



County of Los Angeles Department of Health Services  
Immunization Program  
2006 Annual School Immunization Assessment  
Preschool and Kindergarten  
September 2008

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## Background

State mandated immunization requirements for licensed childcare/preschool entrance play an important role in keeping children up-to-date with their immunization series<sup>1</sup>. 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). Every Fall, all licensed childcare facilities and public and private schools are required to report the immunization status of their preschool and kindergarten enrollees, in aggregate, to the Los Angeles County Immunization Program (LACIP).

## Objective

The objective of the annual immunization assessment is to monitor licensed preschools and public and private schools compliance with the school immunization laws and assess immunization coverage levels of kindergarteners and preschoolers.

## Methods

### Study Population

#### Eligibility

- Enrollees attending public or private schools at preschool and kindergarten grade levels.
  - Preschool enrollees within the age range of 24-59 months.<sup>2</sup>
  - Kindergarten enrollees' of all ages.
  - For ungraded classes, only enrollees within the age range of 57-69 months are included<sup>3</sup>.
- Data were not available for preschool children attending family home day cares, day nurseries, nursery schools and development centers.

### Data Collection Method

Each September, the Los Angeles County Immunization Program and the California State Immunization Program coordinate data collection of preschool and kindergarten immunization status. Traditionally, school staff receive standardized immunization assessment forms and return the completed assessments for each grade-level to the LACIP. Preschool data are analyzed by the LACIP and kindergarten data are forwarded to the State Immunization Program for analysis.

<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> State of California-Health and Human Services Agency (CDPH 8018A-Annual Immunization Report on Children Enrolled in Child Care Centers)

<sup>3</sup> State of California-Health and Human Services Agency (PM 236-Immunization Assessment of Kindergarten Students Annual Report)

## Collected Data

Grade level-specific assessment forms include the following information:

- Number of enrollees who have met the immunization requirements for the specific grade level.
- Number of enrollees who have not met the immunization requirements.
- Number of conditional entrants or follow-up enrollees who need to meet the immunization requirements.
- Number of enrollees with Permanent Medical Exemptions (PME) or Personal Beliefs Exemptions (PBE).

Note: Because of rounding estimation, the proportions indicated in this report may not yield the exact number of corresponding counts as cited in this report.

## Results

The 2006 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 Vaccine Antigen
- V. Immunization Coverage in Los Angeles County Compared to Other Jurisdictions
- VI. Permanent Medical Exemption (PME) or Personal Beliefs Exemption (PBE) Levels
- VII. Healthy People 2010 Objectives and Los Angeles County Status

### I. Immunization Requirements for School Entry

**Table 1. Immunization requirements for school entry, California 2006**

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

<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>Receipt of the dose up to (and including) 4 days before the birthday will satisfy the childcare entry immunization requirement.

<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 (both on or after 1<sup>st</sup> birthday). 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.

Note: DTaP/DTP represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

## II. Population Size

**Table 2. Preschool facilities<sup>1</sup>, Los Angeles County, 1997-2006**

Assessment Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>Enrolled Students</b>	110,768	113,431	110,752	110,532	111,046	110,175	113,873	130,910	129,556	131,839
<b>Total Schools</b>	2,163	2,177	2,084	2,079	2,087	2,075	2,135	2,419	2,331	2,366
<b>Public Schools</b>	171 (7.9%)	194 (9.0%)	246 (11.8%)	292 (14.0%)	316 (15.1%)	331 (16.0%)	323 (15.1%)	359 (14.8%)	354 (15.2%)	354 (15.0%)
<b>Private Schools</b>	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%)	1,538 (63.6%)	1,454 (62.4%)	1,483 (62.7%)
<b>Head Start Schools</b>	436 (20.2%)	456 (20.9%)	442 (21.2%)	456 (22.0%)	444 (21.3%)	473 (22.8%)	426 (20.0%)	522 (21.6%)	523 (22.4%)	529 (22.4%)

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

- In 2006, the number of preschools that reported enrollee immunization status for the Fall Assessment rose slightly from the previous year.
  - The number of preschool facilities that submitted assessment forms increased by 1.5% (n=35) and the total number of preschool enrollees increased by 1.8% (n=2,283).
  - This rise is primarily due to an increase in the number of private and head start school facilities. The number of headstart schools increased for the fourth consecutive year.
- Fluctuations in school levels are common as the number of facilities that open and close in LA County vary from year to year.
- Private schools continued to represent the highest proportion of reporting preschools, 62.7% in 2006.

