Varicella (Chickenpox) and Herpes Zoster (Shingles):

Overview of VZV Disease and Vaccination for Healthcare Professionals

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Outline

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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

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4); Arvin *Clin Microb Rev* 1996; *Vaccine* 5th Edition

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

Chaves *J Infect Dis* 2008; Arvin *Clin Microb Rev* 1996; CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Varicella: Complications

- Secondary bacterial infection of skin lesions
- Central nervous system manifestations (meningoencephalitis, cerebelllar 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

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4); Arvin *Clin Microb Rev* 19

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

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4); Arvin *Clin Microb Rev* 1996; Seward *JAMA* 2004; *Vaccines*, 5th edition

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

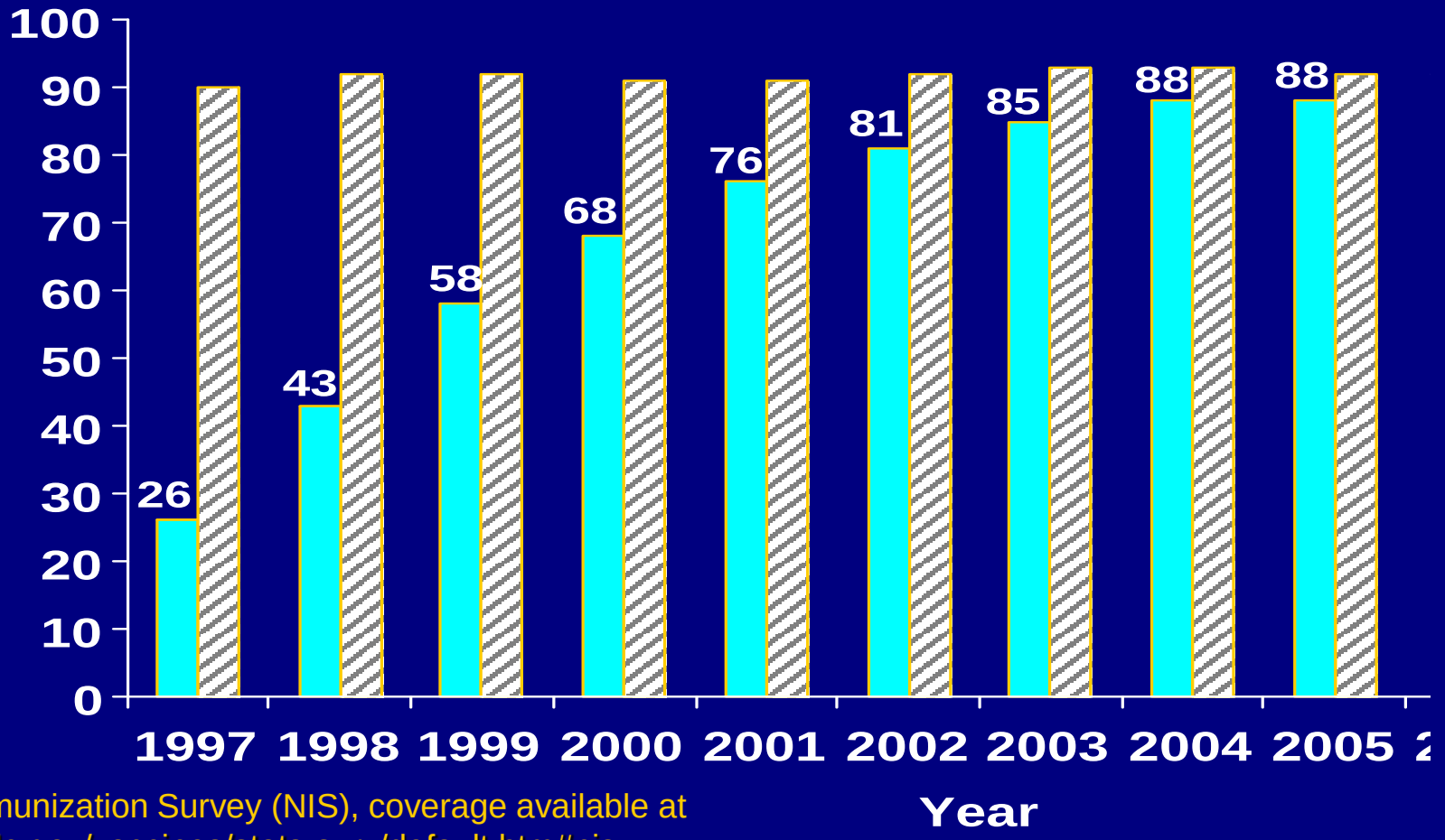
Wharton *Infect Dis Clin North Am* 1996; Galil *Pediatr Infect Dis J* 2002; Davis *Pediatrics* 2004; Meyer *J Infect Dis* 2000; Nguyen *NEMJ* 2005

