

Varicella (Chickenpox) and Herpes Zoster (Shingles):

Overview of VZV Disease and Vaccination for Healthcare Professionals

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Varicella-Zoster Virus (VZV)

- Human alpha-herpesvirus
- Causes varicella (chickenpox) and herpes zoster (shingles)
- Primary VZV infection leads to varicella
- VZV establishes latency in dorsal root ganglia after primary infection
- VZV can reactivate at a later time, causing herpes zoster
- There are 3 licensed vaccines to prevent varicella (Varivax[®], Proquad[®]) and herpes zoster (Zostavax[®]) in the US:
 - Varivax[®] (licensed 1995)
 - Proquad[®] (licensed 2005)
 - Zostavax[®] (licensed 2006)

VARICELLA

VARICELLA: CLINICAL DESCRIPTION

Varicella: Clinical Features in Unvaccinated Cases

- Persons with varicella may develop prodrome of fever, malaise, headache, and abdominal pain 1-2 days before rash
- Rash involves 3 or more successive crops over several days; each crop usually progresses within less than 24 h from macules to papules, vesicles, pustules and crusts so that on any part of the body there are lesions in different stages of development
- Rash usually starts on face and trunk, then spreads to extremities
- Rash usually involves 250-500 lesions that are pruritic
- Lesions are typically crusted 4-7 days after rash onset

Varicella: Clinical Features in Vaccinated Persons (“breakthrough varicella”)

- Breakthrough varicella is defined as infection with wild-type varicella disease occurring > 42 days after vaccination
- Approximately 15-20% of 1-dose vaccinated persons may develop varicella if exposed to VZV
- Usually milder clinical presentation than varicella in unvaccinated cases
 - Usually low or no fever
 - Develop < 50 lesions
 - Experience shorter duration of illness
 - Rash predominantly maculopapular rather than vesicular
- 25-30% of breakthrough varicella cases are not mild and have clinical features more similar to varicella in unvaccinated persons



Varicella: Complications

- Secondary bacterial infection of skin lesions
- Central nervous system manifestations (meningoencephalitis, cerebellar ataxia)
- Pneumonia (viral or bacterial)
- Hepatitis, hemorrhagic complications, thrombocytopenia, nephritis occur less frequently
- Certain groups at increased risk for complications
 - Adults
 - Immunocompromised persons
 - Pregnant Women
 - Newborns

Varicella: Transmission

- Transmitted person to person by direct contact, inhalation of aerosols from vesicular fluid of skin lesions of acute varicella or zoster, or aerosolized respiratory tract secretions
- Average incubation period: 14-16 days after exposure to rash (range: 10-21 days)
- Period of contagiousness: 1-2 days before rash onset until all lesions crusted or disappear if maculopapular rash (typically 4-7 days)
- Varicella in unvaccinated persons is highly contagious (61-100% secondary household attack rate)
- Varicella in 1 dose-vaccinated persons half as contagious as unvaccinated cases
 - One study indicated that varicella in 1-dose vaccinees with < 50 lesions was 1/3 as contagious as unvaccinated persons although contagiousness in vaccinees with ≥ 50 lesions was similar to unvaccinated persons

**VARICELLA: EPIDEMIOLOGY AND
IMPACT OF THE VARICELLA
VACCINATION PROGRAM**

Varicella Disease Burden in the United States Before Introduction of Varicella Vaccine in 1995