**Table 3. Schools<sup>1</sup> with kindergarten enrollment, Los Angeles County, 1997-2006**

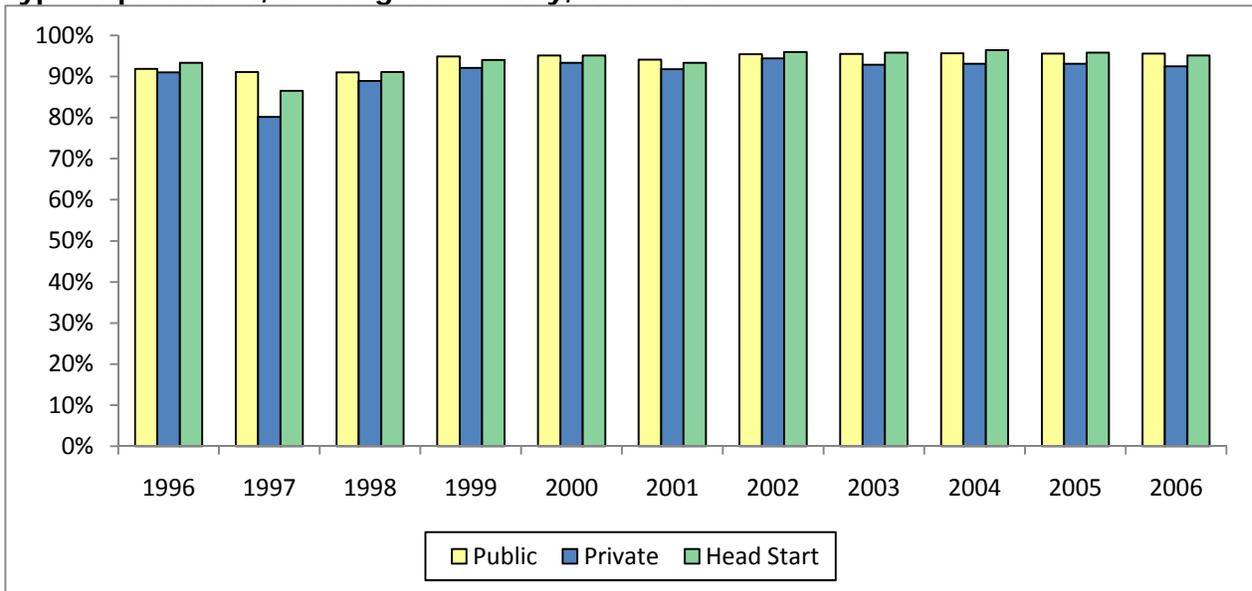
Assessment Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>Enrolled Students</b>	157,918	155,585	154,285	154,020	151,073	148,609	144,334	140,591	138,442	129,608
<b>Total Schools</b>	2,229	2,225	2,258	2,265	2,292	2,263	2,233	2,207	2,186	2,090
<b>Public Schools</b>	1,178 (52.8%)	1,187 (53.3%)	1,185 (52.5%)	1,210 (53.4%)	1,211 (52.8%)	1,217 (53.8%)	1,223 (54.8%)	1,227 (55.6%)	1,240 (56.7%)	1,228 (58.8%)
<b>Private Schools</b>	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%)	980 (44.4%)	946 (43.3%)	862 (41.2%)

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

- The downward trend in the number of kindergarten schools reporting immunization status of their students for the Fall Assessment continued in 2006 for the tenth consecutive year.
  - The number of public and private schools decreased by 1.0% (n=12) and 8.9% (n=84) respectively from 2005.
- In 2006, kindergarten student enrollment levels dropped 6.4% (n=8,834).
- In 2006, the majority of reporting kindergarten facilities were public (58.8%).

### III. Percent of Preschool Enrollees Meeting Immunization Requirements by Type of School

**Figure 1: Percent of preschool enrollees meeting immunization requirements<sup>1</sup>, by type of preschool, Los Angeles County, 1996-2006<sup>2</sup>**



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

<sup>2</sup> Denominator includes enrollees with documented personal belief exemptions and personal medical exemptions.

Note: DTaP/DTP represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

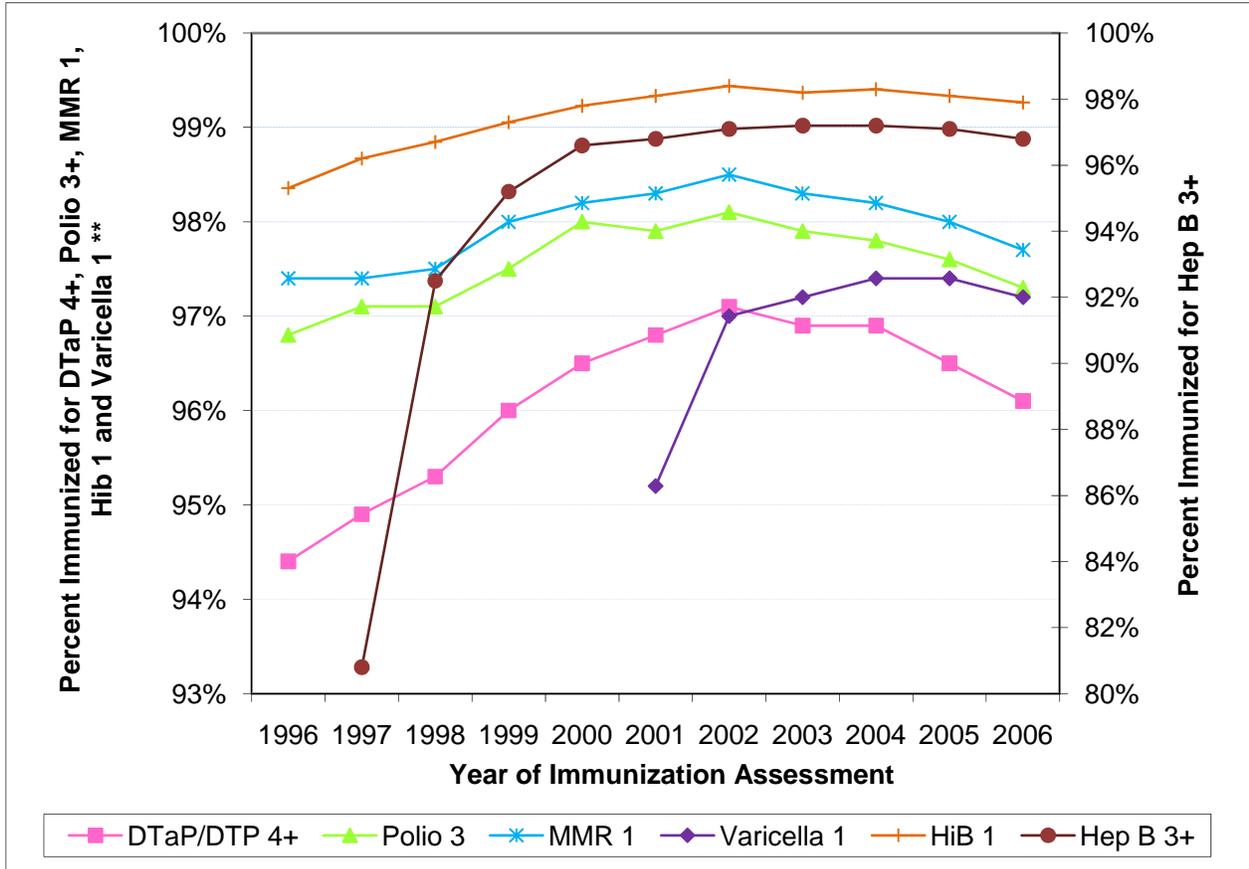
- In 2006, the number of enrollees meeting the immunization requirements for preschool entrance remained high for all preschool categories.
  - The public preschool coverage level remained stable between 2005 and 2006 at 95.6%.
  - Head start and private preschool levels decreased by less than one percent from 2005 to 2006.
- In 2006, private preschools continued to have the lowest proportion of enrollees meeting the immunization requirements (92.5%).

