Financing Childhood Immunizations in Kansas: Report to the Immunize Kansas Kids Steering Committee

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The Kansas Health Institute is an independent, nonprofit health policy and research organization based in Topeka, Kansas. Established in 1995 with a multi-year grant from the Kansas Health Foundation, the Kansas Health Institute conducts research and policy analysis on issues that affect the health of Kansans.

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EXECUTIVE SUMMARY

As part of the Immunize Kansas Kids (IKK) project, this report presents an analysis of the financing of childhood immunizations in Kansas, including sources of funding, costs, reimbursement, and insurance coverage. IKK is a partnership of the Kansas Health Institute, Kansas Department of Health and Environment, and numerous stakeholder organizations whose goal is to develop a sustainable strategy for raising the state's childhood vaccination rate to at least 90 percent. IKK activities are funded by the Kansas Health Foundation.

Key findings of this assessment are:

- Spending on the series of immunizations recommended for Kansas children from birth through three years of age will be close to $16.5 million during the current year. This level of spending is likely sufficient to cover the costs of immunizing at least 90 percent of these children.

- Though the overall funding level appears sufficient, structural aspects of the immunization financing system still contribute to the state's low immunization rate. These factors include the distribution of funds and the difficulty in shifting these funds from one financing stream to another, the lag time between introduction of vaccines to the market and coverage of these vaccines by public programs and third-party payers, the high cost of new vaccines, and potentially high out-of-pocket costs for some patients.

- In addition, identifying and reaching children who aren't up to date on their immunizations may require additional funds and/or mechanisms for redistributing existing funds in order to develop, implement, and evaluate interventions. Sustaining this funding over the long-term will also be a substantial challenge.

- Most physician practices that provide vaccines to **privately insured** children do not lose money on this service primarily because their vaccine reimbursements substantially exceed their costs. And though physician practices that participate in the Vaccines for Children (VFC) program may not fully recover their administrative costs, their Medicaid

payment for vaccine administration equals and sometimes exceeds that paid by private insurers.

- There remains a need for more comprehensive and integrated databases to fully evaluate immunization financing. Stakeholders such as the Kansas Department of Health and Environment, the Kansas Health Policy Authority, and the Kansas Insurance Department should work together to develop a formal analytic framework that allows the various databases that contain immunization information to interface.

INTRODUCTION

Immunize Kansas Kids (IKK) is a partnership of the Kansas Health Institute (KHI), Kansas Department of Health and Environment (KDHE), and numerous stakeholder organizations to develop a sustainable strategy for raising the state's childhood vaccination rate to at least 90 percent (a list of these stakeholder organizations is provided in the appendix). With financial support from the Kansas Health Foundation, IKK has commissioned a set of focused studies to better understand the immunization delivery system in Kansas and identify barriers to improving the state's immunization rate.

The IKK project was initiated to build on and move beyond the work done by the 2004 Governor's Blue Ribbon Task Force on Immunizations. The Task Force, in its Recommendations Report on Immunizations, suggested that a study be conducted to provide a description of the current system for financing childhood immunizations in Kansas, including an assessment of costs and how these costs are shared between various entities. This report addresses these issues and presents an assessment of the financing of childhood immunizations in Kansas, including sources of funding, costs, reimbursement, and insurance coverage.

SOURCES OF DATA

Data from a number of sources were used in this study. Medicaid information comes from the Medical Statistical Information System (MSIS), a database of state Medicaid claims information. Data on expenditures by commercial health insurers comes from the Kansas Health Insurance Information System (KHIIS), which includes claims data from commercial health insurance plans in the state. Information on immunization coverage and expenditures by self-insured health plans is drawn from data provided by six large self-insured Kansas companies. Definitions and descriptions of commercial and self-insured health plans are included in the report. We also collected information on practice costs and reimbursement from a Kansas physician clinic. Other practices also agreed to participate in the study, but have not yet submitted their data. When this information is received and analyzed, we will provide an update to the IKK Steering Committee.

Both MSIS and KHIIS are large complex databases that present numerous analytic challenges. As with much secondary data, these sources exhibit problems with data verification, inconsistent coding, incomplete fields, and other issues that make analysis difficult. In addition, they were established to pay and monitor claims and were not designed for the purposes for which they are used in this study. Despite these limitations, MSIS and KHIIS are valuable sources of information and are the most complete and comprehensive databases currently available.

Other data were collected from KDHE, which administers the Kansas Immunization Program, and the U.S. Centers for Disease Control and Prevention (CDC), which administers the National Immunization Program. We also used information from previously published research and analysis of immunization financing. All data sources are cited, where appropriate, in the report.

THE IMMUNIZATION FINANCING SYSTEM

Financing for childhood immunizations is provided through a complex mix of public and private funding, including federal programs, state and local expenditures, private insurance, and patient out-of-pocket spending. Unlike the case for other health care services, virtually all Kansas children are at least partially covered for the costs of immunization. Nevertheless, the fact that less than 80 percent of Kansas children between the ages of 19 and 35 months have received the full course of recommended vaccines (Hoffman, 2006) indicates that substantial barriers still exist to ensuring this essential public health service for all children.[1] This section of the report describes the various mechanisms for financing immunizations in Kansas.

