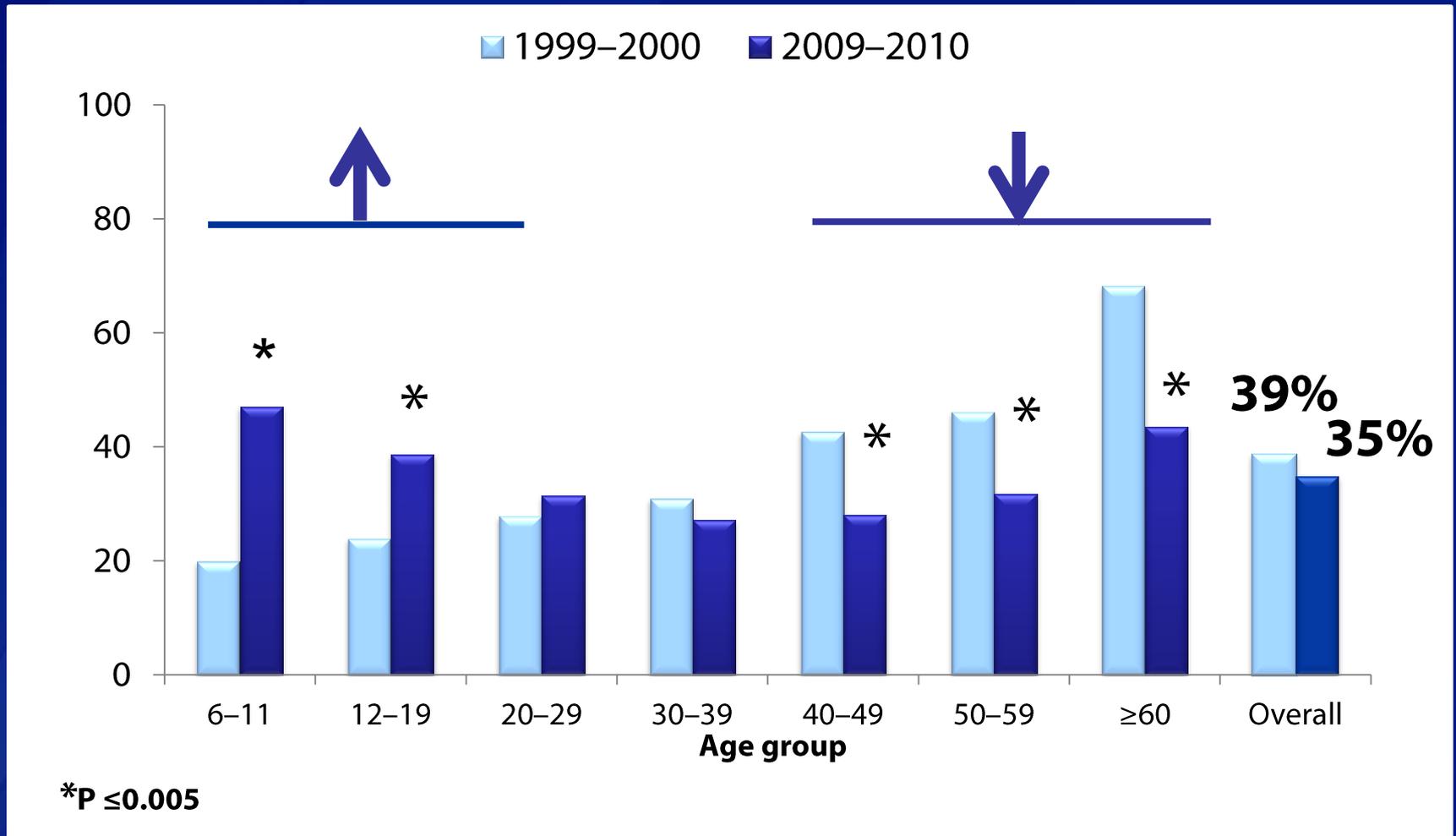
\*Traveled outside the U.S. to countries other than Japan, Australia, New Zealand, Canada or the other countries of Europe since 1995 \*\*No travel outside the U.S. to countries other than Japan, Australia, New Zealand, Canada or the other countries of Europe since 1995