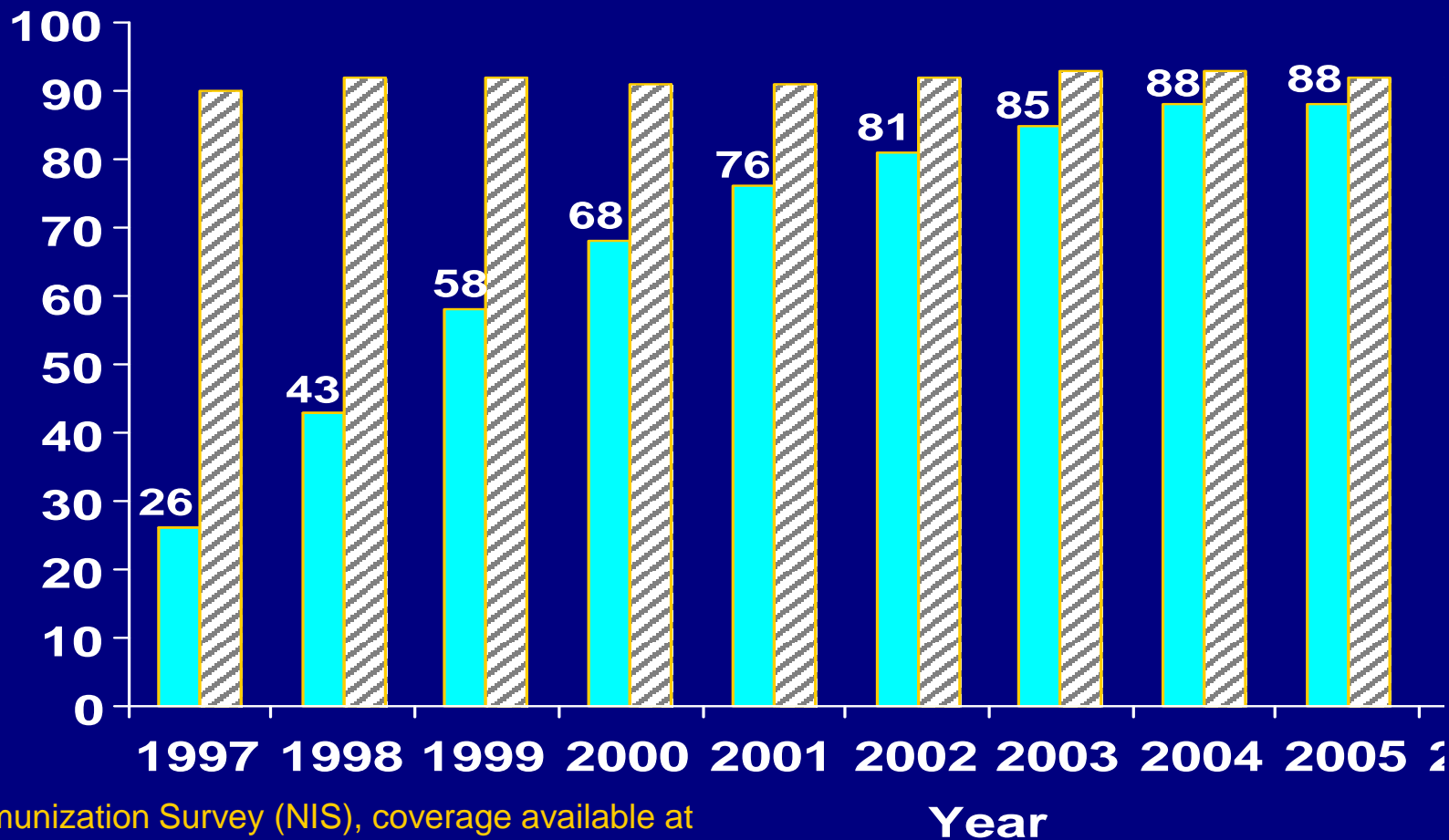
- 4 million cases/year
- 11,0000 - 13,500 hospitalizations/year
- 100 - 150 deaths/year
- Greatest disease burden in children
 - >90% cases
 - 70% hospitalizations
 - 50% deaths



Experience with 1-dose Varicella Vaccination Program

- 1-dose varicella vaccination coverage in 19-35 month-olds increased from 26% to 91% from 1997 to 2008
- Varicella disease incidence declined by 90% in two varicella active surveillance sites by 2005 as compared to 1995
- Varicella hospitalizations declined 88% during 1994-2002
- Varicella mortality rate declined 93% from 1990-1994 to 2005-2006 in persons aged <50 years