Note: Data are not available for the proportion of kindergarten enrollees meeting immunization requirements by type of school.

IV. Percent of Enrollees Meeting Immunization Requirements by Vaccine Antigen

**Figure 2: Percent of preschool enrollees immunized, Los Angeles County, 1996-2006 \***

Note: To determine coverage levels for DTaP/DTP, Polio, MMR, HiB and Varicella, read the values shown on the left axis (between 93%-100%) and the corresponding data point on the graph. For Hep B ONLY, read the values shown on the right axis (between 80%-100%) and the corresponding data point on the graph.



\*Denominator includes enrollees with documented personal belief exemptions and personal medical exemptions.

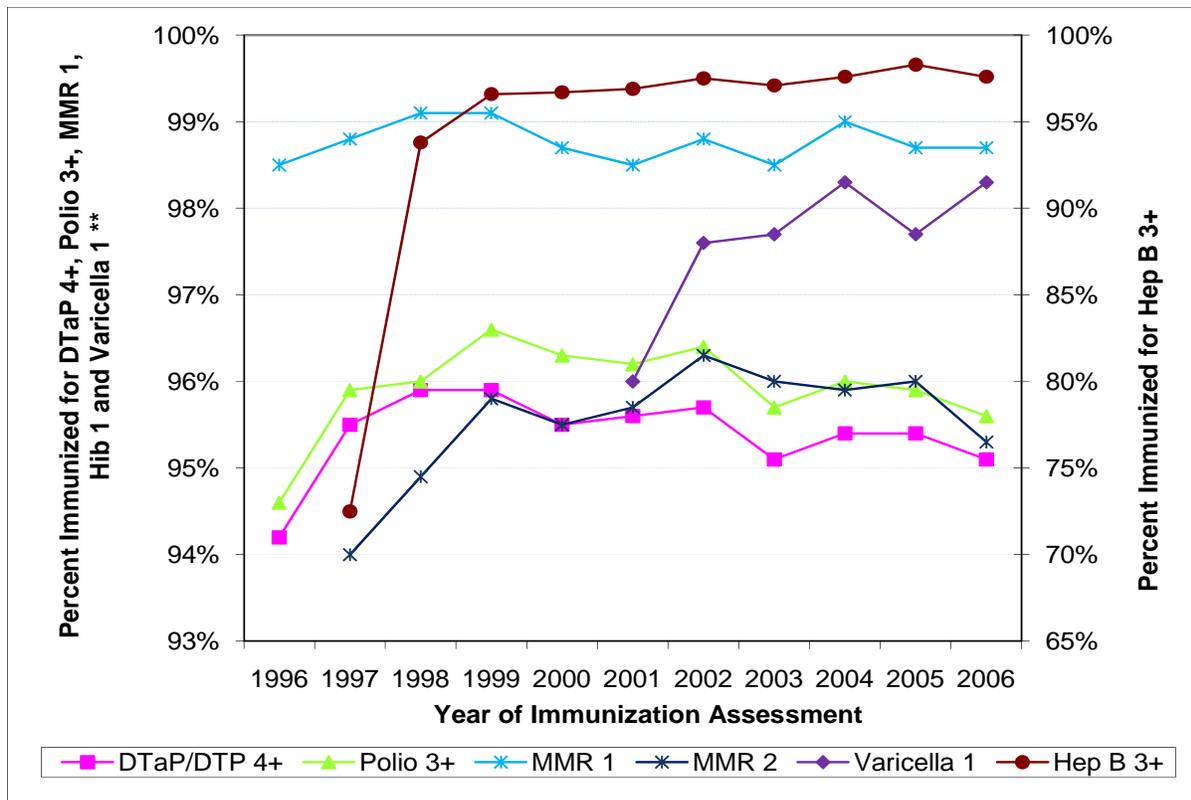
\*\*One dose of Varicella vaccine or physician documented disease/immunity.

