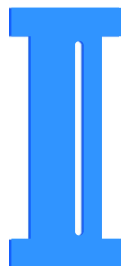


The current and future climate for immunizations: Victories and challenges

Alan R. Hinman, MD, MPH
Missouri Immunization Conference
November 18, 2010



Vaccines Routinely Recommended for Children and Adolescents



1985

Measles
Rubella
Mumps
Diphtheria
Tetanus
Pertussis
Polio

7

1995

Measles
Rubella
Mumps
Diphtheria
Tetanus
Pertussis
Polio
Hib (infant)
HepB
Varicella

10

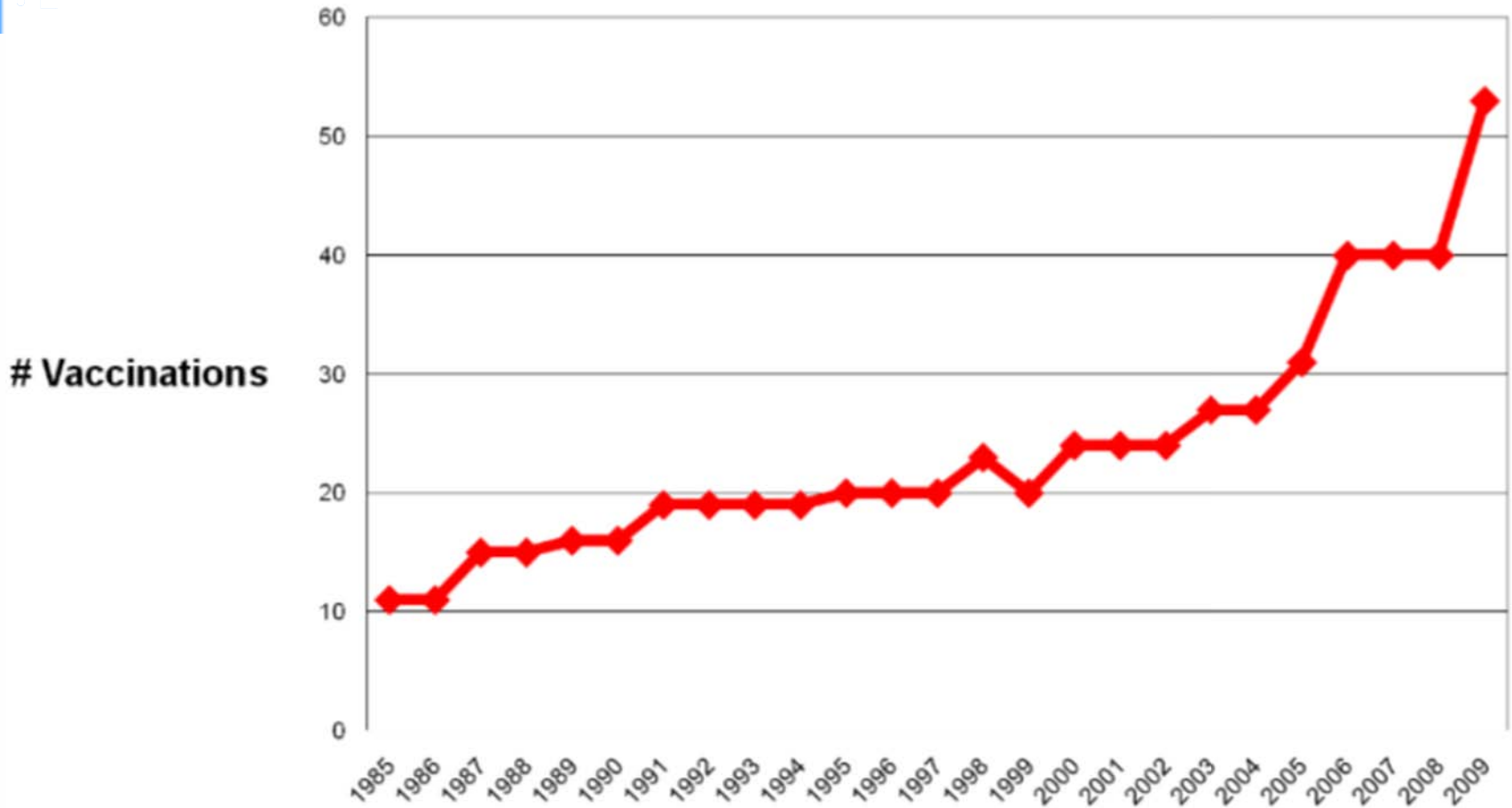
2009

Measles
Rubella
Mumps
Diphtheria
Tetanus
Pertussis
Polio
Hib (infant)
Hepatitis B
Varicella
Pneumococcal disease
Influenza
Meningococcal disease
Hepatitis A
Rotavirus
HPV

16



Number of Recommended Vaccinations Per Child, 1985-2009*



* Does not include recent combination vaccines

Recommended Immunization Schedule for Persons Aged 0 Through 6 Years—United States • 2010

For those who fall behind or start late, see the catch-up schedule

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B ¹	HepB	HepB	HepB			HepB						
Rotavirus ²			RV	RV	RV	RV ²						
Diphtheria, Tetanus, Pertussis ³			DTaP	DTaP	DTaP	^{see footnote³}	DTaP					DTaP
<i>Haemophilus influenzae</i> type b ⁴			Hib	Hib	Hib ⁴		Hib					
Pneumococcal ⁵			PCV	PCV	PCV		PCV				PPSV	
Inactivated Poliovirus ⁶			IPV	IPV			IPV					IPV
Influenza ⁷							Influenza (Yearly)					
Measles, Mumps, Rubella ⁸							MMR		<i>see footnote⁸</i>			MMR
Varicella ⁹							Varicella		<i>see footnote⁹</i>			Varicella
Hepatitis A ¹⁰							HepA (2 doses)				HepA Series	
Meningococcal ¹¹											MCV	

 Range of recommended ages for all children except certain high-risk groups

 Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 15, 2009. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events. Providers should consult the relevant Advisory

Committee on Immunization Practices statement for detailed recommendations: <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS) at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

Recommended Immunization Schedule for Persons Aged 7 Through 18 Years—United States • 2010

For those who fall behind or start late, see the schedule below and the catch-up schedule

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years
Tetanus, Diphtheria, Pertussis ¹			Tdap	Tdap
Human Papillomavirus ²	<i>see footnote 2</i>		HPV (3 doses)	HPV series
Meningococcal ³		MCV	MCV	MCV
Influenza ⁴		Influenza (Yearly)		
Pneumococcal ⁵		PPSV		
Hepatitis A ⁶		HepA Series		
Hepatitis B ⁷		Hep B Series		
Inactivated Poliovirus ⁸		IPV Series		
Measles, Mumps, Rubella ⁹		MMR Series		
Varicella ¹⁰		Varicella Series		

Range of recommended ages for all children except certain high-risk groups

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 15, 2009. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events. Providers should consult the relevant Advisory

Committee on Immunization Practices statement for detailed recommendations: <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS) at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

