

Incidence of Hepatitis A in Arizona after the Implementation of Vaccination for Young Children

**Laura Erhart MPH, Michael Conklin,
Kathy Fredrickson MS MPH, Kimiko Gosney MS**

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Infectious Disease Epidemiology

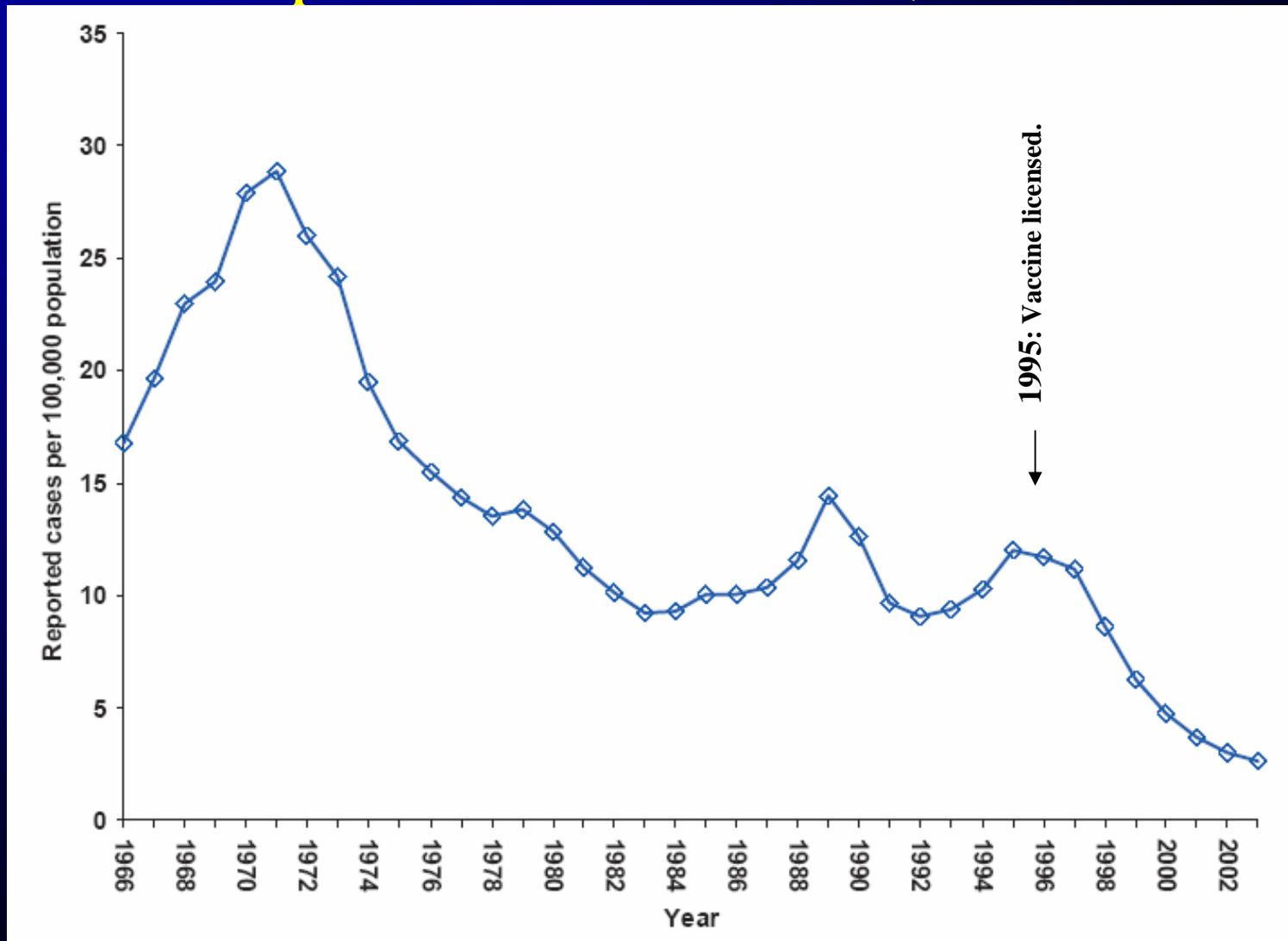
Arizona Immunization Program



Objectives

- Describe the temporal relationship between the introduction of hepatitis A vaccine in Arizona and the decrease in disease incidence.
- Draw interim conclusions about the effectiveness of targeting specific populations.

U.S. Hepatitis A incidence, 1966-2002

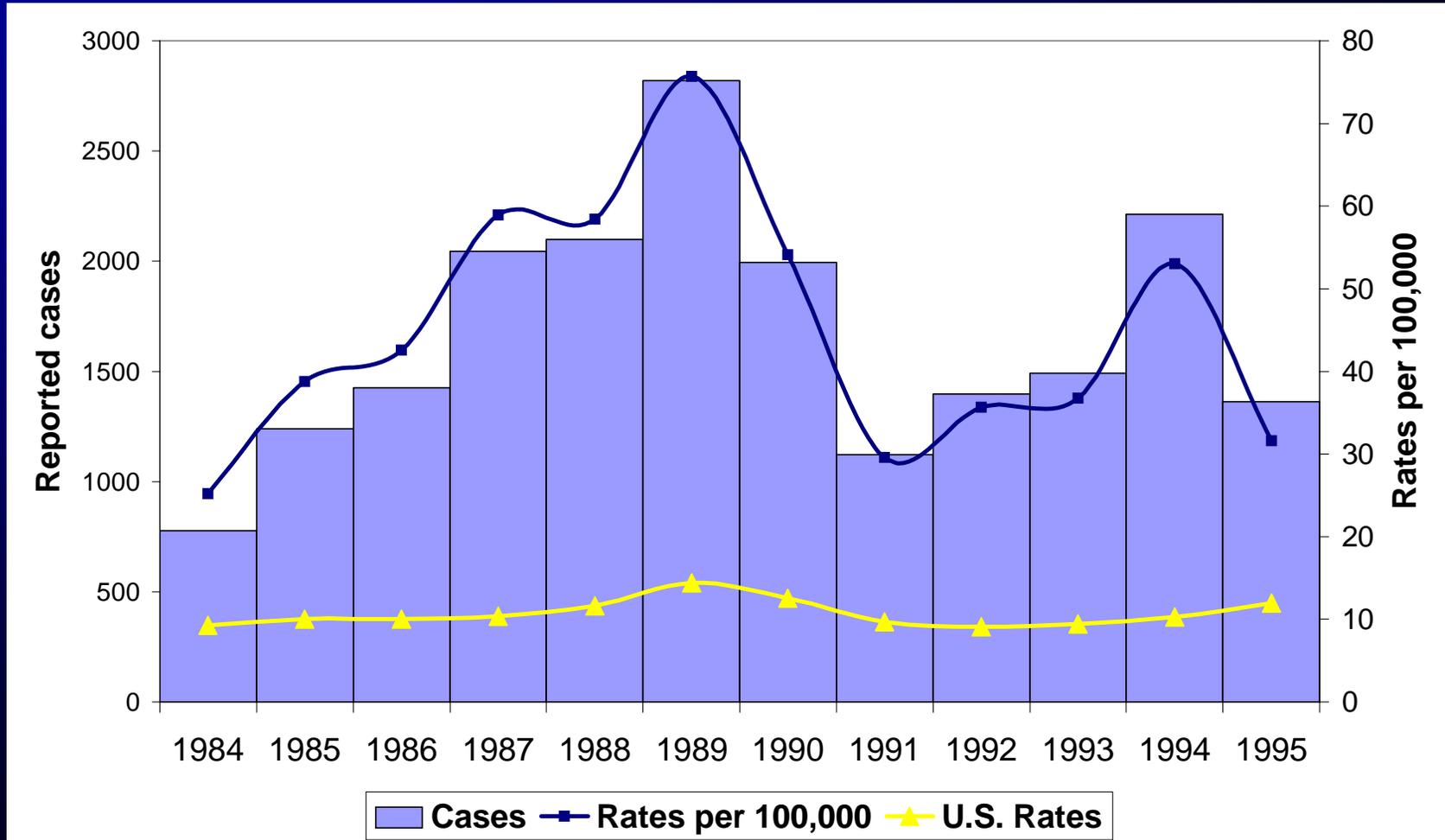


Source: Hepatitis Surveillance Report No. 60. CDC, 2005.

