

BEST PRICE OR BEST VALUE?

*Texas Vaccines for Children Purchasing Policies*

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September 12, 2006

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September 12, 2006

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# I. Executive Summary

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**Vaccines for Children program.** The Vaccines for Children (VFC) program is a federally-funded program that allows state and local governments to purchase and distribute vaccines to immunize children under the age of 19 who are uninsured, Medicaid recipients, Native Americans, or Alaska Natives. The Centers for Disease Control and Prevention (CDC) contracts with all manufacturers of pediatric vaccines, and state and local VFC programs purchase their vaccines through these contracts.

**Purchasing policies.** Most pediatric vaccines are produced by only one manufacturer. There are four vaccines that are available from more than one manufacturer: Hepatitis A (Hep A); Hepatitis B (Hep B); Diphtheria, Tetanus, Pertussis (DTaP); and Tetanus, Diphtheria, Pertussis booster (Tdap). Most of the eight states contacted for this report purchase from all of the manufacturers of these vaccines with variations in purchasing based on price. States may purchase from only one manufacturer if the price difference between manufacturers is perceived as significant.

California, Ohio, and Texas have specific price policies: California splits vaccine purchases evenly between manufacturers unless the price differential is greater than 10 percent, and Ohio splits purchases evenly unless the price differential is more than 40 cents. Texas purchases the lowest-priced vaccine; if manufacturers have the same price, purchases are split equally.

**Concerns about the Texas policy.** While intended to maximize program savings, the Texas purchasing policy does not take into consideration other issues that impact the purchasing decisions of other states:

- Maintaining multiple providers to promote competition and keep prices lower
- Preventing and/or mitigating vaccine shortages, which can have adverse impacts on immunization rates
- Maintaining the stability of manufacturers to ensure that future vaccine supplies are safe and adequate

In addition, there is an inherent cost to the state when there are shortages or delays in vaccine production. If shortages occur, Texas will incur a cost to purchase a higher-priced vaccine. There are also costs incurred if children are not immunized as a result of vaccine shortages.

**Vaccine shortages.** The flu vaccine shortage has received national press coverage, but recent pediatric vaccine shortages indicate that the flu vaccine is not the only issue with vaccine production. The CDC has recognized the need to maintain an adequate supply of flu vaccine and for 2006 has required all states to purchase from multiple manufacturers for the upcoming flu season. A specific percent of purchases from each manufacturer must be made regardless of price differences.

According to several research articles, the vaccine supply in the United States is considered fragile and vulnerable, with vaccine shortages likely continuing into the future. Vaccine shortages have been shown to adversely affect the immunization rates of certain children, including those served in public clinics, children in non-urban areas, and children living in the southern United States.

**Cost analysis.** A cost analysis shows that the savings from the current Texas purchasing policy is minimal. While more flexible purchasing policies could result in somewhat higher costs, the impact of Texas' purchasing policy on vaccine supply and manufacturer stability should be considered in conjunction with price.

**Program outcomes.** In comparison with other states, Texas has very low immunization rates and low rates of private provider participation in the VFC program. Immunization programs in states with more flexible purchasing policies have more favorable program outcomes and participation rates than Texas. While Texas' purchasing policies for the VFC program are certainly not the only reason for low private provider participation and low immunization rates, the VFC program is a significant provider of vaccines, and purchasing policies for this program are likely to have some impact on program outcomes.

**Conclusion.** Texas accounts for 11 percent of the purchases of all pediatric vaccines purchased through the VFC program and approximately 13 percent of the four vaccines made by more than one manufacturer. Texas' purchasing policies are likely to have an impact on vaccine production. There are no federal or Texas state statutory or administrative prohibitions to purchasing from multiple manufacturers, and a practice allowing more flexible purchasing decisions may increase the security of the supply of pediatric vaccines in both the short-term and the long-term.

## II. Methodology

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Information for this report was gathered from the following sources:

**Literature review.** A search of recent journal articles was conducted on PubMed, an on-line service of the U.S. National Library of Medicine that includes over 16 million citations from MEDLINE and other life science journals for biomedical articles since the 1950s. Additional journal articles were identified from websites and contacts. Ten articles were used for this report, and they are listed in Section VI, beginning on page 13.

**Interviews.** Staff in the immunization programs in California, Florida, Illinois, New York, Ohio, Pennsylvania, San Antonio, Texas, and Virginia were contacted and asked about their vaccine-purchasing policies. These states were selected for a combination of the following reasons: their size and demographics are similar to Texas and/or there are some similarities in program administration and purchasing policies. Staff from the Centers for Disease Control and Prevention (CDC) National Immunization Program were also contacted.

**Vaccine purchasing and cost data.** Pediatric vaccine purchasing information as well as price information from the CDC were used to analyze the volume and cost of vaccines purchased by the Texas immunization program.

# III. Vaccines For Children (VFC)

## Overview

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### Background

When large groups of children go without vaccines because parents cannot afford to pay for them on their own, the children are left unprotected and disease outbreaks may occur. In order to address this concern, the Omnibus Budget Reconciliation Act (OBRA) created the Vaccines for Children (VFC) program as Section 1928 of the Social Security Act on August 10, 1993. Since its operational beginning on October 1, 1994, the VFC program has allowed children to receive vaccinations as part of routine care, supporting the reintegration of vaccination and primary care. VFC is a federal entitlement program developed to eliminate cost as a barrier to preventive healthcare and to improve immunization levels.

The VFC program is the largest public-private partnership in the Department of Health and Human Services Centers for Disease Control and Prevention (CDC) and is administered through the National Immunization Program (NIP). The VFC program provides publicly-purchased vaccines for use by all participating providers. These routine vaccines are given to eligible children without cost to the enrolled provider or parent. In addition, all routine childhood vaccines recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the CDC as well as overdue vaccines (through “catch-up” vaccines) are automatically offered to enrollees. VFC provides cost savings to states through bulk purchase of vaccines through CDC’s contracts with vaccine manufacturers to buy vaccines at lower prices, while eliminating state-to-state variations in price.

**Vaccines available.** The CDC recommends the following childhood and adolescent immunizations for children in the United States who are under the age of 19:

- Hepatitis B (Hep B)
- Diphtheria, Tetanus, Pertussis (DTaP)
- *Haemophilus influenzae* type b (Hib)
- Inactivated Poliovirus (IPV)
- Measles, Mumps, Rubella (MMR)
- Varicella
- Meningococcal (MCV4, MPSV4<sup>1</sup>)
- Pneumococcal (PCV, PPV<sup>2</sup>)
- Influenza
- Hepatitis A (Hep A)
- Tetanus, Diphtheria, Pertussis booster (Tdap)

**Eligibility.** The VFC program is a critical funding source for vaccines and provides immunizations at doctors’ offices with little to no out-of-pocket costs<sup>3</sup> for children under the age of 19 who are uninsured, Medicaid recipients, Native Americans, or Alaska Natives. VFC also helps children whose insurance does not cover vaccinations (i.e., underinsured) when they are vaccinated at participating federally-qualified health centers or rural health clinics. Children from all 50 states, the District of

<sup>1</sup>MPSV4 is only offered for selected populations who are considered to be high risk.

<sup>2</sup>PPV is only offered for selected populations who are considered to be high risk.

<sup>3</sup>There may be a fee for an office visit or administrative fee for receiving the vaccine, if the doctor so chooses in order to offset the cost of providing the service. The state of Texas has a maximum regional charge for vaccine administration of \$14.85. Doctors participating in the VFC program are required to administer the vaccine to a child, even if the family cannot afford to pay the administrative fees established by a doctor’s practice.

Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Commonwealth of Northern Mariana Islands may qualify for the VFC program.

The VFC program ensures that all eligible children receive the benefits of newly-recommended vaccines, ensuring that children in low-income and uninsured families receive access to recommended vaccines in the same timely fashion as children in families with middle- and upper-incomes. Through increased access to recommended vaccines, community immunity levels are strengthened and children have decreased risks of serious illness and death from vaccine-preventable diseases.

**Benchmarking.** The CDC requires every state to document the percentage of VFC-eligible children who are being served. This benchmarking process assists the state in documenting the percentage of children who are eligible for federal funding of vaccines under the VFC program. Benchmarking requires annual participation by all public and private health care provider sites enrolled in the state vaccine program. For a specific one-month period each year, each site documents the eligibility status of any child under the age of 19 who receives an immunization at that site during the specified month. Documentation for each child includes the child's age, whether s/he is insured, whether s/he is Medicaid-enrolled, and whether s/he is a Native American or Alaskan Native. The amount of VFC-funded vaccine received is linked to the number of children who meet VFC eligibility criteria.

**Enrollment of public and private healthcare provider sites in Texas.** In CY 2002, the state of Texas had a total of 3,485 active healthcare provider sites, including 680 public health department clinics, 483 public migrant/community health centers and rural health clinics, 2 Indian health services and tribal clinics, 271 additional public clinics, and 2,049 private providers (see Appendix C). In CY 2005, the public sector childhood vaccine supply policy of the state of Texas was the "VFC and underinsured select," indicating that the immunization program supplies most vaccines for VFC-eligible and underinsured children to all VFC-enrolled providers in the state.

