



County of Los Angeles Department of Health Services  
Immunization Program  
2008 Annual School Immunization Assessment  
Preschool and Kindergarten  
July 2009

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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 receives standardized immunization assessment forms and returns the completed assessments for each grade-level to LACIP. Preschool data are analyzed by 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 2008 Fall School Assessment results are grouped into seven categories:

- I. Immunization Requirements for School Entry
- II. Population Size
- III. Percent of Enrollees Meeting Immunization Requirements
- 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 Part I and Part II
- VII. Healthy People 2010 Objectives and Los Angeles County Status

### I. Immunization Requirements for School Entry

**Table 1. Immunization requirements for school entry, California 2008**

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, 1999-2008**

Assessment Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Enrolled Students</b>	110,752	110,532	111,046	110,175	113,873	130,910	129,556	131,839	134,003	137,229
<b>Total Schools</b>	2,084	2,079	2,087	2,075	2,135	2,419	2,331	2,366	2,359	2,450
<b>Public Schools</b>	246 (11.8%)	292 (14.0%)	316 (15.1%)	331 (16.0%)	323 (15.1%)	359 (14.8%)	354 (15.2%)	354 (15.0%)	358 (15.2%)	376 (15.4%)
<b>Private Schools</b>	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%)	1,477 (62.6%)	1,515 (61.8%)
<b>Head Start Schools</b>	442 (21.2%)	456 (22.0%)	444 (21.3%)	473 (22.8%)	426 (20.0%)	522 (21.6%)	523 (22.4%)	529 (22.4%)	524 (22.2%)	559 (22.8%)

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

- Between 2007 and 2008, the number of preschools that reported enrollee immunization status for the Fall Assessment increased.
  - The number of preschools that submitted assessment forms increased by 3.9% (n=91).
  - The number of students enrolled in preschools rose 2.4% (n=3,226) from 2007 to 2008.
- Fluctuations in school levels are common as the number of preschools that open and close in Los Angeles County (LAC) vary from year to year.
- The majority of reporting preschools in 2008 were private (61.8%).

**Table 3. Schools<sup>1</sup> with kindergarten enrollment, Los Angeles County, 1999-2008**

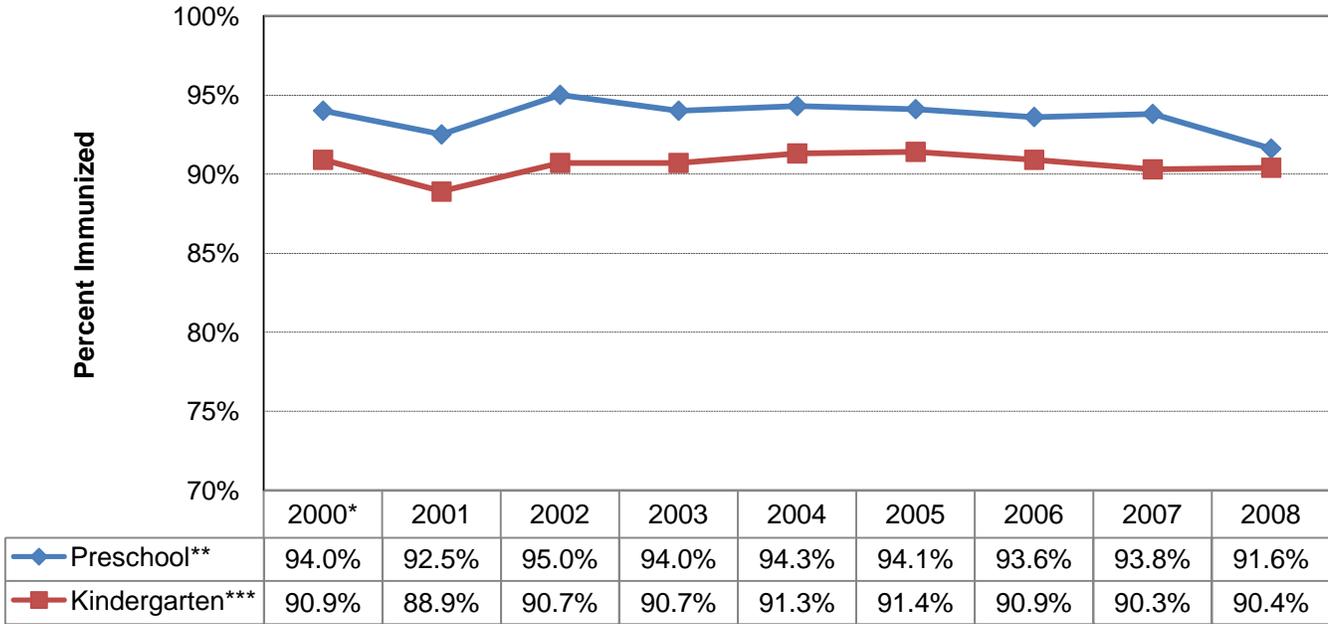
Assessment Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Enrolled Students</b>	154,285	154,020	151,073	148,609	144,334	140,591	138,442	129,608	129,655	125,222
<b>Total Schools</b>	2,258	2,265	2,292	2,263	2,233	2,207	2,186	2,090	2,141	1,978
<b>Public Schools</b>	1,185 (52.5%)	1,210 (53.4%)	1,211 (52.8%)	1,217 (53.8%)	1,223 (54.8%)	1,227 (55.6%)	1,240 (56.7%)	1,228 (58.8%)	1,251 (58.4%)	1,217 (61.5%)
<b>Private Schools</b>	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%)	890 (41.6%)	761 (38.5%)

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

- After experiencing an increase in 2007, the 2008 Fall Assessment returned to the downward trend in the number of kindergarten schools reporting immunization status of their students.
  - The total number of schools with kindergartens decreased 7.6% (n=163) from 2007 to 2008. The largest decline occurred in private schools, a decrease of 14.5% (n=129). Public schools dropped 2.7% (n=34).
  - Student enrollment decreased 3.4% (n=4,433).
- In contrast to preschools, the majority of reporting kindergartens were public (61.5%).

III. Percent of School Enrollees Meeting Immunization Requirements

**Figure 1: Percent of preschool and kindergarten enrollees up-to-date with immunizations, Los Angeles County, 2000-2008**



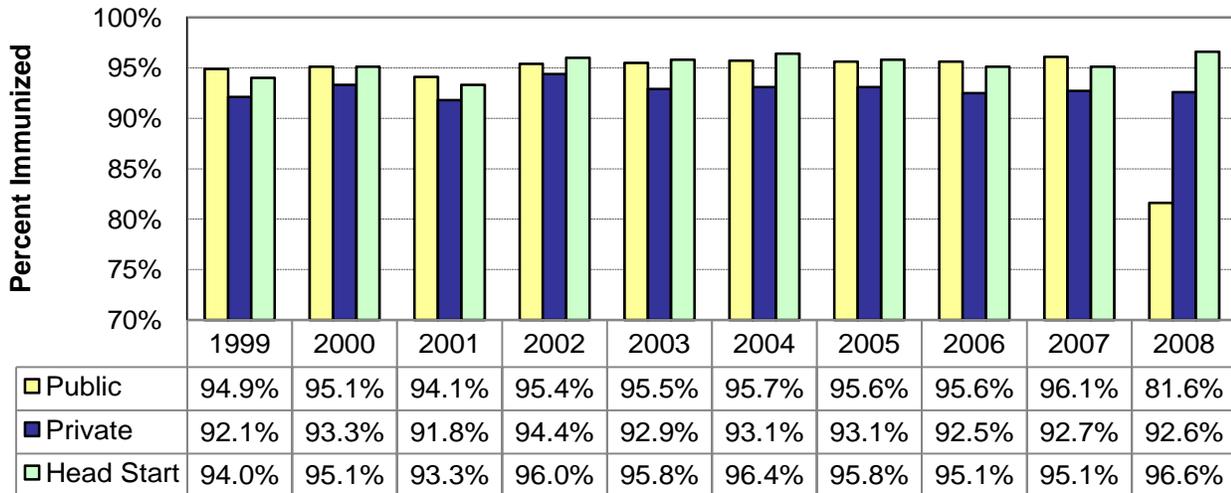
\* Does not include Varicella 1+

\*\* Up-to-date: Enrollee has received 4+DTaP/DTP, 3+ Polio, 1 MMR, 1 Hib, 3 Hep B, and 1 Varicella.

