

Childhood Immunization Coverage for Washington State 2003-2005



**A Report of the National Immunization
Survey and Other Data Sources**



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for
Washington State

2003 – 2005

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and Other Data Sources

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CHILD Profile

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Background

Since April 1994, the CDC (Centers for Disease Control and Prevention) has been conducting a National Immunization Survey (NIS) to estimate immunization coverage rates for children 19-35 months of age. This survey is administered in all 50 states and 28 urban areas in the United States and is conducted by random digit dialed telephone methodology. Vaccine information given by parents is verified by the providers identified by the parents.

While demographic, child, parent and provider characteristics are included as variables in the dataset, no geographic identifiers are available other than state and Immunization Action Plan (IAP) areas (King County). No other county or other small area information is available.

In order to identify segments of the child population in Washington State at increased risk for underimmunization ('pockets-of-need'), the Department of Health's Immunization Program and Maternal and Child Health Assessment Section, in 2004, conducted an analysis of the NIS public-use dataset using calendar years 1995-2002. This analysis focused on eight variables (child's race/ethnicity, age and firstborn status, maternal age, education and marital status, poverty status of the family, and number of immunization providers identified for the child). We also conducted trend analyses of coverage rates for individual antigens and two vaccination series. This is a follow-up report presenting the findings from analyses of the NIS 2003-2005 calendar year data. The results of these analyses comprise the main section of this report.

There is also a section which includes a nine year comparison of school entry and 6th grade coverage rates from school status reports submitted annually by all schools in the state.

We hope in the future to add chapters on findings from analyses of vaccine distribution and administration data, overall results of AFIX (Assessment, Feedback, Incentive and eXchange) assessments conducted in provider offices as well as immunization coverage information from the major health plans in Washington.

In 2006, we have arranged with CDC for an NIS oversample of eastern Washington rural counties (not including Spokane). The plan is to implement a rotating oversample of counties with western Washington rural counties planned for 2007 and the remaining counties planned for 2008. These regions will be oversampled on a rotating basis until the CHILD Profile registry is sufficiently complete to support population-based coverage estimates.

In addition, CDC has begun to analyze NIS data from two years for 205 counties nationwide. For 2003-2004, six Washington counties are included in the initial analysis. The findings should be available soon. The long-range plan is to update these analyses every two years.

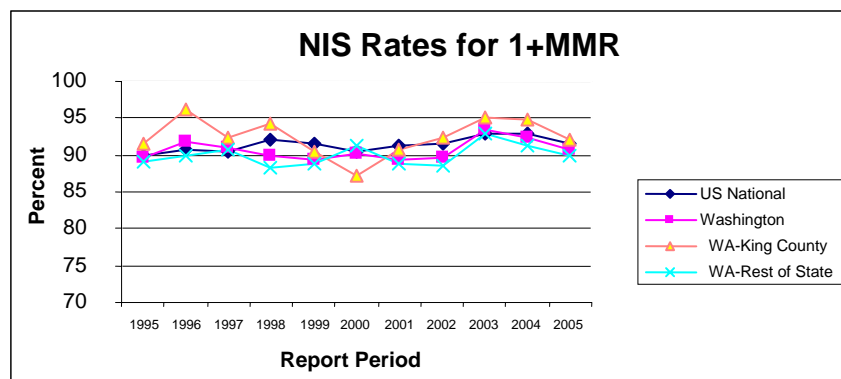
1+ MMR Vaccination

Table 1a				
Characteristics of 19-35 month old children with 1+ MMR vaccinations Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 1+ MMR (n=1420)	1+ MMR (%=92.1)	95% CI** (90.2-93.7)
Child's Race/Ethnicity				
White, non-Hispanic	988	918	92.0	(89.6-93.9)
Black, non-Hispanic	41	35	88.1	(71.9-95.6)
Hispanic	271	257	92.1	(86.4-95.6)
Other	225	210	93.2	(87.8-96.3)
Child's Age				
19-23 months	441	406	91.7	(87.9-94.3)
24-29 months	556	516	91.6	(87.9-94.3)
30-35 months	528	498	93.0	(89.6-95.4)
Maternal Age				
≤19 years	15	13	92.6	(69.5-98.6)
20-29 years	527	488	91.9	(88.6-94.3)
30+ years	983	919	92.3	(89.8-94.3)
Maternal Education				
<12 years	155	141	89.3	(82.1-93.9)
12 years	317	295	92.6	(88.6-95.3)
>12 years	287	271	93.3	(88.9-96.0)
college graduate	766	713	92.2	(89.3-94.3)
Mother's Marital Status				
married	1231	1160	93.1	(91.0-94.8)
widowed/divorced/ separated/deceased	87	70	76.2	(63.5-85.6)
never married	207	190	94.2	(89.8-96.8)
Poverty Status				
at/above poverty	1200	1123	92.7	(90.5-94.4)
below poverty	222	203	90.4	(84.8-94.1)
unknown	103	94	91.5	(82.8-96.0)
Firstborn Status of Child				
Yes	629	592	94.8	(92.4-96.5)
No	896	828	90.3	(87.4-92.6)
Number of Providers				
Missing	7	0	0	--
1	1207	1126	92.0	(89.7-93.8)
2	275	275	93.9	(89.2-96.6)
3+	36	33	97.0	(90.7-99.1)

* National Immunization Survey

** 95 percent Confidence Interval

Table 1b	NIS Rates for 1+ MMR Vaccinations							
	US National		Washington		WA-King County		WA-Rest of State	
1995	89.8	+/-0.9	89.7	+/-3.7	91.6	+/-3.9	89.0	+/-4.9
1996	90.6	+/-0.7	91.7	+/-3.4	96.1	+/-2.3	90.0	+/-4.6
1997	90.4	+/-0.7	91.1	+/-2.7	92.3	+/-3.4	90.7	+/-3.5
1998	92.0	+/-0.6	90.0	+/-3.1	94.4	+/-3.2	88.4	+/-4.1
1999	91.5	+/-0.6	89.3	+/-2.8	90.5	+/-3.7	88.8	+/-3.6
2000	90.5	+/-0.6	90.2	+/-2.6	87.3	+/-4.2	91.4	+/-3.2
2001	91.4	+/-0.6	89.3	+/-3.2	90.7	+/-3.8	88.8	+/-4.3
2002	91.6	+/-0.7	89.6	+/-3.1	92.4	+/-3.3	88.5	+/-4.1
2003	93.0	+/-0.6	93.5	+/-2.8	95.0	+/-2.8	92.9	+/-3.7
2004	93.0	+/-0.6	92.3	+/-2.8	94.8	+/-3.0	91.4	+/-3.7
2005	91.5	+/-0.7	90.6	+/-3.5	92.1	+/-5.3	89.9	+/-4.5



Summary:

- Washington children whose mothers were married or who had never married were more likely to have received 1+ MMR vaccination than children whose mothers were widowed, divorced, separated or deceased.
- Washington State children who were firstborn were almost twice as likely to have received 1+ MMR than children who were born later.
- Washington State children 19-35 months of age who had received at least one MMR vaccination did not differ significantly by their race/ethnicity, or age or by the age or educational level of their mothers, poverty status or number of providers identified.
- When multivariate analysis of the eight selected variables was conducted, there were no changes from the findings of the above bivariate analyses.
- Washington's coverage rates for 1+ MMR vaccination did not change significantly from 1995 to 2005.
- Washington's rates for MMR vaccination coverage are similar to the national rates.

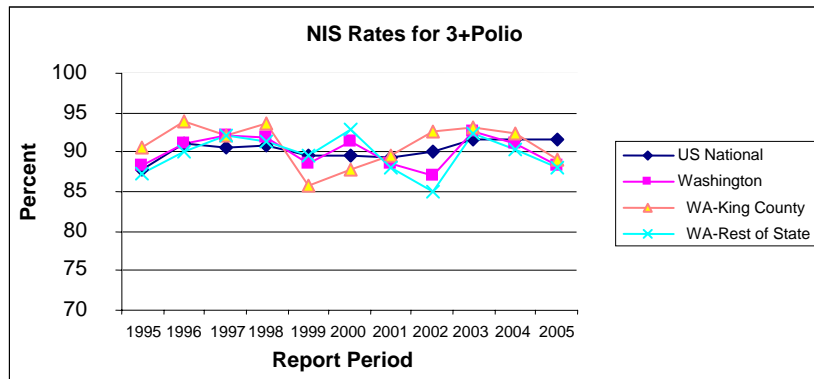
3+ Polio Vaccinations

Table 2a				
Characteristics of 19-35 month old children with 3+ polio vaccinations Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 3+ polio (n=1401)	3+ polio (%=90.7)	95% CI** (88.6-92.4)
Child's Race/Ethnicity				
White, non-Hispanic	988	900	89.7	(87.0-91.9)
Black, non-Hispanic	41	37	92.6	(80.0-97.5)
Hispanic	271	257	92.6	(86.9-95.9)
Other	225	207	91.2	(85.5-94.8)
Child's Age				
19-23 months	441	398	89.0	(84.6-92.2)
24-29 months	556	507	89.1	(84.9-92.2)
30-35 months	528	496	93.7	(90.8-95.7)
Maternal Age				
≤19 years	15	13	86.0	(57.2-96.6)
20-29 years	527	483	90.2	(86.7-92.9)
30+ years	983	905	91.2	(88.5-93.2)
Maternal Education				
<12 years	155	141	90.0	(82.9-94.4)
12 years	317	287	89.6	(85.0-92.9)
>12 years	287	266	91.9	(87.5-94.9)
college graduate	766	707	91.2	(88.3-93.5)
Mother's Marital Status				
married	1231	1138	91.1	(88.8-93.0)
widowed/divorced/ separated/deceased	87	70	77.5	(65.0-86.5)
never married	207	193	93.9	(89.0-96.7)
Poverty Status				
at/above poverty	1200	1104	90.9	(88.6-92.8)
below poverty	222	205	90.5	(84.5-94.3)
unknown	103	92	88.9	(79.3-94.3)
Firstborn Status of Child				
yes	629	593	93.8	(91.1-95.8)
no	896	808	88.5	(85.5-91.0)
Number of Providers				
missing	7	0	0	--
1	1207	1106	90.2	(87.8-92.2)
2	275	262	93.6	(88.1-96.7)
3+	36	33	96.5	(89.0-98.9)