## Funding

As an entitlement program, the Office of Management and Budget approves funding for the VFC program. Funding is provided through the Centers for Medicare and Medicaid Services (CMS) to the CDC, with awards made to eligible grantees.

In 2004, the VFC program purchased approximately 40 percent of the total number of doses of routinely-recommended pediatric vaccines distributed throughout the United States. That same year, CDC awarded \$977 million in VFC funds to state, local, and territorial public health agencies for program operations and vaccine purchases.

## Vaccine Stockpiles

Through the VFC program, CDC is also working to acquire pediatric vaccine stockpiles that provide a six-month national supply of all recommended pediatric vaccines for use in case of supply disruptions or outbreaks of vaccine-preventable diseases.

In 2003, CDC began purchasing vaccines for expanded national pediatric stockpiles with \$172 million in VFC funds designated for the stockpile. Stockpiled vaccinations include measles, mumps, rubella (MMR); varicella; and inactivated polio (IPV) vaccines, as well as partial stockpiles of hepatitis B (Hep

B), hepatitis A (Hep A), pneumococcal conjugate (PCV), and *Haemophilus influenzae* type b (Hib) vaccines. Future vaccination stockpiles will include such vaccines as diphtheria-tetanus-acellular pertussis (DTaP).<sup>1</sup>

The stockpile operates as a strategic inventory. When new vaccine doses are produced, the vaccines in the stockpile are rotated out in sufficient time to be distributed to providers, ensuring that the shelf life of the vaccines in the stockpile is adequate.<sup>2</sup> Since 1983, CDC stockpiles have been accessed on at least eight occasions to relieve production disruptions.<sup>3</sup>

## Coordination

The VFC program maintains close collaboration and participation with a variety of programs and agencies, including the following entities:

- The Centers for Medicare and Medicaid Services (CMS) – State Medicaid Programs
- Health Resources and Services Administration (HRSA)
- Indian Health Services (IHS)
- Association of State and Territorial Health Officials
- Association of Immunization Program Managers
- National, state, and local organizations representing the private health care sector
- Maternal and Child Health (MCH) programs
- Women, Infants, and Children (WIC) program
- State Children’s Health Insurance Program (SCHIP)
- Managed care and national and state health care organizations

<sup>1</sup>Centers for Disease Control and Prevention: Programs in Brief. December 2004. Centers for Disease Control and Prevention. 6 September 2006 <<http://www.cdc.gov/programs/immun07.pdf>>.

<sup>2</sup>Hinman, Alan R., Walter A. Orenstein, Jeanne M. Stanoli, Lance E. Rodewald, and Stephen L. Cochi. “Vaccine Shortages: History, Impact, and Prospects for the Future.” *Annual Review of Public Health* 27 (2006): 235-259. Klein, Jerome O., and Martin G. Myers. “Vaccine Shortages: Why They Occur and What Needs to Be Done to Strengthen Vaccine Supply.” *Pediatrics* 117, no. 6 (2006): 2269-2275.

<sup>3</sup>Rodewald, Lance E., Walter A. Orenstein, Dean D. Mason, and Stephen L. Cochi. “Vaccine Supply Problems: A Perspective of the Centers for Disease Control and Prevention.” *Clinical Infectious Diseases* 42, Suppl 3 (2006): S104-110.

## IV. VFC Purchasing Policies

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### VFC Contract Prices

The Centers for Disease Control and Prevention (CDC) enters into a one-year contract with each pediatric vaccine manufacturer. Prices are negotiated privately, not in an open-bid process. Prices are set for the term of the contract, although manufacturers may lower their prices twice during the contract year. Included in each contract is an obligation by the CDC to purchase a minimum number of doses from each manufacturer.

While the CDC negotiates the Vaccines for Children (VFC) program prices for each manufacturer, grantees (states and some cities) may purchase whichever vaccines are preferred at the CDC price. Most of the pediatric vaccines have only one manufacturer. There are four vaccines (DTaP, Hep A, Hep B, and Tdap) that are each manufactured by more than one manufacturer. Grantees are not required by the CDC to purchase the lowest-priced vaccine, and the CDC does encourage grantees to purchase from multiple manufacturers when possible.<sup>10, p. S108</sup>

The CDC, recognizing the need to maintain an adequate supply of flu vaccine, has required all states to purchase from multiple manufacturers for the upcoming flu season. A specific percent of purchases from each manufacturer must be made.

### VFC Purchasing Strategies

Rather than having policies based solely on price or based solely on choice, interviews with immunization programs in eight states and one city indicate that most programs consider both choice and price.

Of the immunization programs contacted for this report (California, Florida, Illinois, Ohio, New York, Pennsylvania, San Antonio, Texas, and Virginia), only New York indicated that they provide full provider choice of vaccines without regard to price. In the other states and in San Antonio, vaccines are purchased based on preferences indicated by providers, but that cost is a factor in determining which vaccines are available to providers.

While Texas buys from the manufacturer based on which has the lowest price, California and Ohio are the only other states that were contacted that have a specific cost rule: California splits vaccine purchases evenly between manufacturers unless the price differential is greater than 10 percent, and Ohio splits purchases evenly unless the price differential is more than 40 cents. For the remaining states, cost becomes an issue when state program staff perceive that the price difference is large, usually indicated as 75 cents to \$1.

## Benefits of Multiple Manufacturers

The immunization programs contacted for this report indicate that there are several important benefits of purchasing from each manufacturer for the four vaccines that have more than one manufacturer:

**Maintain relationships.** Many of the state program staff contacted believe that it is important to maintain relationships with all of the manufacturers because they provide support for the immunization programs within the states. Maintaining a relationship with all manufacturers allows the state programs to realize the additional benefits listed below.

**Purchasing history.** If the lowest-priced vaccine is delayed or there is a shortage, having a relationship with the other manufacturers is considered helpful in placing an order that needs to be filled quickly.

**Education and awareness.** Having all manufacturers encourage immunization is considered beneficial. Manufacturers educate providers and individuals and increase awareness about the diseases prevented by vaccination. Some of the programs provided by manufacturers to increase immunization rates include:

- Phone and mail reminders to parents when a follow-up shot is due. Studies have shown that these reminder and recall programs do have a positive impact on immunization rates.
- Brochures and other literature that provide information about vaccine-preventable diseases and the benefits of immunization.
- Media campaigns. GlaxoSmithKline (GSK) used a media campaign (print, radio, and TV) in major cities in Texas in 2006 in conjunction with mailed reminder notices to inform adolescents of the importance of the Tdap vaccine.
- Partnership with state and local programs to provide conferences and symposiums that educate staff, providers, and policymakers on issues related to immunization. GSK has worked with state of Texas outreach coordinators to provide information sessions to educate providers on issues such as the storage and handling of vaccines. Programs are also provided to VFC and non-VFC physicians to bring in outside experts on immunization and to inform them about VFC enrollment and the benefits of immunization.

While direct-to-consumer campaigns by pharmaceutical companies have been criticized and widely debated, a recent study suggests that they may represent an opportunity to improve flu vaccination rates among the elderly. The study estimates that such a campaign funded by the federal government would be cost-beneficial.<sup>1</sup>

**Shortage prevention.** Most immunization programs indicate that vaccine shortages have been a problem for their program and they want to be sure that multiple manufacturers are maintained whenever possible. They believe that by purchasing from multiple manufacturers, they are providing an incentive for all manufacturers to stay in business.

<sup>1</sup>Patel, Mitesh S., and Matthew M. Davis. "Could a Federal Program to Promote Influenza Vaccination Among Elders be Cost-Effective?" *Preventive Medicine* 42 (2006) 240-246.

## **Program Benefits and Provider Participation**

Several immunization programs indicated that purchasing from multiple manufacturers and allowing providers to have a choice or at least a preference of vaccine reduces errors within a practice and makes it more likely that each vaccine is applied appropriately. Different manufacturers have different schedules and dosing requirements, and programs indicated a concern that there may be more likelihood of errors for providers that use more than one vaccine within their practice.

One program indicated that providers are happier with the VFC program if they have choice and/or preference in the vaccine that they use in their practice and that, when evaluated, those providers have higher immunization rates.

# V. Texas VFC Purchasing Policy

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## Lowest-Cost Policy

In 2005, Texas spent \$162 million on the purchase of pediatric vaccines. Of this amount, \$26 million was spent on purchasing the four vaccines that are produced by more than one manufacturer (DTaP, Hep A, Hep B, Tdap). For these four vaccines, Texas has a policy of purchasing the lowest-priced vaccine for distribution to providers who provide immunizations for children eligible for the Vaccines for Children (VFC) program. If two manufacturers have the same price, Texas splits the purchase evenly between both manufacturers. In actual practice, other factors, such production delays experienced by one manufacturer, may influence purchasing from a higher-priced manufacturer in order to ensure adequate supply.

The table below shows the price differences between the two manufacturers for the four vaccines that have more than one manufacturer.

