

Immunization Program Update

Philadelphia Immunization Coalition's
Annual Spring Workshop
April 25, 2009

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Happy National Infant
Immunization Week
April 25 – May 2, 2009

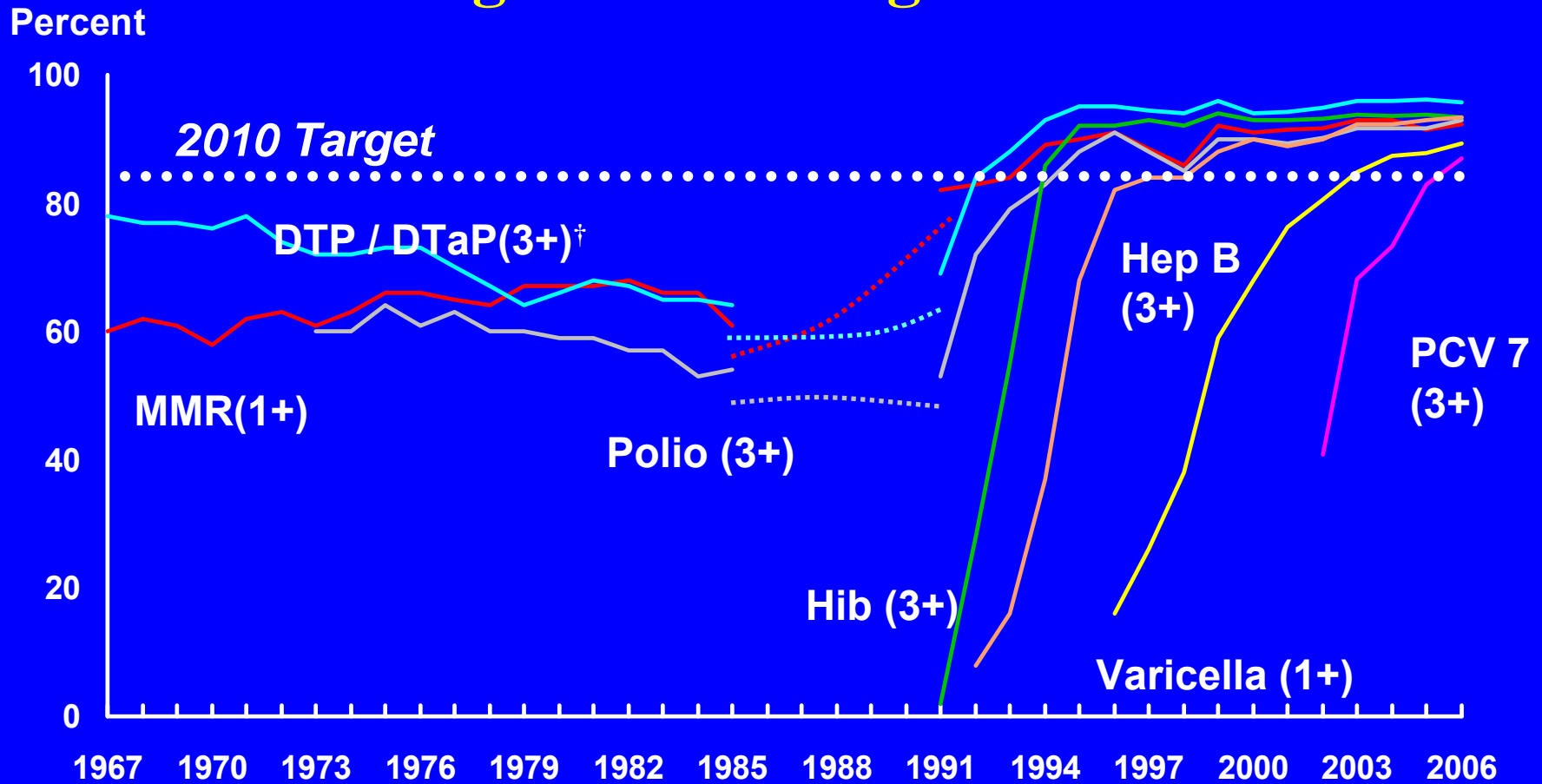
Overview

- Describe most recent data on coverage rates for both long-standing and new vaccines and impact on disease
- Discuss new vaccine recommendations and school requirements
- Questions and discussion

Data Sources

- PDPH Kids Immunization Database/Tracking System (KIDS) Registry
- CDC National Immunization Survey (NIS)
- Published data (as cited)

Increasing Vaccine-Specific Coverage Rates Among Preschool-Aged Children

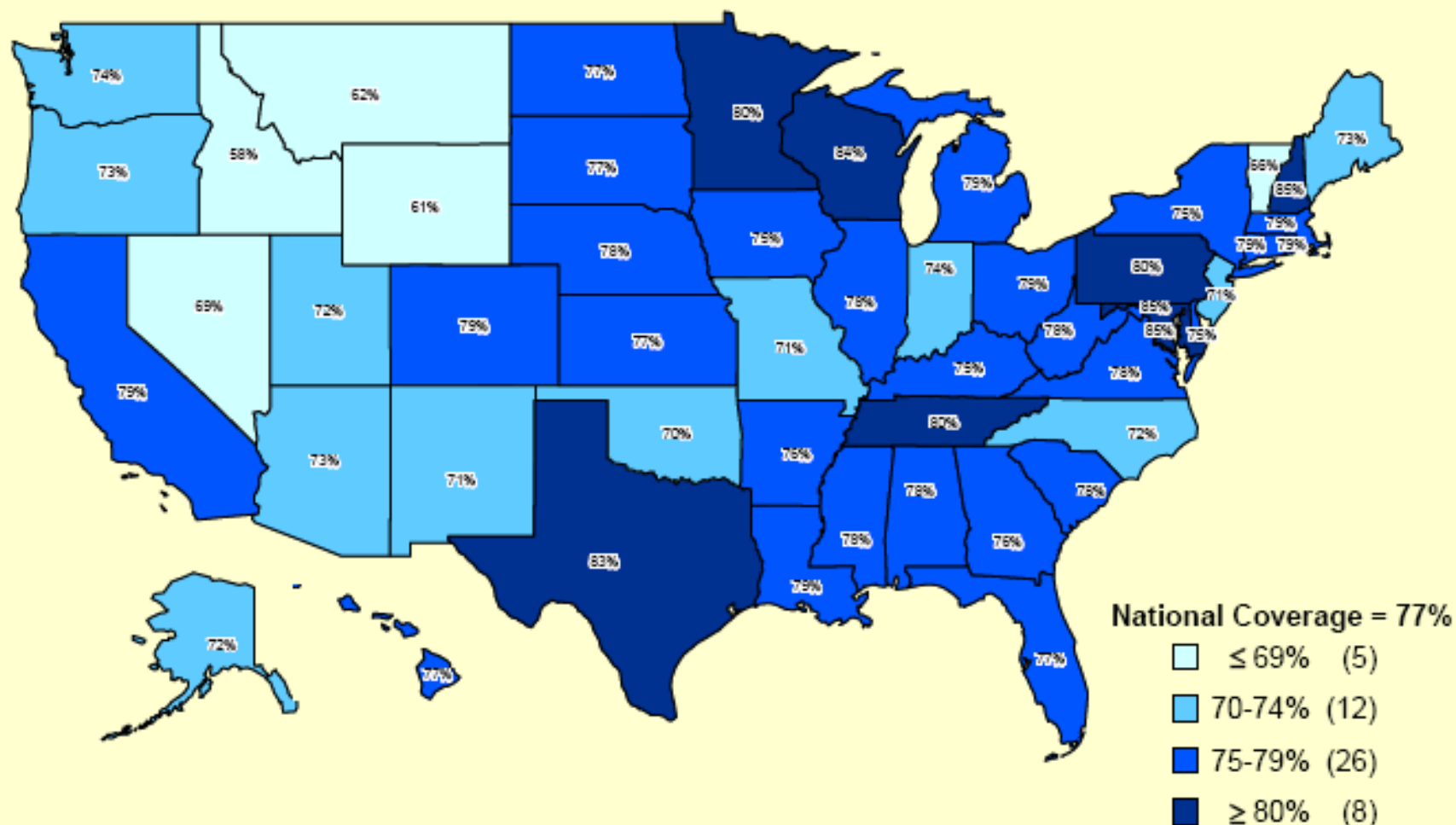


† DTP(3+) is not a Healthy People 2010 objective. DTaP(4) is used to assess Healthy People 2010 objectives.

Note: Children in the USIS and NHIS were 24-35 months of age. Children in the NIS were 19-35 months of age.

Source: USIS (1967-1985), NHIS (1991-1993) CDC, NCHS, and NIS (1994-2006), CDC, NIP and NCHS; No data from 1986-1990 due to cancellation of USIS because of budget reductions.

4:3:1:3:3:1* Series Coverage: Children 19-35 Months, July 2007 - June 2008



Note 1: *4+DTaP, 3+Polio, 1+MMR, 3+Hib, 3+HepB, 1+Varicella.
 Note 2: Includes Children Born Between July 2004 and January 2007
 Source: National Immunization Survey (NIS)



Hepatitis B birth dose rates

Birth to 3 days of age, by US state and local area

		1+ HepB
1	North Carolina	81.9 ± 5.7
2	TX-El Paso County	80.2 ± 5.8
3	IN-Marion County	79.1 ± 5.3
4	Michigan	78.3 ± 6.3
5	Utah	77.8 ± 6.1
6	PA-Philadelphia County	77.7 ± 7.1
7	Arizona	77.0 ± 5.6
8	Arkansas	76.3 ± 5.6
9	WA-Rest of State	76.2 ± 6.6
10	Maryland	75.9 ± 5.6
11	North Dakota	75.7 ± 5.9
12	Kentucky	75.6 ± 6.1
13	Washington	75.0 ± 5.6