* National Immunization Survey

** 95 percent Confidence Interval

	NIS Rates for 3+ Polio Vaccinations							
	US		Washington		WA-King County		WA-Rest of State	
1995	87.8	+/-0.9	88.3	+/-3.8	90.5	+/-4.0	87.4	+/-5.1
1996	91.0	+/-0.6	91.2	+/-3.0	94.0	+/-3.0	90.1	+/-4.0
1997	90.7	+/-0.6	92.2	+/-2.7	92.2	+/-3.5	92.2	+/-3.5
1998	90.8	+/-0.7	91.9	+/-2.7	93.6	+/-3.1	91.3	+/-3.5
1999	89.6	+/-0.6	88.6	+/-2.9	85.8	+/-4.7	89.6	+/-3.6
2000	89.5	+/-0.6	91.4	+/-2.5	87.8	+/-4.1	92.8	+/-3.1
2001	89.4	+/-0.7	88.5	+/-3.3	89.7	+/-4.2	88.0	+/-4.3
2002	90.2	+/-0.7	87.1	+/-3.5	92.6	+/-3.3	84.9	+/-4.7
2003	91.6	+/-0.7	92.6	+/-2.9	93.1	+/-3.8	92.4	+/-3.7
2004	91.6	+/-0.7	91.0	+/-3.0	92.4	+/-3.7	90.4	+/-3.9
2005	91.7	+/-0.7	88.4	+/-4.0	89.1	+/-6.0	88.1	+/-5.0



Summary:

- Washington State children 19-35 months of age who were firstborn or 30-35 months were more likely to have received three or more polio vaccinations than children who were born later or were younger than 30 months.
- Washington children whose mothers were married or who had never married were more likely to have received 3+ polio vaccinations than children whose mothers were widowed, divorced, separated or deceased.
- Children 19-35 months of age who had received three or more polio vaccinations did not differ significantly by their race/ethnicity or by the age or educational level of their mother, poverty status or number of providers.
- When multivariate analysis of the eight selected variables was conducted, there were no changes from the findings of the above bivariate analyses.
- Washington's coverage rates for 3+ polio vaccinations did not change significantly from 1995 to 2005.
- Washington's rates for polio vaccination coverage are similar to the national rates.

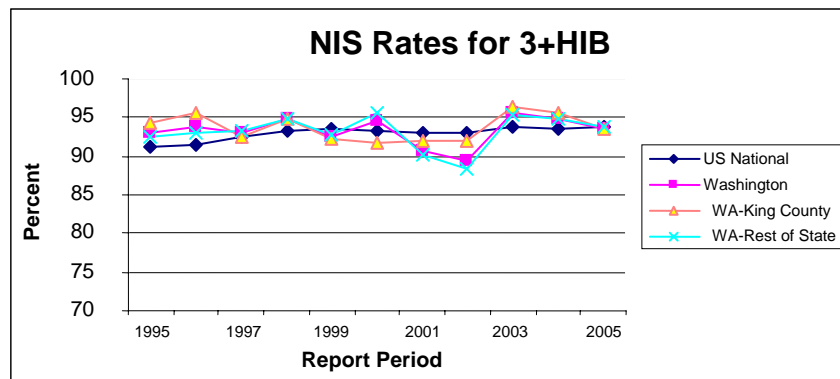
3+ Hib Vaccinations

Table 3a				
Characteristics of 19-35 month old children with 3+ Hib vaccinations Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 3+ hib (n=1450)	3+ hib (%=94.7)	95% CI** (93.1-96.0)
Child's Race/Ethnicity				
White, non-Hispanic	988	945	94.7	(92.5-96.2)
Black, non-Hispanic	41	39	97.1	(88.6-99.3)
Hispanic	271	258	95.4	(90.6-97.8)
Other	225	208	93.4	(88.7-96.2)
Child's Age				
19-23 months	441	420	95.8	(93.1-97.5)
24-29 months	556	521	92.7	(89.2-95.2)
30-35 months	528	509	95.8	(93.1-97.4)
Maternal Age				
≤19 years	15	14	94.2	(67.7-99.2)
20-29 years	527	500	94.7	(91.9-96.5)
30+ years	983	936	94.7	(92.6-96.3)
Maternal Education				
<12 years	155	143	92.3	(85.8-96.0)
12 years	317	296	93.8	(90.2-96.2)
>12 years	287	282	97.8	(94.7-99.1)
college graduate	766	729	94.7	(92.3-96.3)
Mother's Marital Status				
married	1231	1180	95.4	(93.6-96.7)
widowed/divorced/ separated/deceased	87	77	85.7	(73.3-92.9)
never married	207	193	95.4	(91.5-97.6)
Poverty Status				
at/above poverty	1200	1144	94.9	(93.1- 96.3)
below poverty	222	208	92.7	(87.3-95.9)
unknown	103	98	97.3	(93.2-99.0)
Firstborn Status of Child				
yes	629	605	96.5	(94.4-97.8)
no	896	845	93.5	(91.0-95.3)
Number of Providers				
missing	7	0	0	--
1	1207	1145	94.5	(92.6-95.9)
2	275	269	96.8	(92.4-98.7)
3+	36	36	100.0	--

* National Immunization Survey

** 95 percent Confidence Interval

Table 3b		NIS Rates for 3+ Hib Vaccinations						
	US National		Washington		WA-King County		WA-Rest of State	
1995	91.2	+/-0.8	93.1	+/-3.1	94.2	+/-3.3	92.6	+/-4.2
1996	91.4	+/-0.7	93.7	+/-2.6	95.5	+/-2.6	93.0	+/-3.5
1997	92.5	+/-0.6	93.1	+/-2.6	92.5	+/-3.6	93.3	+/-3.4
1998	93.4	+/-0.6	94.8	+/-2.2	94.7	+/-2.9	94.9	+/-2.8
1999	93.5	+/-0.5	92.6	+/-2.7	92.3	+/-3.9	92.7	+/-3.5
2000	93.4	+/-0.5	94.5	+/-2.2	91.8	+/-3.5	95.6	+/-2.7
2001	93.0	+/-0.6	90.6	+/-3.1	91.9	+/-4.0	90.1	+/-4.1
2002	93.1	+/-0.6	89.4	+/-3.6	92.0	+/-3.9	88.4	+/-4.7
2003	93.9	+/-0.6	95.6	+/-2.1	96.3	+/-2.3	95.3	+/-2.8
2004	93.5	+/-0.6	94.9	+/-2.2	95.5	+/-2.9	94.7	+/-2.9
2005	93.9	+/-0.6	93.6	+/-3.0	93.5	+/-5.2	93.7	+/-3.6



Summary:

- Washington children whose mothers were married or who had never married were more likely to have received 3+ Hib vaccinations than children whose mothers were widowed, divorced, separated or deceased.
- Washington State children who were firstborn were almost twice as likely to have received 3+ Hib vaccinations as children who were born later.
- Washington State children 19-35 months of age who had received 3+ Hib vaccinations did not differ significantly by their race/ethnicity, or age or by the age or educational level of their mothers, poverty status or number of providers identified.
- When multivariate analysis of the eight selected variables was conducted, the mother's having had more than 12 years of education was also associated with an increased likelihood of children receiving 3+ Hib vaccinations. However, this was not the case for children whose mothers had graduated from college.
- Washington's coverage rates for 3+ Hib vaccinations did not change significantly from 1995 to 2005.
- Washington's coverage rates for 3+ Hib vaccinations for 19-35 month old children are similar to the national rates.