Note: DTaP/DTP represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

- Although all antigen-specific immunization coverage levels for preschool enrollees declined slightly (between 0.2 – 0.4 percentage points) from 2005 to 2006, coverage has remained high over the last nine years.
  - Since 2004 the first dose of HiB has maintained the highest antigen-specific coverage level. However, in 2006, HiB coverage dropped below 98% (to 97.9%) for the first time in six years.
  - In 2006, the fourth dose of DTaP/DTP continued to have the lowest antigen-specific coverage level at 96.1%.
  - For the first time since its inception in 2001, the first dose of Varicella coverage fell in 2006; coverage dropped 0.2% from 2005 to 2006 to 97.2%
  - In 2006, the first dose of MMR, the third dose of Polio, and the third dose of Hep B coverage dropped to 97.7%, 97.3%, and 96.8% respectively from the previous year.

**Figure 3: Percent of kindergarten enrollees immunized, Los Angeles County, 1996-2006\***

Note: To determine coverage levels for DTaP/DTP, Polio, MMR and Varicella, read the values shown on the left axis (between 93%-100%) and the corresponding data point on the graph. For Hep B ONLY, read the values shown on the right axis (between 65%-100%) and the corresponding data point on the graph.



\* Denominator includes enrollees with documented personal belief exemptions and personal medical exemptions

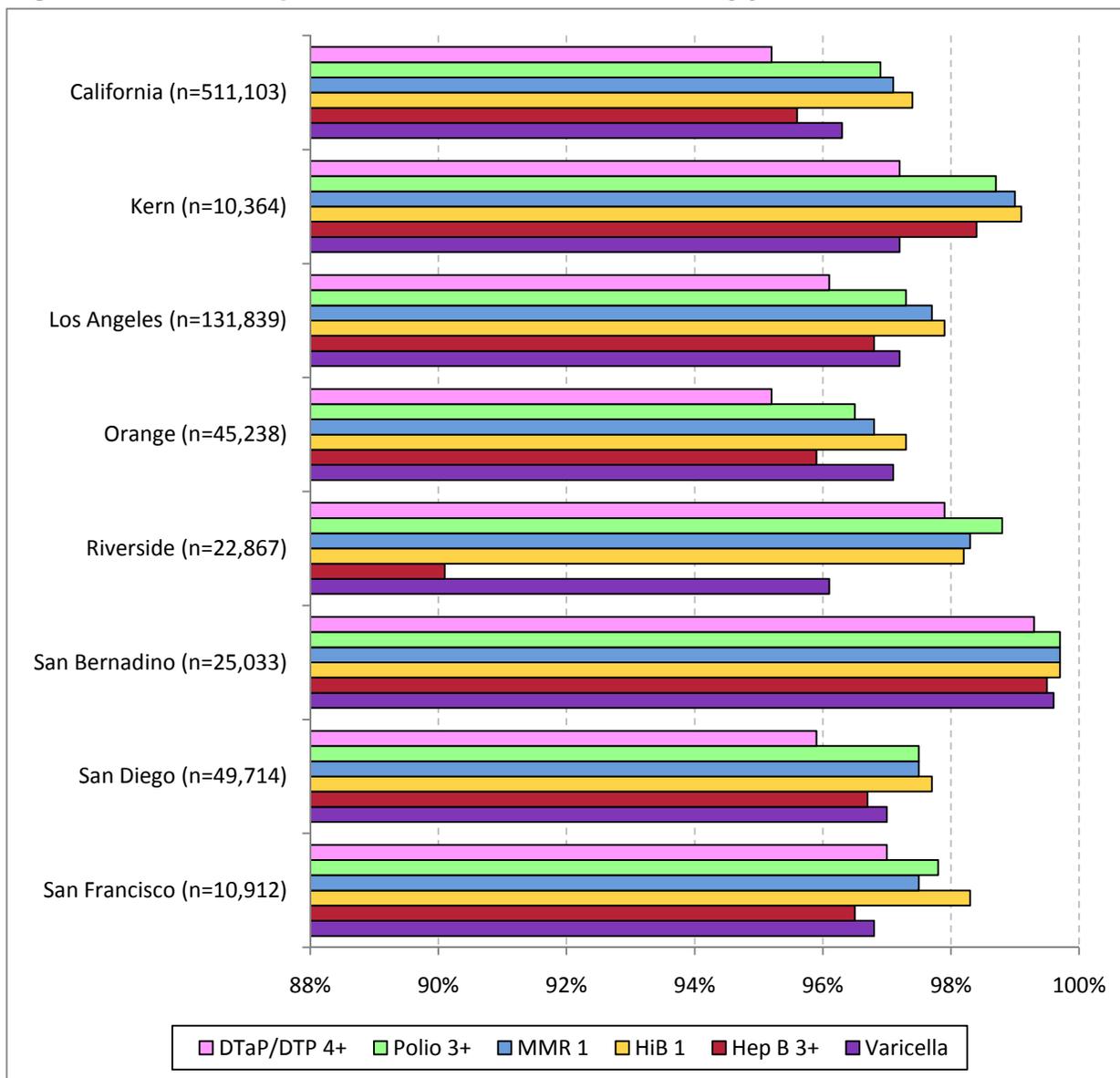
\*\* One dose of Varicella vaccine or physician documented disease/immunity.

Note: DTaP/DTP represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

- The first dose of MMR, the first dose of Varicella and the third dose of Hep B have ranked as the top three highest antigen-specific coverage levels since 2002.
  - The first dose of MMR has maintained the highest coverage level for the last 10 years, and has remained at 98.7% for the last two years (2005-2006).
  - The first dose of Varicella coverage has steadily increased since 1997, with the exception of a decrease in 2005, and reached its highest level in 2006 to 89.3%.
  - The third dose of Hep B coverage has remained at a constant level since 1999. In 2006, Hep B 3 yielded a coverage level of 97.6%.
- The fourth dose of DTaP/DTP continued to maintain the lowest coverage level at 95.1% in 2006 compared to other antigens, a 0.3% decrease from 2005.
- In 2006, the third dose of Polio coverage level dropped 0.3% from 2005, to 95.6%. Polio 3+ has sustained a coverage level above 95% for the last decade.

