

2008 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 264 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 2,574 kindergarten students. Children in this sample were born between 2001 and 2003. 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 76.7±1.9%. Immunization coverage for individual vaccines ranged from 79.4±1.8% for 4+ DTaP to 92.3±1.2% for 1+ MMR. Table 1 shows a comparison of this year's Kindergarten Retrospective Survey and the 2004 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 77.5±3.5% among children in Los Angeles, 76.9±3.4% among children in Southern California, 82.2±5.0% among children in the Bay Area, 77.8±8.9% among children in the Central Coast, 66.2±6.9% among children in the Central Valley, 76.3.8±5.0% among children in the North Central Valley, and 70.9±13.3% 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 75.6±3.1% among white children, 77.3±3.0% among Hispanic children, 66.0.0±9.6% among Black children, and 79.2±7.2% 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.)	2,577	79.4% ± 1.8%	91.7% ± 1.3%	92.3% ± 1.2%	90.1% ± 1.3%	87.2% ± 1.5%	76.7% ± 1.9%
NIS (24 mo.)	n/a	80.8% ± 4.4%	88.4% ± 3.6%	90.9% ± 3.0%	89.3% ± 3.3%	89.1% ± 3.4%	79.0% ± 4.4%

1. Data from the 2004 NIS are used for comparison because data from the KRS are retrospective; Children in both surveys were born between 2001 and 2003
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	2,577	79.4% ± 1.8%	91.7% ± 1.3%	92.3% ± 1.2%	90.1% ± 1.3%	87.2% ± 1.5%	76.7% ± 1.9%	74.1% ± 2.0%	70.2% ± 2.1%
Los Angeles	789	80.7% ± 3.2%	92.4% ± 2.8%	92.6% ± 2.2%	89.0% ± 2.7%	88.6% ± 2.1%	77.5% ± 3.5%	73.9% ± 3.8%	70.4% ± 3.8%
Other So California	602	79.1% ± 3.3%	91.6% ± 2.4%	92.2% ± 2.5%	91.1% ± 2.4%	87.1% ± 3.3%	76.9% ± 3.4%	75.0% ± 3.3%	71.3% ± 3.9%
SF Bay Area	532	85.1% ± 4.6%	93.5% ± 3.5%	94.7% ± 3.2%	91.9% ± 3.6%	86.7% ± 4.9%	82.2% ± 5.0%	80.4% ± 5.3%	74.7% ± 5.8%
Central Coast	141	79.3% ± 7.9%	93.1% ± 5.3%	93.6% ± 4.6%	93.1% ± 5.6%	89.5% ± 5.9%	77.8% ± 8.9%	76.3% ± 10.4%	75.6% ± 10.1%
Central Valley	209	68.1% ± 7.7%	88.5% ± 3.9%	88.8% ± 4.1%	86.7% ± 4.5%	85.9% ± 4.8%	66.2% ± 6.9%	63.3% ± 6.2%	62.2% ± 6.8%
North Central Valley	223	79.0% ± 5.6%	89.9% ± 4.7%	92.2% ± 2.7%	89.2% ± 3.6%	85.3% ± 4.3%	76.3% ± 5.0%	73.0% ± 5.1%	66.7% ± 5.0%
Rural No California	81	76.7% ± 13.8%	88.4% ± 9.1%	86.4% ± 11.7%	89.8% ± 7.6%	81.5% ± 14.7%	70.9% ± 13.3%	67.4% ± 12.2%	60.2% ± 15.7%