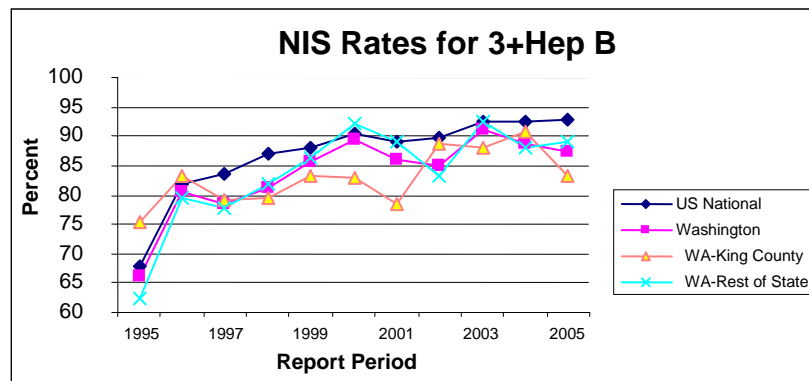
3+ HepB Vaccinations

Table 4a				
Characteristics of 19-35 month old children with 3+ HepB vaccinations Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 3+HepB (n=1349)	3+ HepB (%=89.1)	95% CI** (87.1-90.9)
Child's Race/Ethnicity				
White, non-Hispanic	988	874	88.5	(85.8-90.7)
Black, non-Hispanic	41	36	87.8	(71.2-95.5)
Hispanic	271	246	91.5	(86.4-94.8)
Other	225	193	88.6	(82.7-92.7)
Child's Age				
19-23 months	441	391	91.0	(87.6-93.5)
24-29 months	556	479	86.3	(82.2-89.6)
30-35 months	528	479	90.4	(86.9-93.0)
Maternal Age				
≤19 years	15	10	71.5	(44.5-88.7)
20-29 years	527	461	88.1	(84.6-90.9)
30+ years	983	878	90.5	(88.1-92.5)
Maternal Education				
<12 years	155	137	89.3	(82.5-93.7)
12 years	317	277	88.1	(83.5-91.5)
>12 years	287	266	93.7	(90.1-96.0)
college graduate	766	669	86.9	(83.6-89.5)
Mother's Marital Status				
married	1231	1101	90.2	(88.1-92.1)
widowed/divorced/ separated/deceased	87	69	74.2	(61.2-84.0)
never married	207	179	90.4	(85.5-93.8)
Poverty Status				
at/above poverty	1200	1063	89.5	(87.2-91.4)
below poverty	222	197	88.0	(81.9-92.3)
unknown	103	89	88.8	(80.5-93.8)
Firstborn Status of Child				
yes	629	555	89.5	(86.3-92.0)
no	896	794	88.9	(86.1-91.1)
Number of Providers				
missing	7	0	0	--
1	1207	1054	88.0	(85.6-90.1)
2	275	261	94.7	(90.3-97.2)
3+	36	34	97.6	(90.5-99.4)

* National Immunization Survey

** 95 percent Confidence Interval

	NIS Rates for 3+ HepB Vaccinations							
	US National		Washington		WA-King County		WA-Rest of State	
1995	67.9	+/-1.3	66.1	+/-5.4	75.5	+/-5.7	62.3	+/-7.1
1996	81.8	+/-0.9	80.6	+/-4.1	83.2	+/-4.8	79.6	+/-5.3
1997	83.6	+/-0.8	78.3	+/-3.9	79.3	+/-5.0	77.9	+/-5.1
1998	87.0	+/-0.7	81.3	+/-3.7	79.6	+/-5.3	81.9	+/-4.6
1999	88.1	+/-0.7	85.5	+/-3.4	83.3	+/-4.8	86.4	+/-4.3
2000	90.3	+/-0.6	89.5	+/-2.8	82.9	+/-5.1	92.1	+/-3.3
2001	88.9	+/-0.7	86.0	+/-3.4	78.5	+/-5.5	88.9	+/-4.2
2002	89.9	+/-0.7	84.9	+/-4.0	88.8	+/-4.3	83.4	+/-5.2
2003	92.4	+/-0.6	91.2	+/-2.8	88.0	+/-4.6	92.4	+/-3.5
2004	92.4	+/-0.6	88.7	+/-3.3	90.8	+/-3.8	88.0	+/-4.3
2005	92.9	+/-0.6	87.4	+/-3.7	83.2	+/-6.9	89.1	+/-4.4



Summary:

- Washington children whose mothers were married or who had never married or were 30+ years of age were more likely to have received three or more hepatitis B vaccinations than children whose mothers were widowed, divorced, separated or deceased or who were younger than 30 years.
- Washington State children who had more than one provider were more likely to have received 3 or more hepatitis B vaccinations than children who had one provider identified.
- Washington State children 19-35 months of age who had received at least 3+ hepatitis B vaccinations did not differ significantly by their race/ethnicity, age or firstborn status, or by the educational level of their mothers, or poverty status.
- When multivariate analysis of the eight selected variables was conducted, children 24-29 months of age were also less likely to have received 3+ hepatitis B vaccinations than children who were less than 24 months.
- Washington's coverage rates for 3+ hepatitis B vaccinations for 19-35 month old children have shown an increasing trend and were significantly higher in 1996-2005 than in 1995.
- In 2005, Washington's coverage rates for 3+ hepatitis B vaccinations for 19-35 month old children were lower than the national rates.

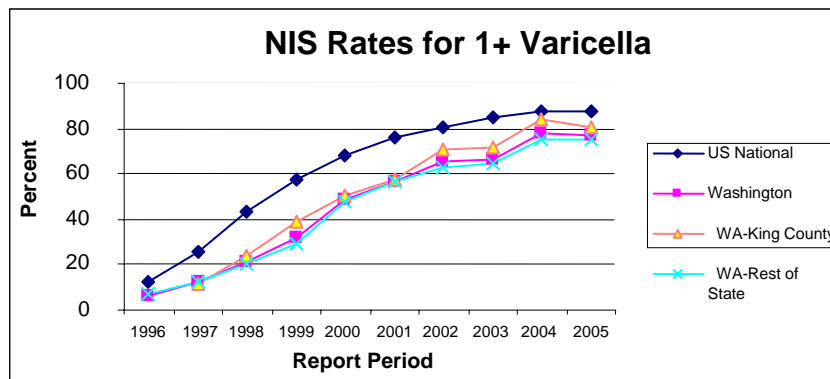
1+ Varicella Vaccinations

Table 5a				
Characteristics of 19-35 month old children with 1+ varicella vaccinations Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 1+ varicella (n=1148)	1+ varicella (%=73.6)	95% CI** (70.7-76.3)
Child's Race/Ethnicity				
White, non-Hispanic	988	732	71.8	(68.1-75.3)
Black, non-Hispanic	41	31	79.1	(62.0-89.7)
Hispanic	271	212	75.7	(68.9-81.5)
Other	225	173	76.2	(68.5-82.6)
Child's Age				
19-23 months	441	331	73.5	(67.9-78.4)
24-29 months	556	411	71.1	(66.0-75.7)
30-35 months	528	406	76.2	(71.4-80.4)
Maternal Age				
≤19 years	15	12	79.3	(51.2-93.3)
20-29 years	527	384	72.6	(67.9-76.9)
30+ years	983	752	74.3	(70.6-77.7)
Maternal Education				
<12 years	155	116	70.8	(61.7-78.6)
12 years	317	235	74.2	(68.3-79.4)
>12 years	287	206	71.0	(64.9-76.4)
college graduate	766	591	76.2	(72.3-79.7)
Mother's Marital Status				
married	1231	943	74.3	(71.0-77.3)
widowed/divorced/ separated/deceased	87	52	58.2	(45.4-70.0)
never married	207	153	76.8	(69.3-82.9)
Poverty Status				
at/above poverty	1200	912	74.2	(70.9-77.3)
below poverty	222	164	72.7	(65.1-79.2)
unknown	103	72	70.6	(59.2-79.9)
Firstborn Status of Child				
yes	629	477	75.6	(71.1-79.6)
no	896	671	72.2	(68.4-75.8)
Number of Providers				
missing	7	0	0	--
1	1207	918	73.9	(70.7-77.0)
2	275	201	72.1	(64.7-78.4)
3+	36	29	83.8	(66.5-93.1)

* National Immunization Survey

** 95 percent Confidence Interval

Table 5b		NIS Rates for 1+ Varicella Vaccinations						
	US National		Washington		WA-King County		WA-Rest of State	
1995								
1996	12.2	+/-0.7	6.4	+/-2.2			7.0	+/-2.9
1997	25.8	+/-0.9	12.2	+/-3.0	11.7	+/-3.8	12.4	+/-3.8
1998	43.2	+/-1.0	21.2	+/-3.7	24.1	+/-5.5	20.0	+/-4.6
1999	57.5	+/-1.0	32.1	+/-4.3	38.5	+/-5.8	29.6	+/-5.6
2000	67.8	+/-0.9	48.7	+/-4.7	50.2	+/-6.4	48.1	+/-6.0
2001	76.3	+/-0.8	57.0	+/-4.8	57.9	+/-6.3	56.7	+/-6.2
2002	80.6	+/-0.9	65.1	+/-5.1	71.2	+/-5.8	62.8	+/-6.7
2003	84.8	+/-0.8	66.6	+/-4.9	71.9	+/-6.6	64.6	+/-6.3
2004	87.5	+/-0.7	77.6	+/-4.4	84.5	+/-4.8	75.0	+/-5.8
2005	87.9	+/-0.8	76.6	+/-5.1	80.5	+/-6.7	75.0	+/-6.7



Summary:

- Washington children whose mothers were married or who had never married were more likely to have received 1+ varicella vaccinations than children whose mothers were widowed, divorced, separated or deceased.
- Washington's children 19-35 months of age who had received 1+ varicella vaccinations did not differ significantly by race/ethnicity, age or firstborn status, or by their mothers' age or educational level, poverty status or number of providers identified.
- When multivariate analysis of the eight selected variables was conducted, there were no changes from the findings of the above bivariate analyses.
- Washington's coverage rate for varicella vaccination has increased significantly from 1996 to 2005. However, as the coverage rose to above 50 percent, the rate of increase slowed.
- Since 1996, Washington's coverage rate for 1+ varicella vaccinations has been below the national rate.