Vaccine	Maximum 2006 Price Differential	Maximum 2005 Price Differential
DTaP	\$1.00	\$0.50
Hep A	\$0.15	\$0.10
Hep B	\$0.10	\$0.35
Tdap	\$0.00	\$2.00

Source: Centers for Disease Control Vaccine Price Lists

No other states contacted for this report have such a stringent rule. The only other large state that has a similar policy is Virginia, where public providers of vaccines are provided with the lowest-priced vaccine, but private providers are allowed to choose which vaccine they want to administer. However, the Virginia price differential policy is more vague, with a change in manufacturer only when the price differential is perceived to be large. Although California and Ohio both provide physician choice, only vaccines within a particular price range are available. In California, vaccine purchases are split between manufacturers unless the price differential is greater than 10 percent and in Ohio, vaccine purchases are made according to provider choice unless the price differential is greater than 40 cents.

Although Texas does not generally allow providers to choose which vaccine they prefer, providers are able to choose between individual vaccines and combination vaccines (of which there are three).

## Cost Analysis

Calculations based on the number of pediatric vaccine doses purchased by Texas in 2005 show that the cost savings achieved from the lowest-cost policy is very small. Using three different scenarios (based on 40-cent, 60-cent, and \$1 cost differentials), the costs associated with a more flexible price purchasing policy were calculated. Charts showing the calculations are located in Appendix A.

**Federal funds.** The bulk of pediatric vaccine purchases is made using federal funds available through the Vaccines for Children (VFC) program. Using 2005 data, the estimated additional cost to purchase vaccines using any of the more flexible spending policies that would allow equal purchases

from manufacturers is \$325,707. This amount represents 1.5 percent of the \$21 million in vaccines purchased using federal funds in 2005. Using first and second quarter 2006 data, there is a slight estimated cost savings of 0.6 percent of total program costs for the 40-cent and 60-cent scenarios and an additional cost of 0.7 percent for the \$1 scenario.

**State general revenue.** For vaccines purchased by Texas using state and local funds (nearly \$5 million in 2005), the calculations using 2005 data show that based on actual purchases, there would be no additional cost to purchasing vaccines using a more flexible purchasing policy. The possible reasons for this are discussed in Appendix A. Using 2006 data, there is very little difference shown between actual purchases made and the scenarios shown. Adopting any of the scenarios based on 2006 data would not significantly alter the cost to the state.

According to the Texas immunization program, the lowest-price policy is maintained in order to have funds available to purchase additional vaccines. While preserving public funds and purchasing additional vaccines is a desirable goal for a public program, there are other economic issues to consider as well. The ability to purchase additional vaccines using state and local funds must be weighed against other issues, such as the impact that the purchasing policy has on vaccine manufacturers, the future supply of vaccines, and program outcomes. Texas accounts for 11 percent of the purchases of all vaccines purchased through the VFC program and approximately 13 percent of the four vaccines made by more than one manufacturer. Texas' purchasing policies are likely to have an impact on vaccine production.

## Program Benefits and Provider Participation

Comparing Texas to the seven other states contacted for this report shows that Texas has the lowest immunization rates overall and ranks 47th among the 50 states (see chart in Appendix B). In addition, Texas has the lowest private provider participation in the VFC program compared to the other states contacted for this report and is lower than the average for all 50 states (see chart in Appendix C). Private provider sites for the VFC program in Texas represent only 59 percent of all VFC sites compared to a range of 70 to 90 percent for the other large states and a national rate of 71 percent. Immunization programs in states with more flexible purchasing policies have more favorable program outcomes and participation rates than Texas.

While Texas' purchasing policies for the VFC program are certainly not the only reason for low private provider participation and low immunization rates, the VFC program is a significant provider of vaccines, and purchasing policies for this program are likely to have some impact on program outcomes.

## State of Texas' "Best Value" Standard

In addition to there being no requirement to purchase the lowest-priced vaccine through the federal VFC contracts, there is also no requirement that Texas state agencies make purchasing decisions solely based on price. The Texas purchasing statute, Chapter 2155 of the Government Code, specifies that state agencies purchase "goods and services that provide the best value for the state" (the full text of the relevant section of the statute is shown below). This includes taking into consideration a vendor's circumstances and ability to perform as well as the "vendor's anticipated economic impact on the state." The Texas immunization program has the ability to consider issues other than price.

## **§ 2155.074. Best Value Standard for Purchase of Goods or Services**

- (a) For a purchase of goods and services under this chapter, each state agency, including the commission, shall purchase goods and services that provide the best value for the state.
- (b) In determining the best value for the state, the purchase price and whether the goods or services meet specifications are the most important considerations. However, the commission or other state agency may, subject to Subsection (c) and Section 2155.075, consider other relevant factors, including:
  - (1) installation costs;
  - (2) life cycle costs;
  - (3) the quality and reliability of the goods and services;
  - (4) the delivery terms;
  - (5) indicators of probable vendor performance under the contract such as past vendor performance, the vendor's financial resources and ability to perform, the vendor's experience or demonstrated capability and responsibility, and the vendor's ability to provide reliable maintenance agreements and support;
  - (6) the cost of any employee training associated with a purchase;
  - (7) the effect of a purchase on agency productivity;
  - (8) the vendor's anticipated economic impact to the state or a subdivision of the state, including potential tax revenue and employment; and
  - (9) other factors relevant to determining the best value for the state in the context of a particular purchase.
- (c) A state agency shall consult with and receive approval from the commission before considering factors other than price and meeting specifications when the agency procures through competitive bidding goods or services with a value that exceeds \$100,000.

# VI. Vaccine Shortages

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## Recent Vaccine Shortages

Vaccine shortages have occurred frequently since 2000, affecting 9 of the 13 diseases for which children are immunized, after a period from 1985 to 2000 with very few shortages.<sup>5, pp. 235, 244</sup> While the reasons for shortages are multi-faceted and vary in each circumstance, the literature points to government purchasing and financing issues as one reason for shortages. Other factors include higher-than-expected demand, interruptions in production, and a lack of resources to purchase vaccines.<sup>5, p. 256</sup>

The vaccine supply in the United States is considered fragile and vulnerable, with vaccine shortages likely continuing into the future until structural and financial issues are resolved.<sup>5, 8 p. 2269, 10 p. S110</sup> Because manufacturers are more likely to research and develop for new markets rather than for existing ones, the United States “is vulnerable to single suppliers for the foreseeable future.”<sup>5, p. 239</sup> Vaccine shortages are predicted to continue to occur until issues such as infrastructure, regulatory processes, financial incentives, and pricing are addressed.

While shortages of the flu vaccine have received recent national press coverage, there have been a number of shortages of pediatric vaccines. According to the Centers for Disease Control and Prevention (CDC) website (<http://www.cdc.gov/nip/news/shortages/default.htm#Which>) as of August 30, 2006, there are currently three pediatric vaccines with supply problems:

- Tdap (brandname Adacel™) is experiencing “supply constraints” and customers may experience backorders.
- Hib vaccine currently is not available from Wyeth.
- MCV4 vaccine is experiencing a high volume of demand, and deferral of vaccines to certain individuals is recommended.

Other recent documented shortages of pediatric vaccines are shown on the following table.

Vaccine	Approximate Start	Approximate End
DTaP	March 2001	July 2002
MMR	October 2001	July 2002
PCV	September 2001	May 2003
	November 2003	September 2004
Td	November 2000	June 2002
Varicella	October 2001	August 2002
Influenza	October 2004	March 2005

Source: 2,3,5,10

One problem exacerbating the well-known shortages in the flu vaccine was that many large purchasers, such as health plans and state governments, “had contracts with only one manufacturer and therefore were in an all-or-none situation with respect to vaccine supply.”<sup>5, p. 247</sup> Effective policies that prevent or minimize the effects of vaccine shortages include avoiding dependence on single manufacturers when possible.<sup>5, p. 255</sup>

## Public Purchasing of Vaccines

Public purchases of vaccines represent about 55 percent of all childhood vaccine purchases.<sup>4</sup> More than 50 percent of preschool children in the United States receive vaccines purchased with public funds.<sup>2</sup> The U.S. government spends more than \$1 billion annually to purchase childhood vaccines, which does not include reimbursements for the administration of the vaccines.<sup>4</sup> In 2005, the private sector purchased 45 percent of childhood vaccines, the federal VFC program purchased 40 percent, federal Section 317 funding purchased 8 percent, and state and local governments purchased 7 percent<sup>5</sup>  
p. 241

## Stability of Manufacturers

The dual goals of negotiating the lowest purchase price and maintaining adequate incentives for vaccine manufacturers to remain in the market are acknowledged throughout the literature. There is a real concern that the number of manufacturers of recommended vaccines is now 5, compared to more than 25 companies 30 years ago<sup>4</sup>. Although no sole manufacturers of vaccines that are universally recommended for children have ever left the U.S. market, the United States would be vulnerable if that occurred.<sup>10, p. S109</sup> While governments seek to reduce the cost of vaccines and limit expenditures, manufacturers “face declining financial incentives to develop and produce vaccines,”<sup>4, p. 1</sup> and there are significant tensions that exist “between the need to control public and private expenditures on vaccines and the need to encourage investment in their development.”<sup>4, p. 5</sup> There is a recognized need to “preserve elements of market competition while providing enhanced incentives for vaccine research and development.”<sup>4, p. 6</sup> Several studies have identified the need to ensure the stability of vaccine manufacturers and maintain incentives for vaccine research and development.<sup>4, 5 p. 252</sup>

Manufacturers have noted that the public purchase of vaccines is a serious impediment to vaccine development and may be a disincentive for new companies to enter existing markets.<sup>5, pp. 241-242</sup> There is an “inherent conflict of interest” at the CDC to purchase vaccines at the lowest possible price while encouraging a “healthy, vigorous, and profitable vaccine industry.”<sup>8, p. 2271</sup> “Vaccines should be profitable for the manufacturer. Financial incentives are needed to ensure that manufacturers stay in business and new manufacturers are attracted to the U.S. marketplace.”<sup>8, p. 2275</sup>

The development of vaccines is a long and costly process.<sup>5</sup> The lag time from initial development to production can be as much as 21 years.<sup>5</sup> The manufacture of a single lot of vaccine can take up to a year. Manufacturing vaccines requires considerable up-front expenditures, as much as \$700 million or more to bring a new vaccine to market.<sup>8, p. 2270</sup> “Developing financial incentives for manufacturers to continue in the vaccine business and encouraging new manufacturers to enter the market have been the subject of extensive discussions and reviews.”<sup>8, p. 2273</sup> In addition, the regulatory process by the Food and Drug Administration (FDA) is extensive and requires, among other things, the approval of individual vaccine lots.