THE KANSAS IMMUNIZATION SCHEDULE

This assessment focuses on the financing of immunizations to Kansas children from birth to three years of age. The required vaccine schedule for this age group, commonly known as the 4:3:1:3:3:1 series, is shown in Table 1 (this is a simplified, optimal version of the schedule and does not show accelerated or "catch up" schedules for children who are not up to date on their immunizations). KDHE recommends that all of these vaccines be administered with the first 12 to 15 months of life.

Table 1. **Kansas Immunization Schedule for Children 0 to 3 Years of Age: The 4:3:1:3:3:1 Series**

	Recommended Age				
Vaccine	**Birth**	**2 months**	**4 months**	**6 months**	**12-15 months**
Hepatitis B (Hep B)	X	X		X	
Diphtheria, Tetanus, Pertussis (DTP, DTaP, DT)		X	X	X	X
Haemophilus Influenzae Type B (HIB)		X	X	X	X
Polio		X	X	X	
Measles, Mumps, Rubella (MMR)					X
Varicella*					X

*Varicella vaccine is not required for children who have had the disease.
Note: Pneumococcal Conjugate (PC7) vaccine is recommended, but not required, for school entry.
Source: KDHE

[1] Kansas' immunization rate improved dramatically between 2004 and 2005 for the series of vaccines measured by the CDC's National Immunization Survey (CDC, 2006). Sustaining this improvement, following several years of relatively low rankings, is a key goal of IKK.

PUBLIC FINANCING

Government at all levels plays a key role in vaccine financing. Federal, state, and local sources of funding are responsible for close to half of total spending on the 4:3:1:3:3:1 immunization series for Kansas children from birth to three years of age. The various sources of government funding for immunizations are described below.

Federal Funding

The federal government administers two programs that provide substantial funding for childhood vaccines. The Vaccines for Children (VFC) program provides free vaccines for children from birth through age 18 who are uninsured, Native American/Alaska Native, or eligible for Medicaid or the State Children's Health Insurance Program (SCHIP). Underinsured children (i.e., those who have health insurance coverage that doesn't fully cover immunization costs) are also eligible for this program, but only if they receive vaccines at federally qualified health centers (FQHCs) or rural health clinics (RHCs).

Through the VFC program, CDC provides funding to states to purchase vaccines at federally-negotiated discount prices. Providers who choose to participate in the VFC program receive vaccines from the state at no cost for provision to eligible children. Although VFC pays for vaccines, it does not reimburse providers for administration of the vaccines (e.g., labor costs and overhead). Providers may bill for vaccine administration, but the population eligible for the VFC program is often unable to pay the fees for this service in full. For children enrolled in Medicaid and SCHIP, these programs pay providers for VFC vaccine administration. Others pay out-of-pocket, often under a sliding fee scale (particularly if they are vaccinated at local health departments). VFC providers are required to provide immunization services to all eligible children regardless of ability to pay.

The other key federal program is known as Section 317, for the section of the Public Health Service Act under which it is authorized. This program provides grant funds to states for purchase of vaccines for the underinsured and for management of immunization programs and development of infrastructure (e.g., education, outreach). Unlike the VFC program, which is focused on childhood immunizations, Section 317 provides vaccines for both children and adults.

Table 2 shows federal VFC and Section 317 funding for immunization programs in Kansas for the period 2003 to 2005 and reports both total program funding and funds used to purchase vaccines in the 4:3:1:3:3:1 series.

Table 2. **Federal Funding for Immunizations in Kansas, 2003-2005**

	VFC	Section 317
2003 (total)	$6,620,104	$3,618,583
2003 (4:3:1:3:3:1 only)	$2,377,718	$2,719,151
2004 (total)	$5,891,879	$834,860
2004 (4:3:1:3:3:1 only)	$2,773,356	$772,602
2005 (total)	$9,175,540	$1,800,737
2005 (4:3:1:3:3:1 only)	$3,827,852	$1,384,095

Source: KDHE

This table illustrates both the volatile nature of the funding from year to year, which is dependent on government appropriations, and the fact that the 4:3:1:3:3:1 series comprises only a portion of total funding. Both the VFC and Section 317 programs cover vaccines for children older than three years of age and the 317 program also purchases adult vaccines. In addition, both programs cover vaccines that are recommended, but not required, for school entry. For example, the pneumococcal conjugate vaccine, which is recommended for all children but not required as part of the 4:3:1:3:3:1 series, accounted for close to 41 percent of VFC expenditures in 2005. Issues surrounding the funding of high cost vaccines such as this are addressed in the "Discussion" section of the report.

Financing for beneficiaries of Medicaid and SCHIP, which are shared federal-state responsibilities, and for dependents of military personnel are discussed later in the report.

State and Local Funding

The state of Kansas supports the purchase of vaccines with state general funds (SGF). The state also provides aid to Local Health Departments (LHDs), which is used to support staff and administrative functions at the local level.

Through Medicaid and SCHIP, the state pays providers directly for delivering immunization services. As discussed above, children eligible for these programs may receive vaccines from VFC providers, then Medicaid or SCHIP is responsible for reimbursing these providers for the administration of the vaccines. MSIS data show that Medicaid also pays for some vaccines directly; these may be for Medicaid beneficiaries who are unable to access services from VFC providers.

County and local governments provide funding to LHDs for immunization programs, as well. In a recent survey conducted by KHI, more than a third of responding LHDs (30 out of 82) indicated that they receive county and/or local government funding for childhood immunization programs. This funding is used both for vaccine purchase and immunization program infrastructure development.

