



County of Los Angeles Department of Public Health
Immunization Program
2009 Annual School Immunization Assessment
Preschool and Kindergarten
December 2010

Background

State mandated immunization requirements for licensed childcare/preschool entrance play an important role in keeping children up-to-date with their immunization series¹. 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.²
 - Kindergarten enrollees' of all ages.
 - For ungraded classes, only enrollees within the age range of 57-69 months are included³.
- 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.

¹ 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

² State of California-Health and Human Services Agency (CDPH 8018A-Annual Immunization Report on Children Enrolled in Child Care Centers)

³ 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). A detailed Personal Beliefs Exemption Report for 2009 is also available.

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 2009 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
- VII. Healthy People 2010 Objectives and Los Angeles County Status

I. Immunization Requirements for School Entry

Table 1. Immunization requirements for school entry, California 2009

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

¹Physician-documented Varicella (chickenpox) disease history or immunity meets the Varicella requirement.

²Health 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

³Receipt of the dose up to (and including) 4 days before the birthday will satisfy the childcare entry immunization requirement.

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

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

⁶Two doses of measles-containing vaccine required (both on or after 1st 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.

⁷Hib is not required for kindergarten enrollment. In addition, Hib has been excluded from the series measure. Computation of this series measure without Hib is being done temporarily due to the Hib shortage which began in December 2007.v

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 facilities¹, Los Angeles County, 2000-2009

Assessment Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Enrolled Students	110,532	111,046	110,175	113,873	130,910	129,556	131,839	134,003	137,229	117,421
Total Schools	2,079	2,087	2,075	2,135	2,419	2,331	2,366	2,359	2,450	2,092
Public Schools	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%)	345 (16.5%)
Private Schools	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%)	1,271 (60.8%)
Head Start Schools	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%)	476 (22.8%)

¹Only includes facilities that submitted assessment forms.

- Between 2008 and 2009, the number of preschools that reported enrollee immunization status for the Fall Assessment decreased considerably.
 - The number of preschools that submitted assessment forms decreased by 14.6% (n=358).
 - Private and Head Start schools had the largest decreases, 16.1% (n=244) and 14.8% (n=83) respectively. Public schools decreased by 8.2% (n=31).
- The majority of reporting preschools continues to be private (60.8%).
- The number of students enrolled in preschools also declined 14.4% (n=19,808) from 2008 to 2009.

Table 3. Schools¹ with kindergarten enrollment, Los Angeles County, 2000-2009

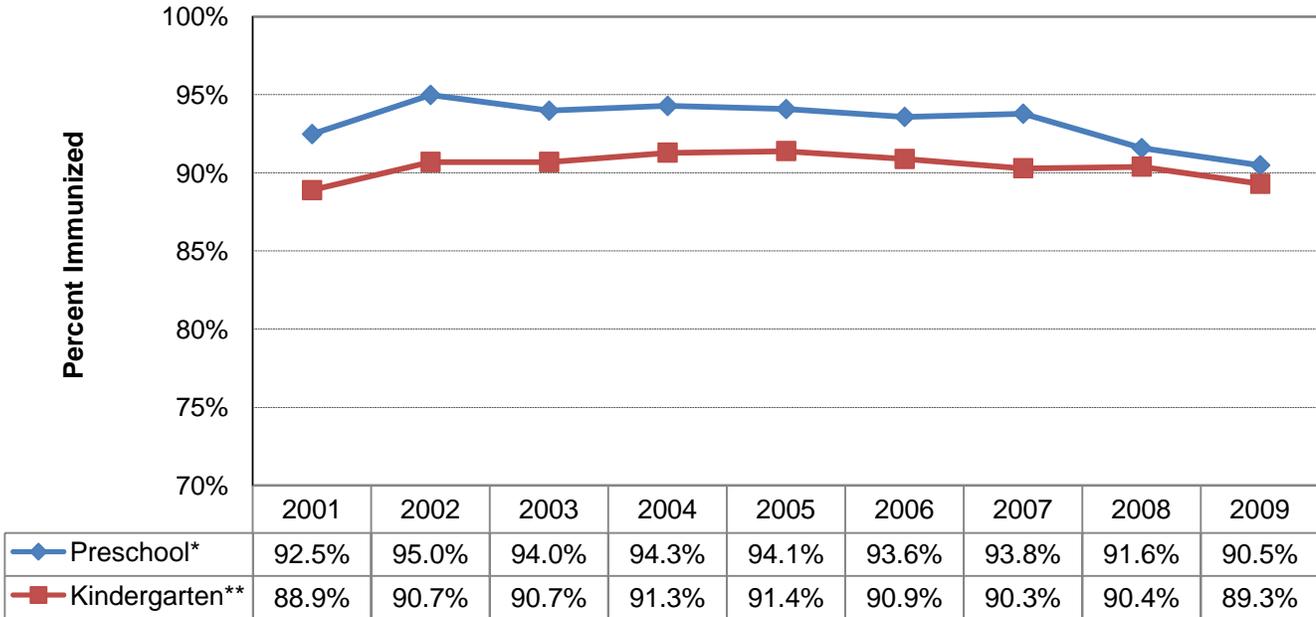
Assessment Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Enrolled Students	154,020	151,073	148,609	144,334	140,591	138,442	129,608	129,655	125,222	126,340
Total Schools	2,265	2,292	2,263	2,233	2,207	2,186	2,090	2,141	1,978	1,935
Public Schools	1,210 (53.4%)	1,211 (52.8%)	1,217 (53.8%)	1,223 (54.8%)	1,227 (55.6%)	1,240 (56.7%)	1,228 (58.8%)	1,251 (58.4%)	1,217 (61.5%)	1,244 (64.3%)
Private Schools	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%)	691 (35.7%)

¹ Only includes facilities that submitted assessment forms.

