

# Systems to Assess Influenza Vaccine Coverage

National Influenza Vaccine Summit  
April 20, 2007



Assessment Branch  
ISD/NCIRD/CDC



*The findings and conclusions in this presentation are those of the presenter and do not necessarily represent those of the CDC.*



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**What proportion of persons are vaccinated?**

**What groups are undervaccinated?**

**What are facilitators and barriers to vaccination?**



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# Assessment Platforms

- NIS - National Immunization Survey
- NHIS - National Health Interview Survey
- BRFSS - Behavioral Risk Factor Surveillance System
- Other
  - MDS, NNHS, Immunization Information Systems, schools, child care facilities, CASA/AFIX, HEDIS, Medicare claims, MCBS, NAMCHS, PRAMS, NHANES ...

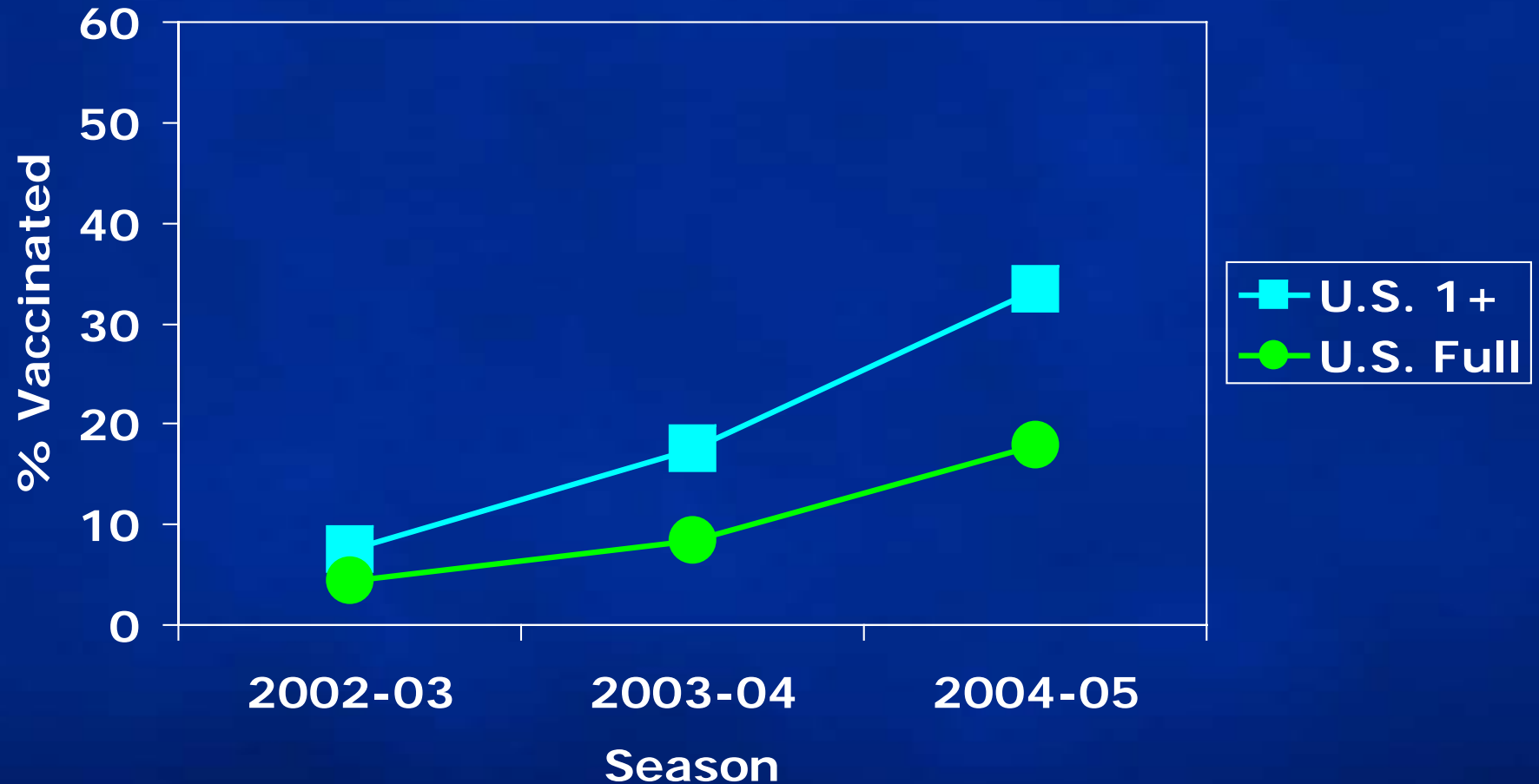


# NIS

- Telephone survey
  - Parents of children aged 19-35 mo
- Mailed survey of providers
  - Vaccinations and dates reported
- Estimates for 56+ areas
  - States, six grantee cities, other areas
- Measures *Healthy People 2010* objective 14.22h (developmental)



