

# Immunization Program: Planning and Forecasting

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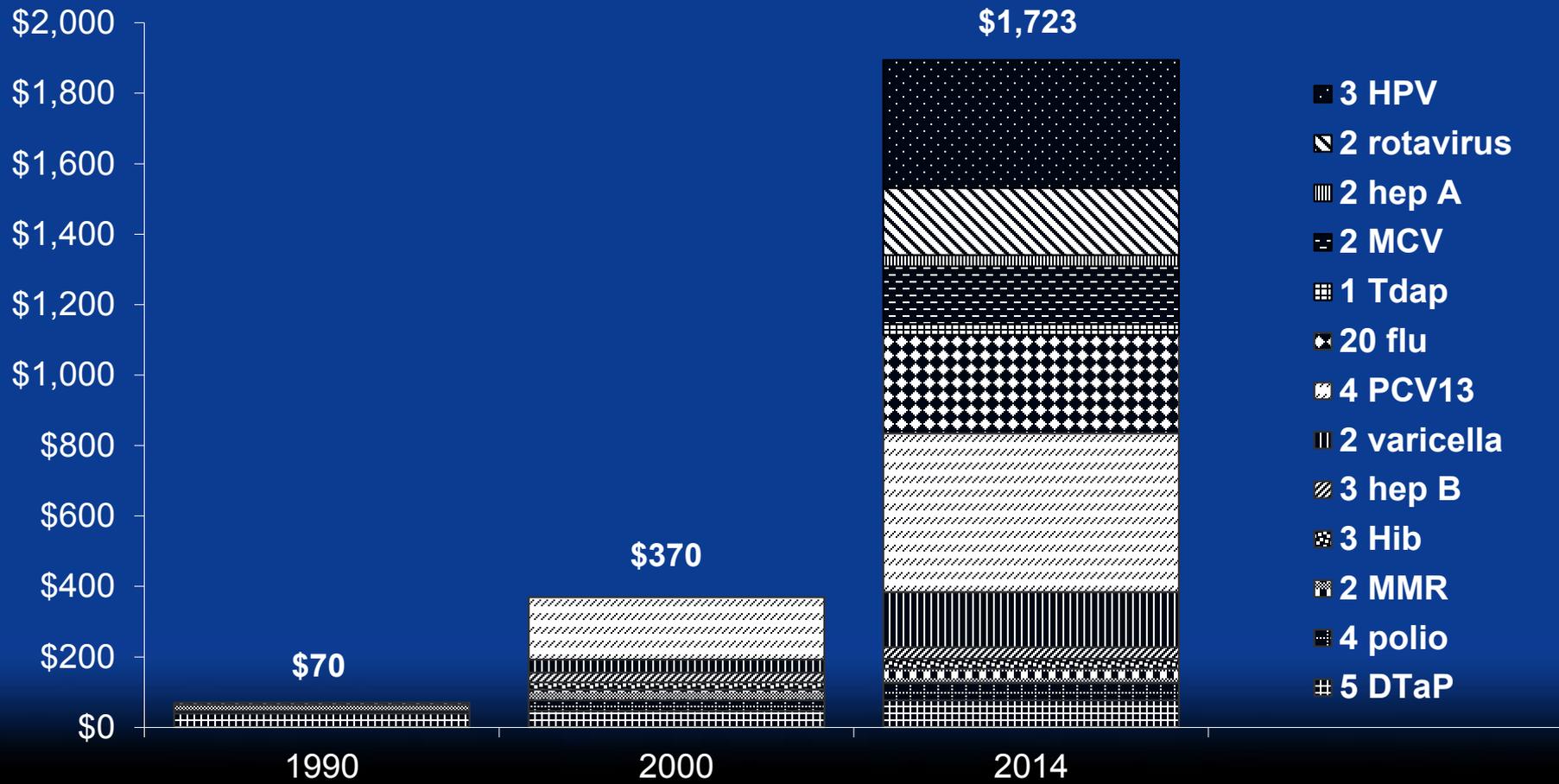
**Centers for Disease Control and Prevention  
National Vaccine Advisory Committee  
June 10, 2014**



# Immunization in the United States

- Most vaccine-preventable diseases at record lows
- Achieved & sustained high childhood immunization
- Reduced disparities in childhood coverage
- Introduced multiple new vaccines
- Improved production and suppliers of influenza vaccine
- Combination of public and private insurance make vaccines accessible to virtually all children and adolescents

# Increase in Pediatric and Adolescent Vaccines, Doses, and Cost of Products: 1990, 2000, and 2014



2014 represents minimum cost to vaccinate a child (birth through 18); exceptions are 1) no preservative pediatric influenza vaccine, and 2) HPV for males and females.