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

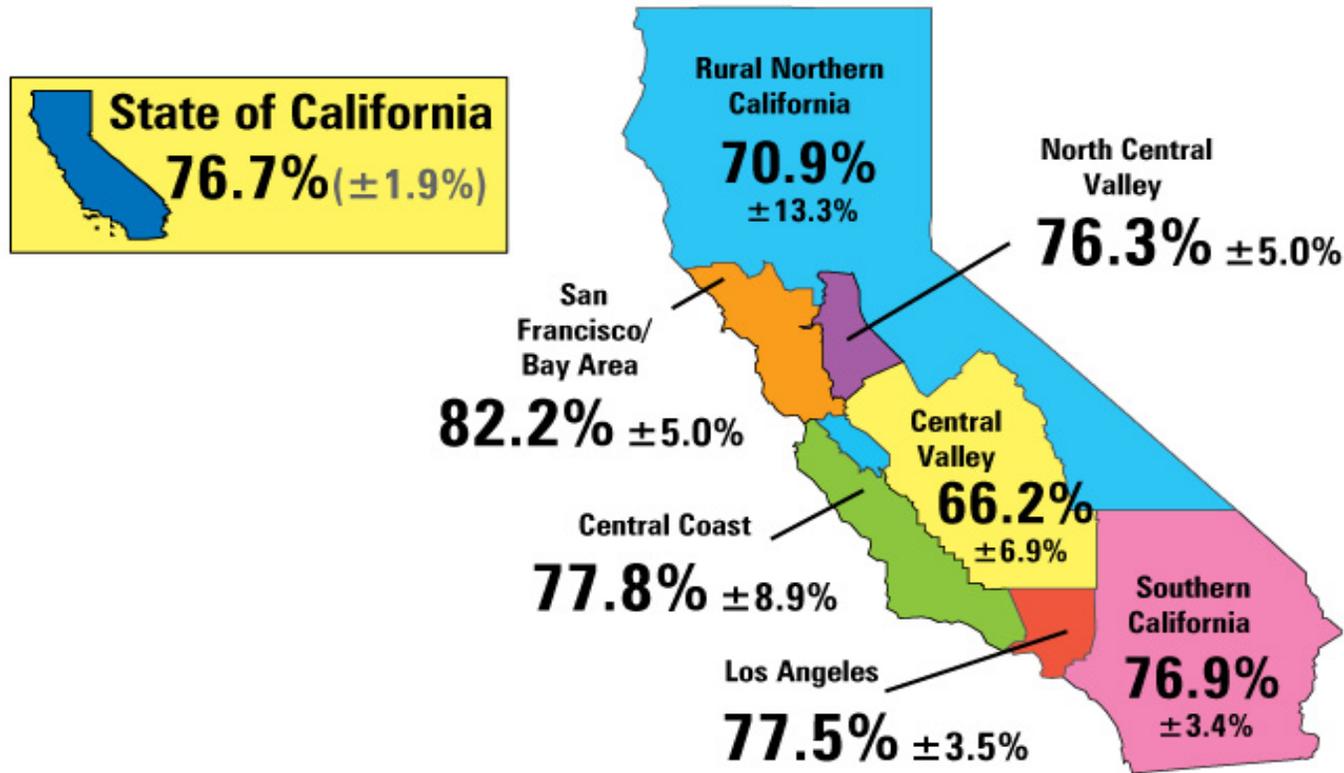
7. Four or more doses of DTaP, three or more doses of Polio, and one or more doses of MMR

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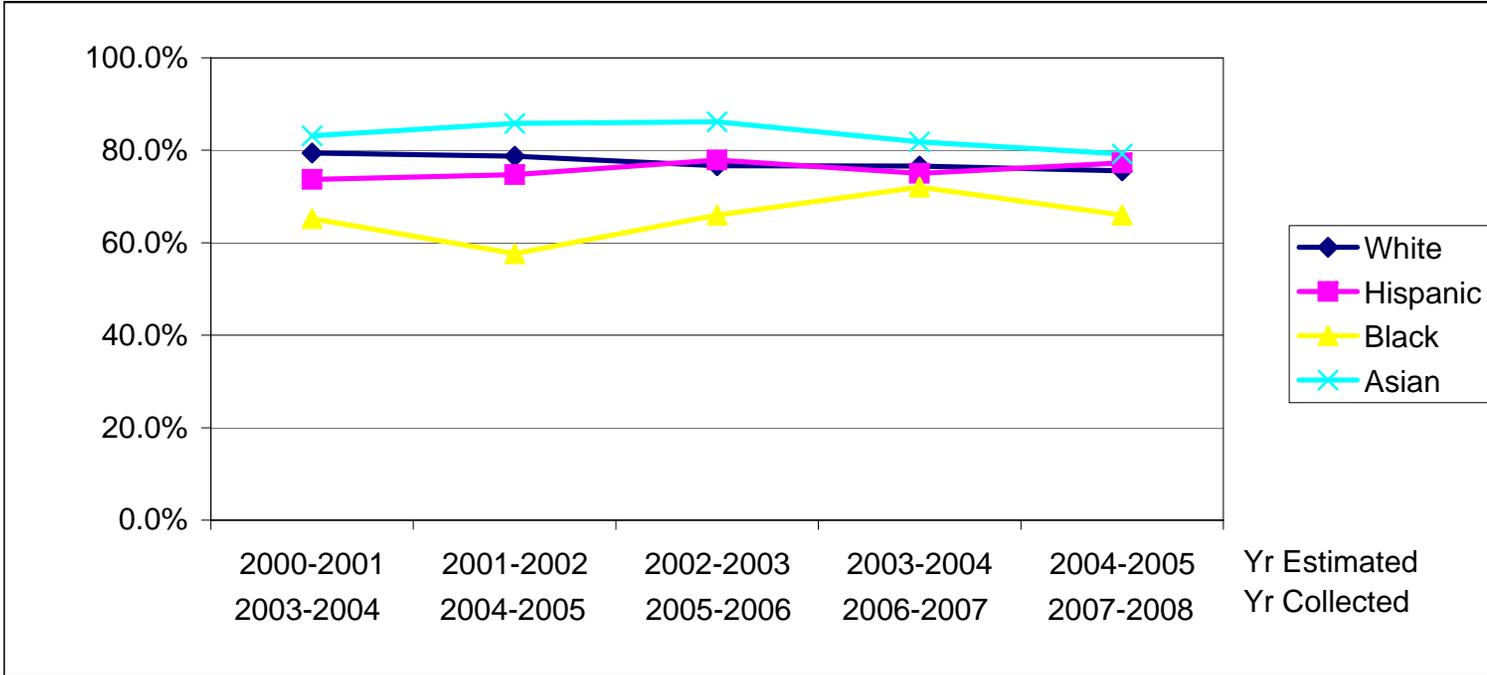
TABLE 3: IMMUNIZATION COVERAGE AMONG KINDERGARTEN STUDENTS AT 24 MONTHS OF AGE BY RACE/ETHNICITY<sup>1</sup>