# Influenza Vaccine Coverage Children 6-23 Months, NIS

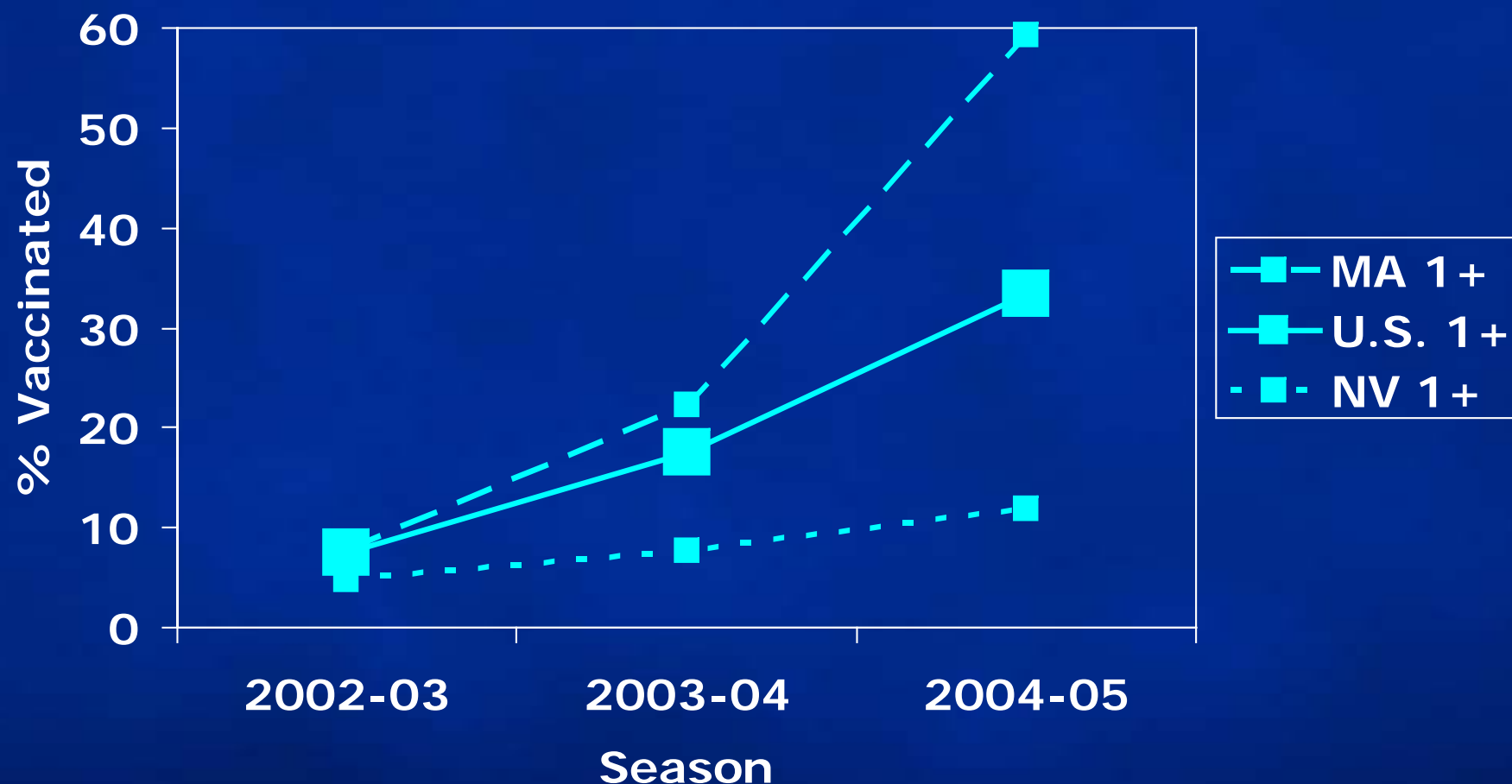


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# Influenza Vaccine Coverage Children aged 6-23 Months, NIS