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

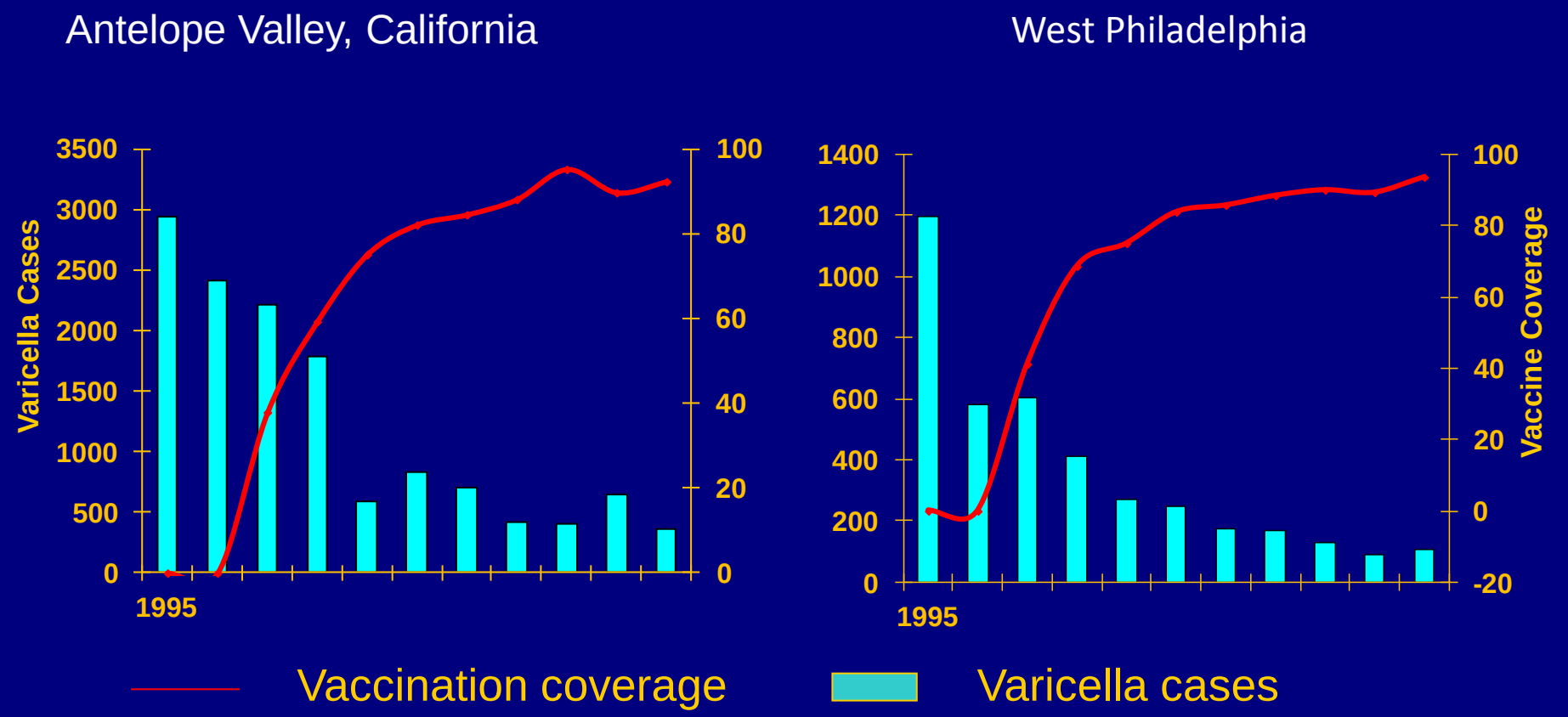
National Immunization Survey (www.cdc.gov/vaccines/stat-surv/default.htm#nis); Guris *J Infect Dis* 2008; Marin *Pediatrics* 2008; Zhou *JAMA* 2005; National Center for Health Statistics

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

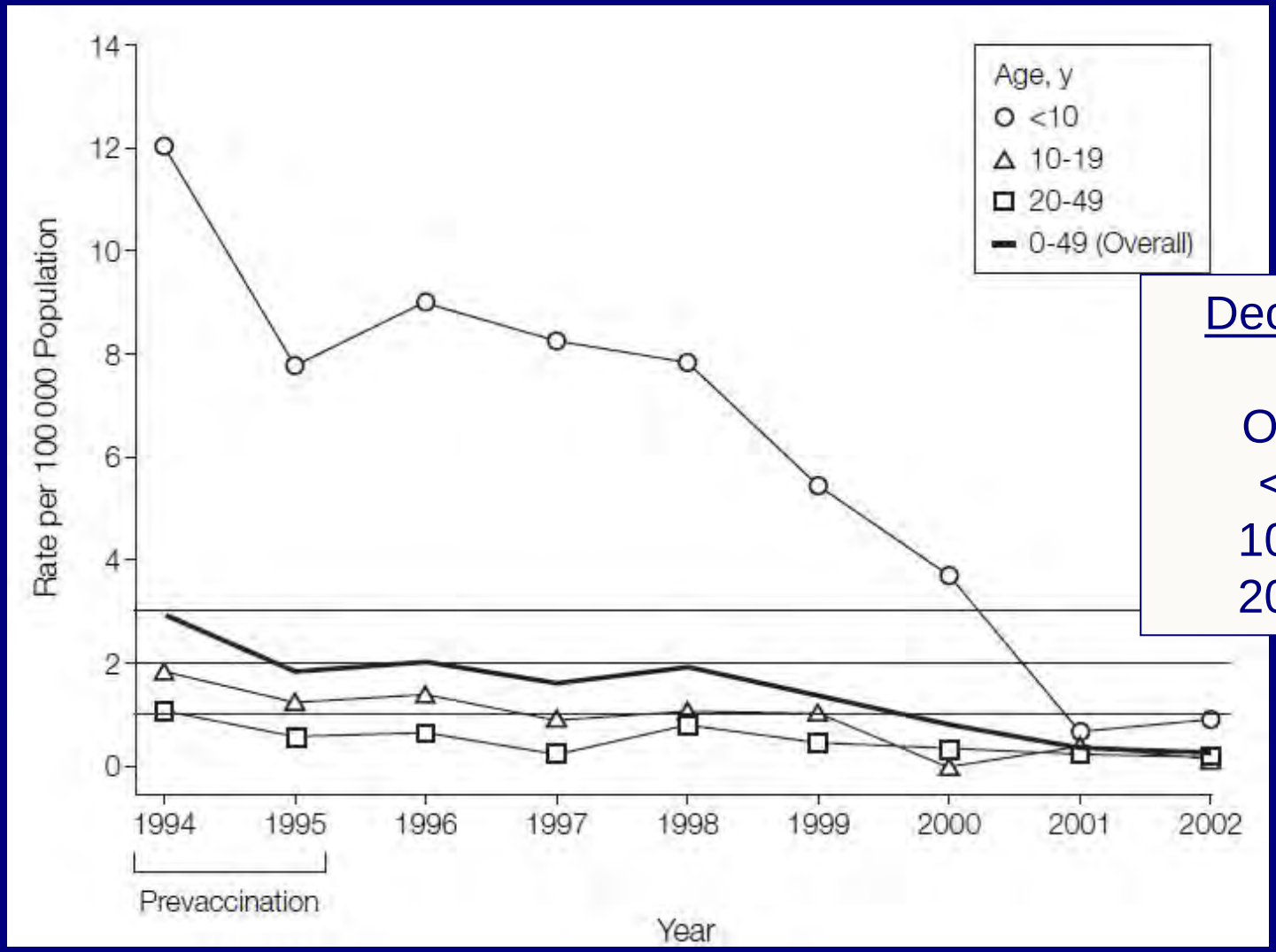
Varicella Cases and 1-Dose Vaccine Coverage
Varicella Active Surveillance Project Sites, 1995-2005