Recommended Adult Immunization Schedule


UNITED STATES - 2010


Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group

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

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

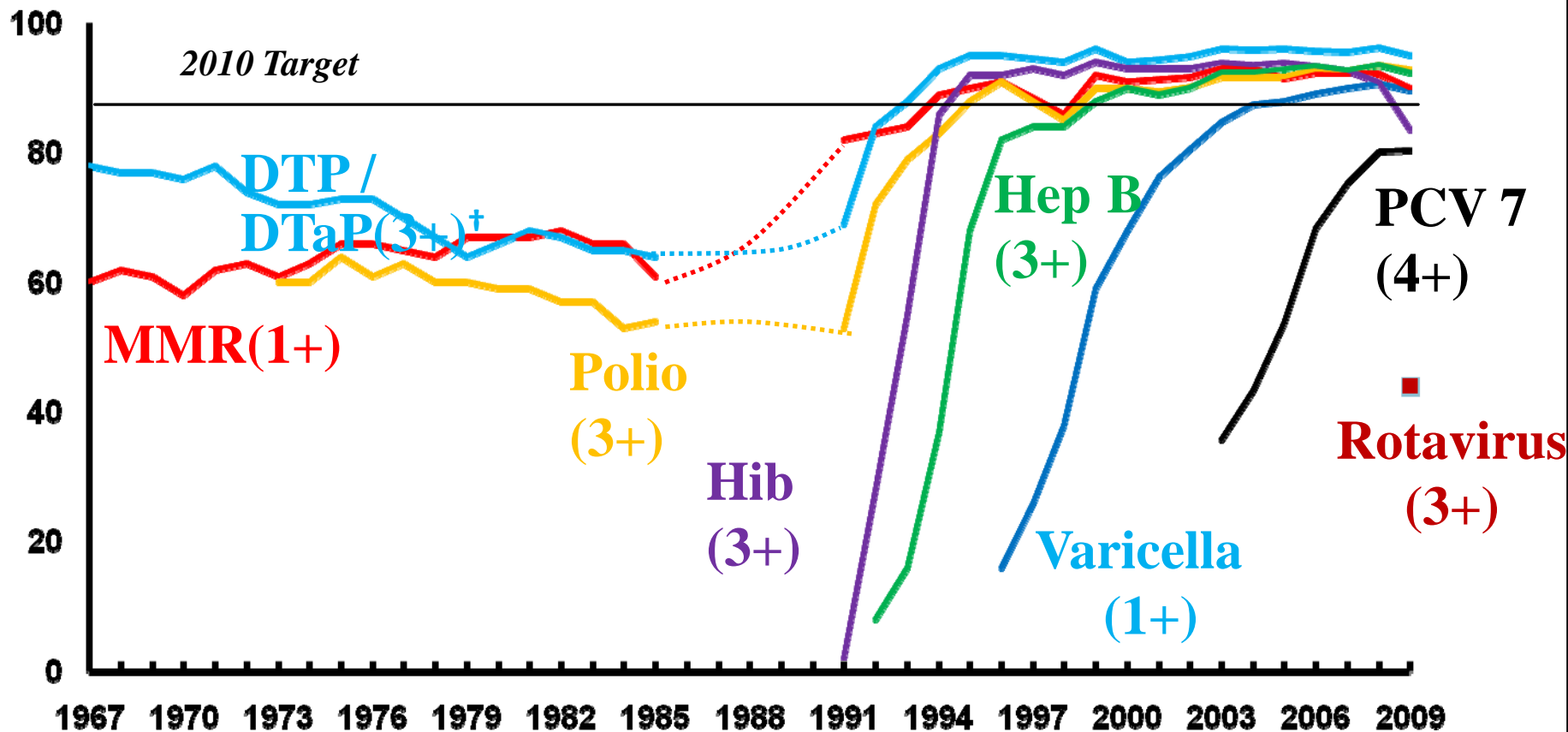
 No recommendation

Comparison of 20th century annual and current morbidity

<u>Disease</u>	<u>20th century*</u>	<u>2009**</u>	<u>% reduction</u>
Diphtheria	21,053	0	100
Hepatitis A	117,333	11,049 ⁺	91
Hepatitis B (acute)	66,232	11,269 ⁺	83
Hib <5	20,000	213 [#]	99
Measles	530,217	71	>99
Mumps	162,344	1,991	99
Pertussis	200,752	16,858	92
Pneumo (inv) all ages	63,607	44,000 ⁺	30
<5	16,069	4,167 ⁺	74
Poliomyelitis (para)	16,316	1	>99
Rotavirus (hosp)	62,500 ^o	7,550 ⁺	88
Rubella	47,745	3	>99
CRS	152	2	99
Smallpox	29,005	0	100
Tetanus	580	18	97
Varicella	4,085,120	449,363 ⁺	89

Increasing Vaccine-Specific Coverage Rates Among Preschool-Aged Children: 1967 - 2009

Percent

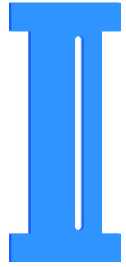


† DTP(3+) is not a Healthy People 2010 objective. DTaP(4) is used to assess Healthy People 2010 objectives.

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 (1994-2009), CDC, NIP and NCHS; No data from 1986-1990 due to cancellation of USIS because of budget reductions.

Vaccination coverage among children 19-35 months of age, 2009



<u>Vaccine</u>		<u>USA</u>	<u>MO</u>
DTP/DTaP	4+	83.9%	78.4%
Polio	3+	92.8%	87.5%
MMR	1+	90.0%	88.8%
Hib	3+	83.6%	79.6%
Hep B	3+	92.4%	89.4%
Varicella	1+	89.6%	87.8%
PCV	4+	80.4%	67.5%
Hep A	2+	46.6%	33.6%
Rota	2+	43.9%	46.9%

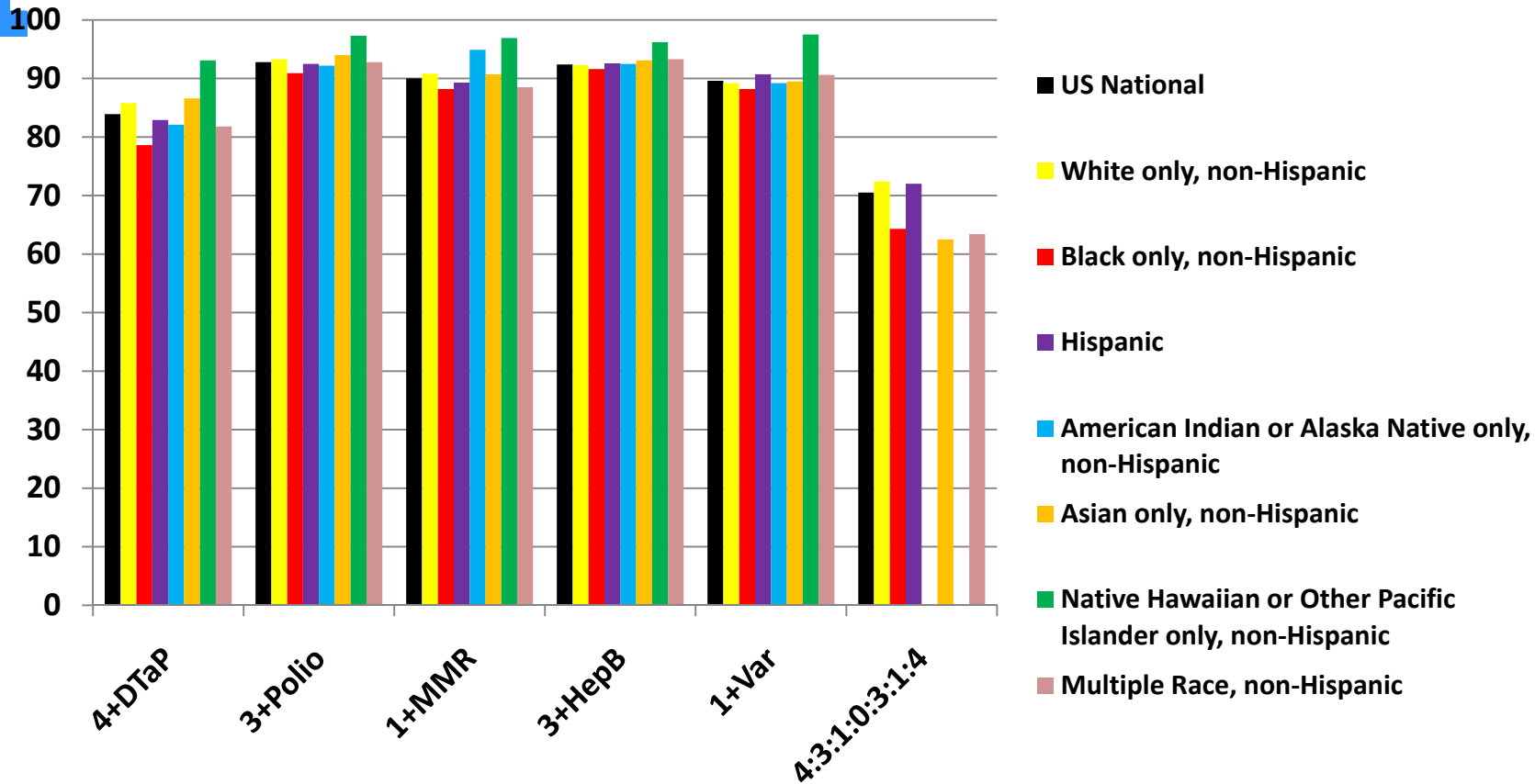


Vaccination coverage among adolescents aged 13-17 years, 2009

<u>Vaccine</u>	<u>USA</u>	<u>MO</u>
MMR 2+	89.1%	86.2%
Hep B 3+	89.9%	89.7%
Var 2+/Hx	75.7%	78.8%
Td/Tdap 1+	76.2%	74.7%
Tdap 1+	55.6%	60.1%
MCV4 1+	53.6%	45.5%
HPV 1+ (F)	44.3%	32.7%
HPV 3+ (F)	26.7%	19.9%