- The Fall Assessment continued its downward trend in the overall number of kindergarten schools reporting immunization status of their students in 2009.
 - The total number of schools with kindergartens decreased 2.2% (n=43) from 2008 to 2009. The largest decline occurred in private schools, a decrease of 9.2% (n=70).
 - The only exception was the number of public schools which increased 2.2% (n=27).
- Student enrollment of reporting schools increased 0.9% (n=1,118) between 2008 and 2009.
- In contrast to preschools, the majority of reporting kindergartens were public (64.3%).

III. Percent of School Enrollees Meeting Immunization Requirements

Figure 1: Percent of preschool and kindergarten enrollees up-to-date with immunizations, Los Angeles County, 2001-2009

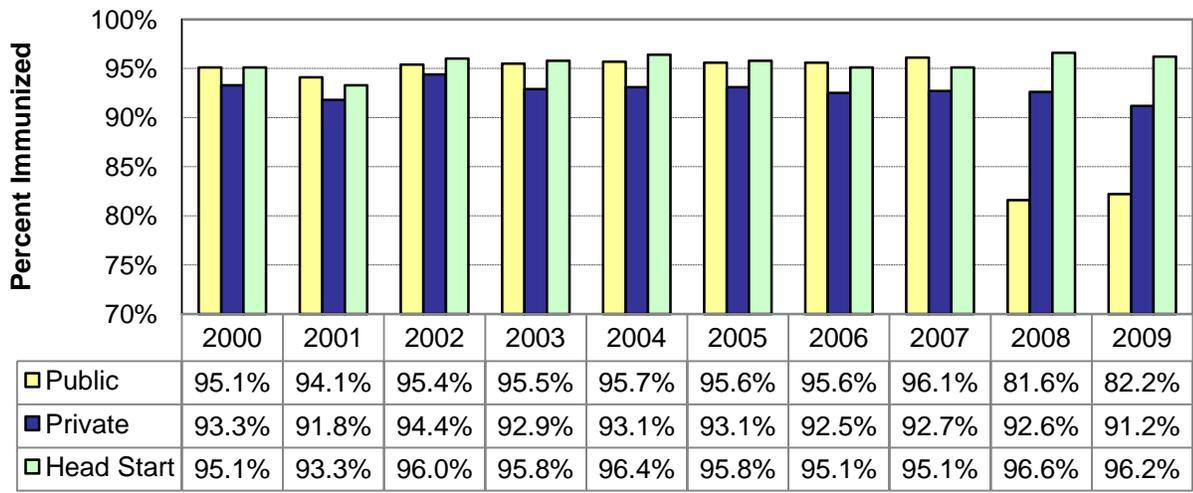


* Up-to-date: Enrollee has received 4+DTaP/DTP, 3+ Polio, 1 MMR, 1 Hib, 3 Hep B, and 1 Varicella.

** Up-to-date: Enrollee has received 4+DTaP/DTP, 3+ Polio, 2 MMR, 3 Hep B, and 1 Varicella. Hib is not required for kindergarten enrollment.

- The percent of preschool and kindergarten enrollees up-to-date slightly declined from 2008 to 2009.
 - For the first time in eight years, the percent of kindergarten enrollees up-to-date dropped below 90% in Los Angeles County in 2009.
 - Both the percent of kindergarten enrollees up-to-date and preschool enrollees up-to-date decreased 1.2% to 89.3% and 90.5% respectively.

Figure 2: Percent of preschool enrollees meeting immunization requirements¹, by type of child care center, Los Angeles County, 2000-2009²



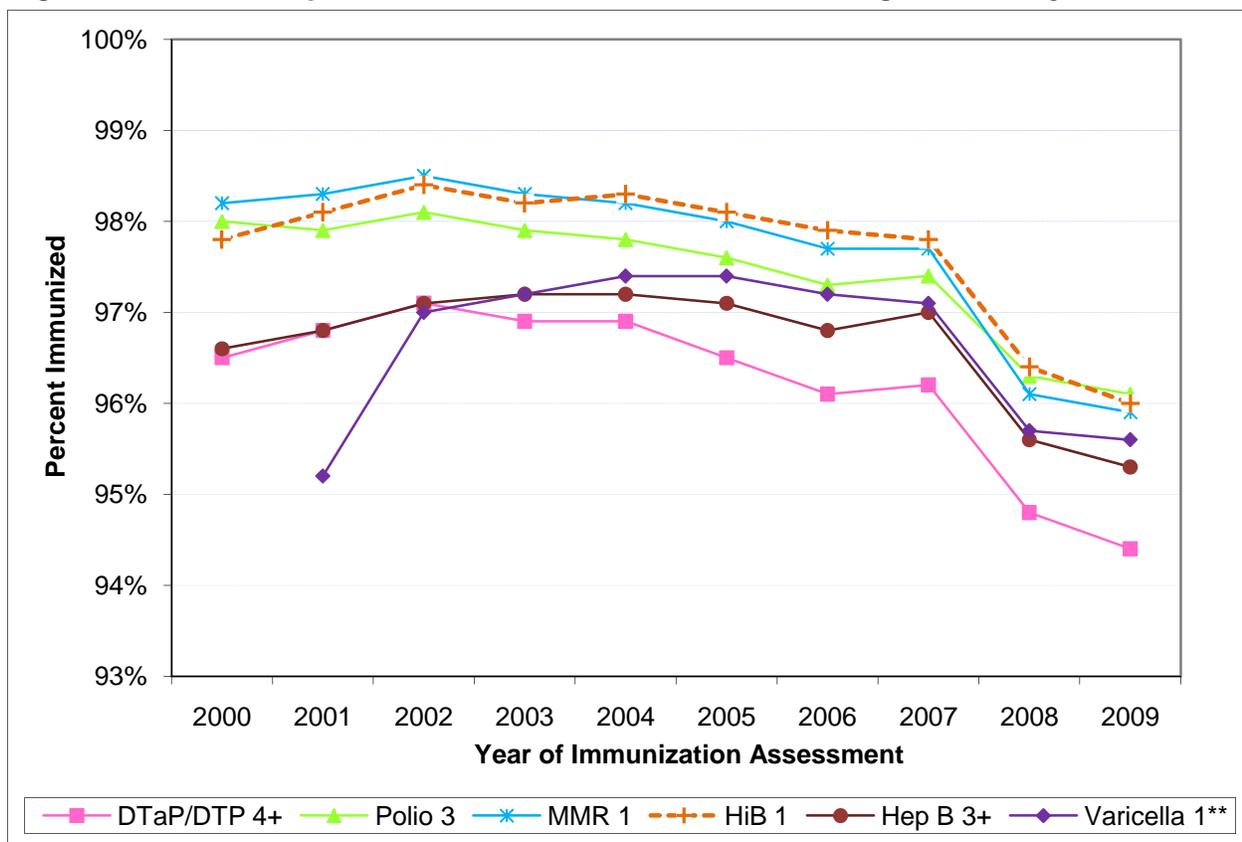
¹ All Required Immunizations: Enrollee has received 4+DTaP/DTP, 3+ Polio, 1 MMR, 1 Hib, 3 Hep B, and 1 Varicella.
² Denominator includes enrollees with documented personal belief exemptions and personal medical exemptions.
 Note: DTaP/DTP represents doses of any diphtheria and tetanus toxoids and pertussis 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.