Federal contract prices as of February 1, 1990, September 27, 2000, and May 1, 2014.

# Vaccines for Children

20 years of protecting America's children

The Vaccines for Children program was established in 1994 to make vaccines available to uninsured children. VFC has helped prevent disease and save lives...big time!

CDC estimates that vaccination of children born between 1994 and 2013 will:

prevent **322 million** illnesses



help avoid **732,000** deaths



save nearly **\$1.4 trillion** in total societal costs  
*(that includes \$295 billion in direct costs)*



MMWR: Benefits from Immunization During the Vaccines for Children Program Era — United States, 1994–2013. NCIRD-404 | 04.23.2014

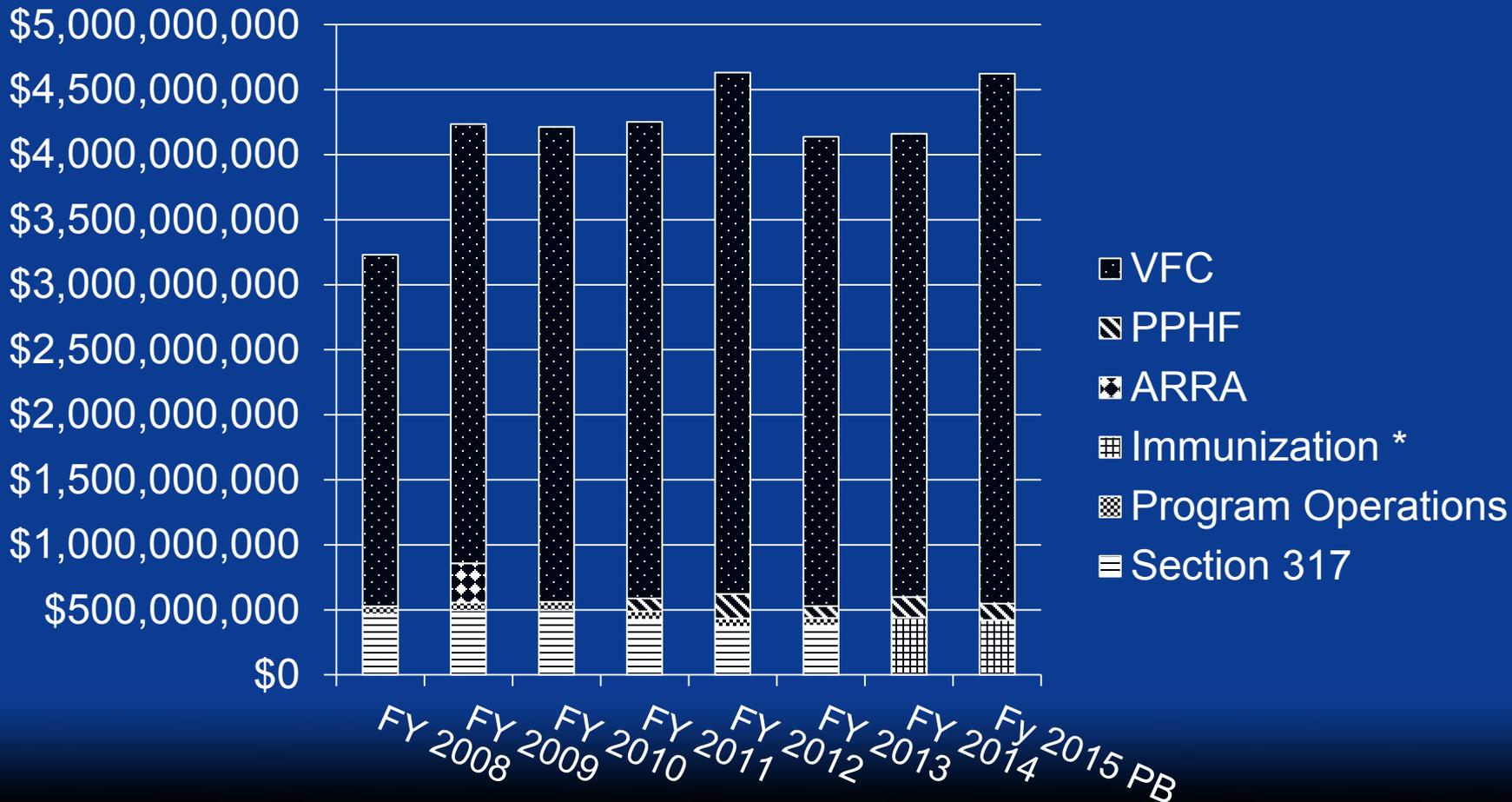


U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

[www.cdc.gov/features/vfcprogram](http://www.cdc.gov/features/vfcprogram)

