



**County of Los Angeles Department of Health Services**  
**Immunization Program**  
**Annual School Immunization Assessment**  
**Preschool, Kindergarten, and Seventh Grade**  
**April 2004**

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## **Background**

- California School Immunization Laws require that enrollees entering kindergarten or preschool receive a series of immunizations before admission to any licensed public or private school or preschool (Table 1)<sup>1</sup>. As of July 1, 1999, seventh grade enrollees have also been required to certify completion of the hepatitis B vaccine series and two doses of Measles-Mumps-Rubella (MMR) vaccine<sup>2</sup>.
- Every Fall, all licensed preschools, and public and private schools are required to report to the Los Angeles County Immunization Program (LACIP) the overall immunization status of their preschool, kindergarten and seventh grade enrollees, respectively.
- The objective of the annual immunization assessment of these three groups of enrollees is to monitor compliance with California School Immunization Laws in order to reduce the morbidity and mortality of vaccine-preventable diseases.

## **Methods**

### Study Population

- All enrollees attending public or private schools at preschool, kindergarten, and seventh grade levels. Preschool children attending home day cares or residential based facilities are not included in the study population.
- Preschool and kindergarten enrollees' ages range from 18-59 months, and 24-59 months, respectively.

### Data Collection Method

- Each September, standardized immunization assessment forms for each grade level are sent to licensed schools by the California State Immunization Program and to childcare facilities by LACIP.
- At each school/childcare facility, the immunization records of enrollees in each grade level are summarized and documented in the grade level-specific assessment form by school staff.

<sup>1</sup> Health and Safety Code, Division 105, Part 2, Chapter 1, Sections 120325-120380; California Code of Regulations, Title 17, Division 1, Chapter 4, Subchapter 8, Sections 6000-6075

<sup>2</sup> AB 381, signed by Governor Wilson October 12, 1997. Regulations in development, California Code of Regulations, Sections 6000-6075

## Collected Data

- The following are key data collected from each school's grade level-specific assessment form:
  1. Number of enrollees who have met the immunization requirements for the specific grade level.
  2. Number of enrollees who have not met the immunization requirements.
  3. Number of conditional entrants or follow-up enrollees who need to meet the immunization requirements.
  4. Number of enrollees with Permanent Medical Exemptions (PME) or Personal Beliefs Exemptions (PBE).
- Because of rounding estimation, the proportions indicated in this report may not yield the exact number of corresponding doses as cited in this report.

## Results

The 2003 Fall School Assessment results are grouped into seven categories:

- I. Immunization requirements for school entry
- II. Population size
- III. Percent of preschool enrollees meeting immunization requirements by type of school
- IV. Percent of enrollees meeting immunization requirements by grade level and vaccine antigen
- V. Immunization coverage in Los Angeles County compared to other jurisdictions
- VI. Permanent Medical Exemption (PME) or Personal Beliefs Exemption (PBE) rate
- VII. Healthy People 2010 Objectives and Los Angeles County status

### I. Immunization Requirements for School Entry

**Table 1. Immunization requirements for school entry, California 2003**

Grade Level	Vaccine					
	Polio	DTP/DTaP	MMR	Hep B	HiB	Varicella <sup>1</sup>
Preschool <sup>2</sup>	3	4	1	3	1	1
Kindergarten <sup>2</sup>	4 <sup>4</sup>	5 <sup>5</sup>	2 <sup>6</sup>	3	-	1
Seventh Grade <sup>3</sup>	NA	NA	2 <sup>6</sup>	3 <sup>7</sup>	-	-

<sup>1</sup>Physician-documented varicella (chickenpox) disease history or immunity meets the varicella requirement.

<sup>2</sup>Health and Safety Code, Division 105, Part 2, Chapter 1, Sections 120325-120380; California Code of Regulations, Title 17, Division 1, Chapter 4, Subchapter 8, Sections 6000-6075

<sup>3</sup>AB 381, signed by Governor Wilson October 12, 1997. Regulations in development, California Code of Regulations, Sections 6000-6075

<sup>4</sup>Four doses at any age, but 3 doses meet requirement for age 4-6 years if at least one was given on or after the 4<sup>th</sup> birthday; 3 doses meet requirement for age 7-17 years if at least one was given on or after the 2<sup>nd</sup> birthday. Receipt of the dose up to (and including) 4 days before the birthday will satisfy the school entry immunization requirement.

<sup>5</sup>Five doses at any age, but 4 doses meet requirements for ages 4-6 years if at least one was on or after the 4<sup>th</sup> birthday. Receipt of the dose up to (and including) 4 days before the birthday will satisfy the school entry immunization requirement.

<sup>6</sup>Two doses of measles-containing vaccine required. One dose of mumps and rubella-containing vaccine required; mumps vaccine is not required for children 7 years of age and older. Receipt of the dose up to (and including) 4 days before the birthday will satisfy the school entry immunization requirement.

<sup>7</sup>Two doses of the 2-dose hepatitis B vaccine formulation along with provider documentation that the 2-dose hepatitis B vaccine formulation was used for both doses and both doses were received at age 11-15 years will also fulfill this requirement.

II. Population size

**Table 2. Preschool/Childcare facilities<sup>1</sup>, Los Angeles County, 1994-2003**

Assessment Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Enrolled Students</b>	110,332	112,741	110,639	110,768	113,431	110,752	110,532	111,046	110,175	113,873
<b>Total Schools</b>	2,247	2,255	2,199	2,163	2,177	2,084	2,079	2,087	2,075	2,135
<b>Public Schools</b>	254 (11.3%)	285 (12.6%)	269 (12.2%)	171 (7.9%)	194 (9.0%)	246 (11.8%)	292 (14.0%)	316 (15.1%)	331 (16.0%)	323 (15.1%)
<b>Private Schools</b>	1,611 (71.7%)	1,551 (68.8%)	1,499 (68.2%)	1,556 (71.9%)	1,527 (70.1%)	1,396 (67.0%)	1,331 (64.0%)	1,327 (63.6%)	1,271 (61.2%)	1,386 (64.9%)
<b>Head Start Schools</b>	382 (17.0%)	419 (18.6%)	431 (19.6%)	436 (20.2%)	456 (20.9%)	442 (21.2%)	456 (22.0%)	444 (21.3%)	473 (22.8%)	426 (20.0%)

<sup>1</sup> Only includes facilities that submitted assessment forms

The annual number of preschool facilities and enrollees that submitted assessment forms has remained similar since 1994. Over the past decade, private schools have accounted for 61.2-71.9% of all preschool facilities returning assessment forms, head start centers represented 17.0-22.8%, while public schools represented 7.91-16.0%.