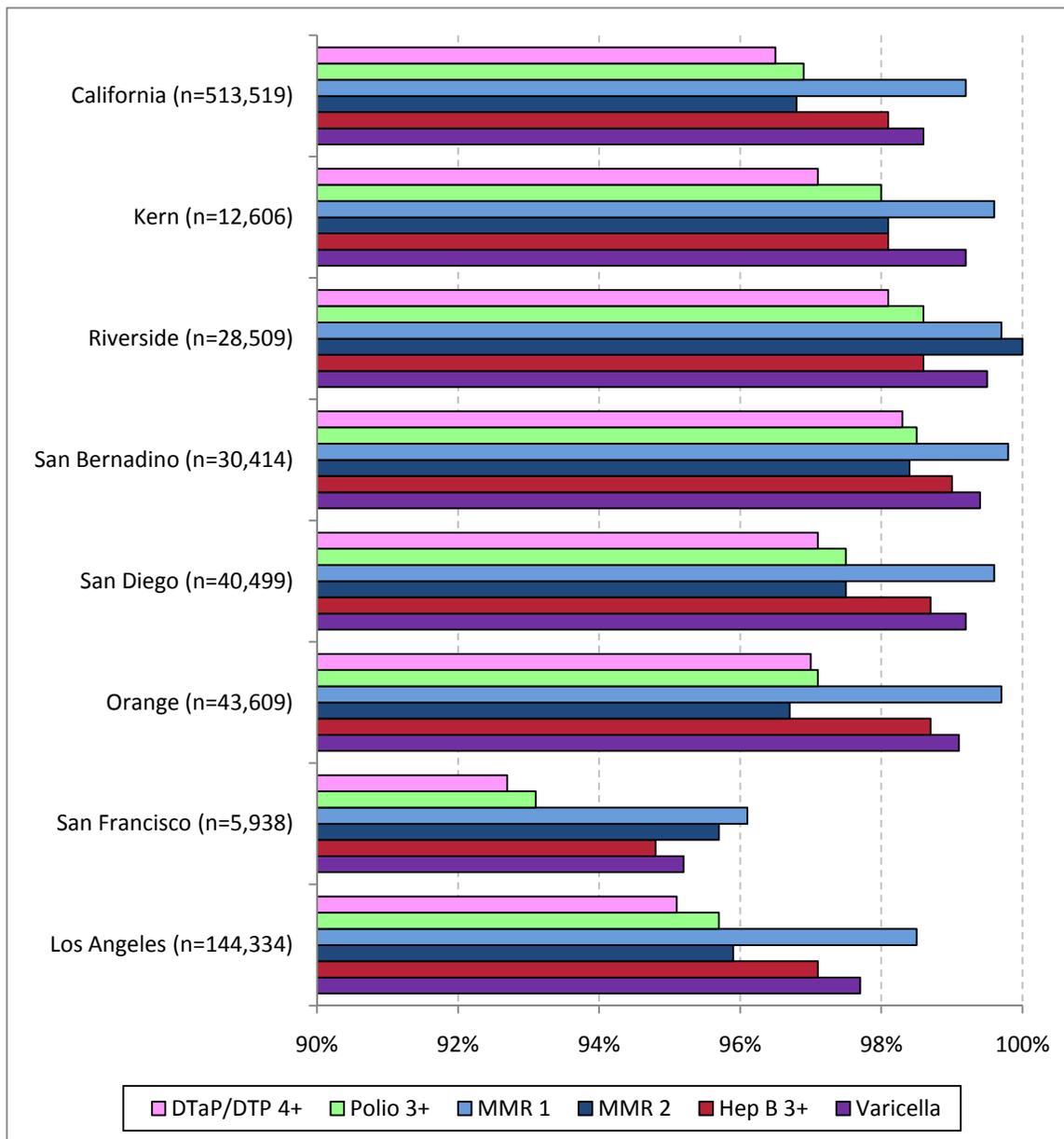
V. Immunization Coverage in Los Angeles County Compared to Other Jurisdictions, Fall Assessment 2006

**Figure 4: Percent of preschool enrollees immunized, by jurisdiction, California, 2006**



- In 2006, Los Angeles County exceeded the State of California’s estimated coverage levels for each vaccine antigen.
- Los Angeles County showed modest results when ranked against six other California jurisdictions by antigen-specific coverage levels.
  - Los Angeles County ranked second for Varicella, third for Hep B 3+, fourth for MMR 1, fifth for both DTaP/DTP 4+ and HiB 1, and sixth for Polio 3+ coverage levels.