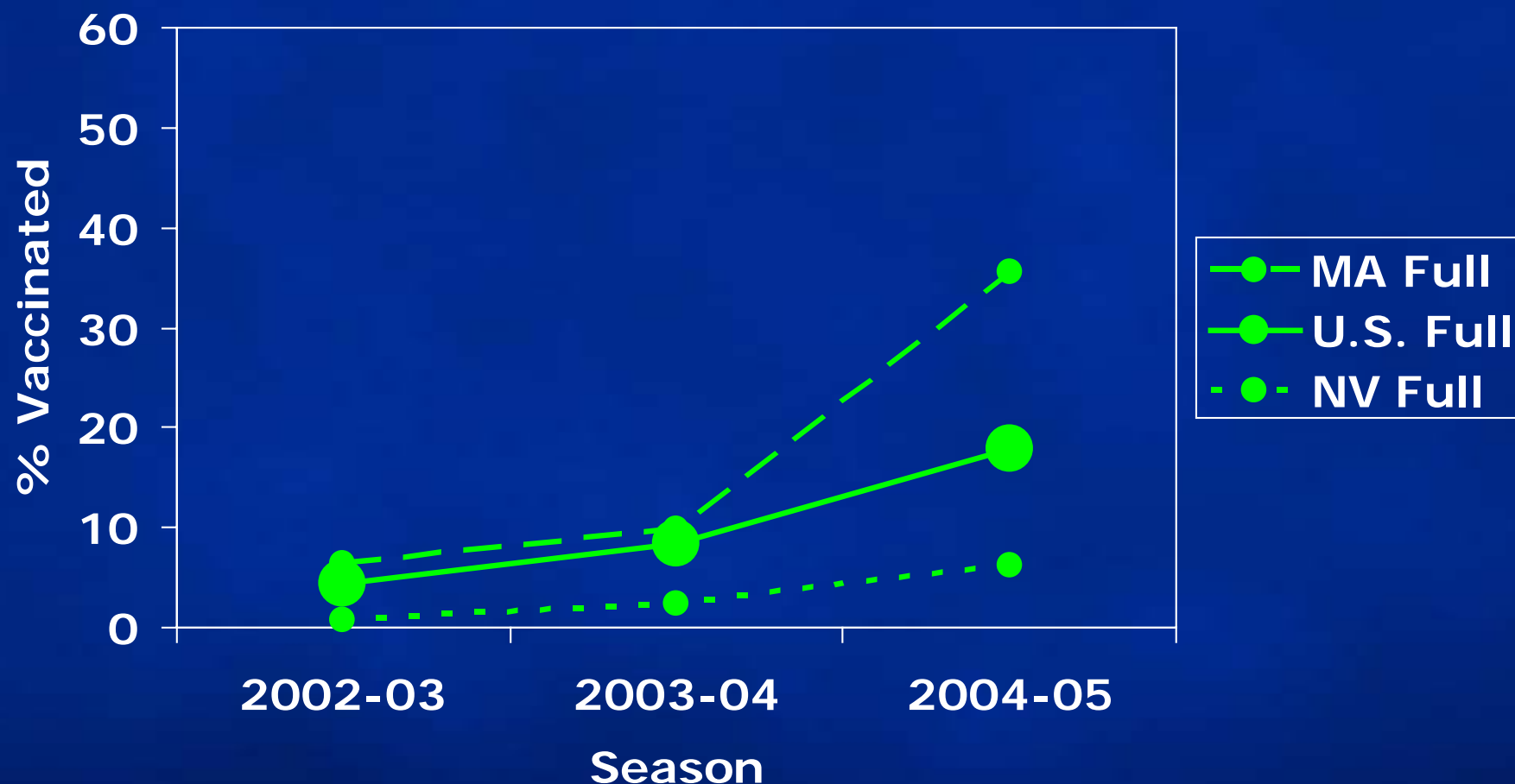


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# Influenza Vaccine Coverage Children aged 6-23 Months, NIS



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# NIS-Teen

- Conducted 4<sup>th</sup> Quarter 2006
- Use NIS sample frame
- National sample of 13-17 year olds
- Provider record check
  - Influenza vaccinations past three seasons
- Asthma status
- Repeat annually





# NHIS

- Household face-to-face interviews of U.S. civilian noninstitutionalized population
- Health interviews per family:
  - 1 sample adult (age = 18 years)
  - 1 sample child (age <18 years)
- All responses are self-reported only
- National level estimates
- Measures *Healthy People 2010* objectives 14.29 (adults)