**Table 3. Schools<sup>1</sup> with kindergarten enrollment, Los Angeles County, 1994-2003**

Assessment Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Enrolled Students</b>	152,177	161,718	160,237	157,918	155,585	154,285	154,020	151,073	148,609	144,334
<b>Total Schools</b>	2,211	2,231	2,193	2,229	2,225	2,258	2,265	2,292	2,263	2,233
<b>Public Schools</b>	1,158 (52.4%)	1,159 (51.9%)	1,165 (53.1%)	1,178 (52.8%)	1,187 (53.3%)	1,185 (52.5%)	1,210 (53.4%)	1,211 (52.8%)	1,217 (53.8%)	1,223 (54.8%)
<b>Private Schools</b>	1,053 (47.6%)	1,072 (48.1%)	1,028 (46.9%)	1,051 (47.2%)	1,038 (46.7%)	1,073 (47.5%)	1,055 (46.6%)	1,081 (47.2%)	1,046 (46.2%)	1,010 (45.2%)

<sup>1</sup> Only includes facilities that submitted assessment forms

Of all the schools with kindergarten enrollees that submitted assessment forms, 51.9-54.8% have been public and 45.2-48.1% have been private since 1994.

**Table 4. Schools<sup>1</sup> with seventh grade enrollment, Los Angeles County, 1999-2003**

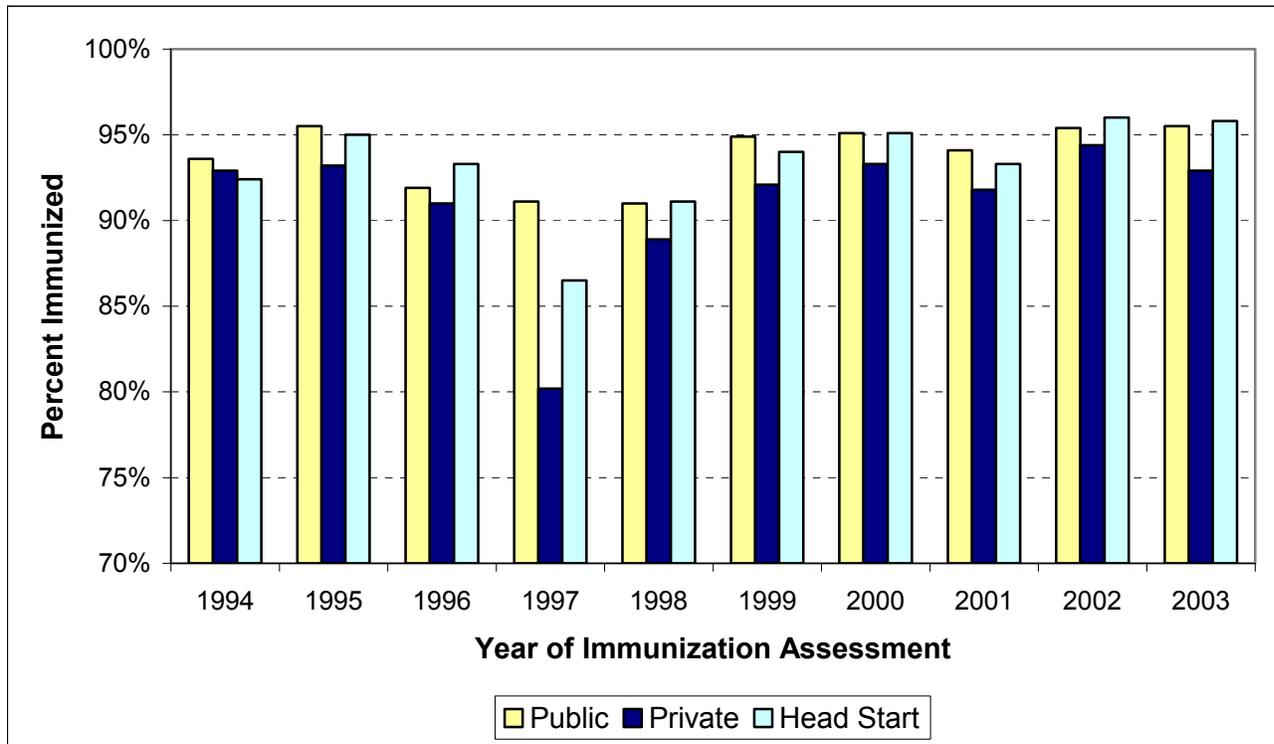
<b>Assessment Year</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
<b>Enrolled Students</b>	119,947	141,775	146,667	154,701	154,245
<b>Total Schools</b>	851	952	1,043	1,040	1,023
<b>Public Schools</b>	300 (35.3%)	364 (38.2%)	389 (37.3%)	401 (38.6%)	393 (38.4%)
<b>Private Schools</b>	551 (64.7%)	588 (61.8%)	654 (62.7%)	639 (61.4%)	630 (61.6%)

<sup>1</sup> Only includes facilities that submitted assessment forms

A pilot immunization assessment for seventh grade enrollees was conducted in July 1999, hence the evidenced lower number of enrollees that year. Of all the licensed seventh grade schools that submitted assessment forms, 61.4-64.7% have been private and 35.3-38.6% public since 1999.

### III. Percent of enrollees meeting immunization requirements by type of school

**Figure 1: Percent of preschool enrollees meeting immunization requirements<sup>1</sup>, by type of child care center, Los Angeles County, 1994-2003<sup>2</sup>**



<sup>1</sup> All Required Immunizations: Enrollee has received 4+DTP, 3+ Polio, 1 MMR, 1 Hib, 3 Hep B, and 1 Varicella.