90% decline in varicella incidence in both sites

Guris *J Infect Dis* 2008

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%

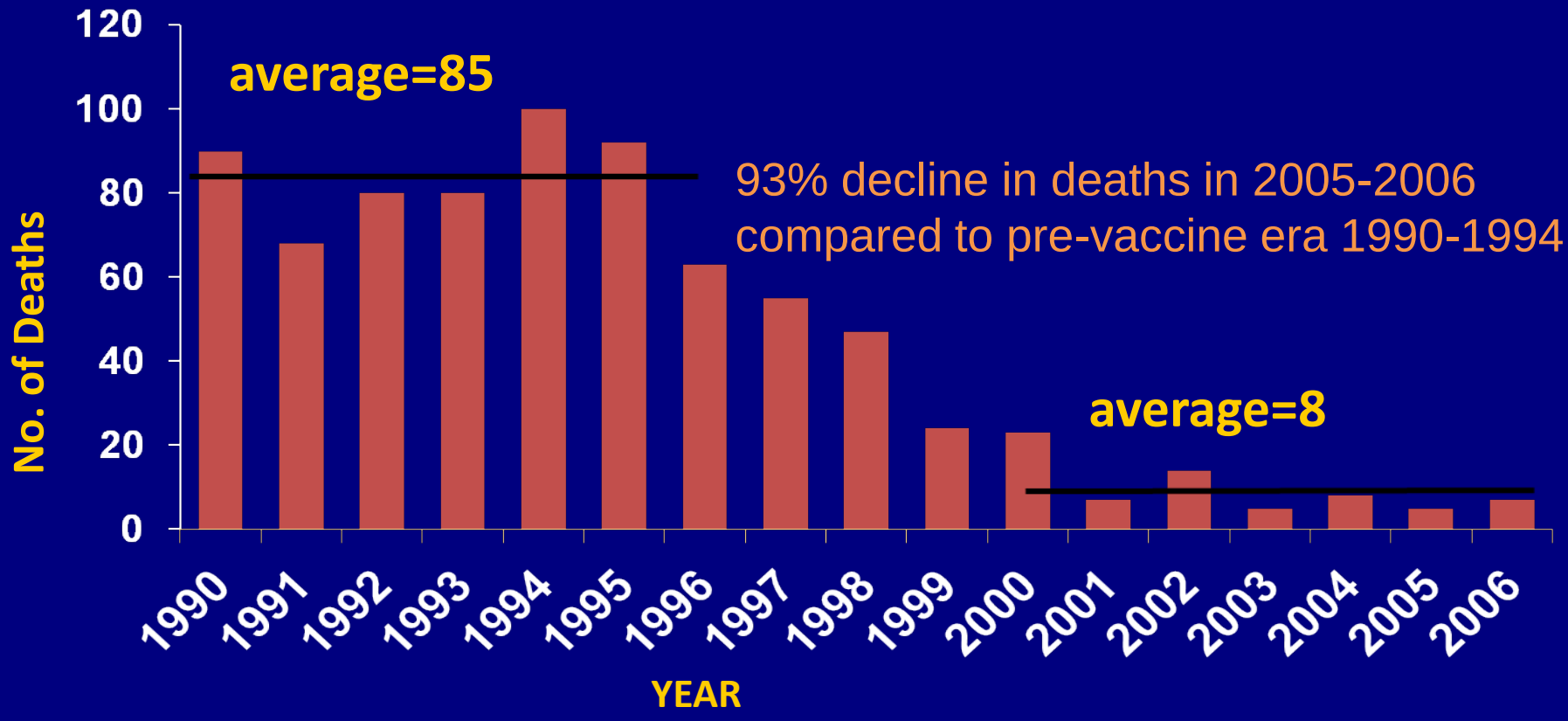
Zhou et al, *JAMA*, 2005

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

Zhou *JAMA* 2005

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



National Center for Health Statistics

Impressive Achievements with the 1-Dose Varicella Vaccination Program But Challenges to Varicella Control Remained…

- 15-20% of children vaccinated with 1 dose remain at risk for varicella due to lack of immune response or partial protection
  - Concern about accumulation of susceptible individuals
- Vaccinated persons with breakthrough varicella disease are contagious
- Outbreaks continued during the 1-dose program

VARICELLA: VACCINE INFORMATION

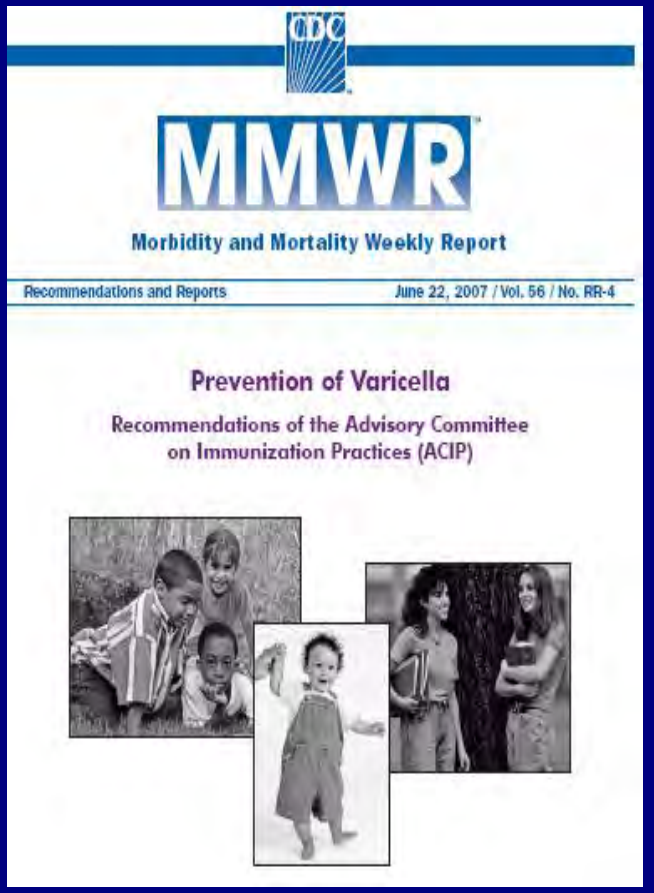
Varicella Vaccines

- Two live attenuated varicella virus vaccines licensed for use in US: Varivax® and Proquad®
- Both vaccines may be used for first and second doses of varicella vaccine
- Varivax ® (1,400 pfu) is the single-antigen varicella vaccine licensed in 1995 for use among healthy persons aged ≥ 12 months
- Proquad® or MMRV (9,800 pfu) is a combination measles, mumps, rubella, and varicella vaccine licensed in 2005 for use among healthy children aged 12 months-12 years