\*\*\* Up-to-date: Enrollee has received 4+DTaP/DTP, 3+ Polio, 2 MMR, 3 Hep B, and 1 Varicella.

- Since 2002, the percent of preschool and kindergarten enrollees up-to-date have remained above 90% in Los Angeles County.
- There were small fluctuations in the percent of enrollees up-to-date between 2007 and 2008.
  - The percent of preschool enrollees up-to-date decreased 2.3% to 91.6% and the percent of kindergarten enrollees up-to-date increased 0.1% to 90.4%.

**Figure 2: Percent of preschool enrollees meeting immunization requirements<sup>1</sup>, by type of child care center, Los Angeles County, 1999-2008<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.

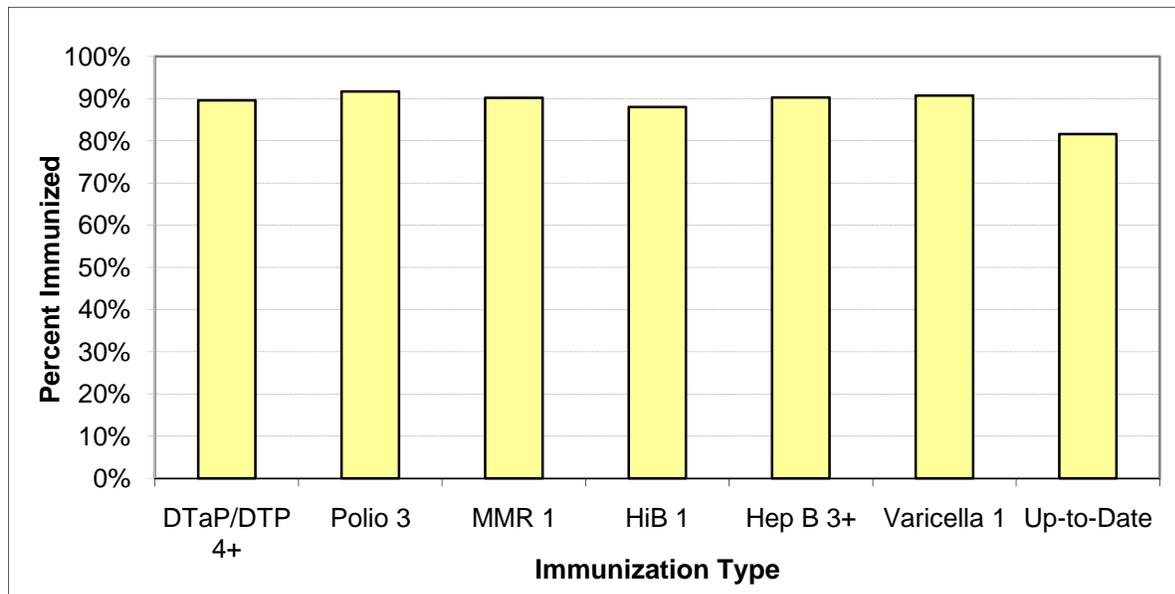
<sup>2</sup> Denominator includes enrollees with documented personal belief exemptions and personal medical exemptions.

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 2008, coverage levels for public schools decreased considerably for the first time in ten years.
  - Although public schools had the highest coverage levels in 2006 and 2007, from 2007 to 2008 coverage dropped 15.1% to 81.6%.
  - LAC was 11.9% below the State coverage level for public schools.
- Private and Head Start schools continued to maintain high immunization coverage levels in 2008.
  - The Head Start preschools had the highest proportion of enrollees meeting the immunization requirements, and its immunization coverage increased 1.6% between 2007 and 2008 to 96.6%.
  - Private preschool coverage decreased only 0.1% from 2007 to 2008 to 92.6%.

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

**Figure 3: Percent of preschool enrollees in public schools immunized by vaccine antigen, Los Angeles County, 2008.**

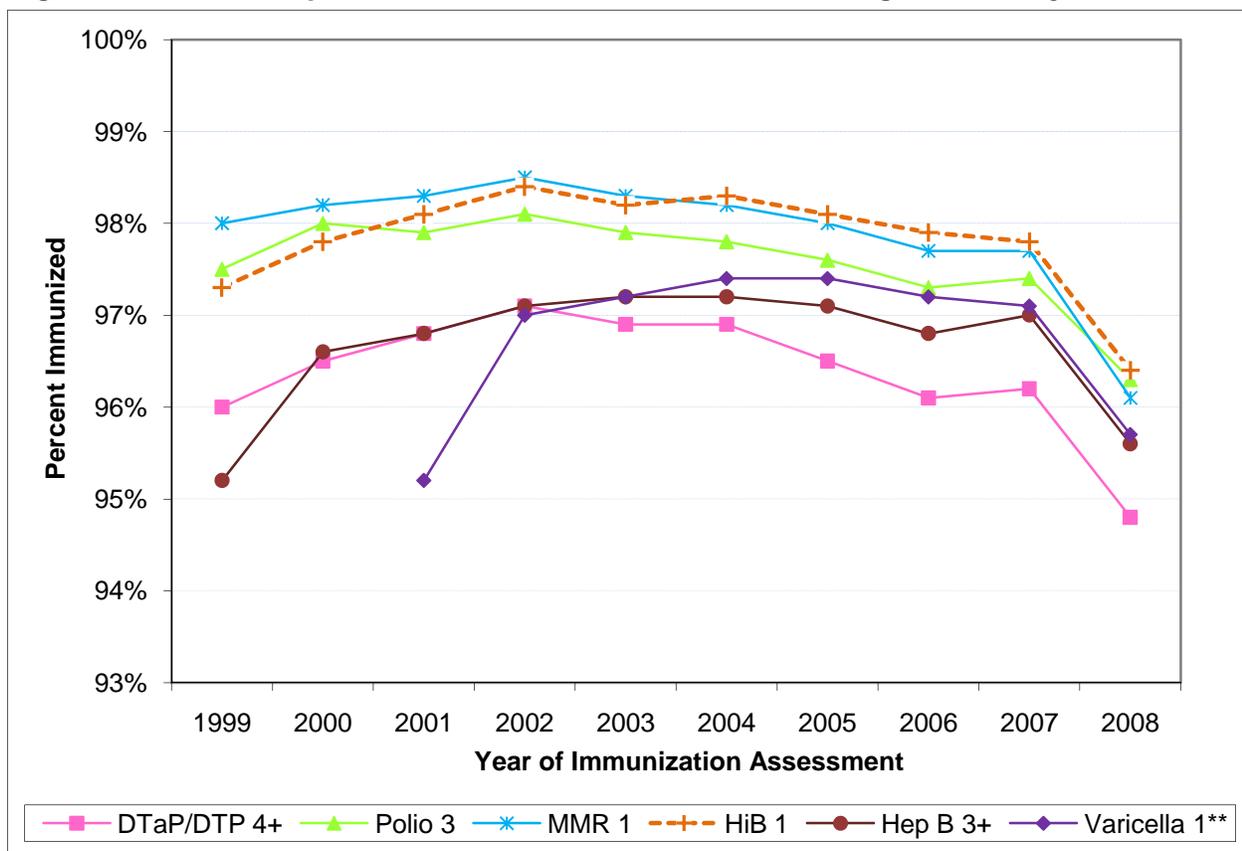


Note: DTaP/DTP represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications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

- While the percent of preschool enrollees meeting all immunization requirements dropped to 81.6% in 2008, coverage levels for each antigen-specific immunization were at or above 90%.
  - The only exception was the first dose of HiB which had a coverage level of 88.0%.
- Coverage for individual immunizations for public schools ranged from 88.0% for the first dose of HiB to 91.7% for the third dose of Polio vaccine.