Infectious Disease Epidemiology
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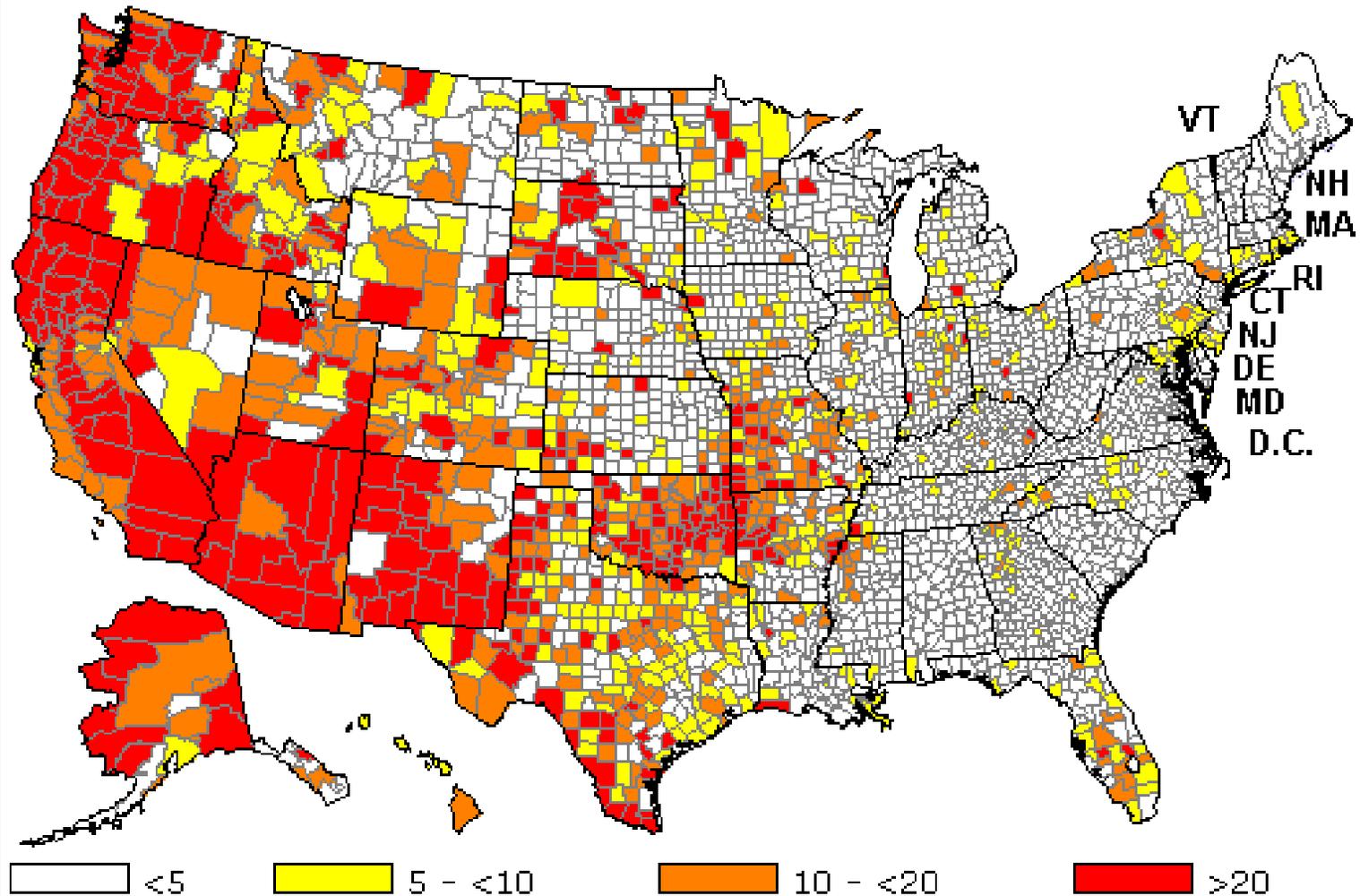


Arizona Hepatitis A incidence, 1984-1995 (reported cases)



Geographic distribution of Hepatitis A

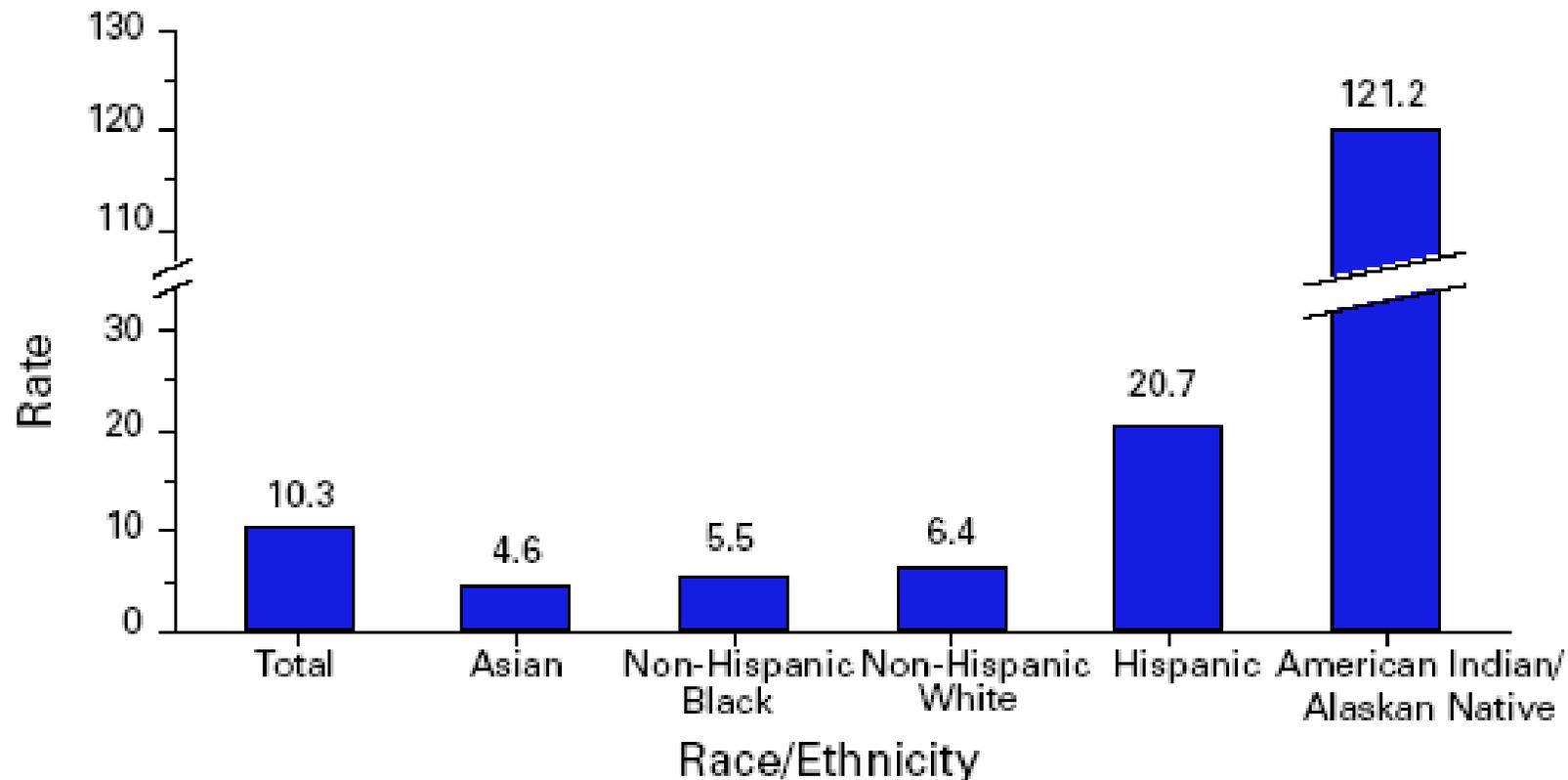
Average reported cases of hepatitis A per 100,000 population*, 1987-1997