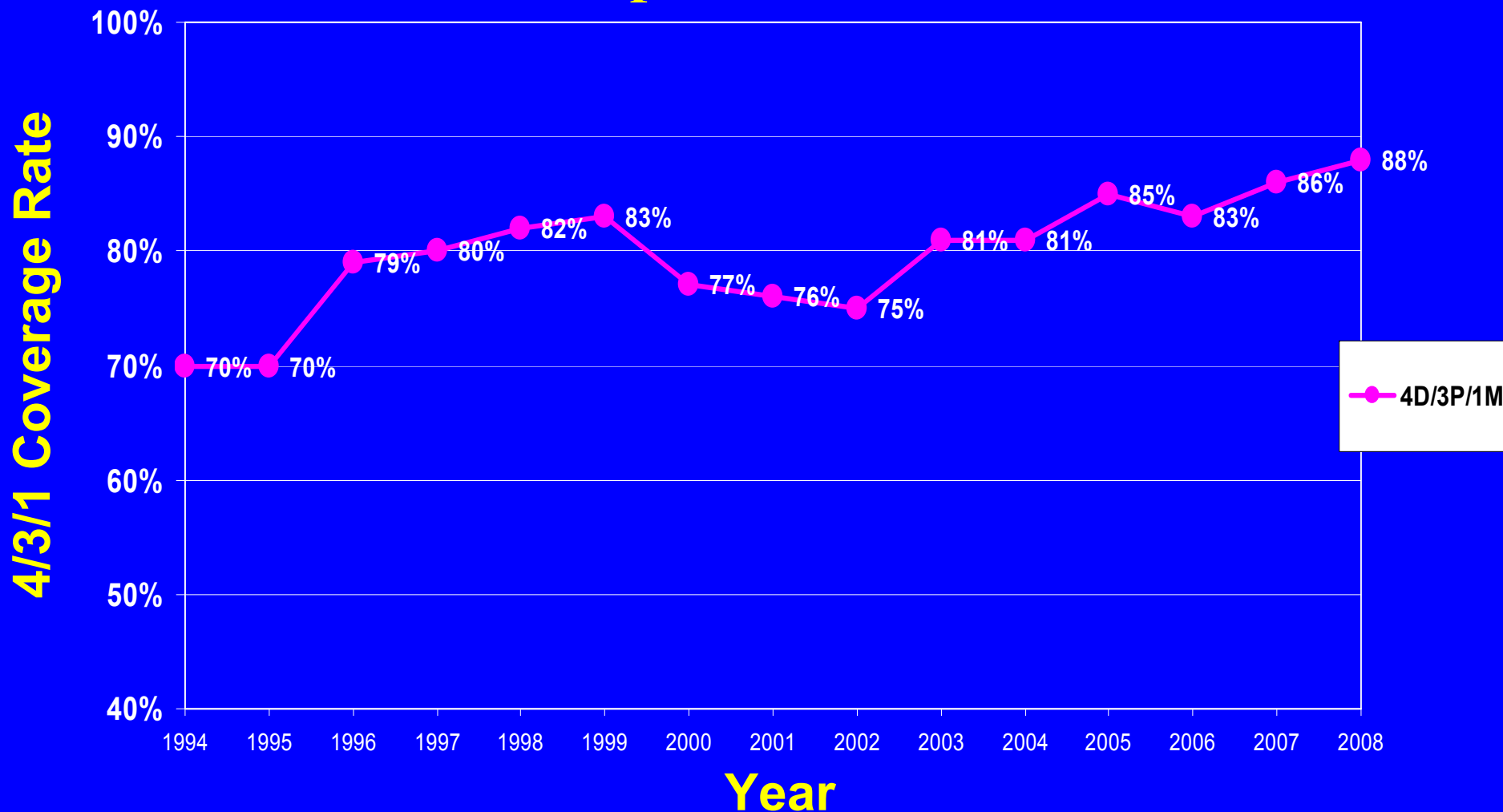
Source: NIS 2007

Coverage Among Children 19-35 Months of Age by State and Local Area, 2007*

	4+DTaP [†]	3+Polio [§]	1+MMR	3+Hib	3+HepB ^{**}	1+Var ^{††}	3+PCV ^{**}	4+PCV ^{§§}	4:3:1	4:3:1:3	4:3:1:3:3 ^{***}	4:3:1:3:3:1 ^{†††}	4:3:1:3:3:1:4 ^{€€}
TX-Rest of State	90.9±4.6	94.4±4.1	96.0±2.6	92.4±4.6	93.9±4.2	96.0±2.6	95.0±4.0	80.0±6.8	90.1±4.7	87.6±5.2	86.7±5.4	86.4±5.4	76.9±7.0
District of Columbia	90.0±4.3	93.8±3.6	95.0±3.0	96.1±3.1	96.3±2.8	94.7±3.2	94.2±3.5	80.3±6.2	88.2±4.6	86.9±4.9	86.4±4.9	85.4±5.1	74.5±6.7
New Hampshire	90.3±5.8	94.0±4.2	93.3±4.7	95.5±3.5	96.9±2.4	92.1±4.4	94.9±3.7	88.6±5.1	88.4±6.3	88.1±6.3	88.1±6.3	84.6±6.7	78.4±7.3
Maryland	93.8±3.0	96.7±2.3	96.5±2.3	95.4±2.8	94.1±3.5	93.3±2.9	92.8±4.4	85.2±5.6	92.3±3.2	90.8±3.4	87.7±4.3	84.6±4.6	78.1±6.0
TX-Bexar County	87.1±5.8	93.0±4.6	95.6±3.2	94.3±4.1	94.9±3.6	94.7±3.9	90.2±5.4	80.7±7.2	86.9±5.8	86.9±5.8	86.3±5.9	84.5±6.2	74.3±7.9
Wisconsin	86.3±5.8	94.1±3.9	93.2±4.7	93.8±3.9	96.1±3.4	90.1±4.8	95.0±3.6	84.4±6.2	86.3±5.8	86.3±5.8	86.3±5.8	83.7±6.0	76.7±7.1
Texas	87.6±3.2	93.5±2.8	94.5±1.9	92.6±3.1	93.5±2.9	94.0±1.9	93.3±2.8	79.0±4.6	86.5±3.3	84.8±3.6	83.7±3.7	82.8±3.8	73.8±4.8
PA-Philadelphia Cty	90.2±4.6	98.5±1.4	92.3±4.4	96.3±2.5	96.4±2.3	92.6±4.1	93.0±3.7	81.6±5.8	88.3±5.0	86.8±5.2	85.5±5.4	82.5±5.7	73.1±6.5
Minnesota	90.2±4.6	94.7±3.6	92.9±4.3	91.9±4.2	95.2±3.4	92.9±3.1	94.7±3.2	84.2±5.8	86.4±5.5	82.8±6.0	82.6±6.0	80.3±6.1	74.0±6.7
Pennsylvania	89.3±3.9	95.4±3.1	93.5±3.0	94.5±3.4	93.3±3.6	92.0±3.1	93.0±3.6	84.0±4.8	85.6±4.8	84.4±4.9	82.9±5.1	79.9±5.2	71.4±6.0
Tennessee	86.7±4.8	95.4±3.2	96.9±2.2	95.2±3.2	93.2±4.2	91.5±4.2	95.0±2.9	81.9±5.5	86.5±4.8	85.8±4.9	83.3±5.5	79.7±5.9	71.3±6.7
PA-Rest of State	89.1±4.6	94.9±3.7	93.7±3.4	94.2±4.0	92.7±4.2	91.9±3.5	93.1±4.2	84.4±5.5	85.2±5.6	84.0±5.7	82.4±5.9	79.5±6.1	71.1±6.9
Colorado	84.1±7.1	94.5±3.5	90.1±6.3	90.0±6.1	94.2±3.8	87.3±6.7	92.8±4.0	75.2±8.2	82.1±7.3	81.4±7.3	81.0±7.4	79.4±7.5	69.7±8.5
Ohio	86.9±6.6	93.2±4.4	91.8±4.4	92.1±6.0	92.5±4.4	87.7±5.6	91.5±4.4	75.4±7.4	85.8±6.6	84.1±6.8	81.5±7.0	79.4±7.3	67.4±7.8
CA-Rest of State	85.6±4.2	92.0±3.4	95.0±2.4	92.1±3.3	92.7±3.2	91.8±3.2	91.6±3.3	77.6±5.7	84.1±4.4	82.4±4.6	81.7±4.7	79.1±4.9	67.8±6.1
Massachusetts	88.7±5.0	97.6±2.0	94.5±3.8	98.5±1.6	95.5±3.2	90.5±4.3	95.1±2.8	88.9±4.4	86.8±5.4	86.8±5.4	84.1±5.9	79.0±6.4	75.3±6.7
Louisiana	83.3±5.5	93.3±3.9	95.1±2.7	88.4±5.0	93.5±3.7	93.5±3.2	91.2±4.3	75.2±6.4	83.0±5.5	81.0±5.8	80.2±5.8	78.9±5.9	70.1±6.7
Connecticut	91.2±4.7	98.2±1.8	94.9±3.4	91.7±6.0	97.9±1.8	93.0±4.4	95.9±3.0	87.2±6.1	88.5±5.2	83.2±7.0	82.4±7.1	78.7±7.5	69.7±8.4
Rhode Island	85.6±5.7	95.4±3.4	92.6±4.2	93.6±3.7	96.7±2.6	92.1±4.3	96.4±2.9	84.7±6.0	82.3±6.2	80.5±6.4	79.9±6.4	78.7±6.5	71.3±7.4

***Ranked by 4:3:1:3:3:1 Coverage Rates**
Source: NIS, Q3/2007-Q2/2008

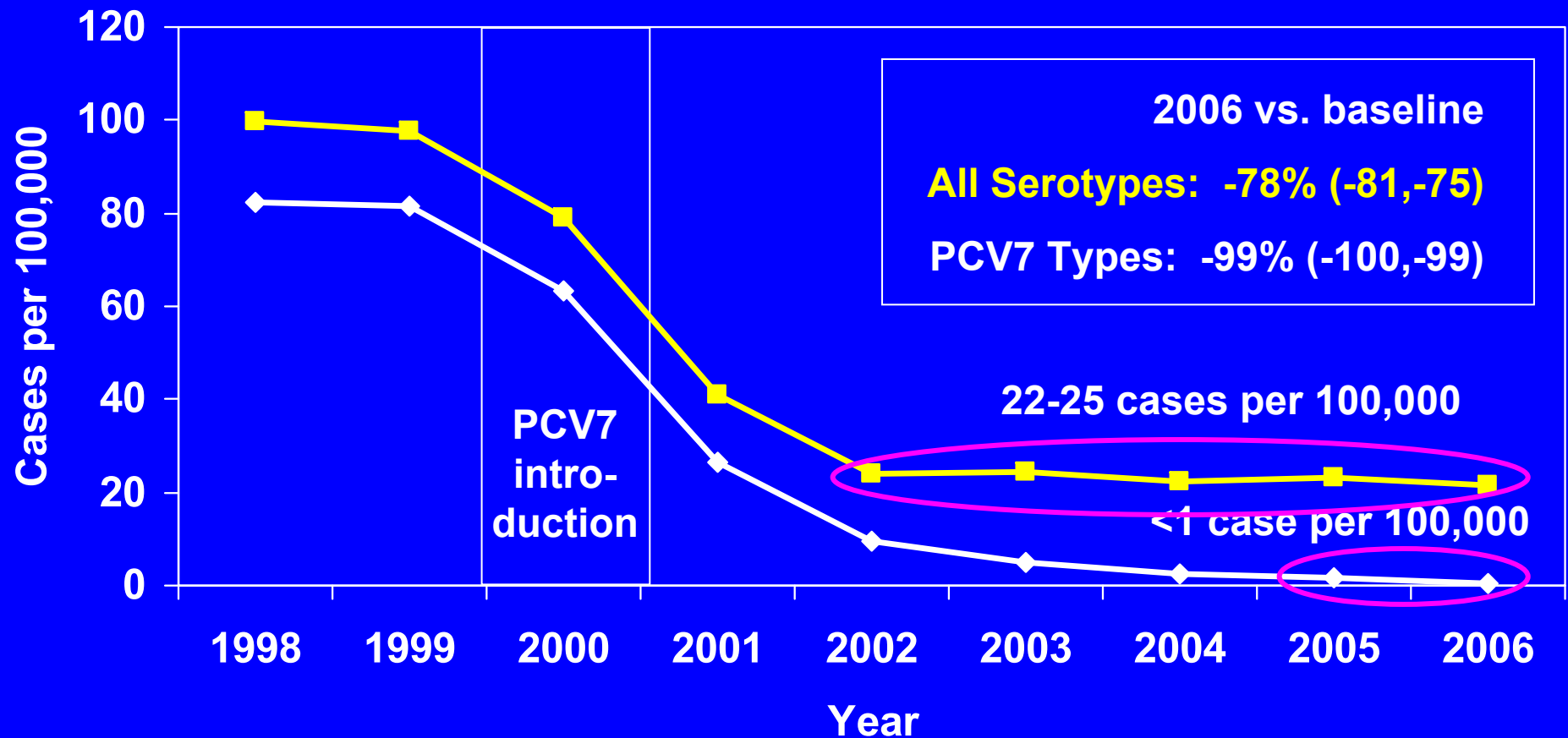
4/3/1* Vaccination Coverage Rates for Children 19-35 Months of Age Philadelphia: 1994-2008†



