# Health Care Worker Vaccinations, 2011: EXTENDED CARE FACILITIES

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# GOALS OF CURRENT LECTURE

- Be able to list vaccines recommended for healthcare workers (HCP)
- Be able to list contraindications to HCP relevant to underlying health issues.
- Be able to list strategies for promoting vaccine acceptance and compliance

# PREVENTING HCP INFECTIONS

- A casual attitude towards employee health entails a high cost
  - Increased patient morbidity
  - Increased staff morbidity
  - Significant financial cost and legal risk
- Prevention is superior to treatment
- The tools used to reduce the risk of acquiring infection can be used to reduce the risk of vaccine preventable diseases

# WHAT IS PRE-EXPOSURE PROPHYLAXIS??

# SUCCESS STORIES

Vaccine Preventable

- Smallpox
- Polio
- Measles
- Rubella
- Varicella
- Invasive *Haemophilus influenzae* type b

**FIGURE 1. Recommended adult immunization schedule, by vaccine and age group — United States, 2011**

| VACCINE ▼ / AGE GROUP ▶ | 19–26 years | 27–49 years | 50–59 years | 60–64 years | ≥65 years |
|---|---|---|---|---|---|
| Influenza[1],* | 1 dose annually | | | | |
| Tetanus, diphtheria, pertussis (Td/Tdap)[2],* | Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 years | | | | Td booster every 10 years |
| Varicella[3],* | 2 doses | | | | |
| Human papillomavirus (HPV)[4],* | 3 doses (females) | | | | |
| Zoster[5] | | | | 1 dose | |
| Measles, mumps, rubella (MMR)[6],* | 1 or 2 doses | | 1 dose | | |
| Pneumococcal (polysaccharide)[7,8] | 1 or 2 doses | | | | 1 dose |
| Meningococcal[9],* | 1 or more doses | | | | |
| Hepatitis A[10],* | 2 doses | | | | |
| Hepatitis B[11],* | 3 doses | | | | |