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Current Varicella Vaccination Policy in the United States

- Implemented routine 2-dose childhood varicella vaccination program in 2006
  - 1st dose at age 12-15 months
  - 2nd dose at age 4-6 years
  - Catch-up vaccination of children and adolescents who had previously received one dose
  - 2 doses for all adolescents and adults without evidence of immunity
  - Pre-natal screening and post-partum vaccination



CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Criteria for Determining Persons Who Can Be Considered Immune to Varicella

- Documentation of age-appropriate vaccination with varicella vaccine
- Laboratory evidence of immunity† or laboratory confirmation of disease
- Birth in the US before 1980§
- Diagnosis or verification of history of varicella disease by a health-care provider
- Diagnosis or verification of history of herpes zoster by a health-care provider

†Commercial assays may lack sensitivity for detecting vaccine-induced immunity
§For healthcare personnel, pregnant women, and immunocompromised persons, birth before 1980 should not be considered evidence of immunity

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Rationale for Timing of 2nd Dose of Varicella Vaccination at 4-6 Years of Age

- Varicella epidemiology during 1-dose program
  - Low incidence among 1-4 year old children
  - Outbreaks in elementary and middle schools
- Similar immune response to 2nd dose with intervals 3 months or 3-4 years after 1st dose
- Programmatic harmonization with MMR vaccine and availability of MMRV vaccine

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Post-licensure One-Dose Vaccine Effectiveness in US*

- 17 studies with 20 estimates
  - Study designs: case-control, cohort (outbreaks, other), household contact
- Prevention all varicella
  - Median 85% (range 44% - 100%) Mean 81%
- Prevention of combined moderate and severe varicella
  - Median 97% (range 86% - 100%) Mean 96%
- Prevention of severe varicella*
  - Median 100% (range 97% to 100%) Mean 99%

*Definition 1) Varicella with > 500 lesions or a complication requiring physician visit
2) disease severity scale used in clinical trails: # lesions, fever, systemic signs and subjective assessment of illness

VARIVAX® Merck and Co. Inc; Seward *J Infect Dis* 2008

Pre-licensure 2-Dose Varicella Vaccine Efficacy and Immune Response

2 Dose Vaccine Efficacy	
-Any disease	98%
-Severe disease	100%
Immune Response children aged 12 months-12 years, single antigen varicella vaccine* ***Measured as Geometric Mean Titer by VZV IgG gpELISA in units of μ/ml**	
-6 weeks after 1 dose	12.5
-6 weeks after dose 2 at age 4-6 years	212.4

CDC. Prevention of Varicella. MMWR 2007; 56(No. RR-4)

Simultaneous Administration of Vaccines

- Varicella vaccine, either Varivax® or combination MMRV may be administered simultaneously with other vaccines recommended for children 12-15 months and children 4-6 years
- If varicella vaccine is not administered on the same day as MMR or live attenuated influenza vaccine, the vaccines should be separated by at least 4 weeks
- If separated by less than 4 weeks the vaccine given second should be repeated

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Contra-indications and Precautions for Varicella Vaccination

- Severe allergic reaction to vaccine component or following a prior dose
- Immunosuppression
- Pregnancy
- Moderate or severe acute illness
- Recent blood product (due to potential inhibition of response to varicella vaccination)

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Varicella Vaccination in Certain Groups of Immunocompromised Persons

- Varicella vaccine may be administered to persons with isolated humoral immunodeficiency
- Patients with leukemia, lymphoma, or other malignancies whose disease is in remission and those chemotherapy have been terminated ≥ 3 months can receive live-virus vaccines
- Consider varicella vaccination for HIV-infected children with CD4+ T-lymphocyte percentage of 15% or higher
  - Eligible children should receive 2 doses of single-antigen varicella vaccine 3 months apart
- Data on use of varicella vaccine in HIV-infected adolescents and adults lacking, but safety is likely to be similar to response in HIV-infected children. Vaccination may be considered for HIV-infected persons with CD4+T-lymphocyte count ≥ 200 cells/μl

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Post-exposure Prophylaxis

- Varicella vaccine recommended for use in healthy persons without evidence of immunity within 3-5 days after exposure to varicella
  - ≥ 90% effective in preventing varicella if vaccinated within 3 days of exposure and ~ 70% effective in preventing varicella and ~100% effective in modifying severe disease if given within 5 days
  - Vaccination still recommended for those with no other evidence of immunity even after 5 days of exposure because it will help provide protection against future exposures
- Varicella Zoster Immune Globulin (available product, VariZIG™) recommended for certain groups at high risk for severe disease AFTER EXPOSURE TO THE VARICELLA-ZOSTER VIRUS AND within 10 days of exposure.