- For the second consecutive year, coverage levels for public schools remained considerably below Head Start and private schools.
 - LAC was 12.2% below the State coverage level for public schools.
 - However, from 2008 to 2009 coverage of public schools increased 0.7% to 82.2%.
- Private and Head Start schools continued to maintain high immunization coverage levels in 2009.
 - Head Start preschools had the highest proportion of enrollees meeting the immunization requirements, and its immunization coverage decreased only 0.4% between 2008 and 2009 to 96.2%.
 - Private preschool coverage decreased only 1.5% from 2008 to 2009 to 91.2%.

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 3: Percent of preschool enrollees immunized, Los Angeles County, 2000-2009*



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

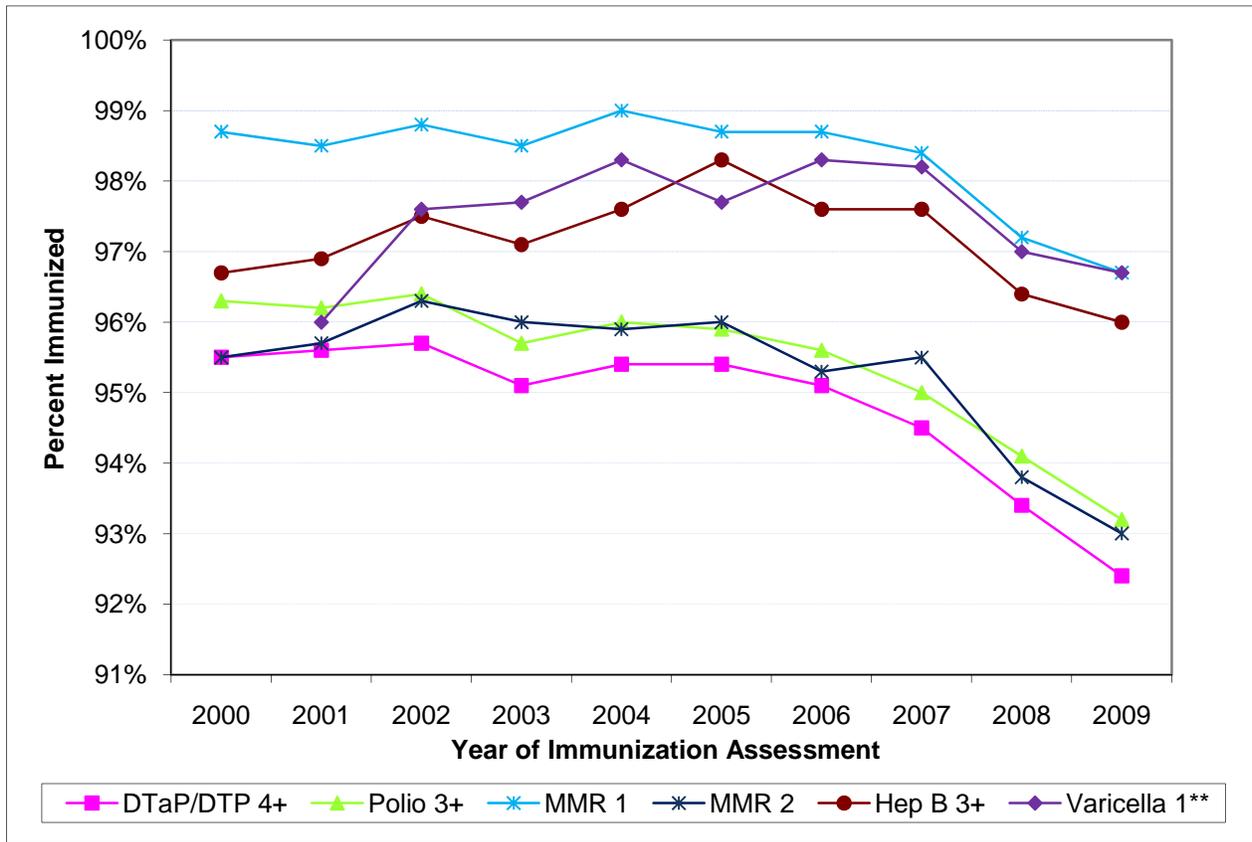
** One dose of Varicella vaccine or physician documented disease/immunity.