* Covered by the Vaccine Injury Compensation Program

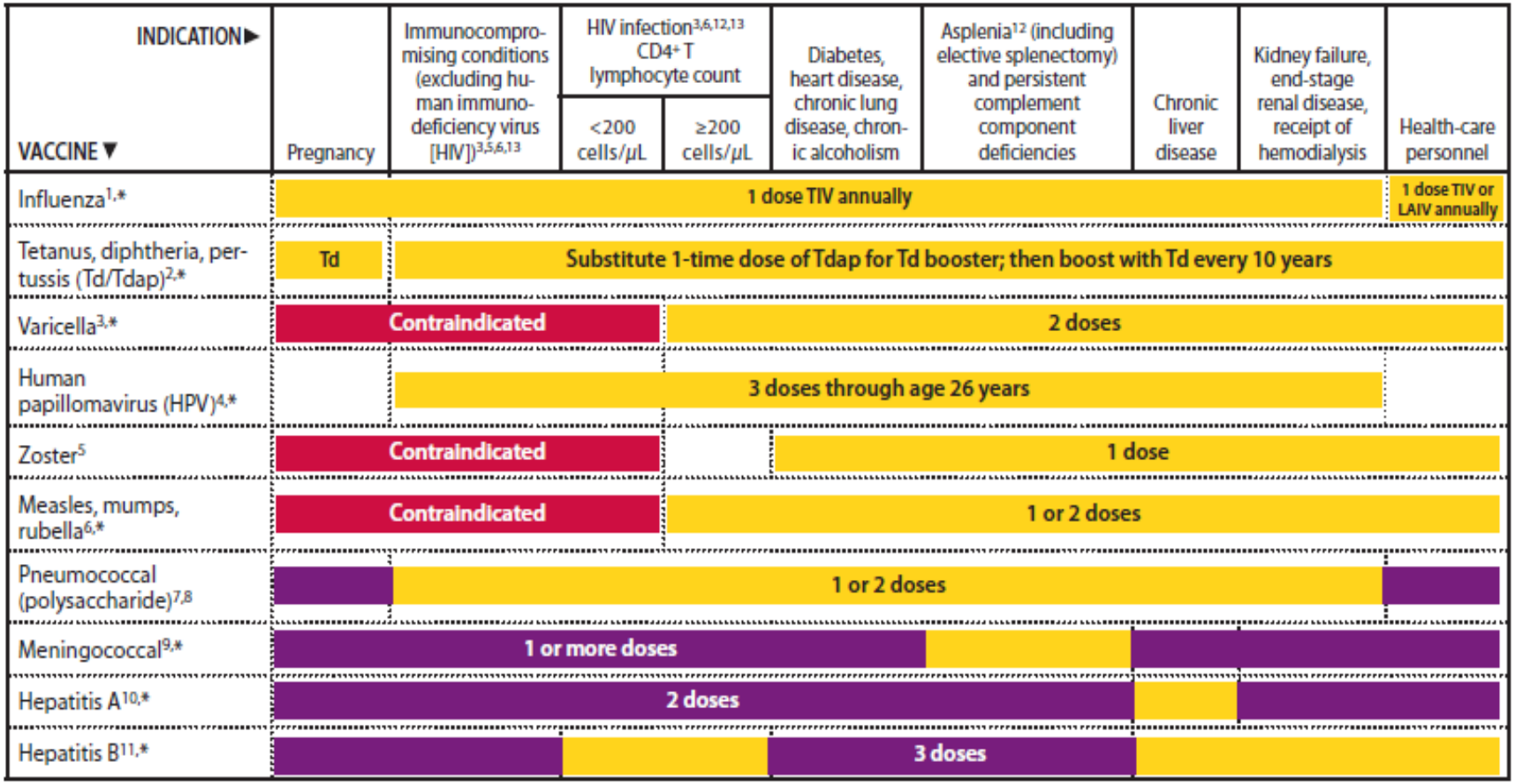
For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of previous infection)

Recommended if some other risk factor is present (e.g., based on medical, occupational, lifestyle, or other indications)

No recommendation

CDC. MMWR 2011;60(4)

**FIGURE 2. Vaccines that might be indicated for adults, based on medical and other indications — United States, 2011**

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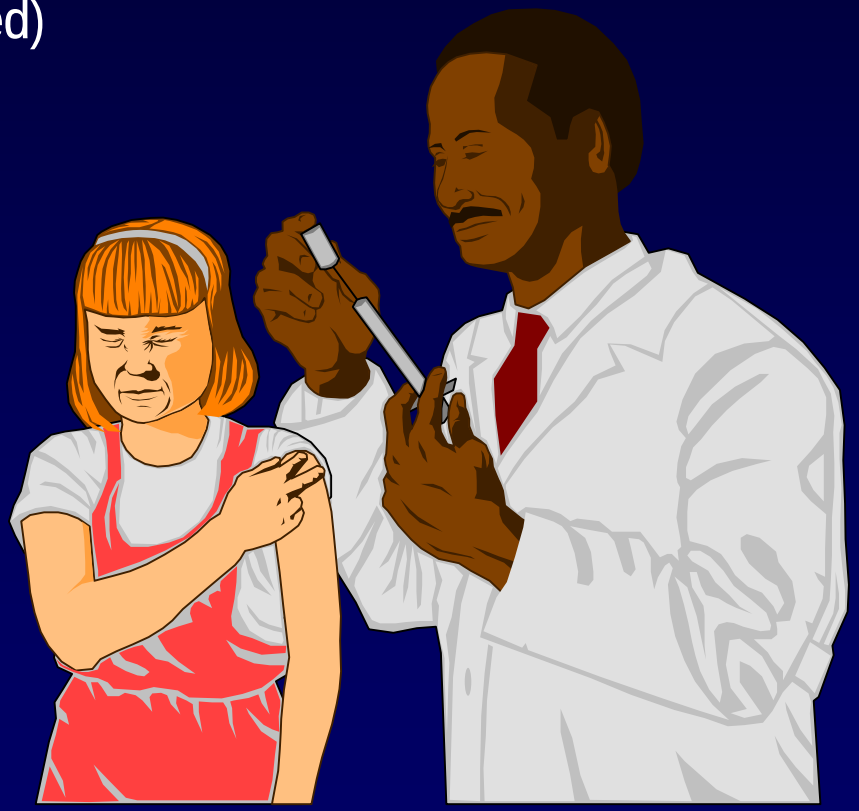
No recommendation