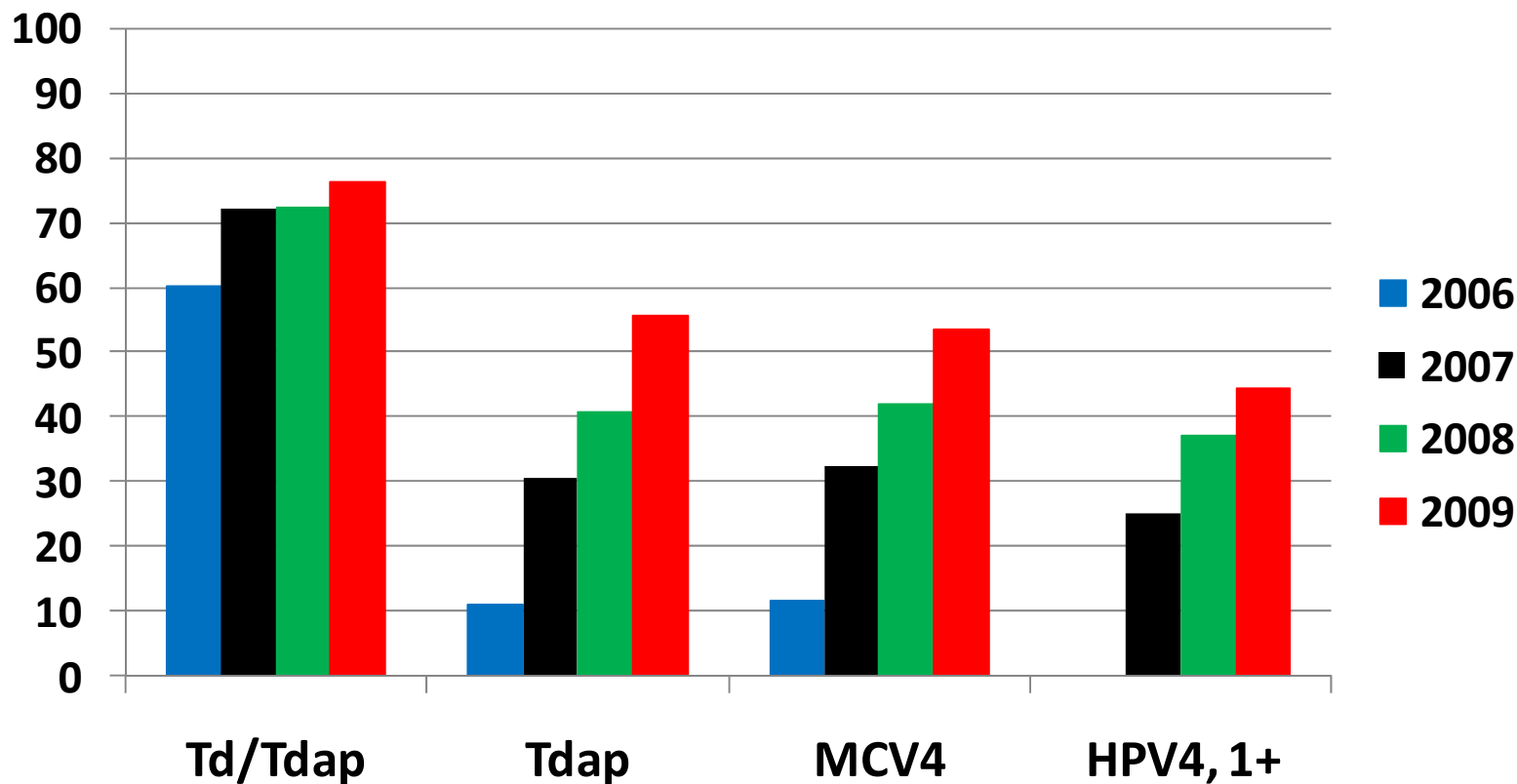


Vaccination Coverage Levels by Race and Ethnicity: NIS 2009



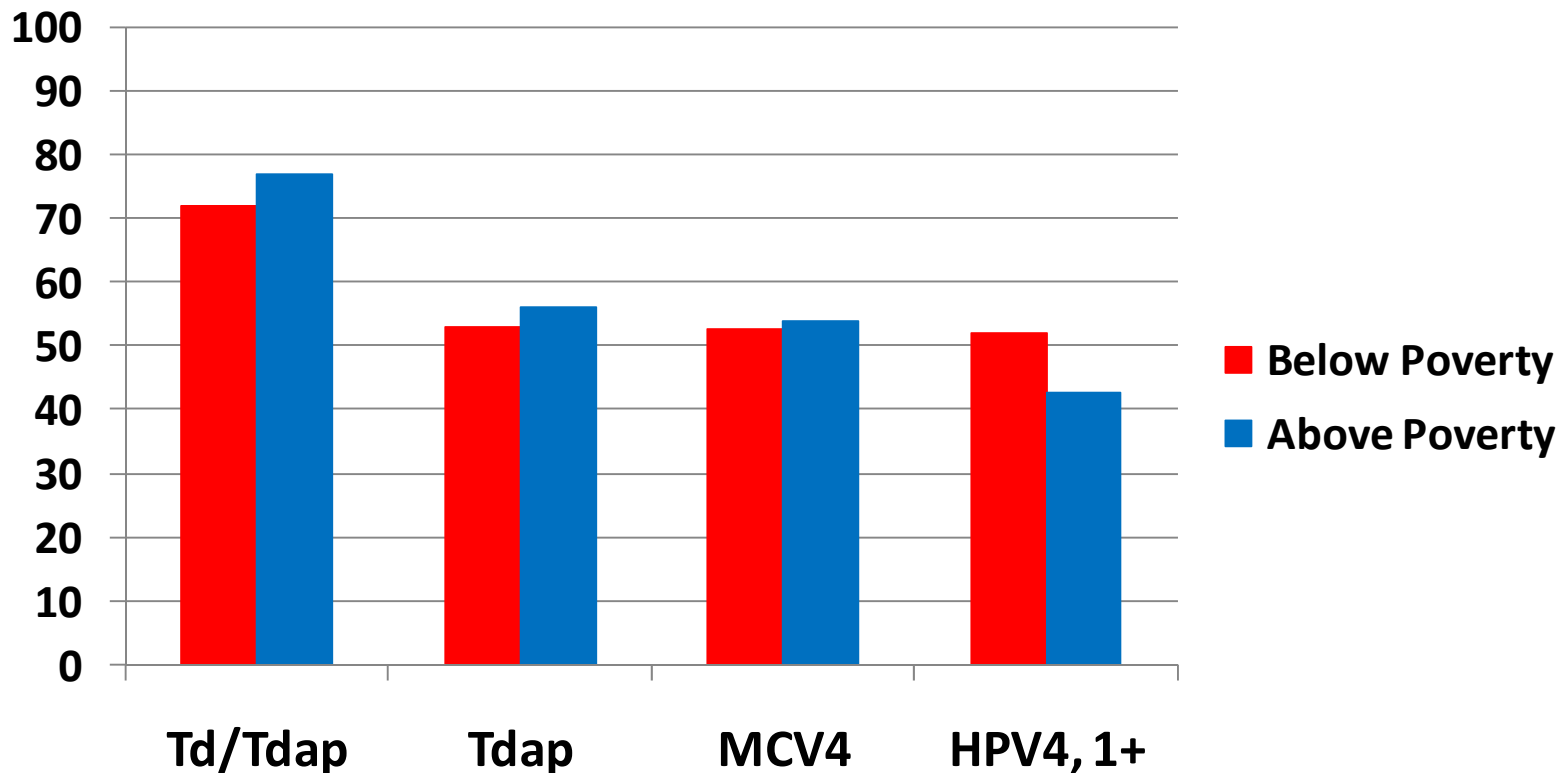


Adolescent Immunization, U.S., 2006 - 2009





Adolescent Immunization by Poverty, U.S., 2009

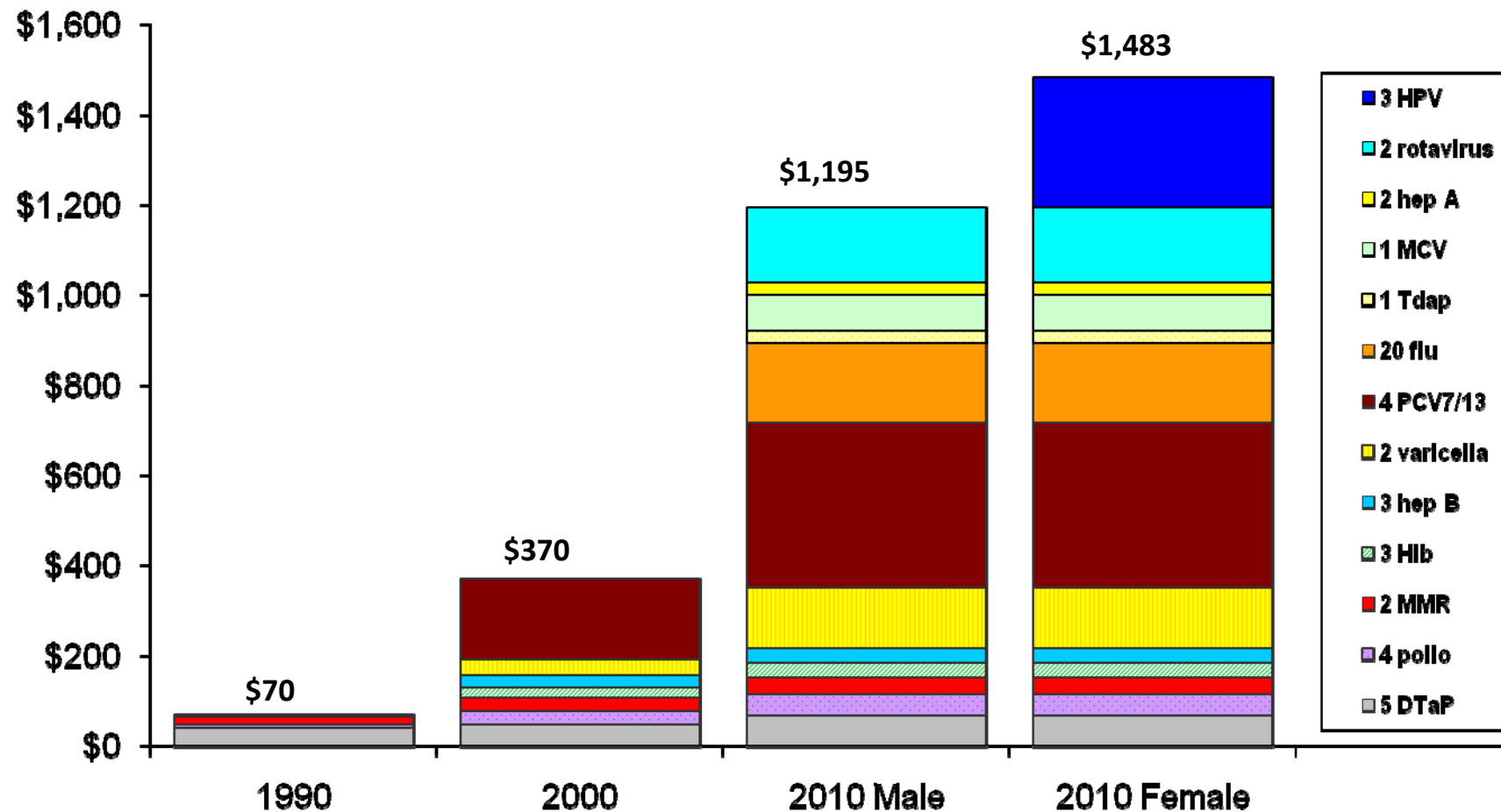




Types of costs in immunization

- **Vaccine purchase**
- **Vaccine administration**
- **Non-vaccine costs**

● Cost to Vaccinate from Birth Through 18 Years of Age with Vaccines Recommended Universally: 1990, 2000, and 2010



2010 represents minimum cost to vaccinate a child (birth through 18); exception is no preservative influenza vaccine, which is included for children 6-47 months of age.

HPV excluded for boys because it is not routinely recommended by the ACIP. *Public Health INFORMATICS Institute*

Federal contract prices as of February 1, 1990, September 27, 2000, and April 6, 2010.



Sources of financing childhood immunizations

- **Government**
 - **Federal**
 - **State/local**
- **Insurance**
 - **Private**
 - **Public**
- **Out-of-pocket**