# VFC Resources Represent Majority of CDC Immunization Budget

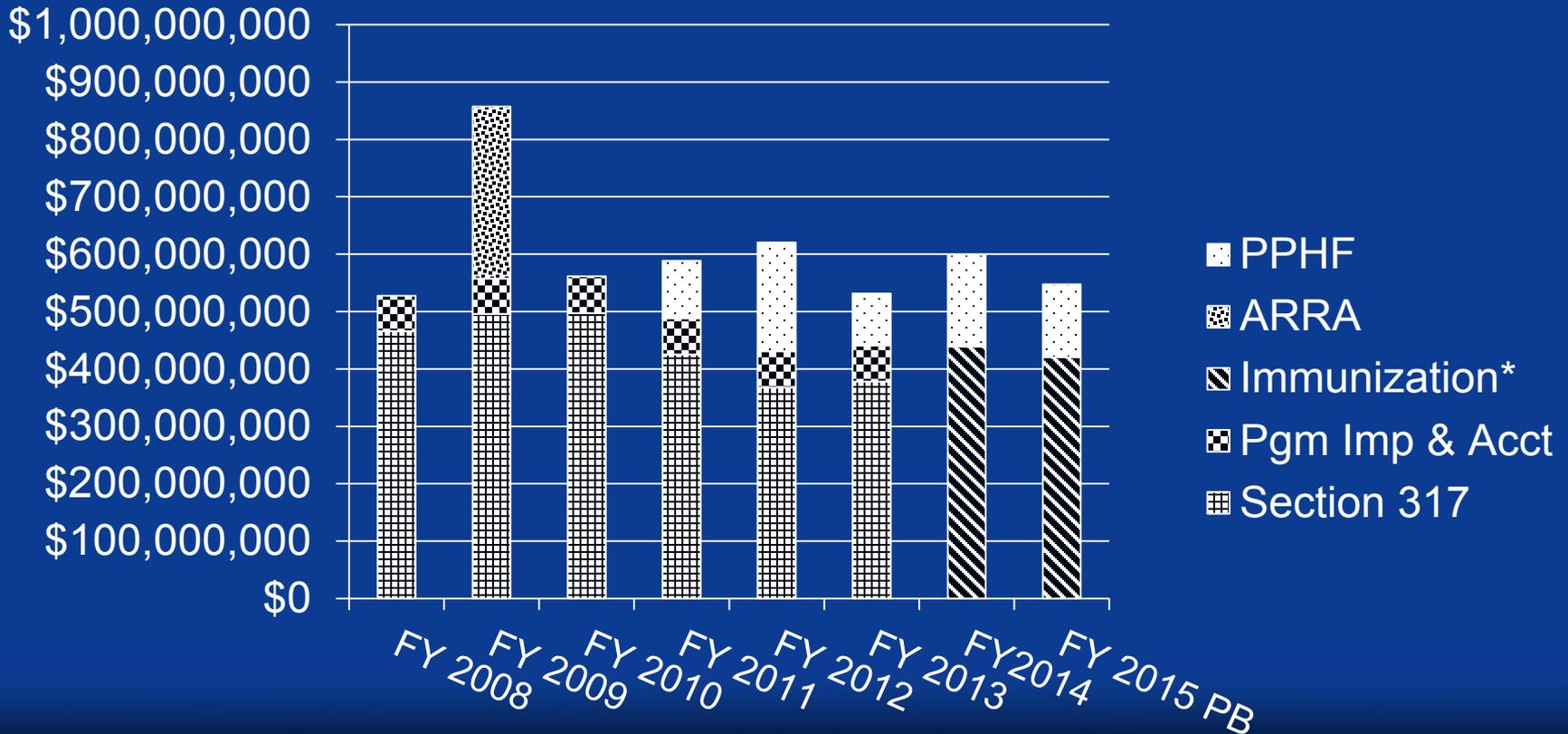
VFC and Discretionary Immunization Funding: FY 2008 - FY 2015 President's Budget



\* FY 2014 Omnibus establishes an Immunization line and eliminates the Section 317 and Program Implementation and Accountability sublines; activities in the former sublines are expected to continue.