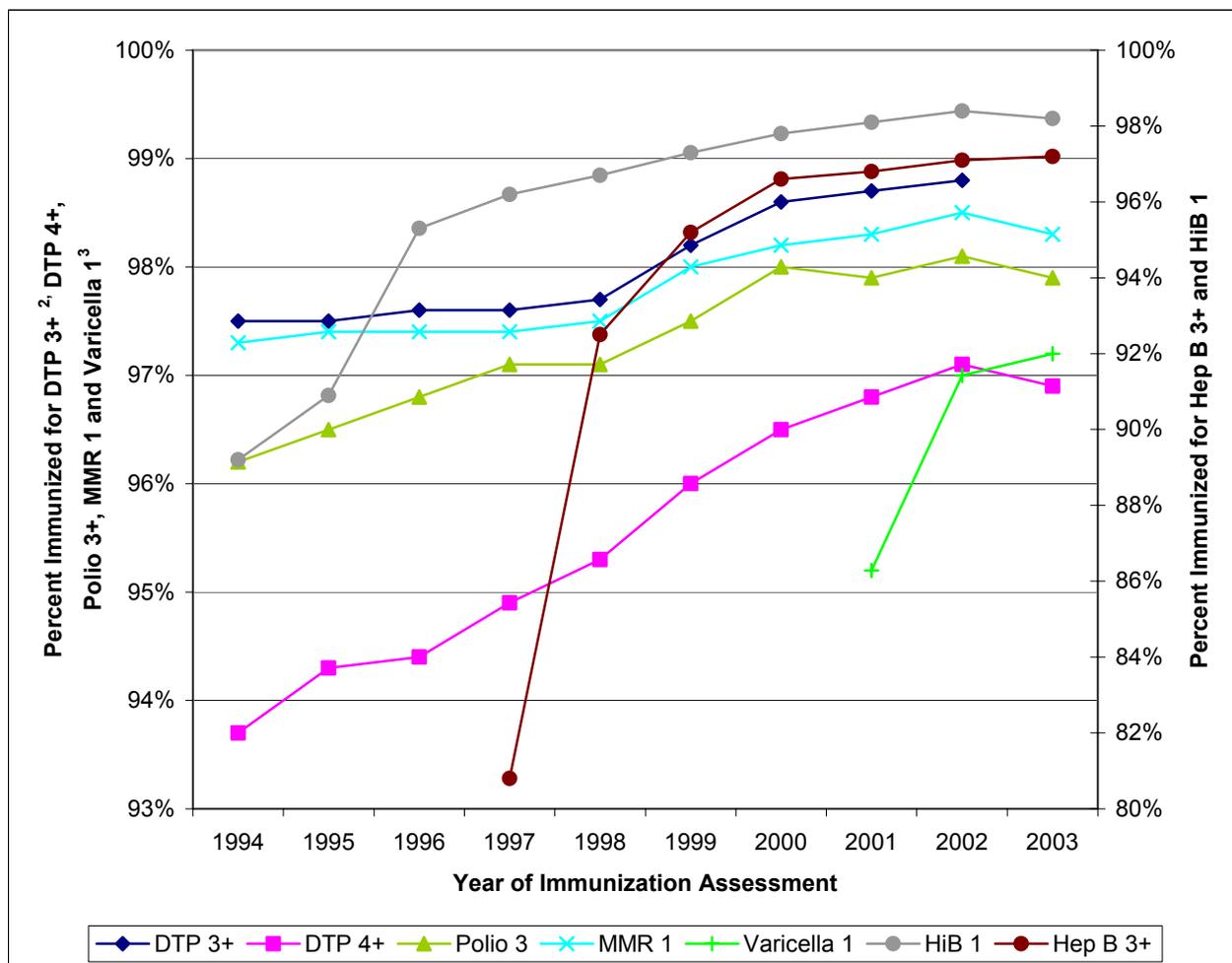
<sup>2</sup> Denominator includes enrollees with documented PBEs and PME.

Among the three types of preschool facilities, private schools consistently had the lowest proportion of enrollees meeting the immunization requirements from 1995 to 2003. With the exception of 1997, public and head start preschools have showed similar immunization coverage levels since 1994.

Data are not available for the proportion of kindergarten and seventh grade enrollees meeting immunization requirements by type of school.

IV. Percent of enrollees meeting immunization requirements by grade level and vaccine antigen, 1994-2003

**Figure 2: Percent of preschool enrollees immunized, Los Angeles County, 1994-2003<sup>1</sup>**



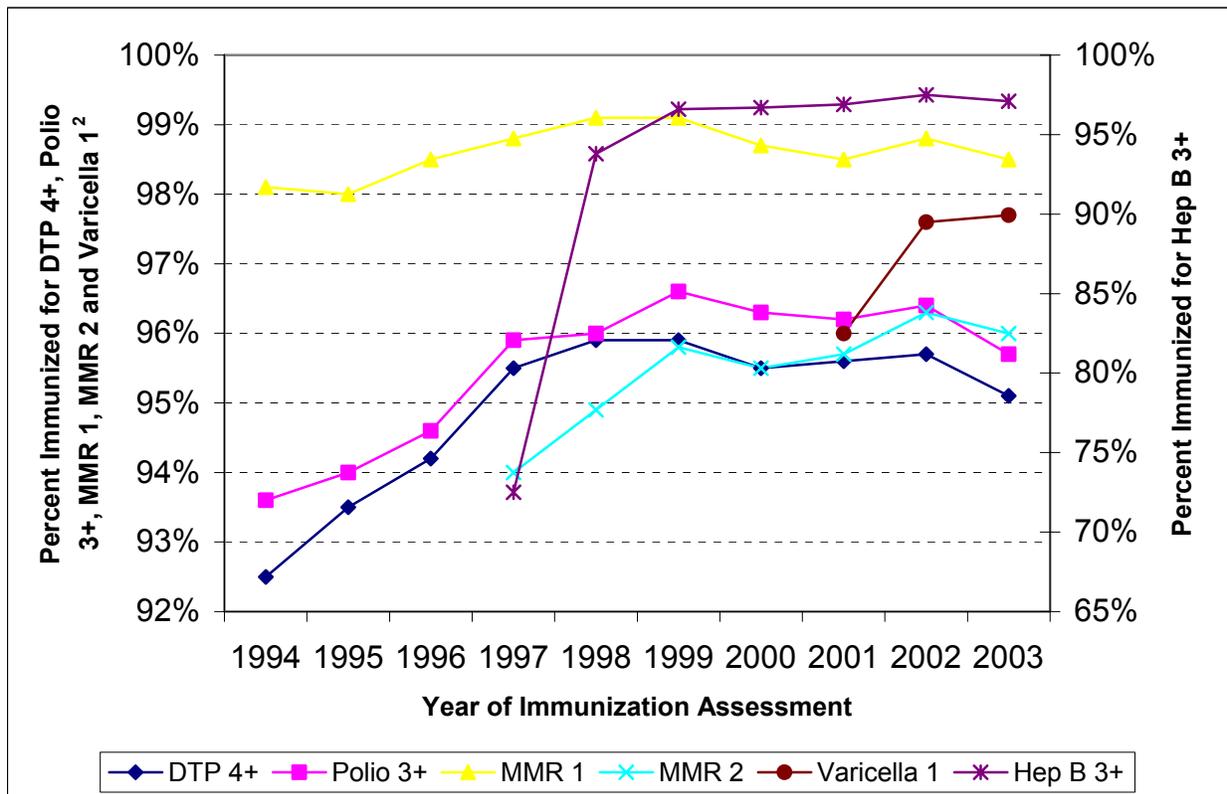
<sup>1</sup>Denominator includes enrollees with documented PBEs and PME.

<sup>2</sup>No data available for DPT 3+ coverage in 2003.

<sup>3</sup>One dose of Varicella vaccine or physician documented disease/immunity.