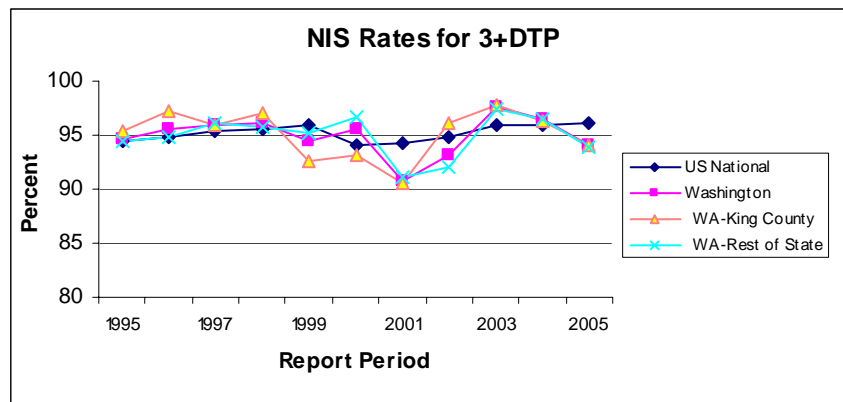
3+ DTP Vaccinations

Table 6a				
Characteristics of 19-35 month old children with 3+ DTP vaccinations, Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 3+ DTP (n=1473)	3+ DTP (%=96.0)	95% CI** (94.4-97.1)
Child's Race/Ethnicity				
White, non-Hispanic	988	956	95.9	(93.9-97.3)
Black, non-Hispanic	41	39	97.1	(88.6-99.3)
Hispanic	271	263	96.1	(91.1-98.3)
Other	225	215	95.8	(91.4-98.0)
Child's Age				
19-23 months	441	427	97.3	(95.1-98.6)
24-29 months	556	531	94.1	(90.5-96.3)
30-35 months	528	515	96.7	(94.2-98.2)
Maternal Age				
≤19 years	15	14	94.2	(67.7-99.2)
20-29 years	527	508	95.9	(93.2-97.5)
30+ years	983	951	96.1	(94.0-97.5)
Maternal Education				
<12 years	155	145	93.1	(86.7-96.6)
12 years	317	301	95.0	(91.5-97.1)
>12 years	287	283	98.1	(94.9-99.3)
college graduate	766	744	97.0	(95.1-98.2)
Mother's Marital Status				
married	1231	1195	96.7	(95.1-97.8)
widowed/divorced/ separated/deceased	87	77	84.8	(72.4-92.2)
never married	207	201	97.5	(93.6-99.0)
Poverty Status				
at/above poverty	1200	1160	96.1	(94.4-97.4)
below poverty	222	212	94.1	(88.8-97.0)
unknown	103	101	98.8	(94.6-99.8)
Firstborn Status of Child				
yes	629	616	98.0	(96.2-99.0)
no	896	857	94.6	(92.2-96.3)
Number of Providers				
missing	7	0	0	--
1	1207	1167	96.0	(94.2-97.2)
2	275	270	97.2	(92.9-99.0)
3+	36	36	100.0	--

* National Immunization Survey

** 95 percent Confidence Interval

Table 6b		NIS Rates for 3+ DTP Vaccinations						
	US National		Washington		WA-King County		WA-Rest of State	
1995	94.5	+/-0.7	94.7	+/-2.9	95.3	+/-3.1	94.5	+/-3.8
1996	94.9	+/-0.5	95.5	+/-2.3	97.2	+/-2.0	94.9	+/-3.1
1997	95.4	+/-0.5	96.0	+/-2.2	95.9	+/-2.6	96.1	+/-2.9
1998	95.6	+/-0.5	96.1	+/-1.9	97.1	+/-2.4	95.7	+/-2.5
1999	95.9	+/-0.4	94.4	+/-2.2	92.6	+/-3.8	95.2	+/-2.7
2000	94.1	+/-0.5	95.6	+/-1.7	93.2	+/-3.1	96.6	+/-2.0
2001	94.3	+/-0.5	90.8	+/-3.1	90.5	+/-4.1	91.1	+/-3.9
2002	94.9	+/-0.6	93.2	+/-2.6	96.1	+/-2.4	92.1	+/-3.5
2003	96.0	+/-0.5	97.6	+/-1.7	97.8	+/-1.9	97.5	+/-2.3
2004	95.9	+/-0.5	96.4	+/-1.9	96.3	+/-2.8	96.4	+/-2.4
2005	96.1	+/-0.5	94.0	+/-2.9	94.1	+/-4.9	93.9	+/-3.6



Summary:

- Washington children whose mothers were married or who had never married or had more than 12 years of education or graduated from college were more likely to have received 3+ DTP vaccinations than children whose mothers were widowed, divorced, separated or deceased or had 12 years or less of education..
- Washington State children who were firstborn were almost three times more likely to have received 3+ DTP vaccinations than children who were born later.
- Washington children 24-29 months of age were less likely to have received 3+ DTP vaccinations than children who were less than 24 months.
- Washington’s children 19-35 months of age who had received 3+ DTP vaccinations did not differ significantly by race/ethnicity, their mothers’ age or by poverty status or the number of providers identified.
- When multivariate analysis of the eight selected variables was conducted, there were no changes from the findings of the above bivariate analyses.
- Although the overall trend for 3+ DTP vaccine coverage in Washington State from 1995 through 2005 is not statistically significant, there was a decrease in coverage in 2001 possibly due to vaccine shortages. The coverage estimates have recovered from this drop and have remained above the 2001 level since 2002.
- In general, Washington’s coverage rates for 3+ DTP vaccinations are similar to the national rates.

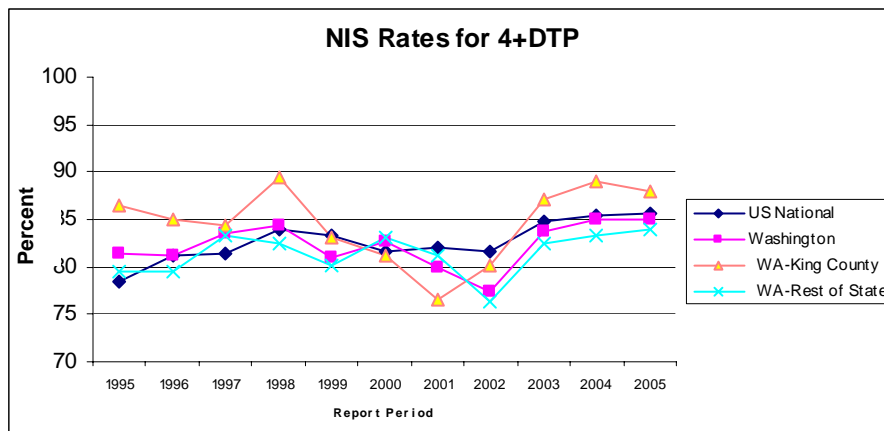
4+ DTP Vaccinations

Table 7a				
Characteristics of 19-35 month old children with 4+ DTP vaccinations Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 4+ DTP (n=1329)	4+ DTP (%=84.6)	95% CI** (82.0-86.9)
Child's Race/Ethnicity				
White, non-Hispanic	988	865	84.9	(81.7-87.6)
Black, non-Hispanic	41	32	83.2	(67.5-92.2)
Hispanic	271	241	86.9	(80.7-91.4)
Other	225	191	80.5	(72.2-86.8)
Child's Age				
19-23 months	441	366	79.6	(73.9-84.3)
24-29 months	556	485	84.1	(79.6-87.8)
30-35 months	528	478	89.3	(85.5-92.1)
Maternal Age				
≤19 years	15	11	77.4	(49.8-92.2)
20-29 years	527	452	82.8	(78.4-86.5)
30+ years	983	866	86.4	(83.4-89.0)
Maternal Education				
<12 years	155	129	81.5	(72.9-87.8)
12 years	317	270	84.1	(78.7-88.3)
>12 years	287	244	82.2	(76.4-86.8)
college graduate	766	686	88.5	(85.2-91.1)
Mother's Marital Status				
married	1231	1091	86.0	(83.2-88.4)
widowed/divorced/ separated/deceased	87	64	69.6	(56.7-80.0)
never married	207	174	84.6	(77.3-89.98)
Poverty Status				
at/above poverty	1200	1063	86.3	(83.5-88.7)
below poverty	222	182	79.6	(72.2-85.5)
unknown	103	84	82.2	(71.4-89.5)
Firstborn Status of Child				
yes	629	579	89.6	(85.6-92.5)
no	896	750	81.2	(77.7-84.4)
Number of Providers				
missing	7	0	0	--
1	1207	1051	84.5	(81.5-87.0)
2	275	246	86.2	(79.7-90.8)
3+	36	32	89.7	(70.5-96.9)