# CDC Discretionary Immunization Funding has Grown more Diverse and Complex

Discretionary Immunization Funding: FY 2008 - FY 2015 PB\*



\* FY 2014 Omnibus establishes an Immunization line and eliminates the Section 317 and Program Implementation and Accountability sublines; activities in the former sublines are expected to continue.

# Section 317 Report to Congress

- First report requested in FY 2007 House and Senate Appropriations Committee Report Language
- Request for CDC's professional judgment for a comprehensive immunization program – vaccine purchase and operations
  - Professional judgment takes into account changing health care landscape
  - Professional judgment for a “steady state” program – not implementable in one fiscal year
  - Prepared independent of the President's Budget request and Administration and agency priorities

# FY 2013 Section 317 Report to Congress Summary of Professional Judgment\*

- Program operations estimate: \$742.7M
  - State and local: \$599.8 million
  - National: \$142.9 million
  
- Vaccine purchase estimate: \$220.7M
  - Uninsured adults: \$207.5 million
  - Time-sensitive public health needs: \$13.4 million

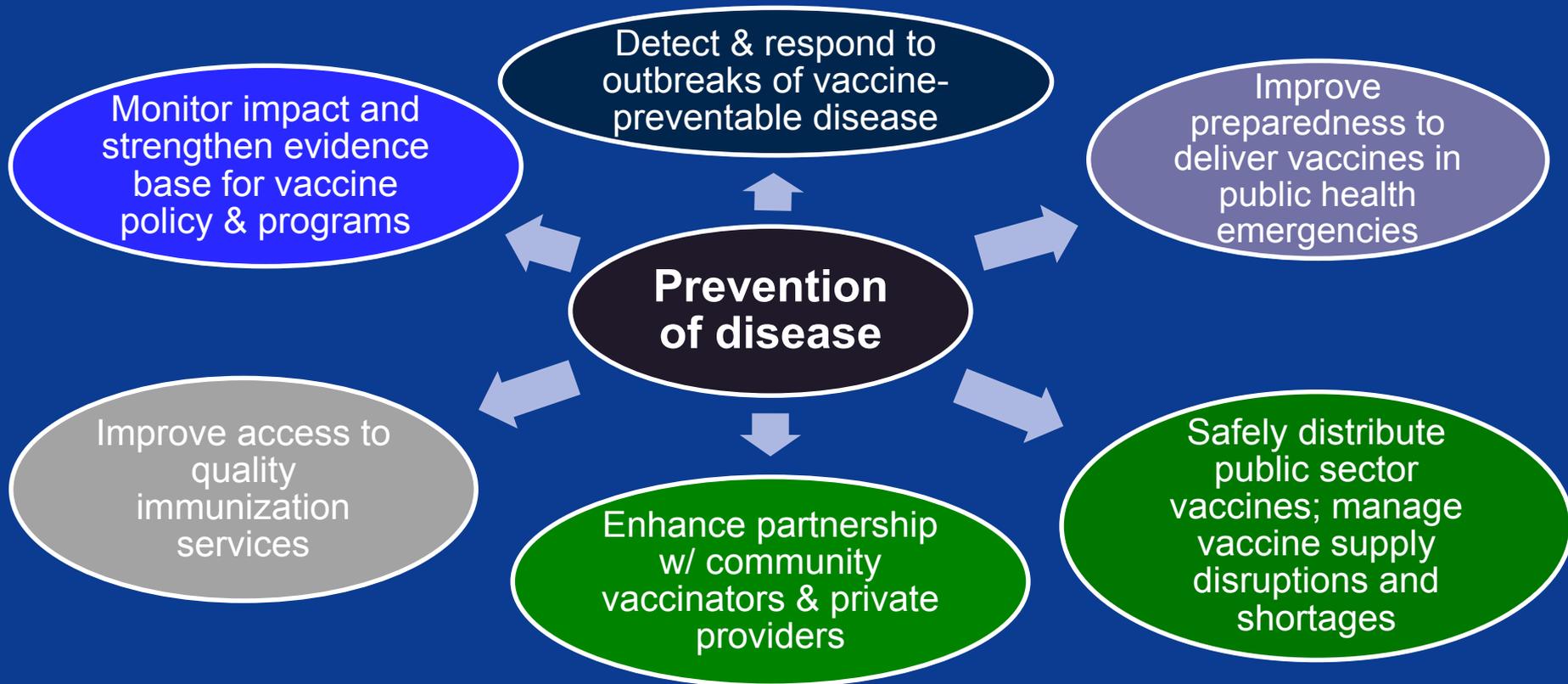
\* From the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