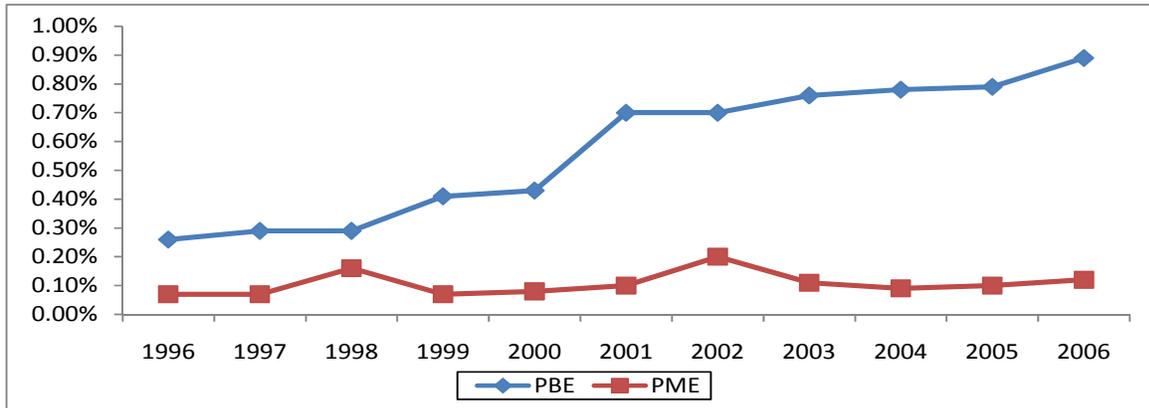
**Figure 5: Percent of kindergarten enrollees immunized, by jurisdiction, California 2006**



- Los Angeles County scored below the State of California's estimated coverage levels for each vaccine antigen.
- Los Angeles County performed adequately when ranked against six jurisdictions by their antigen-specific coverage level.
  - Los Angeles County ranked fourth for MMR 1, fifth for MMR 2 and sixth for DTaP/DTP 4+, Polio 3+, Hep B 3+, and Varicella coverage.

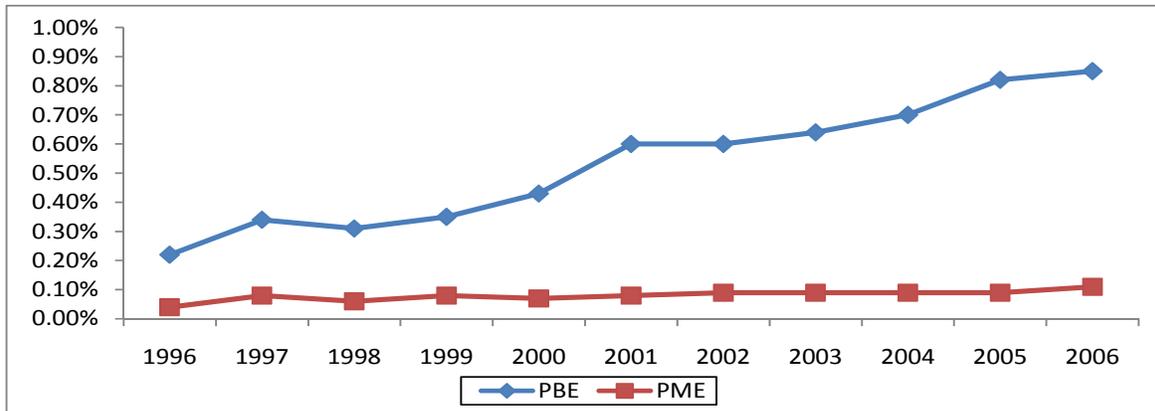
VI. Permanent Medical Exemption (PME) or Personal Beliefs Exemption (PBE) Levels

**Figure 6: Personal belief/medical belief exemptions among preschool enrollees, Los Angeles County, 1996-2006**



- The proportion of preschool enrollees with vaccine exemptions exceeded 1% for the first time in 2006.
  - The personal beliefs exemption level reached an all time high at 0.89% (n=1,167) in 2006.
  - The permanent medical exemption level increased slightly to 0.12% (n=158) in 2006.
- Over the last decade, the PBE level has steadily increased (0.6 percentage points from 1997 to 2006) while the MBE level has remained relatively low (an increase of 0.05 percentage points from 1997 to 2006).

**Figure 7: Personal belief/medical belief exemptions among kindergarten enrollees, Los Angeles County, 1996-2006**



- The number of kindergarten enrollees with vaccine exemptions also increased between 2005 and 2006.
  - The personal beliefs exemption level reached an all time high with 0.85% (n=1102) in 2006.
  - The permanent medical exemptions level increased for the first time since 2002, reaching 0.11% (n=142) in 2006.
- Kindergarten also had similar 10-year trends to preschool; the PBE level steadily increased (0.5 percentage points from 1997 to 2006) while the MBE level remained low (an increase of 0.03 percentage points from 1997 to 2006).

VII. Healthy People 2010 Objectives and Los Angeles County Status

**Table 4. Immunization objectives for Healthy People 2010, target coverage levels vs. Los Angeles County coverage estimates from different data sources**

	<i>Healthy People 2010 Target (%)</i>	Fall Assessment 2006 <sup>1</sup> (%)	Fall Assessment 5-Year Avg 2002-2006 <sup>1</sup> (%)	Clinic Audits 2006 DHS <sup>2</sup> Facilities (%)	Clinic Audits 2006 CHC <sup>3</sup> Facilities (%)
Age of Enrollees		Preschool: 24-59 months Kindergarten: all ages		24-35 months	24-35 months
<b>Healthy People 2010 Objective #1:</b>					
Maintenance of Vaccination Coverage Levels for Enrollees in licensed day care facilities <sup>4</sup>					
DTaP vaccine	95	96.1	96.7	-	-
Hep B vaccine	N/A <sup>5</sup>	96.8	97.1	-	-
MMR vaccine	95	97.7	98.1	-	-
Polio vaccine	95	97.3	97.7	-	-
Varicella vaccine <sup>6</sup>	N/A <sup>5</sup>	97.2	97.2	-	-
<b>Healthy People 2010 Objective #2:</b>					
Maintenance of Vaccination Coverage Levels for Enrollees in kindergarten through the first grade <sup>7</sup>					
DTaP vaccine	95	95.1	95.3	-	-
Hep B vaccine	N/A <sup>5</sup>	97.6	97.6	-	-
MMR vaccine	95	95.3	95.9	-	-
Polio vaccine	95	95.6	95.9	-	-
Varicella vaccine <sup>6</sup>	N/A <sup>5</sup>	98.3	97.9	-	-
<b>Healthy People 2010 Objective #3:</b>					
Increase in and Maintenance of Vaccination Coverage Levels Among Enrollees Aged 19 to 35 Months					
4 doses DTaP	90	96.1	96.7	49.8	69.6
3 doses HiB	90	N/A	N/A	75.6	85.8
3 doses Hep B	90	96.8	97.1	80.2	88.0
1 dose MMR	90	97.7	98.1	71.9	83.5
3 doses polio	90	97.3	97.7	78.7	89.3
1 dose Varicella <sup>6</sup>	90	97.2	97.2	69.1	81.3