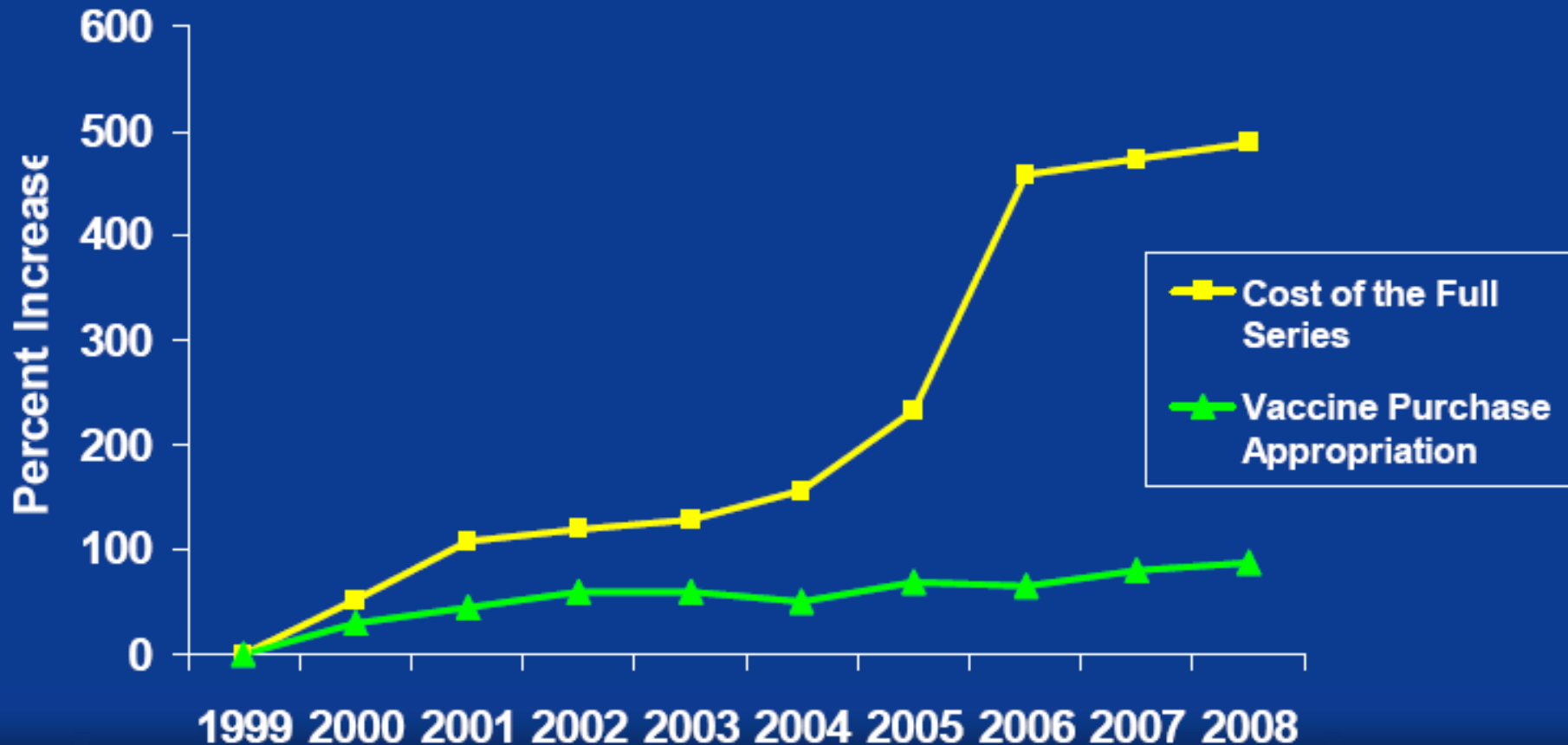


317 Immunization Program

317 grants support:

- **Purchase of vaccine for free administration at local health departments**
- **Immunization delivery**
- **Surveillance**
- **Communication**
- **Education**

Percent Increase of the Cost of Full Series vs. Percent Increase of Appropriation



Percentage Calculations: % increases are cumulative using 1999 as the base year.

Beginning 2006 series costs are an average of the cost to vaccinate a male and a female. Estimates are based on inflationary increases and this figure reflects April 1, 2007 federal contract prices.



Vaccines for Children Act

- **Provides entitlement to free vaccines specified by ACIP for**
 - **Uninsured**
 - **Medicaid**
 - **American Indian/Alaska Native**
 - **Underinsured (FQHC only)**
- **Allows States to buy off Federal Contract with their own funds**

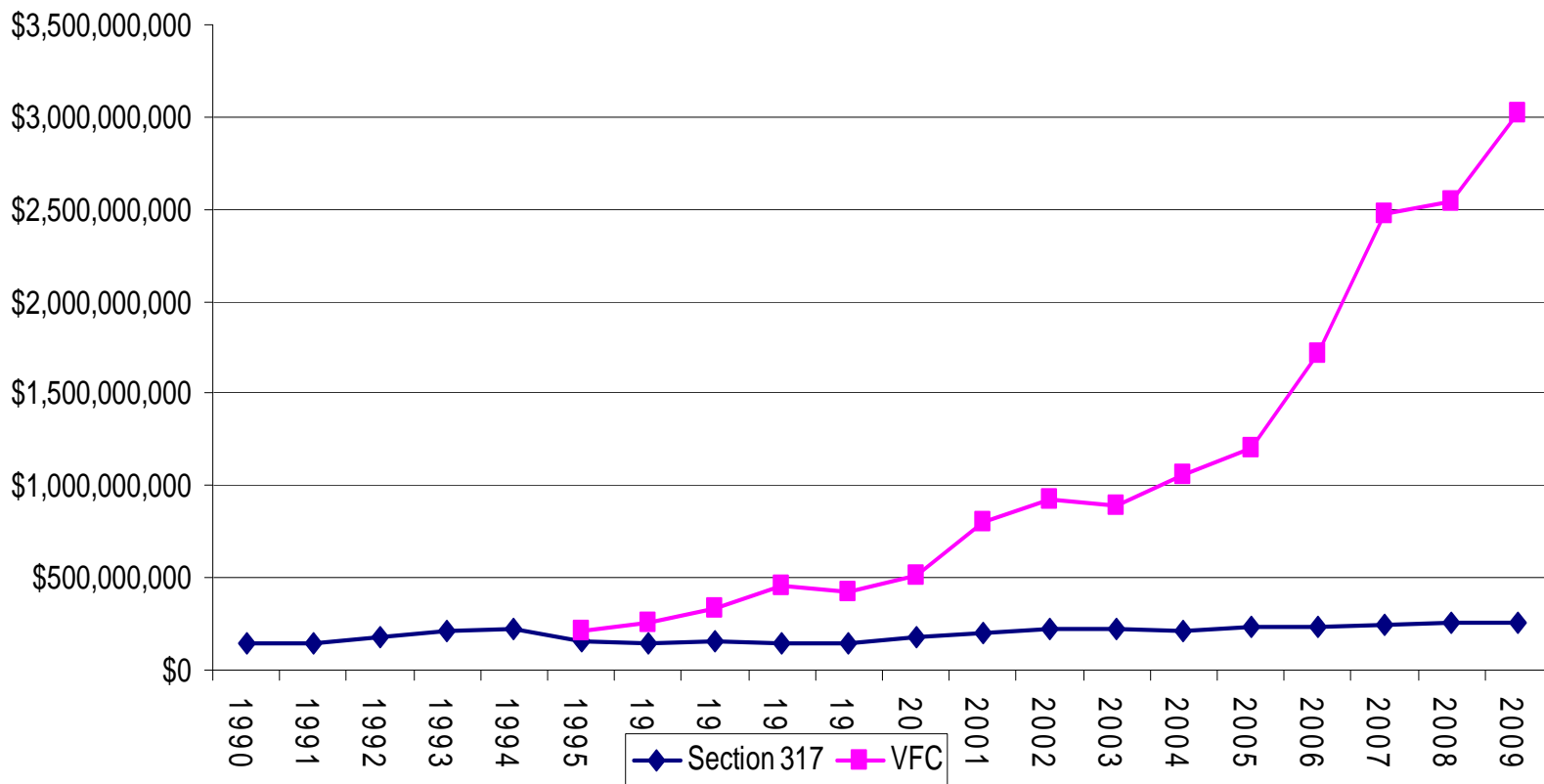


How Public Health Reaches Children through VFC

- **VFC program has 45,000 provider sites**
 - 75% of sites are private providers
 - 25% are public sector sites
- **Collectively, VFC providers vaccinate 90% of children**
 - VFC vaccine for VFC-eligible children
 - Private purchase vaccine for other children
- **Improving VFC providers' practices improves vaccinations for almost all children**