# FY 2013 Section 317 Report to Congress

## Methodology

- Local and State operations
  - Operations cost per dose of federal vaccine purchased from CDC contracts
  - FY 2000 benchmark
- National operations
  - Operations cost per dose of all domestically purchased vaccine (public and private)
  - FY 2000 benchmark
- Vaccine purchase
  - Uninsured adults
  - Urgent vaccine needs

# Public Health's Continuing Role in Immunization



## Current priority issues for state and national focus

- Pertussis Resurgence
- Lagging HPV Coverage Rates
- Measles Importations and Outbreaks
- Short Window of Opportunity to Leverage “EHR Revolution”
- Vaccine Management and Quality Improvement

# FY 2013 Section 317 Report to Congress

## State and Local Operations

- Stewardship and accountability for publicly purchased vaccine and Section 317 and VFC operations funding
- Assess program performance to drive program improvement
- Assure access to vaccines
- Assure that immunization information technology supports programmatic goals
- Strengthen and sustain preparedness for vaccination emergencies, including pandemics

Table 2 from the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

| Fiscal Year | Doses of 317 and VFC Vaccine  |                           | State and Local Program Operations Cost (based on ops cost per federal dose) |  |
|-------------|---|---------------------------|--|--|
| 2000        | Baseline Doses, Including Flu:  | 52,250,229 <sup>1</sup>   | 317 Operations:<br>VFC Operations:<br>Total:                                 | \$132.6 million<br>\$50 million<br>\$182.6 million |
| 2014        | Baseline Doses, Excluding Flu, Adjusted for Population Growth:                  | 53,815,868 <sup>2,3</sup> |  |  |
| 2014        | New Doses, Including Flu<br><br>Children (0-18):<br>Adult:                      | 51,838,176<br>13,587,745  | 2000 Operations/Dose, Adjusted for 2014 Dollars:                             | \$5.03   |
| 2014        | <b>Total Doses (Baseline Doses Adjusted for Population Growth + New Doses):</b> | <b>119,241,789</b>        | <b>Total State and Local Program Operations (119,241,789 x \$5.03)</b>       | <b>\$599,786,199</b>                               |

<sup>1</sup> Includes 1.6 million influenza doses purchased with VFC and Section 317 funding in FY 2000.

<sup>2</sup> The projected change in birth cohort from 2000 to 2014 (6.3 percent, from 4 million to 4.25 million) was used to estimate the growth in baseline doses.

<sup>3</sup> Influenza doses distributed in FY 2000 (1.6 million) are excluded to avoid duplication when calculating FY 2014 new doses

# FY 2013 Section 317 Report to Congress

## National Operations

- Management of vaccine supply
  - Centralized distribution of publicly purchased vaccine
  - Manage supply disruptions
- Immunization information technologies
- Disease surveillance
- Vaccine effectiveness, coverage and safety assessments
- Outbreak detection and response
- National communications to improve public demand and vaccine acceptance
- Communications and education to clinicians and other health care providers
- Technical and logistic support of the Advisory Committee on Immunization Practices (ACIP)

Table 3 from the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

| Fiscal Year | All Doses   |   | National Program Operations Cost<br>(based on ops cost per total public/private dose) |  |
|-------------|---|---|---|--|
| 2000        | Baseline Doses, Including Flu:  | 182,755,410 <sup>1</sup>                | National Program Operations:  | <b>\$61.2 million</b>                        |
|             |   |   | Operations/Dose:  | <b>\$61.2 million/182.8 million = \$0.33</b> |
| 2014        | Baseline Doses, Excluding Flu, Adjusted for Population Growth:                  | 119,377,623 <sup>2,3</sup>              |   |  |
| 2014        | New Doses, Including Flu<br>Children (0-18):<br>Adult:<br>Total New Doses       | 89,200,743<br>95,488,138<br>184,688,881 | 2000 Operations/Dose, Adjusted for 2014 Dollars:                                      | <b>\$0.47</b>                                |
| 2014        | <b>Total Doses (Baseline Doses Adjusted for Population Growth + New Doses):</b> | <b>304,066,504</b>                      | <b>Total National Program Operations (304,066,504 x \$0.47)</b>                       | <b>\$142,911,257</b>                         |

1 Includes 70.4 million influenza doses.

2 The projected change in birth cohort from 2000 to 2014 (6.3 percent, from 4 million to 4.25 million) was used to estimate the growth in baseline doses.