<sup>1</sup>Includes preschool enrollees at 24-59 months of age and all kindergarten enrollees.

<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>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).

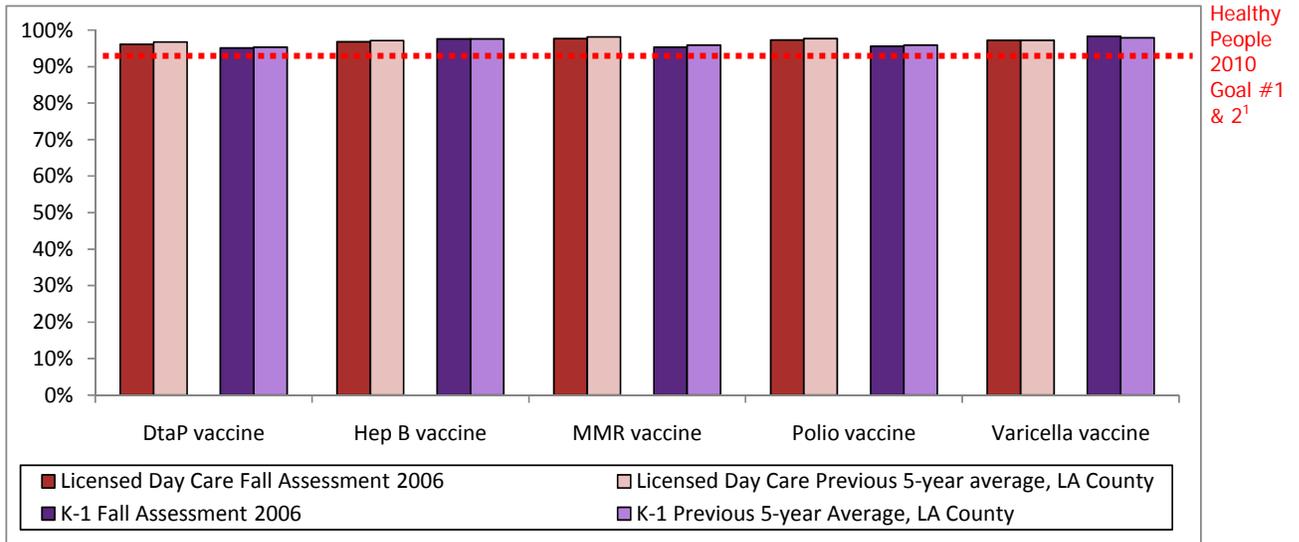
<sup>5</sup>In development.

<sup>6</sup>Physician documented Varicella (chickenpox) disease history or immunity meets the Varicella requirement.

<sup>7</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: 4 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).

- The 2006 Los Angeles County Fall Assessment antigen-specific vaccination coverage levels reached the Healthy People 2010 vaccination coverage objectives.

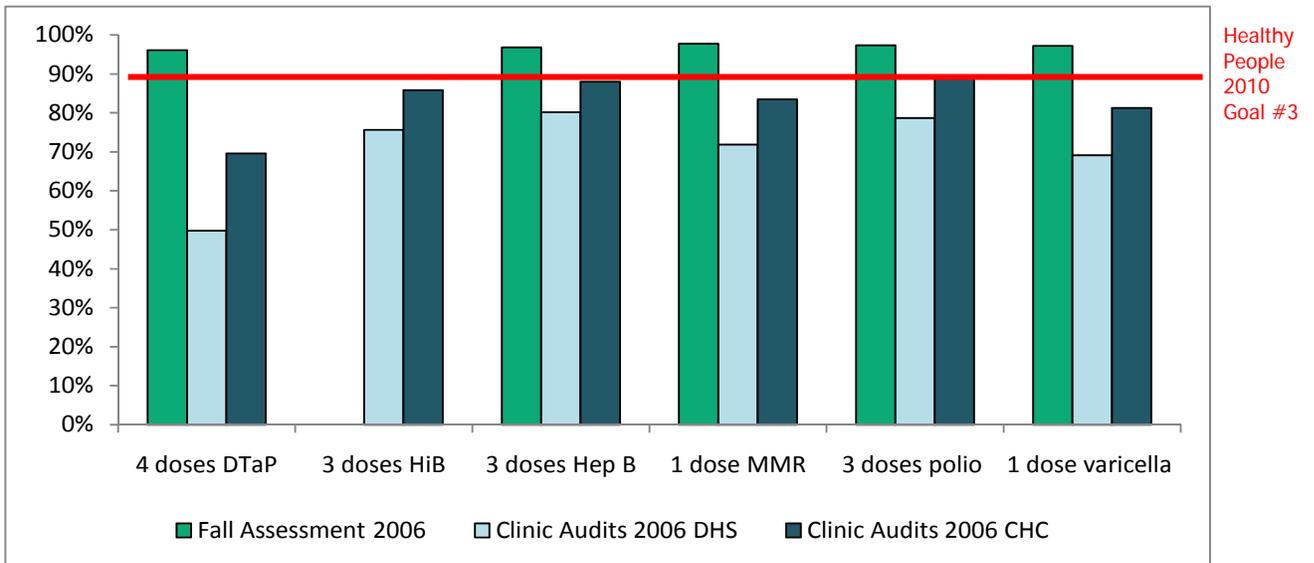
**Figure 8: Healthy People 2010 Objectives #1 & 2: Maintenance of vaccination coverage levels for enrollees in licensed day care facilities and in kindergarten through the first grade.**



