Utah uses GIS to map immunization registry data

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The Utah Statewide Immunization Information System (USIIS) at the Utah Department of Health is an immunization registry that stores and consolidates immunization records for residents of Utah. USIIS receives data from a variety of sources, including local health departments, private healthcare providers, and community health centers. Data is submitted by ASCII flat files through a Web application. As of December 1, 2005, it was estimated that 34 percent of private providers, 100 percent of local health departments, and 58 percent of community health centers were submitting patient and immunization data. Authorized users can access USIIS to ensure adequate patient immunization.

The National Immunization Survey (NIS), a yearly assessment of immunization rates for children age 19 months to 35 months old conducted by the Centers for Disease Control and Prevention (CDC), showed that immunization rates in Utah declined significantly from 2003 to 2004. According to the report, in 2003, the up-to-date immunization rate for Utah children getting four doses of diphtheria, tetanus and pertussis (DTP) vaccine; three doses of polio vaccine; one dose of measles, mumps, and rubella (MMR) vaccine; three doses of hemophilus influenza Type B (Hib) vaccine; and three doses of hepatitis B (HepB) vaccine, was 80.4 percent. In 2004, Utah’s immunization rate was reported to be 75.4 percent, showing a 5 percent decrease in the state’s immunization rate.

The USIIS program developed a strategy to identify where the lowest immunization rates are in Utah by using the immunization registry, ArcGIS ArcView software, and digital maps provided by the Utah Automated Geographic Reference Center. The analyses were conducted for each of the twelve local health districts. Identifying the areas of lowest immunization rates in Utah helped determine where to focus efforts for increasing the number of adequately immunized children.

Children age 19 months to 35 months old as of December 31, 2004, were selected from the USIIS database. They were divided into two groups: those
whose immunizations were up-to-date with three doses of DTP, three doses of polio, three doses of Hib, and three doses of HepB vaccine, and those whose were not. Their physical addresses were geocoded by ZIP Code and placed on the Utah state map. The number of children was summed up within each health district to calculate the percentage of children whose immunizations were up-to-date versus not up-to-date. Estimated percentage intervals for adequately immunized children were determined by calculating 95 percent confidence intervals for proportions of up-to-date children.

Figure 5.12 Map shows the disparity in estimated toddler immunization rates across Utah’s twelve health districts.

Identifying the areas of lowest immunization rates in Utah helped determine where to focus efforts for increasing the number of adequately immunized children.
Estimated rates of adequately immunized children plotted on the Utah Health District map gave a clear representation of data that was easy to compare. They ranged from 82 percent immunized in the Bear River Health District to 39 percent in the Utah County Health District. Thus, administrative decisions were made, without the cost of further investigation, to focus on uncovering and alleviating barriers to immunization in Utah County. The return on investment for those efforts will be realized when studies are completed and interventions are implemented.

Figure 5.13  Map shows by ZIP Code how toddlers in Bear River Health District have the highest immunization rates.
References


Figure 5.14 Map shows by ZIP Code how Utah County’s toddlers suffer the lowest immunization rates in the state.