3 Influenza doses distributed in FY 2000 (70.4 million) are excluded to avoid duplication when calculating FY 2014 new doses.

# FY 2013 Section 317 Report to Congress

## Vaccine Purchase: Uninsured Adults

- Uninsured adults aged 19–64 years living within 200 percent of federal poverty threshold (U.S. Census)
- Estimates calculated for each vaccine based on age recommendation, high-risk specifications, number of doses, and estimated uptake. FY 13 Report included:
  - Influenza, Tdap, HPV, hepatitis B, Pneumococcal Polysaccharide, and Herpes Zoster
- State funding for adult vaccines purchased from the federal vaccine contracts is removed

Table 5 from the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

|   | Uninsured and Within 200 Percent of FPT Population, Total | Final Population, One Cohort <sup>1</sup> | Population to Vaccinate (Uptake) | Vaccine Cost to Fully Vaccinate an Adult | Total Cost           |
|---|---|---|----------------------------------|--|----------------------|
| <b>Adults (19-64 years)</b>                   |   |   |                                  |  |                      |
| <b>Influenza</b>                              | 23,723,229  | 23,723,229                                | 9,204,613                        | \$9.85                                   | \$90,665,438         |
| <b>Tdap</b>                                   | 23,723,229  | 515,722                                   | 357,395                          | \$122.98 <sup>4</sup>                    | \$43,952,437         |
| <b>HPV (females, 19-26)<sup>5</sup></b>       | 2,944,688   | 368,086                                   | 126,990                          | \$287.67 <sup>5</sup>                    | \$36,531,213         |
| <b>HPV (males, 19-21)<sup>5</sup></b>         | 1,099,919   | 366,640                                   | 28,598                           | \$287.67 <sup>5</sup>                    | \$8,226,787          |
| <b>Hepatitis B (venue) <sup>2,5</sup></b>     | 6,954,369   | N/A                                       | 605,030                          | \$76.75 <sup>5</sup>                     | \$46,436,053         |
| <b>Hepatitis B (diabetics) <sup>3,5</sup></b> | 691,471   | N/A                                       | 69,147                           | \$76.75 <sup>5</sup>                     | \$5,307,032          |
| <b>PPV</b>                                    | 9,892,586   | 215,056                                   | 53,979                           | \$23.70                                  | \$1,279,302          |
| <b>Zoster (60-64)</b>                         | 1,271,081   | 254,216                                   | 52,877                           | \$118.47                                 | \$6,264,338          |
| <b>Total</b>                                  |   |   |                                  |  | <b>\$238,662,600</b> |

<sup>1</sup> Total uninsured population divided by number of cohorts.

<sup>2</sup> Hepatitis B vaccine is based on the recommendation that hepatitis B be universally administered in settings where health care is provided where a high proportion of those being served are at risk for hepatitis B infection (i.e., this estimate is determined by venue).

<sup>3</sup> In 2011 the ACIP recommended that unvaccinated persons aged 19 to 59 years diagnosed with diabetes mellitus be vaccinated with hepatitis B vaccine. Persons aged 60 years and over with diabetes mellitus may be vaccinated at the direction of the treating physician.

<sup>4</sup> Reflects price of Tdap because CDC projects all adults in this population will receive Tdap (instead of Td) in FY 2014.

<sup>5</sup> Hepatitis B and HPV are each three-dose series.

# **FY 2013 Section 317 Report to Congress**

## **Vaccine Purchase: Time-sensitive Public Health Needs**

- Public health needs vary year to year, and state to state
- Outbreak response
- Capacity to vaccinate school-age children with seasonal flu vaccine

# Vaccine Purchase: Outbreak Response\*

- Outbreaks that require substantial vaccination effort
  - pertussis, measles, mumps, meningitis, hepatitis A, and hepatitis B
- Vaccination of children and adults as appropriate
- Estimates based on awardee survey, historical use of vaccine for outbreak response, and CDC professional judgment
- Does not include doses for VFC-eligible children