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)
CDC. Updated Recommendations for Use of VariZIG — United States, 2013. MMWR 2013;62:574-576

Varicella Vaccine Storage and Handling

Varivax

- Store frozen at 5°F (-15° C) or colder at all times
- May be stored up to 72 hours at 35-46°F (2-8°C), but discard unused vaccine after 72 hours at this temperature
- Discard if not used within 30 min of reconstitution
- Store diluent at room temp or in refrigerator

MMRV

- Store frozen at 5°F (-15° C) or colder at all times
- May NOT be stored at refrigerator temperature AT ANY TIME
- Discard if not used within 30 min of reconstitution
- Store diluent at room temp or in refrigerator

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Freezer Requirements for Varicella Vaccine Storage

- Acceptable Freezer Units:
  - Stand-alone freezers
  - Freezer compartments of refrigerator-freezer combinations, provided that the freezer compartment has its own separate, sealed, and insulated exterior door
- Unacceptable Freezer Units:
  - Units with an internal freezer door that is unsealed and un-insulated (e.g., small, dormitory-style refrigerators)
- Temperatures should be documented at beginning and end of each day

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

Varicella Vaccine Adverse Events

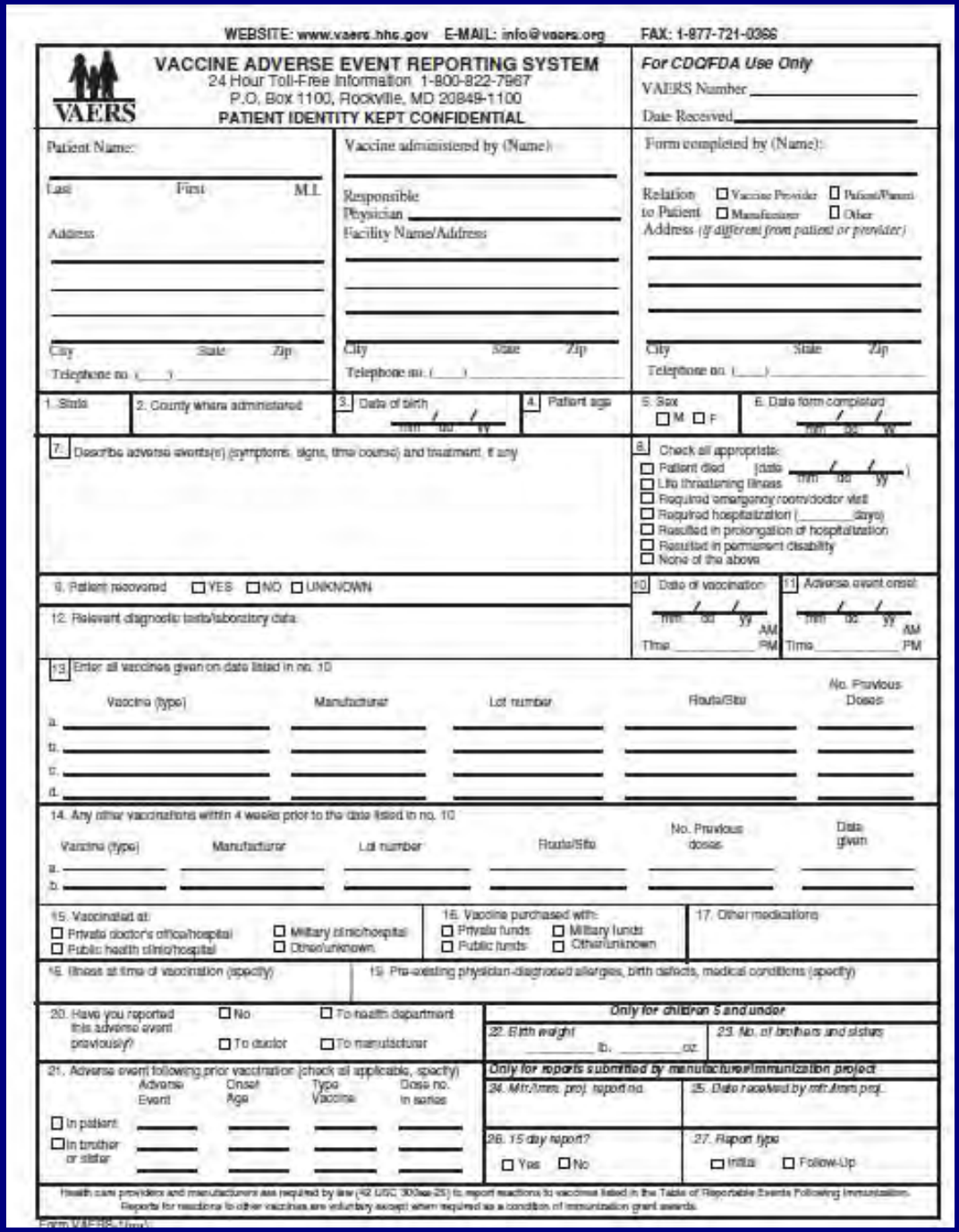
- Non-serious adverse events
  - Rash, Fever
  - Possible vaccine failure
  - Injection site reactions
- Serious adverse events are rare
  - Encephalitis
  - Pneumonia
  - Hepatitis
  - Thrombocytopenia
  - Ataxia
  - Arthritis
  - Vasculitis

Chaves *J Infect Dis* 2008

Reporting a Vaccine Adverse Event

- Complete VAERS form (next slide) for vaccine adverse events and if feasible, collect specimen for testing
  - CDC laboratory can conduct VZV PCR testing and genotyping
  - Genotyping may help to distinguish outcomes caused by wild-type versus vaccine strain VZV
- Additional Info: http://vaers.hhs.gov/index/ ; 1-800-822-7967

Vaccine Adverse Events Reporting System (VAERS)



WEBSITE: www.vaers.hhs.gov E-MAIL: info@vaers.org FAX: 1-877-721-0366

VACCINE ADVERSE EVENT REPORTING SYSTEM
24 Hour Toll-Free Information 1-800-822-7967
P.O. Box 1100, Rockville, MD 20849-1100
PATIENT IDENTITY KEPT CONFIDENTIAL

VAERS

For CDC/FDA Use Only
VAERS Number
Date Received

Patient Name: Last First M.I.
Address
City State Zip
Telephone no. ( )

Vaccine administered by (Name):
Responsible Physician
Facility Name/Address
City State Zip
Telephone no. ( )

Form completed by (Name):
Relation to Patient ☐ Vaccine Provider ☐ Patient/Parent ☐ Manufacturer ☐ Other
Address *(if different from patient or provider)*
City State Zip
Telephone no. ( )

1. State | 2. County where administered | 3. Date of birth mm dd yy | 4. Patient age | 5. Sex ☐ M ☐ F | 6. Date form completed mm dd yy

7. Describe adverse event(s) (symptoms, signs, time course) and treatment, if any

8. Check all appropriate:
☐ Patient died (date mm dd yy)
☐ Life threatening illness
☐ Required emergency room/doctor visit
☐ Required hospitalization (_____ days)
☐ Resulted in prolongation of hospitalization
☐ Resulted in permanent disability
☐ None of the above

9. Patient recovered ☐ YES ☐ NO ☐ UNKNOWN

10. Date of vaccination mm dd yy Time AM PM

11. Adverse event onset mm dd yy Time AM PM

12. Relevant diagnostic tests/laboratory data

13. Enter all vaccines given on date listed in no. 10

	Vaccine (type)	Manufacturer	Lot number	Route/Site	No. Previous Doses
a.					
b.					
c.					
d.					