# Anti-HAV Seroprevalence

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of Viral Hepatitis



# Prevalence of anti-HAV by age group NHANES, United States 1999–2000 and 2009–2010



# Hepatitis A Outbreak

## Food Associated Exposure Risk

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of Viral Hepatitis



# Food associated outbreaks-2013

## ❑ Multi-state outbreak associated with frozen pomegranate arils imported from Turkey

### ■ 165 cases

- 7% aged <18 years
- 93% aged ≥18 years

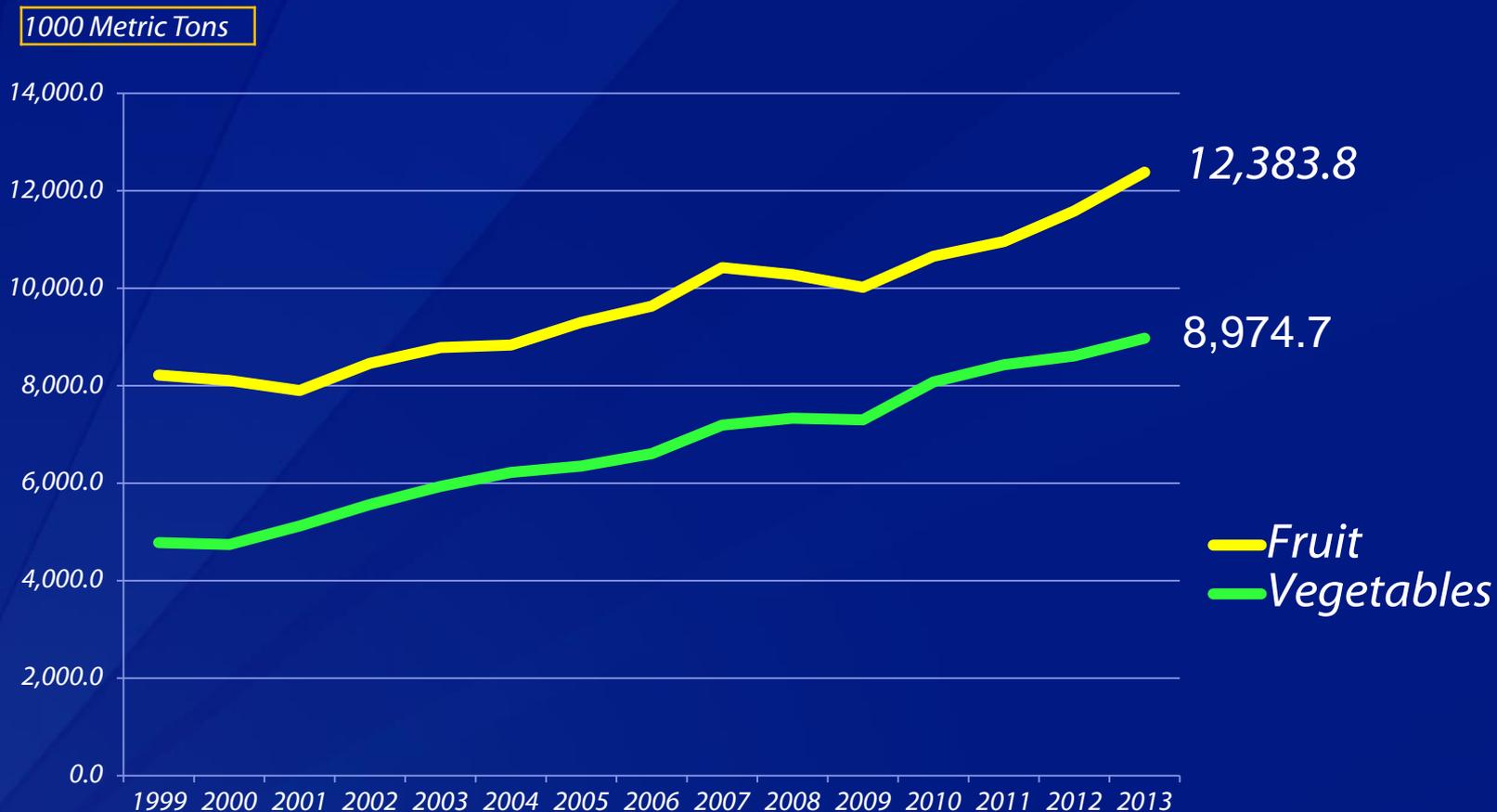
### ■ Complications

- Overall 44% hospitalized
  - 18% aged <18 years
  - 45% aged ≥18 years
- 2 cases fulminant hepatitis
- 1 case liver transplant



## ❑ Ongoing berry-associated outbreaks in multiple European countries

# Trends in the volume of fruit and vegetables imported into the US, 1999-2013



# Examples of countries with intermediate and high hepatitis A viral prevalence exporting fruits and vegetables to United States