**Immunization and  
Infectious Diseases**

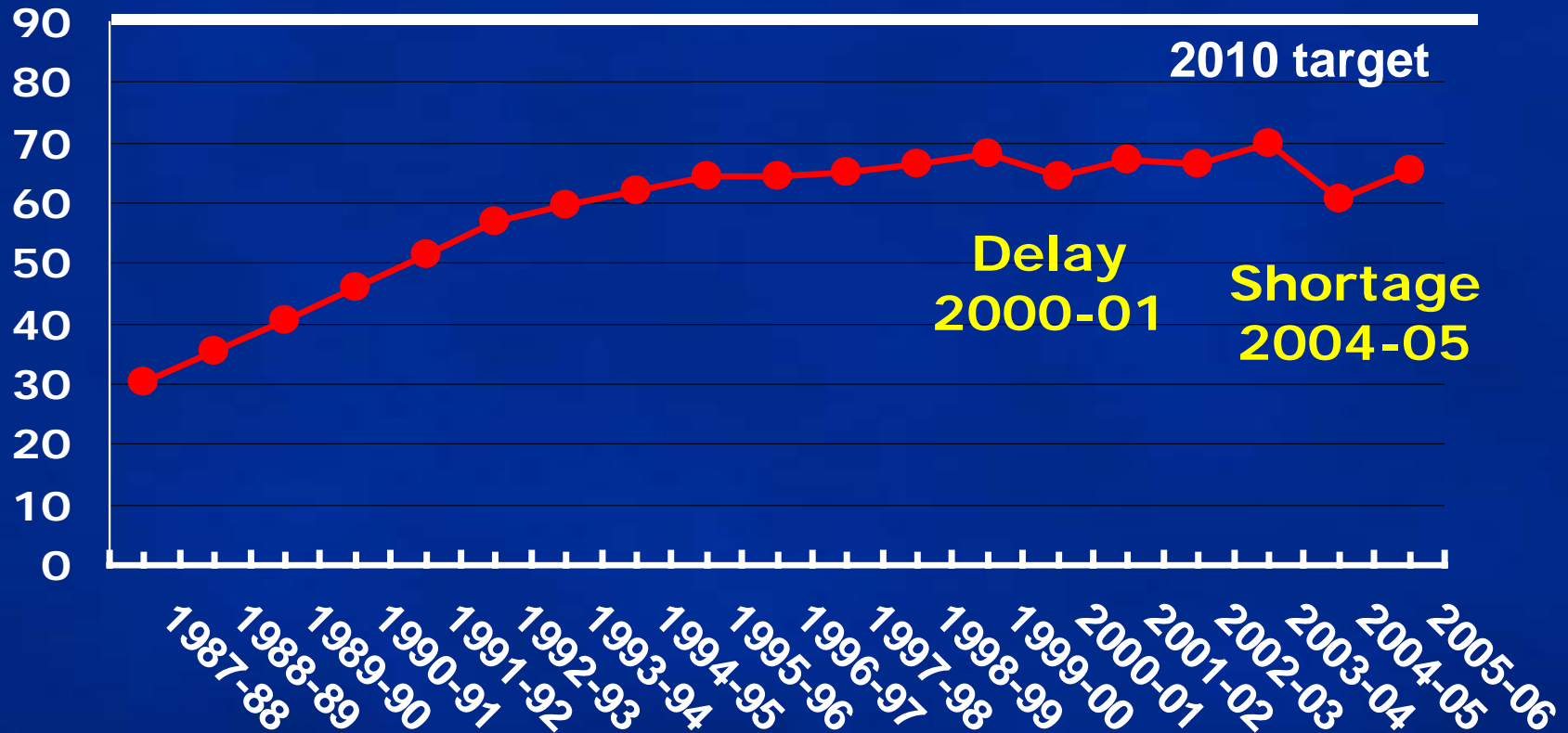
**14**

<b>Objective 14.29 Annual Influenza Vaccination, Adults</b>	<b>2004-05 Season, NHIS</b>	<b>2010 Target</b>
<b>a. Noninstitutionalized adults aged = 65 years</b>	<b>58%</b>	<b>90%</b>
<b>c. Noninstitutionalized high-risk adults 18-64 years</b>	<b>23%</b>	<b>60%</b>
<b>g. Health care workers aged 18-64 years</b>	<b>31%</b>	<b>60%</b>



# 14.29a. Influenza Vaccination Coverage by Season, Adults ; 65 Years

Percent



Note: Seasonal coverage is estimated as the percent reporting influenza vaccination in the past 12 months, among those interviewed during January-June. Source: National Health Interview Survey (NHIS), CDC, NCHS.



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**TABLE 3. Influenza vaccination coverage levels among adult target\* population groups — National Health Interview Survey (NHIS), United States, 2004**

Population group	Crude sample size	Weighted sample size	Influenza vaccination level	
			%	(95% CI†)
All aged 18–49 yrs	18,039	130,493,300	17.9	(17.2–18.6)
All aged 50–64 yrs	6,933	47,757,000	35.9	(34.5–37.3)
All aged ≥65 yrs	5,922	34,019,100	64.6	(63.2–66.0)
Persons with high-risk conditions‡				
