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# “KITS” for Improved Immunization of Kauai Children

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*Kauai physicians and District Health Office staff established a computerized tracking system in 1993 to improve immunization rates in Kauai-born infants. Comparison of 1995 and 1996 audit results of 1993- and 1994-born children showed completion rates for 9 antigens rose from 76% to 86%. Evolution and improvement of the tracking system are discussed. Recommendations for physicians are offered.*

## Introduction

A state-wide retrospective immunization survey in 1993 showed an average of 61% of Hawaii kindergartners completely immunized with 4 diphtheria-tetanus-pertussis (DTP), 3 oral polio vaccine (OPV), and 1 measles-mumps-rubella (MMR) by the age of 24 months.<sup>1</sup> National Year 2000 Health Objectives include the objective of having series-complete immunizations for 90% of two-year-olds.<sup>2</sup> To accomplish this objective for Kauai, an intervention project was designed and implemented by Kauai District Health Office (KDHO) staff in 1993. The computerized Kauai Immunization Tracking System (KITS) initiated an immunization record on each child born on Kauai based on birth certificate data. Immunization data from physicians and clinics were entered into the system. Computer-generated reminder letters were sent to parents of children determined by KITS to be due for immunizations. Periodic reports identifying overdue children were sent to physicians. KDHO staff manually audited provider records and recommended strategies for improving immunization levels. The 1995 and 1996 audits of 1993 and 1994 born children, respectively, are reported in this paper, and the evolution and improvement of the tracking system are discussed.

## Methods

Children born in 1993 followed through the KITS database were analyzed in November of 1995 in the following way:

- 1) Lists of overdue children were distributed to each physician.
- 2) Immunization records were reviewed by KDHO epidemiology and nursing staff. Children who had moved away or died were removed from tracking, and records were updated for those who had been immunized.
- 3) Each physician was sent a report on audit results which included a chart of all physicians with immunization levels of the children in each practice.
- 4) Individual worksheets on overdue children were included in the physician's report to facilitate immunizing delinquent children. Staff were asked to send updated information to KITS.
- 5) Data were re-analyzed 3 months after physicians were notified of their overdue patients and an additional report was generated.

Children born on Kauai in 1994 were analyzed in November of 1996 by the same method noted above in numbers 1 and 2. The results reported here are a comparison of the November 1995 and 1996 audits.

## Results

The November 1995 audit of 1993-born children reported 927 births, 114 (12%) of whom had moved away or died, leaving 813 residents. A total of 617 (76%) were completely immunized with 9 antigens, including 4 DTP/ HiB, 3 hepatitis B/OPV and 1 MMR. The November 1996 audit of 1994-born showed 885 births, 117 (13%) of whom had moved away or died. Of 768 residents, 660 (86%) were completely immunized with 9 antigens (Figure 1). Figures 2 and 3 show comparisons of 1995 and 1996 audit results with physicians grouped according to the number of children tracked in KITS.

## Discussion

Several changes implemented during 1995 and early 1996 streamlined and improved KITS. The power of physician audits was recognized and utilized. To improve efficiency, the parent letter was changed from a reminder sent to all parents to a recall for only those who were overdue. Physicians requested assistance with notification of parents who missed appointments, and asked to be sent KITS worksheets on individual patients to assist in their efforts. Physicians were unaware of the extent of missed opportunities among their patients and responded to information presented at audit report sessions by reducing missed opportunities.

The November 1995 audit report notified physicians of overdue

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**Fig. 1—Number of Kauai Births, Residents, and Percent of Infants Completely\* Immunized for Birth Years 1993 and 1994**

	11/95 audit, 1993-born	3/96 audit, 1993-born	11/96 audit, 1994-born
Births	927	927	885
Number moved/died	114	120	117
Residents	813	807	768
Number Complete	617	674	660
Percent Complete	76%	84%	86%

\* 4 DTP/HiB, 3 Hep B/OPV, 1 MMR

patients by name, and subsequent efforts to immunize these children brought the overall level from 76% to 84% complete, as documented by a post audit dated 3/96 (see Figure 1). Physicians requested regular KITS worksheets showing child's name, birth date, phone number and "due" and "done" date spaces for each immunization. They returned worksheets to KDHO with updated data. These worksheets were sent periodically during 1996 as overdue children were discovered during data entry. The KITS worksheets became routine, and may be one factor that improved immunization levels.