*4 DTaP/ 3 Polio/ 1 MMR

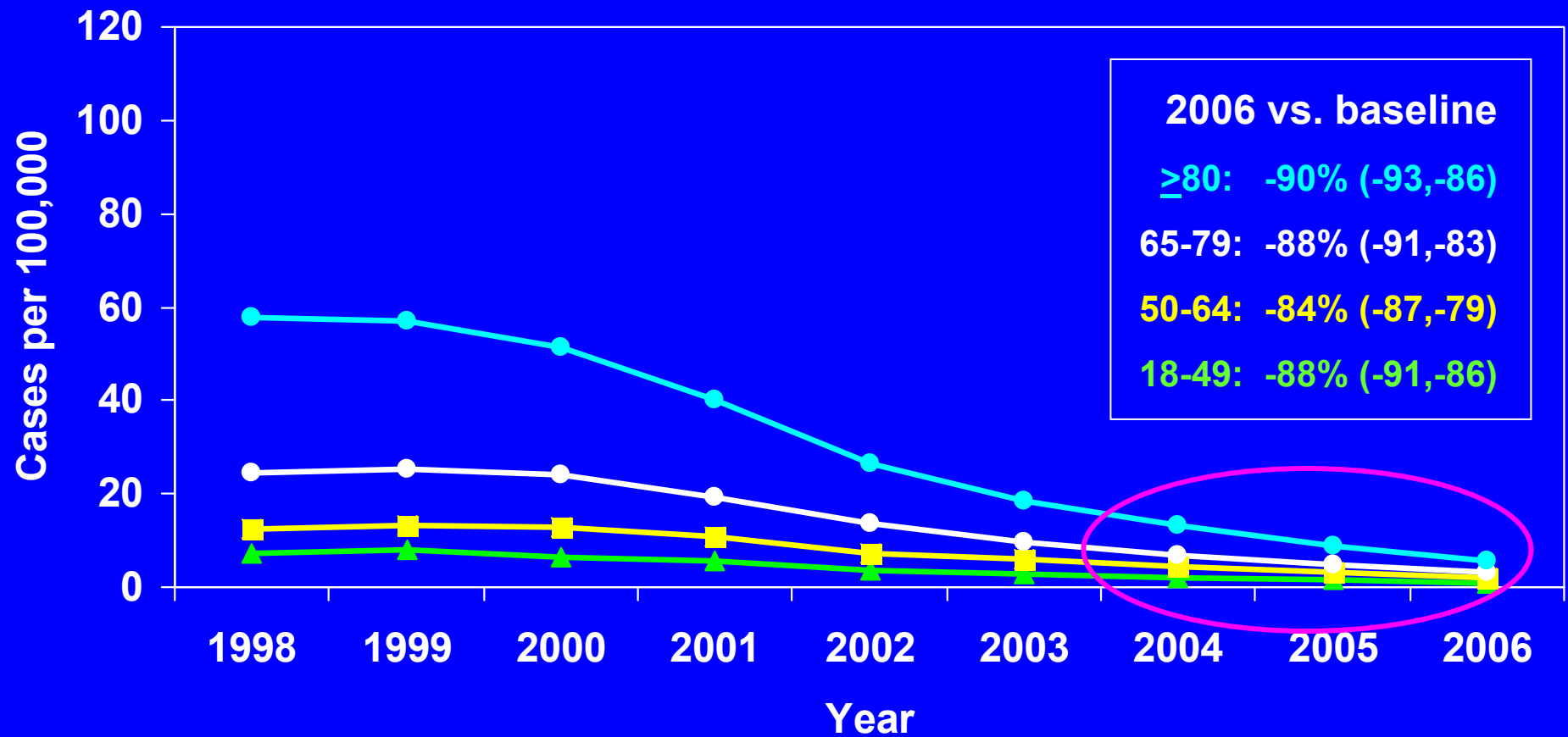
†CDC National Immunization Survey Data

Direct effects of PCV7: Rates of IPD among children aged <5 years, 1998/99-2006

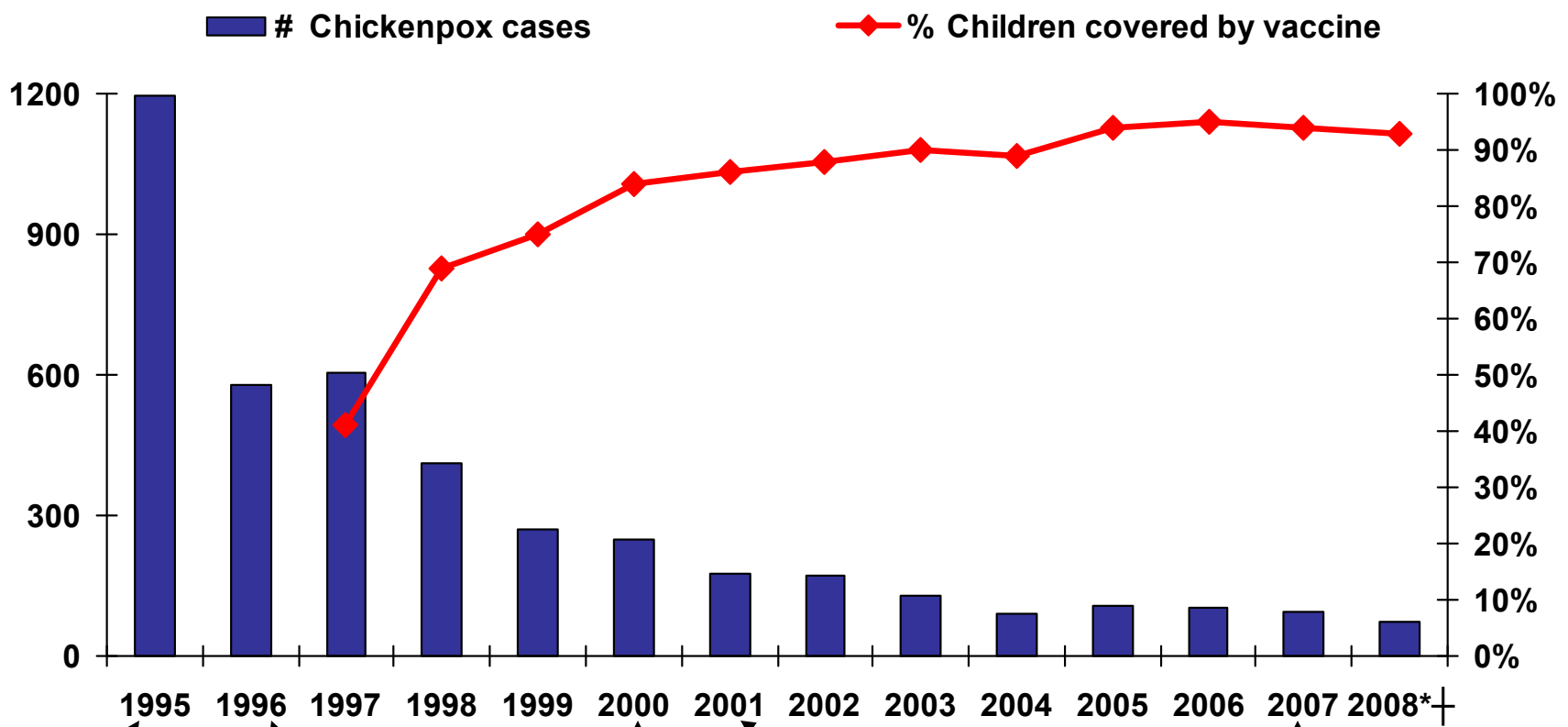


Indirect effects of PCV7: Rates of IPD among adults aged ≥ 18 years, 1998/99-2006

PCV7 serotypes

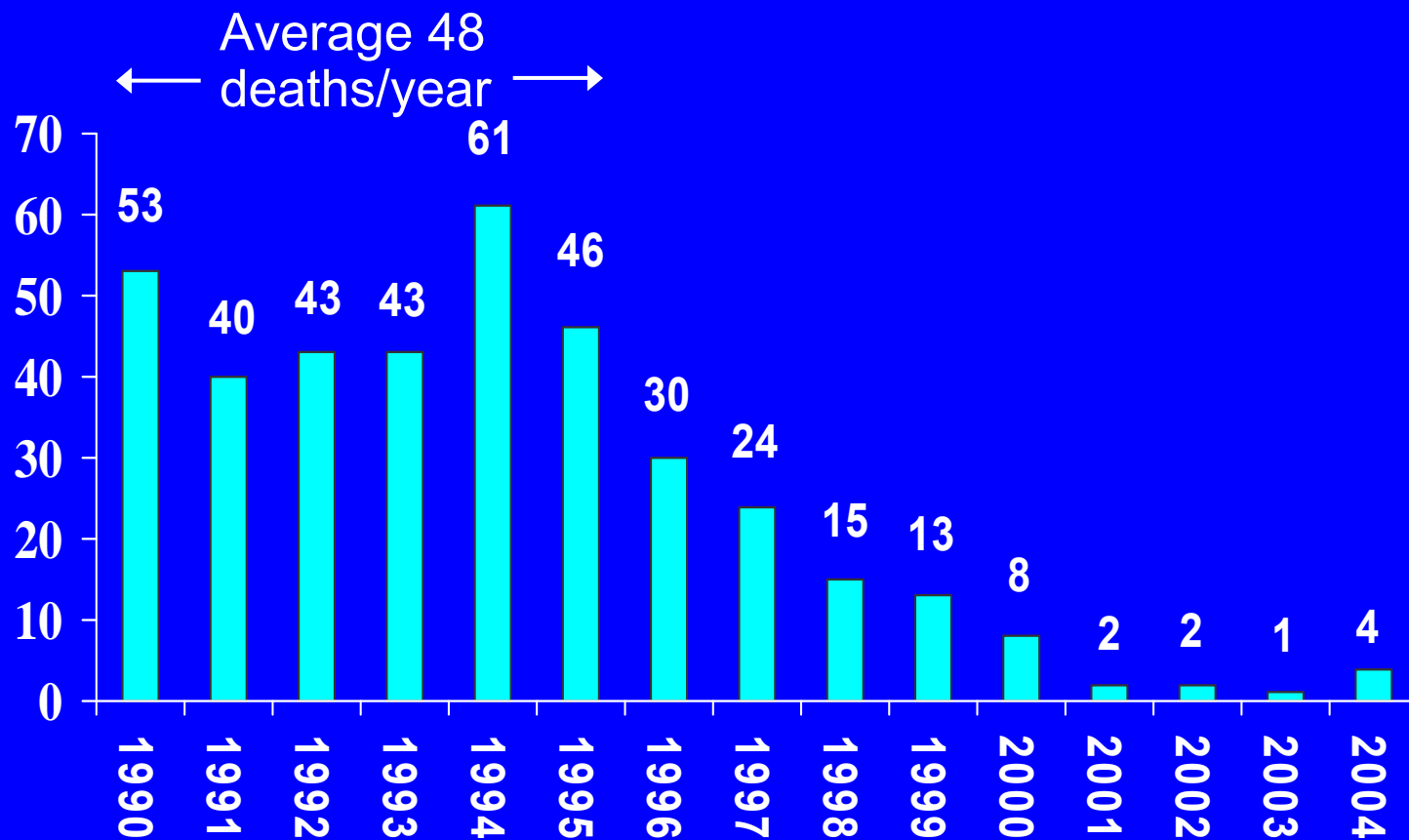


Impact of Varicella Vaccine Distribution on # of Varicella (Chickenpox) Cases in West Philadelphia



1995 Varicella Vaccine Licensed
1996 Widespread Distribution of Vaccine in Philadelphia
2000 School Entry Requirement for Varicella Vaccine in Kindergarten
2001 School Entry Requirement for Varicella Vaccine in 6th grade
2007 Two Doses of Varicella Recommended (June)/ 2 Doses Required for K Entry (July 07)

Varicella Deaths* Among Children and Adolescents < 20 Years of Age U.S., 1990-2004