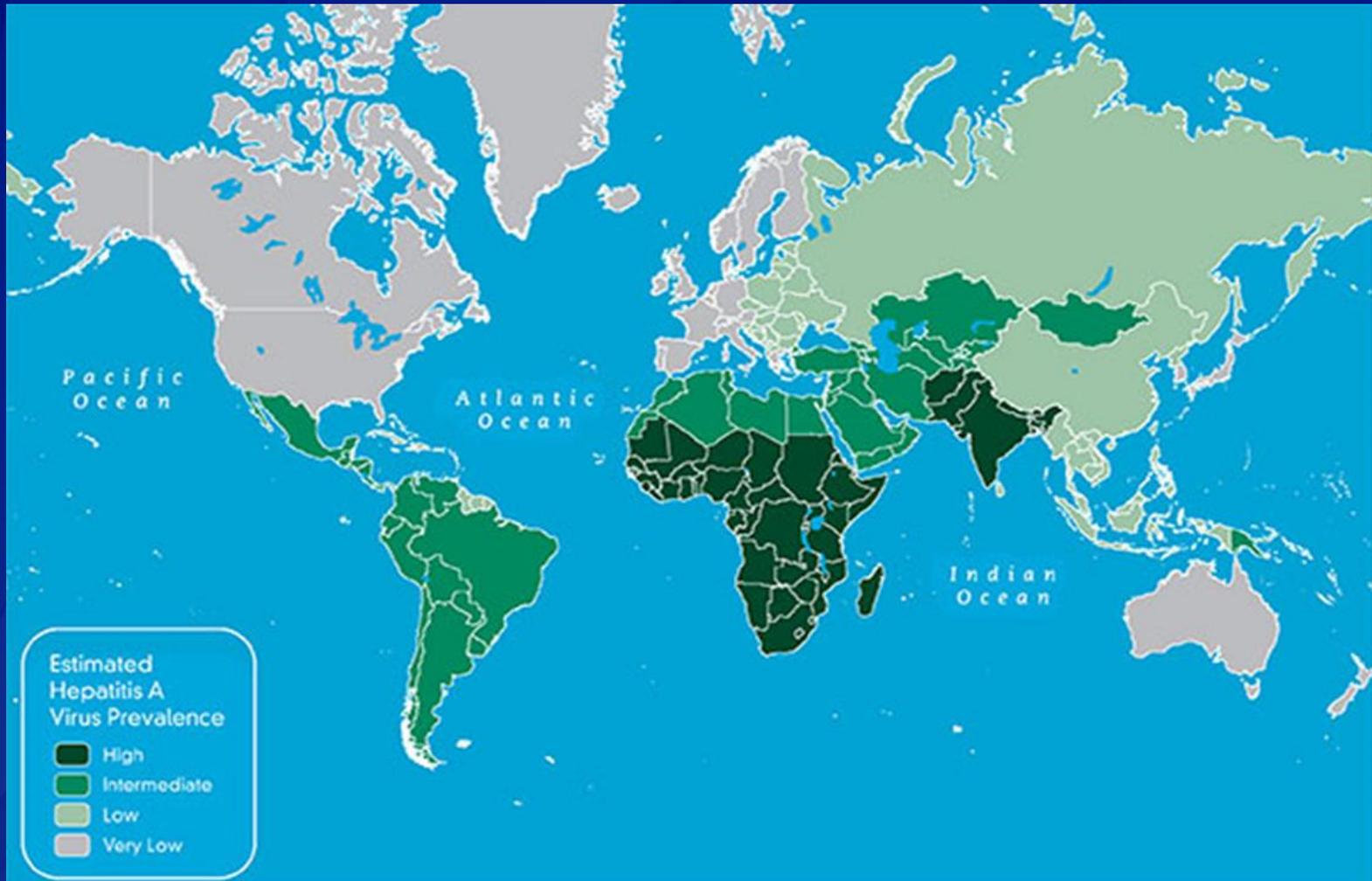
## □ Fruit

- Mexico
- Chile
- Costa Rica
- Guatemala
- Ecuador
- Argentina
- Brazil

## □ Vegetables

- Mexico
- Peru
- Guatemala
- India

# Estimated prevalence of hepatitis A virus, 2005



Jacobsen KH, Wiersma ST. Hepatitis A virus seroprevalence by age and world region, 1990 and 2005. *Vaccine*. 2010

Sep 24;28(41):6653-7.

# Summary

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of Viral Hepatitis



## Summary

- ❑ **Increasing proportion of adults in United States are susceptible to hepatitis A**
  - *Reduced exposure to HAV early in life*
  - *Significant decreases in anti-HAV seroprevalence in older adults ( $\geq 40$  years)*
  - *Low 2-dose vaccination coverage exists in adults, including high risk adults (e.g., travelers -20%, chronic liver disease - 17%)*
  - *Morbidity and mortality increases with age*
- ❑ **Suboptimal hepatitis A vaccination 1 and 2-dose coverage among young children**

## Summary-II

- ❑ **Increasing HAV cases and rates in United States**
  - *Increase in HAV cases in 2012 and 2013 ; first since 1995 - 1996*
  - *HAV infection rates increased from 2011-2012 for ages 20-29 years, and ages  $\geq 40$  years*
  
- ❑ **Hospitalization**
  - *Mean age of persons hospitalized for hepatitis A has increased significantly from 2002-2003 to 2010-2011*
  - *Hospitalization rates for reported hepatitis A cases have increased from 2005 to 2011*

## Summary-III

- ❑ **HAV remains endemic in many areas of the world**