*Approximately the national average during 1987-1997.
Source: National Notifiable Diseases Surveillance System.

Incidence by race/ethnicity

FIGURE 1. Rates* of reported hepatitis A cases, by race/ethnicity — United States, 1994

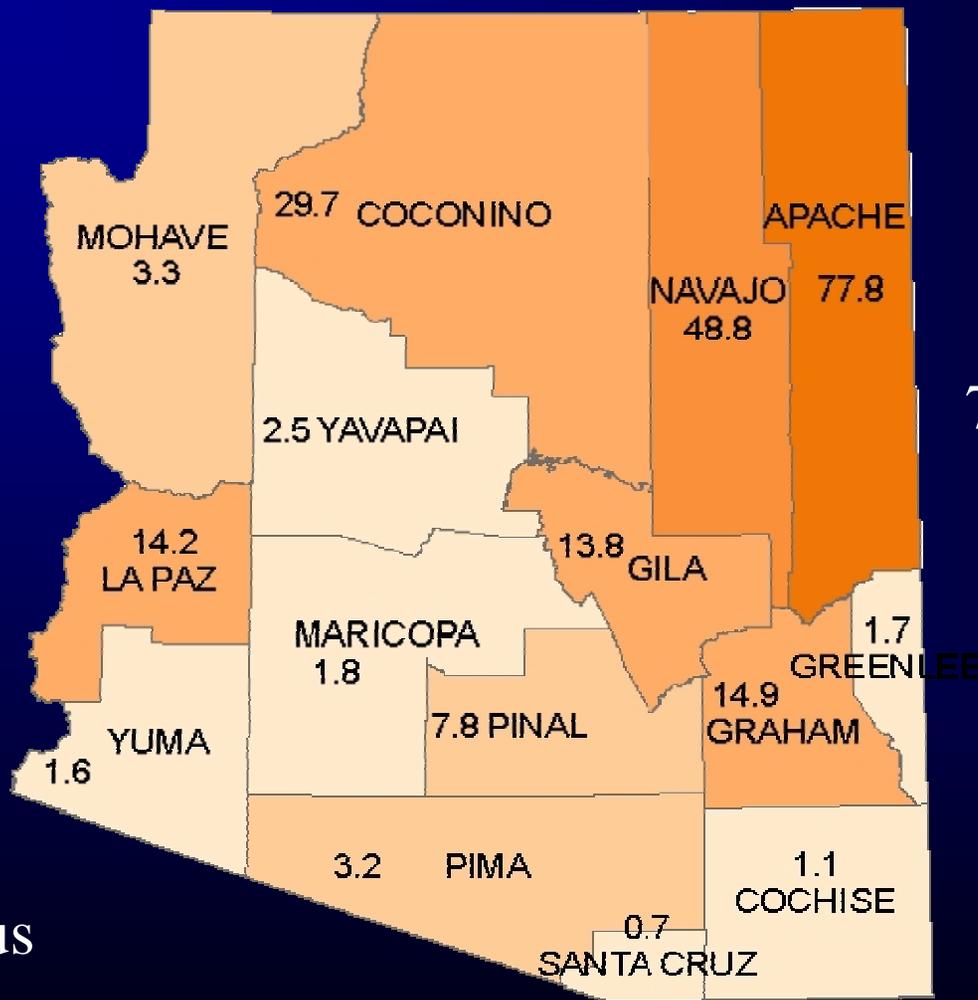


*Per 100,000 population.

Arizona

- Border state with Mexico
- Western U.S.
- Large Hispanic and Native American populations
- 15 counties

AI/AN Population by County (%)



7% of AZ pop

2000 Census

Recommendations: 1996

- High incidence among Hispanics and especially AI/AN recognized by ACIP.
- “Children living in communities that have high rates of hepatitis A should be routinely vaccinated beginning at ≥ 2 years of age.”
- IHS begins routine vaccine in Arizona, targeting AI children 2-12yo.

TABLE 2. Features of communities that have high and intermediate rates of hepatitis A

Community	Anti-HAV prevalence	Age of most patients	Reported annual incidence*	Outbreak periodicity	Populations	Examples (reference)
High rate	30%–40% (<5 yrs of age) 70%–100% (>15 yrs of age)	5–14 yrs	700–1,000	5–10 yrs	Well defined geographically or ethnically	Alaskan Native villages (33) American Indian reservations (29) Selected Hispanic communities (34) Selected religious communities (3)

Source: MMWR 1996;45(No. RR-15)

Recommendations: 1998 (AZ)

- Maricopa County (includes Phoenix metropolitan area) requires Hepatitis A vaccination for all children in licensed childcare.
- Hepatitis A vaccine made available by State for all 2-5 year old children.

Recommendations: 1999

“Children living in areas where rates of hepatitis A are at least twice the national average should be routinely vaccinated. These children include children who live in states where the average annual hepatitis A rate during 1987–1997 was ≥ 20 cases per 100,000 population (Table 2).”

TABLE 2. Burden of hepatitis A in states with average reported incidence of ≥ 20 cases per 100,000 population — 1987–1997*

State	Rate (per 100,000)	Cumulative average number of cases per year [†]	Cumulative percentage of cases	Cumulative percentage of U.S. population [§]
Arizona	48	1,852	7	2
Alaska	45	2,137	8	2
Oregon	40	3,297	12	3
New Mexico	40	3,916	14	4
Utah	33	4,519	16	5
Washington	30	6,007	21	7
Oklahoma	24	6,786	24	8
South Dakota	24	6,953	25	8
Idaho	21	7,172	26	9
Nevada	21	7,449	27	10
California	20	13,706	50	22