#### IV. Percent of Enrollees Meeting Immunization Requirements by Vaccine Antigen

**Figure 4: Percent of preschool enrollees immunized, Los Angeles County, 1999-2008\***



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

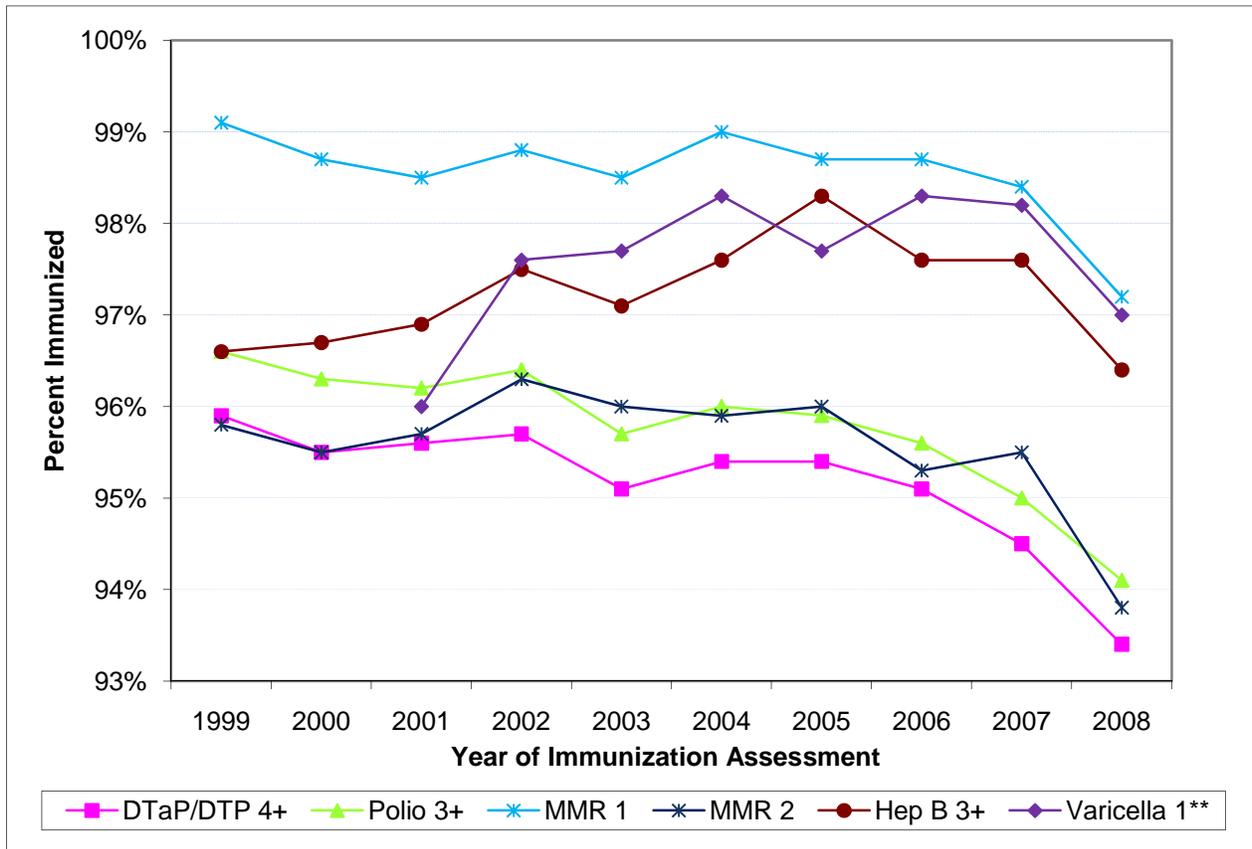
\*\* One dose of Varicella vaccine or physician documented disease/immunity.

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.

- Despite the increase in many antigen-specific immunization coverage levels between 2006 and 2007, all antigen-specific coverage for preschools declined between 1.1% and 1.6% in 2008.
  - The majority of antigen-specific immunization coverage levels dropped to their lowest levels in ten years.
    - Between 2007 and 2008, the fourth dose of DTaP/DTP dropped to 94.8%, the first dose of MMR dropped to 96.1%, the third dose of Polio dropped to 96.3%, and the first dose of HiB dropped to 96.4%.
  - Only the third dose of Hep B and the first dose of Varicella did not fall to its lowest levels in 2008.
    - Both the third dose of Hep B and the first dose of Varicella dropped 1.4% to 95.6% and 95.7% respectively.
- The rankings among antigen-specific immunization coverage were similar to previous years.
  - The first dose of HiB sustained the highest antigen-specific coverage level in 2008 while the fourth dose of DTaP/DTP maintained the lowest coverage level.

**Figure 5: Percent of kindergarten enrollees immunized, Los Angeles County, 1999-2008\***



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

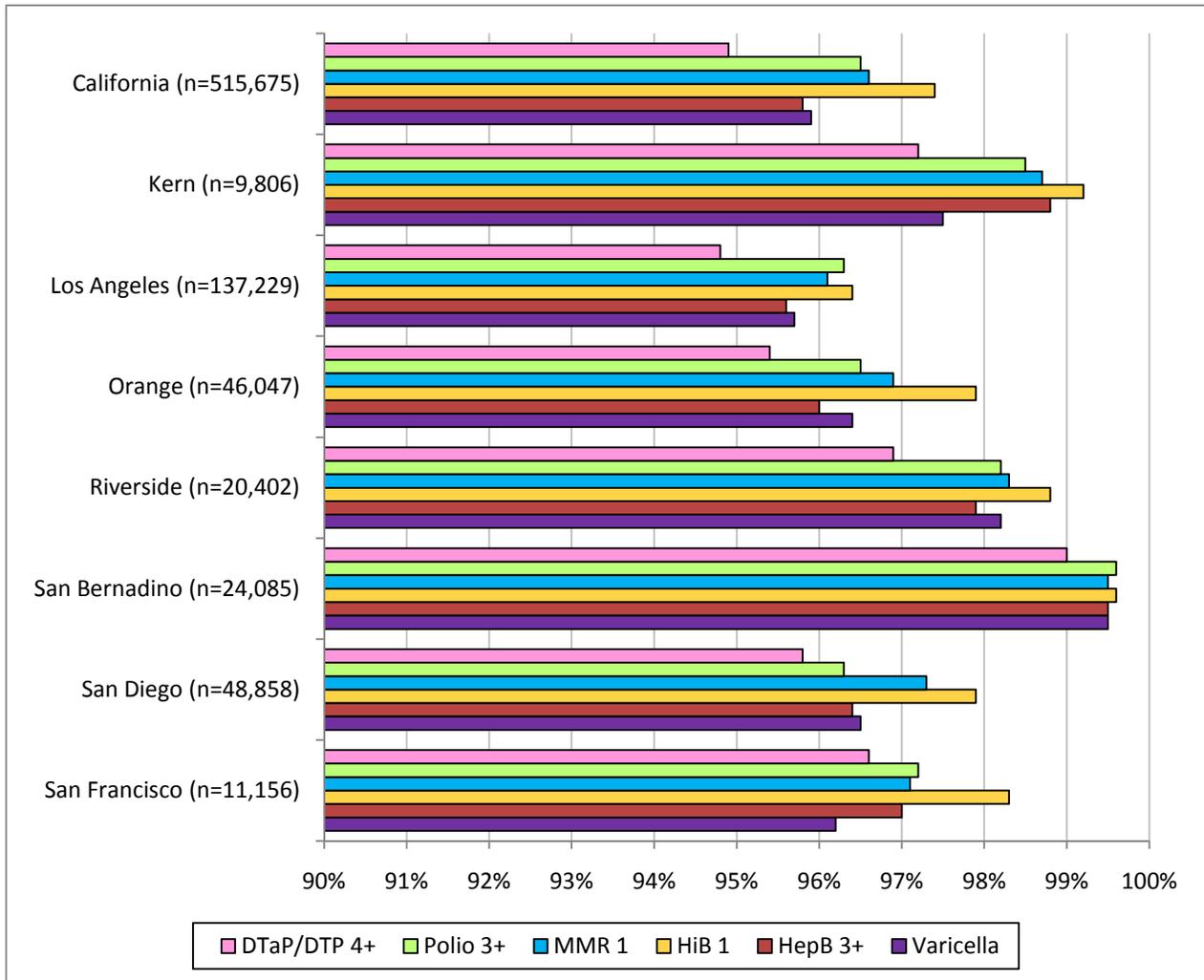
\*\* One dose of Varicella vaccine or physician documented disease/immunity.

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.