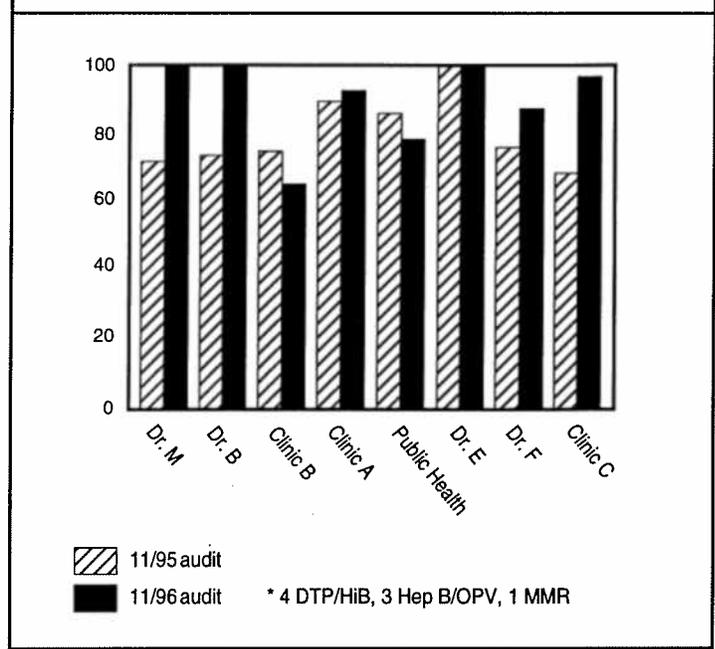
In 1995, KITS changed from a reminder to a recall system. Previously, personalized reminder letters were sent to parents when children reached age 2, 4, 6 and 12-15 months stating "your child will be due for the following immunizations on the date shown". This was determined to be inefficient, as most parents kept well baby appointments.<sup>3</sup> Physicians preferred that KITS assist by notifying parents who missed appointments, so the letter format was changed to read "your child was due...on the date shown" and letters were generated monthly for children who were overdue by 60 or more days.

During physician record audits, information was recorded about missed immunization opportunities. During 1996, presentations were made to physicians and nurses at Kauai's largest clinics at which immunization status and visit records of overdue children were displayed and discussed, and recommendations made for reducing missed opportunities. These presentations, along with the annual audit report stimulated actions to improve immunization levels.<sup>4</sup>

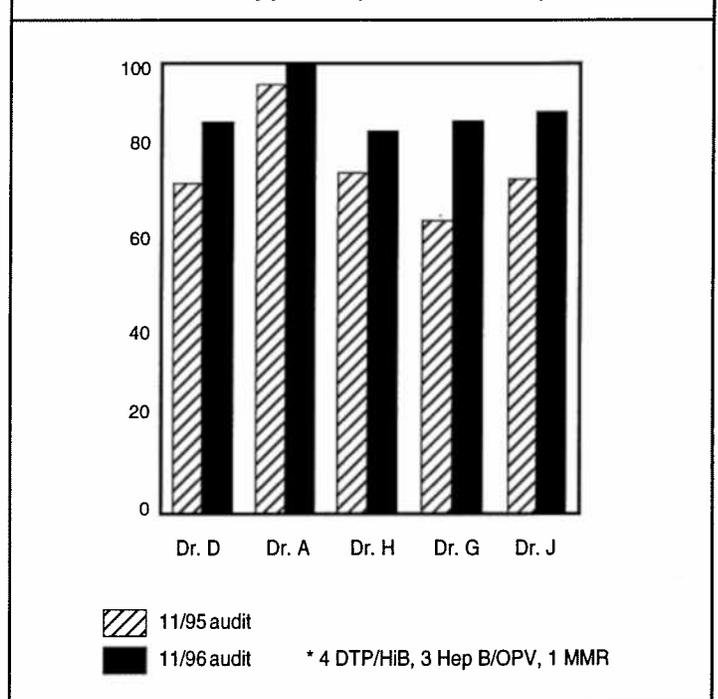
There were various reasons for children not being immunized. Parents' and physicians' lack of awareness that immunizations were overdue was a significant factor. Of the 768 residents in the 1996 audit, there were 82 under-immunized children. For 49 (60%) of these, one visit to the physician was all that was required for completion. Immunizing these children would result in an overall level for this birth cohort of 93%!

What remained was a small group of children whose parents either refused (4%) or appeared to have social or behavioral problems that required special outreach efforts. Kauai Public Health Clinic records reviewed for the 1996 audit revealed 6 overdue children. Five of the 6 families had been contacted by phone or letter from 3 to 8 times and informed that the child was overdue, and provided with the date

**Fig. 2—Percent of 1993 and 1994 Kauai-born infants completely\* immunized by provider (10-50 infants in KITS)**



**Fig. 3—Percent of 1993 and 1994 Kauai-born infants completely\* immunized by provider (>50 infants in KITS)**



and times of the next free clinic in their area, yet none attended.

### Conclusion and Recommendations

A combination of interventions, conducted over an extended period of time, and remodeled based on the community, improved immunization levels of Kauai children.<sup>3,4,5</sup> Admirable progress was

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made toward the National Year 2000 Objective of 90% series-complete immunization by age 2 years. Kauai physicians and nurses deserve special recognition and congratulations for their efforts during 1996. Additional effort is needed to reach the 90% goal, and the following recommendations are intended to assist in focusing that effort.

1) All clinics should initiate their own recall systems to determine which infants have missed immunization appointments, and reschedule appointments to catch-up missed immunizations.<sup>3,5,6</sup>

2) The most frequently missed immunizations are the 12-15 month MMR, DTP and HiB.<sup>1,7</sup> Physicians should initiate a reminder system to parents for this visit.

3) Children should be immunized at appropriate times unless the child is seriously

ill. If the physician chooses not to immunize a child who comes for a "sick" visit, the reason should be documented, an appointment for the immunization made for a few days later, and a staff member designated to follow through if the child misses the appointment.

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