\* From the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

Table 6 from the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

|  | Total   | Doses        |              | Vaccine Cost           |                            |
|--|---------|--------------|--------------|------------------------|----------------------------|
|  |         | Adult        | Child        | Adult                  | Non-VFC Child <sup>1</sup> |
| <b>Outbreak Response Vaccines</b>      |         |              |              |                        |                            |
| <b>MMR</b>                             | 20,000  | 14,000 (70%) | 6,000 (30%)  | \$539,649              | \$60,136                   |
| <b>Meningococcal conjugate vaccine</b> | 2,500   | 1,000 (40%)  | 1,500 (60%)  | \$70,539               | \$63,869                   |
| <b>Tdap/DTaP</b>                       | 100,000 | 10,000 (10%) | 90,000 (90%) | \$245,956 <sup>2</sup> | \$1,311,217 <sup>3</sup>   |
| <b>Varicella</b>                       | 10,000  | 2,000 (20%)  | 8,000 (80%)  | \$126,271              | \$300,689                  |
| <b>Hepatitis A</b>                     | 12,000  | 9,600 (80%)  | 2,400 (20%)  | \$214,933              | \$18,355                   |
| <b>Hepatitis B</b>                     | 1,500   | 1,500 (100%) | 0 (0%)       | \$38,374               | \$0                        |
|  |         |              |              | \$1,235,722            | \$1,754,266                |
| <b>Total<sup>4</sup></b>               |         |              |              | <b>\$2,989,988</b>     |                            |

<sup>1</sup> Doses assumed to be for VFC-eligible children (50 percent) were deleted from cost estimate.

<sup>2</sup> All Tdap.

<sup>3</sup> Assumes 85 percent Tdap and 15 percent DTaP.

<sup>4</sup> Adult vaccine prices (MMR, \$37.17; MCV4, \$68.02; Tdap, \$23.71; hepatitis A, \$21.59; hepatitis B, \$24.67; varicella, \$60.88); child vaccine prices (MMR, \$19.33; MCV4, \$82.12; Tdap, \$30.41; single-antigen DTaP, \$15.00; hepatitis A, \$14.75; hepatitis B, \$10.73; varicella, \$72.49).

# Vaccine Purchase: Flu Vaccine for School-age Children\*

- Achieving annual flu vaccination coverage goals places a significant burden on the primary care system
- Vaccination of school-age children in complementary venues, such as schools (SLV), has broad support from primary care providers as an adjunct setting
- The utility of SLV campaigns was demonstrated in response to the 2009 H1N1 influenza pandemic

Table 7 from the Report to Congress on the Section 317 Immunization Program submitted by CDC in response to FY 2013 Senate Report 112-176, page 59

| Number of school-aged children nationwide (5-17 years) | Children attending lower SES schools <sup>1</sup> | Children attending lower SES schools where SLV conducted <sup>2</sup> | Children vaccinated overall (any location) <sup>3</sup> | Children vaccinated at school <sup>4</sup> | Non-VFC eligible children vaccinated at school <sup>5</sup> | Vaccine cost <sup>6</sup> |
|--|---|---|---|--|---|---------------------------|
| 53,000,000   | 13,250,000  | 6,625,000   | 3,975,000   | 2,385,000                                  | 715,500   | \$14.62                   |
| <b>Total</b>   |   |   |   |  |   | <b>\$10,460,610</b>       |

<sup>1</sup> Approximate number of students nationwide attending lower SES schools, defined as schools where  $\geq 70\%$  of children are eligible for Free or Reduced Price Lunch (FRPL) ( $0.25 \times 53,000,000$ ).

<sup>2</sup> Assuming SLV will be conducted in 50% of lower SES schools, the estimated number of students attending these schools ( $0.50 \times 13,250,000$ ).

<sup>3</sup> Assuming 60% of students attending lower SES schools where SLV will be conducted will receive influenza vaccination, projected number of students vaccinated at any location ( $0.60 \times 6,625,000$ ).

<sup>4</sup> Assuming 60% of vaccinated students attending lower SES schools where SLV will be conducted will be vaccinated at school, projected number of students vaccinated at school ( $0.60 \times 3,975,000$  – This projection is based on a target of 60%, which is higher than most previous experiences with school-located vaccination).