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.

- For the second consecutive year, all antigen-specific coverage for preschools declined. However, coverage levels declined only slightly, less than 1% between 2008 and 2009.
 - With the exception of the first dose of Varicella, antigen-specific immunization coverage levels dropped to their lowest levels in ten years.
 - Between 2008 and 2009, the third dose of Polio dropped to 96.1% (0.2% change), the first dose of HiB dropped to 96.0% (0.4% change), the first dose of MMR dropped to 95.9% (0.2% change), and Varicella dropped to 95.6 (0.1% change), the third dose of Hep B dropped to 95.3 (0.3% change), and the fourth dose of DTaP/DTP dropped to 94.4% (0.4% change).
- The rankings among antigen-specific immunization coverage were similar to previous years.
 - The third dose of Polio, the first dose of Hib, and the first dose of MMR sustained the highest antigen-specific coverage levels in 2009 while the fourth dose of DTaP/DTP maintained the lowest coverage level.

Figure 4: Percent of kindergarten enrollees immunized, Los Angeles County, 2000-2009*



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

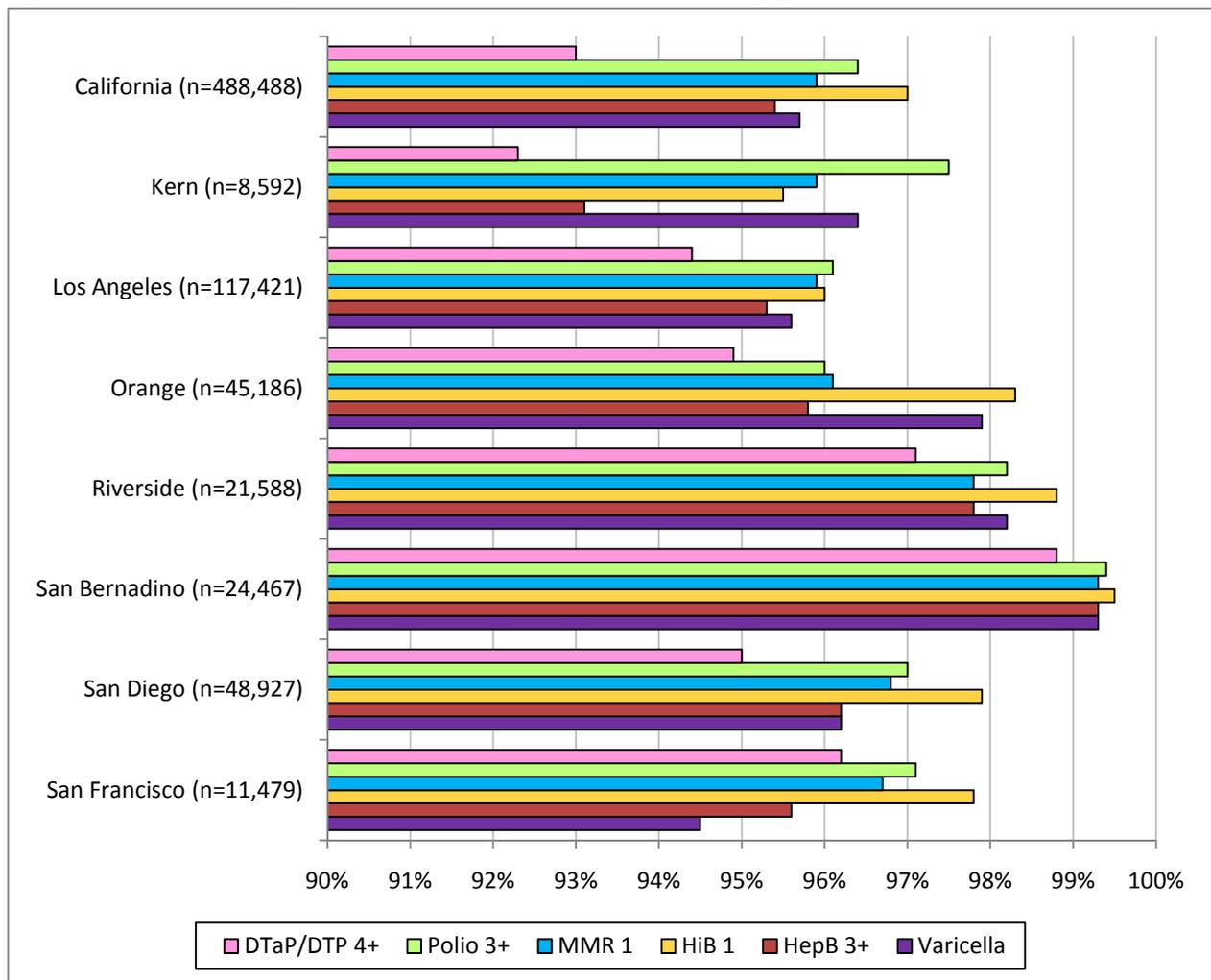
** One dose of Varicella vaccine or physician documented disease/immunity.

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 for the second consecutive year.
 - The fourth dose of DTaP/DTP, the third dose of Polio, and the second dose of MMR experienced the largest declines in coverage of all the vaccines between 2008 and 2009.
 - DTaP/DTP 4+ dropped 1.1% to 92.4%, Polio 3+ dropped 1.0% to 93.2%, and MMR 2+ dropped 0.9% to 93.0%.
 - The first dose of MMR, the first dose of Varicella, and the third dose of Hep B dropped less than 0.6% to 96.7%, 96.7%, and 96.0% respectively.
- Since 2002, the first dose of MMR, the first dose of Varicella, and the third dose of Hep B ranked as the 1st, 2nd, and 3rd highest coverage levels respectively.