Aged 18–49 yrs	2,555	17,599,700	26.0	(23.9–28.1)
Aged 50–64 yrs	2,104	14,126,700	45.5	(43.0–48.0)
Aged 18–64 yrs	4,659	31,726,500	34.6	(33.0–36.4)
Persons without high-risk conditions§				
Aged 18–49 yrs	15,442	112,574,500	16.6	(15.9–17.3)
Aged 50–64 yrs	4,807	33,498,900	32.1	(30.5–33.7)
Pregnant women¶	263	1,967,400	12.9	(7.9–17.9)
Health-care workers**	2,031	14,376,900	41.9	(39.4–44.4)
Household contacts of persons at high risk, including children aged <2 yrs††				
Aged 18–49 yrs	2,365	19,212,100	15.4	(13.8–17.2)
Aged 50–64 yrs	480	4,202,500	33.2	(28.8–37.8)

\* As recommended by the Advisory Committee on Immunization Practices.

† Confidence interval.

‡ Persons categorized as being at high risk for influenza-related complications self-reported one or more of the following: 1) ever being told by a physician they had diabetes, emphysema, coronary heart disease, angina, heart attack, or other heart condition; 2) having a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer) or ever being told by a physician they have lymphoma, leukemia, or blood cancer during the previous 12 months; 3) being told by a physician they have chronic bronchitis or weak or failing kidneys; or 4) reporting an asthma episode or attack during the preceding 12 months.