- Similar to preschool coverage, the kindergarten enrollee antigen-specific coverage levels experienced declines between 2007 and 2008.
  - After increasing between 2006 and 2007, the second dose of MMR experienced the largest decline in coverage of all the vaccines between 2007 and 2008, 1.8% to 93.8%.
  - The third dose of Polio had the smallest decline in coverage, 0.9% to 94.1%. However, the coverage level for Polio 3+ has been on the decline for the past three years.
  - The fourth dose of DTaP/DTP dropped for the third consecutive year to 93.4%, the lowest coverage of all the antigen-specific coverage levels in 2008.
  - The third dose of Hep B, the first dose of Varicella, and the first dose of MMR all dropped 1.2% to 96.4%, 97.0%, and 97.2%, respectively.
- Since 2002, the first dose of MMR, the first dose of Varicella, and the third dose of Hep B ranked as the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> highest coverage levels respectively.

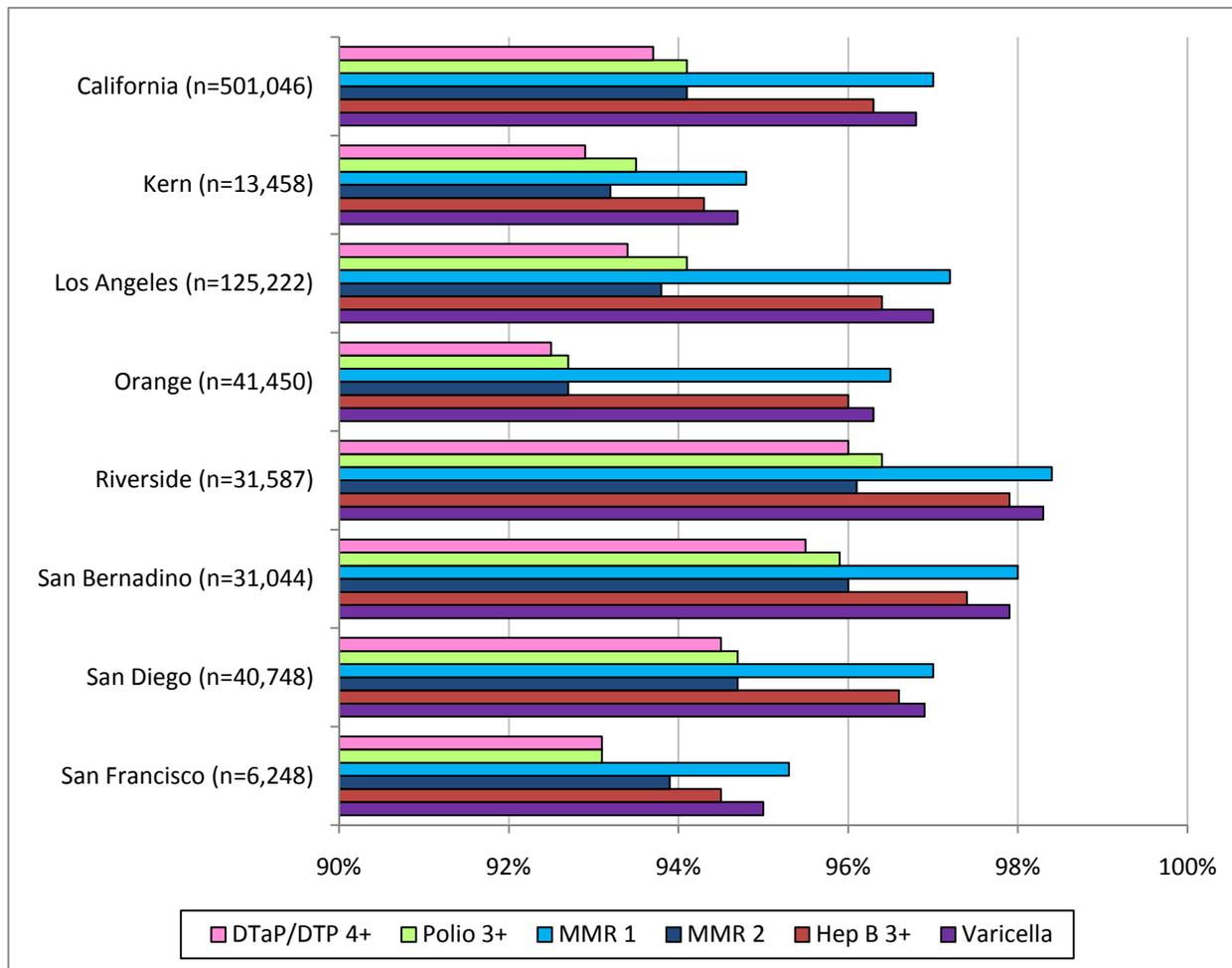
V. Immunization Coverage in Los Angeles County Compared to Other Jurisdictions

**Figure 6: Percent of preschool enrollees immunized, by jurisdiction, California, 2008**



- In 2008, Los Angeles County estimated coverage levels for all vaccine antigens were slightly below the State of California’s coverage levels (range: 0.1%-1.4% below State coverage levels).
- When compared to six other California jurisdictions by antigen-specific coverage level, Los Angeles County ranked last for each antigen.

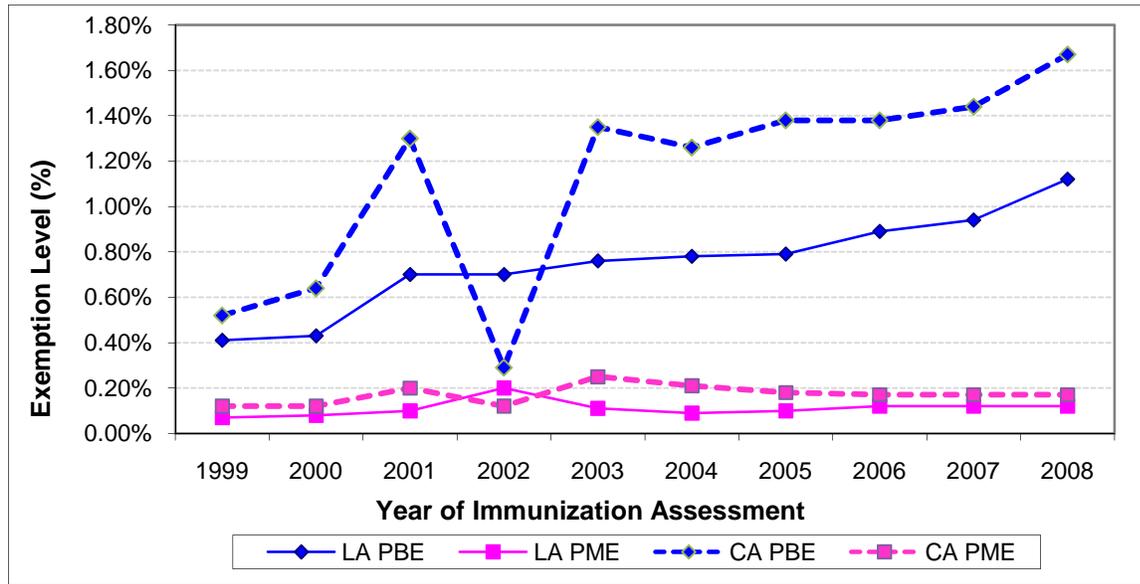
**Figure 7: Percent of kindergarten enrollees immunized, by jurisdiction, California 2008**



- Los Angeles County had similar antigen specific coverage levels as the State.
  - LAC scored slightly above the State's estimated coverage levels for DTaP/DTP 4+ and MMR 2, had the same coverage level for Polio 3+, and scored below the State's levels for MMR 1, Hep B 3+, and Varicella.
- Although, LAC had the largest number of kindergarten enrollees in California, LAC demonstrated satisfactory coverage levels when ranked against six other California jurisdictions by antigen-specific coverage levels.
  - Los Angeles ranked third for MMR 1 and Varicella, fourth for DTaP/DTP 4+, Polio3+, and Hep B 3+, and fifth for MMR 2.