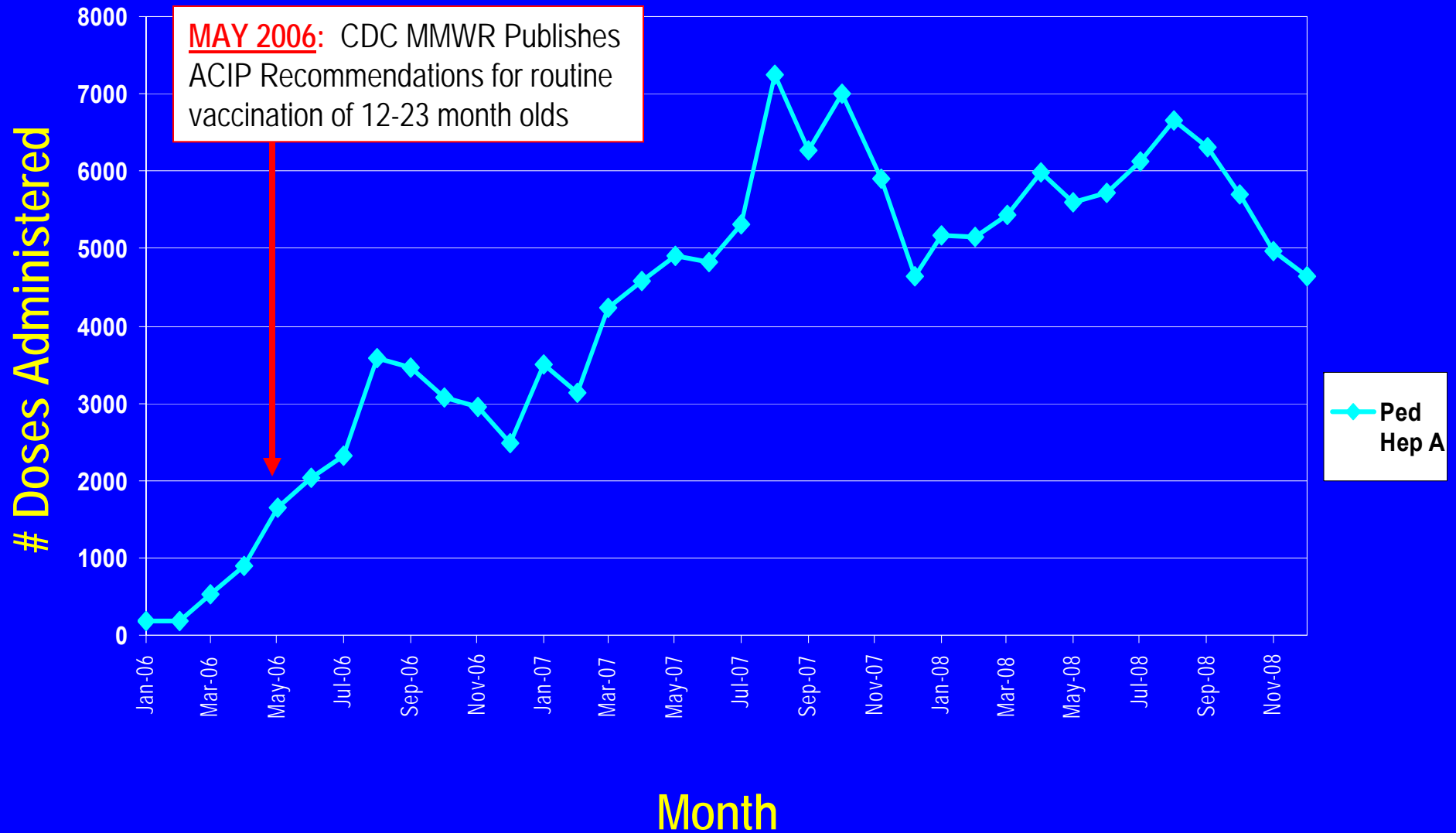


* NCHS, varicella as underlying cause of death

NCHS data

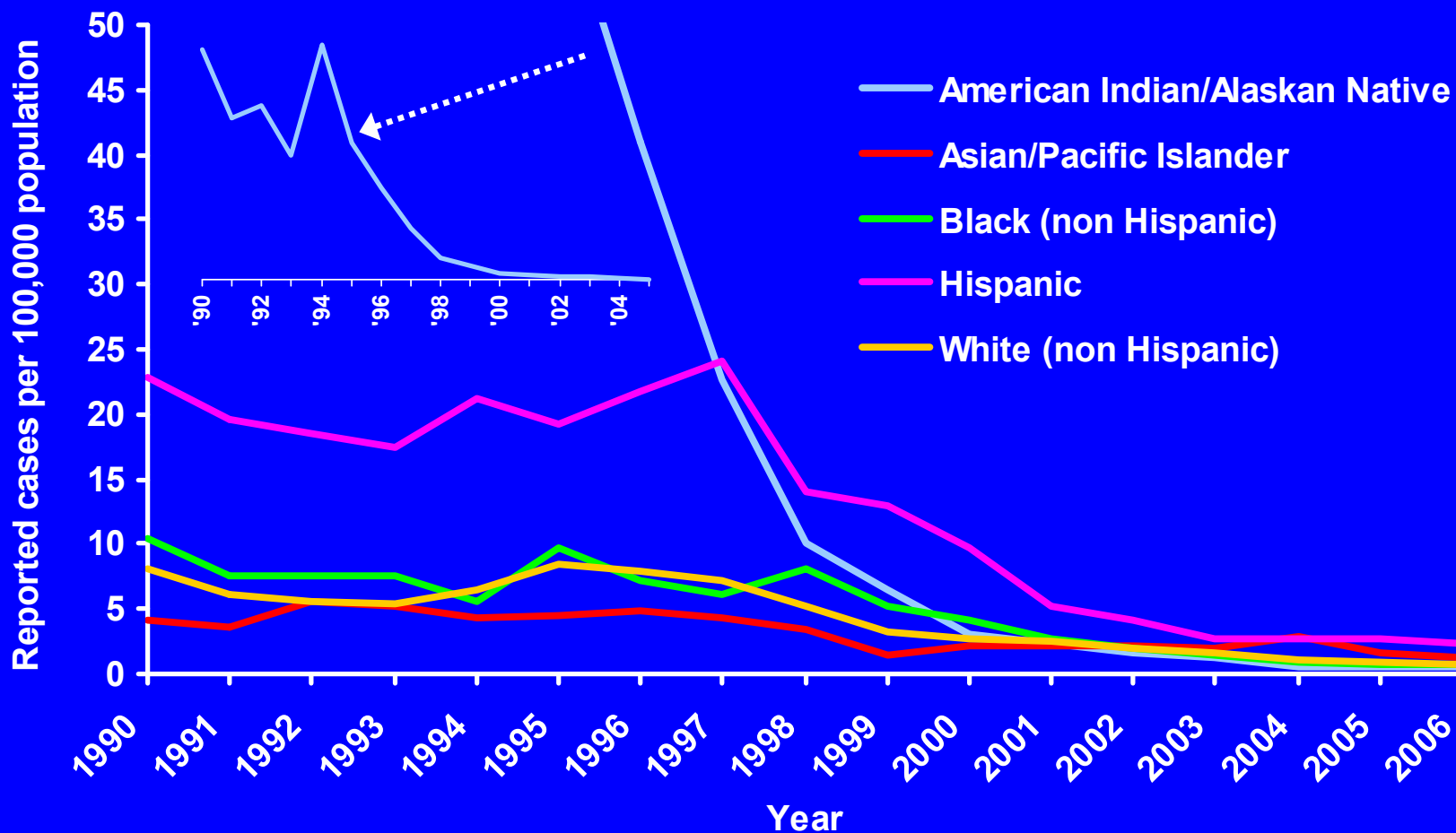
Pediatric Hepatitis A Vaccine

Doses Administered by Month: Philadelphia (Jan 2006-Dec 2008)*



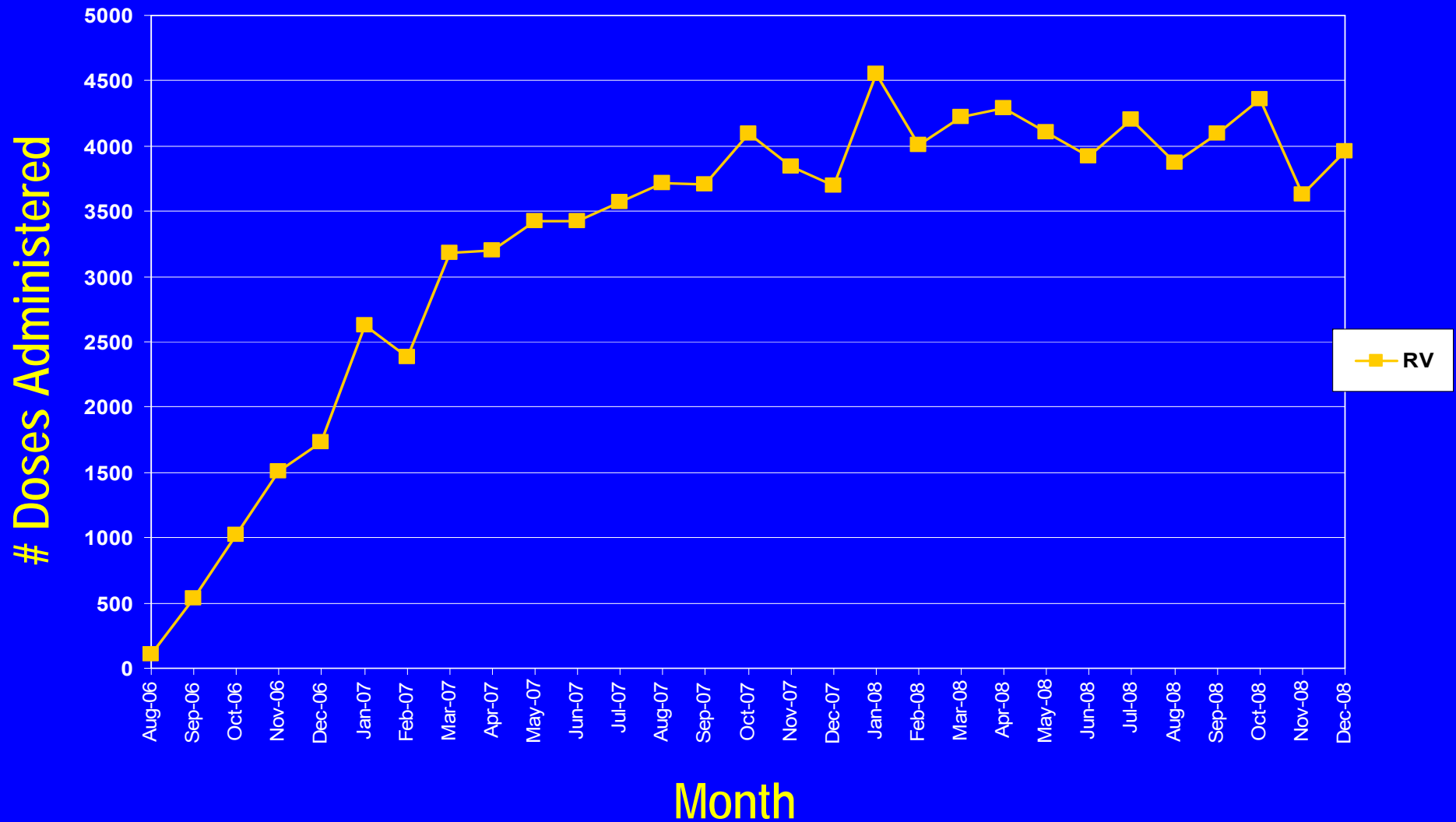
*KIDS Registry Data

Incidence of Reported Hepatitis A, by Race and Ethnicity, United States, 1990-2006



Rotavirus Vaccine (RV)

Doses Administered: Philadelphia (Aug 2006-Dec 2008*)



*KIDS Registry Data

FIGURE 1. Estimated number of annual deaths, hospitalizations, emergency department visits, and episodes of rotavirus gastroenteritis among children aged <5 years before introduction of rotavirus vaccine — United States

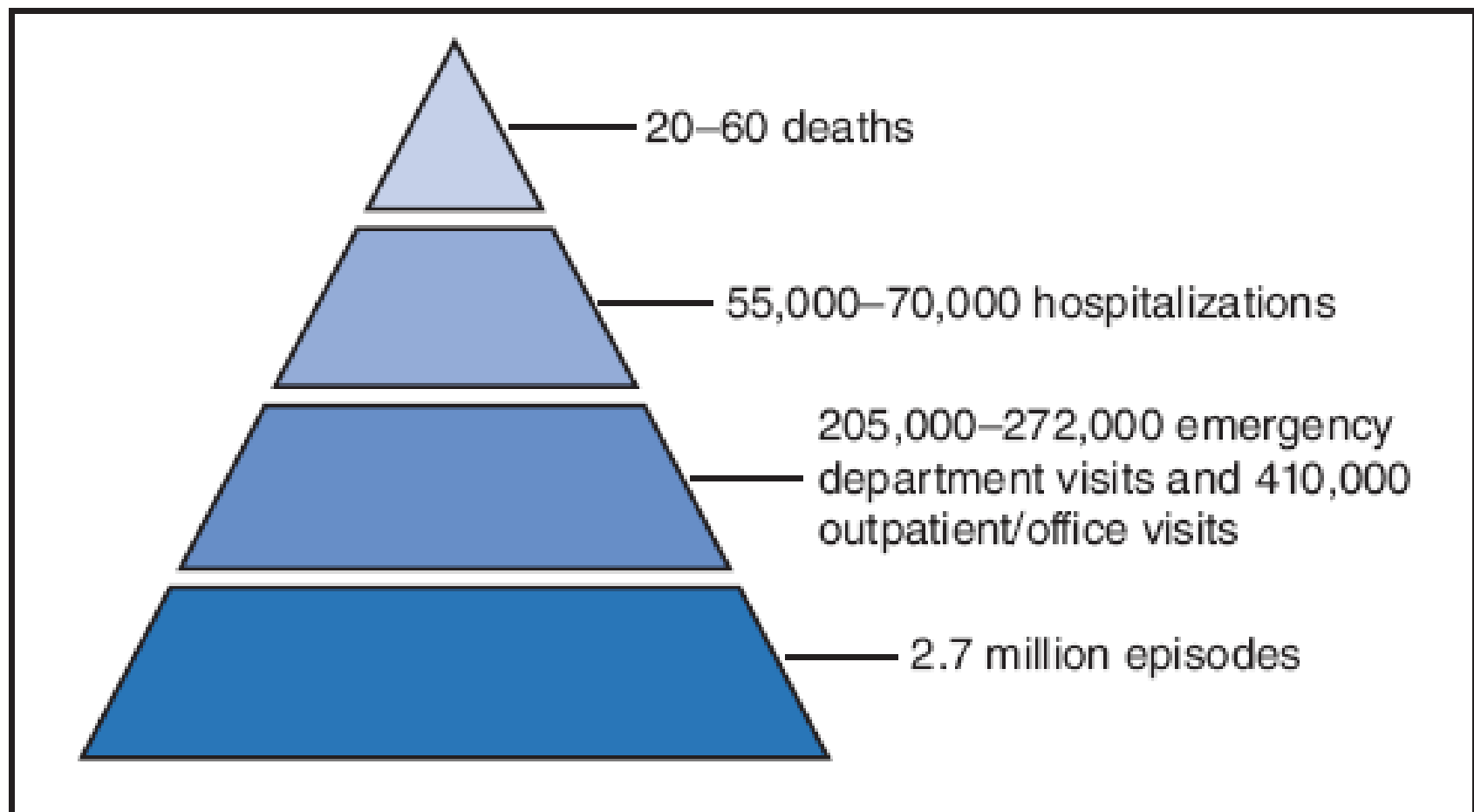
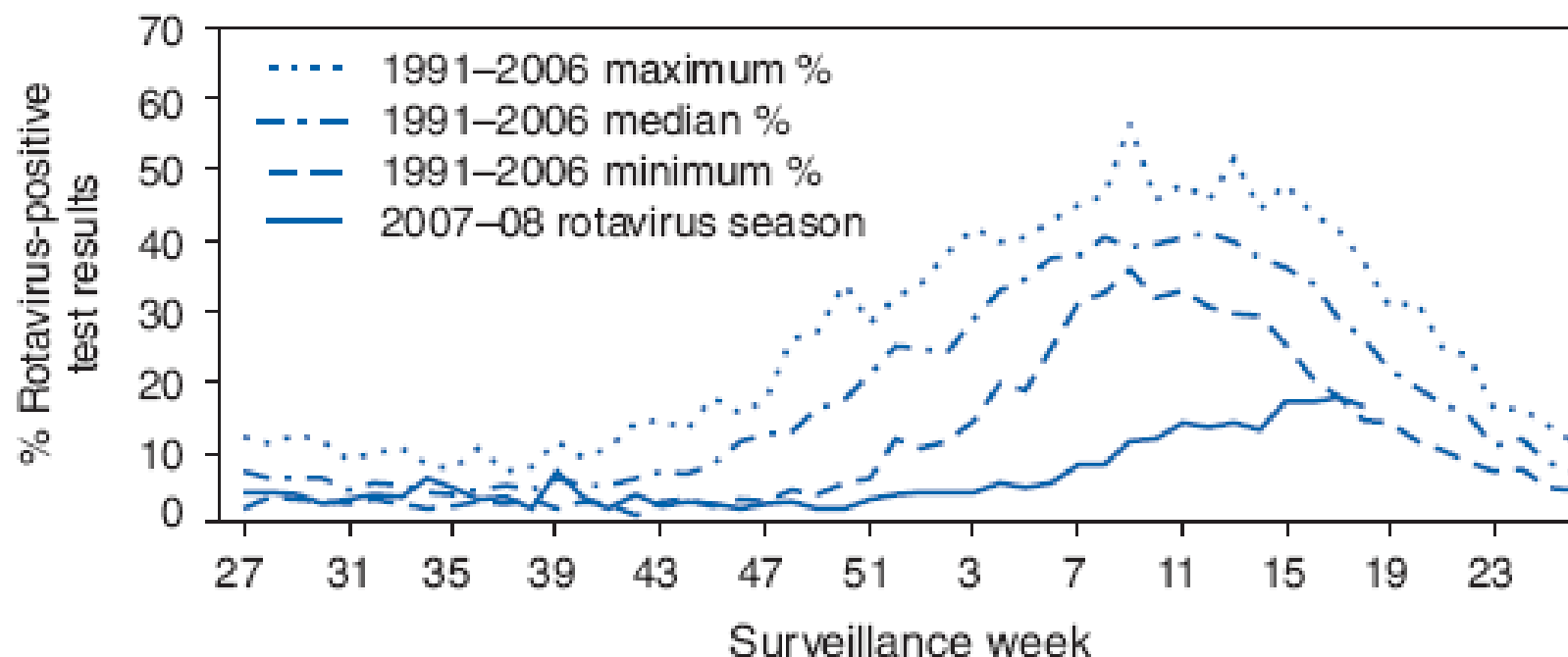