In 2003, the fourth dose of DTP yielded the lowest antigen-specific coverage level of 96.96% (n=110,412), compared to all other antigens. However, the coverage level for DTP4+ has been over 93% since 1994. In 2003, the first dose of MMR yielded the highest antigen-specific coverage level of 98.26% (n=111,887), compared to all other antigens. Over 97% of enrollees have been adequately immunized with the first dose of MMR since 1994. Varicella coverage has remained high, above 95%, since its introduction in 2001. Hepatitis B coverage, which is graphed using the right vertical axis scale, has remained above 95% since 1999.

**Figure 3: Percent of kindergarten enrollees immunized, Los Angeles County, 1994-2003<sup>1</sup>**

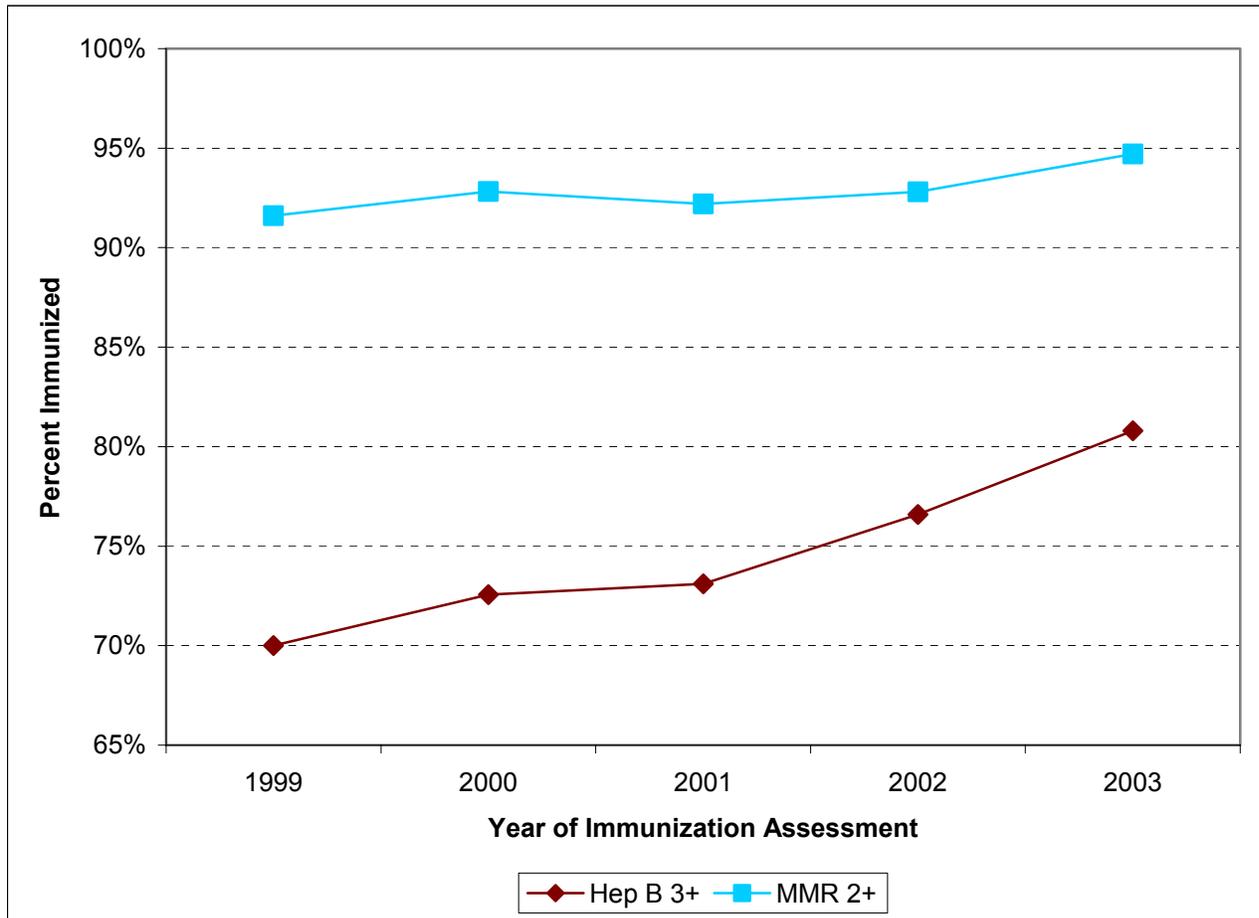


<sup>1</sup> Denominator includes enrollees with documented PBEs and PME.

<sup>2</sup> One dose of Varicella vaccine or physician documented disease/immunity.

In 2003, the fourth dose of DTP yielded the lowest antigen-specific coverage level of 95.09% (n=137,250), compared to all other antigens. However, the coverage level of DTP4+ has been over 92% since 1994. In 2003, the first dose of MMR yielded the highest antigen-specific coverage level of 98.55% (n=142,243), compared to all other antigens. The second dose of MMR coverage level was 96.03% (n=138,607), only a 0.30% dropped from the previous year. Varicella coverage has remained high, 96.02-97.66%, since its introduction in 2001. Hepatitis B coverage, which is graphed using the right vertical axis scale, has risen from 72.50% (n=114,499) in 1997 to 96.61% (n=149,057) in 1999 and since then has remained stable.