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

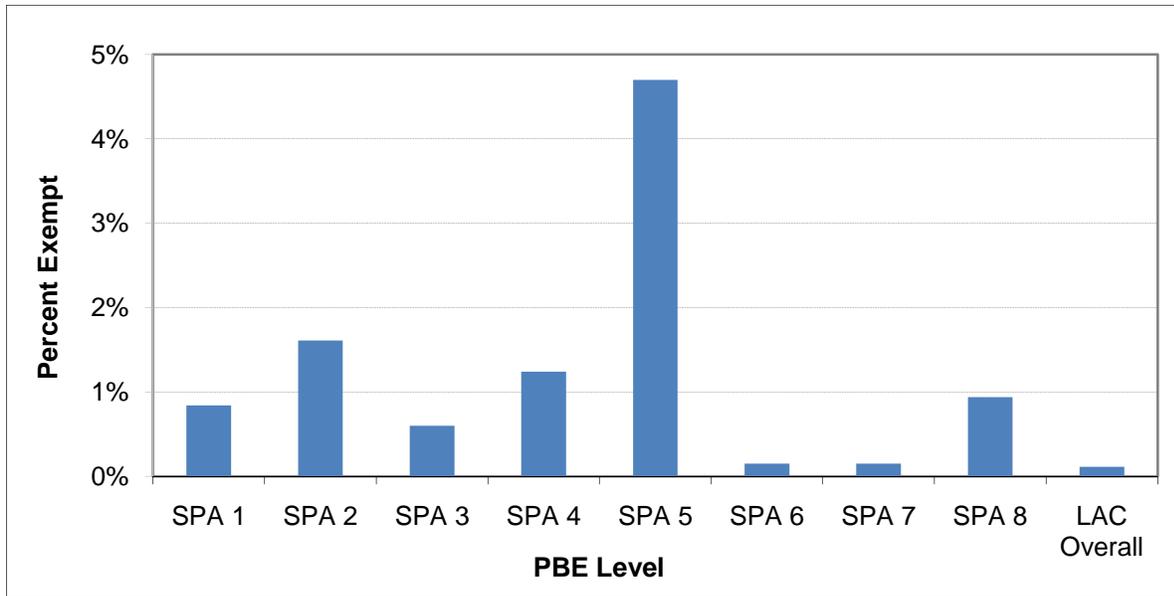
**Figure 8: Personal belief/medical belief exemptions among preschool enrollees, Los Angeles County, 1999-2008**



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>LA PBE</b>	0.41%	0.43%	0.70%	0.70%	0.76%	0.78%	0.79%	0.89%	0.94%	1.12%
<b>LA PME</b>	0.07%	0.08%	0.10%	0.20%	0.11%	0.09%	0.10%	0.12%	0.12%	0.12%
<b>CA PBE</b>	0.52%	0.64%	1.30%	0.29%	1.35%	1.26%	1.38%	1.38%	1.44%	1.67%
<b>CA PME</b>	0.12%	0.12%	0.20%	0.12%	0.25%	0.21%	0.18%	0.17%	0.17%	0.17%

- In 2008, the personal beliefs exemption (PBE) level among preschool enrollees reached 1.12% (n=1,537 enrollees), an increase of 19.1% from 2007.
- Over a ten year time span (1999-2008), the PBE level increased 173.2% with an average annual increase of 9.7% (range: 0% - 38.6%). This annual increase translates to approximately 7,900 LAC individuals.
- The proportion of students with permanent medical exemptions (PME) remained at 0.12% (n=166) for the third consecutive year.
- Exemption levels for Los Angeles County were below the State levels.
  - Los Angeles County was 32.9% below the State PBE level.
  - LAC was only slightly below California's PME level, 0.05 percentage points.

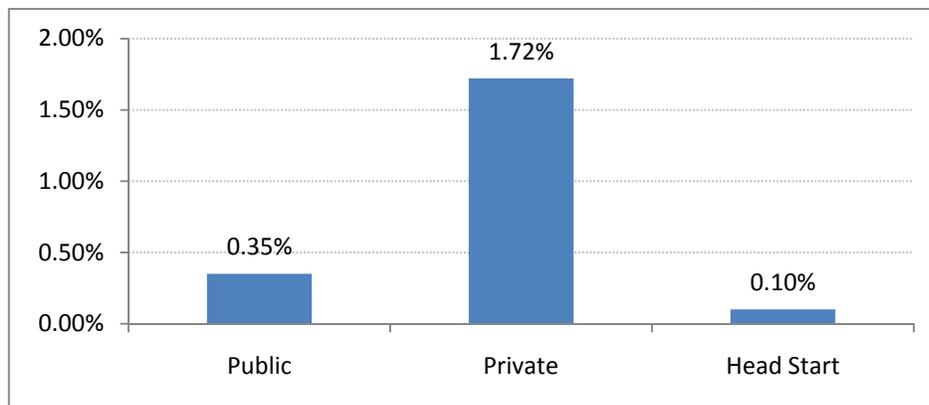
**Figure 9: Personal belief exemptions among preschool enrollees by SPA, Los Angeles County, 2008**



	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8	LAC Overall
PBE	0.84%	1.61%	0.60%	1.24%	4.70%	0.15%	0.15%	0.94%	1.12%

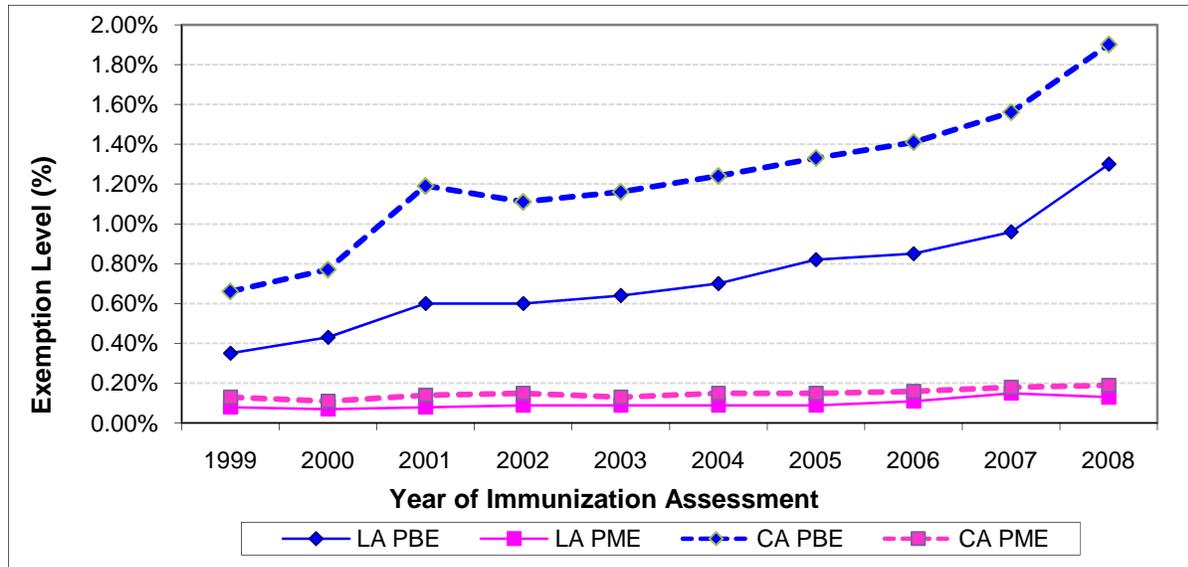
- In 2008, PBE levels by SPA ranged from 0.15% (SPA 6 and 7) to 4.70% (SPA 5).
- The preschool PBE percentage by ZIP code in LAC ranged from 0% (582 schools) to 23.0% (4 schools).
  - A total of 97 preschools had a PBE percentage over 7.5%.

**Figure 10: Personal belief exemptions by preschool type, Los Angeles County, 2008**



- Private preschools had considerably higher personal belief exemption levels than public and Head Start preschools.
  - Private preschools had a PBE level of 1.72% while public and Head Start preschools had PBE levels of 0.35% and 0.10% respectively.

