

How the Immunization Survey Worked

From April 1994 through July 1994, the N.C. Center for Public Policy Research surveyed nine local health departments to determine what percentage of children ages 2 and under were age-appropriately immunized. The Center's survey selected a sample of 4,866 children. The sample excluded 672 children for whom there was no record of immunizations, even though the departments had their names and other data entered on immunization mastercards. That left a total sample of 4,194.

Of those with immunization records, 60.6 percent (2,542) were on schedule or "up to date" on their immunizations. What does that mean?

The definition makes a considerable difference. Using standards based on criteria provided by the Immunization Branch of the N.C. Department of Environment, Health, and Natural Resources, for example, the Center found that 73.2 percent of the New Hanover children included in the survey were "up to date." At about the same time, using the same records, the health department indicated a compliance rate of 95 percent in its monthly "No Name Tracking System" report to the Immunization Section.¹

These results are not necessarily contradictory; the criteria are simply different. The New Hanover criteria allow four months beyond the recommended date for a child to receive vaccinations. The Center's criteria allow as little as one month, depending on the child's age. Also, the county checks only children in their fourth month past a vaccination date. For example, the county checks for vaccinations due at 2 months when children are 6 months, for vaccinations due at 4 months when children are 8 months, and so on. Thus, the Center's method counts any child over 3 months old without records for 2-month vaccinations as overdue, while New Hanover County's method does not include children until they are 6 months old.

In short, the Center's method excludes fewer children from the calculation and uses broader age groups for determining compliance. While any child counted as late in the tracking report would also count as late under the Center's crite-

ria, the reverse is not the case. In New Hanover County, children can be behind schedule, and thus not age-appropriately immunized, without being counted as delinquent (or behind) for the next dose of vaccine. This has to do with the process of catching up. Appropriate spacing between shots must be maintained in order for vaccines to be effective.

State law requires all children to be vaccinated against nine diseases by age 2: diphtheria; tetanus (lock-jaw); pertussis (whooping cough); polio; type b hemophilus influenza (Hib); measles, mumps, rubella (red measles); and hepatitis.² The state's recommended immunization schedule calls for 15 shots in order for a child to be fully immunized against these nine diseases.

Immunizations for the first two years are scheduled at ages 2 months, 4 months, 6 months and 12 to 15 months. Based on Immunization Branch guidelines, the Center survey counts children as "up to date" if they have received vaccinations on the schedule below.³

Age	Required Immunizations
1.5-5 months	First diphtheria, pertussis, tetanus (DPT1); first oral polio (OPV1)
5-7 months	DPT2, OPV2
7-16 months	DPT3, OPV2
Over 16 months	DPT4; OPV3; measles, mumps, rubella (MMR1)

Only children for whom there were some immunization records were included in calculating compliance rates. The survey excludes hepatitis B because the vaccine was not routinely given until after the beginning of the survey period. It also excludes Hib, the shot inoculating children against type b hemophilus influenza, as Hib has not been routinely included for providing data to the federal Centers for Disease Con-

trol. However, it is extremely rare for a child to receive a DPT shot without also receiving Hib. (In most exceptions, the record notes a legitimate reason.)

Except for children under three months, this schedule allows at least a month for a child to receive appropriate vaccinations. The younger children are included because they are eligible for the first round of vaccinations and have had at least some immunizations. Only 96 of the 4,194 children surveyed who had some immunization records were under 3 months, and their compliance rate was 57.3 percent. Most of the rest had received only hepatitis vaccinations, which can be given at birth.

In departments serving fewer than 700 children—Halifax, Hertford, Pender, and Swain—all records were included in the survey. For these counties, there was no sampling error. In larger counties, the Center took random samples of about 600 records. In Johnston County, for example, this involved examining every third record. Center staff drew samples from Johnston, New Hanover, and Robeson counties. Health directors in Buncombe and Mecklenburg generated their own samples from computerized immunization records.⁴

Since the children surveyed do not represent a random statewide sample, statewide generalizations cannot be assumed from the results. The results do, however, parallel other statewide and national surveys.

Because the Center's project focuses on minority health, the departments were deliberately selected to include relatively large minority populations. However, the Center also sought geographic balance and a mix of urban and rural counties. For geographic balance, Buncombe County to the west was chosen. The county is 90.9 percent white, but contains the largest population of African Americans residing in Western North Carolina. One urban county (New Hanover) also has a white population that exceeds the state average, as does rural Johnston—added because the health department serves a relatively large number of Hispanics.

Overall, the proportion of whites in the counties surveyed—70 percent—is slightly lower than the statewide figure of 75.6 percent, according to the 1990 census. However, the census popula-

tion is less than 50 percent white in Halifax (46.8 percent), Hertford (40.9 percent) and Robeson (36.1 percent). There are large Native American populations in Swain (27.3 percent) and Robeson (38.5 percent).

Children with no immunization records were included in calculating the racial makeup of health department patients and in assessing "missed opportunities" to track or provide vaccinations, but excluded in calculating compliance.

The result was a sample of 4,862 children ranging in age from 1.5 months to slightly over 29 months; 4,194 had some immunization records.⁵ The racial designations used by the health departments were used, except that several groups were lumped into the "Other" category. In addition to children designated as "Other" in the records, these include any children not designated as white, African American, Native American, or Hispanic. Asians are included in this group because there were not enough records on Asian children to analyze.⁶ In this analysis, whites are considered to be "majority," and all others are considered "minority." Only 2.9 percent of the records fall into the "Other" category.

—Steve Adams

FOOTNOTES

¹ New Hanover County Health Department "Tracking File Assessment," June 1994.

² G.S. 130A-152.

³ Immunization Section, DEHNR: "Immunization Fact Sheet," undated; "Immunization Status Calculations," undated.

⁴ For the counties in which random samples were drawn, the margin of error varied by sample size, as follows: Buncombe, plus or minus 4 percent; Johnston, plus or minus 5.6 percent; Mecklenburg, plus or minus 4.6 percent; New Hanover, plus or minus 4.4 percent; and Robeson, plus or minus 3.9 percent. Blank records were excluded from the Center's analysis, which accounts for most of the difference in sample size.

⁵ Children younger than 1.5 months (46 days) at the time the sample was taken were eliminated from the group. Records containing obvious clerical errors were also excluded. Occasionally, for example, records contained immunization dates later than the date the sample was taken. In a few cases in which the correct data could be deduced with reasonable certainty, records were corrected. Otherwise, inconsistent records were deleted.

⁶ Others in the "Other" group include records with no racial designation, a few records indicating mixed race, records in which race is designated as "Unknown," and a few records in which race was not clearly designated.