

2009 KINDERGARTEN RETROSPECTIVE SURVEY RESULTS  
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH, IMMUNIZATION BRANCH

### Introduction

The annual Kindergarten Retrospective Survey (KRS) is a primary source of information about childhood immunization coverage in California. This survey provides estimates of immunization coverage among kindergarten students at various age checkpoints. This report presents results from this year's Kindergarten Retrospective Survey and the attached tables and figures present comparisons of immunization coverage by a variety of factors, including region and race/ethnicity.

### Methods and Participants

This year's Kindergarten Retrospective Survey was conducted in a sample of approximately 3% of California's kindergartens in concurrence with selective review. Local health departments visited 256 schools with kindergartens and collected copies of every sixth student immunization record (blue card). Demographic information and immunization history were extracted from each record. Data were analyzed using birth dates and immunization dates to retrospectively estimate immunization coverage at various age checkpoints. Age checkpoints are defined according to whether or not children are up-to-date for DTaP, Polio, MMR, Hep B, and Varicella vaccines at 3, 5, 7, 13, 19 and 24 months.

This year's sample consists of 2,659 kindergarten students. Children in this sample were born between 2002 and 2004. Since this is a retrospective survey, estimates of immunization coverage represent levels among toddlers approximately 3-4 years ago.

### Results and Discussion

Results from this year's Kindergarten Retrospective Survey indicate that the percentage of California's kindergarten students at 24 months of age with the 4:3:1 series (4+ DTP, 3+ Polio, and 1+ MMR) was 77.9±1.9%. Immunization coverage for individual vaccines ranged from 87.2±1.5% for 1+Varicella to 92.8±1.3% for 3+ Polio. Table 1 shows a comparison of this year's Kindergarten Retrospective Survey and the 2005 National Immunization Survey. Estimates of immunization coverage for individual vaccines and the 4:3:1 series were similar in both surveys.

Immunization coverage among California's children varies slightly across regions (Table 2 and Figure A). This year, the percentage of kindergarten students at 24 months of age with the 4:3:1 vaccine series was 75.3±4.5% among children in Los Angeles, 81.1±3.3% among children in Southern California, 79.1±4.0% among children in the Bay Area, 79.2±5.7% among children in the Central Coast, 75.5±5.3% among children in the Central Valley, 72.3±8.4% among children in the North Central Valley, and 80.8±8.6% among children in rural Northern California. Although the point estimates may seem different, once confidence intervals are factored in, it becomes clear that any observed differences are not statistically significant.

Table 3 shows immunization coverage among California's children by race/ethnicity. This year, the percentage of kindergarten students at 24 months of age with the 4:3:1 vaccine series was 79.7±3.5% among white children, 76.7±2.4% among Hispanic children, 65.6.0±7.8% among Black children, and 79.4±7.5% among Asian children. The Kindergarten Retrospective Survey is one of the only sources of information on subpopulations of Black and Asian children and data suggest a serious and persistent disparity in immunization coverage among Black children unrelated to Personal Beliefs Exemptions. Reducing geographic, racial and ethnic disparities in childhood immunization rates by using various reminder/recall interventions in primary care practices may reduce this disparity.<sup>1</sup> Over the past 5 years, coverage with the 4:3:1 vaccine series among Black children has been significantly lower than White, Hispanic, and Asian children (Figure B) and this is consistent at all age checkpoints (Figure C).

#### Description of Attached Tables

Enclosed are tables and figures showing this year's results. Table 1 compares immunization coverage as measured by the Kindergarten Retrospective Survey and the National Immunization Survey. Table 2 shows immunization coverage among kindergarten students at 24 months of age by region. Figure A is a map of 4:3:1 vaccine series coverage by region. Table 3 shows immunization coverage among kindergarten students at 24 months of age by race/ethnicity. Figures B&C show disparities in 4:3:1 vaccine series coverage among children by race/ethnicity over time (Figure B) and at all age checkpoints (Figure C). Tables 4-8 show immunization coverage among kindergarten students at 3, 5, 7, 13 and 19 months of age by race/ethnicity.