## Adverse Effects of Shortages

Vaccine shortages require adjustments in the administration of vaccines, including schedule changes or delayed doses. These adjustments are communicated from the CDC to VFC grantees and then to providers. This creates disruptions and confusion for providers and patients and results in reduced coverage levels. Vaccine shortages have been shown to adversely affect the immunization rates of

children served in public clinics, children in non-urban areas, and children living in the southern United States.<sup>2</sup> Several studies have observed an association between race/ethnicity and receipt of vaccines, overall and during shortages.<sup>3,5,6</sup>

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- <sup>2</sup>Santibanez, Tammy A., Jeanne M. Santoli, and Lawrence, E. Barker. “Differential Effects of the DTaP and MMR Vaccine Shortages on Timeliness of Childhood Vaccination Coverage.” American Journal of Public Health 96, no. 4 (2006): 691-696.
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# Appendix A: Cost Analysis

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The following tables show an analysis of the additional cost to the Vaccines for Children (VFC) program associated with a more flexible purchasing policy by the state of Texas. An analysis was conducted for purchases made in 2005 as well as for the first two quarters of 2006. The analysis included three different sources of funding: federal VFC purchases, state and local vaccine purchases, and vaccine purchases made with federal 317 funds. The data on doses purchased and total cost were obtained from the Centers for Disease Control and Prevention (CDC).

**Actual purchases.** The spreadsheets in this appendix show the actual calendar year (CY) dosages purchased by the state and costs incurred by the state to purchase those doses.

**Prices.** CDC contracts for pediatric vaccines are in effect from April 1 through March 31. Prices may change at any time during the year. Manufacturers are allowed to lower prices for vaccines up to two times during the year. The prices used for this analysis are an average for each calendar year. The average price for 2005 does not include the prices in effect in the 1st quarter of CY 2005 (the last quarter of the CDC contract); those prices were not available at the time this report was prepared. The average price for 2006 includes the prices in effect in the first and second quarters of CY 2006.

**Cost scenarios.** The cost scenarios estimate the difference in total cost if vaccines are purchased equally from manufacturers when the price difference between the two manufacturers is equal to or less than the amount shown in the cost scenario columns. The three cost scenarios chosen for this analysis are 40 cents, 60 cents, and \$1. However, because the average price is either lower than 40 cents or higher than \$1, all of the scenarios for 2005 provide the same result. There are variations among the scenarios for 2006.

For the Hep A and Hep B vaccines, the maximum price differential during the period shown is .35. If any of the scenarios used in this analysis were adopted as policy by the state, these vaccines would be purchased equally from each manufacturer. For DTaP, the current price differential is \$1 and the 2005 maximum differential was 50 cents. Unless the state adopted the \$1 differential policy, this vaccine would only be purchased from the lowest-priced manufacturer. For Tdap, the price of the two vaccines is currently the same, so the state is currently purchasing from both manufacturers equally.

The cost scenarios based on 2005 data for state and local vaccine purchases show a cost savings over the actual purchases made by the state. There are at least two possible reasons for this. First, the state may have made purchases from a higher-priced manufacturer due to a shortage or delay from the lowest-priced manufacturer. Second, the dates of purchases are unknown, so the price in effect for specific purchases is also unknown. As a result, the average price might not adequately reflect the volume of purchases made for each price. Also, the state delayed implementation of the Tdap vaccine that was new in 2005 and was not purchased by the Texas program until an existing supply of Td was exhausted.

**2005 Texas VFC Purchases Scenarios**

									Cost Differential Scenarios		
Vaccine	NDC #	Brand Name	Packaging	Manufacturer	2005 VFC Doses Purchased	Average 2005 CDC Price	2005 Price Change	2005 Actual Cost	.40 cents	.60 cents	\$1
DTAP	49281-298-10	Tripedia	10 single dose vials	sanofi pasteur	585,500	\$ 12.53	\$ (0.50)	\$ 7,127,375	\$ 4,356,535	\$ 4,356,535	\$ 4,356,535
DTAP	49281-286-10	Daptacel	5 single dose vials	sanofi pasteur		\$ 12.97	\$ (0.50)				
		<b>T - sanofi pasteur</b>			<b>585,500</b>			<b>\$ 7,127,375</b>	<b>\$ 4,356,535</b>	<b>\$ 4,356,535</b>	<b>\$ 4,356,535</b>
DTAP	58160-0840-11	Infanrix	10 single dose vials	GSK	110,000	\$ 12.75	\$ -	\$ 1,402,500	\$ 4,433,813	\$ 4,433,813	\$ 4,433,813
DTAP	58160-0840-46	Infanrix	5 single dose syringes	GSK		\$ 12.75	\$ -	\$ -			
		<b>T - GSK</b>			<b>110,000</b>			<b>\$ 1,402,500</b>	<b>\$ 4,433,813</b>	<b>\$ 4,433,813</b>	<b>\$ 4,433,813</b>
		<b>DTAP TOTAL</b>			<b>695,500</b>	<b>\$ 0.22</b>		<b>\$ 8,529,875</b>	<b>\$ 8,790,347</b>	<b>\$ 8,790,347</b>	<b>\$ 8,790,347</b>
HEP A	0006-4831-41	Vaqta	10 single dose vials	<b>T - Merck</b>	<b>241,820</b>	<b>\$ 12.14</b>	<b>\$ (0.05)</b>	<b>\$ 2,926,392</b>	<b>\$ 3,098,291</b>	<b>\$ 3,098,291</b>	<b>\$ 3,098,291</b>
HEP A	58160-0837-01	Havrix	single dose vials	GSK	144,420	\$ 12.17	\$ (0.15)	\$ 1,747,482	\$ 3,103,960	\$ 3,103,960	\$ 3,103,960
HEP A	58160-0837-11	Havrix	10 single dose vials	GSK	124,000	\$ 12.17	\$ (0.15)	\$ 1,500,400			
HEP A-AD	58160-0835-01	Havrix	5 single dose syringes	GSK	-						
		<b>T - GSK</b>			<b>268,420</b>			<b>\$ 3,247,882</b>	<b>\$ 3,103,960</b>	<b>\$ 3,103,960</b>	<b>\$ 3,103,960</b>
		<b>HEP A TOTAL</b>			<b>510,240</b>	<b>\$ 0.02</b>		<b>\$ 6,174,274</b>	<b>\$ 6,202,251</b>	<b>\$ 6,202,251</b>	<b>\$ 6,202,251</b>
HEP B -A	0006-4995-00	Recombivax	10 single dose vials	Merck	-			\$ -	\$ -	\$ -	\$ -
HEP B-PF	0006-4981-00	Recombivax	10 single dose vials	Merck	254,370	\$ 9.16	\$ (0.35)	\$ 2,289,330	\$ 2,192,893	\$ 2,192,893	\$ 2,192,893
		<b>T - Merck</b>			<b>254,370</b>			<b>\$ 2,289,330</b>	<b>\$ 2,192,893</b>	<b>\$ 2,192,893</b>	<b>\$ 2,192,893</b>
HEP B-PF	58160-0856-01	Engerix B	single dose vials	GSK	34,370	\$ 9.00	\$ -	\$ 309,330	\$ 2,155,635	\$ 2,155,635	\$ 2,155,635
HEP B-PF	58160-0856-11	Engerix B	10 single dose vials	GSK	190,290	\$ 9.00	\$ -	\$ 1,712,610			
		<b>T - GSK</b>			<b>224,660</b>			<b>\$ 2,021,940</b>	<b>\$ 2,155,635</b>	<b>\$ 2,155,635</b>	<b>\$ 2,155,635</b>
		<b>HEP B TOTAL</b>			<b>479,030</b>	<b>\$ 0.16</b>		<b>\$ 4,311,270</b>	<b>\$ 4,348,528</b>	<b>\$ 4,348,528</b>	<b>\$ 4,348,528</b>
TDAP	49281-400-10	Adacel	10 single dose vials	sanofi pasteur		\$ 30.75	\$ -		\$ -	\$ -	\$ -
TDAP	58160-0842-11	Boostrix	10 single dose vials	GSK	71,470	\$ 28.75	\$ -	\$ 2,054,763	\$ 2,054,763	\$ 2,054,763	\$ 2,054,763
		<b>TDAP TOTAL</b>			<b>71,470</b>	<b>\$ 2.00</b>		<b>\$ 2,054,763</b>	<b>\$ 2,054,763</b>	<b>\$ 2,054,763</b>	<b>\$ 2,054,763</b>
						<b>Price Differential</b>					
		<b>TOTALS</b>			<b>1,756,240</b>			<b>\$ 21,070,182</b>	<b>\$ 21,395,888</b>	<b>\$ 21,395,888</b>	<b>\$ 21,395,888</b>
		<b>Scenario (savings)/cost compared to 2005 actual cost</b>							<b>\$ 325,707</b>	<b>\$ 325,707</b>	<b>\$ 325,707</b>
		<b>Percent of 2005 actual cost</b>							<b>1.55%</b>	<b>1.55%</b>	<b>1.55%</b>