¶ Aged 18–44 years, pregnant at the time of the survey, and without high-risk conditions.

\*\* Adults were classified as health-care workers if they were currently employed in a health-care occupation or in a health-care–industry setting, on the basis of standard occupation and industry categories recorded in groups by CDC's National Center for Health Statistics.

†† Interviewed adult in each household containing at least one of the following: a child aged <2 years, an adult aged ≥65 years, or any person aged 2–17 years at high risk (see previous § footnote). To obtain information on household composition and high-risk status of household members, the sampled adult, child, and person files from NHIS were merged. Interviewed adults who were health-care workers or who had high-risk conditions were excluded. Information could not be assessed regarding high-risk status of other adults aged 18–64 years in the household, thus, certain adults 18–64 years who live with an adult aged 18–64 years at high risk were not included in the analysis.

**CDC. Prevention and Control of Influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2006;55(RR-10)**



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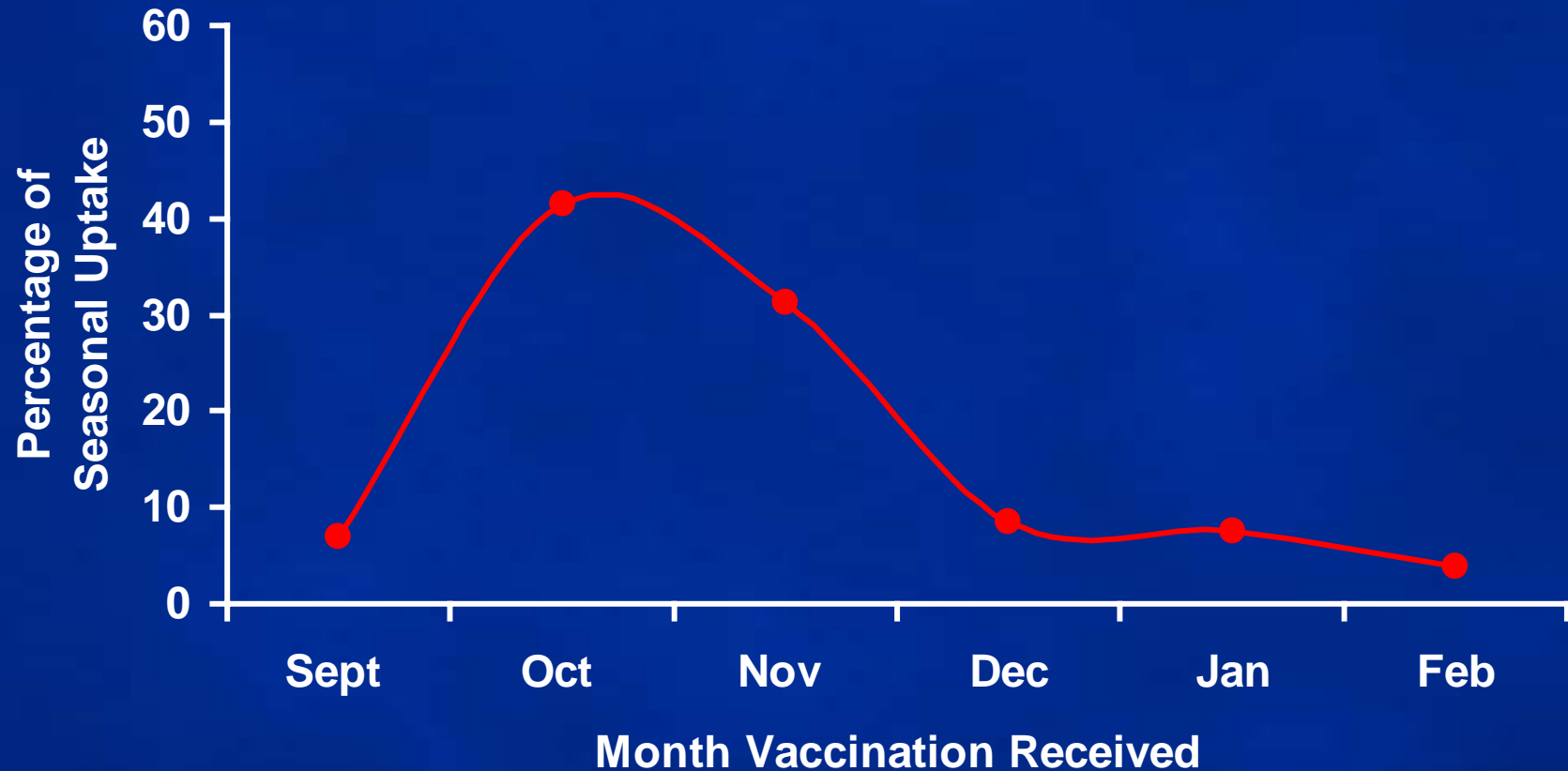
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# NHIS Enhancements

