

**1996 RETROSPECTIVE KINDERGARTEN SURVEY:
VACCINATION COVERAGE ESTIMATE FOR
PRESCHOOL-AGED CHILDREN IN LOS ANGELES COUNTY**

California law requires proof of vaccination, or exemption from vaccination, before a child can be admitted to any public or private California school.¹ Exemptions from vaccination can be granted for medical reasons, or religious or personal beliefs. To monitor vaccination coverage levels among preschool-aged children in Los Angeles County, the Immunization Program reviews vaccination records for a sample of kindergarten entrants each year. During the 1995-1996 school year, 161,638 children entered a Los Angeles County kindergarten. The results of the 1996 Retrospective Kindergarten Survey are presented in this report.

METHODS

The Retrospective Kindergarten Survey is a historical cohort survey that uses the vaccination dates from the school vaccination record to estimate retrospectively vaccination coverage levels during prior years and calculate age-appropriate series completion rates at 3, 7, 12, 19, 24, 36, 48, and 60 months of age. Series completion rates were calculated for:

- one dose of poliovirus (OPV) vaccine and one dose of diphtheria and tetanus toxoids and pertussis (DTP) vaccine at 3 months of age
- two OPV and three DTP at 7 and 12 months of age
- three OPV, four DTP and one dose of measles-mumps-rubella (MMR) vaccine at 19, 24, 36, 48, and 60 months of age.

Selection of schools. The California Immunization Branch determines the sampling method for use throughout the State for a core Retrospective Kindergarten Survey. The California Immunization Branch randomly selects schools from which records are sampled. In Los Angeles County, 31 public and 37 private schools were selected for the 1996 survey. These 68 schools represent 3% of the elementary schools in the County. At each selected school, a systematic random sample of one of every eight (12.5%) kindergarten student records were reviewed.

The Los Angeles County Immunization Program augmented the core Retrospective Kindergarten Survey with an expanded survey by randomly selecting 49 additional public schools from the Los Angeles Unified School District. The selected schools represent 12% of the elementary schools in the Los Angeles Unified School District. The schools selected for the expanded Retrospective Kindergarten Survey were not included in the *core* survey sample. At each selected school, a 100% sample of kindergarten student records were reviewed.

RESULTS

Core Retrospective Survey. Records for 580 students were reviewed at 68 schools. Overall, 56% of the children in the core retrospective survey sample had received four DTP, three OPV, and one MMR *by 24 months of age (Table 7). At each age milestone, coverage levels were lowest for Blacks and Hispanics (Figure 8).

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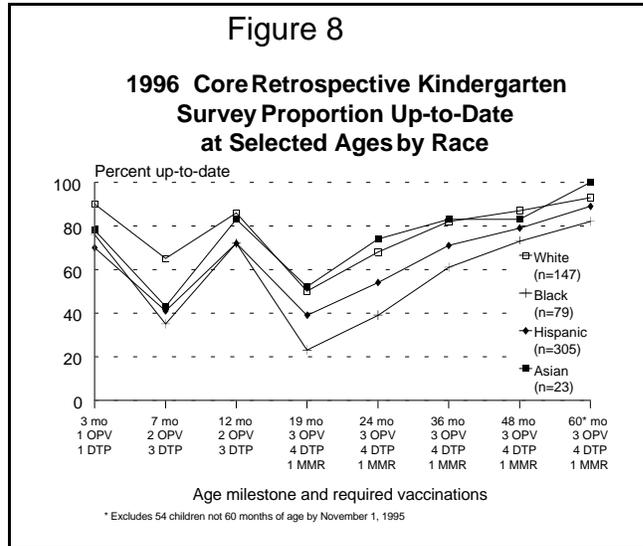


Table 7. Proportion of Kindergarten Students Who Received 4 DTP, 3 OPV, and 1 MMR by 24 Months of Age, by Race/Ethnicity

Race/Ethnicity	Core Survey Schools ^a 68 Schools			Expanded Survey Schools ^b 49 Schools		
	Sample Size	% Up-to-Date	95% CI ^c	Sample Size	% Up-to-Date	95% CI ^c
White	147	68%	±8%	541	36%	±4%
Black	79	39%	±11%	509	30%	±4%
Hispanic	305	54%	±6%	4,577	41%	±1%
Asian	23	74%	±18%	141	50%	±8%
Total	580^d	56%	±4%	5,926^e	40%	±1%

^a 31 public and 37 private schools randomly selected throughout Los Angeles County. The sampled schools represent 3% of the elementary schools in the County. At each school, records for approximately 12.5% of the kindergarten students were randomly selected and reviewed.