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<sup>1</sup> Szilagyi, Peter G., Schaffer, Stanley, Shone, Laura, Barth, Richard, Humiston, Sharon G., Sander, Mardy, Rodewalkd, Lance E. Reducing Geographic, Racial, and Ethnic Disparities in Childhood Immunization Rates by Using Reminder/Recall Interventions in Urban Primary Care Practices. *Pediatrics*, 2002;110:e58

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TABLE 1: COMPARISON OF IMMUNIZATION COVERAGE AS MEASURED BY THE KINDERGARTEN RETROSPECTIVE SURVEY (KRS) AND THE NATIONAL IMMUNIZATION SURVEY (NIS)<sup>1</sup>

	n	DTaP (4+) <sup>2</sup>	Polio (3+) <sup>3</sup>	MMR (1+) <sup>4</sup>	Hep B (3+) <sup>5</sup>	Var (1+) <sup>6</sup>	4:3:1 <sup>7</sup>
KRS (24 mo.)	2,659	80.8% ± 1.8%	92.8% ± 1.3%	92.3% ± 1.2%	91.4% ± 1.5%	87.2% ± 1.5%	77.9% ± 1.9%
NIS (24 mo.)	n/a	83.4% ± 4.4%	89.0% ± 3.9%	87.2% ± 4.1%	90.3% ± 3.5%	85.5% ± 4.6%	79.5% ± 4.9%

1. Data from the 2005 NIS are used for comparison because data from the KRS are retrospective; Children in both surveys were born between 2002 and 2004
2. Four or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any acellular pertussis vaccine (DTP/DTaP/DT)
3. Three or more doses of any poliovirus vaccine
4. One or more doses of measles-mumps-rubella vaccine
5. Three or more doses of hepatitis B vaccine
6. One or more doses of varicella vaccine, unadjusted for history of varicella disease
7. Four or more doses of DTaP, three or more doses of Polio, and one or more doses of MMR

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TABLE 2: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 24 MONTHS OF AGE BY REGION<sup>1</sup>

	n	DTaP (4+) <sup>2</sup>	Polio (3+) <sup>3</sup>	MMR (1+) <sup>4</sup>	Hep B (3+) <sup>5</sup>	Var (1+) <sup>6</sup>	4:3:1 <sup>7</sup>	4:3:1:-:3 <sup>8</sup>	4:3:1:-:3:1 <sup>9</sup>
ALL	2,659	80.8% ± 1.8%	92.8% ± 1.3%	92.3% ± 1.2%	91.4% ± 1.5%	87.2% ± 1.5%	77.9% ± 1.9%	75.1% ± 2.0%	71.9% ± 2.1%
Los Angeles	752	78.6% ± 4.1%	92.2% ± 2.8%	91.4% ± 2.6%	87.6% ± 3.2%	84.8% ± 3.9%	75.3% ± 4.5%	70.7% ± 4.5%	66.5% ± 5.0%
Other So California	673	82.5% ± 3.3%	93.3% ± 2.6%	93.3% ± 2.3%	91.5% ± 2.9%	89.9% ± 1.8%	81.1% ± 3.3%	78.6% ± 3.6%	76.0% ± 3.5%
SF Bay Area	533	83.3% ± 3.2%	92.7% ± 3.0%	90.7% ± 2.8%	94.4% ± 2.1%	87.0% ± 3.6%	79.1% ± 4.0%	76.9% ± 4.3%	73.8% ± 4.4%
Central Coast	123	81.6% ± 5.6%	92.9% ± 3.5%	93.2% ± 4.7%	92.8% ± 6.0%	86.3% ± 4.5%	79.2% ± 5.7%	76.4% ± 4.5%	73.8% ± 4.6%
Central Valley	202	78.1% ± 5.7%	94.4% ± 3.3%	95.1% ± 2.5%	94.5% ± 3.0%	86.7% ± 4.8%	75.5% ± 5.3%	73.9% ± 4.9%	71.8% ± 4.1%
North Central Valley	244	77.7% ± 8.8%	91.7% ± 5.7%	89.0% ± 6.1%	92.9% ± 5.9%	87.4% ± 7.3%	72.3% ± 8.4%	71.2% ± 8.6%	69.6% ± 7.8%
Rural No California	132	82.6% ± 8.8%	92.6% ± 4.7%	95.9% ± 3.4%	91.2% ± 6.0%	86.4% ± 4.3%	80.8% ± 8.6%	77.2% ± 9.9%	70.0% ± 7.9%

1. Regions do not exactly match Field Rep assigned regions:

Los Angeles includes Los Angeles County

Other So. California includes Imperial, Orange, Riverside, San Bernardino, and San Diego Counties

SF Bay Area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties

Central Coast includes Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties

Central Valley includes Fresno, Kern, Kings, Madera, Merced, and Tulare Counties

North Central Valley includes Sacramento, San Joaquin, and Stanislaus Counties

Rural No. California includes Alpine, Amador, Butte, Calaveras, Colusa, Del Norte, El Dorado, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Placer, Plumas, San Benito, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba Counties