**2005 Texas State/Local Purchases Scenarios**

										Cost Differential Scenarios		
Vaccine	NDC #	Brand Name	Packaging	Manufacturer	2005 State/Local Doses Purchased	Average 2005 CDC Price	2005 Price Change	2005 Actual Cost				
									.40 cents	.60 cents	\$1	
DTAP	49281-298-10	Tripedia	10 single dose vials	sanofi pasteur	41,620	\$ 12.53	\$ (0.50)	\$ 526,655	\$ 471,295	\$ 471,295	\$ 471,295	
DTAP	49281-286-10	Daptacel	5 single dose vials	sanofi pasteur		\$ 12.97	\$ (0.50)					
		<b>T - sanofi pasteur</b>			<b>41,620</b>			<b>\$ 526,655</b>	<b>\$ 471,295</b>	<b>\$ 471,295</b>	<b>\$ 471,295</b>	
DTAP	58160-0840-11	Infanrix	10 single dose vials	GSK	-	\$ 12.75	\$ -	\$ -	\$ 479,655	\$ 479,655	\$ 479,655	
DTAP	58160-0840-46	Infanrix	5 single dose syringes	GSK	33,620	\$ 12.75	\$ -	\$ 428,655				
		<b>T - GSK</b>			<b>33,620</b>			<b>\$ 428,655</b>	<b>\$ 479,655</b>	<b>\$ 479,655</b>	<b>\$ 479,655</b>	
		<b>DTAP TOTAL</b>			<b>75,240</b>	<b>\$ 0.22</b>		<b>\$ 955,310</b>	<b>\$ 950,950</b>	<b>\$ 950,950</b>	<b>\$ 950,950</b>	
HEP A	0006-4831-41	Vaqta	10 single dose vials	<b>T - Merck</b>	<b>253,230</b>	<b>\$ 12.14</b>	<b>\$ (0.05)</b>	<b>\$ 3,071,691</b>	<b>\$ 1,599,363</b>	<b>\$ 1,599,363</b>	<b>\$ 1,599,363</b>	
HEP A	58160-0837-01	Havrix	single dose vials	GSK	5,000	\$ 12.17	\$ (0.15)	\$ 60,500	\$ 1,602,289	\$ 1,602,289	\$ 1,602,289	
HEP A	58160-0837-11	Havrix	10 single dose vials	GSK	1,080	\$ 12.17	\$ (0.15)	\$ 13,068				
HEP A-AD	58160-0835-01	Havrix	5 single dose syringes	GSK	4,080			\$ 75,480				
		<b>T - GSK</b>			<b>10,160</b>			<b>\$ 149,048</b>	<b>\$ 1,602,289</b>	<b>\$ 1,602,289</b>	<b>\$ 1,602,289</b>	
		<b>HEP A TOTAL</b>			<b>263,390</b>	<b>\$ 0.02</b>		<b>\$ 3,220,739</b>	<b>\$ 3,201,652</b>	<b>\$ 3,201,652</b>	<b>\$ 3,201,652</b>	
HEP B -A	0006-4995-00	Recombivax	10 single dose vials	Merck	6,866			\$ 132,926				
HEP B-PF	0006-4981-00	Recombivax	10 single dose vials	Merck	23,580	\$ 9.16	\$ (0.35)	\$ 212,220	\$ 176,821	\$ 176,821	\$ 176,821	
		<b>T - Merck</b>			<b>30,446</b>			<b>\$ 345,146</b>	<b>\$ 176,821</b>	<b>\$ 176,821</b>	<b>\$ 176,821</b>	
HEP B-PF	58160-0856-01	Engerix B	single dose vials	GSK	2,500	\$ 9.00	\$ -	\$ 22,500	\$ 173,817	\$ 173,817	\$ 173,817	
HEP B-PF	58160-0856-11	Engerix B	10 single dose vials	GSK	5,680	\$ 9.00	\$ -	\$ 51,120				
		<b>T - GSK</b>			<b>8,180</b>			<b>\$ 73,620</b>	<b>\$ 173,817</b>	<b>\$ 173,817</b>	<b>\$ 173,817</b>	
		<b>HEP B TOTAL</b>			<b>38,626</b>	<b>\$ 0.16</b>		<b>\$ 418,766</b>	<b>\$ 350,638</b>	<b>\$ 350,638</b>	<b>\$ 350,638</b>	
TDAP	49281-400-10	Adacel	10 single dose vials	sanofi pasteur		\$ 30.75	\$ -					
TDAP	58160-0842-11	Boostrix	10 single dose vials	GSK	7,300	\$ 28.75	\$ -	\$ 209,875	\$ 209,875	\$ 209,875	\$ 209,875	
		<b>TDAP TOTAL</b>			<b>7,300</b>	<b>\$ 2.00</b>		<b>\$ 209,875</b>	<b>\$ 209,875</b>	<b>\$ 209,875</b>	<b>\$ 209,875</b>	
						<b>Price Differential</b>						
		<b>TOTALS</b>			<b>384,556</b>			<b>\$ 4,804,689</b>	<b>\$ 4,713,115</b>	<b>\$ 4,713,115</b>	<b>\$ 4,713,115</b>	
		<b>Scenario (savings)/cost compared to 2005 actual cost</b>							<b>\$ (91,574)</b>	<b>\$ (91,574)</b>	<b>\$ (91,574)</b>	
		<b>Percent of 2005 actual cost</b>							<b>-1.91%</b>	<b>-1.91%</b>	<b>-1.91%</b>	

## 2005 Texas 317 Purchases Scenarios

									Cost Differential Scenarios		
Vaccine	NDC #	Brand Name	Packaging	Manufacturer	2005 317 Doses Purchased	Average 2005 CDC Price	2005 Price Change	2005 Actual Cost	.40 cents	.60 cents	\$1
DTAP	49281-298-10	Tripedia	10 single dose vials	sanofi pasteur	6,500	\$ 12.53	\$ (0.50)	\$ 79,625	\$ 81,431	\$ 40,715	\$ 40,715
DTAP	49281-286-10	Daptacel	5 single dose vials	sanofi pasteur		\$ 12.97	\$ (0.50)				
<b>T - sanofi pasteur</b>					<b>6,500</b>			<b>\$ 79,625</b>	<b>\$ 81,431</b>	<b>\$ 40,715</b>	<b>\$ 40,715</b>
DTAP	58160-0840-11	Infanrix	10 single dose vials	GSK	-	\$ 12.75	\$ -	\$ -		\$ 41,438	\$ 41,438
DTAP	58160-0840-46	Infanrix	5 single dose syringes	GSK	-	\$ 12.75	\$ -	\$ -			
<b>T - GSK</b>					<b>-</b>			<b>\$ -</b>	<b>\$ -</b>	<b>\$ 41,438</b>	<b>\$ 41,438</b>
<b>DTAP TOTAL</b>					<b>6,500</b>	<b>\$ 0.22</b>		<b>\$ 79,625</b>	<b>\$ 81,431</b>	<b>\$ 82,153</b>	<b>\$ 82,153</b>
HEP A	0006-4831-41	Vaqta	10 single dose vials	<b>T- Merck</b>	<b>550</b>	<b>\$ 12.14</b>	<b>\$ (0.05)</b>	<b>\$ 6,655</b>	<b>\$ 12,752</b>	<b>\$ 12,752</b>	<b>\$ 12,752</b>
HEP A	58160-0837-01	Havrix	single dose vials	GSK	1,550	\$ 12.17	\$ (0.15)	\$ 18,755	\$ 12,775	\$ 12,775	\$ 12,775
HEP A	58160-0837-11	Havrix	10 single dose vials	GSK	-	\$ 12.17	\$ (0.15)	\$ -			
HEP A-AD	58160-0835-01	Havrix	5 single dose syringes	GSK	-			\$ -			
<b>T - GSK</b>					<b>1,550</b>			<b>\$ 18,755</b>	<b>\$ 12,775</b>	<b>\$ 12,775</b>	<b>\$ 12,775</b>
<b>HEP A TOTAL</b>					<b>2,100</b>	<b>\$ 0.02</b>		<b>\$ 25,410</b>	<b>\$ 25,527</b>	<b>\$ 25,527</b>	<b>\$ 25,527</b>
HEP B -A	0006-4995-00	Recombivax	10 single dose vials	Merck	-			\$ -			
HEP B-PF	0006-4981-00	Recombivax	10 single dose vials	Merck	550	\$ 9.16	\$ (0.35)	\$ 4,950	\$ 5,036	\$ 5,036	\$ 5,036
<b>T - Merck</b>					<b>550</b>			<b>\$ 4,950</b>	<b>\$ 5,036</b>	<b>\$ 5,036</b>	<b>\$ 5,036</b>
HEP B-PF	58160-0856-01	Engerix B	single dose vials	GSK	550	\$ 9.00	\$ -	\$ 4,950	\$ 4,950	\$ 4,950	\$ 4,950
HEP B-PF	58160-0856-11	Engerix B	10 single dose vials	GSK	-	\$ 9.00	\$ -	\$ -			
<b>T - GSK</b>					<b>550</b>			<b>\$ 4,950</b>	<b>\$ 4,950</b>	<b>\$ 4,950</b>	<b>\$ 4,950</b>
<b>HEP B TOTAL</b>					<b>1,100</b>	<b>\$ 0.16</b>		<b>\$ 9,900</b>	<b>\$ 9,986</b>	<b>\$ 9,986</b>	<b>\$ 9,986</b>
TDAP	49281-400-10	Adacel	10 single dose vials	sanofi pasteur		\$ 30.75	\$ -		\$ -	\$ -	\$ -
TDAP	58160-0842-11	Boostrix	10 single dose vials	GSK	-	\$ 28.75	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TDAP TOTAL</b>					<b>-</b>	<b>\$ 2.00</b>		<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTALS</b>					<b>9,700</b>			<b>\$ 114,935</b>	<b>\$ 116,943</b>	<b>\$ 117,665</b>	<b>\$ 117,665</b>
<b>Scenario (savings)/cost compared to 2005 actual cost</b>									<b>\$ 2,008</b>	<b>\$ 2,730</b>	<b>\$ 2,730</b>
<b>Percent of 2005 actual cost</b>									<b>1.75%</b>	<b>2.38%</b>	<b>2.38%</b>