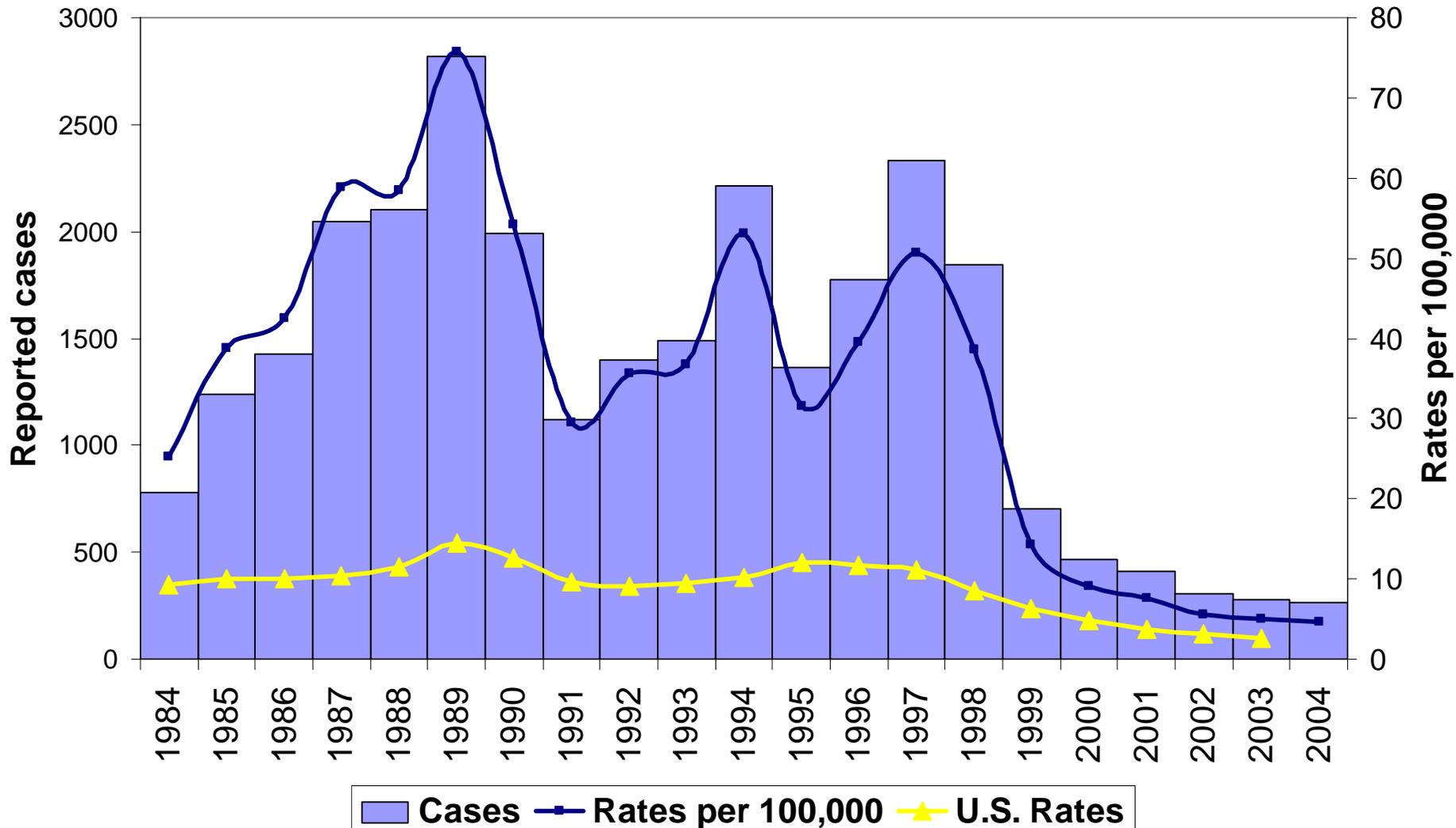
Data sources: Cases

- NETSS
 - Maintained by ADHS Infectious Disease Epidemiology Section
 - Includes all of Arizona
 - Hepatitis A reporting is required
 - Also lab-reporting of Hepatitis A IgM+ tests
 - IHS/tribal health not covered by same legislation but do courtesy reporting
- Population denominators from census data

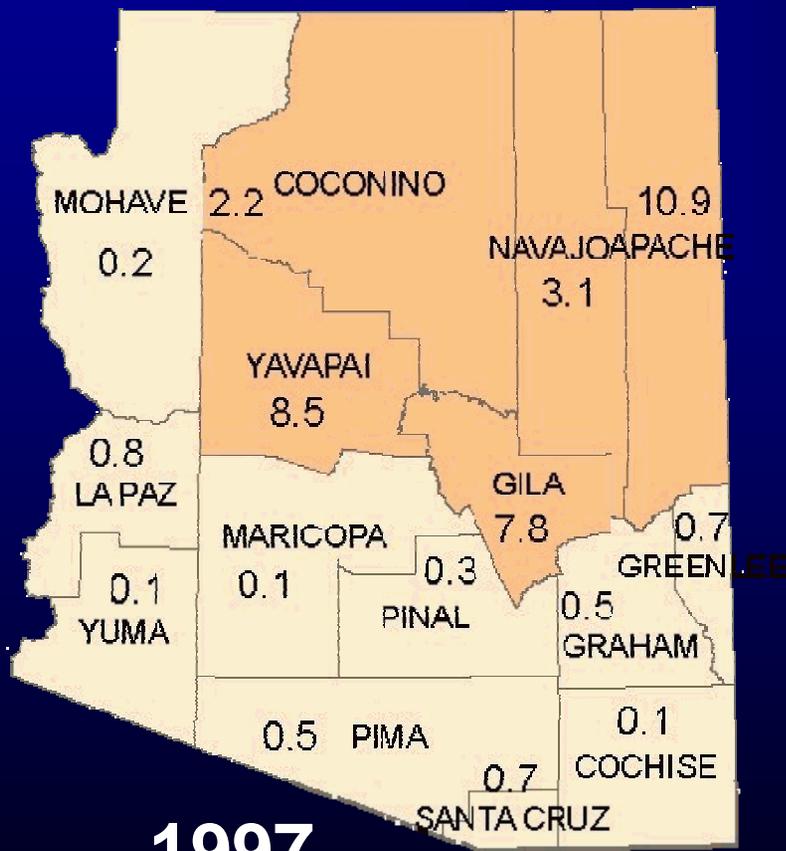
Data sources: Vaccine coverage

- ASIIS (Arizona State Immunization Information System)
 - Populated by birth records
 - Mandated by statute ARS 36-135 in January of 1998. Reporting required from all providers for shots to persons under 19 years old.
 - Historical shots included
 - Data sharing agreements with IHS have led to recent uploads of IHS/tribal shot records.
- “Vaccinated” = 1 or more shots after age 2 years

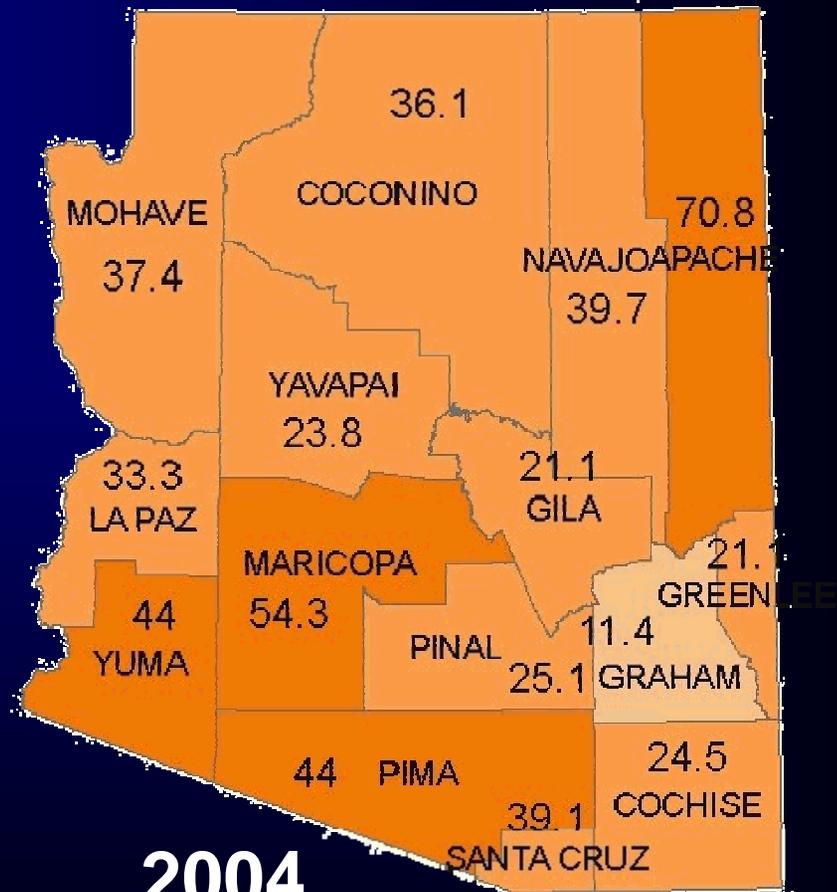
Reported hepatitis A, Arizona, 1984-2004