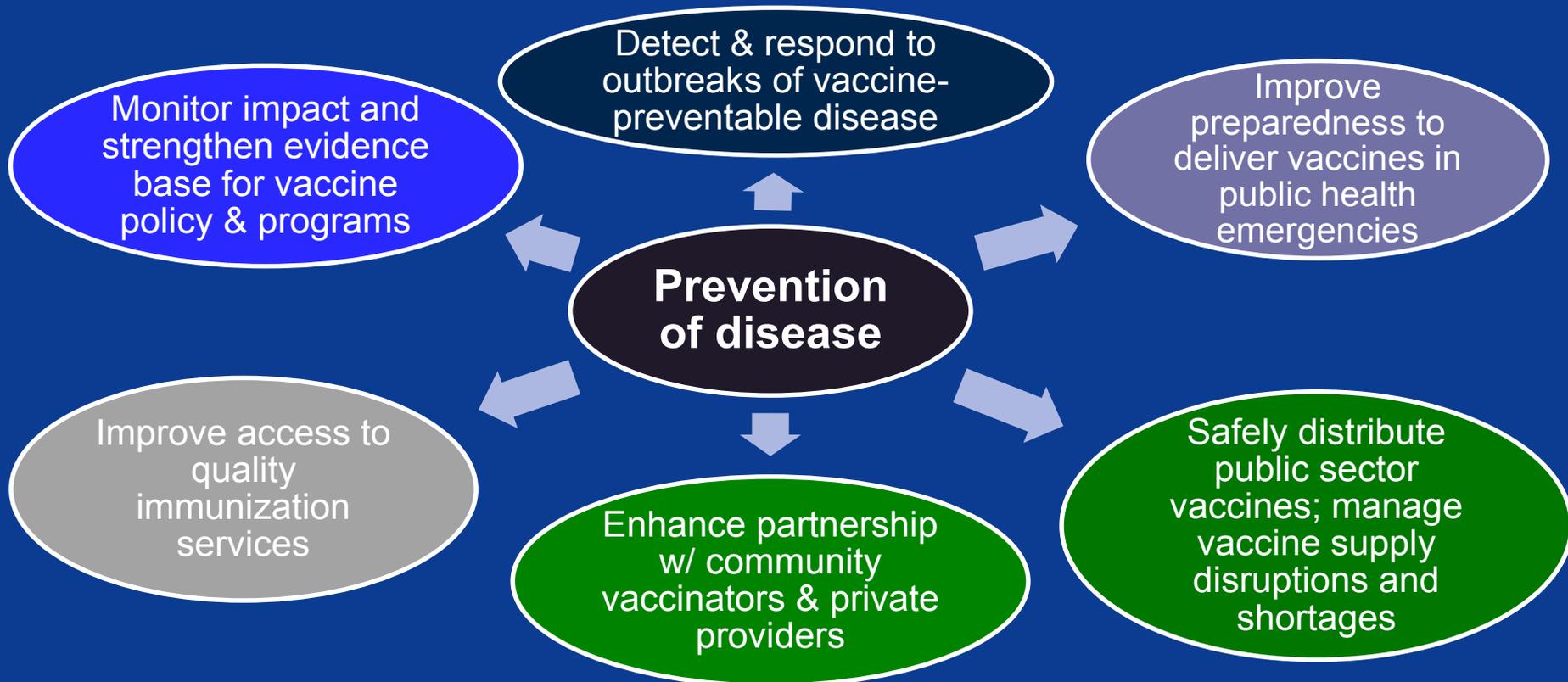
<sup>5</sup> Assuming 30% of students attending lower SES schools who are vaccinated at school are not VFC-eligible, estimated number of non-VFC-eligible students ( $0.30 \times 2,385,000$  – 30% was selected because, among schools where  $\geq 70\%$  of students are eligible for FRPL, the median percent of students eligible for FRPL is about 80-85%, so 15-20% are not eligible for FRPL. Since the percentage of students eligible for FRPL is greater than the percentage eligible for VFC, the non-VFC eligible percentage was set higher, at 30%).

<sup>6</sup> Assuming 30% TIV and 70% LAIV.

# Additional Requirements

- Beginning in FY 2012: discussion of *the evolving role of Federal programs as expanded coverage for vaccination becomes more available from private and public sources.*

# Public Health's Continuing Role in Immunization



## Current priority issues for state and national focus

- Pertussis Resurgence
- Lagging HPV Coverage Rates
- Measles Importations and Outbreaks
- Short Window of Opportunity to Leverage "EHR Revolution"
- Vaccine Management and Quality Improvement

# Considerations for Future Planning and Forecasting

- **VFC Program dollars are majority of federal immunization resources**
  - Mandatory entitlement to eligible children
  - Stable source of funding to meet vaccine need
  - Restricted funding cannot meet urgent vaccine needs
- **Discretionary Immunization funding is more complex and diverse**
  - Various funding streams with different requirements and reporting
  - Majority of support for public health immunization infrastructure
  - More flexible funding for program priorities and urgent vaccine needs
- **Role of public health in evolving health insurance landscape**