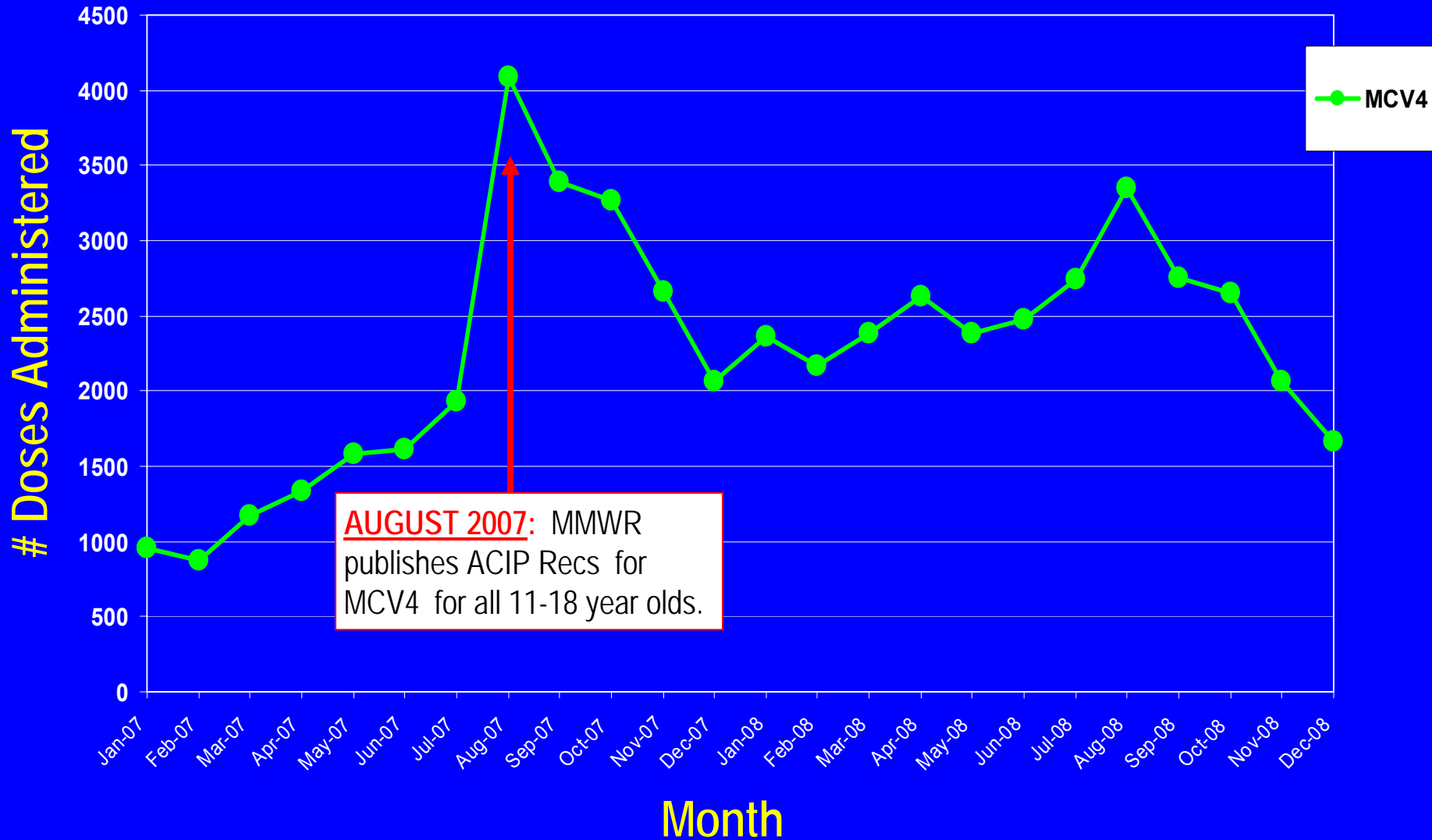
FIGURE 4. Percentage of rotavirus tests with positive results from participating laboratories, by week of year — National Respiratory and Enteric Virus Surveillance System, United States, 1991–2006 rotavirus seasons and 2007–08 rotavirus season*



* 2008 data current through week ending May 3, 2008. Data from July 2006–June 2007 were excluded from the (1991–2006) prevaccine baseline data because some persons tested likely received vaccine during that period.

Meningococcal Conjugate Vaccine (MCV4)

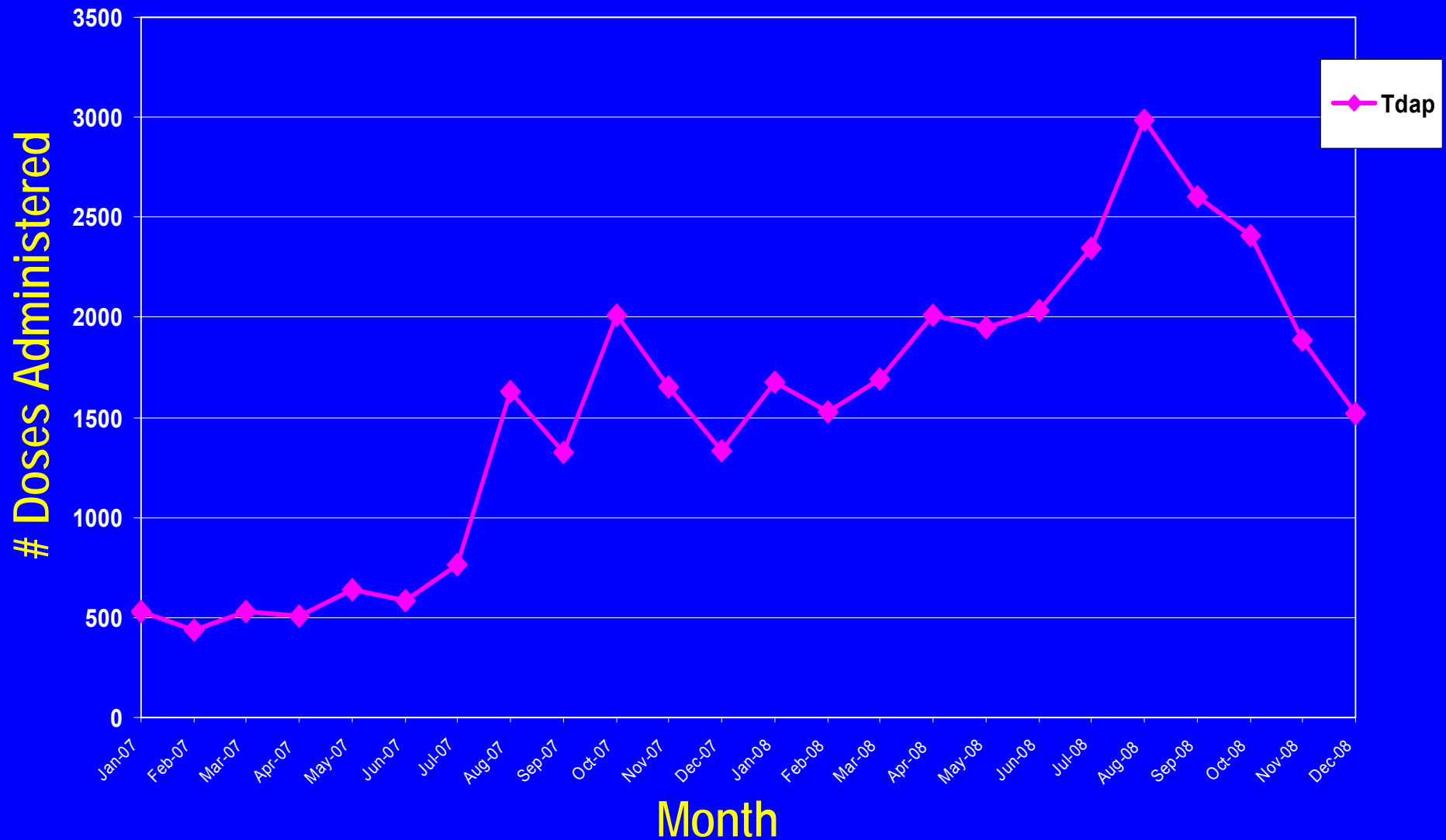
Doses Administered to 11-18 Year Olds by Month
Philadelphia (Jan 2007-Dec 2008)*



*KIDS Registry Data

Tdap Doses Administered

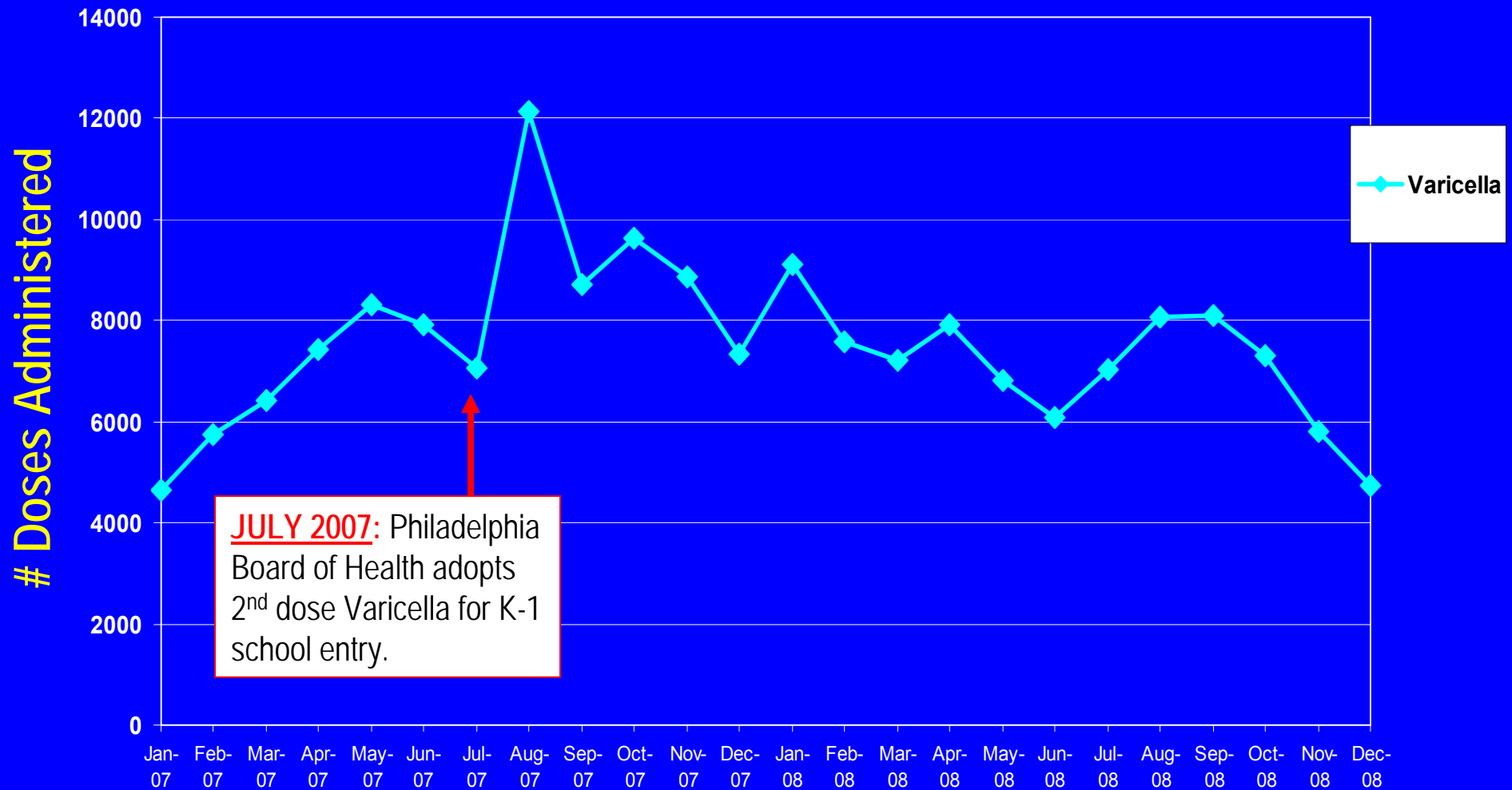
10-18 Year Olds: Philadelphia (2007-2008)*