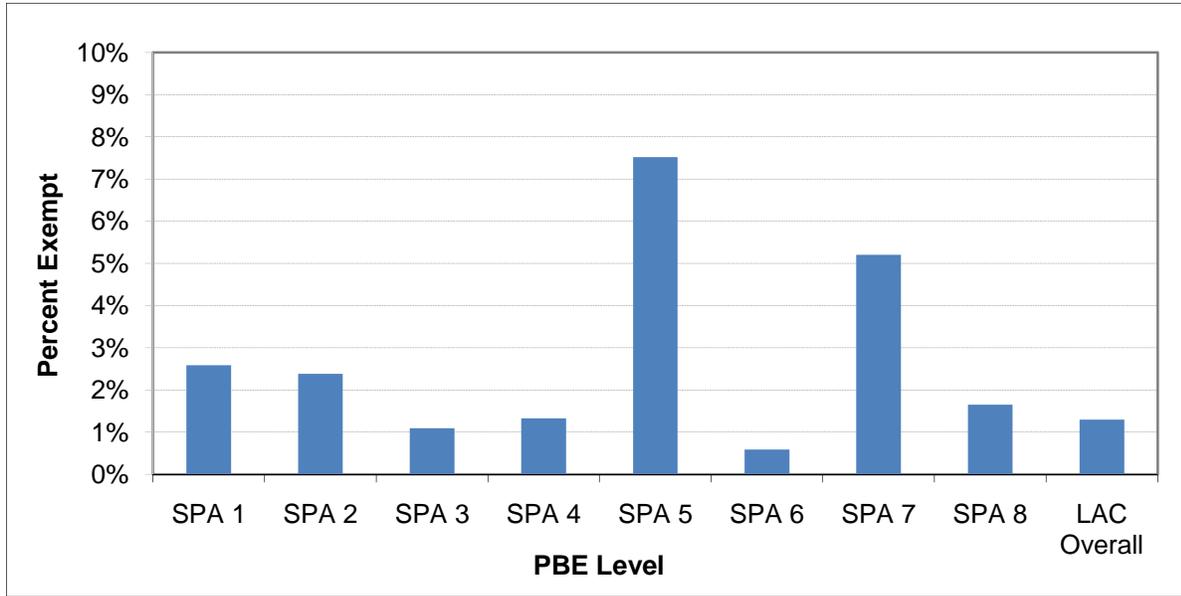
**Figure 11: Personal belief/medical belief exemptions among kindergarten enrollees, Los Angeles County, 1999-2008**



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>LA PBE</b>	0.35%	0.43%	0.60%	0.60%	0.64%	0.70%	0.82%	0.85%	0.96%	1.30%
<b>LA PME</b>	0.08%	0.07%	0.08%	0.09%	0.09%	0.09%	0.09%	0.11%	0.15%	0.13%
<b>CA PBE</b>	0.66%	0.77%	1.19%	1.11%	1.16%	1.24%	1.33%	1.41%	1.56%	1.90%
<b>CA PME</b>	0.13%	0.11%	0.14%	0.15%	0.13%	0.15%	0.15%	0.16%	0.18%	0.19%

- The personal beliefs exemption level among kindergarten enrollees increased considerably from 2007 to 2008, 35.4% to a PBE level of 1.30% (n=1,628 enrollees).
- Over a ten year time span (1999-2008), the PBE level increased 271.4% with an average annual increase of 13.1% (range: 0% - 28.3%). This annual increase translates to approximately 10,500 LAC individuals.
- In contrast, the permanent medical exemption level dropped slightly to 0.13% (n=158), a decrease of 0.1% from 2007.
- Exemption levels for Los Angeles County were below the State level.
  - LAC was 32.9% below the State PBE level.
  - LAC was only slightly below California’s PME level, 0.05 percentage points.

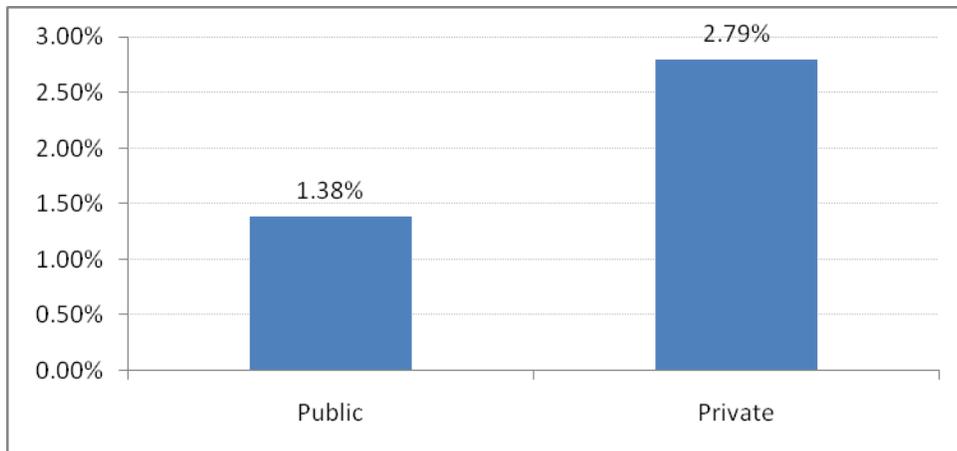
**Figure 12: Personal belief exemptions among kindergarten enrollees by SPA, Los Angeles County, 2008**



	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8	LAC Overall
PBE	2.59%	2.38%	1.09%	1.33%	7.52%	0.59%	0.52%	1.65%	1.30%

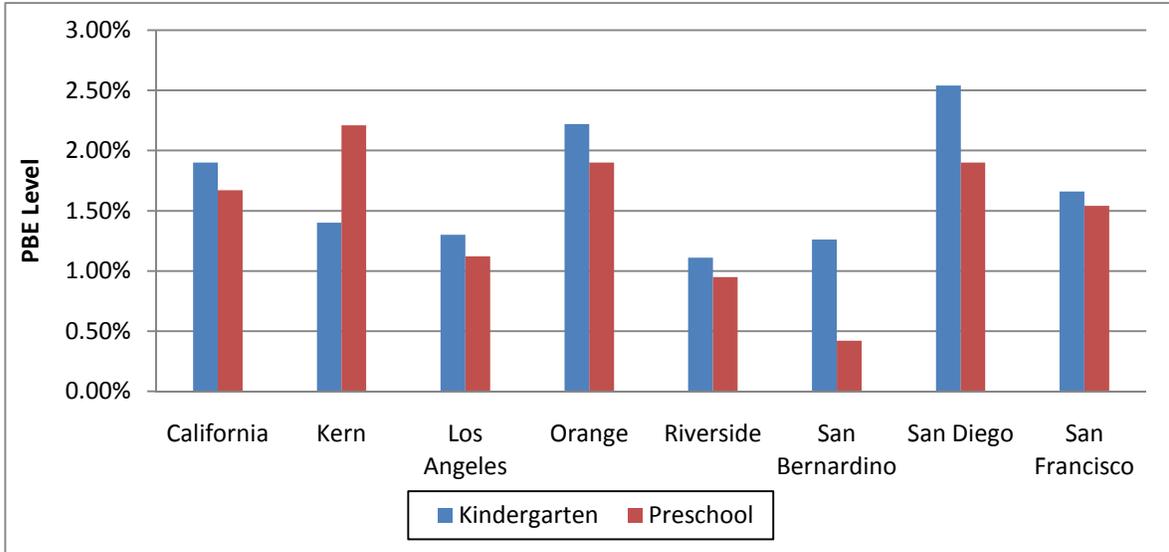
- In 2008, PBE levels by SPA ranged from 0.52% (SPA 7) to 7.52% (SPA 5).
- The kindergarten PBE percentage by ZIP code in LAC ranged from 0% (277 schools) to 100.0% (1 school).
  - A total of 116 kindergartens had a PBE percentage over 7.5%.

**Figure 13: Personal belief exemptions by kindergarten type, Los Angeles County, 2008**



- Private kindergartens had noticeably higher personal belief exemption levels than public kindergartens.
  - Private kindergartens had a PBE level of 2.79% while public kindergartens had PBE levels of 1.38% respectively.

**Figure 14: Personal belief exemption levels by jurisdiction, California, 2008**



	California	Kern	Los Angeles	Orange	Riverside	San Bernardino	San Diego	San Francisco
Kindergarten	1.90%	1.40%	1.30%	2.22%	1.11%	1.26%	2.54%	1.66%
Preschool	1.67%	2.21%	1.12%	1.90%	0.95%	0.42%	1.90%	1.54%

- When compared to 6 other California regions, LAC had the third lowest PBE levels for both kindergarten and preschool.