Vaccination rates among 2-14 year olds: one or more hepatitis A vaccinations

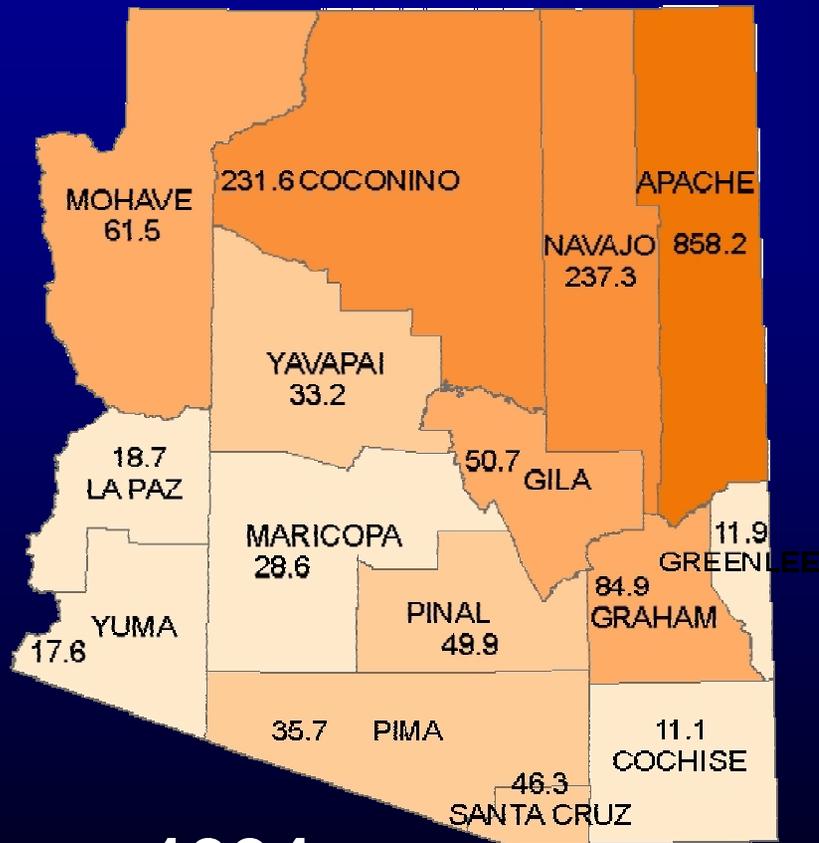


1997

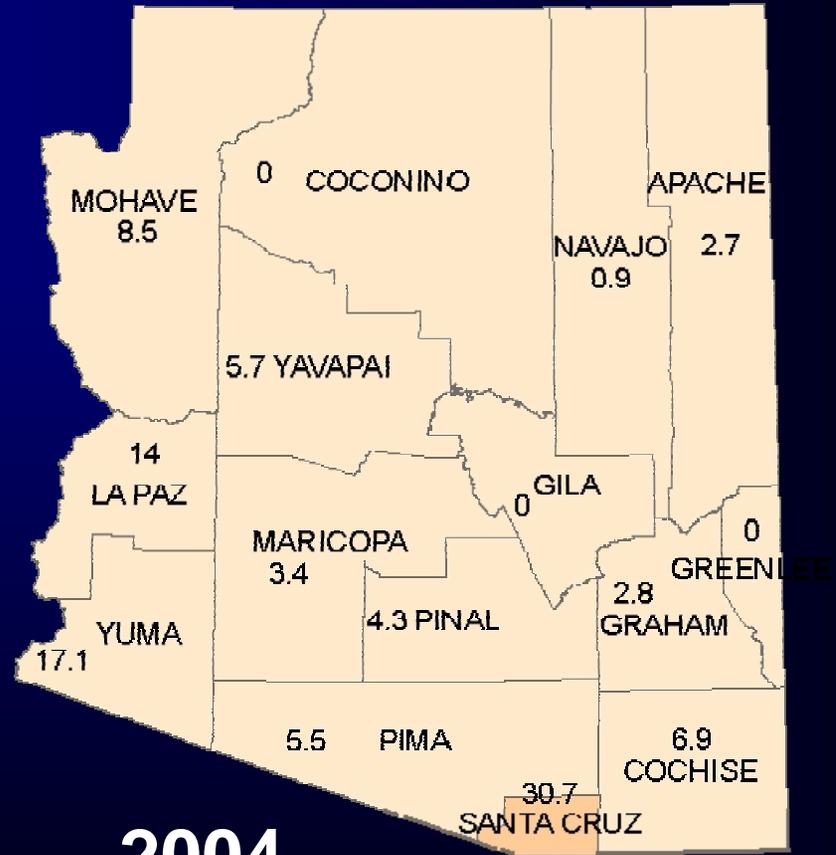


2004

Rates of reported hepatitis A cases, per 100,000, Arizona