14. Any other vaccinations within 4 weeks prior to the date listed in no. 10

	Vaccine (type)	Manufacturer	Lot number	Route/Site	No. Previous doses	Date given
a.						
b.						

15. Vaccinated at:
☐ Private doctor's office/hospital ☐ Military clinic/hospital
☐ Public health clinic/hospital ☐ Other/unknown

16. Vaccine purchased with:
☐ Private funds ☐ Military funds
☐ Public funds ☐ Other/unknown

17. Other medications

18. Illness at time of vaccination (specify)

19. Pre-existing physician-diagnosed allergies, birth defects, medical conditions (specify)

20. Have you reported this adverse event previously?
☐ No ☐ To health department ☐ To doctor ☐ To manufacturer

Only for children 5 and under
22. Birth weight lb. oz
23. No. of brothers and sisters

21. Adverse event following prior vaccination (check all applicable, specify)

	Adverse Event	Onset Age	Type Vaccine	Dose no. in series
☐ In patient				
☐ In brother or sister				

Only for reports submitted by manufacturer/immunization project
24. Mfr./Imm. proj. report no.
25. Date received by mfr./imm. proj.
26. 15 day report? ☐ Yes ☐ No
27. Report type ☐ Initial ☐ Follow-Up

Health care providers and manufacturers are required by law (42 USC 300aa-25) to report reactions to vaccines listed in the Table of Reportable Events Following Immunization. Reports for reactions to other vaccines are voluntary except when required as a condition of immunization grant awards.

Form VAERS 1 (rev.)

VARICELLA: VARICELLA VACCINATION OF HEALTHCARE PERSONNEL

Varicella Vaccination of Healthcare Personnel

- To prevent disease and nosocomial spread of VZV, healthcare institutions should ensure that all HCP have evidence of immunity to varicella
  - Evidence of immunity = (1) laboratory evidence of immunity, (2) history of clinician diagnosed or verified varicella or zoster, (3) Documentation of age-appropriate vaccination
- Pre-vaccination serologic probably cost-effective
- Routine testing for varicella immunity after 2 doses of vaccine not recommended
  - Sensitive tests indicate 94-99% adults develop antibodies after second dose
  - VZV-specific cell-mediated immunity affords protection to vaccinated adults, even in the absence of detectable antibody response.
  - Available commercial assays may not be able to detect vaccine-induced immunity

CDC. Prevention of Varicella. *MMWR* 2007; 56(No. RR-4)

HERPES ZOSTER

HERPES ZOSTER: CLINICAL DESCRIPTION

Herpes Zoster (Shingles)

- Following initial infection (varicella), VZV establishes permanent latent infection in dorsal root and cranial nerve ganglia
- Years to decades later VZV reactivates and spreads to skin through peripheral nerves causing pain and a unilateral vesicular rash in a dermatomal distribution
- ~1 million cases in the U.S. annually
- Lifetime risk of developing zoster: about 30%

Clinical Features of Herpes Zoster

Prodrome: headache, photophobia, malaise, fever, abnormal skin sensations and pain

Rash:

- Unilateral, involving 1-3 adjacent dermatomes
- Thoracic , cervical, ophthalmic involvement most common
- Initially erythematous, maculopapular
- Vesicles form over several days, then crust over
- Full resolution in 2-4 weeks
- Occasionally, rash never develops (zoster sine herpete)

Complications of Herpes Zoster

- Postherpetic Neuralgia (PHN)
  - Pain ≥ 30 days occurs in 18-30% of zoster cases
  - Mild to excruciating pain after resolution of rash
  - Constant, intermittent, or triggered by trivial stimuli
  - May persist weeks, months or occasionally years
  - Can disrupt sleep, mood, work, and activities of daily living and lead to social withdrawal and depression
  - Risk factors for PHN include age ≥ 50, severe pain before or after onset of rash, extensive rash, and trigeminal or ophthalmic distribution of rash

Complications of Herpes Zoster

- Herpes Zoster Ophthalmicus
  - ~15% of HZ cases
  - Can occur when ophthalmic division of trigeminal nerve is involved
  - Untreated, 50-70% develop acute ocular complications
  - Can lead to chronic ocular complications, reduced vision, even blindness
- Neurologic complications
  - Myelitis, encephalitis, ventriculitis, meningoencephalitis, cranial nerve palsies, ischemic stroke syndrome
- VZV viremia
  - Cutaneous dissemination, pneumonia, hepatitis, disseminated intravascular coagulation
- Dermatologic complications
  - Secondary infections of rash
  - Permanent scarring and changes in pigmentation