	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	2,577	79.4% ± 1.8%	91.7% ± 1.3%	92.3% ± 1.2%	90.1% ± 1.3%	87.2% ± 1.5%	76.7% ± 1.9%	74.1% ± 2.0%	70.2% ± 2.1%
White	731	78.3% ± 3.1%	90.6% ± 2.3%	91.6% ± 2.2%	89.6% ± 2.4%	85.4% ± 2.7%	75.6% ± 3.1%	72.7% ± 3.1%	66.9% ± 3.4%
Hispanic	1,062	80.1% ± 2.8%	92.7% ± 2.0%	93.2% ± 1.7%	91.3% ± 1.8%	88.9% ± 2.3%	77.3% ± 3.0%	74.9% ± 3.0%	72.2% ± 3.3%
Black	313	70.3% ± 8.7%	86.4% ± 5.2%	85.3% ± 7.2%	84.3% ± 6.6%	84.6% ± 6.3%	66.0% ± 9.6%	62.8% ± 9.1%	60.7% ± 9.0%
Asian	204	82.1% ± 7.4%	90.6% ± 5.2%	93.1% ± 3.9%	88.9% ± 5.9%	85.6% ± 5.7%	79.2% ± 7.2%	76.3% ± 7.6%	71.7% ± 8.4%
Other	110	78.5% ± 7.9%	92.5% ± 5.8%	92.9% ± 5.2%	91.5% ± 6.4%	86.2% ± 7.5%	78.4% ± 7.9%	75.8% ± 8.6%	72.2% ± 9.0%
Unknown	157	86.0% ± 5.1%	95.6% ± 4.2%	94.5% ± 4.2%	91.1% ± 4.0%	88.6% ± 5.1%	85.3% ± 5.4%	82.8% ± 5.9%	79.9% ± 6.8%