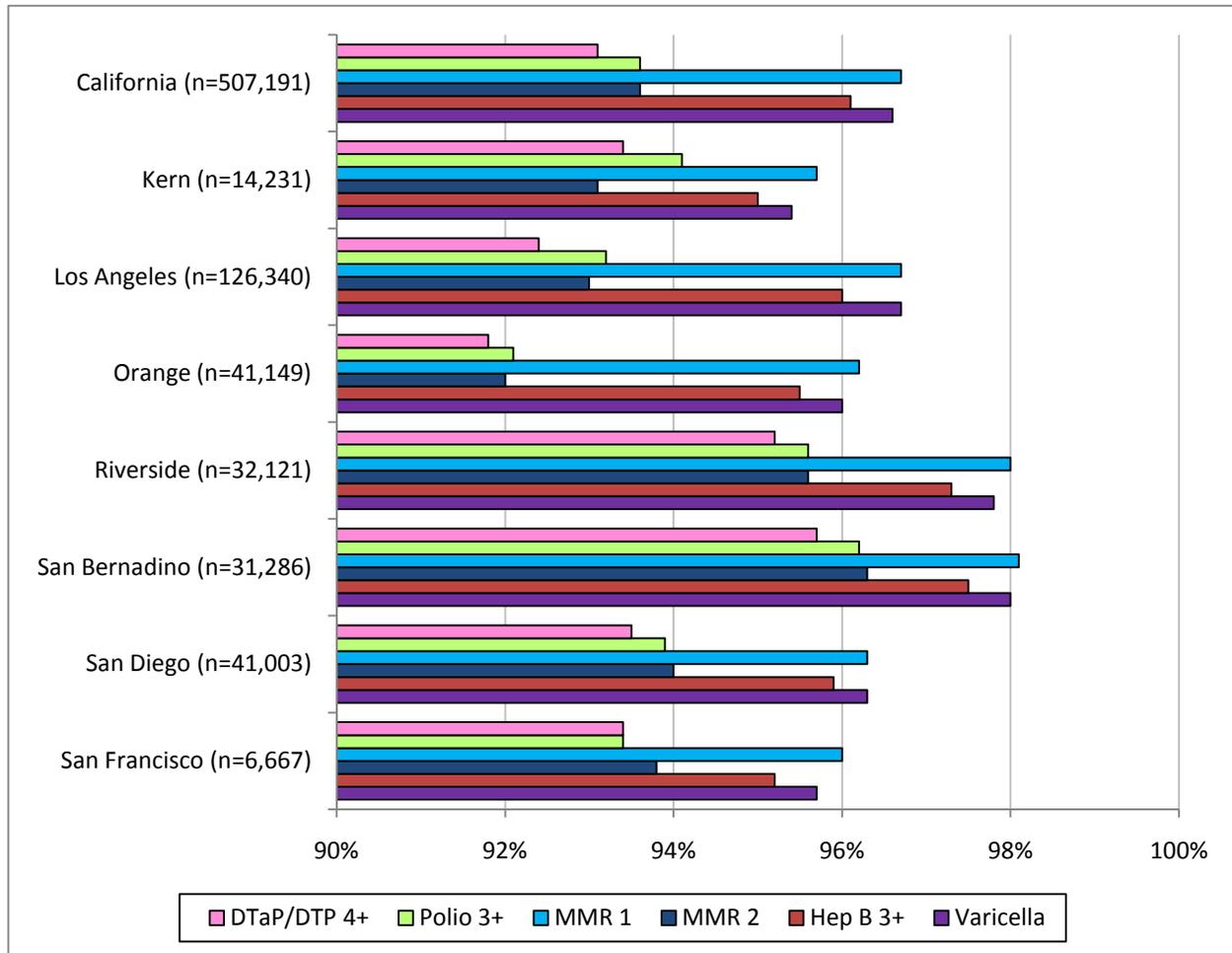
V. Immunization Coverage in Los Angeles County Compared to Other Jurisdictions

Figure 5: Percent of preschool enrollees immunized, by jurisdiction, California, 2009



- In 2009, Los Angeles County estimated coverage levels for vaccine antigens were similar to the State of California's coverage levels (within 1.5% of State coverage levels).
- When compared to six other California jurisdictions by antigen-specific coverage level, Los Angeles County ranked sixth for each antigen.