Table 3 presents state and local funding for immunizations from 2003 to 2005. The SGF figures in the table show total spending for vaccine purchase and funds used to purchase vaccines in the 4:3:1:3:3:1 series only. Because a breakout of spending for only the 4:3:1:3:3:1 series was not available at the local level, the Local Aid to LHDs column shows total funding, which includes funds used for vaccine purchase and staff/administrative support, and also shows spending for the purchase of all vaccines. The Medicaid and SCHIP figures report spending for the 4:3:1:3:3:1 series and predominantly represents payment for administrative fees (as discussed above, Medicaid/SCHIP eligible children may receive vaccines through the VFC program).

Table 3. **State and Local Funding for Immunizations in Kansas, 2003-2005[(1)]**

	State General Funds	Local Aid to LHDs	Medicaid & SCHIP[(2)]
2003 (total)	$1,033,738	$98,269	--
2003 (4:3:1:3:3:1 only)	$931,630	$55,718	$823,236
2004 (total)	$839,914	$141,493	--
2004 (4:3:1:3:3:1 only)	$796,373	$90,926	$864,398[(3)]
2005 (total)	$1,211,302	$180,963	--
2005 (4:3:1:3:3:1 only)	$621,953	$129,546	$907,618[(3)]

Notes: See next page

Notes, Table 3.

(1) The SGF column shows total spending for vaccine purchase and funds used to purchase vaccines in the 4:3:1:3:3:1 series. Local Aid to LHDs shows total funding, which is used for vaccine purchase and staff/administrative support, and spending for all vaccines. A breakout of spending only for the 4:3:1:3:3:1 series was not available for the local level. The Medicaid & SCHIP figures report spending for the 4:3:1:3:3:1 series.

(2) SCHIP data have not been analyzed. SCHIP is estimated at 18.5 percent of the Medicaid amount, based on the number of children enrolled in the programs (KCMU, 2005).

(3) Medicaid data for 2004 and 2005 have not been analyzed. Medicaid spending for these years is estimated based on a five percent yearly increase in payments from 2003. Although actual annual increases in health spending have ranged from eight percent to more than 11 percent since 2000 (Strunk et al. 2005), we use the lower five percent figure to ensure the conservatism of the analysis

Sources: KDHE, KHI survey of LHDs, MSIS

PRIVATE FINANCING

Private financing for vaccines comes from two sources — private health insurance and patient out-of-pocket payments. These sources are discussed below.

Health Insurance

Health insurance is provided either through the commercial market or through the self-insured health plans of large employers. In the commercial market, coverage policies are purchased directly from health insurance companies by employers or by individuals. Commercial plans are regulated by the Kansas Insurance Department and are required by Kansas law to provide "first dollar coverage" for immunizations — i.e., to cover routine and necessary immunizations for children up to six years of age with no copayment, deductible, or coinsurance requirements[2] (KSA 40-2, 102).

Table 4 shows expenditures by commercial health insurance plans for immunizations to Kansas children 0 to 3 years of age from 2003 to 2005. These figures include reimbursement for vaccines and administrative fees for the 4:3:1:3:3:1 series.

[2] A copayment is a fee paid by the policy holder at the point of service (e.g., $15 for a physician office visit). A deductible is an amount that must be paid by the policy holder before insurance payments commence (e.g., the policy holder must pay the first $500 for services). Coinsurance is the amount of each claim that must be paid by the policy holder (e.g., the policy holder pays 20 percent coinsurance and the plan pays 80 percent). All of these payments are prohibited in Kansas for routine and necessary immunizations covered by commercial health insurance plans for children up to six years of age.

Table 4. **Commercial Health Insurance Payments for the 4:3:1:3:3:1 Immunization Series to Kansas Children, Ages 0-3 Years, 2003-2005**

Year	Total
2003	$3,702,956
2004	$4,053,009
2005	$4,255,659*

*Complete data for 2005 are not yet available. The figure shown here represents an estimated five percent increase from 2004 payments. As noted above, although annual increases in health spending have historically been higher (e.g., the rate of increase from 2003 to 2004 was 9.5 percent), we used the lower five percent figure to ensure the conservatism of the analysis.

Source: KHIIS

Self-insured health plans are typically provided by large companies to their employees and families. Although these plans are often administered by commercial insurers, the companies themselves are at risk for payment for services, not the insurers. Self-insured plans are not subject to state regulation. Instead, they function under the federal Employee Retirement Income Security Act (ERISA), which prohibits states from imposing mandates and other requirements on these plans (the rationale for this prohibition is to free multi-state corporations from the need to meet a different set of rules in each state in which they operate). As a result, unlike commercial health insurance plans, self-insured plans in Kansas may provide no coverage for immunizations or may impose copayments, deductibles, coinsurance requirements, or other limitations (e.g., limits on preventive services).

For this study, six large employers with self-insured health plans agreed to provide data on their immunization policies and expenditures (although the sample is not representative, it includes some of the largest employers in the state). All of these self-insured plans provide coverage for childhood immunizations and none impose copayments for these services. Some, however, have deductible and coinsurance requirements.

Because self-insured plans aren't regulated by the state, there are no publicly available data on the number of people they cover. It is generally estimated that at least as many Kansans are covered by self-insured plans as by commercial health insurance plans.