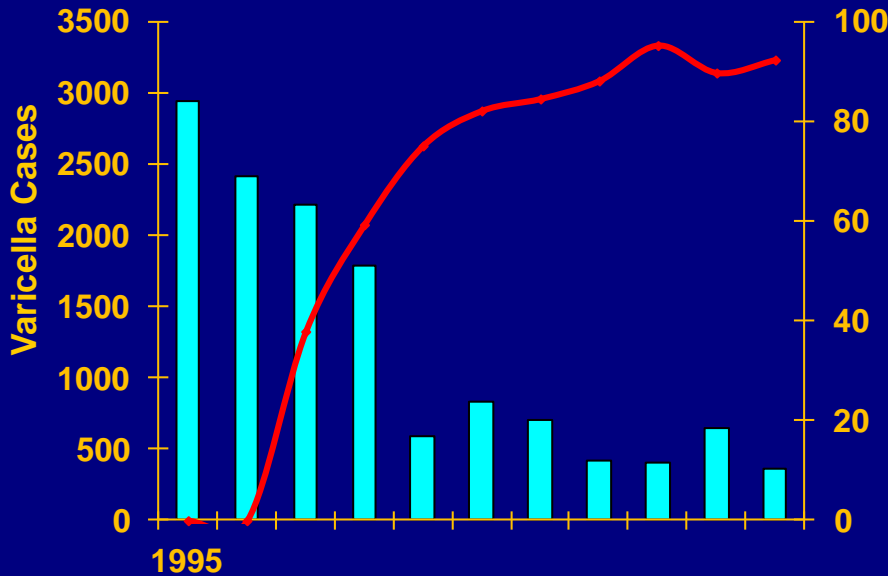
Varicella and Measles Vaccine Coverage (1+ doses)*, Children 19-35 Months National Immunization Survey, 1997-2008



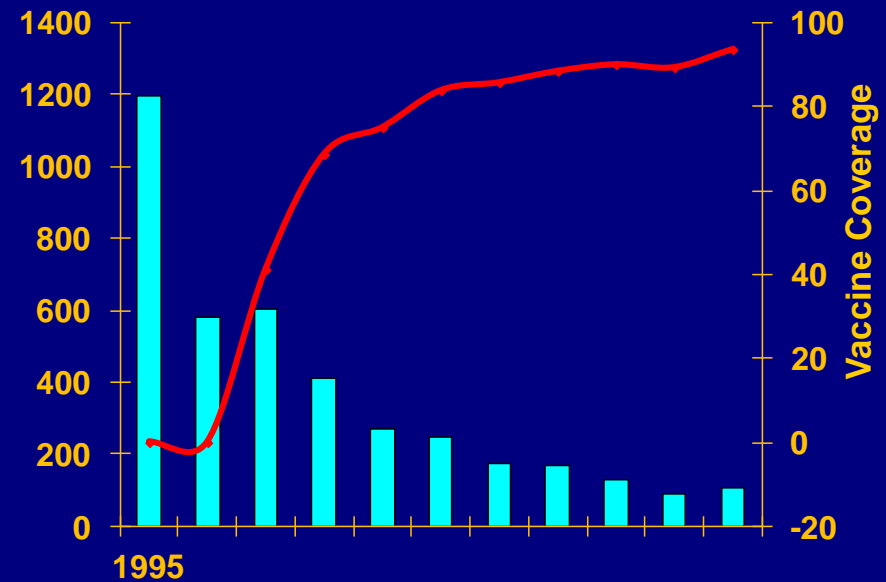
*National Immunization Survey (NIS), coverage available at <http://www.cdc.gov/vaccines/stats-surv/default.htm#nis>

Varicella Cases and 1-Dose Vaccine Coverage Varicella Active Surveillance Project Sites, 1995-2005