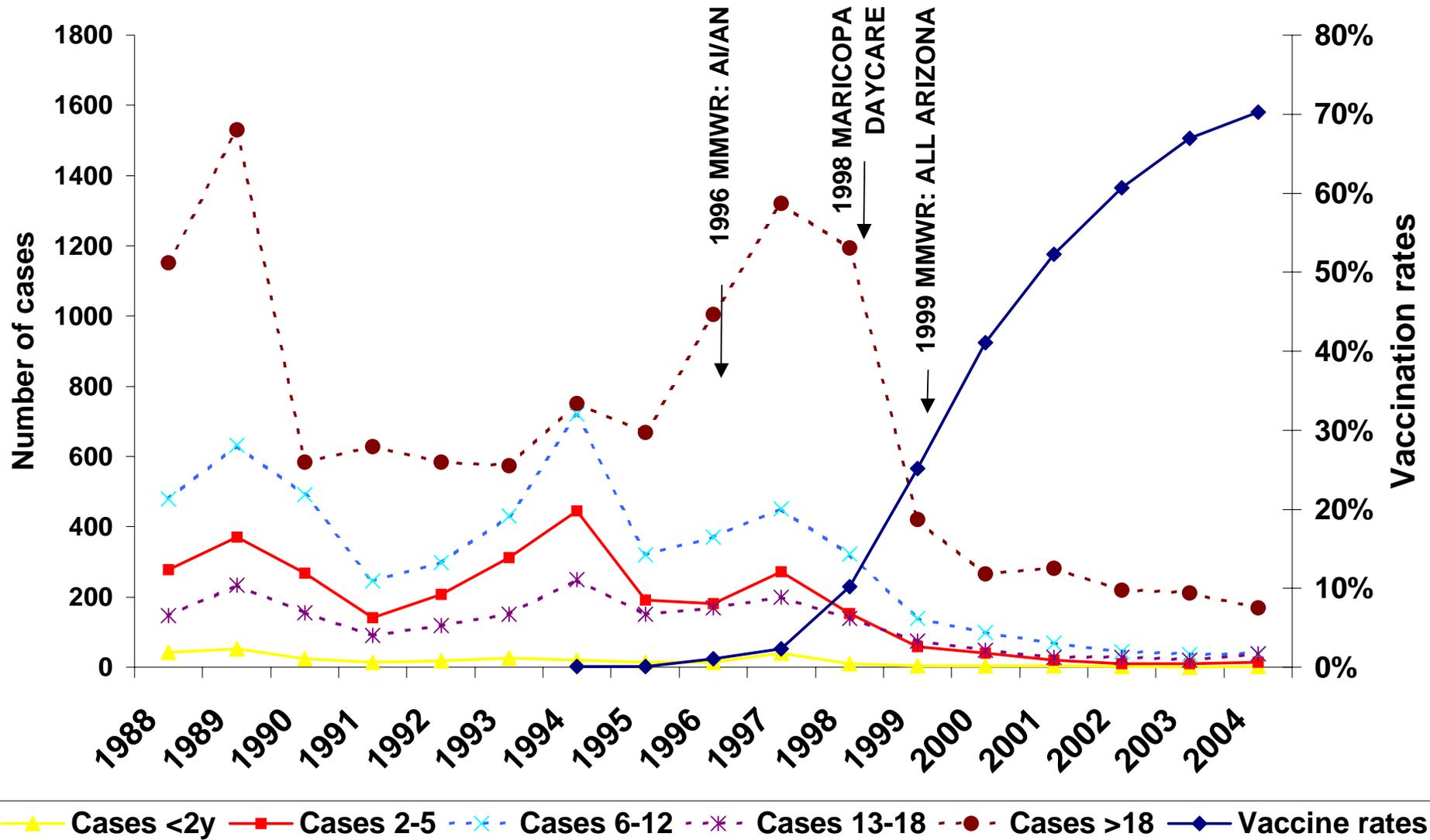


1994

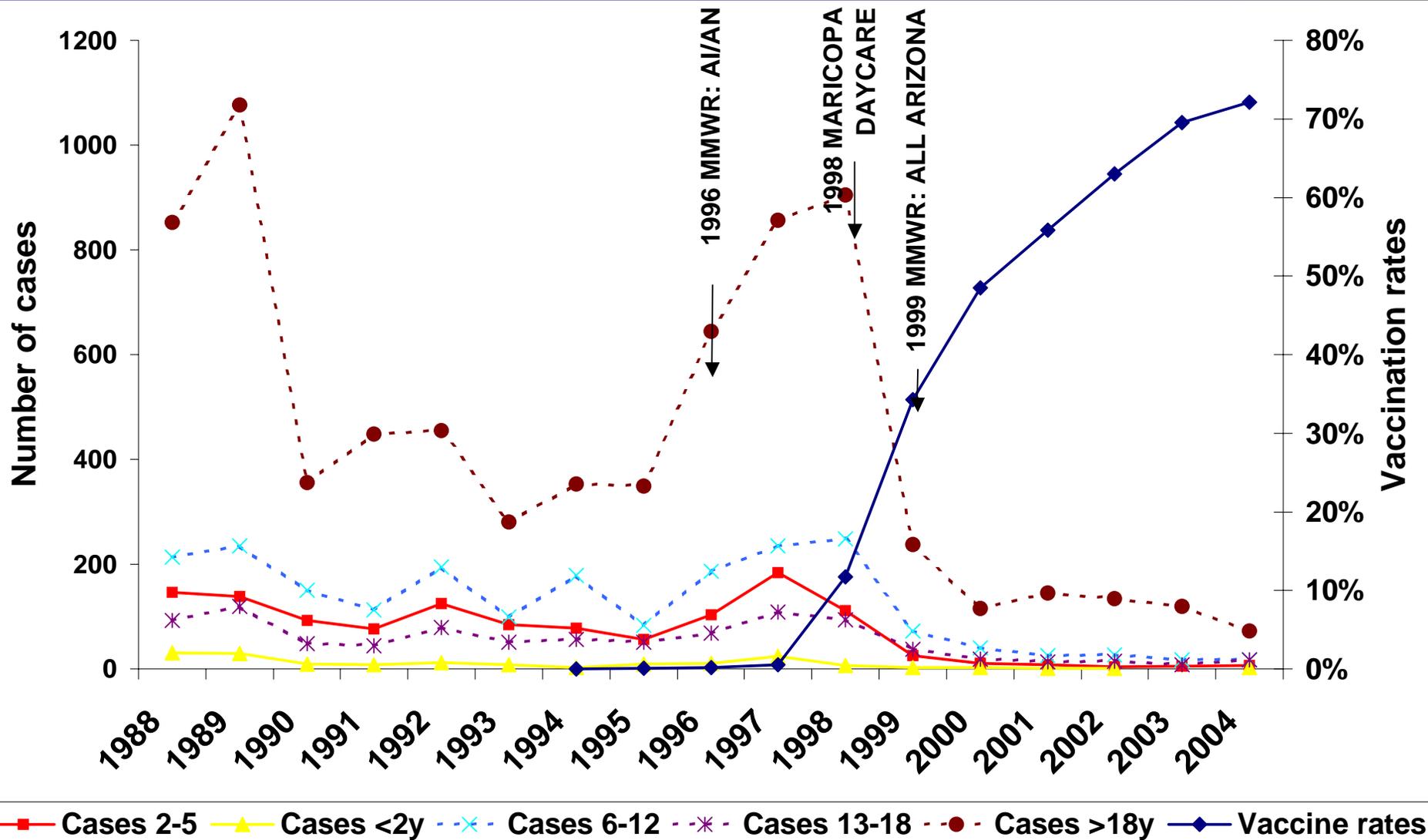


2004

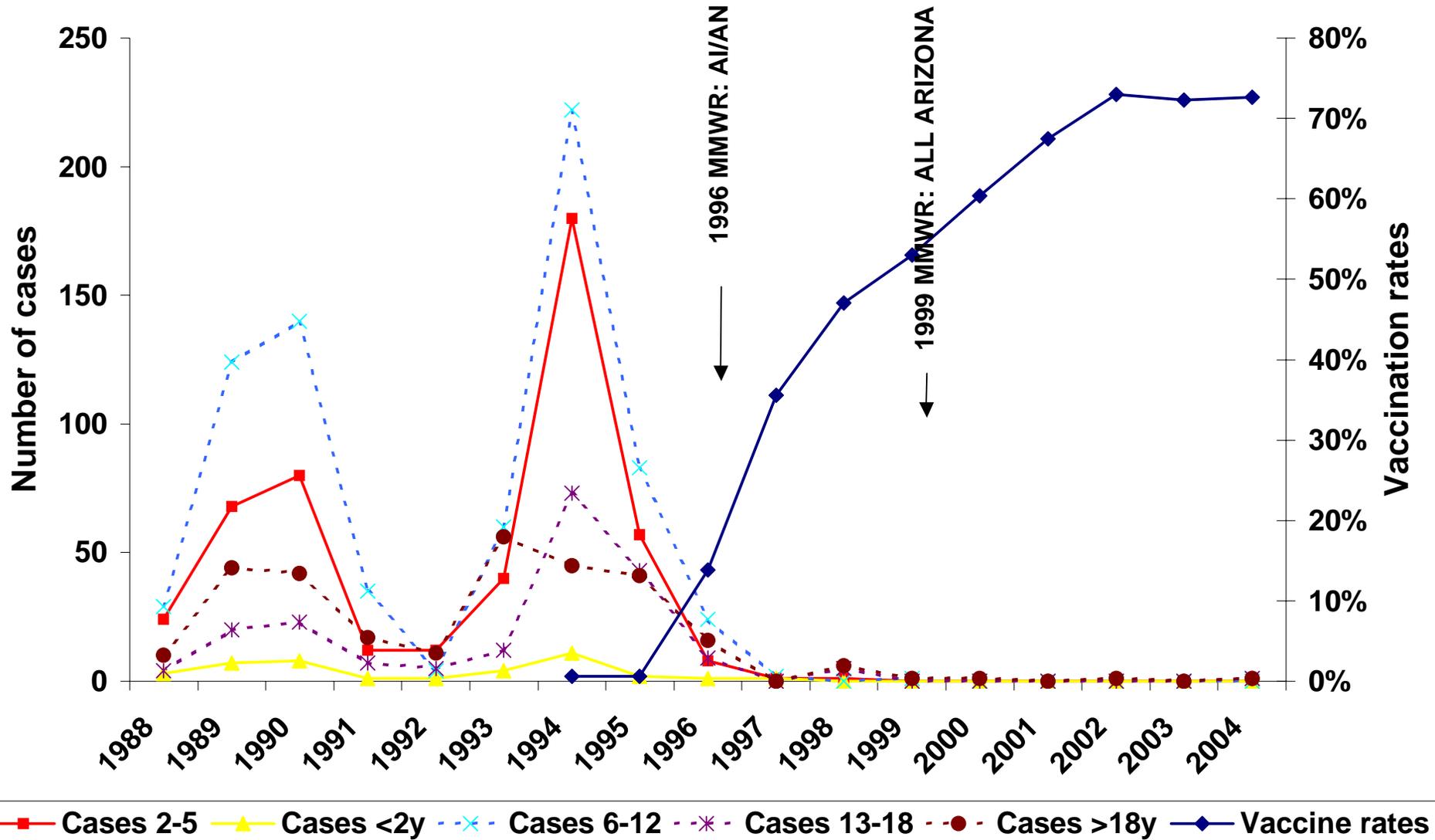
Vaccination rates and cases reported, Arizona, 1988-2004