Out-of-Pocket Payments

Out-of-pocket payments are expenditures made by patients that are not reimbursed by a third-party payer. As noted above, Kansas children covered by commercial health insurance plans are not subject to direct out-of-pocket payments for immunization services. Children covered by self-insured plans may be subject to out-of-pocket expenditures, but the amounts will vary from plan to plan. Based on the data provided by the self-insured plans for this study, these payments are likely a relatively small proportion of total vaccine costs. Nevertheless, they may be a barrier to immunization for some patients. Statewide data on overall out-of-pocket spending are not available and are not included in this analysis.

Although the VFC program provides vaccines at no cost to providers, patients may be billed for vaccine administration. VFC providers are required to provide vaccines to eligible children regardless of their ability to pay. However, physicians often cite the inability of patients to pay these fees and low payment by insurers as reasons for not providing immunizations and referring children to LHDs (Zimmerman et al., 2006; Zimmerman et al., 2001; Szilagyi, 2000).

There may also be substantial "hidden" or indirect out-of-pocket costs associated with immunizations. Costs for travel to vaccine providers and parents' time off work are not generally included in calculations of out-of-pocket payments, but may be significant in some cases. In particular, parents who take their children to one provider for routine primary care services and to a different provider, likely an LHD, for immunization services may be subject to a substantial level of such indirect costs. Data on these costs are unavailable and are not considered in this analysis.

FINANCIAL BARRIERS TO IMMUNIZATION

Despite near universal coverage for childhood immunizations through government programs and insurance, financial barriers to immunization remain. As discussed above, parents may face direct and indirect out-of-pocket costs for having their children immunized. Also, as noted, physicians may be reluctant to vaccinate children who have difficulty paying administrative fees.

In addition, vaccine costs have increased as new vaccines have been introduced and added to the immunization schedule (this issue is addressed further in the "Discussion" section of the report). According to the Institute of Medicine, vaccine costs increased four-fold between 1986 and 1998 and then more than doubled again between 1998 and 2002 (IOM, 2004). Despite these increases, year-to-year federal and state support for immunization programs does not usually rise at the same rate. In addition, because government funding is subject to the yearly appropriations process, it can be somewhat variable. For example, total state general funds and federal funding for immunization programs declined from 2003 to 2004 before being substantially increased in 2005.

When a vaccine is first introduced to the market, there is often a "catch up" period before it is recognized by regulators and insurance plans. Federal contracts for vaccine acquisition at special negotiated rates lag behind recommendations to add these vaccines to required schedules, which directly impacts purchases for the VFC and 317 programs. Private insurance coverage may be delayed, as well, even in commercial plans that are mandated to cover immunizations.

Physicians and other providers point out that even when coverage is available, reimbursement rates may be less than the actual costs of the vaccine and administration (this issue is discussed further in the next section of the report). Some physicians also cite the administrative costs associated with participating in the VFC program and the cost of equipment (e.g., refrigerators for the varicella vaccine) as financial barriers to providing immunizations. The reasons that physicians choose to provide or not provide vaccines to their patients are the subject of another study commissioned by IKK.

IMMUNIZATION COSTS AND REIMBURSEMENT

This section of the report assesses the costs to a physician practice of providing immunizations and reimbursement for these services.

IMMUNIZATION COSTS

The cost of immunizations includes the cost of the vaccine itself and the cost of administering the vaccine. Vaccines are sold by manufacturers through several different mechanisms. For the VFC program, the state purchases vaccines at discounted rates negotiated by CDC and supplies these vaccines to participating providers. Non-VFC vaccines are purchased by providers at market prices or at discounted prices negotiated through multi-state or other purchasing contracts. Market prices are variable and may fluctuate throughout the year. CDC reports both the discounted rates that it negotiates with vaccine manufacturers and average private-sector prices on its website and regularly updates these data. We used the CDC Pediatric/VFC Vaccine Price List to determine the cost of the vaccines included in the Kansas immunization schedule. We also obtained a list of vaccine prices paid by a Kansas physician practice (and are awaiting data to be provided by other practices).

To determine administrative costs, we used Medicare's Resource-Based Relative Value Scale (RBRVS), a standardized physician payment schedule based on the actual costs of providing services. The RBRVS takes into account the costs of labor, practice expense, and professional liability insurance and is adjusted annually for geographic differences in resource costs. Although Medicare, the federal health insurance program for the elderly and disabled, pays for only a small fraction of childhood immunizations, the RBRVS is the most comprehensive effort to date to determine the actual costs of providing physician services.

Table 5 shows the costs of providing the 4:3:1:3:3:1 vaccine series. The table groups the vaccines by age of administration and includes an administrative cost for each age-related set of vaccines. For example, the schedule calls for a two-month old child to receive four vaccines – Hep B, DTP, HIB, and Polio. The table shows the cost of each of the vaccines and the cost of administration of these four vaccines during a single visit. Because CDC often negotiates prices with several manufacturers for the same type of vaccine, the low and high prices reported by

CDC are presented in the table. The table also shows low and high private-sector prices as reported by CDC and the prices paid by the sample Kansas practice. Administrative costs are calculated based on the RBRVS and are related to the number of vaccines provided. Administrative costs do not vary based on manufacturer/source. All figures reported in the table are current to 2006.