^b Random sample of Los Angeles Unified School District public elementary schools. The sampled schools represent 12% of the elementary schools in the Los Angeles Unified School District. At each school, records for all kindergarten students were reviewed.

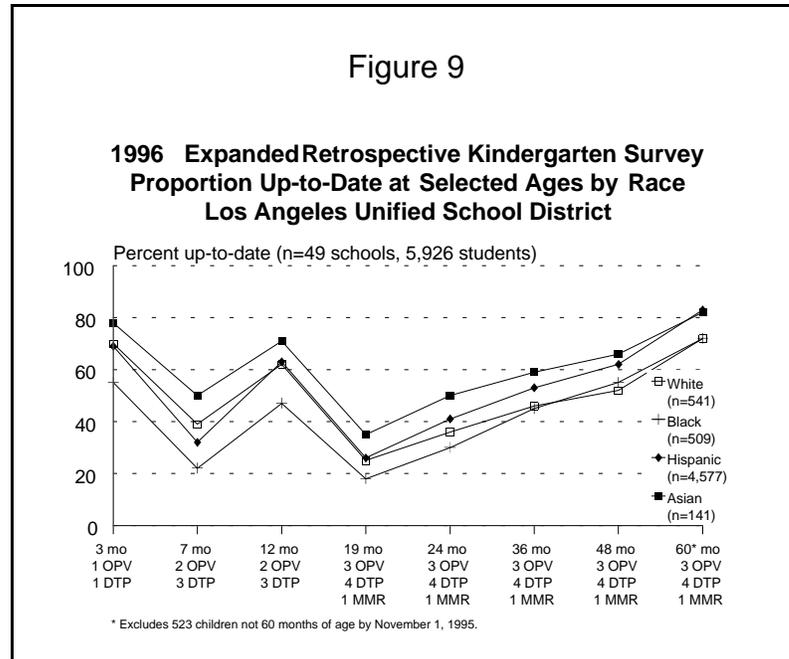
^c CI=confidence interval. The smaller the confidence interval, the more precise the estimate.

^d Core survey totals include 26 (4%) children of other or unknown race/ethnicity.

^e Expanded survey totals include 158 (3%) children of other or unknown race/ethnicity.

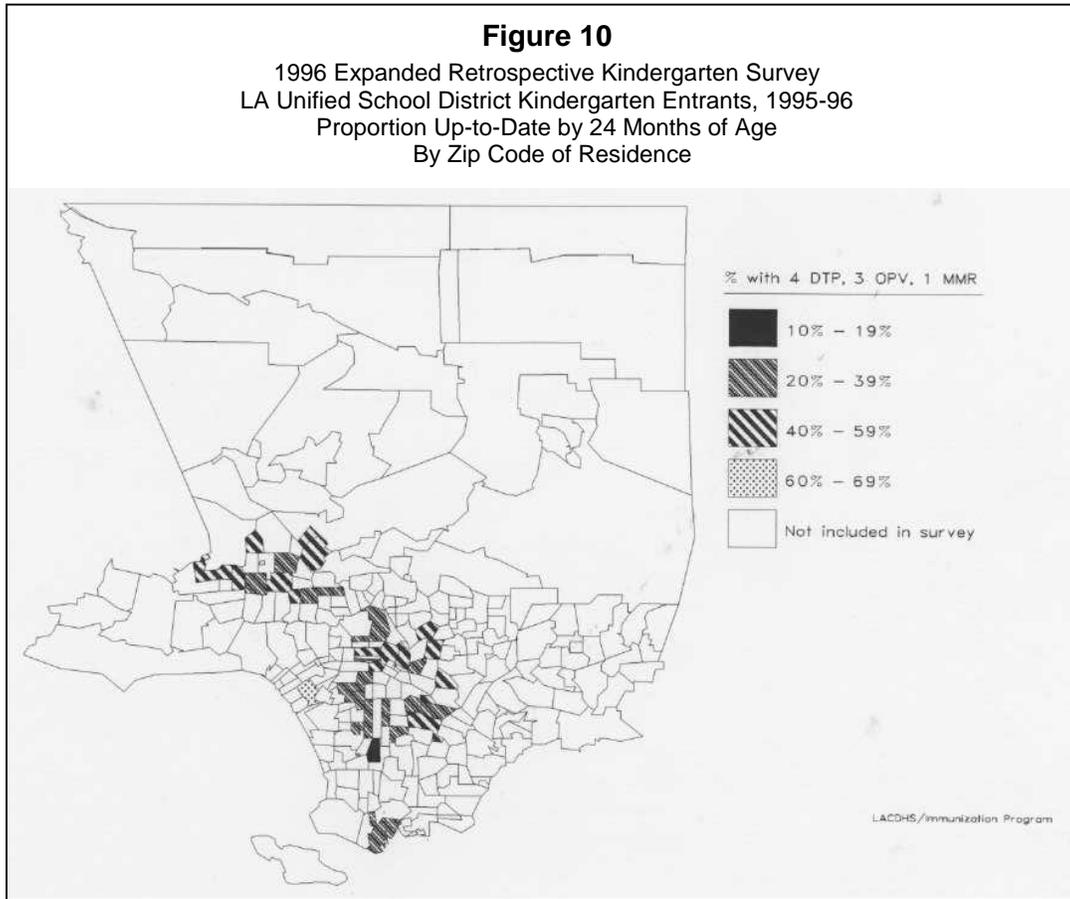
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Expanded Retrospective Survey. Records were reviewed for 5,926 students at 49 schools. Overall, 40% of the children in the expanded retrospective survey sample had received four DTP, three OPV, and one MMR by 24 months of age. At each age milestone assessed, coverage levels were generally lowest for Blacks and highest for Asians (Figure 9).