# ADVANCES IN VACCINOLOGY: NEW 2010-2011

- Influenza
  - Recommended for ALL persons 6 months of age or older
  - Addition of 2009 novel H1N1 strain to seasonal influenza vaccine
  - Licensure of high titer influenza vaccine for persons 65 years and older (improved immunogenicity; efficacy not yet studied)
- Tdap
  - Enhanced indications: Adults >65 years of age with close contact with infants <12 months of age, children 8-11, no waiting period since last Td (previously was 2 years)

# RECOMMENDED VACCINES FOR HCP: CDC, ACIP, HICPAC

- Hepatitis B (OHSA required to be offered)
- Influenza
- Measles (MMR preferred)#
- Mumps (MMR preferred)#
- Rubella (MMR preferred)#
- Varicella#
- Tetanus (Tdap)#
- Diphtheria (Tdap)#
- Pertussis (Tdap)*#
  (Pertussis uncommon in ECFs)



# Required at UNC

# IMMUNIZATIONS FOR HCP

- Influenza
  - 1 dose annually (inactivated or live-attenuated/nasal)
  - Attenuated influenza vaccine (FluMist) contra-indicated only in HCP working with highly immunocompromised patients housed in a protected environment
- Pneumococcal (polysaccharide)
  - 1 dose (booster may be indicated)
  - No specific indication for HCP

# IMMUNIZATIONS FOR HCP

- Measles (provide as MMR)
  - 2 doses in susceptible persons (1 month apart)
  - Demonstration of immunity: Appropriate immunizations, positive serology
  - Birth before 1957: Consider immune (except during an outbreak)
- Rubella (provide as MMR)
  - 1 dose in susceptible persons
  - Demonstration of immunity: Immunization, positive serology