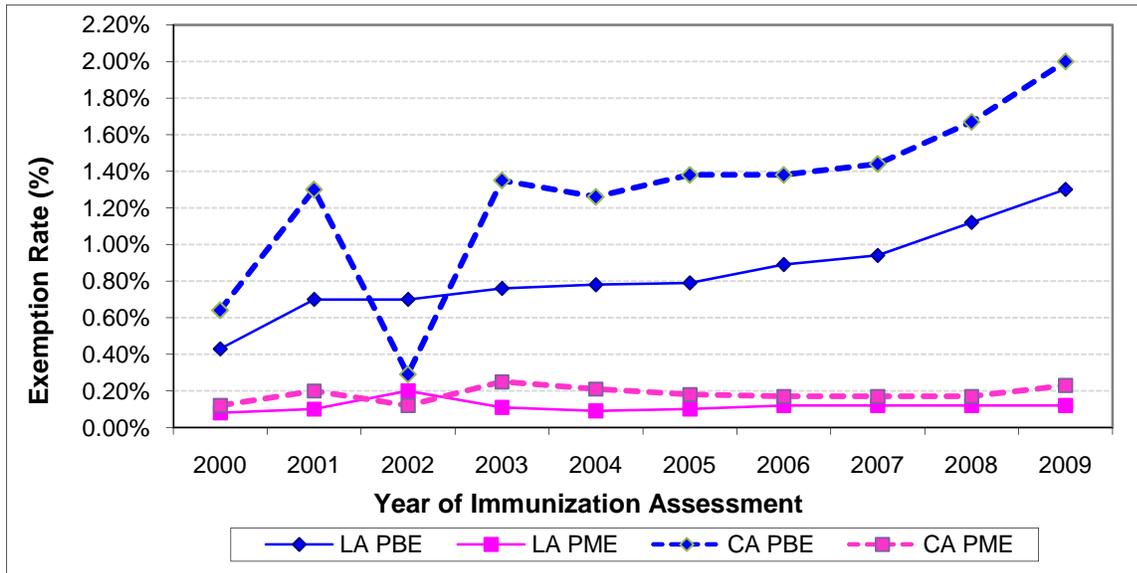
Figure 6: Percent of kindergarten enrollees immunized, by jurisdiction, California 2009



- In 2009, Los Angeles County estimated coverage levels for vaccine antigens were similar to the State of California’s coverage levels (within 0.8% of State coverage levels).
- 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 Hep B 3+, MMR 1, and Varicella, and sixth for DTaP/DTP 4+, MMR 2, and Polio 3+.

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

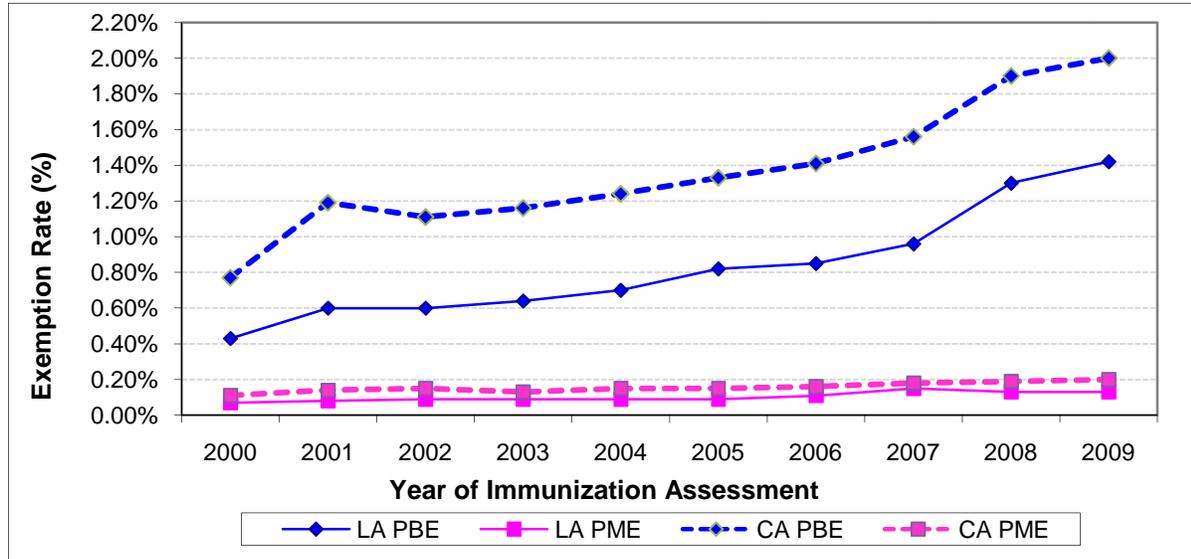
Figure 7: Personal belief/medical belief exemptions among preschool enrollees, Los Angeles County, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
LA PBE	0.43%	0.70%	0.70%	0.76%	0.78%	0.79%	0.89%	0.94%	1.12%	1.30%
LA PME	0.08%	0.10%	0.20%	0.11%	0.09%	0.10%	0.12%	0.12%	0.12%	0.12%
CA PBE	0.64%	1.30%	0.29%	1.35%	1.26%	1.38%	1.38%	1.44%	1.67%	2.00%
CA PME	0.12%	0.20%	0.12%	0.25%	0.21%	0.18%	0.17%	0.17%	0.17%	0.23%

- In 2009, the personal beliefs exemption (PBE) level among preschool enrollees reached 1.30% (n=1,526 enrollees), an increase of 16.1% from 2008.
- Over a ten year time span (2000-2009), the PBE level increased 202.3% with an average annual increase of 14.3% (range: 0% - 62.8%).
- The proportion of students with permanent medical exemptions (PME) remained at 0.12% (n=146) for the fourth consecutive year.
- Exemption levels for Los Angeles County were below the State levels.
 - Los Angeles County was 35.0% below the State PBE level and 47.8% below the State PME level.