* National Immunization Survey

** 95 percent Confidence Interval

	NIS Rates for 4+ DTP Vaccinations							
	US National		Washington		WA-King County		WA-Rest of State	
1995	78.4	+/-1.2	81.5	+/-4.7	86.5	+/-4.6	79.5	+/-6.3
1996	81.1	+/-0.9	81.1	+/-4.3	85.0	+/-4.6	79.5	+/-5.6
1997	81.5	+/-0.9	83.6	+/-3.6	84.4	+/-4.8	83.3	+/-4.7
1998	83.9	+/-0.8	84.4	+/-3.5	89.4	+/-4.3	82.5	+/-4.6
1999	83.3	+/-0.8	80.9	+/-3.7	83.2	+/-4.9	80.1	+/-4.8
2000	81.7	+/-0.8	82.6	+/-3.6	81.3	+/-4.9	83.1	+/-4.6
2001	82.1	+/-0.8	79.9	+/-4.0	76.5	+/-5.8	81.3	+/-5.1
2002	81.6	+/-0.9	77.4	+/-4.6	80.1	+/-5.1	76.4	+/-6.1
2003	84.8	+/-0.8	83.7	+/-4.1	87.2	+/-4.7	82.4	+/-5.3
2004	85.5	+/-0.8	85.0	+/-4.1	89.0	+/-4.7	83.4	+/-5.3
2005	85.7	+/-0.9	85.1	+/-4.6	88.0	+/-6.5	83.9	+/-5.9



Summary:

- A higher percentage of firstborn ages 19-35 months have received four or more DTP vaccinations than children who were born later.
- Washington State children 19-35 months of age who were 30-35 months or above poverty were more likely to have received four or more DTP vaccinations than children who were younger than 30 months or below the poverty level.
- Washington children whose mothers were married or had never married were more likely to have received 4+ DTP vaccinations than children whose mothers were widowed, divorced, separated or deceased.
- Children ages 19-35 months who had received four or more DTP vaccinations did not differ significantly by race/ethnicity, by the age or educational level of their mother, or by the number of providers identified.
- When multivariate analysis of the eight selected variables was conducted, children who were both non-Hispanic and either non-Black or non-White were less likely to have received 4+ DTP vaccinations than children who were Hispanic or Black or White non-Hispanic and children below the poverty level were no longer less likely to have received 4+ DTP vaccinations.
- Although the overall trend for 4+ DTP vaccine coverage in Washington State from 1995 through 2005 is not statistically significant, there were decreases in coverage in 2001 and 2003, possibly due to vaccine shortages. The coverage estimates have recovered from this drop and have increased since 2003.
- Washington's coverage rates for 4+ DTP vaccinations are similar to the national rates.

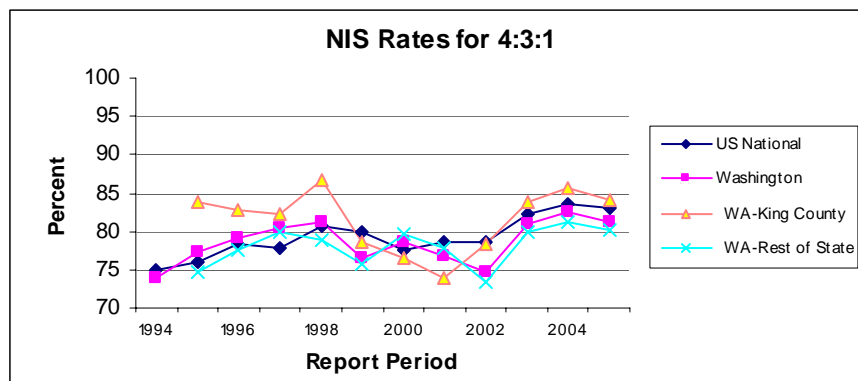
4-3-1 (4DTP, 3Polio, 1MMR) Vaccination Series

Table 8a				
Characteristics of 19-35 month old children with 4-3-1 vaccination series Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 4-3-1 vaccination series (n=1282)	4-3-1 vaccinatio n series (%=81.5)	95% CI** (78.8-84.0)
Child's Race/Ethnicity				
White, non-Hispanic	988	829	81.7	(78.3-84.7)
Black, non-Hispanic	41	30	74.9	(56.9-87.1)
Hispanic	271	238	85.4	(79.0-90.0)
Other	225	185	77.1	(68.7-83.7)
Child's Age				
19-23 months	441	350	76.5	(70.7-81.5)
24-29 months	556	469	81.1	(76.3-85.1)
30-35 months	528	463	86.1	(82.1-89.4)
Maternal Age				
≤19 years	15	11	77.4	(49.8-92.2)
20-29 years	527	434	78.8	(74.1-82.8)
30+ years	983	837	84.2	(81.0-86.9)
Maternal Education				
<12 years	155	126	79.2	(70.5-85.9)
12 years	317	261	80.3	(74.6-85.0)
>12 years	287	238	80.6	(74.7-85.3)
college graduate	766	657	84.8	(81.3-87.7)
Mother's Marital Status				
married	1231	1052	82.7	(79.7-85.4)
widowed/divorced/ separated/deceased	87	62	66.9	(53.9-77.7)
never married	207	168	82.4	(74.9-88.0)
Poverty Status				
at/above poverty	1200	1026	83.4	(80.5-86.0)
below poverty	222	178	77.3	(69.7-83.5)
unknown	103	78	76.3	(65.1-84.8)
Firstborn Status of Child				
yes	629	552	85.5	(81.4-88.9)
no	896	730	78.8	(75.1-82.1)
Number of Providers				
missing	7	0	0	--
1	1207	1015	81.5	(78.4-84.2)
2	275	236	82.2	(75.3-87.5)
3+	36	31	88.6	(70.1-96.2)

* National Immunization Survey

** 95 percent Confidence Interval

Table 8b		NIS Rates for 4-3-1 Vaccination Series							
	US National		Washington		WA-King County		WA-Rest of State		
1994	75.0	+/-1.2	74.0	+/-4.9					
1995	76.0	+/-1.2	77.4	+/-5.0	83.9	+/-5.0	74.7	+/-6.6	
1996	78.4	+/-0.9	79.1	+/-4.4	82.8	+/-4.8	77.6	+/-5.8	
1997	77.9	+/-0.9	80.5	+/-3.8	82.3	+/-5.0	79.8	+/-4.9	
1998	80.6	+/-0.9	81.1	+/-3.8	86.7	+/-4.6	79.0	+/-5.0	
1999	79.9	+/-0.8	76.5	+/-3.9	78.5	+/-5.3	75.8	+/-5.0	
2000	77.6	+/-0.9	78.7	+/-3.8	76.5	+/-5.4	79.6	+/-4.8	
2001	78.6	+/-0.9	76.7	+/-4.2	73.8	+/-5.9	77.9	+/-5.3	
2002	78.5	+/-1.0	74.7	+/-4.7	78.3	+/-5.3	73.3	+/-6.2	
2003	82.2	+/-0.9	81.0	+/-4.3	83.8	+/-5.1	80.0	+/-5.5	
2004	83.5	+/-0.9	82.4	+/-4.3	85.7	+/-5.0	81.1	+/-5.6	
2005	83.1	+/-1.0	81.2	+/-5.0	84.0	+/-7.2	80.1	+/-6.4	



Summary:

- A higher percentage of Washington State children 19-35 months of age who were firstborn or who were 30-35 months of age have received the 4-3-1 series of vaccinations than children who were born later or who were younger than 30 months.
- Washington children whose mothers were married or who had never married were more likely to have received the 4-3-1 series of vaccinations than children whose mothers were widowed, divorced, separated or deceased.
- Washington's children ages 19-35 months of age who had received the 4-3-1 vaccination series did not differ significantly by their race, or poverty status, number of providers identified or by the age or educational level of their mother.
- When multivariate analysis of the eight selected variables was conducted, children who were both non-Hispanic and of non-Black or non-White race were less likely to have received the 4-3-1 series of vaccinations than children who were Hispanic or Black or White non-Hispanic.
- Washington's coverage rates for the 4-3-1 series of vaccinations did not change significantly from 1994 to 2005.
- Washington's coverage rates for the 4-3-1 series of vaccinations for 19-35 month old children are similar to the national rates.

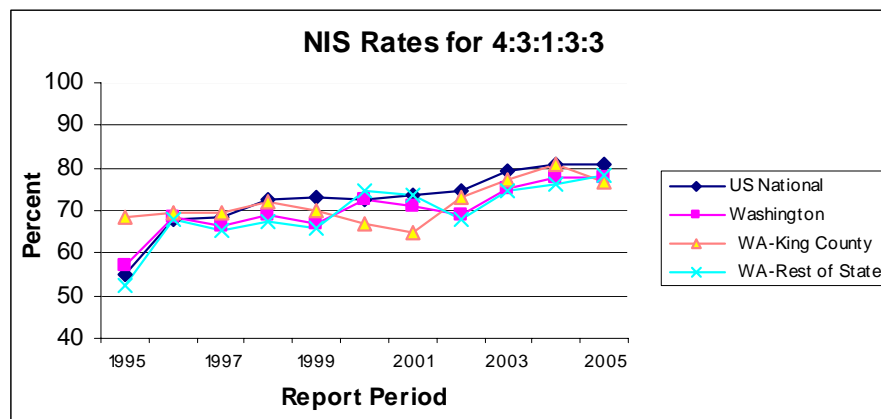
4-3-1-3-3 (4DTP, 3Polio, 1MMR, 1HepB, 1Hib) Vaccination Series