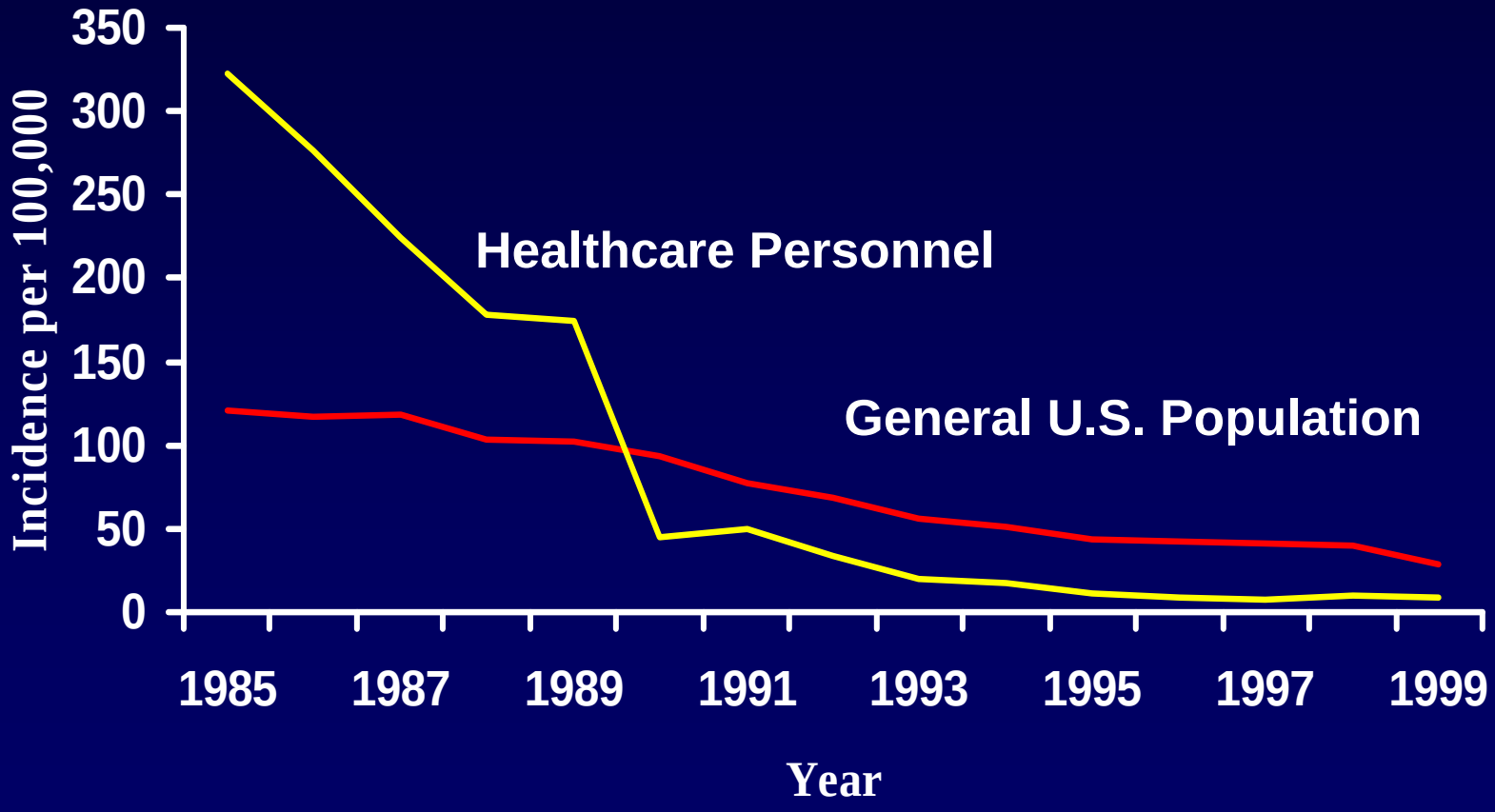
# IMMUNIZATIONS FOR HCP

- Mumps (provide as MMR)
  - 2 doses
  - Demonstration of immunity: Appropriate immunizations, positive serology
  - Birth before 1957: Consider immune (except during an outbreak)
- Varicella
  - 2 doses
  - Demonstration of immunity:  MD diagnosed disease, immunization, positive serology, {report of varicella or zoster?}

# HEPATITIS B VACCINE

- Indications
  - Universal; HCP with potential blood exposure (OSHA required OR signed refusal)
- Administration
  - IM dose into deltoid; 1-1.5” needle, 20-25 gauge
  - Schedule: 0, 1, 6 mo (May interchange current vaccines)
  - Prior to administration do not routinely perform serologic screening for HB unless cost effective
  - After 3rd dose, test for immunity (≥10 mIU/mL){OSHA required}; if inadequate provide 3 more doses and test again for immunity; if inadequate test consider as “nonresponder”
  - If non-immune after 6 (or 3) doses, test for HBsAg

# Estimated Incidence of HBV infections among HCP and General Population, United States, 1985-1999



# ASSURING HCW COVERAGE

- Healthcare facility employees - requirement for employment
- Medical staff - include in credentialing process
- Students - require for attending class
- Volunteers - require
- Contract workers - require in contract
- Emergency responders