Table 5. **Practice Costs of Providing the 4:3:1:3:3:1 Immunization Series to Kansas Children**

Vaccine	Age (months)	CDC VFC Cost/Dose (low)	CDC VFC Cost/Dose (high)	CDC Private Cost/Dose (low)	CDC Private Cost/Dose (high)	Kansas Practice Cost/Dose
Hep B	0 (birth)	$9.00	$9.10	$21.37	$23.20	$13.33
Admin	0 (birth)	$17.05	$17.05	$17.05	$17.05	$17.05
Hep B	2	$9.00	$9.10	$21.37	$23.20	$13.33
DTP	2	$12.25	$13.25	$20.96	$22.04	$15.25
HIB	2	$7.92	$10.62	$22.53	$22.77	$21.56
Polio	2	$10.82	$10.82	$22.80	$26.34	$22.02
Admin	2	$47.74	$47.74	$47.74	$47.74	$47.74
DTP	4	$12.25	$13.25	$20.96	$22.04	$15.25
HIB	4	$7.92	$10.62	$22.53	$22.77	$21.56
Polio	4	$10.82	$10.82	$22.80	$26.34	$22.02
Admin	4	$37.51	$37.51	$37.51	$37.51	$37.51
Hep B	6	$9.00	$9.10	$21.37	$23.20	$13.33
DTP	6	$12.25	$13.25	$20.96	$22.04	$15.25
HIB	6	$7.92	$10.62	$22.53	$22.77	$21.56
Polio	6	$10.82	$10.82	$22.80	$26.34	$22.02
Admin	6	$47.74	$47.74	$47.74	$47.74	$47.74
DTP	12-15	$12.25	$13.25	$20.96	$22.04	$15.25
HIB	12-15	$7.92	$10.62	$22.53	$22.77	$21.56
MMR	12-15	$17.28	$17.28	$40.37	$40.37	$38.22
Varicella	12-15	$56.90	$56.90	$66.81	$66.81	$62.87
Admin	12-15	$47.74	$47.74	$47.74	$47.74	$47.74
Subtotal (vaccine)		$214.32	$229.42	$413.65	$435.04	$354.38
Subtotal (admin)		$197.78	$197.78	$197.78	$197.78	$197.78
TOTAL		**$412.10**	**$427.20**	**$611.43**	**$632.82**	**$552.16**

Notes:

CDC costs based on CDC Pediatric/VFC Vaccine Price List (August 3, 2006).

Admin costs based on Medicare 2006 RBRVS price for Kansas for CPT codes 90471-Immunization Administration, one vaccine ($17.05) and 90472-Immunization Administration, each additional vaccine ($10.23).

As shown in Table 5, the total costs of immunizing a Kansas child with the 4:3:1:3:3:1 vaccine series ranges from about $412 at the lowest CDC prices to nearly $633 at the highest private-sector prices. Costs at the Kansas practice are about $552, between these two extremes.

Increased use of combination vaccines could reduce these costs because the price of these vaccines is often less than the price of separately purchased single vaccines. In addition, combination vaccines reduce administrative costs by decreasing the number of injections required. Increased use of combination vaccines can also reduce the pain and emotional stress associated with receiving injections and thus address another barrier to immunization (Meyerhoff et al., 2001). For these reasons, the use of combination vaccines is advocated by the CDC Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics, and the American Academy of Family Physicians (Feldman, 2001).

IMMUNIZATION PAYMENT

Immunization payment information is based on the data reported by the sample Kansas practice for immunization-related payments from six different insurers. Although these data are from a single practice, they're likely to be similar or identical to payment to other practices. Payers typically establish consistent rates and don't substantially vary these rates for each practice with which they contract.[3] Reimbursement for vaccines and administration is shown in Table 6 (this table is organized in the same way as Table 5). As required by the contracts between third-party payers and the Kansas practice, individual insurers are not identified in order to maintain confidentiality.

Table 6. **Reimbursement for the 4:3:1:3:3:1 Immunization Series for Kansas Children**

		Reimbursement					
Vaccine	**Age (months)**	**Insurer A**	**Insurer B**	**Insurer C**	**Insurer D**	**Insurer E**	**Insurer F**
Hep B	0 (birth)	$28.93	$26.42	$37.00	$35.00	$28.66	$37.00
Admin	0 (birth)	$8.36	$7.80	$8.45	$10.20	$10.91	$11.05

[3] To validate these data, KHI is collecting cost and payment information from other providers and practices. When this information is received and analyzed, we will report it to the IKK Steering Committee.

Table 6 (continued). **Reimbursement for the 4:3:1:3:3:1 Immunization Series for Kansas Children**

		Reimbursement					
Vaccine	**Age (months)**	**Insurer A**	**Insurer B**	**Insurer C**	**Insurer D**	**Insurer E**	**Insurer F**
Hep B	2	$28.93	$26.42	$37.00	$35.00	$28.66	$37.00
DTP	2	$24.78	$25.54	$36.00	$31.00	$25.64	$31.85
HIB	2	$28.27	$28.97	$26.38	$32.00	$31.35	$28.05
Polio	2	$28.31	$27.06	$24.00	$30.83	$23.75	$32.00
Admin	2	$31.70	$31.20	$33.80	$40.80	$43.64	$44.20
DTP	4	$24.78	$25.54	$36.00	$31.00	$25.64	$31.85
HIB	4	$28.27	$28.97	$26.38	$32.00	$31.35	$28.05
Polio	4	$28.31	$27.06	$24.00	$30.83	$23.75	$32.00
Admin	4	$23.92	$23.40	$25.35	$30.60	$32.73	$33.15
Hep B	6	$28.93	$26.42	$37.00	$35.00	$28.66	$37.00
DTP	6	$24.78	$25.54	$36.00	$31.00	$25.64	$31.85
HIB	6	$28.27	$28.97	$26.38	$32.00	$31.35	$28.05
Polio	6	$28.31	$27.06	$24.00	$30.83	$23.75	$32.00
Admin	6	$31.70	$31.20	$33.80	$40.80	$43.64	$51.64
DTP	12-15	$24.78	$25.54	$36.00	$31.00	$25.64	$31.85
HIB	12-15	$28.27	$28.97	$26.38	$32.00	$31.35	$28.05
MMR	12-15	$51.00	$48.00	$38.26	$43.35	$45.48	$51.00
Varicella	12-15	$83.33	$80.00	$59.74	$69.70	$71.43	$84.00
Admin	12-15	$31.70	$31.20	$33.80	$40.80	$43.64	$51.64
Subtotal (vaccine)		$518.25	$506.48	$530.52	$562.54	$502.10	$581.60
Subtotal (admin)		$127.38	$124.80	$135.20	$163.20	$174.56	$176.80
TOTAL		**$645.63**	**$631.28**	**$665.72**	**$725.74**	**$676.66**	**$758.40**