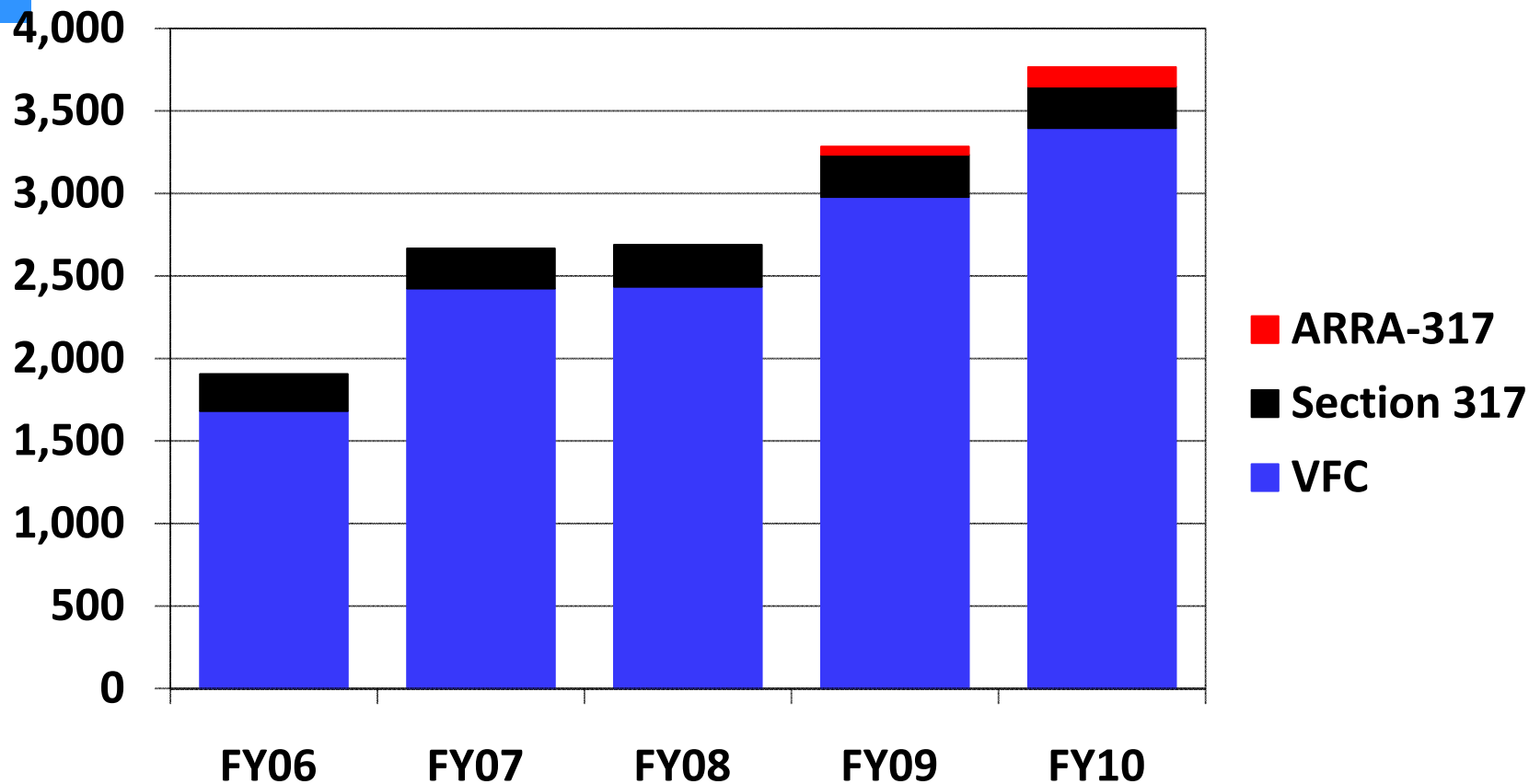


VFC and Section 317 Vaccine Funding to Immunization Programs: 1990 - 2009



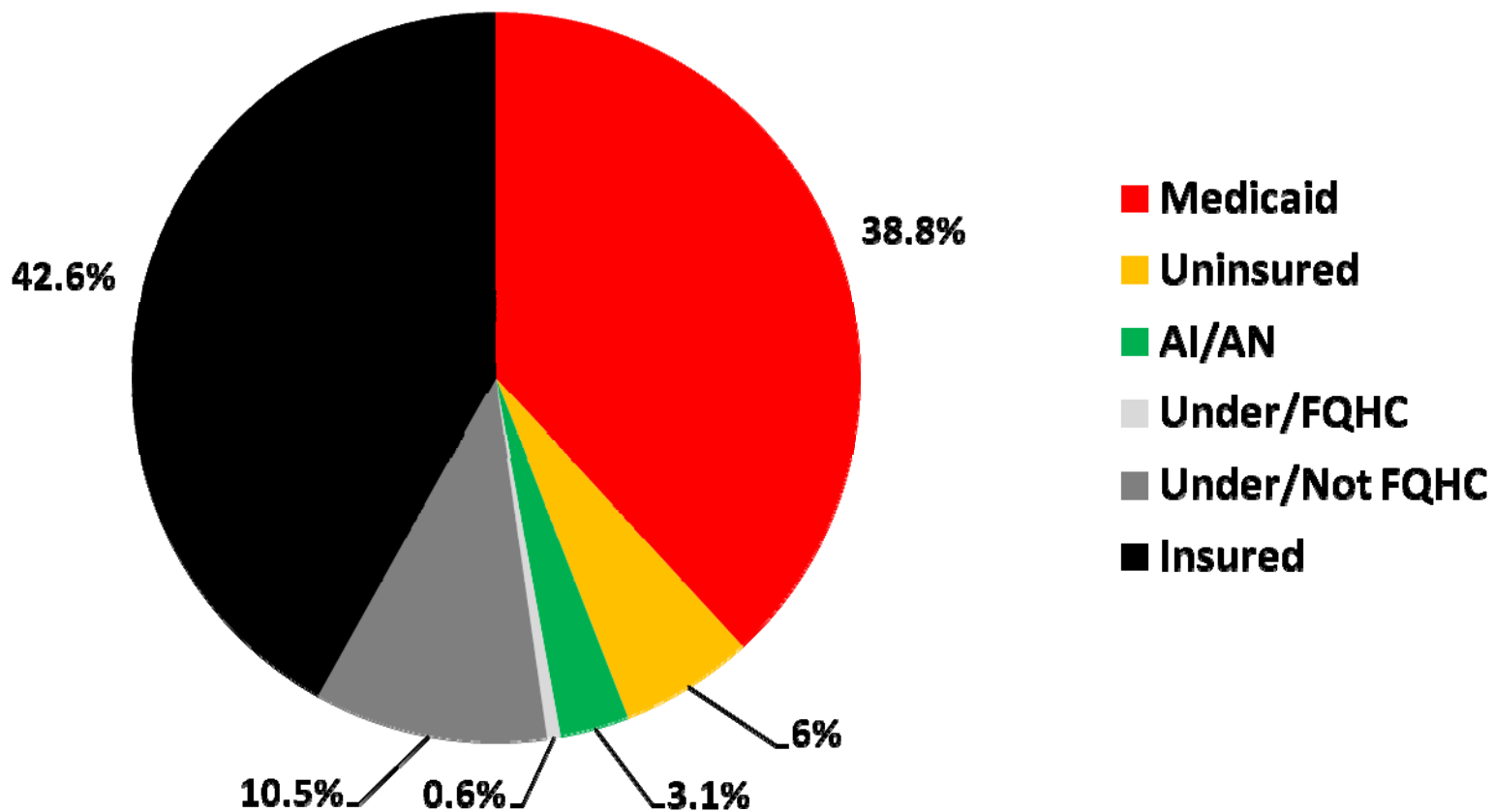


Vaccine Funding; VFC, Section 317, ARRA-317: 2006-2010



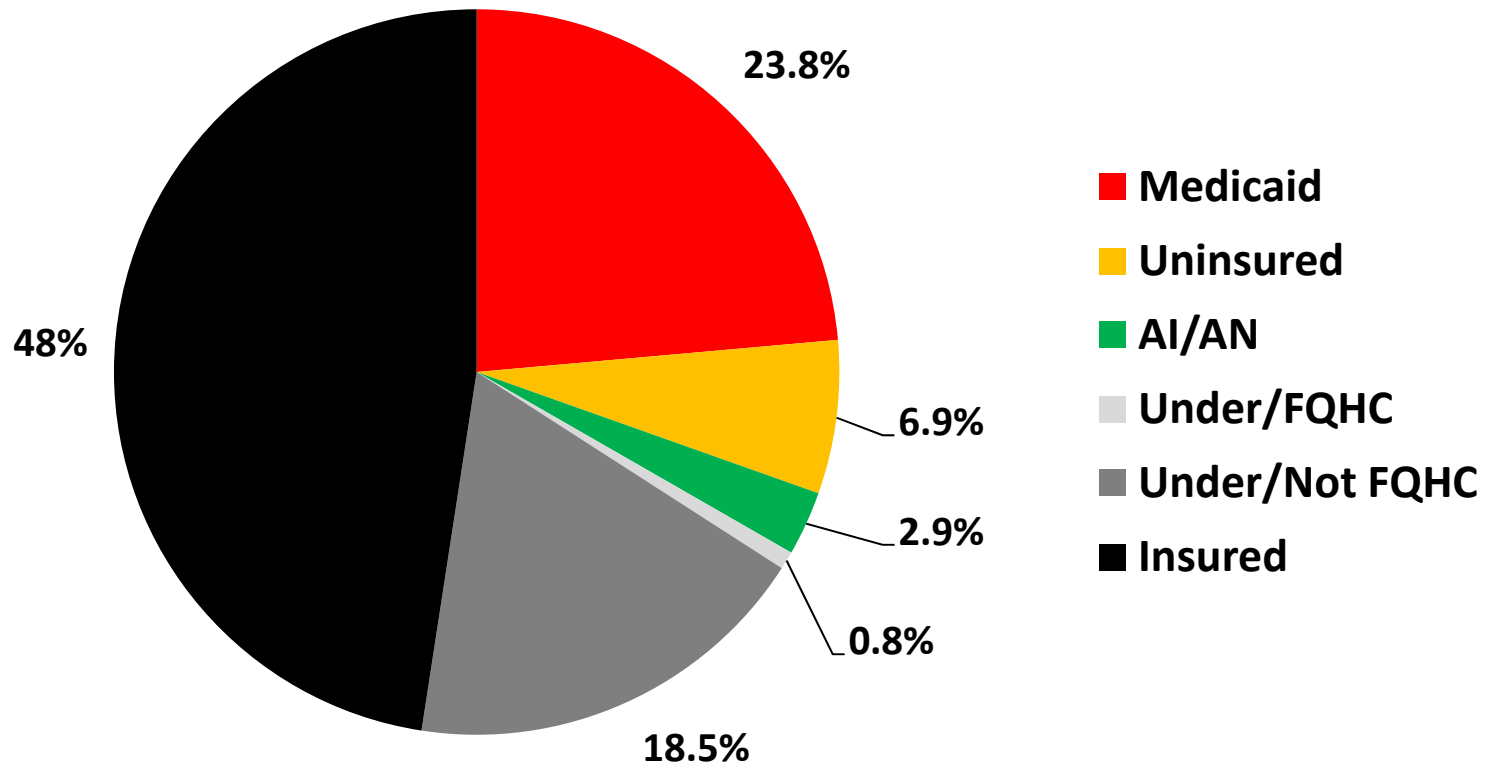


Insurance/VFC Status 19-35 Month Old Children; 2008 NIS Insurance Module





Insurance/VFC Status 13-17 Year Olds; 2008 NIS-Teen Insurance Module





Annual Premiums for Routine Vaccines as a Percent of Total Premiums

	2009 Premiums for Routine Vaccination	2009 Premiums for Large Plans	% of Premiums Due to Vaccines
Family Coverage	\$107	\$13,280	0.8%
Single Coverage	\$8	\$4,940	0.2%

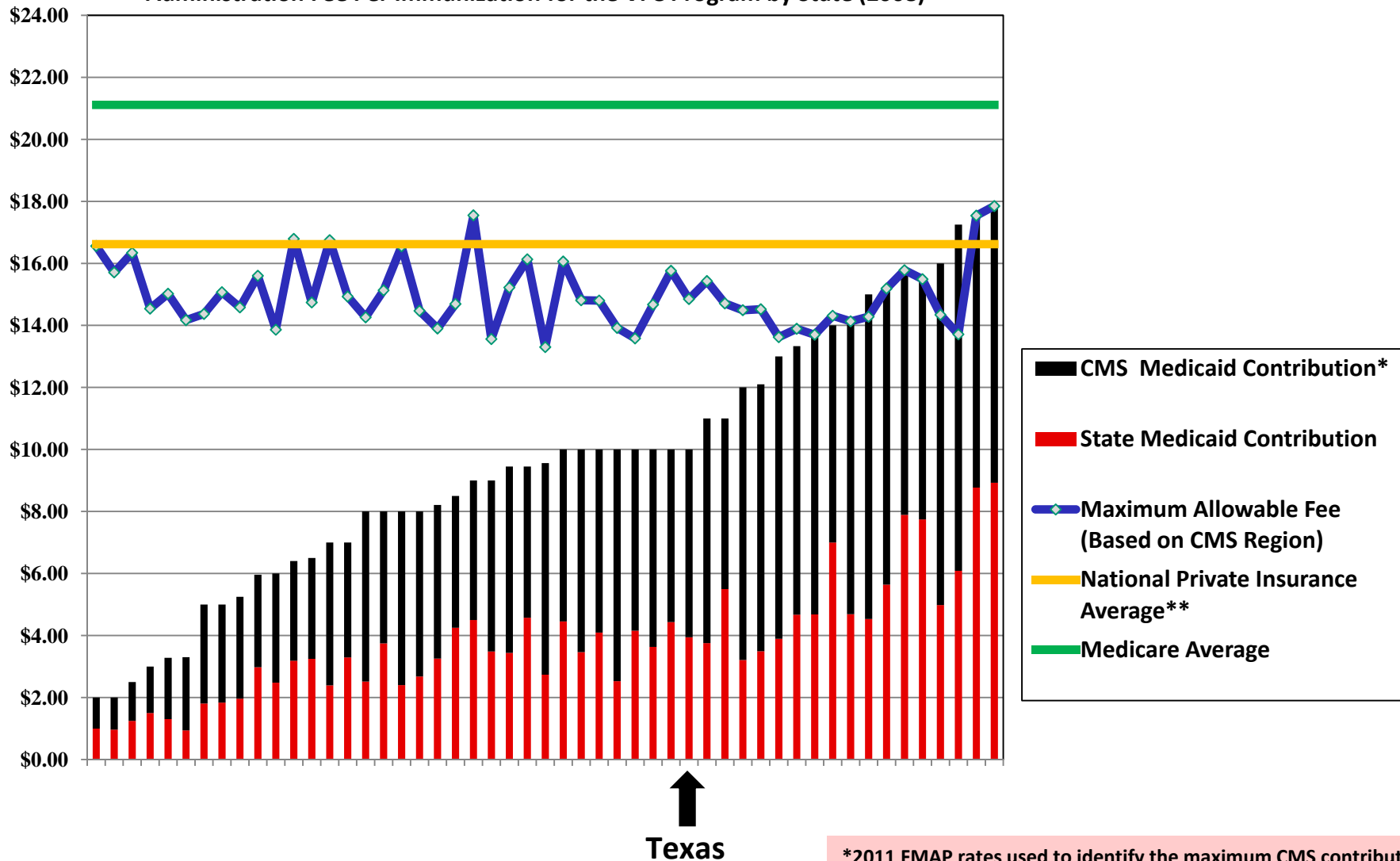


Public insurance for childhood immunizations

- **Medicare**
- **Medicaid**
- **CHIP**
 - **Medicaid enhancement**
 - **S-CHIP**

VFC, average private insurance, and average Medicare vaccine administration rates

Administration Fee Per Immunization for the VFC Program by State (2008)



*2011 FMAP rates used to identify the maximum CMS contribution
 **National private insurance average from: Freed G, et al. Pediatrics 2008; 122:1325-1331



Out-of-pocket expenses for childhood immunizations

- **Primarily with underinsured children**
- **Providers may refer to health departments**
- **Exacerbated by costs of newer vaccines**
- **May be further exacerbated by efforts to make HPV mandatory without assuring that all children have access to vaccine in public sector**



317 funding FY 2009-2011

FY 2009	\$ 557 M
FY 2010	\$ 559 M
+ ARRA (2 yr)	\$ 300M
FY 2011	\$ 576 M
CDC estimate	\$1,629 M
317 Coalition ask	\$ 803 M



Vaccine administration

- **Studies indicate that it costs approximately \$18-25/injection to administer vaccines**