# GENERAL GUIDELINES: KEY RECOMMENDATIONS

- Follow guideline for minimal ages and intervals
  - Most follow minimal interval listed
  - May increase interval (i.e., never need to restart a series)
- Interchangeability of vaccines from different manufacturers
  - HepB vaccines are interchangeable (also HepA vaccines)
- Unknown or uncertain vaccination status
  - With the exception of influenza and pneumococcal vaccine, self-reported dose of vaccine should not be accepted (I.e., immunize unless written documentation provided)

CDC. General Recommendations on Immunization. MMWR 2011 60(RR-2)

# GENERAL GUIDELINES: KEY RECOMMENDATIONS

- May administer all vaccines simultaneously (separate syringes and needles)
  - Two or more live intranasal or injectable live vaccines: Use 4-week minimum interval , if not administered simultaneously
- Simultaneous administration of vaccine and antibody (Ab) containing products
  - May administer inactivated vaccine with Ab containing products
  - Should not administer live antigen and Ab containing products (exceptions = yellow fever, Ty21 typhoid, live-attenuated influenza)

# GENERAL GUIDELINES: KEY RECOMMENDATIONS

- Safety needles or needle-free injection devices should be used in available to reduce the risk for injury
- Use recommended route: IM (intramuscular), SC (subcutaneous)
- Observe patient for 15 minutes after vaccination
  - Syncope after vaccination: 63% within 5 min; 89% within 15 min
- Have resuscitation equipment available (for anaphylaxis)
- Store at proper temperature (refrigerator = $35^{0}$F-$46^{0}$F)

# PROVIDING VACCINES

- Patient name and identification number
- Vaccine
- Dose, Site, Route of Administration
- Date given
- Manufacturer
- Lot number
- Name, title & address of person providing vaccine
- Date next dose due
- Informed consent

# PROVIDING VACCINES: SEROLOGIC TESTING

- Pre-immunization testing for immunity
  - Do not obtain serological screening for immunity unless cost-effective, desired by employee (may require employee to bear cost), or vaccine contraindicated (e.g., MMRV, hepatitis B)
- Post-immunization testing for immunity
  - Indicated for hepatitis B, rabies (high risk exposure)
- Consider persons with an with an “indeterminate” antibody level susceptible

# INFLUENZA: EPIDEMIOLOGY

- Geographic distribution - global
- Reservoir: Humans, swine, birds
- Incubation - 1 to 5 days; usually 2 days
- Transmission
  - Droplet (airborne?) route
  - Direct contact
- Communicability
  - 1 to 2 days before onset of symptoms to 7 days post-onset (adults) or 10 days (children)
  - Attack rates: Up to 60%
- No carrier state (but inapparent illness may occur)

# INFLUENZA VACCINE (Inactivated): CONTRAINIDATIONS & PRECAUTIONS

- Contraindication
  - Hypersensitivity to eggs or vaccine components
- Precaution
  - Moderate-to-severe acute febrile illness (postpone vaccine)
  - GBS within 6 weeks following a previous TIV dose
- Untrue (vaccine may be administered)
  - Pregnancy or breastfeeding
  - Nonsevere allergy (e.g., contact) to latex or thimerosal
  - Concurrent administration of coumadin or aminophylline