Notes:

Payment for admin is based on payment from each insurer for CPT codes 90471 (first vaccine) and 90472 (each additional vaccine). These payments are as follows:

Insurer A: 90471 = $8.36; 90472 = $7.78

Insurer B: 90471 = $7.80; 90472 = $7.80

Insurer C: 90471 = $8.45; 90472 = $8.45

Insurer D: 90471 = $10.20; 90472 = $10.20

Insurer E: 90471 = $10.91; 90472 = $10.91

Insurer F: 90471 = $11.05; 90472 = $11.05

As shown in Table 6, total reimbursement to a private provider for this series of vaccines ranges from about $631 to about $758, depending on the payer. Table 5 shows costs to a private provider of $412 to $633, depending on vaccine price. According to these data, therefore, an "average" private physician practice would not lose money on the provision of these vaccines to

insured children. Depending on the prices paid for vaccines and the payer mix of the practice, profit margins range from zero percent (costs of $633 and reimbursement of $631) to 46 percent (costs of $412 and reimbursement of $758).[4] Most practices probably fall within this wide range.

It is important to note that each payer has different policies for reimbursement, particularly regarding vaccine administration. Some insurers, for example, do not pay an administration fee if immunizations are provided during a well child or other office visit in which additional services are rendered. In these cases, reimbursement for vaccine administration is supposed to be included in the payment for the office visit. Analysis of the KHIIS database seems to confirm this practice, as it includes fewer claims for vaccine administration than for vaccines. The economics of providing immunizations to privately insured patients, therefore, will vary based on the patient, payer, and cost characteristics of each practice.

The economics of providing VFC vaccines are somewhat different. Under the VFC program, the state purchases vaccines and supplies them to participating providers at no charge. The provider, therefore, incurs costs and receives reimbursement only for vaccine administration.

Children eligible for the VFC program are either covered by Medicaid/SCHIP or pay for vaccine administration out-of-pocket. Those paying out-of-pocket may or may not be able to pay the provider's full administration fee (many immunization services, particularly in LHDs, are provided under a sliding fee scale). Medicaid currently pays $14.15 for administration of a single vaccine during an office visit and $10 for administration of each additional vaccine (the rate for administration of a single vaccine was recently increased; prior to July 2006, Medicaid paid $10 for administration of each vaccine). These rates are close to, but below, the RBRVS prices of $17.05 for the initial vaccine and $10.23 for each additional vaccine. Table 7 shows the cost to the provider of delivering the 4:3:1:3:3:1 immunization series and the Medicaid payment for administration of these vaccines before and after the recent payment increase.

[4] Profit margin is calculated by subtracting expenses from revenue (to derive profit) and dividing by revenue.

Table 7. **Practice Costs and Medicaid Reimbursement for Administration of the 4:3:1:3:3:1 Vaccine Series for Kansas Children**

Vaccine	Age (months)	Administration Cost	Medicaid Payment (prior to July 2006)	Medicaid Payment (since July 2006)
Hep B	0 (birth)	$17.05	$10.00	$14.15
Hep B	2	$17.05	$10.00	$14.15
DTP	2	$10.23	$10.00	$10.00
HIB	2	$10.23	$10.00	$10.00
Polio	2	$10.23	$10.00	$10.00
DTP	4	$17.05	$10.00	$14.15
HIB	4	$10.23	$10.00	$10.00
Polio	4	$10.23	$10.00	$10.00
Hep B	6	$17.05	$10.00	$14.15
DTP	6	$10.23	$10.00	$10.00
HIB	6	$10.23	$10.00	$10.00
Polio	6	$10.23	$10.00	$10.00
DTP	12-15	$17.05	$10.00	$14.15
HIB	12-15	$10.23	$10.00	$10.00
MMR	12-15	$10.23	$10.00	$10.00
Varicella	12-15	$10.23	$10.00	$10.00
TOTAL		**$197.78**	**$160.00**	**$180.75**

As shown in Table 7, Medicaid payment for vaccine administration does not cover provider costs, even after the recent increase in payment rates. It is important to point out, however, that Medicaid payment for vaccine administration is now higher than the fees paid by the private insurers in our sample. With the exception of Medicare, which pays according to RBRVS, no third-party payer reimburses physician practices at a rate adequate to cover the costs of vaccine administration. Providers that serve the private market are likely able to make up for these losses through relatively high reimbursement for most vaccines compared to their cost. Providers that serve only the VFC population cannot cross-subsidize in this way.

