

# Summary and Discussion

## Third Dose of MMR Vaccine for Mumps Control

## Summary of Issues

- ❑ US experienced large mumps outbreaks in 2006 and 2009-2010 among highly 2-dose vaccinated populations
- ❑ Mumps outbreaks are likely to occur in the future
- ❑ Standard outbreak control measures (e.g. isolation of cases and vaccination of eligible contacts) have not been completely effective in some situations
- ❑ Currently, no recommendation for use of a third dose of MMR vaccine during mumps outbreaks

# Summary of Third Dose MMR Vaccine Studies

- ❑ **Decline in attack rates in targeted age group**
  - Orange County: 96% decline
  - Guam: 84% decline
  - Limitations include timing of intervention
- ❑ **Third dose of MMR vaccine appears to be safe**
  - Very few mild and no serious adverse events reported
- ❑ **Outbreak investigations and vaccine interventions can be resource intensive**
  - Orange County: \$463,202 ---- \$586/case
  - Guam: \$281,856 ---- \$558/case

## Option for Use of MMR Vaccine during Mumps Outbreaks

- ❑ Permissive use of a targeted third dose for mumps outbreak control in certain situations with appropriate guidelines
  1. Appropriate setting
  2. High 2-dose coverage
  3. Timing and group to target
    - Minimum attack rate or number of reported cases
    - Minimum number of generations

# 1. In what setting would an intervention be appropriate?

- ❑ **Congregate environments with prolonged or repeated, intense exposure**
  - Schools
  - Colleges
  - Correctional facilities
  - Residential or institutional settings
- ❑ **Health facilities**
  - Personnel – potential to expose immunocompromised patients

## 2. How high should 2-dose coverage be?

### □ >90% coverage in the target group

- National 2 dose MMR coverage among adolescents aged 13-17 years: 90.5%<sup>1</sup>
- Estimated herd immunity threshold: 85%-92%<sup>2,3</sup>
- MMR vaccine uptake in 3 large colleges: 88-89%

<sup>1</sup>MMWR. 2011; 60(33);1117-1123

<sup>2</sup>Anderson RM, et al. *Epidemiol Infect.* Aug 1987;99(1):65-84.

<sup>3</sup>Anderson RM, May RM. *Nature.* Nov 28-Dec 4 1985;318(6044):323-329.