VZV Transmission from Zoster

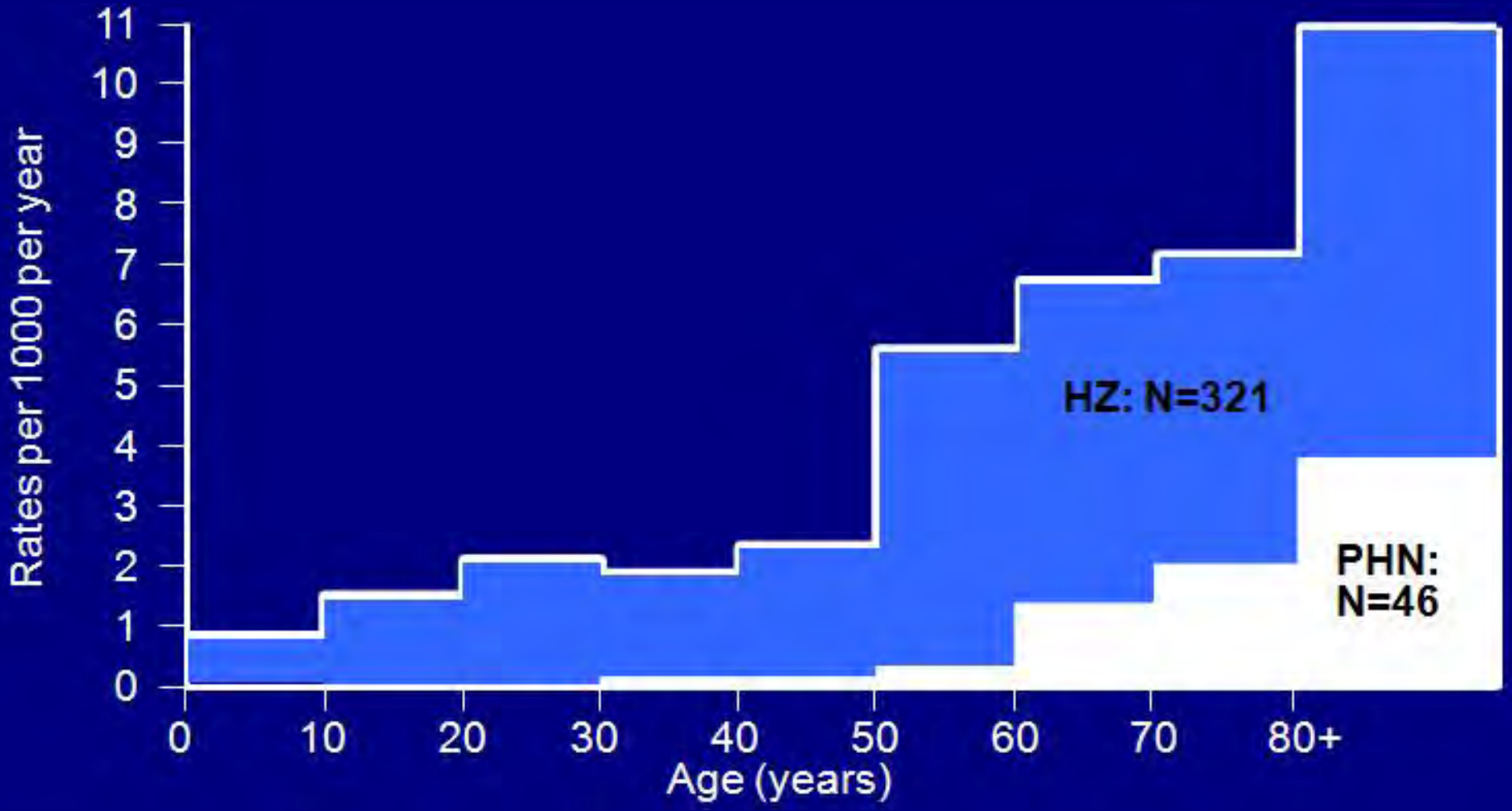
- VZV can be transmitted from persons with zoster to persons with no history of varicella disease or vaccine and cause varicella
  - Risk of VZV transmission from zoster is much lower than from varicella
  - Transmission is mainly through direct contact with zoster lesions, although airborne transmission has been reported in healthcare settings
  - Localized zoster is only contagious after the rash erupts and until the lesions crust
  - Transmission from localized zoster can be decreased by covering the lesions

HERPES ZOSTER: EPIDEMIOLOGY

Risk Factors for Herpes Zoster

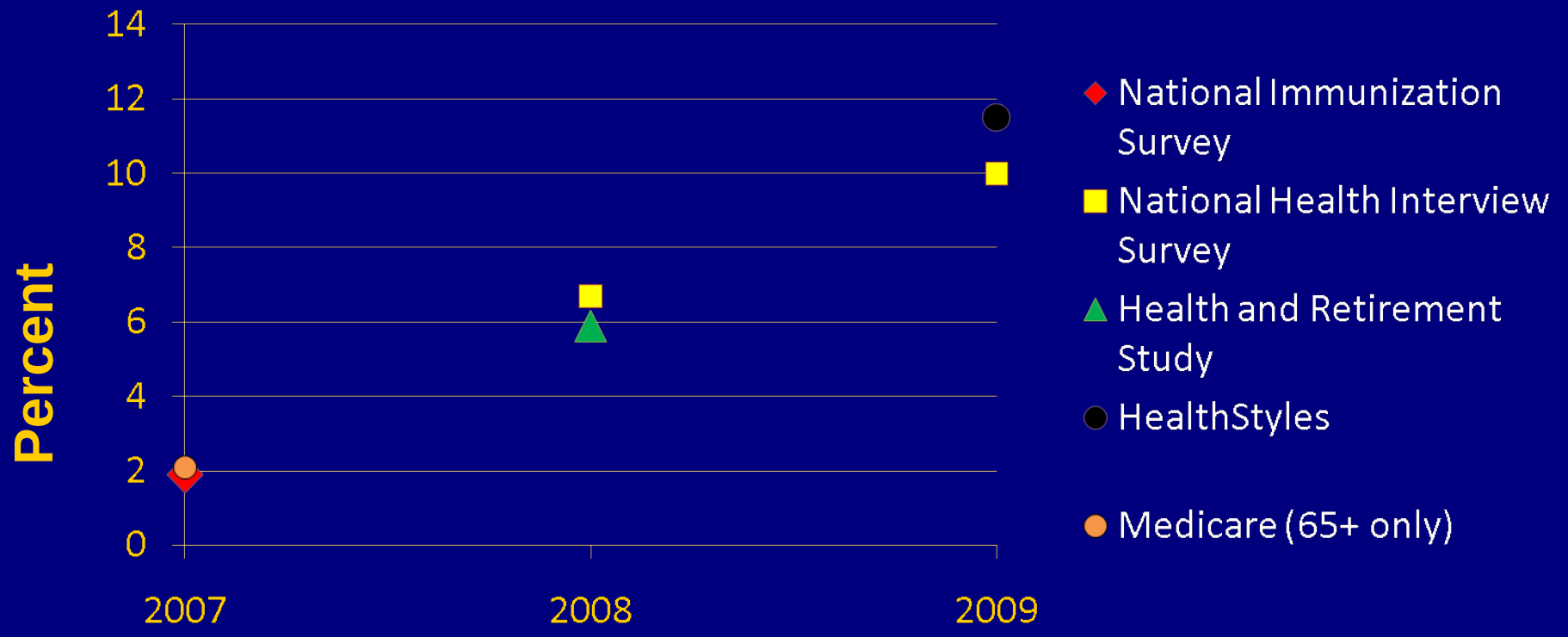
- Increasing age
- Immunosuppression
  - Bone marrow and solid organ transplantation
  - Patients with hematological malignancies and solid tumors
  - HIV
  - Immunosuppressive medications
- Gender: Increased risk in females
- Race: Risk in blacks less than half that in whites
- Trauma or surgery in affected dermatome
- Early varicella (in utero, infancy): Increased risk of pediatric zoster