Table 9a				
Characteristics of 19-35 month old children with 4-3-1-3-3 vaccination series Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 4-3-1-3- 3 vaccination series (n=1197)	4-3-1-3-3 vaccination series (%=76.9)	95% CI** (74.1-79.5)
Child's Race/Ethnicity				
White, non-Hispanic	988	779	77.1	(73.5-80.3)
Black, non-Hispanic	41	29	73.5	(55.5-86.0)
Hispanic	271	225	82.1	(75.6-87.1)
Other	225	164	70.2	(61.7-77.4)
Child's Age				
19-23 months	441	329	73.4	(67.5-78.5)
24-29 months	556	434	76.4	(71.5-80.7)
30-35 months	528	434	80.5	(76.0-84.3)
Maternal Age				
≤19 years	15	8	62.9	(36.6-83.3)
20-29 years	527	407	74.4	(69.6-78.6)
30+ years	983	782	79.7	(76.4-82.7)
Maternal Education				
<12 years	155	119	75.9	(67.1-83.0)
12 years	317	244	75.5	(69.5-80.6)
>12 years	287	230	78.7	(72.8-83.6)
college graduate	766	604	77.8	(74.0-81.2)
Mother's Marital Status				
married	1231	983	77.9	(74.7-80.8)
widowed/divorced/ separated/deceased	87	57	61.5	(48.5-73.1)
never married	207	157	79.1	(71.6-85.0)
Poverty Status				
at/above poverty	1200	958	78.8	(75.7-81.6)
below poverty	222	167	72.8	(65.0-79.4)
unknown	103	72	71.6	(60.1-80.8)
Firstborn Status of Child				
yes	629	508	79.4	(74.9-83.2)
no	896	689	75.3	(71.5-78.7)
Number of Providers				
missing	7	0	0	--
1	1207	936	76.1	(72.9-79.1)
2	275	231	80.8	(73.8-86.2)
3+	36	30	87.3	(69.3-95.4)

* National Immunization Survey

** 95 percent Confidence Interval

Table 9b		NIS Rates for 4-3-1-3-3 Vaccination Series							
	US National		Washington		WA-King County		WA-Rest of State		
1995	55.1	+/-1.4	57.0	+/-5.5	68.4	+/-6.3	52.4	+/-7.2	
1996	67.7	+/-1.0	68.5	+/-4.8	69.7	+/-5.9	68.0	+/-6.3	
1997	68.5	+/-1.0	66.6	+/-4.4	69.7	+/-6.0	65.4	+/-5.7	
1998	72.7	+/-1.0	68.8	+/-4.4	71.9	+/-5.9	67.6	+/-5.7	
1999	73.2	+/-0.9	67.1	+/-4.4	70.1	+/-5.7	66.0	+/-5.6	
2000	72.8	+/-0.9	72.5	+/-4.2	66.9	+/-6.1	74.6	+/-5.3	
2001	73.7	+/-0.9	71.2	+/-4.4	64.7	+/-6.2	73.8	+/-5.6	
2002	74.8	+/-1.0	69.2	+/-5.0	73.1	+/-5.6	67.7	+/-6.5	
2003	79.4	+/-0.9	75.3	+/-4.6	77.1	+/-6.0	74.7	+/-5.9	
2004	80.9	+/-0.9	77.7	+/-4.6	81.0	+/-5.5	76.4	+/-5.9	
2005	80.8	+/-1.0	77.8	+/-5.2	76.8	+/-7.8	78.2	+/-6.5	



Summary:

- Washington children who were 30-35 months of age or whose mothers were married or who had never married were more likely to have received the 4-3-1-3-3 series of vaccinations than children who were younger than 24 months or whose mothers were widowed, divorced, separated or deceased.
- Washington children who were both non-Hispanic and either non-Black or non-White were less likely to have received the 4-3-1-3-3 vaccination series than children who were Hispanic.
- Washington's children 19-35 months of age who had received the 4-3-1-3-3 series of vaccinations did not differ significantly by firstborn status, by their mothers' age or educational level or by their poverty status or the number of providers identified.
- When multivariate analysis of the eight selected variables was conducted White non-Hispanic children and those of 'Other' race were less likely to have received the 4-3-1-3-3 series of vaccinations than children of Hispanic ethnicity and children whose mothers were 30+ years of age were more likely to have received the 4-3-1-3-3 vaccination series than children whose mothers were younger than 30 years..
- Washington's coverage rates for the 4-3-1-3-3 vaccination series for children 19-35 months of age have shown a statistically significant upward trend from 1995 to 2005.
- Washington's coverage rates 4-3-1-3-3 vaccination series for children 19-35 months of age are similar to the national rates.

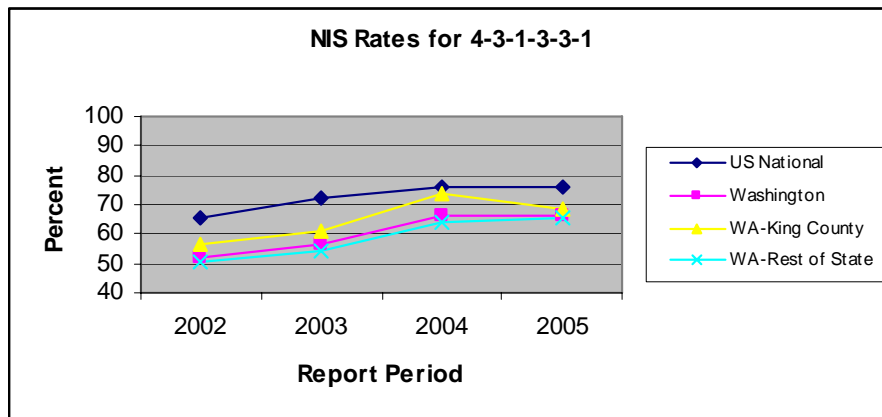
4-3-1-3-3-1 (4DTP, 3Polio, 1MMR, 1HepB, 1Hib, 1Varicella) Vaccination Series

Table 10a				
Characteristics of 19-35 month old children with 4-3-1-3-3-1 vaccination series Washington State from NIS* 2003-2005				
Characteristic	Total (N=1525)	Number 4-3-1-3-3-1 vaccination series (n=992)	4-3-1-3-3-1 vaccination series (%=63.0)	95% CI** (59.9-66.0)
Child's Race/Ethnicity				
White, non-Hispanic	988	639	61.8	(57.8-65.6)
Black, non-Hispanic	41	23	60.6	(42.4-76.3)
Hispanic	271	190	69.1	(62.0-75.3)
Other	225	140	60.0	(51.5-68.0)
Child's Age				
19-23 months	441	275	60.4	(54.3-66.2)
24-29 months	556	358	62.1	(56.8-67.1)
30-35 months	528	359	66.2	(61.0-71.0)
Maternal Age				
≤19 years	15	7	55.0	(29.5-78.1)
20-29 years	527	330	60.9	(55.8-65.7)
30+ years	983	655	65.2	(61.3-68.9)
Maternal Education				
<12 years	155	101	62.3	(53.1-70.8)
12 years	317	198	61.8	(55.4-67.8)
>12 years	287	181	61.8	(55.4-67.8)
college graduate	766	512	65.6	(61.4-69.6)
Mother's Marital Status				
married	1231	824	64.1	(60.6-67.5)
widowed/divorced/ separated/deceased	87	43	47.9	(35.6-60.5)
never married	207	125	64.5	(56.3-72.0)
Poverty Status				
at/above poverty	1200	800	64.8	(61.3-68.2)
below poverty	222	137	60.6	(52.6-68.0)
unknown	103	55	54.4	(42.5-65.7)
Firstborn Status of Child				
yes	629	412	64.4	(59.4-69.1)
no	896	571	62.1	(58.0-66.0)
Number of Providers				
missing	7	0	0	--
1	1207	787	63.1	(59.5-66.5)
2	275	180	62.7	(55.1-69.7)
3+	36	25	73.1	(54.0-86.3)

* National Immunization Survey

** 95 percent Confidence Interval

	NIS Rates for 4-3-1-3-3-1 Vaccination Series							
	US National		Washington		WA-King County		WA-Rest of State	
2002	65.5	+/-1.1	51.9	+/-5.1	56.3	+/-6.3	50.2	+/-6.6
2003	72.5	+/-1.0	56.2	+/-5.1	61.2	+/-7.0	54.4	+/-6.5
2004	76.0	+/-1.0	66.5	+/-5.0	73.7	+/-6.1	63.7	+/-6.5
2005	76.1	+/-1.1	66.3	+/-5.9	68.7	+/-6.3	65.4	+/-7.5



Summary:

- Washington children whose mothers were married or who had never married were more likely to have received the 4-3-1-3-3-1 series of vaccinations than children whose mothers were widowed, divorced, separated or deceased.
- Washington's children 19-35 months of age who had received the 4-3-1-3-3-1 series of vaccinations did not differ significantly by race/ethnicity, age or firstborn status, by their mothers' age or educational level or by their poverty status or the number of providers identified.
- When multivariate analysis of the eight selected variables was conducted a lower likelihood of having received the 4-3-1-3-3-1 series of vaccinations was also associated with non-Hispanic, White or non-Black/non-White race.
- Washington's coverage rates for the 4-3-1-3-3-1 vaccination series for children 19-35 months of age have shown an upward trend since 2002.
- Washington's coverage rates 4-3-1-3-3-1 vaccination series for children 19-35 months of age are lower than the national rates due to the lower rates for 1+ varicella vaccination. The gap between Washington's rates and the US rates is narrower in the past two years than it was previous to that.