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>



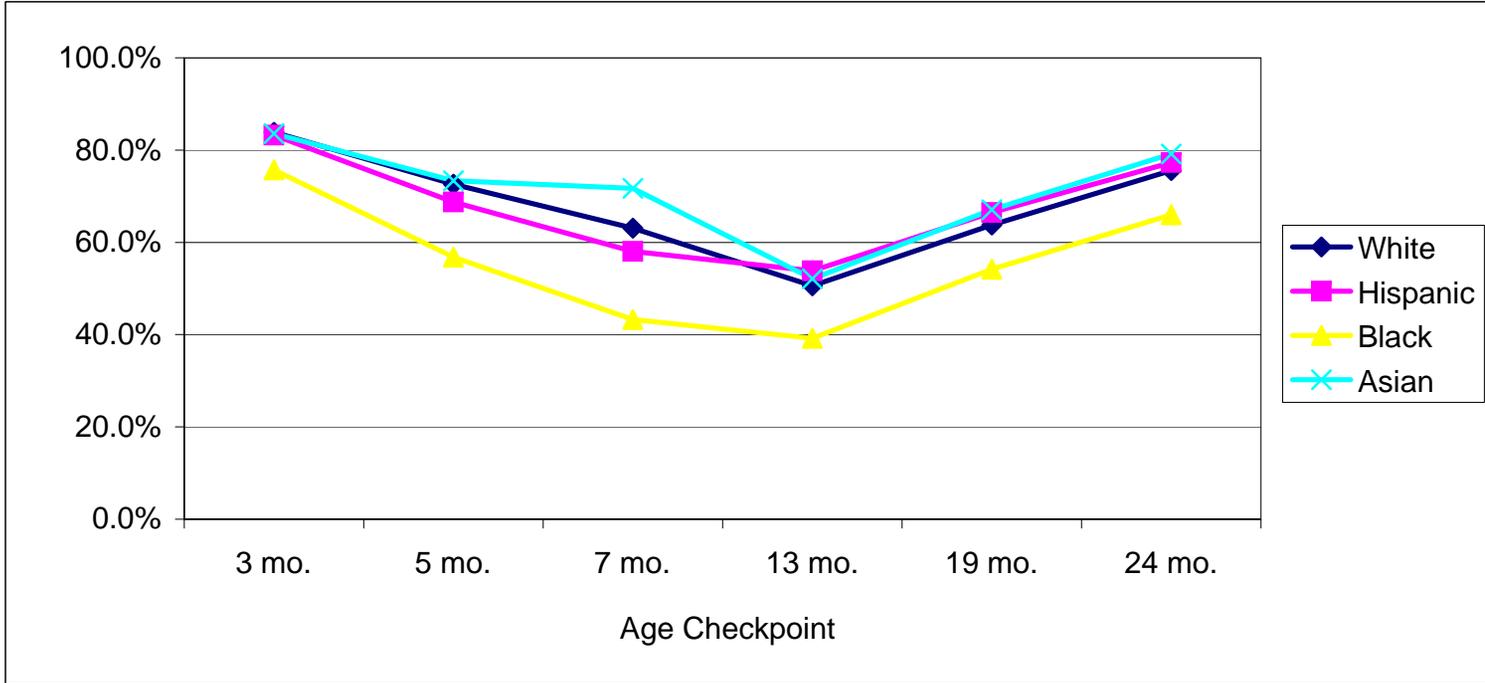
1. Four or more doses of DTaP, three or more doses of polio, and one or more doses of MMR

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: 4:3:1<sup>1</sup> 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	2,577	85.6% ± 1.6%	84.8% ± 1.6%	87.0% ± 1.5%	83.3% ± 1.7%	78.6% ± 1.9%
White	731	87.8% ± 2.4%	84.6% ± 2.9%	85.0% ± 3.1%	83.8% ± 3.0%	77.0% ± 3.5%
Hispanic	1,062	84.6% ± 2.7%	85.4% ± 2.4%	88.4% ± 2.1%	83.2% ± 2.7%	79.9% ± 2.9%
Black	313	77.3% ± 5.7%	75.9% ± 5.9%	82.3% ± 5.4%	75.7% ± 6.0%	73.5% ± 6.4%
Asian	204	85.3% ± 6.1%	86.0% ± 5.5%	86.6% ± 5.8%	83.6% ± 5.9%	77.3% ± 6.4%
Other	110	88.1% ± 6.5%	85.9% ± 6.8%	90.1% ± 7.0%	84.8% ± 7.0%	81.7% ± 8.2%
Unknown	157	89.3% ± 6.5%	89.1% ± 6.3%	89.7% ± 5.6%	86.9% ± 6.3%	82.3% ± 6.8%

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	2,577	73.3% ± 2.3%	72.3% ± 2.1%	74.7% ± 2.1%	70.2% ± 2.2%	62.5% ± 2.3%
White	731	76.9% ± 3.6%	74.7% ± 3.6%	73.2% ± 3.7%	72.6% ± 3.8%	61.6% ± 4.1%
Hispanic	1,062	70.7% ± 2.9%	71.2% ± 2.7%	76.5% ± 2.7%	68.8% ± 2.8%	63.6% ± 3.1%
Black	313	58.4% ± 6.6%	57.0% ± 6.7%	67.7% ± 7.3%	56.8% ± 6.7%	51.3% ± 7.2%
Asian	204	76.0% ± 6.8%	75.6% ± 7.3%	76.5% ± 7.8%	73.3% ± 7.1%	66.3% ± 7.6%
Other	110	80.1% ± 8.5%	76.0% ± 9.0%	75.4% ± 9.9%	74.6% ± 9.3%	68.2% ± 10.9%
Unknown	157	81.9% ± 10.4%	77.4% ± 8.4%	72.1% ± 8.5%	75.6% ± 9.2%	60.7% ± 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. 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	2,577	62.4% ± 2.7%	89.6% ± 1.4%	87.6% ± 1.6%	61.3% ± 2.7%	58.4% ± 2.6%
White	731	65.5% ± 4.4%	88.2% ± 2.8%	84.9% ± 3.3%	63.1% ± 4.4%	58.4% ± 4.1%
Hispanic	1,062	58.4% ± 3.2%	91.5% ± 2.0%	90.1% ± 1.9%	58.1% ± 3.2%	56.8% ± 3.2%
Black	313	44.0% ± 7.1%	81.2% ± 6.2%	83.5% ± 6.8%	43.2% ± 7.3%	41.4% ± 7.9%
Asian	204	71.8% ± 7.5%	91.1% ± 5.6%	86.1% ± 6.0%	71.7% ± 7.5%	67.7% ± 7.8%
Other	110	72.6% ± 11.0%	87.2% ± 7.0%	88.9% ± 7.4%	69.3% ± 11.5%	66.6% ± 12.5%
Unknown	157	75.9% ± 11.7%	91.5% ± 4.0%	88.6% ± 4.9%	74.8% ± 11.0%	69.6% ± 9.6%