  - *Risk for travelers to intermediate, high endemic countries*
  - *Risk for consumption of imported HAV contaminated food from global sources*
    - *Herd immunity does not protect against foodborne exposure*
  
- ❑ **No routine or catch-up hepatitis A vaccine recommendation for adolescents or adults**

# Hepatitis A vaccination - Considerations

## □ ACIP Hepatitis Work Group

- *Strategies to address increasing number/rate of acute hepatitis A and continue progress to HP2020 goal*
  - *Catch-up vaccination for children/teens age 2 -18 years*
    - *Continuing exposure to hepatitis A virus*
    - *Future protection of the adult population*
    - *Maximize herd immunity from childhood vaccination by expanding the age range of routine/catch-up vaccination*
  - *Other strategies (e.g., vaccination for other ages)*
  - *Additional information is needed*

## Hepatitis A vaccination - Additional information

- ❑ **Model hepatitis A disease and cost-effectiveness with higher hepatitis A vaccination coverage among children and adolescents, and/or subsets of adults**
  - *Planning underway*
- ❑ **GRADE for hepatitis A one and two dose vaccine efficacy (immunogenicity), safety, long term protection**
  - *Systematic review in progress*
- ❑ **Study of hepatitis A vaccine immune response 2 weeks after first dose to consider vaccine for post-exposure prophylaxis among adults ages >40 years**
  - *Planning underway*

# Acknowledgements

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