Figure 8: Personal belief/medical belief exemptions among kindergarten enrollees, Los Angeles County, 2000-2009

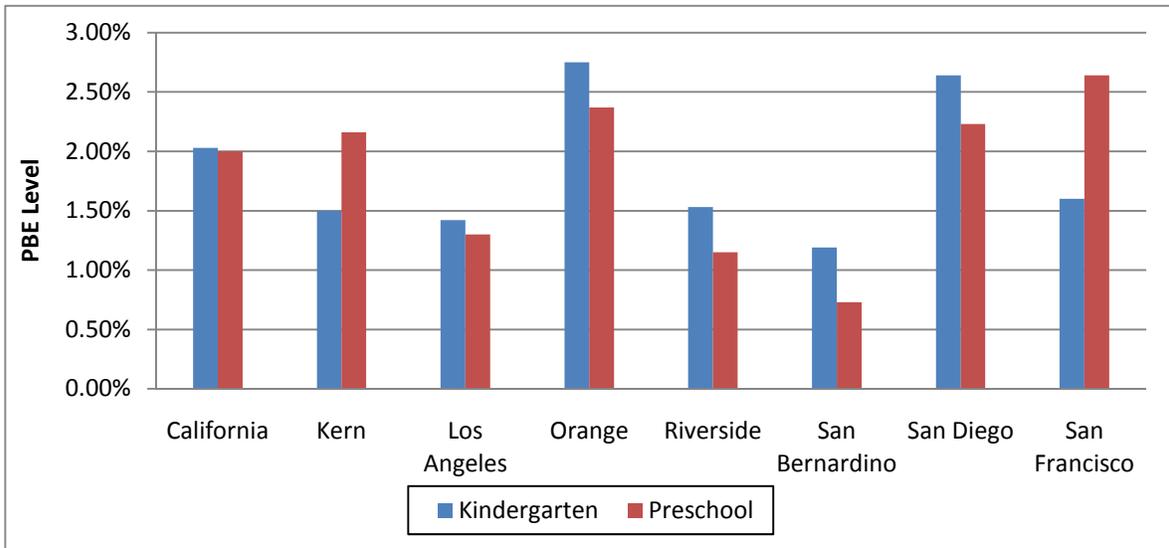


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
LA PBE	0.43%	0.60%	0.60%	0.64%	0.70%	0.82%	0.85%	0.96%	1.30%	1.42%
LA PME	0.07%	0.08%	0.09%	0.09%	0.09%	0.09%	0.11%	0.15%	0.13%	0.13%
CA PBE	0.77%	1.19%	1.11%	1.16%	1.24%	1.33%	1.41%	1.56%	1.90%	2.03%
CA PME	0.11%	0.14%	0.15%	0.13%	0.15%	0.15%	0.16%	0.18%	0.19%	0.20%

- From 2008 to 2009, the personal beliefs exemption level among kindergarten enrollees increased 9.2% to a PBE level of 1.42% (n=1,798 enrollees).
- Over a ten year time span (2000-2009), the PBE level increased 230.2% with an average annual increase of 14.9% (range: 0% - 39.5%).
- In contrast, the permanent medical exemption level (PME) remained at 0.13% (n=163) in 2009.
- Exemption levels for Los Angeles County were below the State level.
 - LAC was 30.0% below the State PBE level.
 - LAC was 35.0% below the State PME level.

Note: A detailed Personal Beliefs Exemption Report for 2009 is also available.

Figure 9: Personal belief exemption levels by jurisdiction, California, 2009



	California	Kern	Los Angeles	Orange	Riverside	San Bernardino	San Diego	San Francisco
Kindergarten	2.03%	1.50%	1.42%	2.75%	1.53%	1.19%	2.64%	1.60%
Preschool	2.00%	2.16%	1.30%	2.37%	1.15%	0.73%	2.23%	2.64%

- When compared to six other California jurisdictions, LAC had the second lowest PBE level kindergarten and third lowest PBE level for preschool.

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 2009 ¹ (%)	Fall Assessment 5-Year Avg 2005-2009 ¹ (%)	Clinic Audits 2009 DHS ² Facilities (%)	Clinic Audits 2009 CHC ³ Facilities (%)
Age of Enrollees		Preschool: 24-59 months Kindergarten: all ages		24-35 months	24-35 months
Healthy People 2010 Objective #1:					
Maintenance of Vaccination Coverage Levels for Enrollees in Licensed Day Care facilities ⁴					
DTaP vaccine	95	94.4	95.6	-	-
Hep B vaccine	N/A ⁵	95.3	96.4	-	-
MMR vaccine	95	95.9	97.1	-	-
Polio vaccine	95	96.1	96.9	-	-
Varicella vaccine	N/A ⁵	95.6 ⁶	96.6	-	-
Healthy People 2010 Objective #2:					
Maintenance of Vaccination Coverage Levels for Enrollees in Kindergarten Through the First Grade ⁷					
DTaP vaccine	95	92.4	94.2	-	-
Hep B vaccine	N/A ⁵	96.0	97.2	-	-
MMR vaccine	95	96.7	97.9	-	-
Polio vaccine	95	93.2	94.8	-	-
Varicella vaccine	N/A ⁵	96.7	97.6	-	-
Healthy People 2010 Objective #3:					
Increase in and Maintenance of Vaccination Coverage Levels Among Enrollees Aged 19 to 35 Months					
4 doses DTaP	90	94.4	95.6	54.4	74.0
3 doses HiB	90	N/A	N/A	74.0	85.7
3 doses Hep B	90	95.3	96.4	80.0	90.1
1 dose MMR	90	95.9	97.1	75.5	87.9
3 doses polio	90	96.1	96.9	80.0	90.9
1 dose Varicella	90	95.6 ⁶	96.6	73.4	86.4

¹Only Preschool enrollees at 24-59 months of age and all kindergarten enrollees.

²LAC Department of Health Services health centers and hospitals.

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

⁴Health 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).

⁵In development.

⁶Physician documented Varicella (chickenpox) disease history or immunity meets the Varicella requirement.

⁷Health 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 2009 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 94.4% and 92.4% respectively, less than 3% below the 95% target level. Polio coverage of kindergarten enrollees was 93.2%, 2% below the 95% target level.