*KIDS Registry Data

Varicella-Containing Vaccine

Doses Administered to Children: Philadelphia (2007-2008)*



Month

*KIDS Registry Data

Philadelphia Immunization Requirements

School Entry: 2009-2010

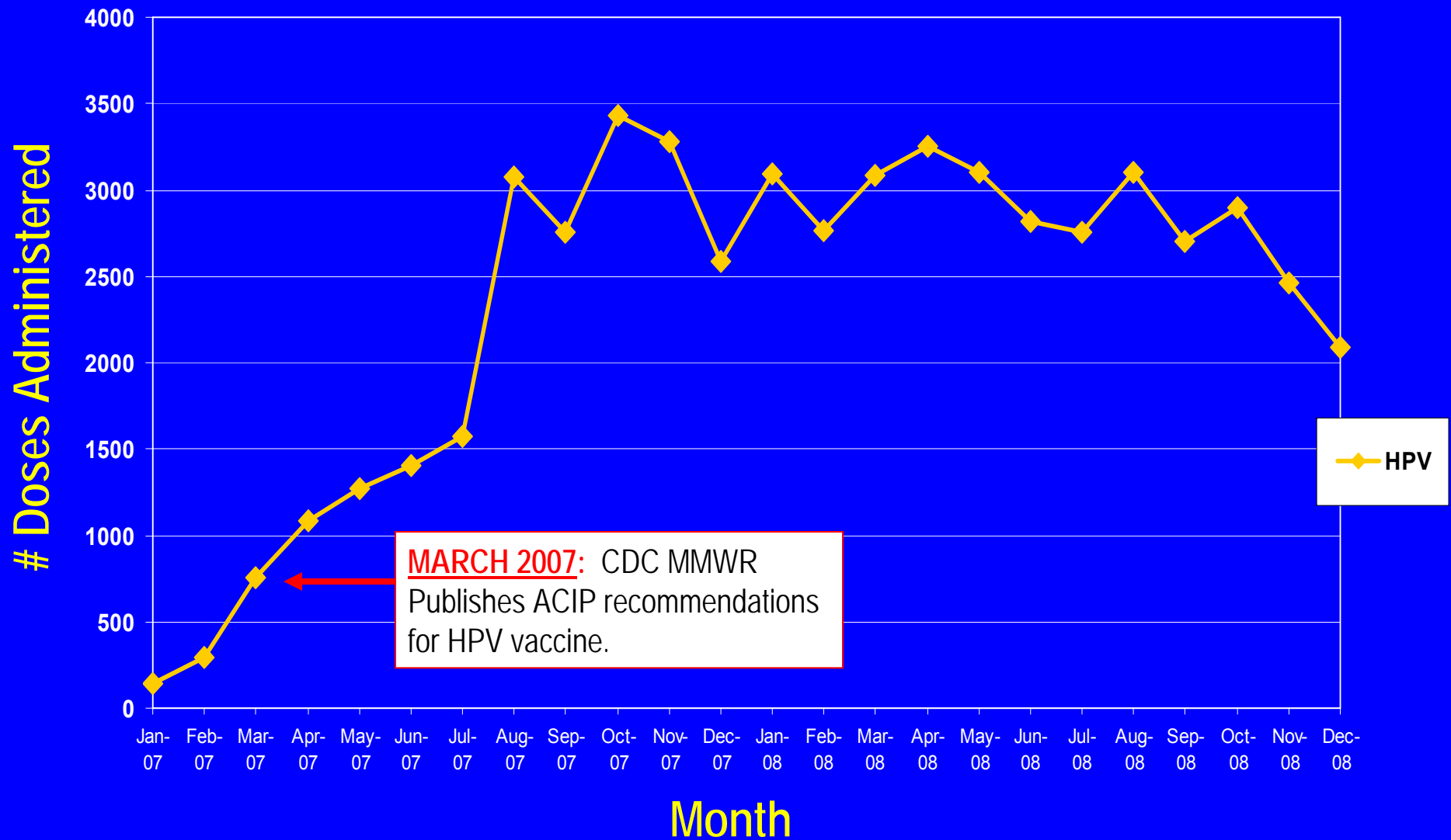
Grades	Vaccines	Requirements
K – 1	Diphtheria & Tetanus..... Pertussis..... Polio..... Measles..... Mumps..... Rubella..... Hepatitis B..... Varicella.....	4 Doses: at least one after 4 th birthday (DTaP/DTP/DT/Td) 4 Doses: at least one after 4 th birthday (DTaP or DTP) 3 Doses (OPV/IPV) 2 Doses: both after 1 st birthday (MMR or MMRV) 2 Doses: both after 1 st birthday (MMR or MMRV) 2 Doses: both after 1 st birthday (MMR or MMRV) 3 Doses: properly spaced (HBV) 2 Doses: both after 1 st birthday (Varicella or MMRV) or documentation of chickenpox immunity proven by laboratory testing or a written statement of prior chickenpox disease from a healthcare provider
2-5 and 7-12	Diphtheria & Tetanus..... Polio..... Measles..... Mumps..... Rubella..... Hepatitis B..... Varicella.....	3 Doses: at least one after 4 th birthday (DTaP/DTP/DT/Td/Tdap) 3 Doses (OPV/IPV) 2 Doses: both after 1 st birthday (MMR or MMRV) 1 Dose: after 1 st birthday (MMR or MMRV) 1 Dose: after 1 st birthday (MMR or MMRV) 3 Doses: properly spaced (HBV) 1 Dose: after 1 st birthday (Varicella or MMRV) (2 doses if the 1 st dose was given after the 13 th birthday.) *
6	Diphtheria & Tetanus..... Pertussis..... Polio..... Measles..... Mumps..... Rubella..... Hepatitis B..... Varicella..... Meningococcal.....	4 Doses: at least one after 10 th birthday (DTaP/DTP/DT/Td/Tdap)** 1 Dose: at least one after 10 th birthday (Tdap) ** 3 Doses (OPV/IPV) 2 Doses: both after 1 st birthday (MMR or MMRV) 1 Dose: after 1 st birthday (MMR or MMRV) 1 Dose: after 1 st birthday (MMR or MMRV) 3 Doses: properly spaced (HBV) 2 Doses: both after 1 st birthday (Varicella or MMRV) * 1 Dose (MCV4)

HPV Prevalence: Population Estimates, U.S.

- 20 million people are infected
- 15% of persons aged 15-49 years currently infected
- 6.2 million new infections each year
- 9,700 new cervical cancers each year
- 3,700 cervical cancer deaths each year

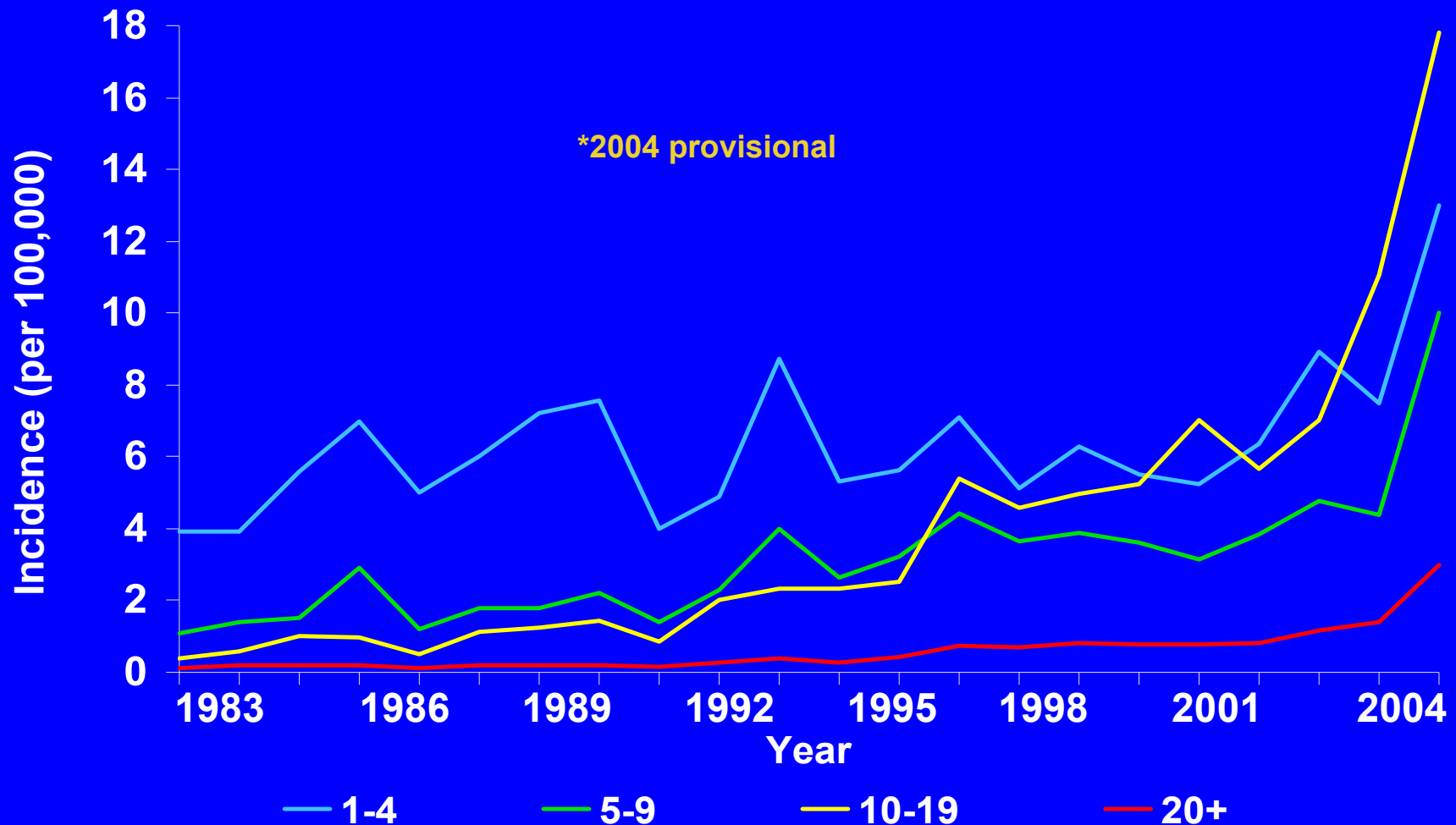
Human Papillomavirus (HPV) Vaccine

Doses Administered to Children: Philadelphia (2007-2008)*



*KIDS Registry Data

Reported Pertussis Incidence in the US by Age (1983-2004*)



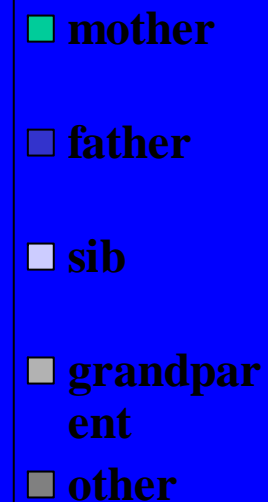
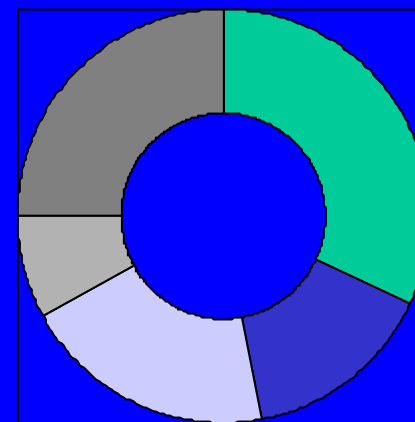
Centers for Disease Control and Prevention. Pertussis Surveillance Report – 8/6/04.
Murphy TV. Presented at ACIP, February 11, 2005.

Why does Pertussis Persist?

- Persistent human reservoir due to:
- Incomplete immunization of children (Strebel *et al*)
- Variable Vaccine efficacy (Plotkin, Edwards)
- Waning Immunity (Steele) and, until 2005, lack of booster doses
- CDC estimates 1 million cases of pertussis in US each year
 - Under-diagnosis in adolescents and adults (Cherry)

CDC study- Infant Pertussis: who was the source

- 774 infant cases from 4 states
- 264 cases source identified



The “Cocooning” Strategy

- Vaccinate to provide secondary protection to most vulnerable populations
 - Infants too young to be immunized
- Vaccinate those people in closest contact with the baby: most likely to pass along disease
 - Household contacts
 - Health Care Workers (HCWs)
- Hospital must ensure HCWs and immediate household contacts of the baby get vaccinated
 - Tdap (all year)
 - Flu vaccine during flu season

Post partum Tdap

- Should be routine
- As soon as feasible (before discharge)
- Breast feeding mothers included
- >2 year interval suggested since most recent Td
- A shorter interval can be used if necessary

(ACIP, Feb. 2006)

Universal Childhood Influenza Vaccination

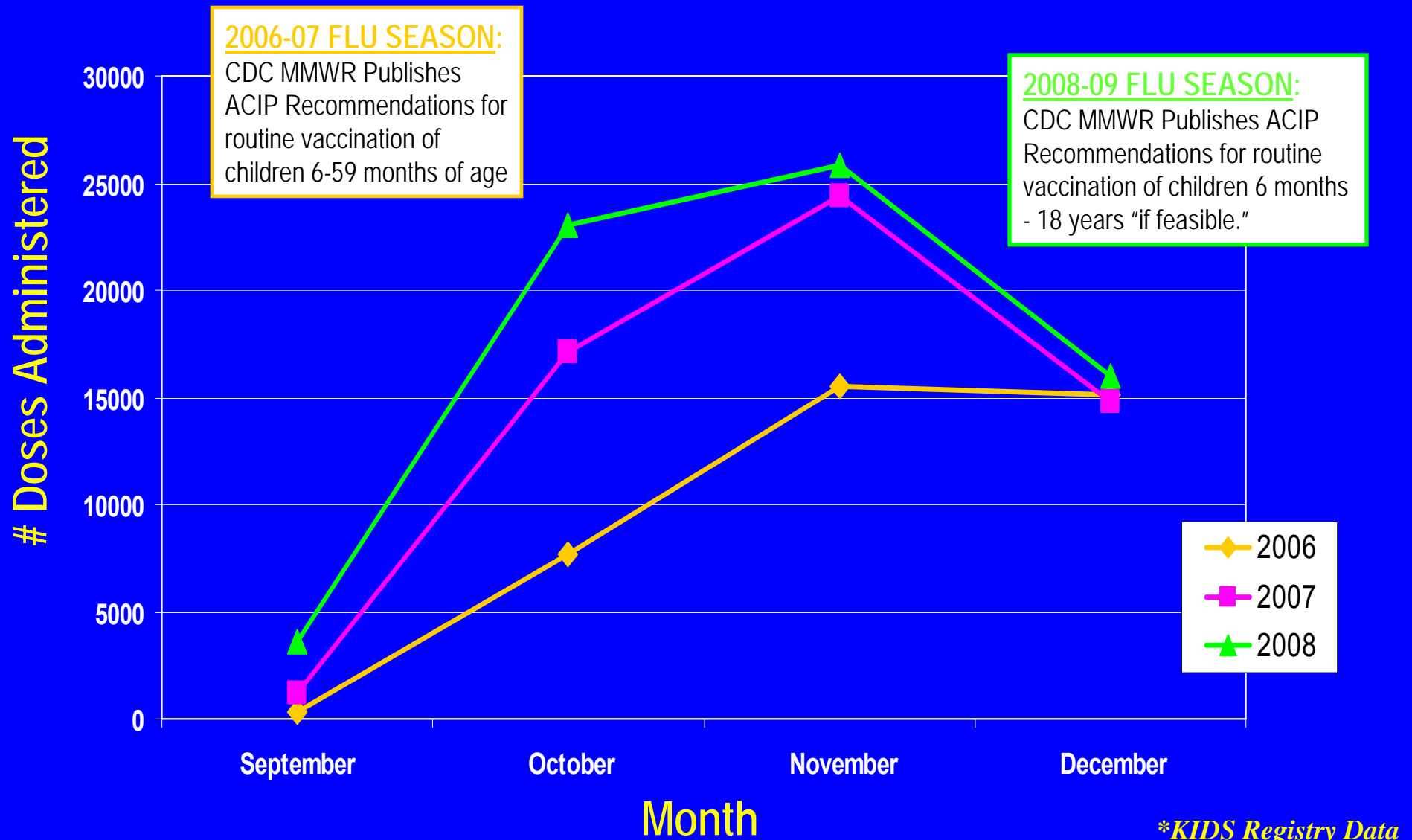
- For 2009-10 flu season – ACIP has removed “if feasible” from pediatric recommendation
- February 27, 2008: ACIP recommends all children 6 months – 18 years vaccinated
 - Expands on 2005-06 ACIP recommendation to vaccinate children 6 months – 59 months
 - Expands on 2003-04 ACIP recommendation to vaccinate children 6-23 months of age