- **VFC does not reimburse for vaccine administration**
- **Widely varying rates of reimbursement from Medicaid and private insurers**

I Variation in provider vaccine purchase prices and payer reimbursement* - 1

- **Survey of 76 practices in 5 states**
- **Major variation (up to 3X) in minimum & maximum purchase price for a given vaccine**
- **Some practices got better prices than VFC**
- **Larger practices, those in MSAs, and those participating in purchasing cooperatives generally had lower prices**

***Freed *et al.* Pediatrics 2008;122:1325-1331**

Variation in provider vaccine purchase prices and payer reimbursement - 2

- On average, practices had a positive net yield on vaccine purchase, ranging from \$2.90 - \$24.34 / dose for different vaccines
- However, for 15 / 21 vaccines studied, 2% – 26% of practices lost money (up to \$29.31/dose)
- Larger practices, those in MSAs, and those participating in purchase cooperatives generally had higher net yield

Variation in provider vaccine purchase prices and payer reimbursement - 3

- **Vaccine administration fee reimbursement from most common payer**
 - **First dose**
 - **Mean** **\$16.62**
 - **Range** **\$ 3.87 - \$26.55**
 - **Subsequent doses**
 - **Mean** **\$11.63**
 - **Range** **\$ 3.36 - \$37.20**

I Variation in provider vaccine purchase prices and payer reimbursement - 4

“There is a wide range of prices paid by practices for the same vaccine product and in the reimbursement for vaccines and administration fees by payers. This variation highlights the need for individual practices to understand their own costs and reimbursements and to seek opportunities to reduce costs and increase reimbursements.”