Because of the larger sample size, the expanded retrospective survey vaccination coverage estimates could also be summarized by zip code of the student's residence. Zip codes with at least 30 students residing in them were included in the analysis (Figure 10). Coverage levels at 24 months of age for four DTP, three OPV, and one MMR from the 37 zip code areas included in the analysis ranged from 18% to 61%.

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The following table shows annual core retrospective survey coverage estimates for four DTP, three OPV, and one MMR at 24 months of age since the 1992 school year. There are no comparable estimates from the expanded retrospective survey for prior years.

Table 8. Trends in DTP, OPV, and MMR Coverage

School Year	Estimate for	Coverage
1995-96	1992	56%
1994-95	1991	52%
1993-94	1990	60%
1992-93	1989	40%

DISCUSSION

The Retrospective Kindergarten Survey provides a population-based estimate of vaccination coverage levels. A limitation of a retrospective survey is that it does not provide a current estimate of vaccination coverage. The 1996 Retrospective Kindergarten Survey provides an estimate of vaccination coverage for children who were 24 months of age in 1992. We cannot determine whether there have been significant changes in vaccination coverage levels in recent years. The increase in coverage for 24-month-old children from 40% to 60% between 1989 and 1990 was likely due in part to increased awareness of the need for vaccinations in response to the measles epidemic of 1989-1991.²

Although the basic series of four DTP, three OPV, and one MMR should be completed by 18 months of age, many children in the survey did not actually complete the basic series until kindergarten entry. Nineteen percent of the children from the expanded retrospective survey sample and 11% of the children from the *core* retrospective survey sample were lacking one or more vaccinations at 60 months of age.

Some of the differences between the 1996 core and expanded Retrospective Kindergarten Survey results may be explained by the overrepresentation in the expanded retrospective survey of schools from central Los Angeles where coverage levels are expected to be lower. Differences may also be the result of sampling variation because the *core* retrospective survey sampled only a small number of children from each school while the expanded retrospective survey included every kindergarten student from the selected schools.

Regardless of the survey method used, vaccination coverage level estimates for Los Angeles County are below the national goal to completely vaccinate 90% of children during their second year of life.³ The Los Angeles County Immunization Program is intensifying efforts to develop timely and accurate estimates of vaccination coverage among preschool-aged children in Los Angeles County.⁴ The Immunization Program will continue to monitor vaccination coverage estimates from various sources for use in the development of interventions and to improve vaccination coverage levels.

REFERENCES

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4. Shaheen MA, Frerichs RR. Pilot study of young child immunization survey. January 1997 (unpublished report).