Barriers to Universal Childhood Influenza Vaccination 2008-09

- Delayed delivery of vaccine in the past has not been conducive to 2-dose primary vaccination
- Privately-purchased vaccine often delivered before VFC vaccine (creates two-tiered dilemma)
- Capacity of pediatric providers to vaccinate through age 18 years needs to be developed and supported by Public Health

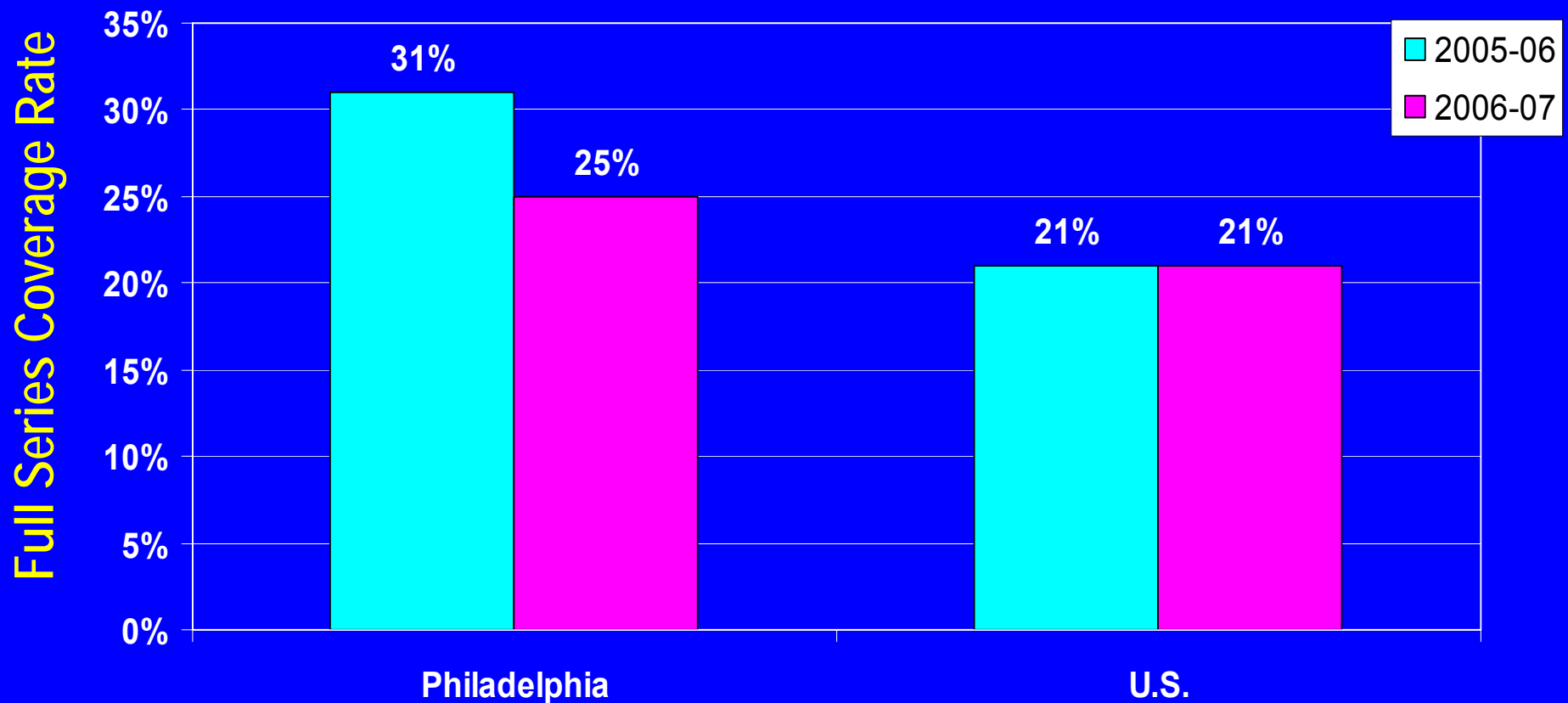
Pediatric Influenza Vaccine

Doses Administered by Month: Philadelphia (2006 - 2008)*



Influenza Completion Rate for Children 6-23 Months of Age 2005-06 vs. 2006-07 Season Philadelphia vs. U.S.

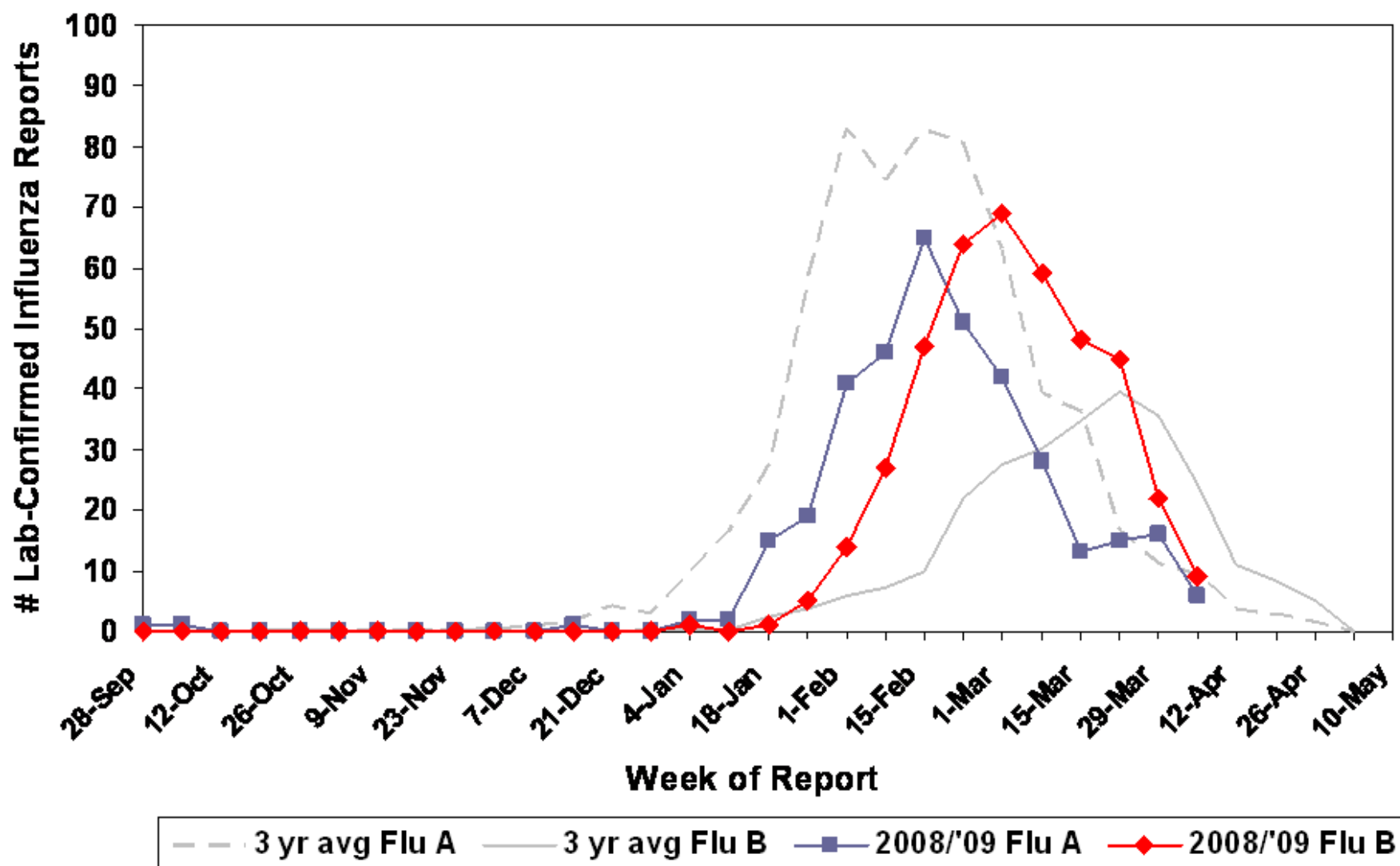
(Universal flu recommendation for 6-23 month old children began in 2004-05 season)



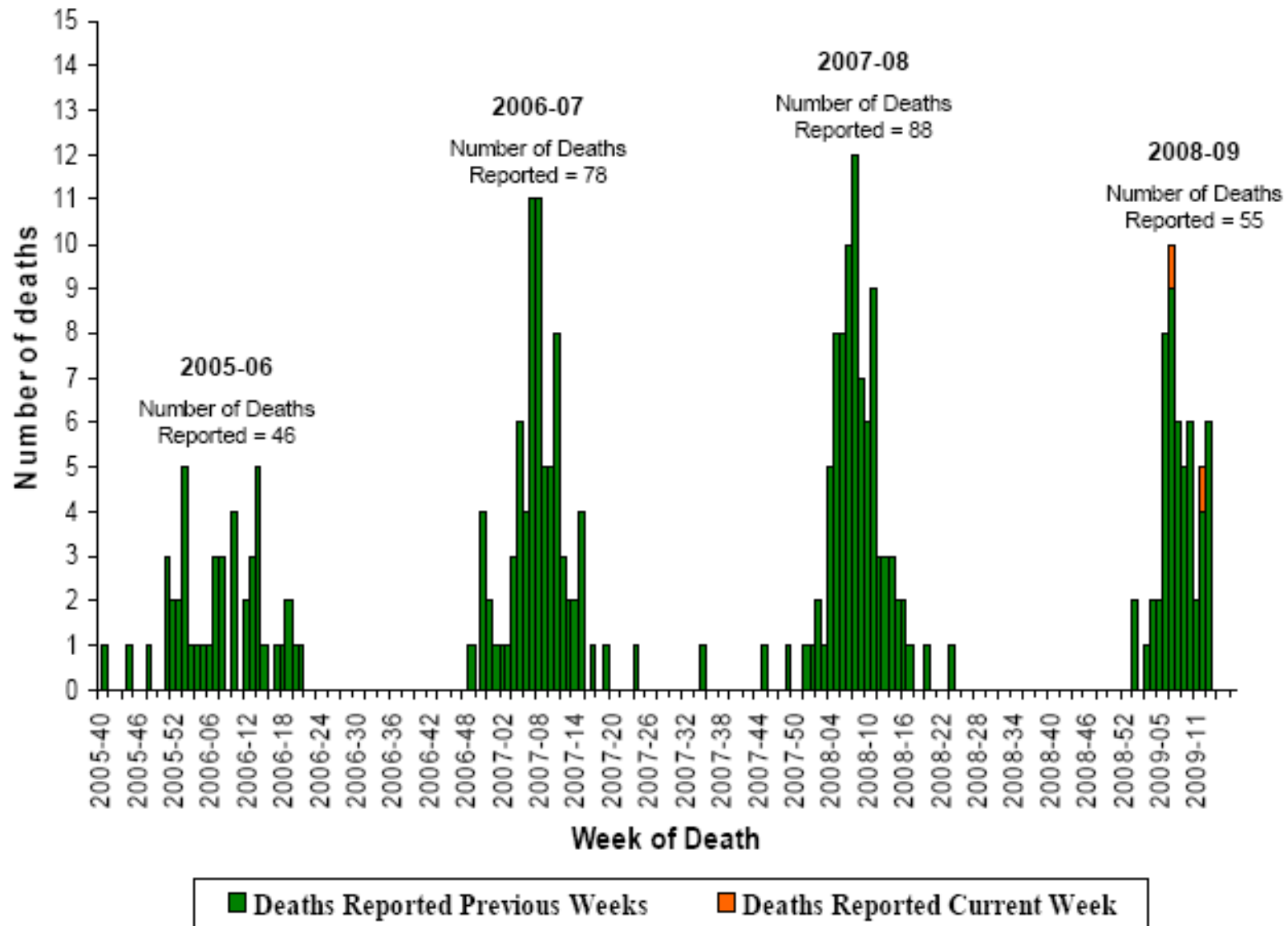
**NIS data*

Laboratory-Based Surveillance for Influenza: Philadelphia, 2008/2009 Season Compared to 3 Year Averages*

*Based on 6 hospital laboratories participating in surveillance across respiratory virus seasons