- Report estimates by season
- Monitor extended season vaccination
  - Month/year of most recent influenza vaccination added in 2005
- Report estimates for children
  - Influenza vaccination receipt questions added for sample child in 2005
    - Influenza vaccination coverage among children with asthma, United States, 2004-05 season. MMWR 2007;56
- NCHS providing preliminary estimates for 2005-06 season for ACIP recs.



# Monthly Distribution of Seasonal Influenza Vaccination Uptake, 2004-05



National Health Interview Survey (NHIS) 2005



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# BRFSS

- CDC-directed, state-based annual telephone survey of one randomly selected adult per household
- Provides state level estimates for adults
- Influenza vaccination question asked in all states annually
  - Estimate by season & monitor extended season vaccination, 2008+
- Indications include asthma, diabetes, heart disease, currently pregnant



# BRFSS

- **CDC supports optional modules**
  - Type of place where vaccinated
  - Influenza High-risk conditions (2008)
  - Health-care worker status (2008)
- **Used for rapid assessment of influenza vaccination Nov 2004 – Feb 2005**
  - Included asking parents about their children
- **Estimates available for adults = 65 for selected counties and metropolitan and micropolitan statistical areas - MMWR 2005;54(SS-6)**





# Institutionalized Population Long Term Care or Nursing Homes

- **Healthy People 2010 objective 14.29 e**
  - Measured by National Nursing Home Survey (NNHS), 1995, 1997, 1999, 2004
  - 66% vaccinated, 1999 (90% target)
- **Influenza vaccination included on 2004 National Nursing Assistant Survey**
  - Supplement to 2004 NNHS
- **Nursing Home Compare**
  - Influenza vaccination from MDS from Medicare & Medicaid certified nursing homes



# Other National Surveys 2006-07 Influenza Season

- **NIS-Adult Survey May-July 2007**
  - National samples by age & race/ethnicity
    - (18-49, 50-64, = 65 years) x (white NH, black NH, Hispanic)
  - KAB questions on influenza vaccination
- **National Survey of Children's Health, 2007**
  - Conducted by NCHS, sponsored by HRSA
  - Seasonal influenza vaccination estimates by age and high-risk status
  - N=26,000 children age <18 years, April-June
    - ~500 children per state



# Influenza Assessment Challenges (1)

- Current systems provide seasonal estimates 14-19 months after end of season
- NHIS can track coverage for children aged 3-17 years, but how valid is parental report of child's influenza vaccination?
- No estimates for out-of-home caregivers of young children



# Influenza Assessment Challenges (2)

- Household contacts of high-risk
  - Limited data - NHIS does not ascertain high-risk status of all household members
- NHIS ascertainment of health care workers and pregnancy not specific
- State-specific data only for 6-35 month olds (NIS) and adults (BRFSS)
- Limited data below state level
  - selected areas for NIS & BRFSS
  - selected well-developed IIS (registries)