# INFLUENZA VACCINE (Live): CONTRAINIDATIONS

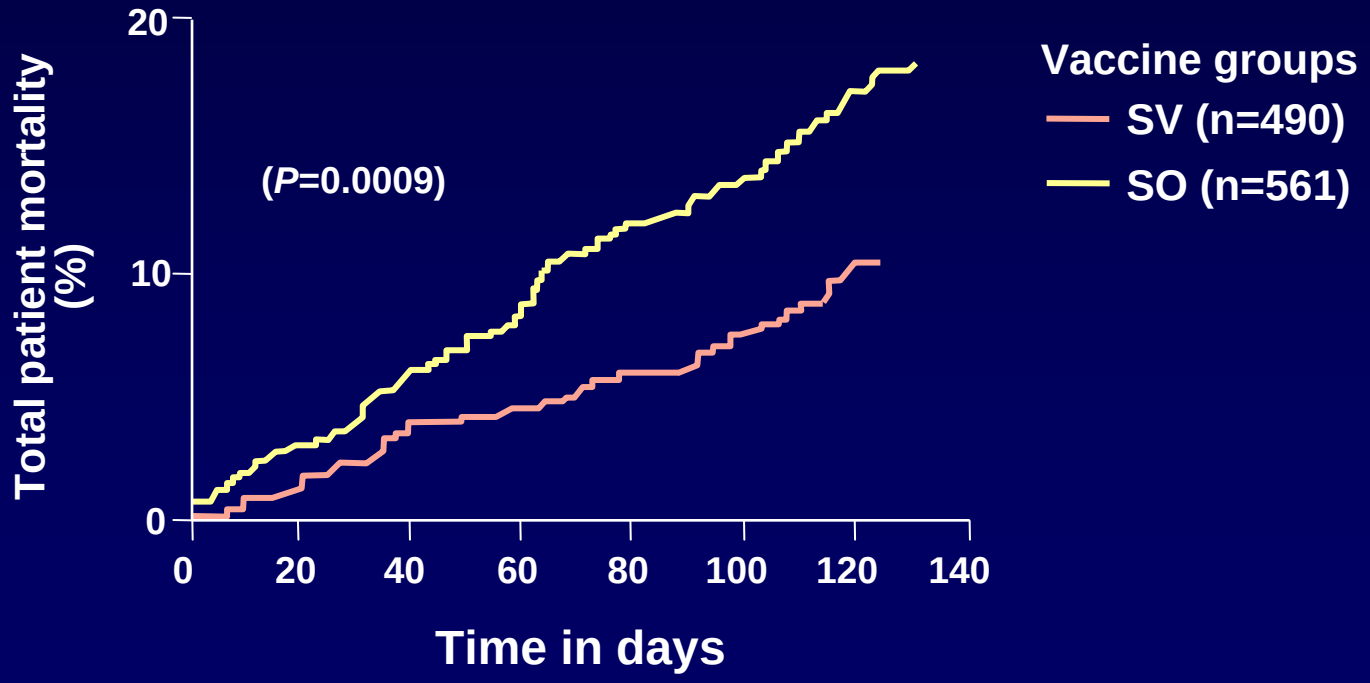
- Hypersensitivity to eggs or vaccine components
- <2 years or ≥50 years of age
- Persons with any of the underlying medical conditions that serve as indication for routine influenza vaccination including: asthma, reactive airway disease, chronic cardio-pulmonary disorders, metabolic disorders (AODM, renal dysfunction), immunodeficiency diseases or immunosuppressive states
- Persons with a history of Guillain-Barre syndrome
- Pregnant women

# INFLUENZA IN HEALTHCARE FACILITIES

- More than 25 outbreaks described in literature in acute care hospitals
  - Infected staff may initiate outbreak or aid in propagation
  - HCW infection may lead to absenteeism and disruption of health care
  - Attack rates in HCWs have ranged from 25% to 80%
- More than 15 outbreaks described in literature in extended care facilities
  - Important morbidity and mortality among residents may result
  - High rates of immunization (>60%) among staff may lead to decreased attack rate in residents