2. Four or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any acellular pertussis vaccine (DTP/DTaP/DT)

3. Three or more doses of any poliovirus vaccine

4. One or more doses of measles-mumps-rubella vaccine

5. Three or more doses of hepatitis B vaccine

6. One or more doses of varicella vaccine, unadjusted for history of varicella disease

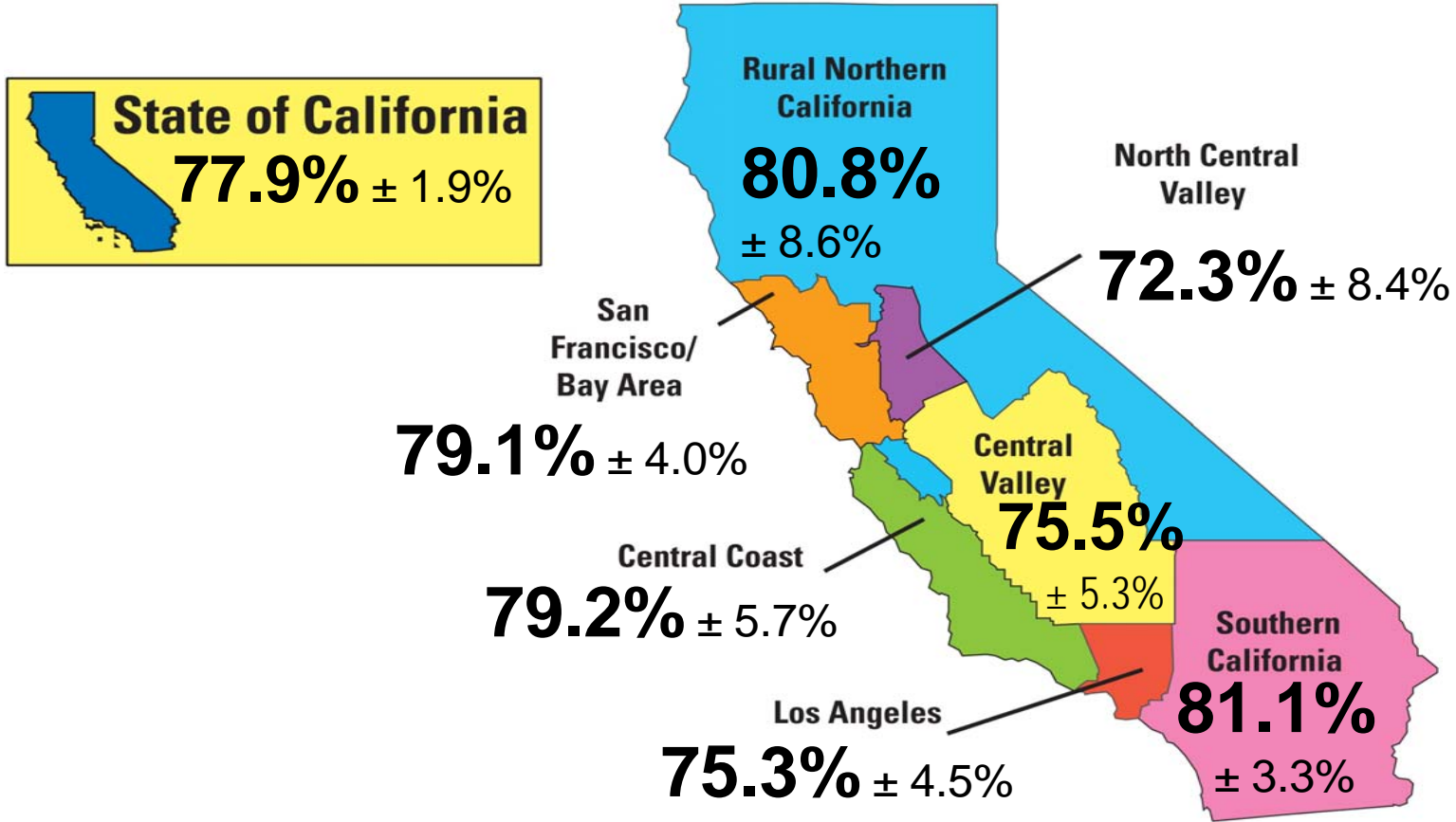
7. Four or more doses of DTaP, three or more doses of Polio, and one or more doses of MMR