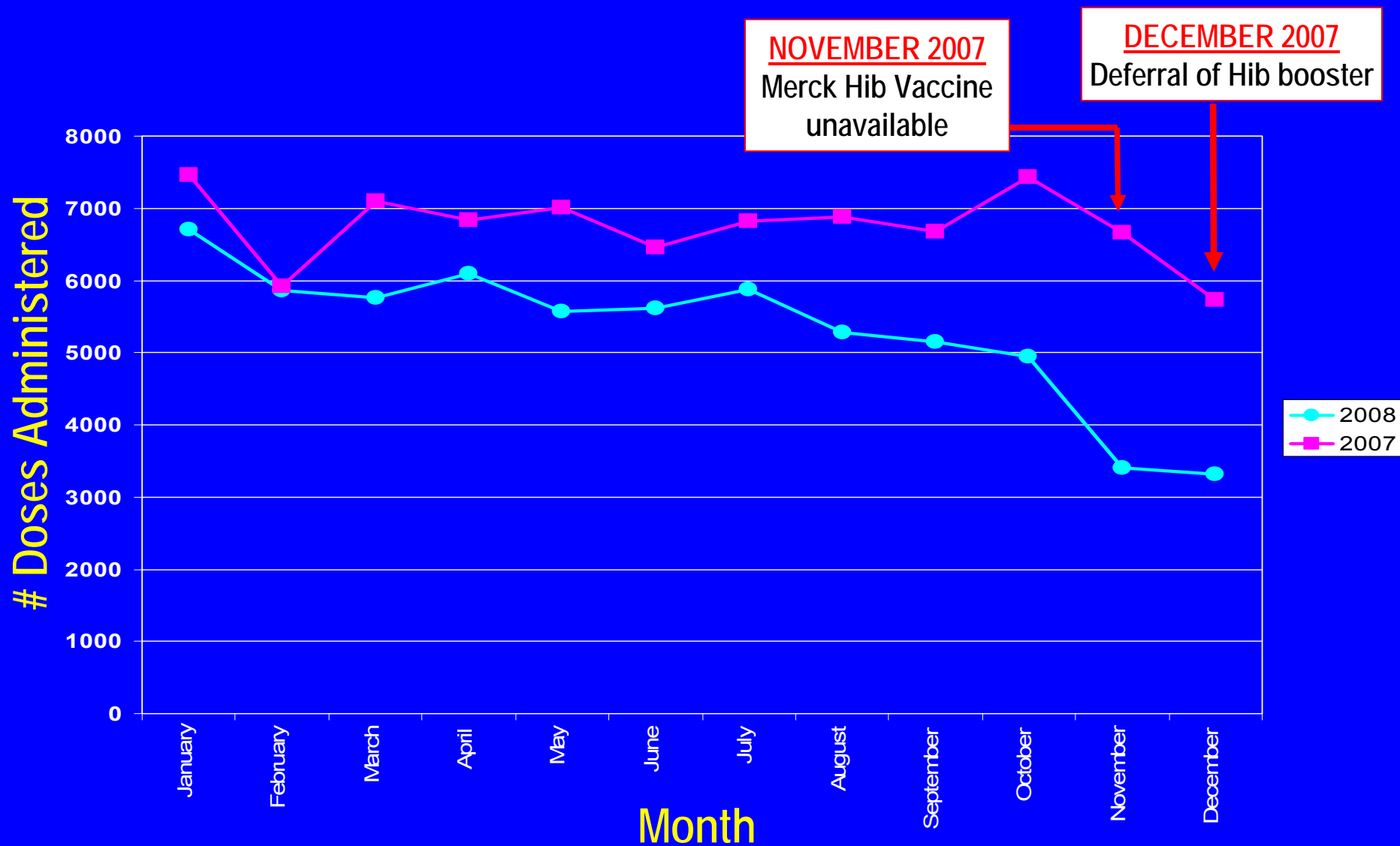


Number of Influenza-Associated Pediatric Deaths by Week of Death: 2005-06 season to present



Hib-Containing Vaccine

Doses Administered by Month: Phila (2007 vs. 2008)*



*KIDS Registry Data

Impact of Hib Vaccine Shortage in Philadelphia

- From October 2008 – April 2009, 8 cases of Hib occurred in SE Pennsylvania in children < 5 years of age
- 3 of the 8 children with invasive Hib died
- All 8 cases were unvaccinated and members of religious communities that oppose vaccination

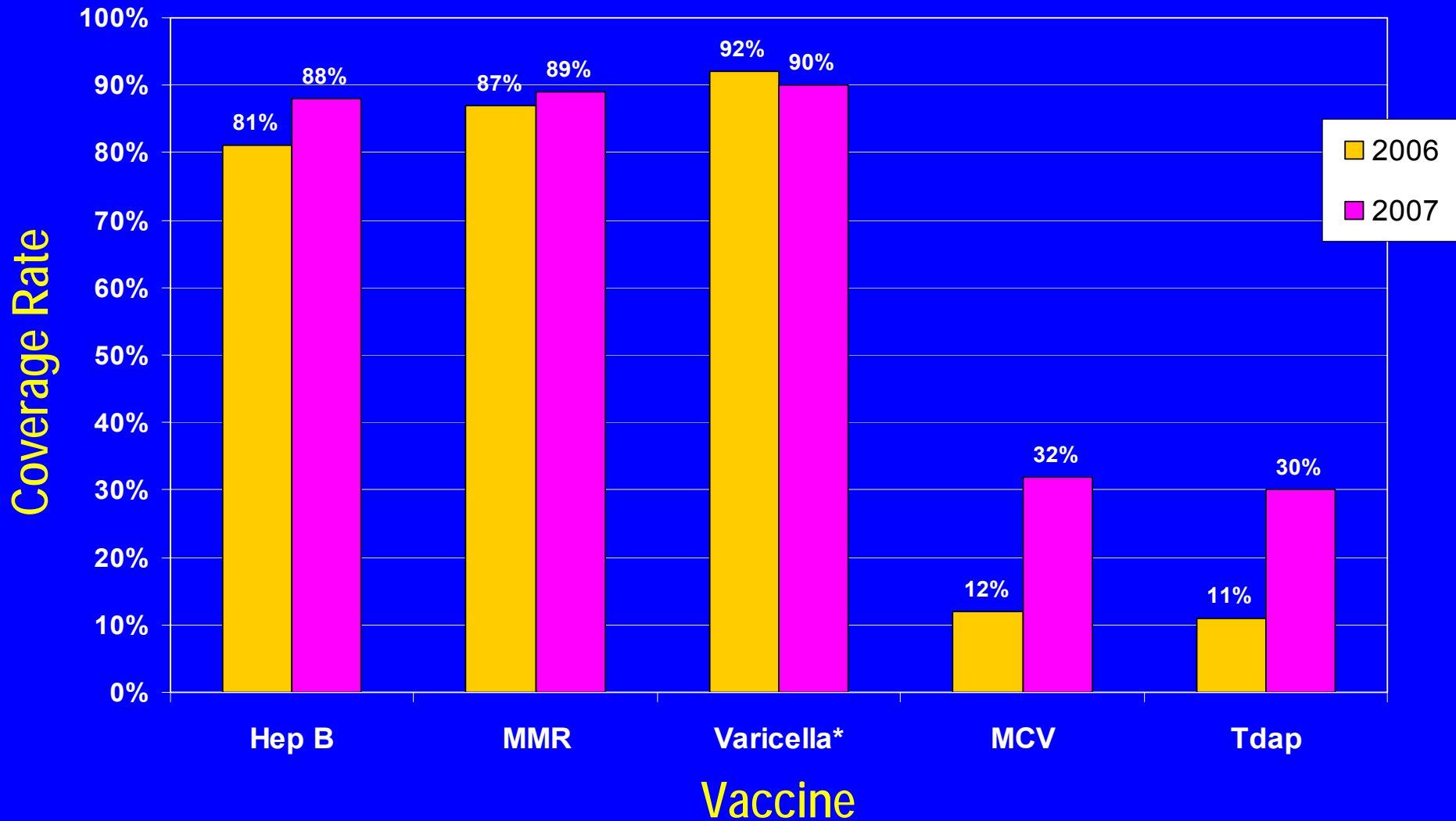
NIS-Teen 2007

- Conducted 4th Quarter, 2007
- Collected information for adolescents born between October 1, 1989 and December 31, 1994
- 5,474 household interviews conducted
 - 83.3% household response rate
- 2,947 teens (53.8% of those with completed household interviews) had adequate provider records to determine vaccination coverage

Vaccines Evaluated by NIS-Teen 2007

- “Catch-up” infant vaccines
 - Hepatitis B
 - MMR
 - Varicella (vaccine and disease)
- “New” vaccines
 - Tdap
 - MCV4
 - HPV

Vaccination Coverage Among Adolescents Aged 13-17 Years by Vaccine: U.S. (2006 vs 2007)[†]



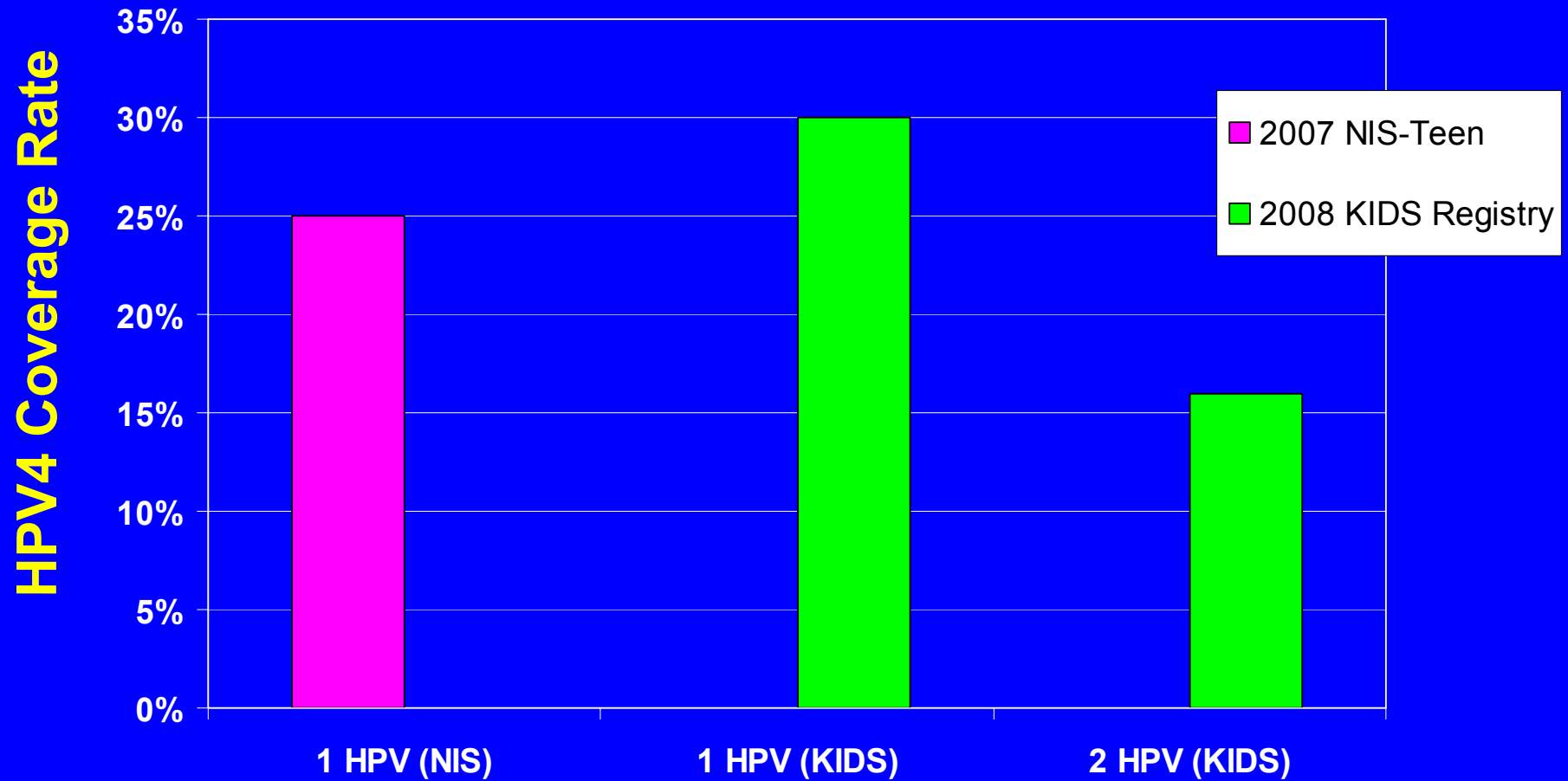
[†] NIS Teen Data

* Varicella vaccine OR history of disease

HPV4 Vaccination Coverage Rates

2007 NIS Teen (13-17 yrs)

vs. 2008 KIDS Registry (11-18 yrs)



Summary of NIS-Teen, 2007

- NIS-Teen is able to give national estimates of vaccination coverage using provider reported vaccination histories
- Vaccination coverage of adolescents
 - High for catch up infant vaccines (MMR (2), HepB (3), Varicella (1) dose)
 - Low for Tdap, MCV4, and HPV but climbing

Future Plans for NIS-Teen

The NIS-Teen is now an annual survey

2007

- 4th quarter only
- National estimates only

2008 and beyond

- All 4 quarters
- National and state-specific estimates
- NIS Teen will mirror the methodology and the scope of the NIS for 2 Year Olds
- Sample size will be increased to estimate state and local coverage, by race/ethnicity and SES

Challenges to Immunization Programs

- Health care delivery system for vaccines is growing increasingly fragmented.
- Shortages of many vaccines currently exist, complicating an already complex schedule
- Health care providers bear brunt of burden
- Providers must receive more reasonable reimbursement for vaccines, vaccine inventory and maintenance, vaccine administration, education and consultation time spent, etc.
- Adult vaccination infrastructure remains unfunded

Summary

- Philadelphia and the U.S. continue to hold high coverage rates for infant/childhood vaccines recommended for at least five years
- In Philadelphia, uptake of newly recommended vaccines for infants/children (Hep A, RV, 2nd Var) has been good per KIDS – Influenza vaccine is an exception
- Philadelphia and the U.S. show improving uptake rates for newly recommended pre-teen/adolescent vaccines (HPV, MCV, Tdap).
 - 2009-10 school requirements for Tdap and MCV will expedite uptake.
- Use of “cocooning” strategy of protecting high-risk infants by expanding vaccination programs for adults (pertussis), as well as protecting at-risk adults by expanding vaccination programs for children (PCV, flu, Hep A) will continue to grow as a focus of public health programs and resources

Thank you

Kate Cushman, PDPH

Brian Jorgage, PDPH

Bhavani Sathya, PDPH

Philadelphia Immunization Coalition

Questions?

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