Age (in Months) Doses Received, All Children

Washington State Data from the National Immunization Survey - 2005									
Vaccine/ Dose	Age in Months								
	1	3	5	7	13	16	19	25	35
DT/DTP1	18.8%	91.8%	94.9%	95.9%	96.5%				
DT/DTP2	0.0%	9.7%	86.9%	92.1%	93.7%	94.9%	95.2%	96.1%	
DT/DTP3	0.0%	0.0%	0.2%	78.3%	88.8%	91.5%	93.0%	94.3%	94.8%
DT/DTP4	0.0%	0.0%	0.0%	0.3%	7.3%	42.7%	73.6%	84.1%	87.2%
Polio1	18.1%	89.0%	93.9%	94.1%	95.5%	96.5%	96.5%	96.8%	
Polio2	0.1%	9.3%	82.5%	89.7%	92.5%	93.5%	94.0%	94.9%	
Polio3	0.0%	0.2%	2.5%	41.0%	65.0%	75.5%	84.3%	87.4%	89.2%
MMR1	0.0%	0.0%	0.0%	0.0%	60.9%	82.3%	86.9%	91.3%	91.6%
Hib1	17.5%	91.9%	94.7%	95.9%	96.7%	97.5%	97.5%	98.0%	
Hib2	0.0%	9.8%	88.1%	92.2%	94.2%	94.9%	95.3%	95.3%	95.7%
Hib3	0.0%	0.2%	5.5%	73.7%	87.0%	90.1%	92.7%	93.7%	93.7%
HepB1	84.1%	91.0%	91.9%	95.1%	96.5%	96.9%	96.9%	97.2%	97.5%
HepB2	26.2%	64.0%	74.5%	83.3%	91.7%	92.6%	92.6%	93.0%	93.6%
HepB3	0.3%	0.7%	6.8%	35.9%	75.6%	80.1%	84.2%	87.8%	88.5%
Varicella	0.1%	0.2%	0.2%	0.2%	47.4%	64.2%	74.1%	78.7%	78.8%

- This Table illustrates, in the yellow highlighted cells, the decline in percentage of children fully immunized with age appropriate vaccinations.
- There is a continuing low percentage of two-year old children who have received four DTP vaccinations.
- There is an increase since 2002 in the percentage of children who have received varicella vaccination.
- Yellow highlighted cells indicate the maximum age that the antigen dose is recommended plus a one month grace period.

Summary Table of NIS Analysis Results

Demographic Variables and Trends										
	MMR	Polio	Hib	HepB	Varicella	3DTP	4DTP	431	43133	431331
Child Race	↔	↔	↔	↔	↔	↔	↔	↔	Other, non-Hisp. ↓	↔
Child Age	↔	30-35 mos. ↑	↔	↔	↔	24-29 mos. ↓	30-35 mos. ↑	30-35 mos. ↑	30-35 mos. ↑	↔
Maternal Age	↔	↔	↔	30+ years	↔	↔	↔	↔	↔	↔
Maternal Education	↔	↔	↔	↔	↔	12+ yrs or College graduate ↑	↔	↔	↔	↔
Marital Status	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑	Married Never Married ↑
Poverty Status	↔	↔	↔	↔	↔	↔	>Poverty ↑	↔	↔	↔
Firstborn	↑	↑	↑	↔	↔	↑	↑	↑	↔	↔
Number of Providers	↔	↔	↔	>1 ↑	↔	↔	↔	↔	↔	↔
National Comparison	↔	↔	↔	↓	↓	↔	↔	↔	↔	↓
Trend	↔	↔	↔	↑	↑	↔	↔	↔	↑	↑

Legend: ↑ increasing
 ↓ decreasing
 ↔ no change

- Although there are no consistent findings across antigens, there are some indications that 19-35 month old children who are firstborn or 30-35 months of age are more likely to be vaccinated than children who are born later or who are younger than 30 months of age.
- There are consistent findings that children whose mothers are married or who have never been married are more likely to be vaccinated than children whose mothers are widowed, divorced, separated or deceased.
- Children whose mothers have a college education are more likely to have received 3+ DTP vaccinations than children whose mothers have less than a college education.
- In general, Washington's immunization coverage rates are similar to the national rates except for hepatitis B and varicella and for the 4-3-1-3-3-1 series which includes varicella for which they are lower.
- Washington State's coverage rates are increasing for Hepatitis B and varicella vaccinations as well as the 4-3-1-3-3 and the 4-3-1-3-3-1 series of vaccinations.

Immunization Coverage in Washington State Schools

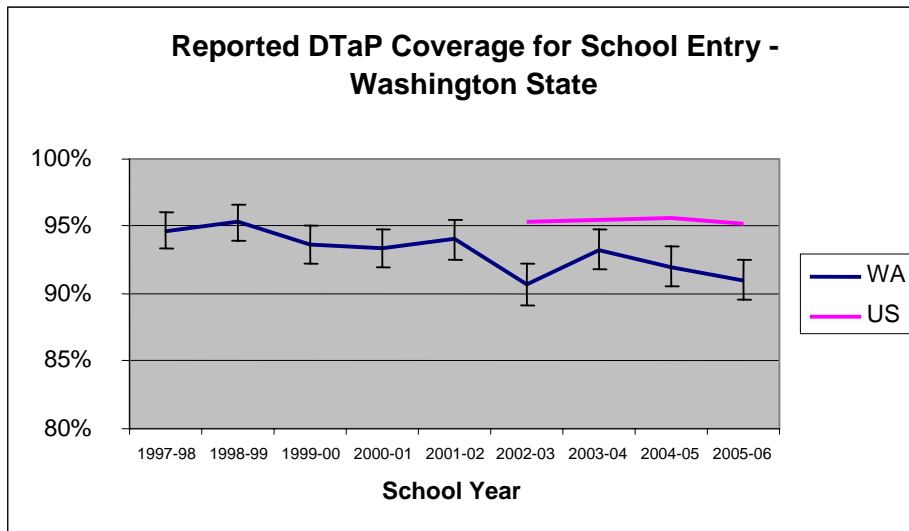
Children of School Age:

Washington State law requires that children be immunized by the time they first enter school. Immunization records of all children entering school are reviewed each fall. School data is parent-reported and not provider verified. All states and territories are required to report coverage summaries to CDC. Vaccine requirements vary generally among states.

A nine-year comparison of Washington State school immunization coverage rates shows a declining trend across school years 1997-98 through 2005-2006.

Diphtheria, Tetanus and Pertussis

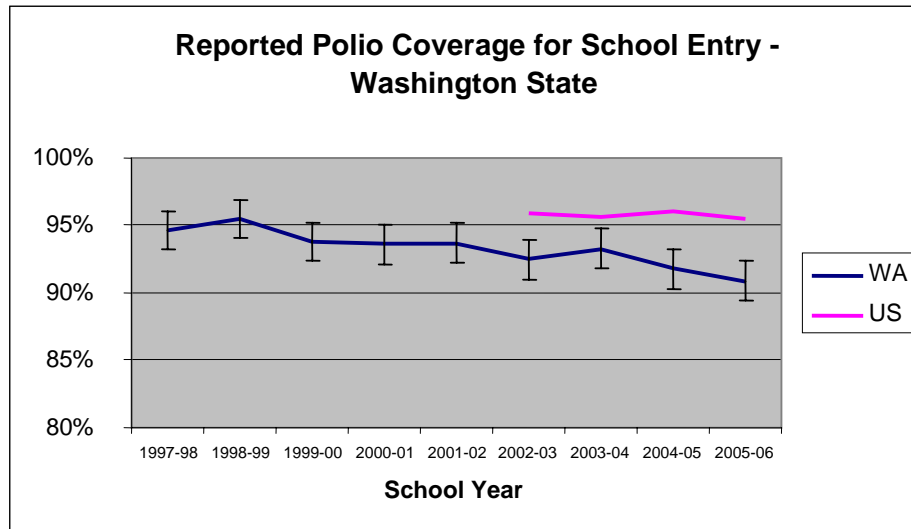
A significant drop in Washington State coverage rates for Diphtheria/Tetanus/acellular Pertussis for school entry from 94 percent to 90.7 percent occurred between SY 2001-02 and 2002-03. This may reflect the vaccine shortage during that period. States' requirements for school entry DTaP range from three to five shots. Washington requires a series of four. Washington's rate remains below the national estimate for complete DTaP coverage (in SY 2005-06, 91 percent and 95.2 percent, respectively).



95 percent confidence intervals represented by marker bars

Polio

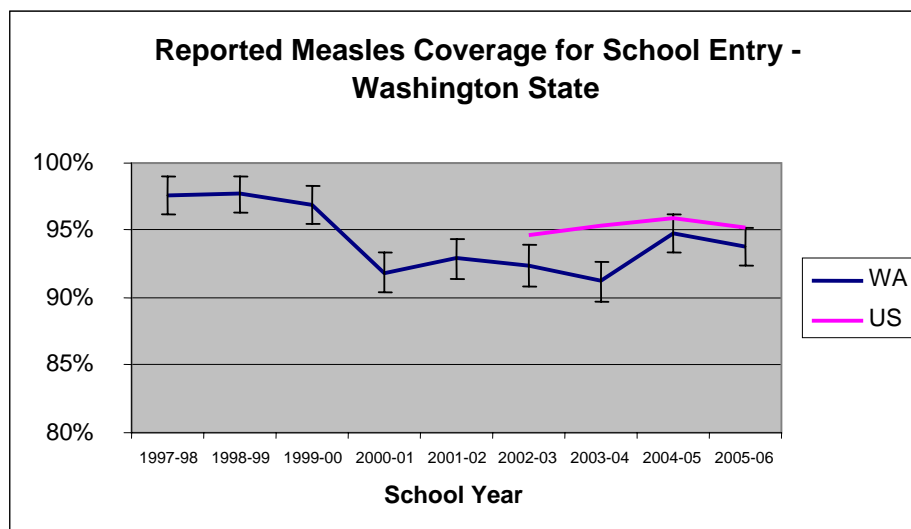
School entry coverage rates for polio vaccination dropped significantly between SY 1998-99 and SY 2002-03 from 95.5 percent to 92.5 percent. States' requirements for polio vaccination range between three and four shots. Washington requires a series of three. Washington's rate in SY 2005-06 was 90.9 percent, significantly below the national estimate of 95.5 percent.