It is also important to note that the CDC private-sector prices and the Medicare RBRVS cost figures represent averages of data collected from a broad national sample. The costs to a particular practice may differ. For example, the cost of vaccine administration may be higher for solo and small group practices than for large group practices. It is possible, as well, that actual

costs to some Kansas providers are less than nationally reported figures. The Kansas practice that provided data for this analysis, for instance, which could be considered a “medium” size practice, had lower vaccine purchase costs than the averages reported by CDC.

TOTAL IMMUNIZATION COSTS AND EXPENDITURES

THE COST OF IMMUNIZING KANSAS KIDS

Using the cost figures calculated above, we determined the yearly cost of immunizing Kansas children with the series of vaccines recommended for the first year of life. According to KDHE, nearly 40,000 children are born in Kansas each year (KDHE, 2005). Table 8 shows the cost of providing this immunization series to all of these children and to 90 percent of these children, by source of vaccine, for the current year.

Table 8. **Annual Cost of Immunizing Kansas Children with the 4:3:1:3:3:1 Vaccine Series (2006)**

	CDC VFC Cost for Series (low)	CDC VFC Cost for Series (high)	CDC Private Cost for Series (low)	CDC Private Cost for Series (high)	Kansas Practice Cost for Series
Cost of Vaccine Series	$412.10	$427.20	$611.43	$632.82	$552.16
Number of Children	40,000	40,000	40,000	40,000	40,000
TOTAL COST (100% coverage)	**$16,484,000**	**$17,088,000**	**$24,457,200**	**$25,312,800**	**$22,086,400**
TOTAL COST (90% coverage)	**$14,835,600**	**$15,379,200**	**$22,011,480**	**$22,781,520**	**$19,877,760**

KANSAS SPENDING ON IMMUNIZATIONS

Based on the figures derived in this analysis, Table 9 shows cumulative spending on the 4:3:1:3:3:1 vaccine series for Kansas children ages 0 to 3 years from 2003 to 2005. Figure 1 then shows the proportional distribution of these funds.

Table 9. **Immunization Expenditures for the 4:3:1:3:3:1 Vaccine Series for Kansas Children, 0 to 3 Years of Age, 2003-2005**

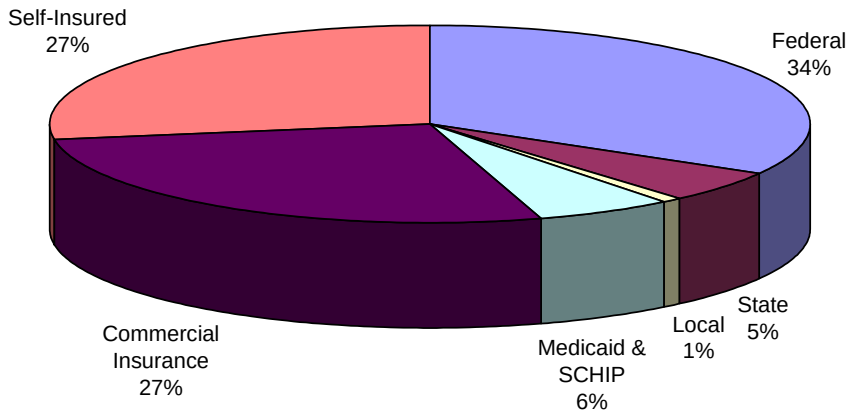
	Federal (VFC, 317, & Military)	State (SGF)	Local	Medicaid & SCHIP	Commercial Health Insurance	Self-Insured Health Plans	TOTAL
2003	$5,343,743	$931,630	$55,718	$823,236	$3,702,956	$3,702,956	**$14,560,240**
2004	$3,815,070	$796,373	$90,926	$864,398	$4,053,009	$4,053,009	**$13,672,785**
2005	$5,494,515	$621,953	$129,546	$907,618	$4,255,659	$4,255,659	**$15,664,950**

Notes:

Spending by the military is estimated at three percent of total spending by Medicaid and SCHIP, commercial health insurance, and self-insured health plans. This estimate is based on data that show that three percent of U.S. children are covered by health insurance provided through the military (IOM, 2000).

Spending by self-insured plans is estimated at the same level as spending by commercial plans.

Figure 1.
Source of Immunization Expenditures for the 4:3:1:3:3:1 Vaccine Series for Kansas Children Ages 0-3 Years (2003-2005)



As shown in Table 9, more than $15.6 million was spent in 2005 providing the 4:3:1:3:3:1 vaccine series to Kansas children from 0 to 3 years of age. Because out-of-pocket expenditures are not included in this total and estimates for spending increases, where necessary, were conservative, this total is likely understated. Using a conservative five percent inflation estimate, total spending for 2006 would be $16,448,197.

As shown in Table 8, above, the cost of immunizing all Kansas children with the 4:3:1:3:3:1 vaccine series ranges from approximately $16.5 million to $25.3 million, depending on source and price of vaccines. The cost of achieving a 90 percent immunization rate is estimated at approximately $14.8 million to $22.8 million. The amount of funding in the system, as calculated in Table 9 and inflated to the current year, is within this range, although on the low end of the range. In addition, system funding from private insurance will increase as the proportion of privately insured children who are fully immunized increases.

DISCUSSION

Is the relatively low immunization rate in Kansas a function of inadequate financing? This analysis demonstrates that the current level of expenditures is sufficient or close to sufficient to immunize at least 90% of Kansas kids with the 4:3:1:3:3:1 vaccine series. Nevertheless, the mechanism of financing immunizations, along with other factors, may contribute to the state's immunization rate.