### 3. When should the intervention be conducted?

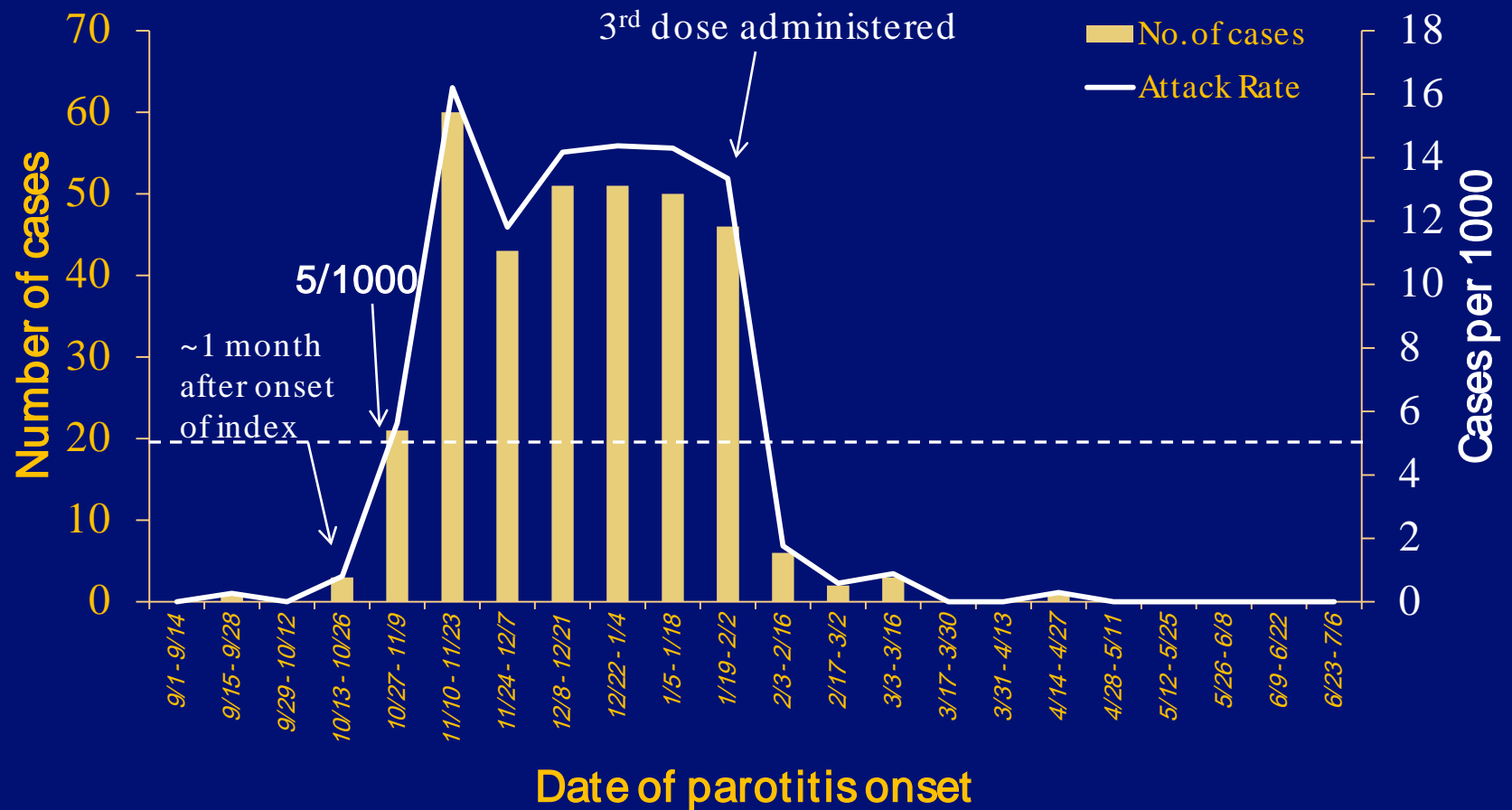
- ❑ **Minimum attack rate**

- 5 cases/ 1000 population at risk

- ❑ **Number of generations**

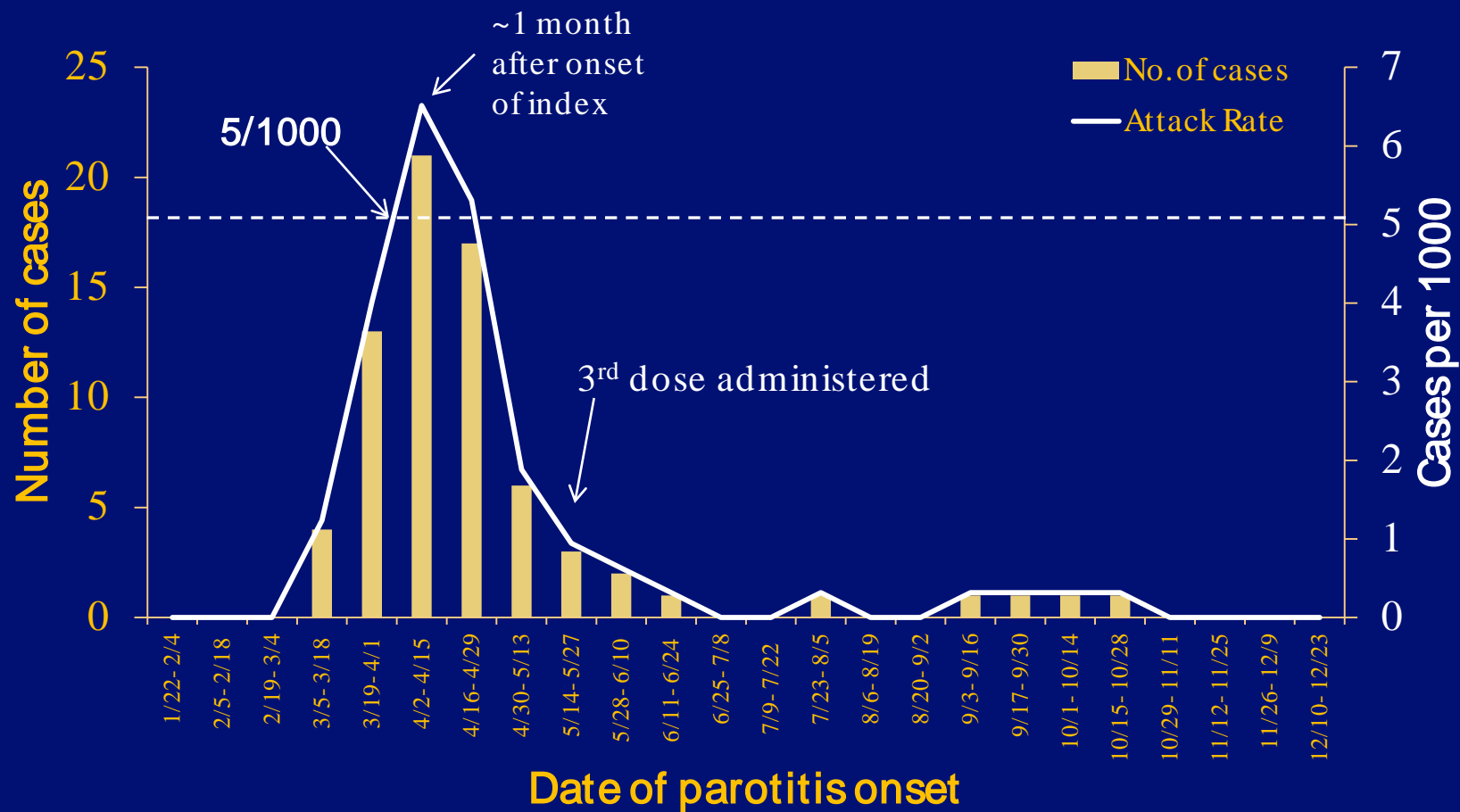
- 2 generations of spread in the target group