VI. Permanent Medical Exemption (PME) or Personal Beliefs Exemption (PBE) Levels Part II: PBE by School, City, and Zip Code

**Table 4: Schools with personal belief exemptions greater than 7.5%<sup>1</sup> among preschool enrollees by school type, Los Angeles County, 2008**

School Type	No. of Schools	SPA
Head Start	1	6
Private	92	1, 2, 3, 4, 5, 7, 8
Public	4	2, 5
<b>Total</b>	<b>97</b>	<b>All</b>

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 5: PBE levels among preschool enrollees in private schools, Los Angeles County, 2008**

	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8
<b>No. of enrollees</b>	2,734	19,511	17,284	7,143	8,352	5,123	7,486	15,251
<b>Average PBE (range)</b>	0.9% (0-13.5%)	1.9% (0-64.1%)	1.0% (0 - 42.1%)	2.5% (0-46.2%)	5.6% (0-65.0%)	0.3% (0-6.5%)	0.3% (0-8.3%)	1.2% (0-31.4%)
<b>No. of schools with PBE &gt; 7.5%<sup>1</sup></b>	1	17	11	15	34	0	1	13

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 6: Public schools with PBE levels greater than 7.5%<sup>1</sup> among preschool enrollees, Los Angeles County, 2008**

Name	SPA	City	Zip code	Total Enrollment	PBE Level
LANCASTER MONTESSORI SCHOOL	2	LANCASTER	93534	21	14.3%
FRANKLIN STATE PRESCHOOL RM.K-30	5	SANTA MONICA	90403	30	13.3%
INTRO. FOR THE ARTS PRESCH.AT HAW.ELEM. SCHOOL.	5	BEVERLY HILLS	90210	19	10.5%
ST. DIDACUS PRESCHOOL	2	SYLMAR	91342	12	8.3%

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 7: Head Start schools with PBE levels greater than 7.5%<sup>1</sup> among preschool enrollees, Los Angeles County, 2008**

Name	SPA	City	Zip code	Total Enrollment	PBE Level
LINCOLN STATE PRESCHOOL	6	Los Angeles	90059	12	8.3%

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 8: Top 20 PBE levels among preschool enrollees by zip code, Los Angeles County, 2008**

Zip Code	SPA	City	Enrollment	Average School PBE Level	No. of schools with PBE level > 7.5% <sup>1</sup>
90265	5	MALIBU	187	23.0%	4
90272	5	PACIFIC PALISADES	611	11.1%	5
90404	5	SANTA MONICA	589	9.8%	4
91024	3	SIERRA MADRE	313	8.0%	1
90292	5	MARINA DEL REY	152	7.9%	1
90068	4	L.A.	108	7.4%	1
90290	2	TOPANGA	143	7.0%	1
91362	2	THOUSAND OAKS/WESTLAKE VLG	143	7.0%	0
90049	5	L.A. (NEAR BRENTWOOD)	547	6.6%	2
91423	2	SHERMAN OAKS/VAN NUYS	404	6.4%	2
90039	4	L.A.	405	6.2%	2
90401	5	SANTA MONICA	173	5.8%	1
90041	2	LA/EAGLE ROCK	441	5.7%	3
90211	5	BEVERLY HILLS	175	5.1%	1
90608	7	WHITTIER	79	5.1%	0
90230	5	CULVER CITY	646	5.0%	2
91356	2	TARZANA	578	4.8%	2
91316	2	ENCINO/VAN NUYS	237	4.6%	0
90403	5	SANTA MONICA	660	4.5%	1
91354	2	VALENCIA/SANTA CLARITA	22	4.5%	0

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 9: Top 20 PBE levels among preschool enrollees by city, Los Angeles County, 2008**

City	Enrollment	Average School PBE Level	No. of schools with PBE level > 7.5% <sup>1</sup>
MALIBU BEACH	12	25.0%	1
MALIBU	175	24.7%	3
BEL AIR	61	14.8%	1
TOPANGA	60	13.6%	1
PACIFIC PALISADES	635	12.7%	5
MARINA DEL REY	152	8.6%	1
HOLLYWOOD	262	8.5%	0
SHERMAN OAKS	734	6.2%	3
SANTA MONICA	2,122	5.1%	8
AGOURA	198	4.9%	1
ROLLING HILLS	417	4.8%	1
TARZANA	741	4.6%	2
LA VERNE	359	4.4%	2
SIERRA MADRE	335	4.2%	1
PORTER RANCH	148	4.1%	0
CULVER CITY	1,035	3.7%	2
SOUTH PASADENA	431	3.7%	1
NORTHRIDGE	1,622	3.6%	1
CALABASAS	83	3.6%	0
BEVERLY HILLS	528	3.5%	3

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 10: Schools with personal belief exemptions greater than 7.5%<sup>1</sup> among kindergarten enrollees by school type, Los Angeles County, 2008**

School Type	No. of Schools	SPA
Private	52	1, 2, 3, 4, 5, 6, 8
Public	64	1, 2, 3, 4, 5, 6, 7, 8
<b>Total</b>	<b>116</b>	<b>all</b>

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 11: PBE levels among kindergarten enrollees in private schools, Los Angeles County, 2008**

	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8
<b>No. of enrollees</b>	2,442	9,211	7,215	4,540	2,300	4,455	5,813	7,256
<b>Average PBE (range)</b>	3.0% (0-40.9%)	3.2% (0-100.0%)	1.3% (0-40.0%)	1.3% (0-20.0%)	8.4% (0-87.5%)	1.1% (0-50.0%)	0.3% (0-6.6%)	1.6% (0-50.0%)
<b>No. of schools with PBE &gt; 7.5%<sup>1</sup></b>	2	18	5	6	16	2	0	3

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 12: PBE levels among kindergarten enrollees in public schools, Los Angeles County, 2008**

	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8
<b>No. of enrollees</b>	5,316	14,636	13,534	7,448	4,115	10,977	12,995	12,274
<b>Average PBE (range)</b>	2.4% (0-21.4%)	1.7% (0-51.7%)	0.9% (0-48.7%)	1.3% (0-55.6%)	6.8% (0-75.0%)	0.3% (0-15.0%)	0.6% (0-18.2%)	1.7% (0-33.3%)
<b>No. of schools with PBE &gt; 7.5%<sup>1</sup></b>	4	13	7	6	18	1	4	11

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 13: Top 15 PBE levels among kindergarten enrollees by Zip code, Los Angeles County, 2008**

Zip Code	SPA	City	Enrollment	Average School PBE Level	No. of schools with PBE level > 7.5% <sup>1</sup>
90290	2	TOPANGA	95	28.4%	1
90704	8	AVALON, CATALINA ISL	49	28.2%	1
90212	5	BEVERLY HILLS	129	24.9%	1
90404	5	SANTA MONICA	526	18.5%	6
91040	2	SUNLAND	158	17.5%	1
90265	5	MALIBU	151	17.0%	4
90272	5	PACIFIC PALISADES	360	15.7%	5
90403	5	SANTA MONICA	164	12.5%	2
90277	8	REDONDO BEACH	355	11.7%	4
90402	5	SANTA MONICA	97	10.5%	1
91403	2	SHERMAN OAKS	167	10.2%	1
90405	5	SANTA MONICA	249	9.9%	1
91380	1	SANTA CLARITA	119	9.7%	1
90608	7	WHITTIER	46	8.7%	1
90732	8	SAN PEDRO	249	8.2%	1

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

**Table 14: Top 15 PBE levels among kindergarten enrollees by city, Los Angeles County, 2008**

City	Enrollment	Average School PBE Level	No. of schools with PBE level > 7.5% <sup>1</sup>
TWO HARBORS, CATALIN	2	50.0%	1
LAKE BALBOA	85	41.6%	1
TOPANGA	95	28.4%	1
LEONA VALLEY	14	21.4%	1
SUNLAND	158	17.5%	1
MALIBU	151	17.0%	4
PACIFIC PALISADES	360	15.7%	5
SANTA MONICA	1036	15.5%	10
AGOURA HILLS	120	15.3%	2
BEVERLY HILLS	311	13.3%	1
REDONDO BEACH	784	7.8%	3
LA VERNE	340	7.5%	0
VALLEY VILLAGE	34	7.1%	1
PALOS VERDES ESTATES	134	6.5%	1
VENICE	231	6.4%	1

<sup>1</sup> The 7.5% PBE cutoff level is based on the average of the U.S. Centers for Disease Control and Prevention estimate that infections can spread quickly within a group when as few as 5% to 10% lack vaccination.