8. Four or more doses of DTaP, three or more doses of Polio, one or more doses of MMR, and three or more doses of Hep B

9. Four or more doses of DTaP, three or more doses of Polio, one or more doses of MMR, three or more doses of Hep B, and one or more doses of varicella

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FIGURE A: 4:3:1<sup>1</sup> COVERAGE AMONG KINDERGARTEN STUDENTS AT 24 MONTHS OF AGE BY REGION<sup>2</sup>



1. Four or more doses of DTaP, three or more doses of polio, and one or more doses of MMR

2. Regions do not exactly match Field Rep assigned regions:

Los Angeles includes Los Angeles County

Other So. California includes Imperial, Orange, Riverside, San Bernardino, and San Diego Counties

SF Bay Area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties

Central Coast includes Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties

Central Valley includes Fresno, Kern, Kings, Madera, Merced, and Tulare Counties

North Central Valley includes Sacramento, San Joaquin, and Stanislaus Counties

Rural No. California includes Alpine, Amador, Butte, Calaveras, Colusa, Del Norte, El Dorado, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada,

Placer, Plumas, San Benito, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba Counties

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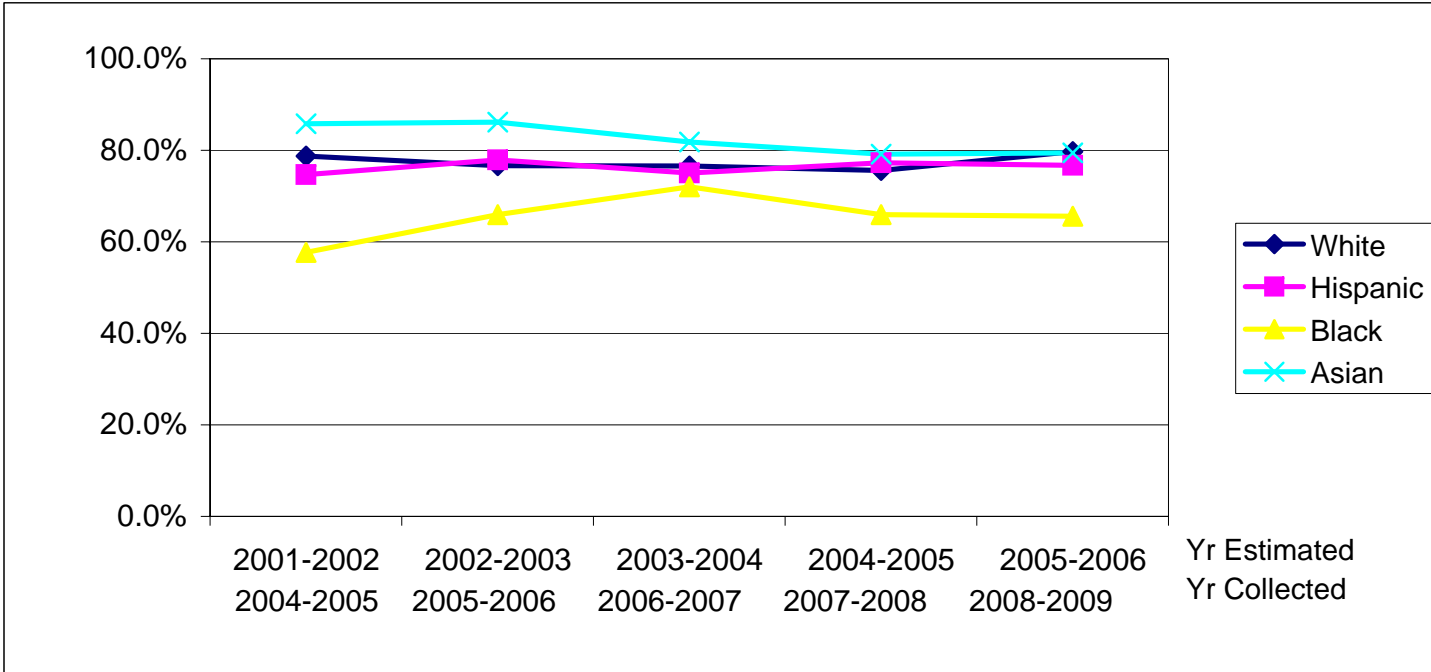
TABLE 3: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 24 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	n	DTaP (4+) <sup>2</sup>	Polio (3+) <sup>3</sup>	MMR (1+) <sup>4</sup>	Hep B (3+) <sup>5</sup>	Var (1+) <sup>6</sup>	4:3:1 <sup>7</sup>	4:3:1:-:3 <sup>8</sup>	4:3:1:-:3:1 <sup>9</sup>
ALL	2,659	80.8% ± 1.8%	92.8% ± 1.3%	92.3% ± 1.2%	91.4% ± 1.5%	87.2% ± 1.5%	77.9% ± 1.9%	75.1% ± 2.0%	71.9% ± 2.1%
White	705	83.0% ± 3.1%	91.9% ± 2.3%	91.3% ± 2.6%	89.9% ± 3.1%	87.9% ± 2.6%	79.7% ± 3.5%	76.0% ± 3.9%	72.5% ± 3.9%
Hispanic	1,229	79.3% ± 2.2%	94.4% ± 1.6%	93.0% ± 1.4%	92.6% ± 1.6%	86.1% ± 2.0%	76.7% ± 2.4%	74.2% ± 2.4%	71.2% ± 2.7%
Black	320	67.9% ± 7.8%	82.5% ± 7.7%	85.5% ± 6.4%	82.7% ± 7.3%	82.7% ± 7.0%	65.6% ± 7.8%	62.7% ± 7.3%	60.2% ± 7.5%
Asian	181	84.6% ± 7.0%	91.6% ± 5.1%	93.6% ± 3.8%	93.8% ± 3.9%	91.1% ± 4.7%	79.4% ± 7.5%	76.8% ± 8.2%	71.9% ± 8.1%
Other	100	85.0% ± 7.4%	94.5% ± 4.9%	92.7% ± 5.5%	92.7% ± 5.7%	88.7% ± 6.7%	82.6% ± 7.8%	80.9% ± 8.2%	78.5% ± 8.6%
Unknown	124	90.5% ± 7.3%	95.0% ± 5.9%	97.1% ± 3.6%	94.9% ± 4.8%	93.8% ± 5.0%	89.5% ± 7.6%	88.0% ± 7.9%	84.5% ± 8.3%

1. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race
2. Four or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any acellular pertussis vaccine (DTP/DTaP/DT)
3. Three or more doses of any poliovirus vaccine
4. One or more doses of measles-mumps-rubella vaccine
5. Three or more doses of hepatitis B vaccine
6. One or more doses of varicella vaccine, unadjusted for history of varicella disease
7. Four or more doses of DTaP, three or more doses of Polio, and one or more doses of MMR
8. Four or more doses of DTaP, three or more doses of Polio, one or more doses of MMR, and three or more doses of Hep B
9. Four or more doses of DTaP, three or more doses of Polio, one or more doses of MMR, three or more doses of Hep B, and one or more doses of varicella

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FIGURE B: 4:3:1<sup>1</sup> COVERAGE AMONG KINDERGARTEN STUDENTS AT 24 MONTHS OF AGE BY YEAR OF KRS<sup>2</sup> AND RACE/ETHNICITY<sup>3</sup>



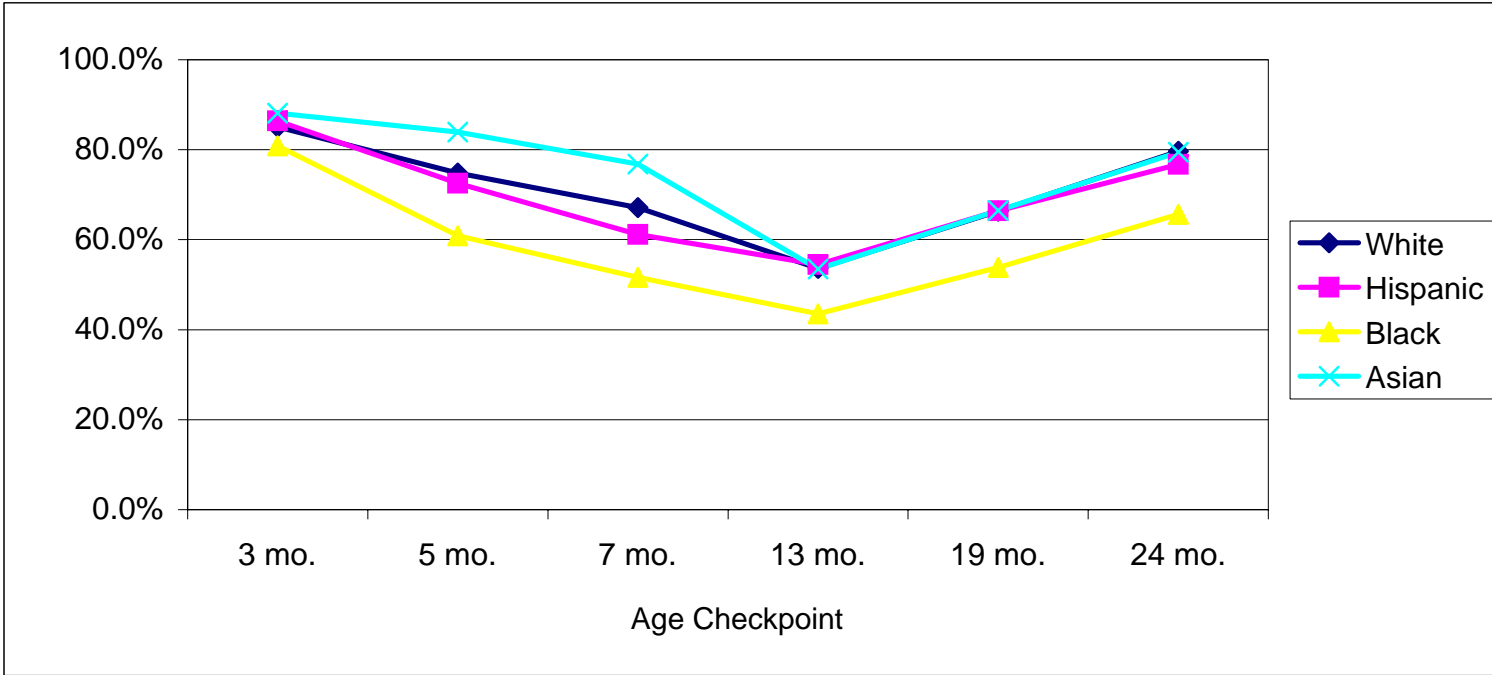
1. Four or more doses of DTaP, three or more doses of polio, and one or more doses of MMR

2. Year of KRS: year collected is the school year that students were in kindergarten. Since this is a retrospective survey, year estimated reflects the year when kindergarten students were 24 months

3. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race

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FIGURE C: 4:3:11 COVERAGE AMONG KINDERGARTEN STUDENTS BY AGE CHECKPOINT<sup>2</sup> AND RACE/ETHNICITY<sup>3</sup>