# Orange County Mumps Attack Rates, Aged 11-17 years, June 1, 2009 – June 30, 2010 (n=338)

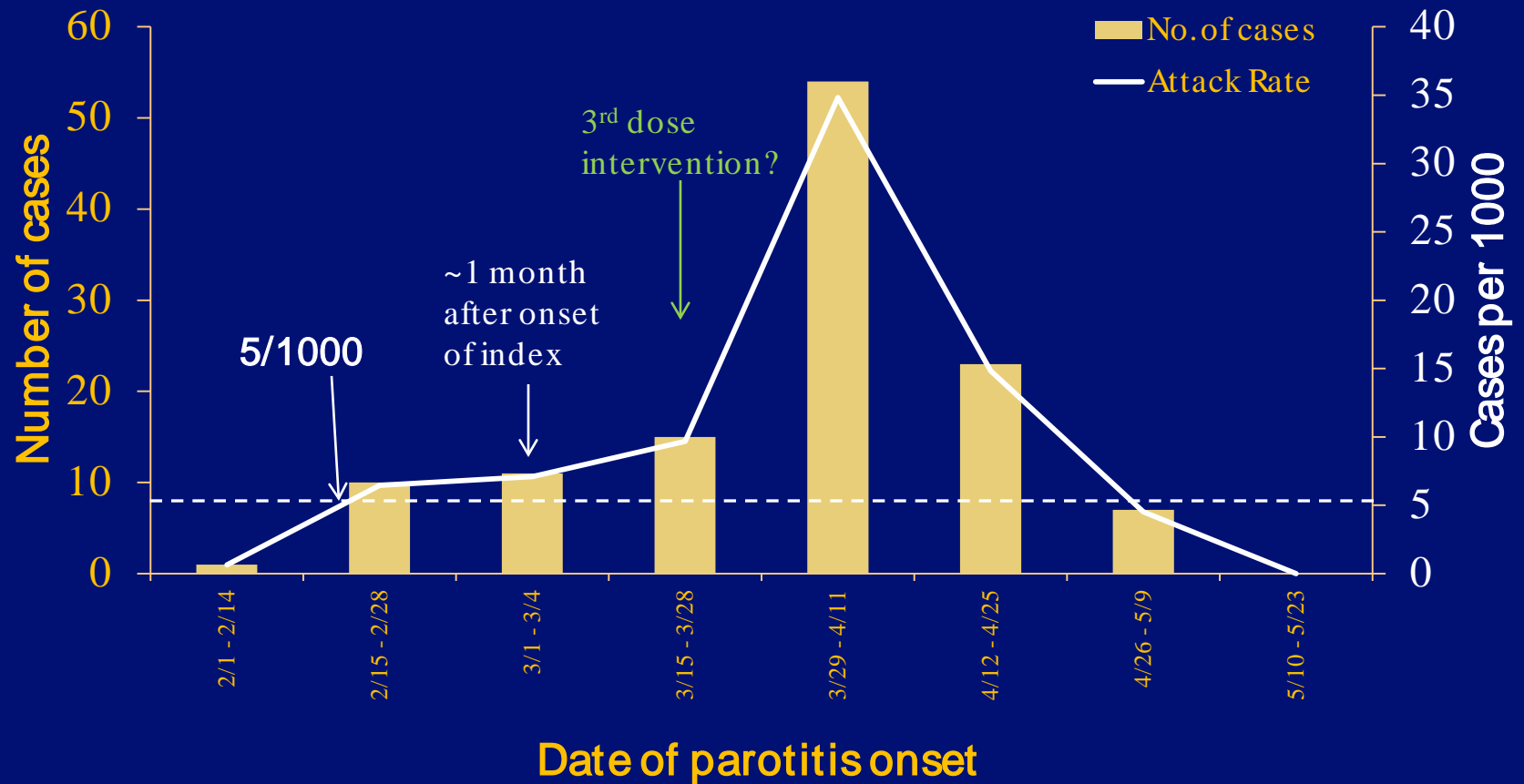




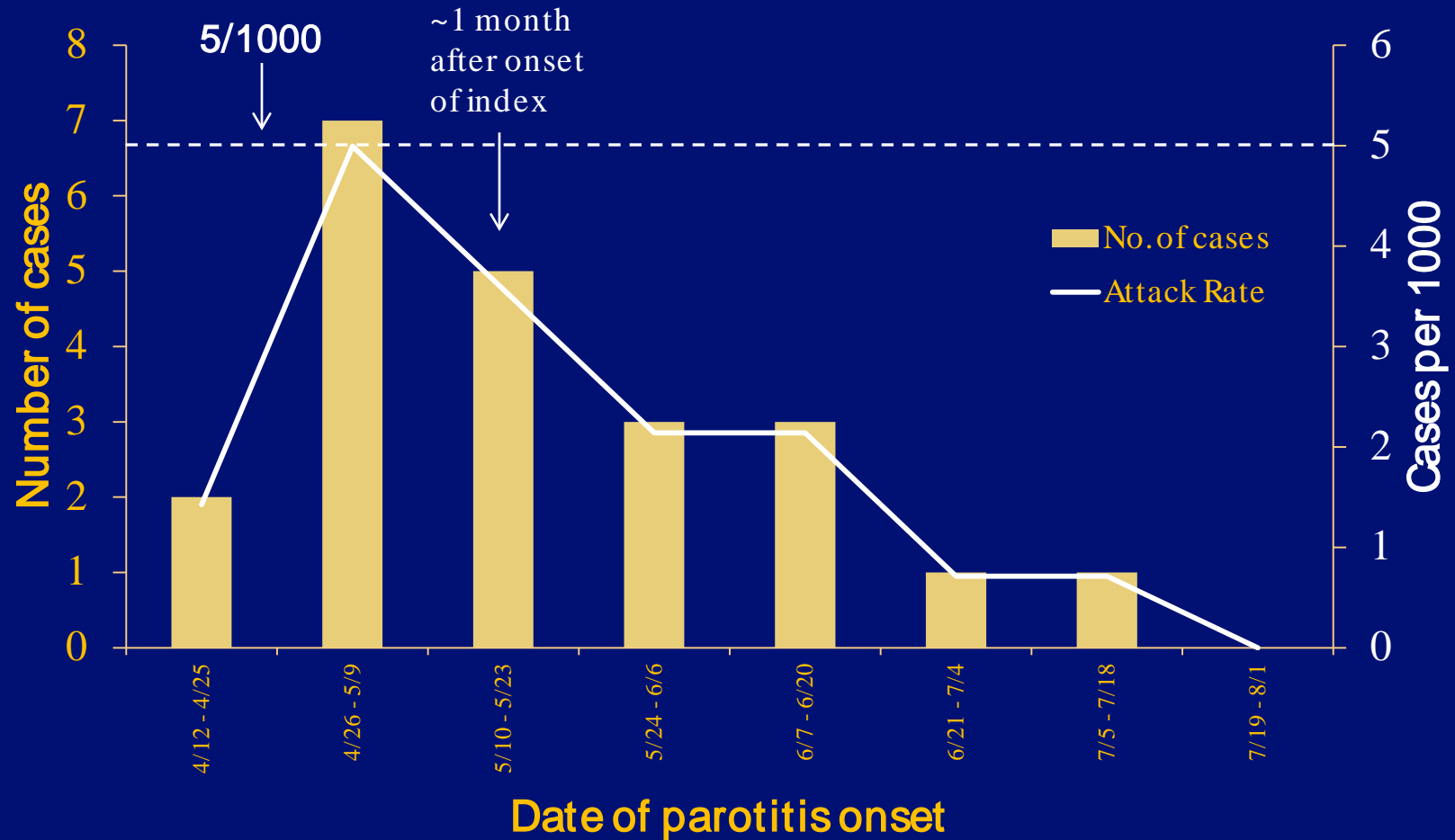
# Guam Mumps Attack Rates, Students Aged 9-14 years, January 22 – December 23, 2010 (n=72)



# Mumps Outbreak Example 1, College A (n=121)



## Mumps Outbreak Example 2, College B (n=22)



## Discussion

- ❑ **Is permissive use of a targeted third dose for mumps outbreak control in certain situations reasonable?**
  - Congregate environments with prolonged or repeated, intense exposure
  - >90% coverage with 2 doses of MMR in target population
  - Attack rate >5/1000
  - At least 2 generations of spread