VII. Healthy People 2010 Objectives and Los Angeles County Status

**Table 15. 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 2008 <sup>1</sup> (%)	Fall Assessment 5-Year Avg 2004-2008 <sup>1</sup> (%)	Clinic Audits 2008 DHS <sup>2</sup> Facilities (%)	Clinic Audits 2008 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	94.8	96.1	-	-
Hep B vaccine	N/A <sup>5</sup>	95.6	96.7	-	-
MMR vaccine	95	96.1	97.5	-	-
Polio vaccine	95	96.3	97.3	-	-
Varicella vaccine	N/A <sup>5</sup>	95.7 <sup>6</sup>	97.0	-	-
<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	93.4	94.8	-	-
Hep B vaccine	N/A <sup>5</sup>	96.4	97.5	-	-
MMR vaccine	95	97.2	98.4	-	-
Polio vaccine	95	94.1	95.3	-	-
Varicella vaccine	N/A <sup>5</sup>	97.0	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	94.8	96.1	53.2	71.1
3 doses HiB	90	N/A	N/A	81.6	89.2
3 doses Hep B	90	96.3	96.7	80.3	87.4
1 dose MMR	90	96.1	97.5	75.9	86.6
3 doses polio	90	96.4	97.3	80.9	89.6
1 dose Varicella	90	95.7	97.0	71.8	83.4

<sup>1</sup>Only 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 2008 LAC Fall Assessment antigen-specific vaccination coverage levels reached most Healthy People 2010 vaccination coverage objectives.
  - The exceptions were for DTaP and Polio coverage. DTaP coverage of preschool and kindergarten enrollees was 94.8% and 93.4% respectively, less than 2% below the 95% target level. Polio coverage of kindergarten enrollees was 94.1%, 0.9% below the 95% target level.

## Discussion

In 2008, the Los Angeles County (LAC) Fall Assessment antigen-specific vaccination coverage levels slightly declined among enrollees in preschools and kindergartens. While coverage levels still exceed 93%, for the first time in 10 years coverage for DTaP/DTP among preschool enrollees and coverage for Polio, MMR 2+, and DTaP/DTP among kindergarten enrollees dropped below 95%. Although the decline in coverage seen in LAC was not a nationwide trend, regions throughout the U.S. have experienced similar declines in coverage. In New Jersey, the number of children receiving the required number of vaccines declined by 10% from 2007 to 2008.<sup>1</sup> In Maine, the percent of children in compliance with federal immunization recommendations dropped from 89% in 1996 to 72.9% in 2007.<sup>2</sup> The decline in coverage levels could endanger public safety by creating a reservoir for resurgence of vaccine preventable diseases.

One of the primary factors contributing to the downward trend in coverage levels is parents' knowledge, attitudes, beliefs, and practices toward vaccinations (PKABP). Parent fears and misperceptions about vaccines and their side effects continue to persist. Some parents still believe that there is a link between autism and vaccines, although there is overwhelming scientific evidence to the contrary and the journal, *Lancet*, has published a retraction to the study that initially suggested a link between MMR and autism.<sup>3</sup> Nonetheless fears about vaccines have resulted in some parents choosing to alter their immunization practices and not follow the recommended schedule leaving their children as well as others in the community at risk of vaccine preventable diseases for a longer period of time. In addition, parents who spread out the vaccinations may forget to bring their children back to their health care provider to receive the missed vaccines or because of limited finances they may no longer have access to providers who offer vaccinations or the funds to pay for the vaccines.<sup>1</sup> Other parents, primarily out of concerns of vaccine side effects, are choosing not to vaccinate their child at all.

The level of noncompliance due to PKABP has led to the surge in personal belief exemptions (PBE) among school enrollees. The simplicity of the exemption process in which parents only sign a waiver at the time of school entrance has also contributed to the growing number of PBEs. Both preschool and kindergarten PBE level reached all-time highs in 2008, 1.12% and 1.30% respectively. Among preschools, private preschools had a particularly high level at 1.72%. A recent news article in the *Los Angeles Times* which analyzed California state data on kindergarten immunization levels has helped raise awareness of the increasing PBE levels. Based on the State data, public charter schools and non-Catholic private schools have the highest PBE levels. Additionally, PBEs appear to be concentrated in a small number of schools in affluent areas. Schools with high PBE levels can result in outbreaks as demonstrated by the 2008 measles outbreak in San Diego. A measles outbreak occurred at a San Diego Charter School in which 12 children were infected and 70 other children were voluntarily quarantined. The virus spread quickly primarily because of the large number of unvaccinated children, the PBE level for the charter school was 10%.<sup>4</sup>

To address the upward trend in exemption levels, LAC recommends schools distribute 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 risks, student school exclusions in the event of school outbreaks, vaccine safety and effectiveness, and free/low-cost immunization sources. Also, LAC will be conducting a Personal Belief Exemptions Needs Assessment with schools to further understand the PBE trends in the County. Additionally, the State's Immunization Branch will be conducting a special population study to determine which vaccines are most frequently exempted in order to better target education efforts for parents.<sup>5</sup>

Another contributing factor in the decline of coverage levels is financial barriers. With the weakening economy and the loss of jobs and job based health insurance we may begin to see further decreases in coverage levels. Additionally, if funding for public health and health services immunization programs begin to drop, there may be less access to care (e.g. shorter clinic hours). Moreover, several studies investigating immunization barriers in minority populations concluded that factors associated with poverty (e.g. transportation issues, lack of continuous care) continue to be the most powerful obstacles to timely immunization. Other commonly reported risk factors for delayed immunization include: misinformation on vaccine safety and efficacy, lack of knowledge of vaccine schedules, limited clinic hours, and lack of culturally sensitive care.<sup>6-9</sup>

Although the enforcement of state mandated immunization requirements for school entrance has helped maintain high antigen-specific vaccination coverage levels among enrollees in preschools and in kindergartens, LAC has initiated several local strategies to improve immunization coverage.<sup>10</sup> Efforts have focused on immunization registries, reminder systems, education interventions, and community outreach to high-risk populations.

#### Immunization Registries:

Los Angeles-Orange Immunization Network (LINK). LINK is a standardized web-based immunization registry for Los Angeles and Orange counties that maintains electronic immunization records across multiple providers and tracks immunization records for patient reminder lists. Similar registries are being implemented throughout California and in all 50 states. In 2009, LINK will integrate into the statewide system, the California Immunization Registry (CAIR) so that records can be maintained across other California regions.

#### Community Outreach Strategies:

LAC, in collaboration with community and academic organizations, established several outreach programs including the Rescatando Salud/Health Rescue (RS) Promotora Immunization Project and the African American Immunization Collaborative Project. The objective of these programs is to improve vaccine coverage levels especially in the high-risk populations of Central and South Los Angeles through education and other outreach interventions.

#### 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.

## References:

1. Leach B. U.S. survey shows fewer N.J. children getting vaccinated. Press of Atlantic City. 2009
2. Haskell M. Maine kids' immunization rates decline. Bangor Daily News. 2009
3. Murch SH, Anthony A, Casson DH, et al. Retraction of an interpretation. Lancet. 2004;363 (9411): 750
4. Lin RG, Poindexter S. California schools' risks rise as vaccinations drop. Los Angeles Times 2009.
5. California Department of Public Health. IZ Update. 2008. Retrieved March 12, 2009 from CDPH site. Web site: [http://www.eziz.org/update/Dec08/update\\_Asess1.html](http://www.eziz.org/update/Dec08/update_Asess1.html)
6. 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)
7. Whitehead SJ, Cui KX, De AK et al. Identifying risk factors for underimmunization by using geocoding matched to census tracts: A statewide assessment of children in Hawaii. Pediatrics. 2007;120:e535-e542
8. Goodman KJ, Wu JS, Frerichs RR. Compliance with childhood immunizations in Kern County, California. J of Immigrant Health. 2000;2:213-222
9. 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
10. Davis MM, Gaglia MA. Associations of daycare and school entry vaccination requirements with varicella immunization rates. Vaccine. 2006;23:3053-3060