# Indirect Benefits of Influenza Vaccination of Health Care Workers

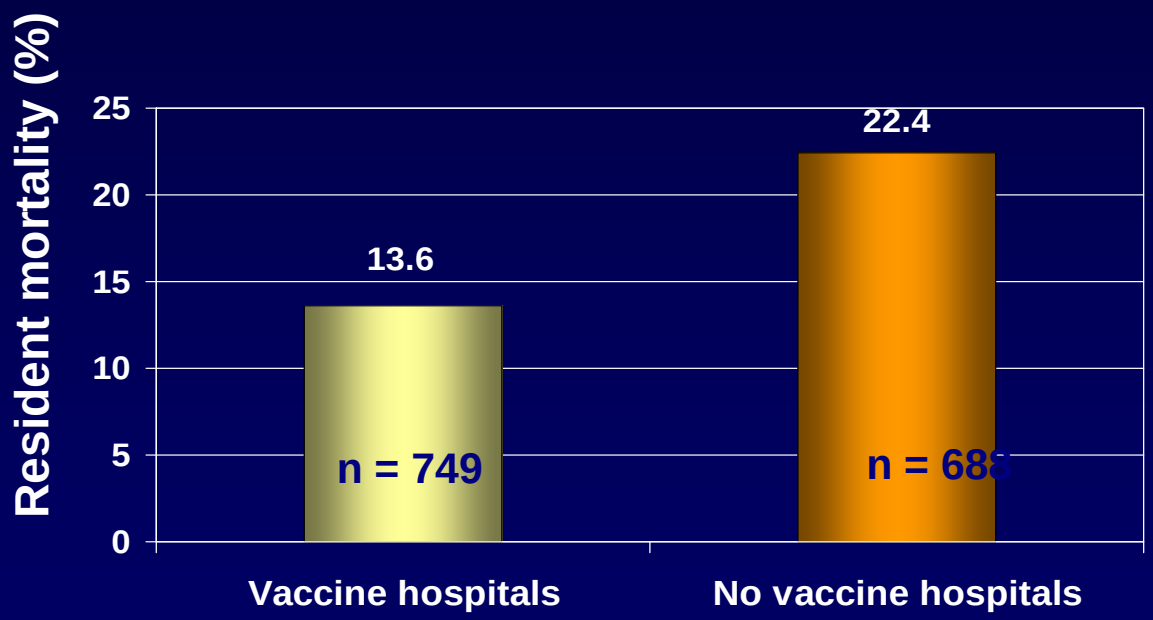
**Mortality of residents was significantly reduced (10% vs 17%) in nursing homes where the staff was vaccinated (SV) compared to facilities where they were not (S0)**




Potter J et al. *J Inf Dis*. 1997;175:1-6.