Non-vaccine costs

- **Include costs of**
 - **Acquiring vaccine**
 - **Storing vaccine**
 - **Handling vaccine**
 - **Loss of vaccines**
 - **Infrastructure**
 - **Insurance**

PCP perspectives on reimbursement for childhood immunizations* - 1

- National survey of 1280 pediatricians and family physicians
- Response rate 70% for pediatricians; 60% for family physicians
- 49% reported delaying purchase of specific vaccines for financial reasons
- 53% reported decreased profit margin from immunizations in previous 3 years

***Freed *et al.* Pediatrics 2008;122:1319-1324**

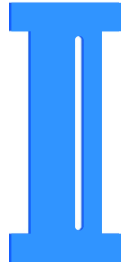
PCP perspectives on reimbursement for childhood immunizations - 2

- **Decreased profit margin from immunizations**
 - **Mod/significant decrease** **41.4%**
 - **No/small decrease** **22.6%**
 - **Don't know** **36.0%**

PCP perspectives on reimbursement for childhood immunizations - 3

- **Extent to which practice has seriously considered whether to stop providing all vaccines to privately insured patients**
 - **Seriously considered 11%**
 - **Considered not seriously 23%**
 - **Never considered 66%**

PCP perspectives on reimbursement for childhood immunizations - 4



“Physicians who provide vaccines to children and adolescents report dissatisfaction with reimbursement levels and increasing financial strain from immunizations. Although large-scale withdrawal of immunization providers does not seem to be imminent, efforts to address root causes of financial pressures should be undertaken.”



Selected NVAC recommendations on vaccine financing, 2008 - 1

- **Extend VFC underinsured access to public health departments, not just FQHC/RHC**
- **Expand VFC by reimbursing for vaccine administration**
- **Reduce financial burden for initial & ongoing vaccine inventories**
- **Professional organizations should provide Technical Assistance to members on efficient business practices**



Selected NVAC recommendations on vaccine financing, 2008 - 2

- **Providers should participate in purchasing pools**
- **Insurance plans should provide first-dollar coverage with no deductible or co-pays for all ACIP-recommended vaccines**
- **NVPO should calculate marginal increase in insurance premiums if plans were to cover all ACIP-recommended vaccines**

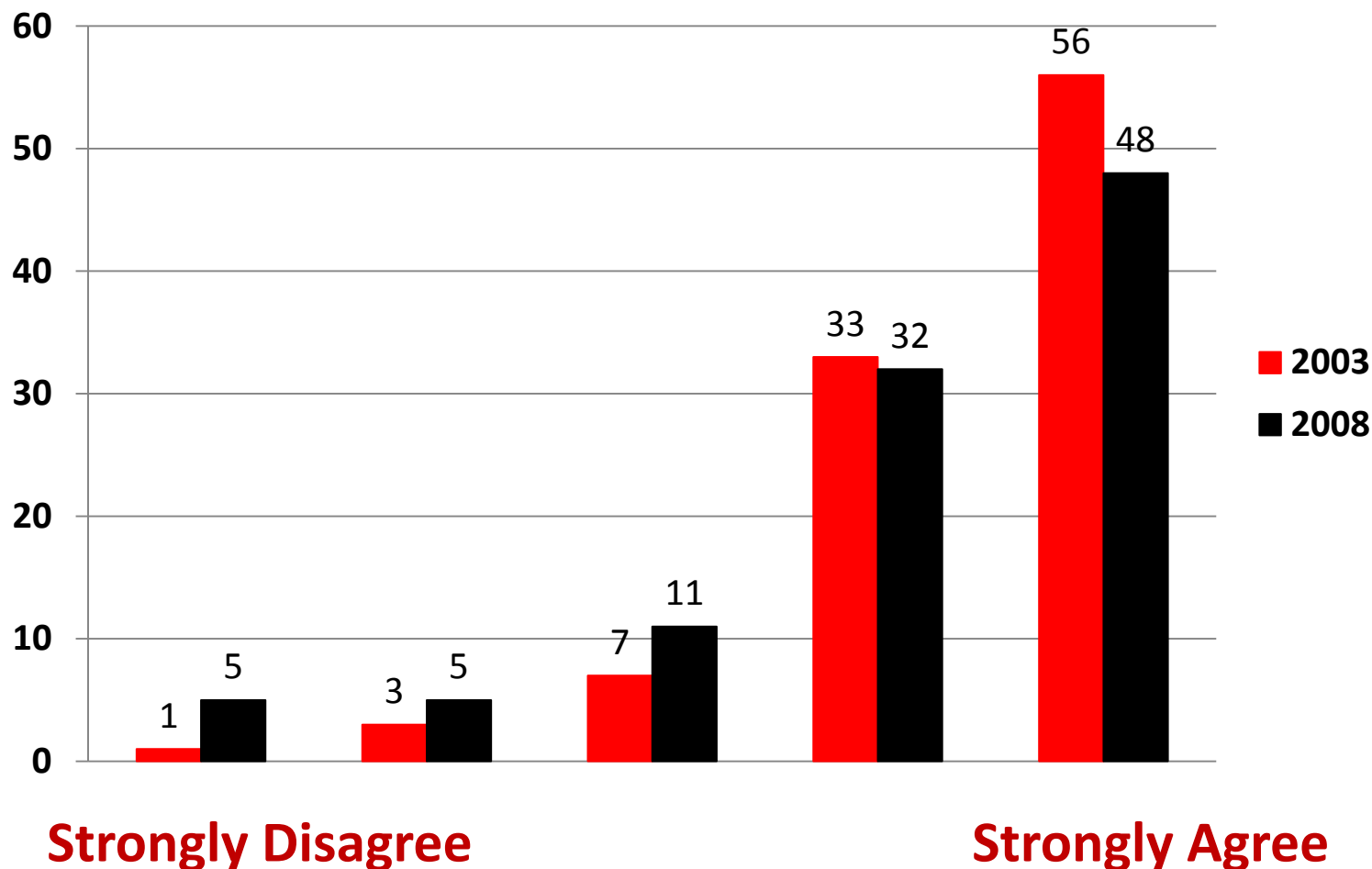


Selected NVAC recommendations on vaccine financing, 2008 - 3

- **Government & professional organizations should encourage participation in VFC**
- **Ensure funding to cover all costs arising from assuring compliance with school immunization requirements**
- **Promote public/private sector approaches to help fund school-based and other complementary-venue child & adolescent immunization efforts**



Response to: "I trust the vaccine advice my child's main healthcare provider gives me."





Conclusions

- **Vaccine-preventable diseases in children are at, or near, record low levels**
- **Immunization coverage in children is at, or near, record high levels**
- **Private-public partnership has improved childhood immunization rates**
 - **VFC has been a major factor**
- **Increasing number and costs of vaccines have put strains on system**
- **Unless resolved, these strains may undermine our current successes**