**Figure 4: Percent of seventh grade enrollees immunized, Los Angeles County, 1999-2003<sup>1</sup>**

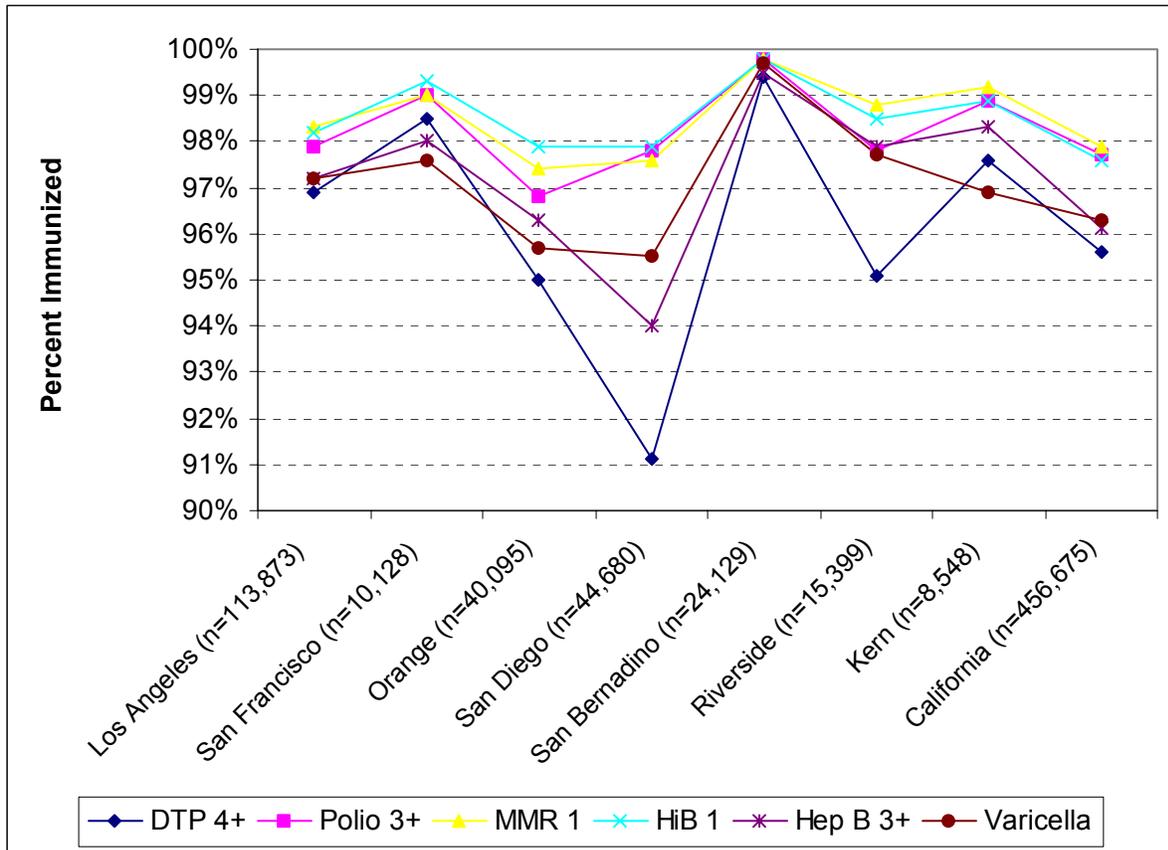


<sup>1</sup> Denominator includes enrollees with documented PBEs and PME

In 2003, the proportion of total seventh grade enrollees (n=154,245) meeting Hepatitis B series requirements reached 80.85% (n=124,704), a rise of 10.80% since 1999. An MMR coverage level of above 91% has been maintained since 1999.

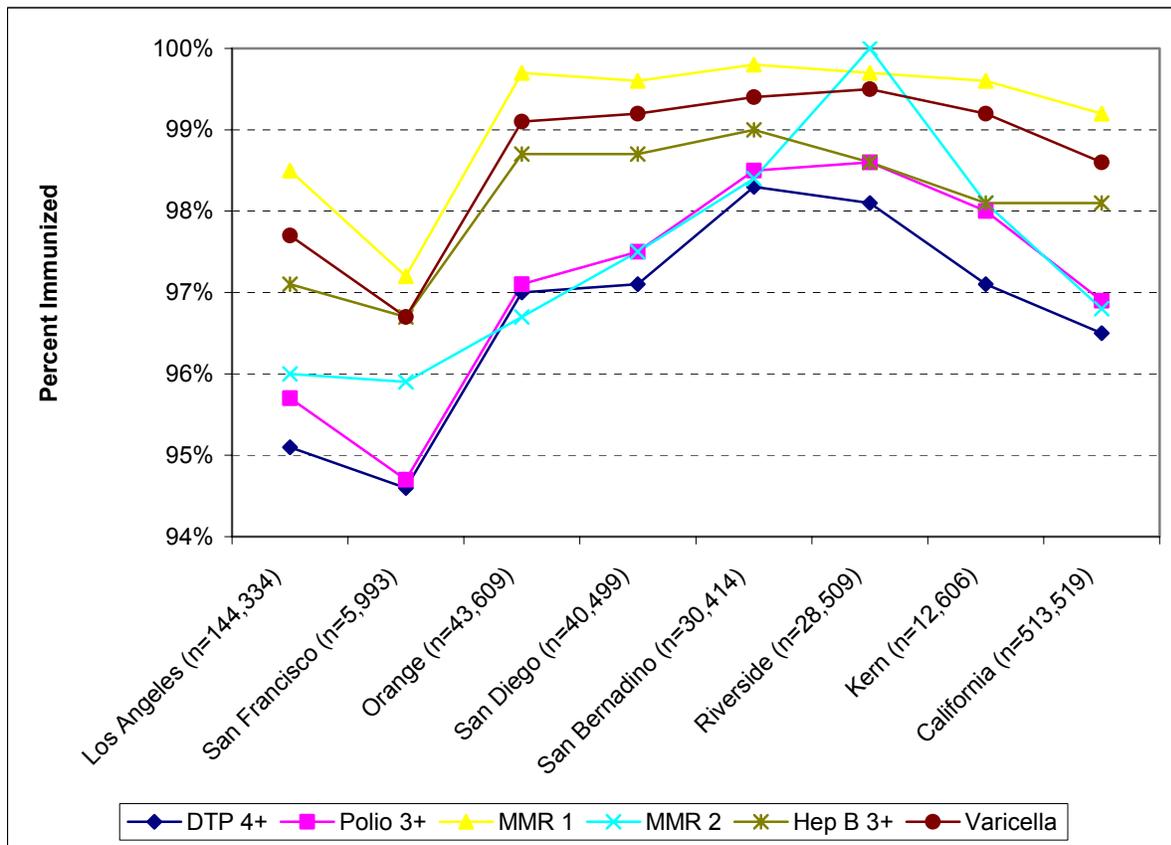
V. Immunization coverage in Los Angeles County compared to other jurisdictions, Fall Assessment 2003