Age-specific Incidence of Herpes Zoster and Postherpetic Neuralgia: U.K., 1947-1972



Hope-Simpson *J R Coll Gen Pract* 1975.

Herpes Zoster Vaccination Coverage: U.S., Age 60 or Older, 2007-2009



1 Lu PJ, Euler G, Jumaan A, Harpaz R. Herpes zoster vaccination among adults aged 60 years or older in the United States, 2007: Uptake of the first new vaccine to target seniors. Vaccine. 2009; 27: 882-7

2 (2008) Lu PJ, Euler GL, Harpaz R. Herpes zoster vaccination among adults aged 60 years and older, in the U.S., 2008. Am J Prev Med. 2011 Feb;40(2):e1-6

2 (2009) Greby S, Lu PJ, Euler G, Williams W, Singleton J. 2009 Adult Vaccination Coverage, The National Health Interview Survey. Available from: http://www.cdc.gov/vaccines/stats-surv/nhis/2009-nhis.htm

3 Hales C, Harpaz R, Bialek S. Herpes Zoster In the Health and Retirement Study. Poster Session Presented at: Infectious Diseases Society of America; 2010 October 21-24; Vancouver, BC. Available at: http://idsa.confex.com/idsa/2010/webprogram/Paper4825.html

4 Lindley M, Harpaz R, Bialek S. Awareness and Uptake of Zoster Vaccine among U.S. Adults ≥60 Years. Presented at National Immunization Conference; 2010 April 19 – 22; Atlanta, GA. Available at: http://cdc.confex.com/cdc/nic2010/recordingredirect.cgi/id/6765

Am J Prev Med. 2011 Feb;40(2):e1-6

5 Joesoef R, Harpaz R, Bialek S. Herpes Zoster (HZ) Vaccination Among Elderly in the United States, 2007: Costs and Geographic Variation. Poster Session Presented at: Infectious Diseases Society of America; 2010 October 21-24; Vancouver, BC. Available at: http://idsa.confex.com/idsa/2010/webprogram/Paper2756.html

HERPES ZOSTER: VACCINE INFORMATION

Herpes Zoster Vaccine

- Licensed in 1996
- Live, attenuated VZV
- Same strain used in the varicella vaccine, but 14x more potent
- Administered subcutaneously in deltoid region

Herpes Zoster Vaccine Efficacy

- Decreased zoster incidence by 51%
- Decreased risk of post-herpetic neuralgia in all participants by 67%
- Decreased burden of illness (severity x duration) in all participants by 61%

Oxman *NEMJ* 2005

ACIP Recommendations for Zoster Vaccine

- In October 2008, the Advisory Committee on Immunization Practices (ACIP) recommended a dose of the herpes zoster vaccine (HZV) for all adults ≥60 years of age unless they have contraindications
- HZV should be offered at the patient's first available clinical encounter

CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): p. 1-30

ACIP Recommendations for Zoster Vaccine

- HZV can be administered simultaneously with influenza and pneumococcal vaccines
- HZV is recommended whether or not the patient reports a prior episode of zoster
- It is not necessary to check varicella history or titers before administering HZV
- HZV should be offered to eligible persons including those >80 y.o., frail, or with chronic illnesses

CDC. Prevention of Herpes Zoster. *MMWR* 2008. 57(RR-5): p. 1-30

Contraindications for Zoster Vaccine

- Immunosuppression (high-dose steroids, biological response modifiers, chemotherapy, AIDS) is a contraindication for HZV
- HIV-positive status alone is not an contraindication
- Persons ≥60 y.o. anticipating immunodeficiency due to initiation of treatments or progression of illness should be offered HZV
- HZV is not recommended for persons ≥60 y.o. who have received the varicella vaccine

CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): p. 1-30

Zoster Vaccine Storage and Handing

- Must be stored at 5° F (-15° C) or colder AT ALL TIMES until reconstitution
- Protect from light
- Administer within 30 minutes of reconstitution

VZV LABORATORY TESTING

VZV Laboratory Testing

- Objectives of VZV Laboratory Testing
  - Confirm clinical diagnosis of varicella or herpes zoster with atypical presentation, such as varicella disease in vaccinated persons or shingles in immunosuppressed persons
  - Assess a person's susceptibility to varicella
  - Distinguish between vaccine and wild-type strains of the virus
- Available Testing Facilities
  - Contact your local health department to check if they offer VZV testing
  - CDC's National VZV Laboratory offers a range of VZV testing services. Please contact your local health department to determine the policy for sending specimens to CDC

Contact Information and Additional Resources

Contact Information:

- Nipinfo@cdc.gov
- 800.CDC.INFO

National VZV Laboratory:

- vzvlab@cdc.gov
- http://www.cdc.gov/shingles/lab-testing/index.html

Additional Resources:

- CDC Chickenpox (Varicella) Website: http://www.cdc.gov/chickenpox/index.html
- CDC Varicella Vaccine Webpage: http://www.cdc.gov/vaccines/vpd-vac/varicella/
- CDC Herpes Zoster Disease and Vaccine Webpages:
  http://www.cdc.gov/shingles/index.html
  http://www.cdc.gov/vaccines/vpd-vac/shingles/

CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): p. 1-30