Discussion

Key Findings

The 2009 Annual School Immunization Assessment Preschool and Kindergarten Assessment revealed the following:

- In 2009, the Los Angeles County (LAC) Fall Assessment antigen-specific vaccination coverage levels slightly declined among enrollees in preschools and kindergartens. While coverage levels remain high, coverage for DTaP/DTP among preschool enrollees and coverage for Polio and DTaP/DTP among kindergarten enrollees dropped below the Healthy People 2010 target of 95%. Similar trends were seen in other states across the nation. This decline in coverage levels could endanger the public's health by creating a reservoir for resurgence of these diseases.
- Both preschool and kindergarten PBE levels reached all-time highs in 2009, 1.30% and 1.42% respectively. Among preschools, private preschools had a particularly high level at 2.04%. Alarmingly, parents who choose exemptions tend to live in geographical clusters which lead to low coverage levels in the surrounding schools. For example, in LAC, areas in Malibu, Pacific Palisades, and Sherman Oaks have coverage levels below 90%.

Key Factors Influencing Findings

Parents' Knowledge, Attitudes, Beliefs, and Practices toward vaccinations (PKABP)

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. One study found that in 2009 approximately 25% of parents believed that some vaccines cause autism in healthy children.¹ However 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.² 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. One study found the 11.5% of parents had refused at least 1 vaccine that their doctor had recommended. The most commonly refused vaccines associated with preschools and kindergarten aged children were Varicella and MMR.¹ Other parents, primarily out of concerns of vaccine side effects, are choosing not to vaccinate their child at all.

Personal Belief Exemption (PBE) Process

The level of noncompliance due to PKABP has led to the surge in personal belief exemptions (PBE) among school enrollees. The simplicity of the California exemption process in which parents only sign a waiver at the time of school entrance has also contributed to the growing number of PBEs. Additionally, some parents are choosing to complete the PBE waiver because their child is not up-to-date at the time of school enrollment. High exemption levels compromises herd immunity and the ability to protect unvaccinated children. One study found that children with exemptions are almost 23 times more likely to get pertussis than vaccinated children and 11% of all pertussis cases in the total population were attributed to exceptions.³ Additionally, according to the Centers for Disease Control and Prevention, measles outbreaks can occur when as few as 5% of children in elementary schools are exempt.

Financial Barriers

Another contributing factor in the decline of coverage levels is financial barriers. Most children are vaccinated by private providers.⁵ However, there is growing concern among private providers over the level of reimbursement for vaccine administration. One study found that of the 53% of pediatricians who reported decreased profit margins for childhood vaccination, 64% identified increased practice costs for immunization as an important reason for the decrease. Additionally 5% of pediatricians and 21% of family physicians reported seriously considering not providing vaccines to privately insured patients because of vaccine costs.⁶ High vaccination costs are the result of 1) multiple new vaccination recommendations over the last decade and 2) costs to administer vaccines (e.g. storage and inventory management) have increased. Because of the rising costs, some private providers may choose to refer patients to public health clinics for vaccinations. This disruption in care can lead to missed opportunities to vaccinate and lower vaccination rates.⁵

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.⁷⁻¹⁰

LAC Coverage Improvement Strategies

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.¹¹ Efforts have focused on immunization registries, reminder systems, education interventions, and community outreach to high-risk populations.

Education Interventions:

To address the upward trend in exemption levels, LAC recommends schools distribute a fact sheet on the risks 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.

Immunization Registries:

The California Immunization Registry (CAIR). Los Angeles County is a member of CAIR, a standardized web-based immunization registry for California that maintains electronic immunization records across multiple providers and tracks immunization records for patient reminder lists. Similar registries are being implemented in other states.

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.

Next Steps

The State's Immunization Branch has recently conducted a special population study to determine which vaccines are most frequently exempted in order to better target education efforts for parents.

The study found that the vaccine doses most likely to be missed are the first dose of Varicella, the third dose of Hepatitis B, and the second dose of MMR.⁴ LAC will be conducting a Personal Belief Exemptions Needs Assessment with schools to further understand the PBE trends in the County. Additionally, a supplemental report focusing on personal belief exemptions will be available later in the year.

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. Freed GL, Clark SJ, Butchart DC, et al. Parental Vaccine Safety Concerns in 2009. *Pediatrics*. 2010
2. Murch SH, Anthony A, Casson DH, et al. Retraction of an Interpretation. *Lancet*. 2004;363 (9411): 750
3. Glanz JM, McClure DL, Magid DJ, et al. Parental Refusal of Pertussis Vaccination is Associated with an Increased Risk of Pertussis Infection in Children. *Pediatrics* 2009;123:1446-1451
4. Lee T, Sharifi M, Nickell S. Vaccination Status and School Practices Among California Kindergartens with High Number of Personal Beliefs Exemptors. Retrieved May 18, 2010 from CDC site. Web site:<http://cdc.confex.com/cdc/nic2010/webprogram/Paper22752.html>
5. Lindley MC, Shen AK, Orenstein WA, et al. Financing the Delivery of Vaccines to Children and Adolescents: Challenges to the Current System. *Pediatrics* 2009;124:S548-S557
6. Freed GL, Cowan AE, Clark SJ. Primary Care Physician Perspectives on Reimbursement of Childhood Immunizations. *Pediatrics* 2009;124:S466-S471
7. 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)
8. Whitehead SJ, Cui KX, De AK et al. Identifying Risk Factors for Underimmunization by Using Geocoding Matched to Vensus Tracts: A Statewide Assessment of Children in Hawaii. *Pediatrics*. 2007;120:e535-e542
9. Goodman KJ, Wu JS, Frerichs RR. Compliance with Childhood Immunizations in Kern County, California. *J of Immigrant Health*. 2000;2:213-222
10. 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
11. Davis MM, Gaglia MA. Associations of Daycare and School Entry Vaccination Requirements with Varicella Immunization Rates. *Vaccine*. 2006;23:3053-3060