# Indirect Benefits of Influenza Vaccination of Health Care Workers

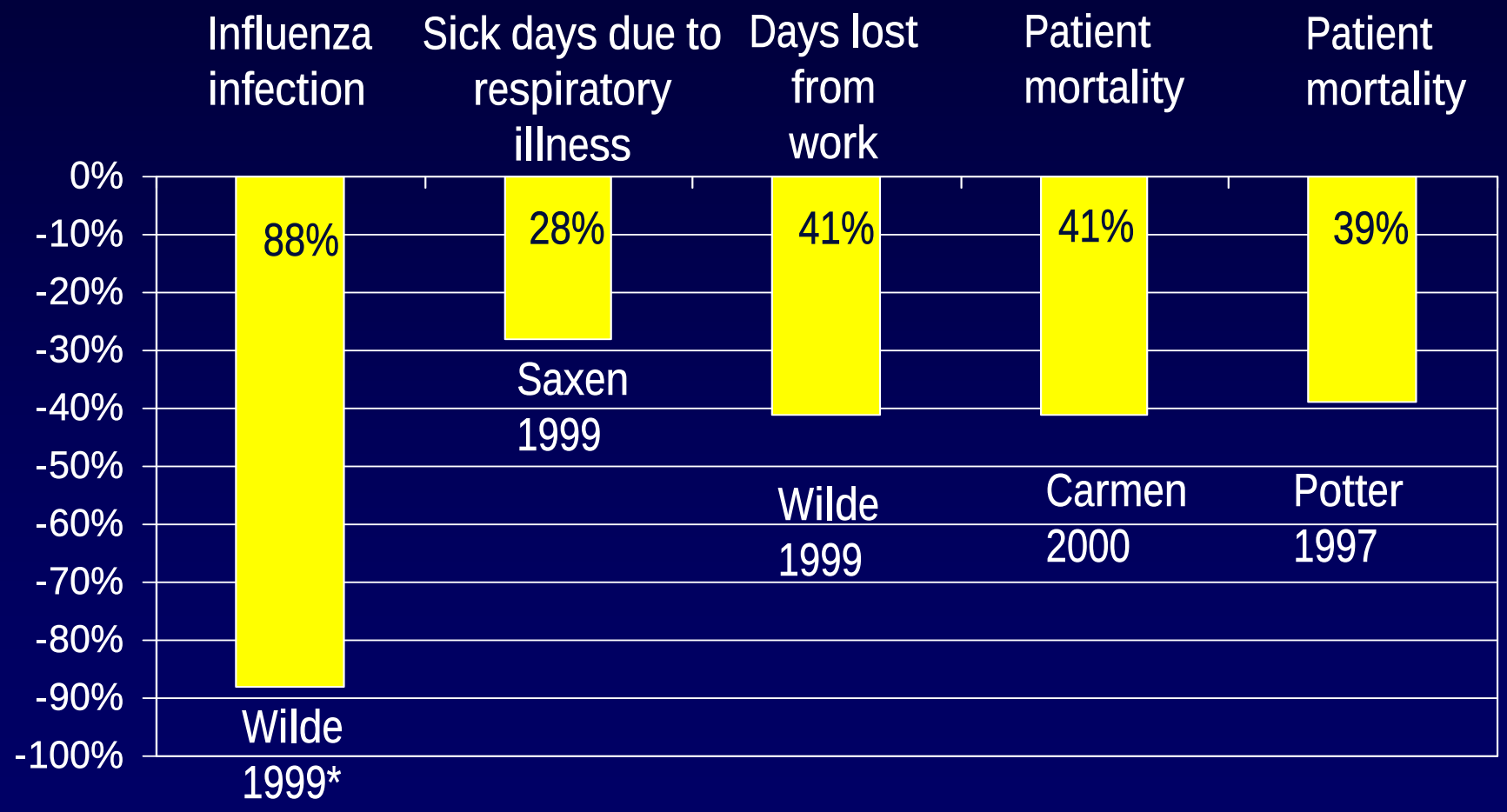
- 20 long-term care facilities, stratified cluster randomization staff influenza vaccination or not
- Resident mortality odds ratio 0.58 (95% CI 0.40, 0.84) p=0.014




**No significant difference in % residents positive for influenza: 'Vaccine hospitals' 5.4%; 'no vaccine hospitals' 6.7%**

Carman WF et al. *Lancet.* 2000;355:93-7.

# REDUCTION IN OUTCOMES IN HCWs RECEIVING INFLUENZA VACCINE




Attack rate unvaccinated = 13.4%

Talbot TT, Weber DJ, et al. ICHE 2005;26:882-890

# BARRIERS AND SOLUTIONS TO HCW INFLUENZA VACCINE CONCERNS

- Access to vaccine, inconvenience
  - Off-hours clinics
  - Use of mobile vaccination carts
  - Vaccination at staff and department meetings
- Cost
  - Provision of vaccine free of charge
- Concerns for adverse events
  - Targeted education, including specific information to dispel vaccine myths

# BARRIERS AND SOLUTIONS TO HCW INFLUENZA VACCINE CONCERNS

- Fear of needles
  - Use of LAIV for eligible HCWs
- Other
  - Strong and visible leadership
  - Visible vaccination of key leaders
  - Surveillance of HCW-associated influenza
  - Accurate tracking of individual and unit-based compliance
  - Active declination for HCP who do not wish to be or cannot be vaccinated

# Questions?