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	2,577	89.7% ± 1.4%	96.2% ± 0.8%	53.8% ± 2.5%	94.4% ± 1.1%	51.8% ± 2.5%	51.9% ± 2.5%	51.2% ± 2.5%	43.0% ± 2.6%
White	731	90.6% ± 2.3%	96.0% ± 1.5%	52.4% ± 4.4%	93.5% ± 2.2%	52.4% ± 4.1%	50.6% ± 4.3%	49.5% ± 4.2%	40.5% ± 4.0%
Hispanic	1,062	89.6% ± 2.0%	97.0% ± 1.0%	55.3% ± 3.3%	95.8% ± 1.3%	52.4% ± 3.7%	53.8% ± 3.4%	53.4% ± 3.5%	46.9% ± 3.8%
Black	313	82.9% ± 5.3%	92.9% ± 3.6%	41.2% ± 7.8%	92.0% ± 4.0%	45.5% ± 7.8%	39.2% ± 7.0%	39.1% ± 7.0%	35.3% ± 6.3%
Asian	204	89.6% ± 5.7%	96.4% ± 3.5%	56.4% ± 8.9%	92.4% ± 4.8%	51.9% ± 9.8%	52.1% ± 9.2%	50.4% ± 9.1%	38.7% ± 9.7%
Other	110	91.5% ± 5.7%	92.2% ± 5.7%	48.3% ± 10.3%	93.2% ± 5.3%	46.2% ± 11.1%	46.1% ± 10.0%	46.1% ± 10.0%	36.5% ± 10.4%
Unknown	157	92.1% ± 5.6%	96.9% ± 3.7%	63.9% ± 12.1%	94.1% ± 3.8%	54.4% ± 9.3%	61.6% ± 12.1%	61.5% ± 12.1%	46.4% ± 10.3%

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. 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, 2008

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	2,577	68.0% ± 2.2%	86.9% ± 1.6%	88.4% ± 1.4%	87.6% ± 1.5%	83.2% ± 1.7%	65.0% ± 2.2%	62.6% ± 2.2%	59.2% ± 2.2%
White	731	66.2% ± 3.8%	85.7% ± 2.7%	87.8% ± 2.4%	86.8% ± 2.5%	82.7% ± 2.9%	63.8% ± 3.7%	61.0% ± 3.7%	56.5% ± 3.9%
Hispanic	1,062	69.4% ± 3.3%	88.7% ± 2.3%	89.2% ± 2.1%	88.8% ± 2.1%	84.3% ± 2.4%	66.4% ± 3.4%	64.3% ± 3.4%	62.0% ± 3.5%
Black	313	57.8% ± 8.4%	79.4% ± 6.6%	80.5% ± 7.4%	81.5% ± 7.4%	80.3% ± 7.4%	54.2% ± 8.7%	51.7% ± 8.7%	48.9% ± 8.4%
Asian	204	71.1% ± 7.1%	87.2% ± 5.3%	90.4% ± 4.7%	88.2% ± 6.0%	82.2% ± 6.2%	67.1% ± 7.0%	64.8% ± 7.1%	60.1% ± 7.7%
Other	110	71.3% ± 9.5%	88.9% ± 6.6%	86.7% ± 7.4%	86.9% ± 7.1%	77.6% ± 8.9%	70.0% ± 9.4%	66.3% ± 9.5%	61.3% ± 10.2%
Unknown	157	70.5% ± 8.7%	86.4% ± 8.2%	92.7% ± 5.1%	88.3% ± 5.0%	85.1% ± 5.3%	65.6% ± 9.2%	63.2% ± 8.9%	60.8% ± 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