**Figure 5: Percent of preschool enrollees immunized, by jurisdiction, California, 2003**



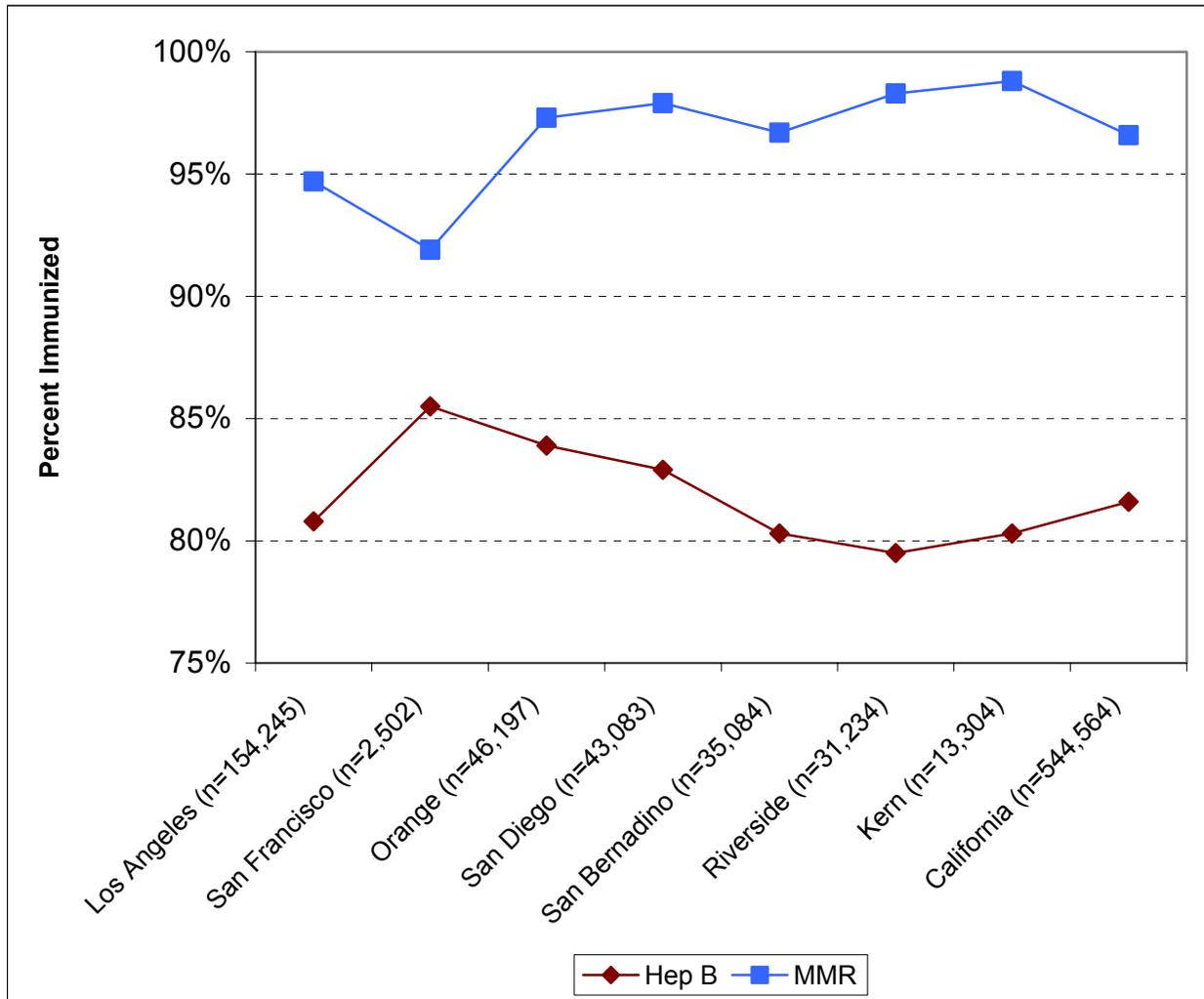
In 2003, Los Angeles County preschool enrollees (n=113,873) have achieved higher coverage levels for each individual vaccine antigen than those of the entire state. Ranking the jurisdictions by their antigen-specific coverage levels, Los Angeles County preschool enrollees were ranked fourth for DTP 4+, fourth for Polio 3+, fifth for MMR 1, fifth for HiB 1, fifth for Hep B 3+, and fourth for Varicella, relative to neighboring jurisdictions.

**Figure 6: Percent of kindergarten enrollees immunized, by jurisdiction, California 2003**



In 2003, Los Angeles County kindergarten enrollees (n=144,334) have achieved lower coverage levels for each individual vaccine antigens than those of the entire state. Ranking the jurisdictions by their antigen-specific coverage levels, Los Angeles County kindergarten enrollees were ranked at sixth for all individual vaccine antigen coverage levels, relative to neighboring jurisdictions.

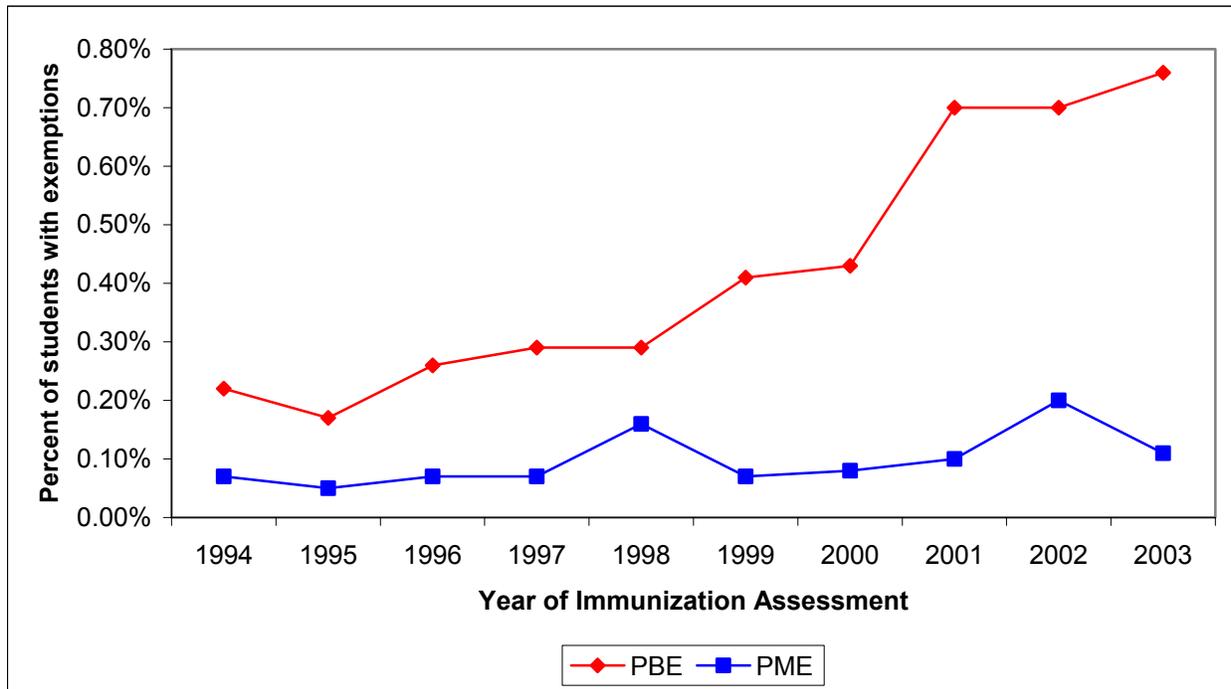
**Figure 7: Percent of seventh grade enrollees immunized, by jurisdiction, California 2003**



In 2003, the percent of seventh grade enrollees in Los Angeles County meeting the hepatitis B requirement was lower than that of the entire state (80.85% [n=124,704] and 81.59% [n=444,310], respectively). The percent of seventh grade enrollees in Los Angeles County meeting the MMR requirement was lower than that of the entire state (94.67% [n=146,028] and 96.62% [n=526,176], respectively). Ranking the jurisdictions by antigen-specific coverage levels, Los Angeles County seventh grade enrollees were ranked fourth for Hep B 3+ and sixth for MMR, relative to neighboring jurisdictions.