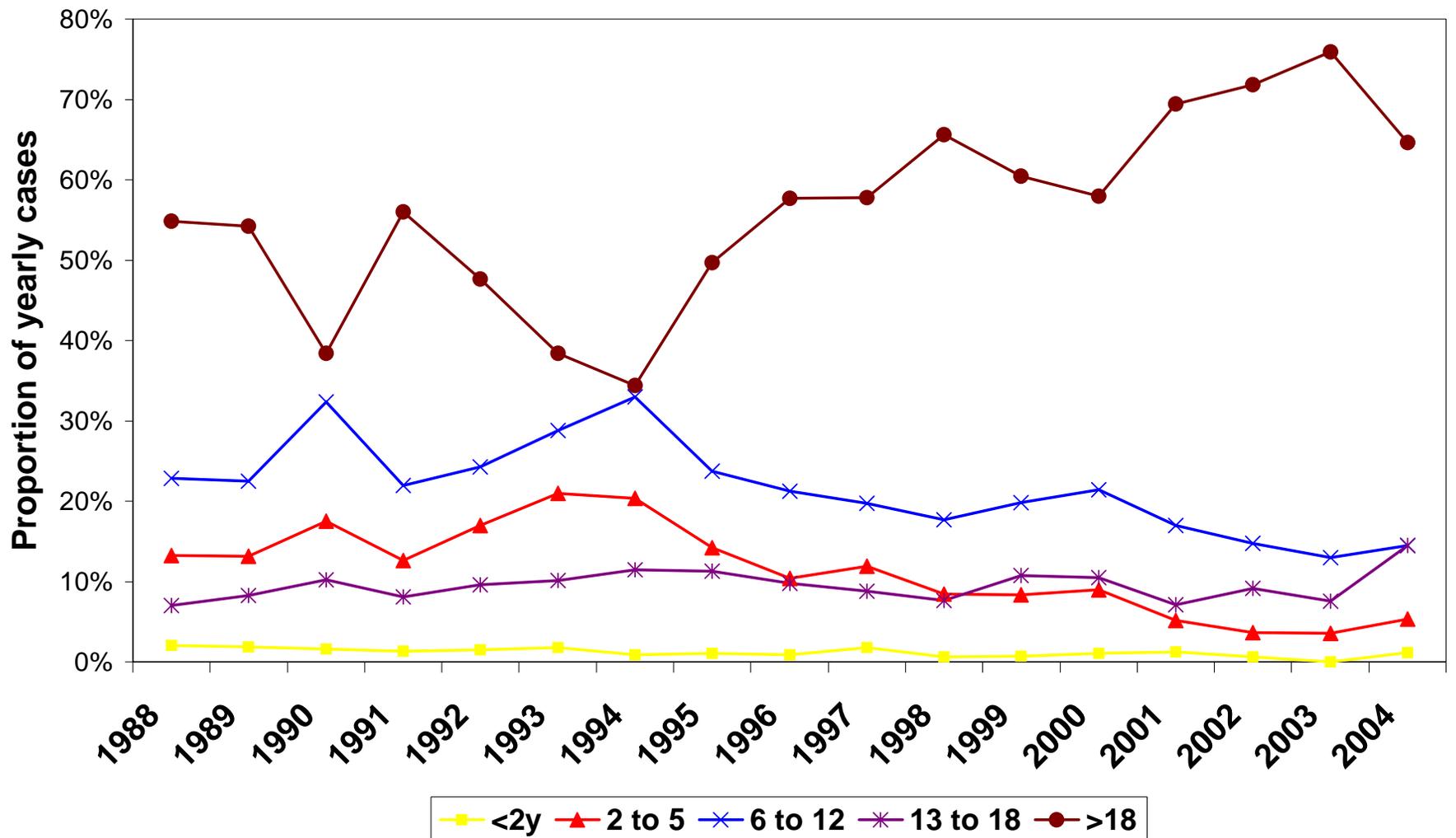
Vaccination rates and cases reported, Maricopa County, 1988-2004