Price  
Differential

**2006 (Qtr 1 and Qtr 2) Texas VFC Purchases Scenarios**

2006 (Qtr 1&2)									Cost Differential Scenarios		
Vaccine	NDC #	Brand Name	Packaging	Manufacturer	VFC Doses Purchased	Average 2006 CDC Price	2006 Price Change	2006 Actual Cost	.40 cents	.60 cents	\$1
DTAP	49281-298-10	Tripedia	10 single dose vials	sanofi pasteur	279,290	\$ 12.25	\$ -	\$ 3,421,303	\$ 3,421,303	\$ 3,421,303	\$ 1,710,651
DTAP	49281-286-10	Daptacel	5 single dose vials	sanofi pasteur		\$ 12.75	\$ -				
<b>T - sanofi pasteur</b>					<b>279,290</b>			<b>\$ 3,421,303</b>	<b>\$ 3,421,303</b>	<b>\$ 3,421,303</b>	<b>\$ 1,710,651</b>
DTAP	58160-0840-11	Infanrix	10 single dose vials	GSK		\$ 13.00	\$ 0.50				\$ 1,815,385
DTAP	58160-0840-46	Infanrix	5 single dose syringes	GSK		\$ 13.00	\$ 0.50				\$ 1,815,385
<b>T - GSK</b>					<b>-</b>			<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,815,385</b>
<b>DTAP TOTAL</b>					<b>279,290</b>	<b>\$ 0.75</b>		<b>\$ 3,421,303</b>	<b>\$ 3,421,303</b>	<b>\$ 3,421,303</b>	<b>\$ 3,526,036</b>
HEP A	0006-4831-41	Vaqta	10 single dose vials	<b>T - Merck</b>	359,340	\$ 12.10	\$ -	\$ 4,348,014	\$ 2,492,963	\$ 2,492,963	\$ 2,492,963
HEP A	58160-0837-01	Havrix	single dose vials	GSK		\$ 12.18	\$ 0.15		\$ 2,508,415	\$ 2,508,415	\$ 2,508,415
HEP A	58160-0837-11	Havrix	10 single dose vials	GSK	52,720	\$ 12.18	\$ 0.15	\$ 637,912			
HEP A-AD	58160-0835-01	Havrix	5 single dose syringes	GSK							
<b>T - GSK</b>					<b>52,720</b>			<b>\$ 637,912</b>	<b>\$ 2,508,415</b>	<b>\$ 2,508,415</b>	<b>\$ 2,508,415</b>
<b>HEP A TOTAL</b>					<b>412,060</b>	<b>\$ 0.08</b>		<b>\$ 4,985,926</b>	<b>\$ 5,001,378</b>	<b>\$ 5,001,378</b>	<b>\$ 5,001,378</b>
HEP B -A	0006-4995-00	Recombivax	10 single dose vials	Merck					\$ 580,410	\$ 580,410	\$ 580,410
HEP B-PF	0006-4981-00	Recombivax	10 single dose vials	Merck	77,600	\$ 9.00	\$ -	\$ 698,400			
<b>T - Merck</b>					<b>77,600</b>			<b>\$ 698,400</b>	<b>\$ 580,410</b>	<b>\$ 580,410</b>	<b>\$ 580,410</b>
HEP B-PF	58160-0856-01	Engerix B	single dose vials	GSK		\$ 9.05	\$ 0.10		\$ 583,635	\$ 583,635	\$ 583,635
HEP B-PF	58160-0856-11	Engerix B	10 single dose vials	GSK	51,380	\$ 9.05	\$ 0.10	\$ 462,420			
<b>T - GSK</b>					<b>51,380</b>			<b>\$ 462,420</b>	<b>\$ 583,635</b>	<b>\$ 583,635</b>	<b>\$ 583,635</b>
<b>HEP B TOTAL</b>					<b>128,980</b>	<b>\$ 0.05</b>		<b>\$ 1,160,820</b>	<b>\$ 1,164,045</b>	<b>\$ 1,164,045</b>	<b>\$ 1,164,045</b>
TDAP	49281-400-10	Adacel	10 single dose vials	sanofi pasteur	57,410	\$ 30.75	\$ -	\$ 1,765,358			\$ 2,039,648
TDAP	58160-0842-11	Boostrix	10 single dose vials	GSK	75,250	\$ 29.75	\$ 2.00	\$ 2,278,258	\$ 3,946,635	\$ 3,946,635	\$ 1,973,318
<b>TDAP TOTAL</b>					<b>132,660</b>	<b>\$ 1.00</b>		<b>\$ 4,043,615</b>	<b>\$ 3,946,635</b>	<b>\$ 3,946,635</b>	<b>\$ 4,012,965</b>
						<b>Price Differential</b>					
<b>TOTALS</b>					<b>952,990</b>			<b>\$ 13,611,664</b>	<b>\$ 13,533,360</b>	<b>\$ 13,533,360</b>	<b>\$ 13,704,424</b>
<b>Scenario (savings)/cost compared to 2006 actual cost</b>									<b>\$ (78,303)</b>	<b>\$ (78,303)</b>	<b>\$ 92,761</b>
<b>Percent of 2006 actual cost</b>									<b>-0.58%</b>	<b>-0.58%</b>	<b>0.68%</b>