1. Age appropriate doses of DTaP, polio, and MMR

2. Age checkpoints are defined according to whether or not children are up-to-date for age appropriate doses of DTaP, polio, and MMR at 3, 5, 7, 13, 19 and 24 months

3. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race

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TABLE 4: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 3 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	n	DTaP (1+) <sup>2</sup>	Polio (1+) <sup>3</sup>	Hep B (1+) <sup>4</sup>	1:1:0 <sup>5</sup>	1:1:0:-:1 <sup>6</sup>
ALL	2,659	88.5% ± 1.6%	86.7% ± 1.7%	90.1% ± 1.6%	85.8% ± 1.7%	83.6% ± 1.8%
White	705	88.8% ± 2.6%	86.1% ± 3.0%	89.1% ± 2.9%	85.1% ± 3.1%	81.9% ± 3.5%
Hispanic	1,229	88.5% ± 2.3%	87.0% ± 2.2%	90.7% ± 2.3%	86.4% ± 2.3%	84.7% ± 2.4%
Black	320	82.5% ± 5.9%	82.7% ± 6.1%	87.0% ± 5.1%	80.9% ± 6.4%	78.6% ± 7.2%
Asian	181	90.1% ± 5.1%	90.1% ± 4.9%	91.0% ± 4.7%	88.2% ± 5.4%	84.8% ± 6.0%
Other	100	88.3% ± 10.5%	87.6% ± 10.4%	88.4% ± 10.5%	86.5% ± 10.4%	84.4% ± 10.7%
Unknown	124	91.3% ± 6.9%	86.6% ± 8.4%	93.8% ± 4.8%	86.6% ± 8.4%	85.3% ± 8.1%

1. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race
2. One or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT)
3. One or more doses of any poliovirus vaccine
4. One or more doses of hepatitis B vaccine
5. One or more doses of DTaP and one or more doses of Polio
6. One or more doses of DTaP, one or more doses of polio, and one or more doses of Hep B