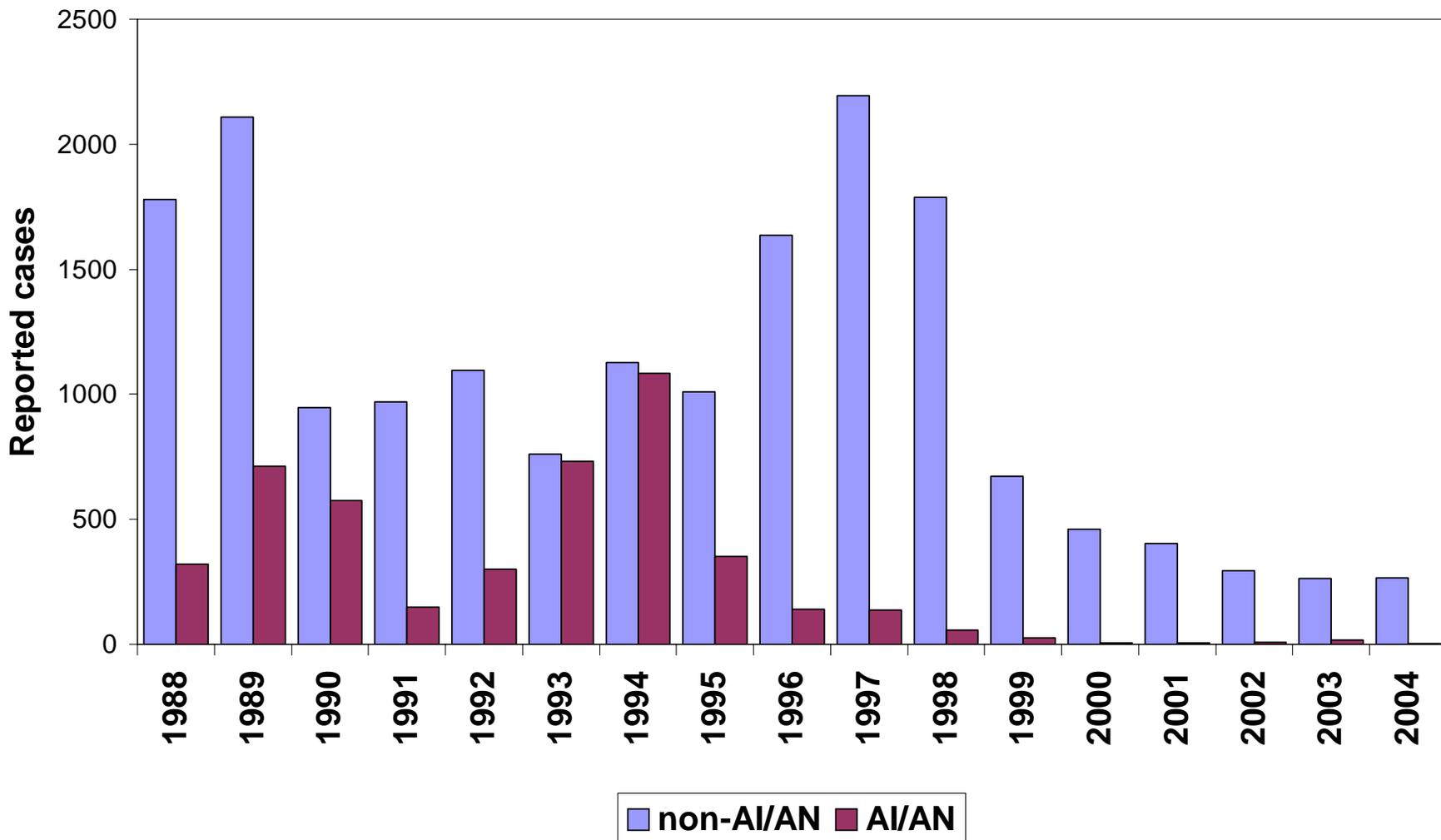
Vaccination rates and cases reported, Apache County, 1988-2004



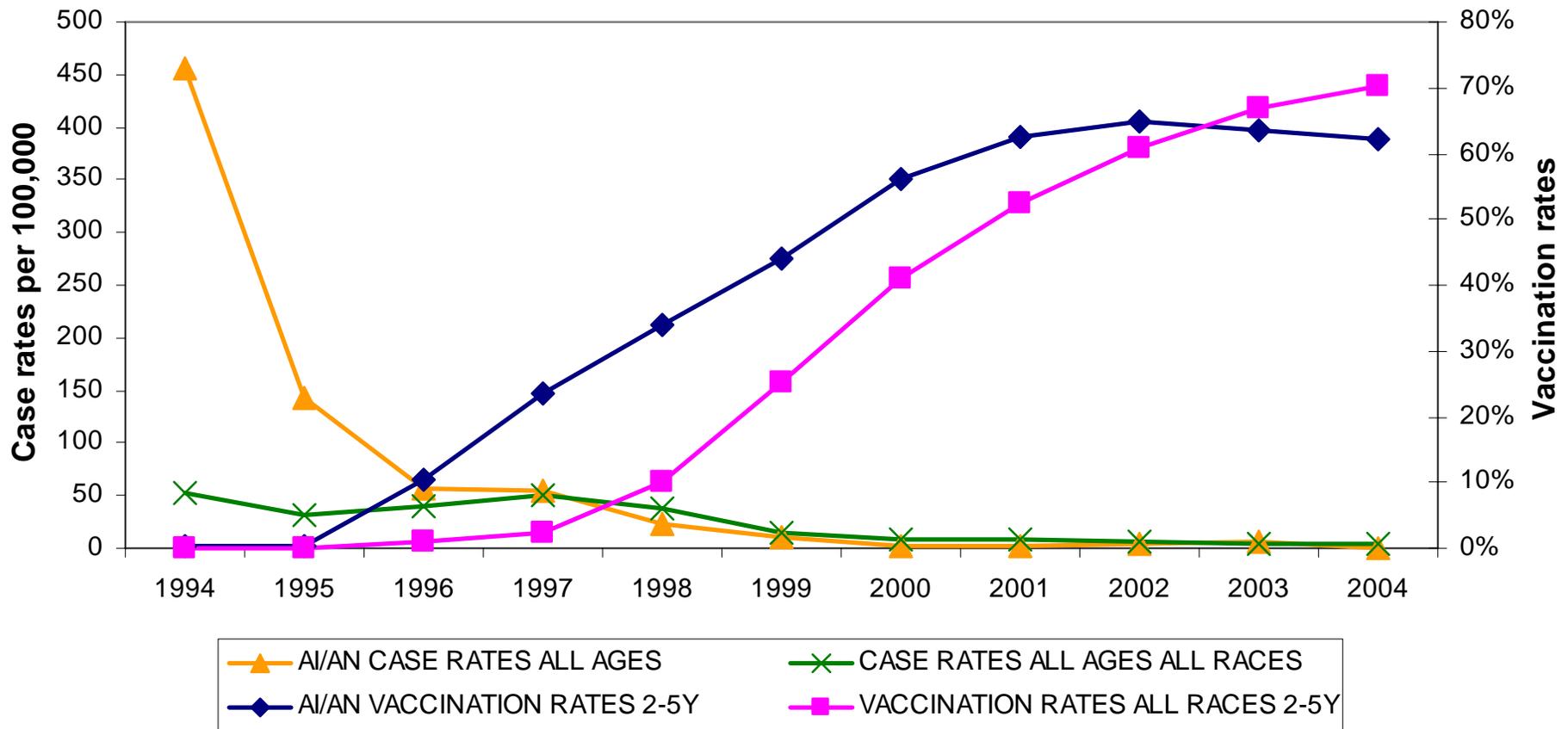
Trends in age breakdown of hepatitis A cases, Arizona



Cases reported among Native Americans, Arizona, 1988-2004



Case rates and vaccination rates among Native Americans, 1994-2004



Limitations

- Dependent on completeness of reporting
 - Reporting not mandatory for IHS/tribes
- Registry may not include all vaccinations, especially for earlier years
- No way to measure direct impact of childcare rule (incomplete case data on association with childcare)

Discussion

- Temporality
 - Steep decrease in number of reported cases followed vaccine licensure & recommendations
 - Decrease more consistent for counties with higher vaccination rates
 - Decreases were concurrent with increasing vaccination rates, but started before coverage was very high.
 - Coincidental with downturn in cases; vaccine then prevented another cycle?
 - Other associated factors?

Discussion

- Targeting of specific groups
 - AI/AN: Appears to have had significant impact among this group.
 - Vaccination uptake was much sooner among AI than in AZ as a whole.
 - Very few cases reported in last five years (2000-2004)
 - 43 cases (3.1 per 100,000) reported as AI/AN in AZ.
 - 23 cases (2.7 per 100,000) reported from Apache + Navajo Counties (large % AI/AN)
 - Comparison with shigellosis reporting indicates that this significant decline is not entirely due to lack of reporting from IHS/tribes, lack of racial data, or environmental factors.

Discussion

- Targeting of specific groups
 - Decreased incidence among 2-5yo group
 - Declines in all age groups (interruption of transmission)
 - Change in age-specific burden of disease
 - Shift towards adults

Conclusions

- Increase in vaccination coverage concurrent with decrease in hepatitis A cases
- Within Arizona, case rates somewhat higher in areas where recommendations not as strong
- Broadening of vaccination requirements & recommendations may contribute to continued decline of cases