Antelope Valley, California



West Philadelphia

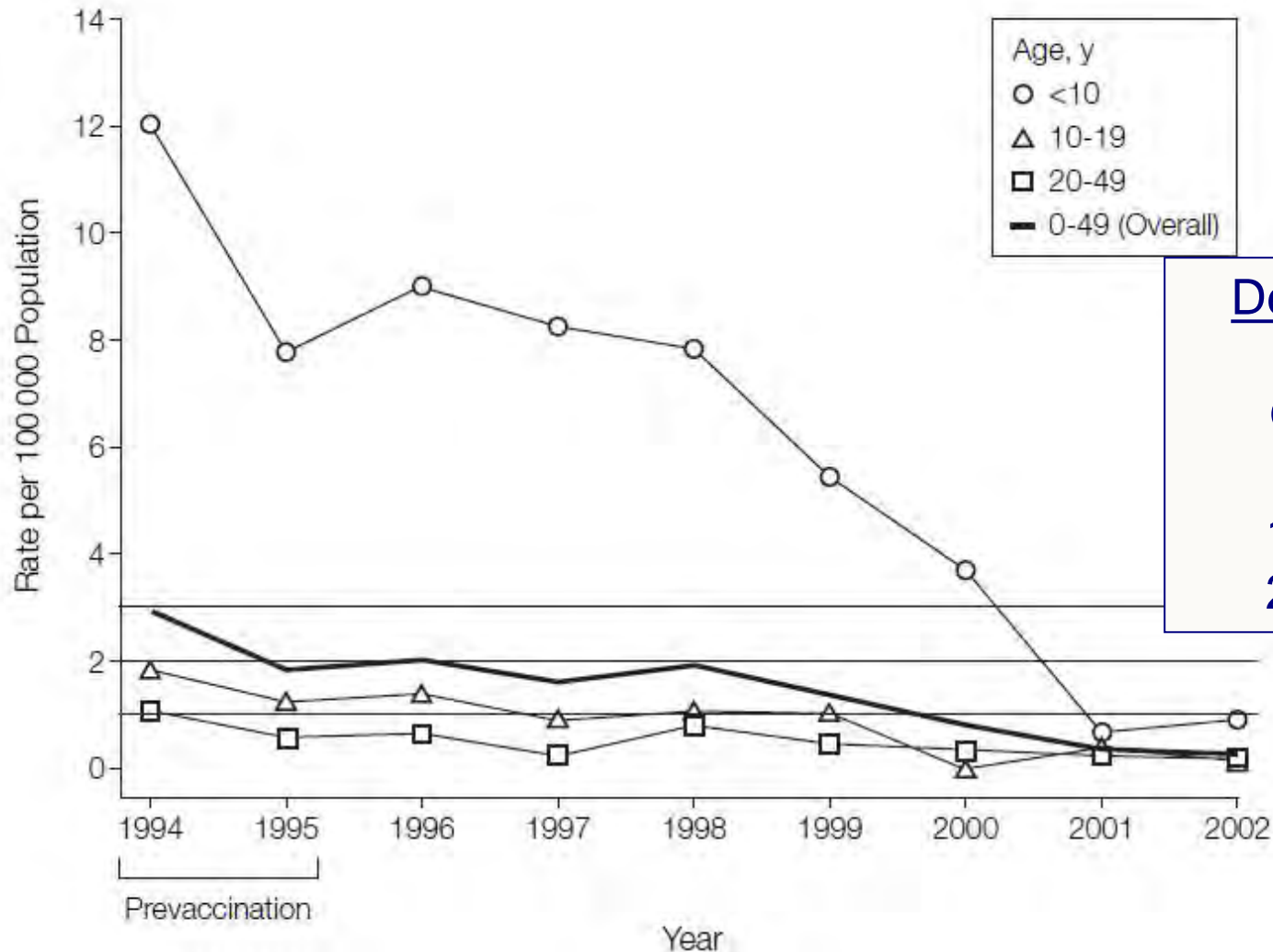


— Vaccination coverage

■ Varicella cases

90% decline in varicella incidence in both sites

Varicella-Related Hospitalization Rates U.S., 1994-2002



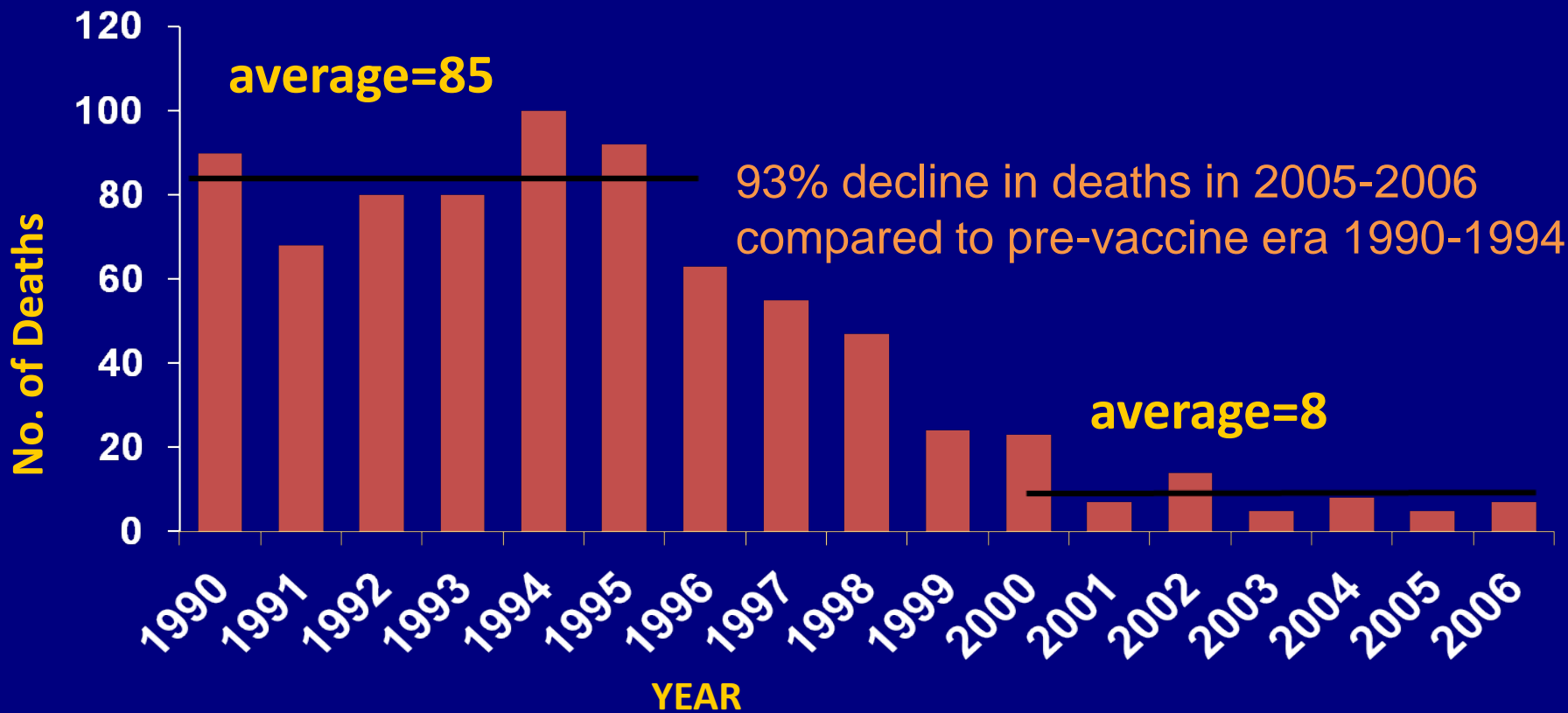
Decline 1994-95 to
2002

Overall	88%
< 10 yrs	91%
10-19 yrs	92%
20-49 yrs	78%

Reduction in Varicella Health Care Costs

- Total estimated direct medical expenditures for varicella hospitalizations and ambulatory visits
 - 1994-1995 \$85 million
 - 2002 \$22 million
- 74% decline in total estimated direct medical expenditures for varicella hospitalizations and ambulatory visits from 85 to 22 million

Decline in Reported Varicella Deaths <50 years of age, US, 1990-2006



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