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TABLE 5: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 5 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	n	DTaP (2+) <sup>2</sup>	Polio (2+) <sup>3</sup>	Hep B (2+) <sup>4</sup>	2:2:0 <sup>5</sup>	2:2:0:-:2 <sup>6</sup>
ALL	2,659	76.6% ± 2.3%	74.9% ± 2.2%	78.8% ± 2.1%	73.7% ± 2.2%	68.4% ± 2.2%
White	705	79.5% ± 3.8%	75.3% ± 3.6%	75.8% ± 3.8%	74.9% ± 3.7%	66.6% ± 4.1%
Hispanic	1,229	74.4% ± 2.9%	74.3% ± 2.8%	80.1% ± 2.8%	72.6% ± 2.8%	68.9% ± 2.7%
Black	320	62.7% ± 8.7%	62.9% ± 8.8%	70.5% ± 8.5%	60.9% ± 8.8%	56.2% ± 9.8%
Asian	181	87.0% ± 5.4%	84.7% ± 5.6%	86.6% ± 6.0%	83.9% ± 5.8%	78.4% ± 7.2%
Other	100	73.8% ± 11.6%	73.0% ± 11.4%	77.0% ± 11.3%	71.9% ± 11.3%	67.8% ± 11.5%
Unknown	124	86.2% ± 7.8%	81.4% ± 9.1%	83.6% ± 7.9%	80.3% ± 9.2%	75.2% ± 9.5%

1. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race
2. Two or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT)
3. Two or more doses of any poliovirus vaccine
4. Two or more doses of hepatitis B vaccine
5. Two or more doses of DTaP and two or more doses of Polio
6. Two or more doses of DTaP, two or more doses of polio, and two or more doses of Hep B

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TABLE 6: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 7 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	n	DTaP (3+) <sup>2</sup>	Polio (2+) <sup>3</sup>	Hep B (2+) <sup>4</sup>	3:2:0 <sup>5</sup>	3:2:0:-:2 <sup>6</sup>
ALL	2,659	65.0% ± 2.5%	89.9% ± 1.3%	90.3% ± 1.4%	64.1% ± 2.5%	62.7% ± 2.5%
White	705	69.3% ± 4.3%	90.4% ± 2.6%	88.3% ± 3.1%	67.2% ± 4.4%	64.6% ± 4.7%
Hispanic	1,229	61.4% ± 3.3%	90.1% ± 1.8%	91.9% ± 1.6%	61.2% ± 3.3%	60.4% ± 3.2%
Black	320	51.7% ± 8.7%	79.9% ± 7.2%	82.1% ± 7.2%	51.7% ± 8.7%	51.5% ± 8.7%
Asian	181	77.4% ± 6.5%	91.7% ± 4.5%	91.6% ± 4.8%	76.8% ± 6.5%	74.2% ± 7.1%
Other	100	64.6% ± 11.7%	94.1% ± 5.2%	94.3% ± 5.1%	64.6% ± 11.7%	64.1% ± 11.7%
Unknown	124	74.7% ± 11.0%	90.1% ± 7.3%	91.6% ± 5.4%	72.4% ± 10.8%	70.4% ± 10.2%

1. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race
2. Three or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT)
3. Two or more doses of any poliovirus vaccine
4. Two or more doses of hepatitis B vaccine
5. Three or more doses of DTaP and two or more doses of Polio
6. Three or more doses of DTaP, two or more doses of polio, and two or more doses of Hep B

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TABLE 7: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 13 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	n	DTaP (3+) <sup>2</sup>	Polio (2+) <sup>3</sup>	MMR (1+) <sup>4</sup>	Hep B (2+) <sup>5</sup>	Var (1+) <sup>6</sup>	3:2:1 <sup>7</sup>	3:2:1:-:2 <sup>8</sup>	3:2:1:-:2:1 <sup>9</sup>
ALL	2,659	90.3% ± 1.3%	95.9% ± 0.9%	55.7% ± 2.7%	95.3% ± 0.8%	52.1% ± 2.5%	53.8% ± 2.6%	53.3% ± 2.6%	44.5% ± 2.6%
White	705	91.2% ± 2.3%	95.7% ± 1.6%	55.6% ± 4.3%	94.2% ± 1.9%	52.4% ± 4.7%	53.7% ± 4.3%	52.8% ± 4.3%	42.1% ± 4.2%
Hispanic	1,229	90.9% ± 1.6%	96.4% ± 1.1%	56.4% ± 3.4%	96.2% ± 0.9%	52.3% ± 2.8%	54.5% ± 3.4%	54.1% ± 3.3%	47.0% ± 3.1%
Black	320	77.4% ± 8.0%	90.9% ± 6.1%	45.5% ± 10.0%	90.0% ± 5.4%	45.2% ± 9.7%	43.5% ± 10.0%	43.4% ± 10.0%	37.5% ± 9.0%
Asian	181	91.6% ± 4.3%	95.5% ± 3.4%	54.2% ± 9.3%	96.3% ± 3.0%	52.1% ± 9.5%	53.5% ± 9.4%	53.5% ± 9.4%	42.8% ± 9.8%
Other	100	89.8% ± 7.0%	96.7% ± 4.1%	57.7% ± 11.7%	96.6% ± 4.1%	52.5% ± 14.0%	51.9% ± 12.1%	51.9% ± 12.1%	42.6% ± 13.1%
Unknown	124	91.9% ± 6.8%	98.7% ± 2.4%	63.1% ± 12.5%	96.5% ± 3.6%	57.7% ± 12.3%	61.7% ± 13.0%	60.8% ± 12.2%	47.3% ± 12.5%

1. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race
2. Three or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any acellular pertussis vaccine (DTP/DTaP/DT)
3. Two or more doses of any poliovirus vaccine
4. One or more doses of measles-mumps-rubella vaccine
5. Two or more doses of hepatitis B vaccine
6. One or more doses of varicella vaccine, unadjusted for history of varicella disease
7. Three or more doses of DTaP, two or more doses of Polio, and one or more doses of MMR
8. Three or more doses of DTaP, two or more doses of Polio, one or more doses of MMR, and two or more doses of Hep B
9. Three or more doses of DTaP, two or more doses of Polio, one or more doses of MMR, two or more doses of Hep B, and one or more doses of varicella

**KINDERGARTEN RETROSPECTIVE SURVEY**  
CALIFORNIA, 2009

TABLE 8: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 19 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	n	DTaP (4+) <sup>2</sup>	Polio (3+) <sup>3</sup>	MMR (1+) <sup>4</sup>	Hep B (3+) <sup>5</sup>	Var (1+) <sup>6</sup>	4:3:1 <sup>7</sup>	4:3:1:-:3 <sup>8</sup>	4:3:1:-:3:1 <sup>9</sup>
ALL	2,659	69.4% ± 2.1%	89.2% ± 1.5%	89.2% ± 1.5%	89.4% ± 1.6%	83.5% ± 1.8%	66.2% ± 2.2%	64.0% ± 2.1%	60.8% ± 2.2%
White	705	70.3% ± 3.7%	86.9% ± 2.9%	87.8% ± 3.0%	87.2% ± 3.5%	84.1% ± 2.9%	66.3% ± 4.1%	63.3% ± 4.1%	60.4% ± 4.1%
Hispanic	1,229	68.9% ± 2.8%	91.7% ± 2.0%	90.1% ± 1.7%	90.8% ± 1.7%	82.2% ± 2.4%	66.4% ± 3.0%	64.4% ± 2.9%	61.3% ± 3.2%
Black	320	56.1% ± 8.2%	78.6% ± 8.0%	82.5% ± 6.7%	79.9% ± 7.4%	78.8% ± 7.3%	53.9% ± 8.1%	51.1% ± 7.2%	46.7% ± 7.7%
Asian	181	72.3% ± 8.5%	86.3% ± 5.9%	90.1% ± 5.2%	93.0% ± 4.0%	88.2% ± 5.5%	66.5% ± 9.0%	65.2% ± 9.1%	60.2% ± 9.5%
Other	100	72.6% ± 9.3%	90.5% ± 6.4%	91.1% ± 7.2%	88.5% ± 6.5%	86.5% ± 8.1%	69.2% ± 10.5%	67.5% ± 10.6%	66.2% ± 10.8%
Unknown	124	77.9% ± 8.6%	93.7% ± 6.2%	95.5% ± 4.3%	94.9% ± 4.8%	91.3% ± 5.8%	76.4% ± 8.7%	75.2% ± 8.9%	71.7% ± 8.5%

1. As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race
2. Four or more doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any acellular pertussis vaccine (DTP/DTaP/DT)
3. Three or more doses of any poliovirus vaccine
4. One or more doses of measles-mumps-rubella vaccine
5. Three or more doses of hepatitis B vaccine
6. One or more doses of varicella vaccine, unadjusted for history of varicella disease
7. Four or more doses of DTaP, three or more doses of Polio, and one or more doses of MMR
8. Four or more doses of DTaP, three or more doses of Polio, one or more doses of MMR, and three or more doses of Hep B
9. Four or more doses of DTaP, three or more doses of Polio, one or more doses of MMR, three or more doses of Hep B, and one or more doses of varicella