

THE OREGON IMMUNIZATION SURVEY OF TWO-YEAR-OLDS

IMMUNIZATIONS are among the most successful and cost-effective methods available for preventing disease and death. We have eradicated smallpox worldwide and polio in the western hemisphere, and have reduced immensely the incidence of measles, mumps, rubella, pertussis and *Haemophilus influenzae* type B (HIB) infection. Newer vaccines against hepatitis A, varicella, and pneumococcal disease hold the promise of substantially reducing these infections, too. National and international immunization programs are charged with maximizing immunization rates, so that we can consolidate and perpetuate our gains and witness the global eradication of polio, measles, and other diseases.

The cornerstones of Oregon's immunization program are the childhood immunization schedule and the requirement for children to receive certain immunizations before entering school or day care. Unless parents apply for medical or religious exemptions, Oregon law requires (among others) the "4:3:1 series" of basic immunizations for diphtheria, tetanus and pertussis (4 DTP doses), polio (3 doses), and measles, mumps and rubella (1 MMR dose) for day-care attendance and school entry. Additional immunizations are now required.*

CDC conducts the National Immunization Survey (NIS) to ascertain national and state-specific immunization rates and reports the results every six months. According to NIS results, Oregon has the 49th-worst immunization rate in the country — in July, 2000, 73.2% ($\pm 5.9\%$) of Oregon children aged 19-35 months had completed the 4:3:1 series, compared to 79.9% ($\pm 0.3\%$) of children nationally.¹ NIS is the official means by which we measure our progress toward the health objective established by the U.S. Department of Health and Human Services of 90% immunization with the 4:3:1 series by the year 2010.²

The Oregon Immunization Program at the Health Division has, in the last decade, also undertaken two major studies of childhood immunization. The first study found that 67%

of 24-month-old children had received the recommended 4:3:1 series.³ Key results of the second study are the subject of this issue of *CD Summary*.

SURVEY METHODS IN BRIEF

For the purposes of this study, we defined "full immunization" as receipt of the 4:3:1 series; the recommended immunization schedule calls for administration of all eight of these vaccines by 19 months of age. We studied a stratified random sample of children 19-35 months old selected from birth certificates, with oversampling by race and ethnicity, and geographic region. The parents of children in the sample were sent a fourteen-item questionnaire about what immunizations the child received, when and where the child received them, problems encountered when seeking immunizations, health insurance coverage, and knowledge and beliefs about immunizations. Eighty percent responded to the survey; findings are based on the 2,452 responses.

Researchers collected immunization data from parent-held shot records and verified these records with public- and private-sector providers. When a parent did not provide shot records, researchers contacted as many providers as the parent could remember. They furthermore searched databases containing immunization records of children attending immunization clinics financed with state and federal funds. By mail, phone or fax, providers furnished immunization data for 56% of the children in the study.

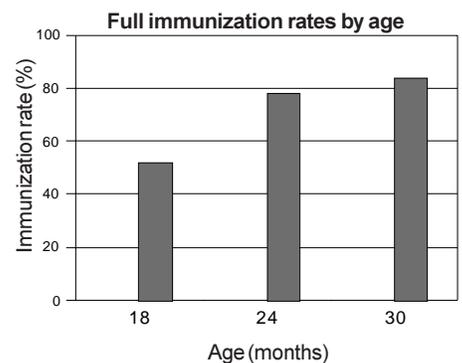
These extensive data collection activities distinguish our state-based survey from the NIS. Because our researchers left no data collection stone unturned, immunization data for each child in our survey were probably more complete than immunization data collected for each child in NIS. This accounts for the higher rates of full immunization reported in the following sections.

IMPORTANT FINDINGS

Full immunization rates are improving. Overall, 81% of 19- to 35-month-old Oregon children were fully immunized with the 4:3:1 series, and 81% had the 4:3:1 series plus three immunizations for *Haemophilus influenzae* type B (HIB). Children also fared well with

respect to individual immunizations — more than 90% had the recommended number of the following vaccines: polio, MMR, HIB and hepatitis B.

Full immunization rates were age-dependent. Coverage increased from a meager 52% when children were 18 months old to a more reassuring 84% when they were 30 months old (see figure).



Black and American Indian children had lower immunization rates. Just 71% of Black and 75% of American Indian children were fully immunized, compared to 81% of White, Asian and Hispanic children.