**2006 (Qtr 1 and Qtr 2) Texas State/Local Purchases Scenarios**

										Cost Differential Scenarios		
Vaccine	NDC_NO	Brand Name	Packaging	MFG	2006 (Qtr 1&2)		Average 2006 CDC Price	2006 Price Change	2006 Actual Cost			
					State/Local Doses Purchased					.40 cents	.60 cents	\$1
DTAP	49281-298-10	Tripedia	10 single dose vials	sanofi pasteur	6,090	\$	12.25	\$ -	\$ 74,603	\$ 74,603	\$ 74,603	\$ 37,301
DTAP	49281-286-10	Daptacel	5 single dose vials	sanofi pasteur		\$	12.75	\$ -				
<b>T - sanofi pasteur</b>					<b>6,090</b>				<b>\$ 74,603</b>	<b>\$ 74,603</b>	<b>\$ 74,603</b>	<b>\$ 37,301</b>
DTAP	58160-0840-11	Infanrix	10 single dose vials	GSK		\$	13.00	\$ 0.50				\$ 39,585
DTAP	58160-0840-46	Infanrix	5 single dose syringes	GSK		\$	13.00	\$ 0.50				
<b>T - GSK</b>					<b>-</b>				<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 39,585</b>
<b>DTAP TOTAL</b>					<b>6,090</b>	<b>\$</b>	<b>0.75</b>		<b>\$ 74,603</b>	<b>\$ 74,603</b>	<b>\$ 74,603</b>	<b>\$ 76,886</b>
HEP A	0006-4831-41	Vaqta	10 single dose vials	<b>T - Merck</b>	44,170	<b>\$</b>	<b>12.10</b>	<b>\$ -</b>	<b>\$ 534,457</b>	<b>\$ 305,223</b>	<b>\$ 305,223</b>	<b>\$ 305,223</b>
HEP A	58160-0837-01	Havrix	single dose vials	GSK		\$	12.18	\$ 0.15		\$ 307,114	\$ 307,114	\$ 307,114
HEP A	58160-0837-11	Havrix	10 single dose vials	GSK	6,280	\$	12.18	\$ 0.15	\$ 75,988			
HEP A-AD	58160-0835-01	Havrix	5 single dose syringes	GSK								
<b>T - GSK</b>					<b>6,280</b>				<b>\$ 75,988</b>	<b>\$ 307,114</b>	<b>\$ 307,114</b>	<b>\$ 307,114</b>
<b>HEP A TOTAL</b>					<b>50,450</b>	<b>\$</b>	<b>0.08</b>		<b>\$ 610,445</b>	<b>\$ 612,337</b>	<b>\$ 612,337</b>	<b>\$ 612,337</b>
HEP B -A	0006-4995-00	Recombivax	10 single dose vials	Merck								
HEP B-PF	0006-4981-00	Recombivax	10 single dose vials	Merck	1,960	\$	9.00	\$ -	\$ 17,640	\$ 13,095	\$ 13,095	\$ 13,095
<b>T - Merck</b>					<b>1,960</b>				<b>\$ 17,640</b>	<b>\$ 13,095</b>	<b>\$ 13,095</b>	<b>\$ 13,095</b>
HEP B-PF	58160-0856-01	Engerix B	single dose vials	GSK		\$	9.05	\$ 0.10		\$ 13,168	\$ 13,168	\$ 13,168
HEP B-PF	58160-0856-11	Engerix B	10 single dose vials	GSK	950	\$	9.05	\$ 0.10	\$ 8,550			
<b>T - GSK</b>					<b>950</b>				<b>\$ 8,550</b>	<b>\$ 13,168</b>	<b>\$ 13,168</b>	<b>\$ 13,168</b>
<b>HEP B TOTAL</b>					<b>2,910</b>	<b>\$</b>	<b>0.05</b>		<b>\$ 26,190</b>	<b>\$ 26,263</b>	<b>\$ 26,263</b>	<b>\$ 26,263</b>
TDAP	49281-400-10	Adacel	10 single dose vials	sanofi pasteur	3,870	\$	30.75	\$ -	\$ 119,003			\$ 153,135
TDAP	58160-0842-11	Boostrix	10 single dose vials	GSK	6,090	\$	29.75	\$ 2.00	\$ 182,848	\$ 296,310	\$ 296,310	\$ 148,155
<b>TDAP TOTAL</b>					<b>9,960</b>	<b>\$</b>	<b>1.00</b>		<b>\$ 301,850</b>	<b>\$ 296,310</b>	<b>\$ 296,310</b>	<b>\$ 301,290</b>
							Price Differential					
<b>TOTALS</b>					<b>69,410</b>				<b>\$ 1,013,088</b>	<b>\$ 1,009,512</b>	<b>\$ 1,009,512</b>	<b>\$ 1,016,776</b>
Scenario (savings)/cost compared to 2006 actual cost										<b>\$ (3,575)</b>	<b>\$ (3,575)</b>	<b>\$ 3,688</b>
Percent of 2006 actual cost										<b>-0.35%</b>	<b>-0.35%</b>	<b>0.36%</b>

**2006 (Qtr 1 and Qtr 2) Texas 317 Purchases Scenarios**

										Cost Differential Scenarios		
Vaccine	NDC #	Brand Name	Packaging	Manufacturer	2006 (Qtr 1&2) 317 Doses Purchased	Average 2006 CDC Price	2006 Price Change	2006 Actual Cost	.40 cents	.60 cents	\$1	
DTAP	49281-298-10	Tripedia	10 single dose vials	sanofi pasteur	6,240	\$ 12.25	\$ -	\$ 76,440	\$ 76,440	\$ 76,440	\$ 38,220	
DTAP	49281-286-10	Daptacel	5 single dose vials	sanofi pasteur		\$ 12.75	\$ -					
		<b>T - sanofi pasteur</b>			<b>6,240</b>			<b>\$ 76,440</b>	<b>\$ 76,440</b>	<b>\$ 76,440</b>	<b>\$ 38,220</b>	
DTAP	58160-0840-11	Infanrix	10 single dose vials	GSK		\$ 13.00	\$ 0.50				\$ 40,560	
DTAP	58160-0840-46	Infanrix	5 single dose syringes	GSK		\$ 13.00	\$ 0.50				\$ 40,560	
		<b>T - GSK</b>			<b>-</b>			<b>\$ -</b>			<b>\$ 40,560</b>	
		<b>DTAP TOTAL</b>			<b>6,240</b>	<b>\$ 0.75</b>		<b>\$ 76,440</b>	<b>\$ 76,440</b>	<b>\$ 76,440</b>	<b>\$ 78,780</b>	
HEP A	0006-4831-41	Vaqta	10 single dose vials	<b>T - Merck</b>	13,560	\$ 12.10	\$ -	\$ 164,076	\$ 100,430	\$ 100,430	\$ 100,430	
HEP A	58160-0837-01	Havrix	single dose vials	GSK		\$ 12.18	\$ 0.15		\$ 101,053	\$ 101,053	\$ 101,053	
HEP A	58160-0837-11	Havrix	10 single dose vials	GSK	3,040	\$ 12.18	\$ 0.15	\$ 36,784				
HEP A-AD	58160-0835-01	Havrix	5 single dose syringes	GSK								
		<b>T - GSK</b>			<b>3,040</b>			<b>\$ 36,784</b>	<b>\$ 101,053</b>	<b>\$ 101,053</b>	<b>\$ 101,053</b>	
		<b>HEP A TOTAL</b>			<b>16,600</b>	<b>\$ 0.08</b>		<b>\$ 200,860</b>	<b>\$ 201,483</b>	<b>\$ 201,483</b>	<b>\$ 201,483</b>	
HEP B -A	0006-4995-00	Recombivax	10 single dose vials	Merck					\$ -	\$ -	\$ -	
HEP B-PF	0006-4981-00	Recombivax	10 single dose vials	Merck	2,090	\$ 9.00	\$ -	\$ 18,810	\$ 15,480	\$ 15,480	\$ 15,480	
		<b>T - Merck</b>			<b>2,090</b>			<b>\$ 18,810</b>	<b>\$ 15,480</b>	<b>\$ 15,480</b>	<b>\$ 15,480</b>	
HEP B-PF	58160-0856-01	Engerix B	single dose vials	GSK		\$ 9.05	\$ 0.10		\$ 15,566	\$ 15,566	\$ 15,566	
HEP B-PF	58160-0856-11	Engerix B	10 single dose vials	GSK	1,350	\$ 9.05	\$ 0.10	\$ 12,150				
		<b>T - GSK</b>			<b>1,350</b>			<b>\$ 12,150</b>	<b>\$ 15,566</b>	<b>\$ 15,566</b>	<b>\$ 15,566</b>	
		<b>HEP B TOTAL</b>			<b>3,440</b>	<b>\$ 0.05</b>		<b>\$ 30,960</b>	<b>\$ 31,046</b>	<b>\$ 31,046</b>	<b>\$ 31,046</b>	
TDAP	49281-400-10	Adacel	10 single dose vials	sanofi pasteur	2,700	\$ 30.75	\$ -	\$ 83,025			\$ 149,138	
TDAP	58160-0842-11	Boostrix	10 single dose vials	GSK	7,000	\$ 29.75	\$ 2.00	\$ 210,530	\$ 288,575	\$ 288,575	\$ 144,288	
		<b>TDAP TOTAL</b>			<b>9,700</b>	<b>\$ 1.00</b>		<b>\$ 293,555</b>	<b>\$ 288,575</b>	<b>\$ 288,575</b>	<b>\$ 293,425</b>	
						Price Differential						
		<b>TOTALS</b>			<b>35,980</b>			<b>\$ 601,815</b>	<b>\$ 597,544</b>	<b>\$ 597,544</b>	<b>\$ 604,734</b>	
		<b>Scenario (savings)/cost compared to 2006 actual cost</b>							<b>\$ (4,272)</b>	<b>\$ (4,272)</b>	<b>\$ 2,919</b>	
		<b>Percent of 2006 actual cost</b>							<b>-0.71%</b>	<b>-0.71%</b>	<b>0.48%</b>	

## Appendix B: Immunization Rates

The table below shows immunization rates and state ranking. The states highlighted were contacted for this report.