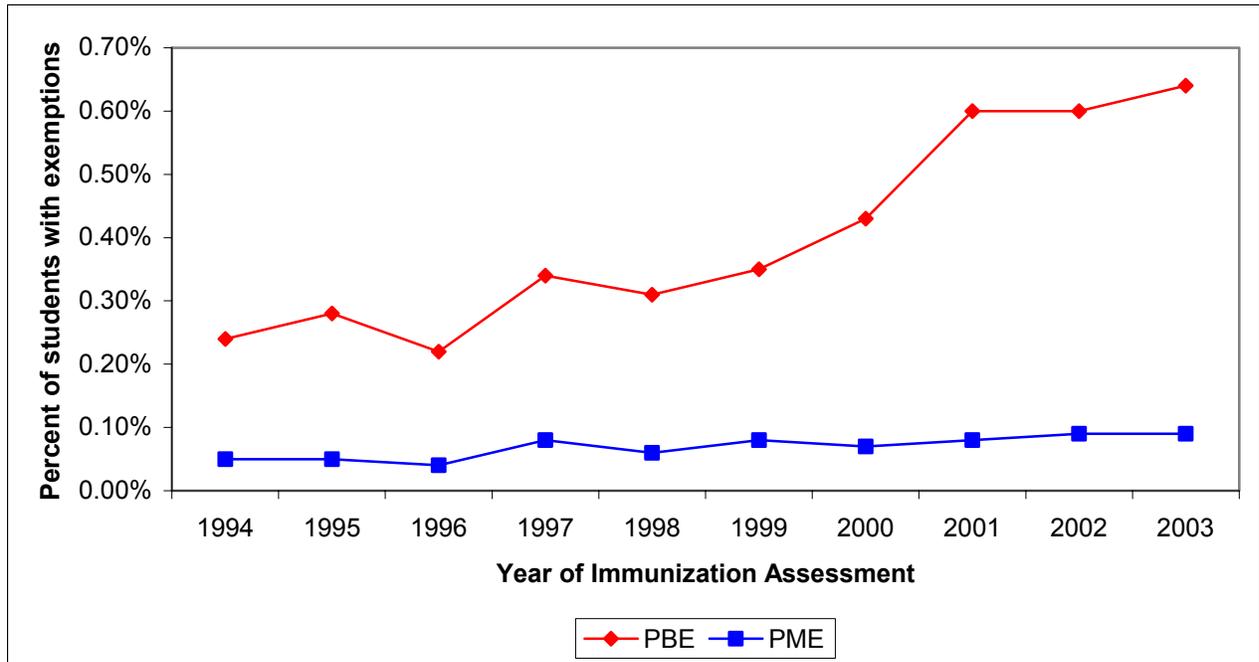
VI. Permanent medical exemption (PME) or personal beliefs exemptions rate (PBE), 1994-2003

**Figure 8: Personal belief/medical belief exemptions in preschool enrollees, Los Angeles County, 1994-2003**



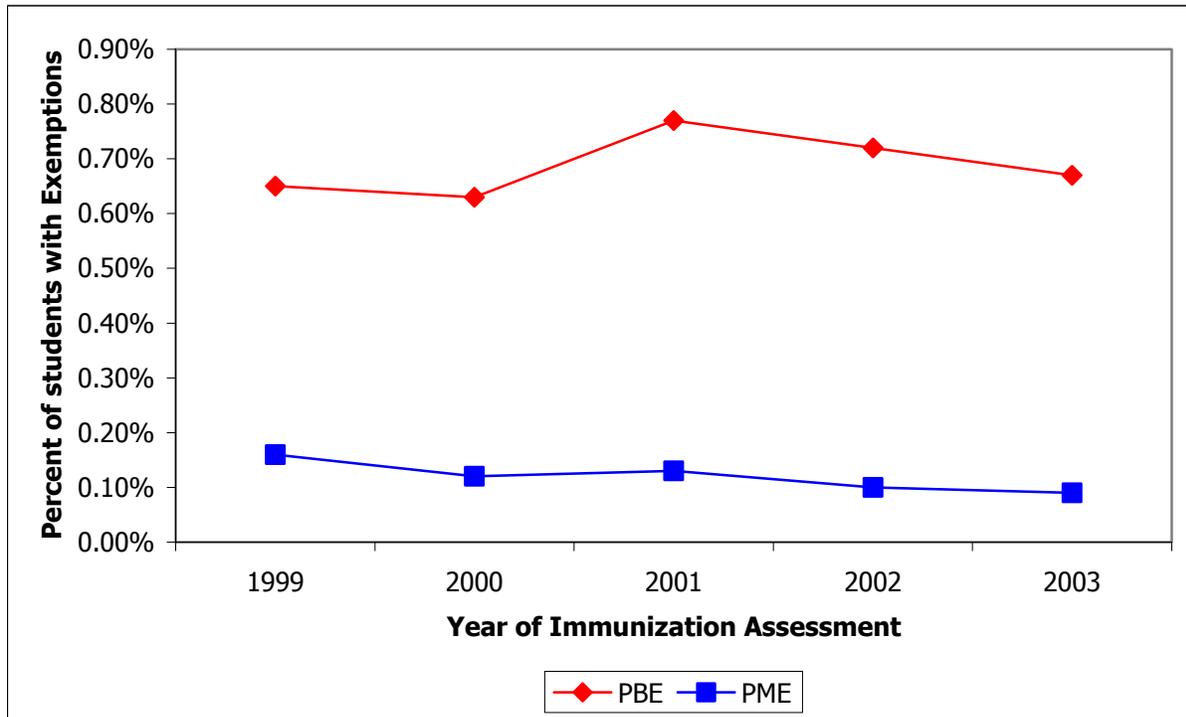
The proportion of preschool enrollees with personal beliefs exemptions has risen from 0.22% (n=247) in 1994 to 0.76% (n=871) in 2003. The proportion of preschool enrollees with permanent medical exemptions remained constant at less than 0.2% since 1994.

**Figure 9: Personal belief/medical belief exemptions in kindergarten enrollees, Los Angeles County, 1994-2003**



The proportion of kindergarten enrollees with personal beliefs exemptions has gradually risen from .24% (n=370) in 1994 to .64% (n=927) in 2003. The proportion of kindergarten enrollees with permanent medical exemptions has not exceeded .1% since 1994.