Children with a "medical home" were better immunized. More than 90% of children had a "medical home," i.e., their parents took them to the same clinic or doctor for basic visits and immunizations most of the time. Children who repeatedly visited the same provider for both sick- and well-child care may have had more opportunities for immunizations and other preventive services such as lead screening and nutrition counseling. Private providers were the medical home for 80% of children in the survey. Children with medical homes *did* have higher rates of full immunization than other children (83% vs. 70%), regardless of whether the medical home was a private or public immunization provider. This latter finding suggested that it was the medical home instead of the provider type that made the difference. Furthermore, 25% of children who got only 1-4 immunizations did not have a medical home, compared to 7% of fully immunized children who received all eight.

* OAR 333-019-035; revisions requiring *Haemophilus influenzae* (for day care attendance) and hepatitis B, varicella and the second dose of measles vaccines (for school entry) were not in effect at the time we conducted the survey.

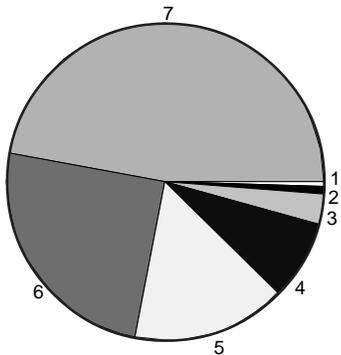


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Still... almost 10,000 kids were under-immunized. Under-immunized children are at risk of acquiring and transmitting vaccine-preventable diseases. Risk was especially pronounced in Black and American Indian children, 29% and 24% of whom were, respectively, under-immunized.

Among under-immunized children, almost half had received seven immunizations (see figure), and most of these kids were missing the 4th DTP. Among children missing their 4th DTP, 33% were “late starters,” that is, they had received their first immunization after 3 months of age.

Number of shots received by under-immunized kids



Parents could tell us why kids were under-immunized. Parents were asked “Can you think of anything that made it hard to get baby shots for this child?” and 19% reported the following things (in rank order): (1) scheduling appointments, (2) cost, (3) child sickness, (4) not understanding the immunization schedule, and (5) transportation problems. It is worth noting that encountering “barriers” didn’t always stop parents, since 64% of those who reported them still managed to immunize their children fully.

Reasons for under-immunization varied with the number of immunizations children received. Parents of under-immunized children reported that scheduling provider visits and reluctance to immunize a sick child were the two main reasons their children were missing shots; however, it was difficult to tell from the survey data whether these barriers were raised by the provider or parent.

More than 70% of parents mistakenly believed their children were fully immunized when they were not, especially when they were missing just one or two shots.

The issue appeared to be one of awareness of the immunization schedule and timing of typical well-child visits. Parents wanted their children to be fully immunized, but they relied on clinicians to ensure this. (Studies have found that clinicians also tend to believe that immunization rates among their patients are higher than they actually are — sometimes as much as 40%-57% higher — and that few clinicians actually assess immunization levels in their practices. In terms of the information gap, then, patients are similar to clinicians.)⁴

WHAT ARE THE DATA TELLING US?

- It’s best if kids don’t get referred elsewhere for immunizations; giving them their shots in their “medical home” is associated with higher immunization rates and allows better continuity of care for other health problems.
- Do whatever you can to identify and get into your clinic any kids who have already missed their first well-baby checkup. Note that the immunization schedule has some flexibility, and the 4th DTP can be administered at the 12-month well-baby visit, provided six months have elapsed since the 3rd dose.

- Try to be available some nights or weekends for those children whose parents can’t make it during more conventional hours.
- Screen kids at every visit for any immunizations that might be missing.
- Support and participate in Immunization ALERT. Read more about ALERT at <http://www.immalert.org>.
- Re-familiarize yourself with those (very few!) contraindications for vaccination; don’t withhold vaccine for minor illness.

AFTERWORD

The efforts of clinicians, public health agencies, hospitals, day care centers and others need to continue to improve in order to reach the 90% objective. This survey has identified ways to get us closer to our goal of full immunization against the “traditional” diseases. In preparation for taking the battle to pneumococcal disease, hepatitis A and varicella, we will survey clinicians’ delivery practices to ascertain which practices best sustain the 4:3:1 series and promote the new vaccines; so please return our questionnaire if you are lucky enough to be in our sample!

REFERENCES

1. CDC. National, state, and urban-area vaccination coverage levels among children aged 19-35 months. MMWR 2000; 49:585-9.
2. U.S. Dept. of Health and Human Services. Healthy People 2010 (conference ed. 2 vols.). Washington DC: U.S. Dept. of Health and Human Services, 2000.
3. CD Summary 44(17); August 22, 1995.
4. Santoli JM, Szilagyi PG, Rotwald LE. Barriers to immunization and missed opportunities. Pediatric Annals 1998; 27:366-74.

This report is a brief summary of the larger report, which will soon be available. To obtain a copy, contact the Immunization Program, Oregon Health Division, at 503/731-4020.