<sup>1</sup> Healthy People 2010 goals for Hepatitis B and Varicella vaccines are in development.

- All LA County antigen-specific coverage levels have fluctuated within one percent of the Healthy People 2010 target levels for the last 5 years for both preschool and kindergarten facilities.

**Figure 9: Healthy People 2010 Objective #3: Increase in and maintenance of vaccination coverage levels for among enrollees aged 19 to 35 months.**



- The Fall Assessment results achieved higher vaccination coverage levels for all required antigens relative to the clinic audits.
  - The wider age range of enrollees included in the Fall Assessment (24 months – age in kindergarten) may explain the higher vaccination coverage levels.

## Discussion

In 2006, the Los Angeles County (LAC) Fall Assessment antigen-specific vaccination coverage levels among enrollees in preschools and in kindergartens exceeded 95%. Although vaccination coverage estimates were high, the vaccine exemption levels surged to record levels in 2006. Concurrently, endemic cases of vaccine preventable diseases continue to persist including several pertussis and measles cases in California in 2006. These cases are commonly associated with the importing of disease from other countries and occur almost exclusively in unvaccinated individuals. Consequently, considerable attention has focused on the number of vaccine exemptions due to misperceptions or misinformation about vaccines and parental safety concerns. The simplified process to claim exemptions in California may have also contributed to higher exemption levels. Parents only sign a waiver with the school at the time of school entrance. Accordingly, a positive relationship has been observed between the nonmedical exemption rates and the ease of obtaining immunization exemptions at both the school and state level.<sup>1-2</sup> The ongoing trend in exemption levels could endanger public safety by creating a reservoir for increasing vaccine preventable disease morbidity. Public health initiatives are focusing on eliminating this risk by improving coverage levels and minimizing barriers to immunization.

### Initiatives to Maintain High Coverage Levels

#### State Level

The State has issued immunization requirements for school entrance. The enforcement of the mandated immunization requirements is the most effective approach to maintaining high coverage levels.<sup>3</sup>

#### Local Level

LAC has initiated several strategies to address challenges specific to Los Angeles County. Efforts have focused on immunization registries, reminder systems, education interventions, and community outreach to high-risk populations.

#### Immunization Registries:

Non-standardized data sources and patients multiple and irregular sources of care has lead to immunization coverage level inaccuracies. In response to these data challenges, LAC implemented the Los Angeles-Orange Immunization (LINK), the standardized web-based immunization registry for Los Angeles and Orange Counties. LINK consolidates and maintains electronic immunization records across multiple providers and enables providers to track and update immunization records and identify patients due for immunization and produce reminder lists. Similar registries are being implemented throughout California and in all 50 states.

#### Education Interventions:

LAC requires a fact sheet on the risk and benefits of vaccination to be provided to parents/guardians who request a vaccine exemption. The fact sheet contains information on disease risk, student school exclusion in the event of school outbreaks, vaccine safety and effectiveness, and free/low-cost immunization sources.

#### Community Outreach:

Factors associated with poverty are the most powerful obstacles to timely immunization for minority populations. These factors include but are not limited to transportation difficulties, lack

of continuous care, language barriers, and work/school hours interfering with clinic hours.<sup>4-6</sup> To address these issues, LAC in collaboration with community and academic organizations established the Rescatando Salud/Health Rescue (RS) Promotora Immunization Project. Rescatando Salud's objective is to improve vaccine coverage levels especially in the high-risk population of Central and South Los Angeles. RS program activities include education and other community outreach interventions and providing home visits and free vaccines. Similar programs, including the African American Immunization Collaborative Project, have also been employed to raise awareness and improve access to services.

#### 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 school/childcare facilities in Los Angeles County.

#### **References:**

1. Omer SB, Pan W, Halsey, NA, et al. Nonmedical Exemptions to School Immunization Requirements: Secular Trends and Association of State Policies With Pertussis Incidence. *JAMA*. 2006;296:1757-1763
2. Salmon DA, Sapsin JW, Teret S, et al. Public Health and the Politics of School Immunization Requirements. *Am J Public Health Assoc*. 2005;95:778-783
3. Davis MM, Gaglia MA. Associations of daycare and school entry vaccination requirements with varicella immunization rates. *Vaccine*. 2006;23:3053-3060
4. Bumpers B, Hearne SA, Segal DN, et al. Closing the vaccination gap: A shot in the arm for childhood immunization programs. Washington, DC: Trust for America's Health, 2004. 27 pp. (Issue report)
5. Goodman KJ, Wu JS, Frerichs RR. Compliance with Childhood Immunizations in Kern County, California. *J of Immigrant Health*. 2000;2:213-222
6. Thomas M, Kohli V, King D. Barriers to Childhood Immunization: Findings From a Needs Assessment Study. *Home Health Care Services Quarterly*. 2004;23:19-39