Estimated Vaccination Coverage <sup>1</sup> with Individual Vaccines and Selected Vaccination Series Among Children 19-35 Months of Age by State and Immunization Action Plan Area U.S. National Immunization Survey, 2004 <sup>2</sup>						
	Universal?	Choice?	Rank: 4:3:1 <sup>3</sup>	4:3:1 <sup>3,4</sup>	Rank: 4:3:1:3 <sup>5</sup>	4:3:1:3 <sup>4,5</sup>
Massachusetts			1	91.5	1	90.9
Rhode Island			2	90.9	6	88.2
Florida		✓	3	90.1	2	89.7
Vermont			4	89.6	4	88.8
New Hampshire			5	89.5	3	89.0
South Dakota		✓	6	89.2	7	88.0
Connecticut		✓	7	88.9	5	88.7
Iowa		✓	8	88.0	11	86.1
West Virginia		✓	9	87.7	8	87.7
Pennsylvania			10	87.3	9	87.1
Georgia			11	86.7	16	85.5
Minnesota		✓	12	86.5	15	85.7
Delaware		✓	13	86.4	10	86.4
Illinois		✓	14	86.4	23	83.7
Mississippi			15	86.4	14	85.8
District of Columbia	n/a	n/a	16	86.3	12	86.0
Wisconsin		✓	17	86.3	17	85.1
Maine			18	86.2	18	85.0
Missouri		✓	19	86.0	13	86.0
Virginia			20	85.6	24	83.4
Arkansas			21	84.9	19	84.9
Wyoming		✓	22	84.9	21	84.1
New Mexico			23	84.8	20	84.8
North Dakota			24	84.7	22	84.0
New York			25	84.6	30	82.8
Tennessee			26	84.3	26	83.2
Alabama			27	84.1	28	83.0
California		✓	28	84.1	27	83.1

**Estimated Vaccination Coverage<sup>1</sup> with Individual Vaccines and Selected Vaccination Series  
Among Children 19-35 Months of Age by State and Immunization Action Plan Area  
U.S. National Immunization Survey, 2004<sup>2</sup>**

	<b>Universal?</b>	<b>Choice?</b>	<b>Rank: 4:3:1<sup>3</sup></b>	<b>4:3:1<sup>3,4</sup></b>	<b>Rank: 4:3:1:3<sup>5</sup></b>	<b>4:3:1:3<sup>4,5</sup></b>
<b>New Jersey</b>		✓	29	84.1	25	83.3
<b>Hawaii</b>			30	83.4	31	82.6
<b>Michigan</b>		✓	31	83.1	37	81.3
<b>Ohio</b>			32	83.1	34	82.2
<b>Nebraska</b>			33	83.0	29	83.0
<b>Idaho</b>	✓	✓	34	82.8	32	82.6
<b>South Carolina</b>			35	82.8	35	82.2
<b>Montana</b>			36	82.6	36	81.6
<b>North Carolina</b>	✓		37	82.5	33	82.3
<b>Washington</b>	✓		38	82.4	40	81.2
<b>Arizona</b>		✓	39	81.8	42	81.0
<b>Oregon</b>		✓	40	81.8	41	81.1
<b>Indiana</b>		✓	41	81.3	38	81.3
<b>Maryland</b>		✓	42	81.3	39	81.3
<b>Kansas</b>		✓	43	80.6	45	79.5
<b>Kentucky</b>		✓	44	80.4	43	80.4
<b>Colorado</b>		✓	45	80.1	44	80.1
<b>Alaska</b>	✓		46	78.2	47	76.1
<b>Louisiana</b>			47	76.9	46	76.3
<b>Texas</b>			48	75.4	49	74.4
<b>Utah</b>		✓	49	75.4	48	75.2
<b>Oklahoma</b>		✓	50	74.8	50	72.6
<b>Nevada</b>	✓	✓	51	71.3	51	70.6
<b>U.S. National</b>				83.5		82.5

Source: Centers for Disease Control, National Immunization Program. [http://www.cdc.gov/nip/coverage/nis/04/tab02\\_antigen\\_iap.xls](http://www.cdc.gov/nip/coverage/nis/04/tab02_antigen_iap.xls)

Notes:

<sup>1</sup>Estimate is not available if the unweighted sample size for the numerator was <30 or (CI half width)/Estimate > 0.5 or (CI half width) >10.

<sup>2</sup>Children in the Q1/2004-Q4/2004 National Immunization Survey were born between February 2001 and May 2003.

<sup>3</sup>Four or more doses of any diphtheria and tetanus toxoids and pertussis vaccines, including diphtheria and tetanus toxoids, and any acellular pertussis vaccine (DTP/DTaP/DT), three or more doses of poliovirus vaccine, and one or more doses of any measles-containing vaccine (MCV).

<sup>4</sup>Numbers represent percentages. Reported statistical variations were removed from the vaccination coverage estimates for ranking purposes.

<sup>5</sup>Four or more doses of DTP/DTaP/DT, three or more doses of poliovirus vaccine, one or more doses of any MCV, and three or more doses of *Haemophilus influenzae* type b (Hib).

n/a = not available

## Appendix C: Provider Participation

The table below shows the provider sites participating in the Vaccines for Children (VFC) programs. The states highlighted were contacted for this report. Universal states provide all vaccines for all children and choice states allow providers to purchase whichever vaccines they choose.

CY 2002 Active Provider Sites											
Project Name	Universal?	Choice?	Public Health Dept. Clinics	Public Migrant/Community Health Centers & Rural Health	Public Indian Health Svcs./Tribal Clinics	Other Public Provider Sites	Total Public Providers	Private Provider Sites	Total Provider Sites	Private Provider Sites as % of Total Sites	Rank
Maryland		✓	44	20	0	4	68	676	744	90.9%	1
California		✓	203	156	0	0	359	3,423	3,782	90.5%	2
Hawaii			12	13	0	10	35	241	276	87.3%	3
Pennsylvania			74	114	0	23	211	1,452	1,663	87.3%	4
New York			90	19	7	103	219	1,474	1,693	87.1%	5
Florida		✓	190	50	4	0	244	1,564	1,808	86.5%	6
New Jersey		✓	115	29	0	14	158	875	1,033	84.7%	7
Michigan		✓	124	184	9	0	317	1,382	1,699	81.3%	8
Maine	✓		17	47	3	24	91	382	473	80.8%	9
Delaware		✓	8	4	0	33	45	178	223	79.8%	10
Connecticut	✓	✓	25	28	0	51	104	409	513	79.7%	11
Ohio			141	68	0	49	258	823	1,081	76.1%	12
Indiana		✓	95	49	0	51	195	614	809	75.9%	13
Arizona		✓	51	43	26	54	174	529	703	75.2%	14
Nevada	✓	✓	20	18	10	20	68	205	273	75.1%	15
Vermont	✓		12	27	0	1	40	116	156	74.4%	16
Virgin Islands	n/a	n/a	7	0	0	0	7	20	27	74.1%	17
Oregon		✓	49	49	10	31	139	391	530	73.8%	18
Massachusetts	✓		111	69	0	277	457	1,238	1,695	73.0%	19
Alaska	✓		26	2	17	4	49	124	173	71.7%	20
Virginia			135	66	0	13	214	517	731	70.7%	21
Wisconsin		✓	103	24	11	24	162	386	548	70.4%	22
Utah		✓	48	23	2	16	89	211	300	70.3%	23
Wyoming		✓	30	13	2	0	45	106	151	70.2%	24
Washington	✓		63	139	26	123	351	816	1,167	69.9%	25
North Carolina	✓		103	112	1	152	368	793	1,161	68.3%	26
Nebraska			52	28	4	0	84	177	261	67.8%	27
Illinois		✓	257	90	0	49	396	792	1,188	66.7%	28
Tennessee		✓	130	56	0	31	217	430	647	66.5%	29
New Hampshire	✓		3	32	0	96	131	241	372	64.8%	30

**CY 2002 Active Provider Sites**

Project Name	Universal?	Choice?	Public Health Dept. Clinics	Public Migrant/Community Health Centers & Rural Health	Public Indian Health Srvs./Tribal Clinics	Other Public Provider Sites	Total Public Providers	Private Provider Sites	Total Provider Sites	Private Provider Sites as % of Total Sites	Rank
Colorado		✓	62	84	0	40	186	331	517	64.0%	31
Minnesota		✓	82	42	11	34	169	288	457	63.0%	32
Louisiana			88	63	0	104	255	428	683	62.7%	33
South Carolina			78	122	0	25	225	373	598	62.4%	34
Georgia			251	181	0	36	468	755	1,223	61.7%	35
District of Columbia	n/a	n/a	8	3	0	27	38	58	96	60.4%	36
Oklahoma		✓	96	84	36	44	260	383	643	59.6%	37
Missouri		✓	121	144	0	40	305	439	744	59.0%	38
Texas			680	483	2	271	1,436	2,049	3,485	58.8%	39
Idaho	✓	✓	42	47	3	18	110	130	240	54.2%	40
Montana			53	2	15	17	87	99	186	53.2%	41
New Mexico	✓	✓	53	78	23	60	214	229	443	51.7%	42
Iowa		✓	100	83	1	44	228	243	471	51.6%	43
West Virginia		✓	54	85	0	36	175	185	360	51.4%	44
Alabama			105	111	0	40	256	257	513	50.1%	45
Kentucky		✓	139	73	0	109	321	221	542	40.8%	46
Arkansas			95	58	0	35	188	128	316	40.5%	47
Kansas		✓	108	53	3	14	178	120	298	40.3%	48
South Dakota	✓	✓	52	68	12	13	145	85	230	37.0%	49
North Dakota	✓	✓	52	43	5	5	105	59	164	36.0%	50
Mississippi			106	129	1	23	259	126	385	32.7%	51
Puerto Rico	n/a	n/a	2	31	0	228	261	0	261	0.0%	52
Rhode Island		✓	0	20	1	2	23	0	23	0.0%	53
<b>TOTALS</b>	14	28	4,765	3,659	245	2,518	11,187	27,571	38,758	71.1%	

Source: Centers for Disease Control, National Immunization Program. [http://www.cdc.gov/nip/vfc/st\\_immz\\_proj/data/public\\_sites\\_2002.htm](http://www.cdc.gov/nip/vfc/st_immz_proj/data/public_sites_2002.htm)

n/a = not available