95 percent confidence intervals represented by marker bars

Measles, Mumps and Rubella

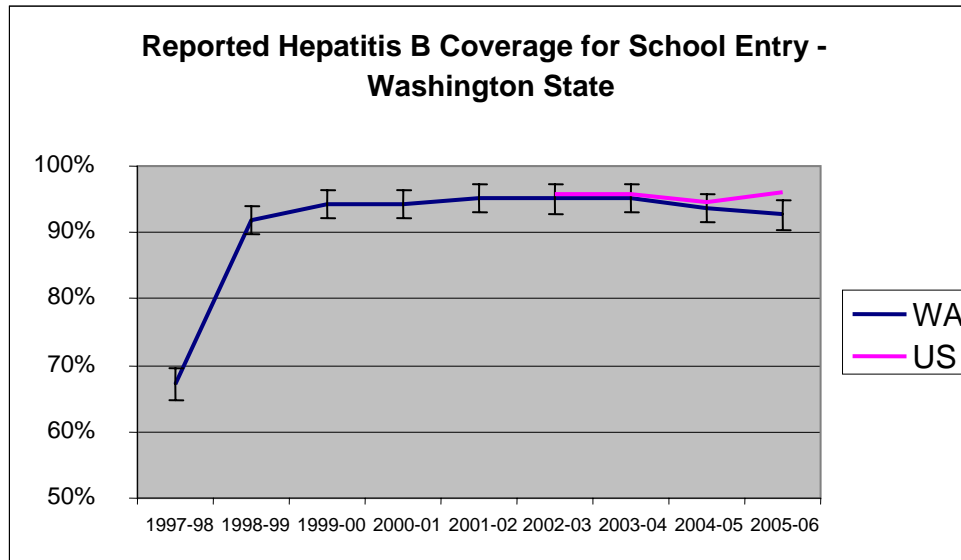
Washington requires two measles shots. In school year 2005-06, 21 out of the 39 Washington counties reported schools with measles vaccination rates below 95 percent, a recognized standard threshold for adequate herd immunity. The linear trend for kindergarten measles coverage from 1997-2005 is downward. Washington State completion rates for measles, mumps and rubella in SY 2005-06 were 93.8 percent, 95.4 percent and 95.4 percent, respectively, and are not statistically different from the national rates which were 95.2 percent, 95.9 percent and 95.9 percent, respectively.



95 percent confidence intervals represented by marker bars

Hepatitis B

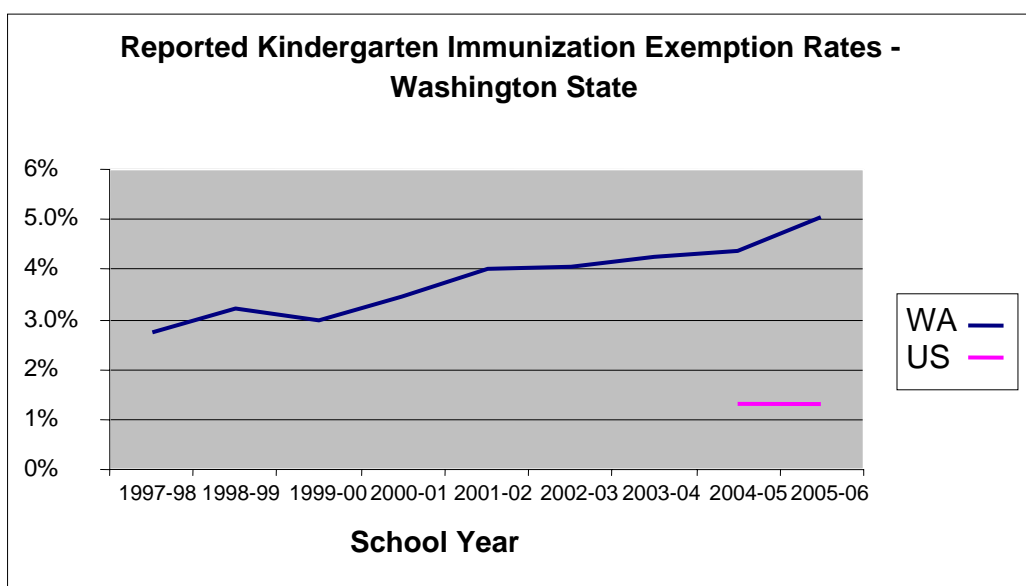
All states require three Hepatitis B shots with the exception of the District of Columbia which requires two. The rate for states reporting a Hepatitis B vaccination requirement for school entry averages 96 percent. Since implementation of the Hepatitis B vaccination requirement in 1998-99, Washington rates have risen steadily from 67 percent in 1997-98 to 95 percent in three consecutive school years 2001-02, 2002-03 and 2003-04. The rate dropped to 92.7 percent in SY 2005-06, but this is partially attributed to a reporting anomaly related to implementation of a new reporting system during SY 2004-05.



95 percent confidence intervals represented by marker bars

Immunization Exemption Rates

Washington is one of about 20 states which allow personal/philosophical exemptions from required school immunizations in addition to medical and religious exemptions. For the past eight years, Washington's rates have increased significantly. It is believed this is due to a number of factors, including growing anti-immunization sentiment as well as the second measles vaccination requirement. For school year 2005-06, the statewide exemption rate for school entry was 5.1 percent; the national estimated rate was ~1.3 percent. Personal/philosophical exemptions represent about 95 percent of total statewide exemptions. In some cases, parents choose to take the personal exemption rather than trying to locate their children's immunization records. This artificially inflates the overall exemption rate. In a Washington State exemption study in 2000, it was found that only 39 percent of exempt students included in the survey were completely unimmunized.



95 percent confidence intervals represented by marker bars

Data source: Washington State School and Childcare Assessment Database

Prepared by the WA DOH Immunization Program, 12/2006

Summary and Discussion

Overall, the analysis of demographic variables from the National Immunization Survey did not reveal any consistent findings to direct targeted immunization interventions or guide immunization policy in Washington State.

This analysis did reveal, however, some indications that 19-35 month old children who are firstborn or 30-35 months of age are more likely to be fully immunized with age appropriate recommended vaccines than children less than 30 months of age. These findings suggest that it may be helpful for immunization providers to pay particular attention to the vaccination status of children who are not firstborn or who are younger than 30 months as they may be more likely to be under-immunized.

This analysis also revealed that children whose mothers are married or who have never been married are more likely to be fully vaccinated than children whose mothers are widowed, divorced, separated or deceased.

The table, Age (in Months) Doses Received, All Children, further illustrates the importance of children starting their vaccination series on time and receiving further doses on the recommended schedule since coverage with age appropriate doses declines with increasing age of the child. The 4th DT/DTP vaccination is particularly problematic with less than 74 percent of children receiving this dose by 19 months of age and with the statistically significant trend toward lower coverage in Washington from 1995 through 2002. While vaccines shortages may play some part in this decline, the shortages were nation-wide and a similar decrease in coverage was not seen for the US as a whole over the same period of time.

Overall, trends in immunization coverage in Washington State are similar to those seen nationally with the exception of the previously mentioned hepatitis B and varicella vaccinations and the 4-3-1-3-3-1 series which includes varicella. Varicella immunization rates in Washington have been continuously and significantly increasing since 1995 although the 2005 rate of 76.6 percent (± 5.1 percent) is still significantly lower than the 87.9 percent (± 0.8 percent) seen for the nation. As varicella coverage increases, the rate for the 4-3-1-3-3-1 series will also increase.

Examination of data from the annual school status reports also highlights a decreased coverage of 4+ DT/DTP in Washington for children at school entry. It also illustrates that, for the 2005-06 school year, Washington's DT/DTP school entry coverage was significantly lower than the US rate. School entry coverage rates for 3+ polio vaccinations also have decreased over the past six years and remain below the rate for the US as a whole.

Conversely, Washington State school exemption rates have increased significantly from the 1997-98 through the 2005-06 school years. Approximately 95 percent, of claimed school exemptions are for personal/philosophical reasons. Furthermore, Washington's school entry exemption rates are the highest in the nation.

This report highlights that continuing emphasis on childhood immunizations is necessary to maintain high coverage and thus, protection against vaccine-preventable diseases. In Washington, the low rates of 4+ DT/DTP coverage, the lower than national varicella coverage and the high and consistently increasing rates of personal/philosophical school immunization exemptions warrant specific targeted policies and interventions. The CHILD Profile Immunization Registry, as it is increasingly populated, will play an increasing role in improving immunization practice and estimation of population based vaccination coverage rates.