**Figure 10: Personal belief/medical belief exemptions in seventh grade enrollees, Los Angeles County, 1999-2003**



In 2003, the proportion of seventh grade enrollees with personal beliefs exemptions was at 0.67% (n=1,040), a drop of 0.05% from the previous year. The proportion of seventh grade enrollees with permanent medical exemptions has not exceeded 0.2% since 1999.

VII. Healthy People 2010 Objectives and Los Angeles County Status

**Table 5. Immunization objectives for Healthy People 2010, target coverage levels vs. Los Angeles County Fall Assessment**

Healthy People 2010 Objective	Healthy People 2010 Target (%)	Los Angeles County Fall Assessment (%), 2003	Previous 5-year average (%), Los Angeles County (1998-2002)
<b>Maintenance of Vaccination Coverage Levels for Enrollees in licensed day care facilities<sup>1</sup></b>			
Diphtheria-tetanus-acellular pertussis (DTaP) vaccine	95	96.9	96.3
Hepatitis B (hep B) vaccine	N/A <sup>3</sup>	97.2	95.6
Measles-mumps-rubella (MMR) vaccine	95	98.3	98.1
Polio vaccine	95	97.9	97.7
Varicella vaccine	N/A <sup>3</sup>	97.2 <sup>4</sup>	96.1 <sup>5</sup>
<b>Maintenance of Vaccination Coverage Levels for Enrollees in kindergarten through the first grade<sup>2</sup></b>			
Diphtheria-tetanus-acellular pertussis (DTaP) vaccine	95	95.1	95.7
Hepatitis B (hep B) vaccine	N/A <sup>3</sup>	97.1	96.3
Measles-mumps-rubella (MMR) vaccine	95	96.0	95.6
Polio vaccine	95	95.7	96.3
Varicella vaccine	N/A <sup>3</sup>	97.7 <sup>4</sup>	96.8 <sup>5</sup>

<sup>1</sup>Health and Safety Code, Division 105, Part 2, Chapter 1, Sections 120325-120380; California Code of Regulations, Title 17, Division 1, Chapter 4, Subchapter 8, Sections 6000-6075 (California immunization requirements for Child Care: 4 doses of diphtheria-tetanus-acellular pertussis (DTaP) vaccine, 3 doses of hepatitis B vaccine, 1 dose of measles-mumps-rubella (MMR) vaccine, 3 doses of polio vaccine, 1 dose of varicella vaccine).

<sup>2</sup>Health and Safety Code, Division 105, Part 2, Chapter 1, Sections 120325-120380; California Code of Regulations, Title 17, Division 1, Chapter 4, Subchapter 8, Sections 6000-6075 (California immunizations requirements for school entry Grades K-12: 5 doses of diphtheria-tetanus-acellular pertussis (DTaP) vaccine, 3 doses of hepatitis B vaccine, 2 doses of measles-mumps-rubella (MMR) vaccine, 3 doses of polio vaccine, 1 dose of varicella vaccine).

<sup>3</sup>In development

<sup>4</sup>Physician documented varicella (chickenpox) disease history or immunity meets the varicella requirement.

<sup>5</sup>The 2-year average (2001-2002) for varicella vaccine was calculated.

Los Angeles County has reached all the Healthy People 2010 vaccination coverage objectives for enrollees in licensed day care facilities and in kindergarten grades, as evidenced in 2003 and by the previous 5-year average.

**Table 6. Immunization objectives for Healthy People 2010, target coverage levels vs. Los Angeles County coverage estimates from different data sources**

Healthy People 2010 Objective	Healthy People 2010 Target (%)	Fall Assessment 2003 (% enrollees 18-59 months in 2003) <sup>1</sup>	Clinic Audits 2003 DHS <sup>2</sup> Facilities (% enrollees 24-35 months in 2003)	Clinic Audits 2003 CHC <sup>3</sup> Facilities (% enrollees 24-35 months in 2003)
Increase in and Maintenance of Vaccination Coverage Levels for Among Enrollees Aged 19 to 35 Months				
4 doses DTaP	90	96.9	65.4	87.6
3 doses HiB	90	N/A	77.3	93.6
3 doses Hep B	90	97.2	76.4	93.2
1 dose MMR	90	98.3	82.1	92.5
3 doses polio	90	97.9	80.9	95.6
1 dose varicella	90	97.2	76.4	89.3
Increase in Coverage Levels of Universally Recommended Vaccines Among Enrollees Aged 19 to 35 Months				
4:3:1:3:3 <sup>4</sup>	80	N/A	57.6	82.4
4:3:1 <sup>5</sup>	N/A	N/A	61.9	84.8

<sup>1</sup> Only Preschool enrollees at 18-59 months of age.

<sup>2</sup> LAC Department of Health Services health centers and hospitals.

<sup>3</sup> Community Health Centers (nonprofit healthcare providers that receive immunization subvention contract funds).

<sup>4</sup> Four doses of DTaP/DT, three doses of poliovirus vaccine, one dose of MMR, three doses of HiB, and three doses of hepatitis B vaccine.

<sup>5</sup> Four doses of DTaP/DT, three doses of poliovirus vaccine, one dose of MMR.

Compared to the 2003 clinic audits, the Fall Assessment results show higher vaccination coverage levels for all the required antigens. This is most likely due to the wider age range of the enrollees included in the Fall Assessment (18-59 months), compared to the clinic audits which only included enrollees up to 35 months of age. Strict enforcement of school vaccination requirements have probably contributed to a higher level of coverage among enrollees.

## **Discussion**

### Summary

A lower proportion of private preschool enrollees met the immunization requirements, compared to public and head start enrollees. This consistent pattern indicates an opportunity for improvement in this sector and may require additional training among private school staff.

With the exception of San Francisco, kindergarten enrollees in Los Angeles County had the lowest coverage rate of all required antigens over the past three years, compared to other jurisdictions in California. A probable explanation to this finding is the much larger population size served in Los Angeles County, compared to other jurisdictions. A concern is the potential for school-related vaccine preventable disease transmission.

Contrary to the highest coverage level for a single dose of MMR, the fourth dose of DTP showed the lowest coverage level among kindergarten and preschool enrollees. The lowest antigen-specific coverage level of DTP 4+ was also observed from all other data sources that determine vaccination coverage levels. The results of the 2002 National Immunization Survey (NIS) have shown that delaying the fourth dose of DTaP is the primary reason for incomplete vaccination series.

An upward trend in personal belief exemptions against vaccination among preschool and kindergarten enrollees is of concern. This phenomenon might indicate some misconceptions among parents regarding the safety of childhood immunizations, contributing to increased immunization refusal rates by families.

### Limitations

The Fall School Assessment is a records-based estimation rather than a population-based survey, thus these results can only be generalized to enrollees attending licensed schools/childcare facilities in Los Angeles County.