Although total expenditures may be sufficient, the distribution of funds may not be appropriate. Dollars cannot easily be shifted from one funding stream to another to better cover a certain population group or address a particular problem. For example, VFC funds are used to purchase vaccines for VFC eligible children. These vaccines cannot be given to children who may need to be immunized but are ineligible for the program, even if the vaccines would otherwise go to waste. Likewise, VFC funds cannot be used for development and support of program infrastructure, such as outreach, even if there is a need for such activities. Other funding streams (e.g., Section 317 and State Aid to LHDs) are available for this purpose, but may not be sufficient to cover all infrastructure needs. The same types of limitations apply to most of the funding streams that make up the immunization financing "pie."

Another key issue revolves around the process of new vaccine development and subsequent coverage of these vaccines by public and private immunization programs. As discussed in the section "Financial Barriers to Immunization," there is often a lag time between the introduction of a new vaccine to the market and coverage of this vaccine by insurers and public programs. During this interval, the vaccine may be recommended or even required for certain children and substantial public demand for it created.

A current example of this is the new vaccine to protect against infection by human papilloma virus (HPV).[5] This vaccine was approved for use by the Food and Drug Administration (FDA) in June 2006 and shortly thereafter, the ACIP recommended that it be administered to girls and women 11 to 26 years of age. FDA approval, the ACIP recommendation, and subsequent news

[5] Although this vaccine is not intended for the 0 to 3 years age group, it is used here to illustrate the lag time in coverage of new vaccines.

coverage has created a substantial demand for the vaccine, which costs $360 for a three-shot series, but many insurers do not yet cover it. In addition, although ACIP has included the vaccine in the VFC program, CDC has thus far not contracted for its purchase and it remains unavailable through the VFC program (USA Today, 2006; Merck, 2006).

Fortunately, for those covered by private insurance, this is probably a short-term problem. Commercial insurers, as they do with other vaccines, will likely provide coverage for HPV vaccine at a rate that exceeds its cost. For example, pneumococcal conjugate vaccine, another high cost vaccine that is recommended but not required for school entry in Kansas, cost the sample Kansas practice in our study $69.20 per dose and is reimbursed by third-party payers at $75 to $85 per dose. Coverage by commercial insurance plans would be mandated if HPV or the pneumococcal conjugate vaccines are added to the series of vaccines required for Kansas children.

Despite the short-term nature of this issue, it can potentially be a substantial problem for providers and patients if a number of new vaccines are introduced to the market in a short period of time. The lag time between vaccines reaching the market and coverage of these vaccines increases potential out-of-pocket costs and may discourage patients from seeking new vaccines and providers from offering them. This issue thus creates a new barrier to immunizations for some and exacerbates the barrier already in place for those subject to high out-of-pocket spending.

Similar to the situation with private insurance, once a contract is completed between CDC and the manufacturer of the HPV vaccine, it will be available through the VFC program. Whether VFC funding will increase enough to fully cover the purchase of this and all the other vaccines covered by the program, however, is a serious question, illustrated by the experience with the pneumococcal conjugate vaccine. Since 2003, spending on the pneumococcal conjugate vaccine has accounted for 46 percent of total VFC spending in Kansas. Addition of the HPV vaccine and other high-cost vaccines that may be introduced in the future will further squeeze immunization resources that are barely adequate at the present time.

Finally, it is important to note that the data used for this analysis, although the best currently available, are limited by gaps and quality problems (as is common with secondary data). The databases we used are claims-based systems that were not designed to provide research information. Problems we encountered in analyzing these data included problems with data verification, incomplete information, and inconsistent coding.

Despite these caveats, however, it is clear that substantial financing for childhood immunizations is provided through a number of funding streams. Factors other than the overall level of funding are likely responsible for Kansas' relatively low immunization rate. These factors, which are not necessarily unique to Kansas, include those discussed above, such as the rigidity of the funding streams, and others, such as structural issues in the delivery system and provider perceptions. Data in this report show that the common perception that provision of immunizations is not financially self-supporting may not be true (particularly for privately insured children). Other factors are also being investigated as part of the IKK project.

Identifying and effectively reaching the children who are not up to date on their immunizations may nevertheless require additional funding and/or mechanisms for redistributing existing funds for development, implementation, and evaluation of interventions. Sustaining this funding over the long-term, in the face of government budgetary pressures and rapidly increasing costs for other health services, will also be a substantial challenge.

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APPENDIX

ORGANIZATIONS REPRESENTED ON THE IKK STEERING COMMITTEE

Blue Cross and Blue Shield of Kansas

FirstGuard Health Plan

Kansas Academy of Family Physicians

Kansas Action for Children

Kansas Association of Local Health Departments

Kansas Association for the Medically Underserved

Kansas Association of Osteopathic Medicine

Kansas Chapter, American Academy of Pediatrics

Kansas Children's Cabinet

Kansas Department of Health and Environment

Kansas Department on Aging

Kansas Division of Health Policy and Finance

Kansas Foundation for Medical Care

Kansas Health Foundation

Kansas Health Institute

Kansas Health Policy Authority

Kansas Insurance Department

Kansas Medical Society

Kansas Public Health Association

Kansas State Nurses Association

KU School of Medicine—Wichita

KU Medical Center—Kansas City