

PRINT-Driving to Increase Childhood Vaccination Rates

Despite the availability of free routine immunizations for low-income families through a federal program, many children are not vaccinated, vaccinated late for their age, or don't complete the course of the immunization schedule. [OSF HealthCare](#) wants to change that.

Through a nearly \$75,000 grant available through its [Jump ARCHES program](#), and nearly \$30,000 in state grant funding through the [Illinois Innovation Network](#), [OSF Innovation](#) and partners are using artificial intelligence (AI) tools to design, develop and deploy a mobile child vaccination program for underserved communities in Illinois.

The grants leverage the resources of OSF HealthCare's [Innovation Design Lab](#) where solutions can be developed, tested, and refined for practical use. Design Lab Director Scott Barrows says teams at [OSF Jump Simulation](#) and the [University of Illinois College of Medicine in Peoria](#) (UICOMP) will use machine learning algorithms to build artificial intelligence (AI) models designed to accurately identify geographic locations with the biggest need for childhood vaccinations.

OSF HealthCare is also developing digital tools to systematically collect information during mobile clinics to help address social determinants of health – barriers outside of a medical office that affect access to care and vaccinations including food, transportation, and income among others.

"We will be both gathering information, anonymous information, plus applying new apps and new ways to gather information about what are a community's needs and some of them are quite dramatic, according to Barrows.

He emphasizes solving the root causes that influence why kids aren't vaccinated is an important aspect of the mobile vaccination clinics.

Barrows stresses, "The social determinants of health impacts everything really and that is involved in almost every app and technological intervention we create. It is critical. That is something OSF has really focused on."

Another partner, Illinois State University in Normal, will use AI to create heat maps that identify geographic areas with the most concerning rates of under-vaccination, while also predicting the supply needs in high risk zip codes. By building on already existing data, Barrows believes the project can make a case for future funding to expand resources within communities. For example, the project could include a reminder system for families who visited a mobile clinic – to keep them on a routine vaccination schedule.

Elise Albers, Population Health manager for [OSF HealthCare Children's Hospital of Illinois \(CHOI\)](#) says a significant number of children they see at OSF Children's Hospital are not vaccinated or they're under vaccinated. She acknowledges vaccination rates

were impacted by the COVID-19 pandemic, particularly in the months where some primary care and walk-in clinics were temporarily closed.

Albers says a federal government program to provide free vaccines for kids saw a decline.

“[Vaccines for Children](#) ordering took a significant drop after March 13 (2020) when COVID-19 was declared a national emergency. So, if there’s a drop in the ordering of these vaccines that means there’s a drop in the administration of the vaccines.”

Even before the pandemic, certain populations saw lower vaccination rates, in part, caused by challenges for busy, working parents.

“Typical office hours for doctors’ offices and clinics, they may not be open on the weekends or into the evening and we know our families work various hours, various shifts, have different schedules so it can be hard to get your children to the doctor to get vaccines,” according to Albers. “It is something we expect to see continue even after the effects of the pandemic so it’s not going away.”

Mary Stapel, MD, an internal medicine pediatrics physician and [OSF HealthCare Saint Francis Medical Center](#) director of Community Care-Clinics, says the [2019 National Immunization Survey](#), the latest year for which data is available, shows nationwide and in Illinois, those who are more likely to be vaccinated are those who live above the poverty line and have private insurance.

“Those less likely to be vaccinated are those who have public insurance like Medicaid, those who are under the poverty line, Blacks and Native American Indian. So we do definitely see that health disparity within immunization,” says Dr. Stapel.

Data from OSF HealthCare medical group and multi-specialty offices shows for example, a clinic in Peoria aimed at serving neighborhoods with the highest poverty has vaccination rates 30% lower than in zip codes covering more affluent areas.

According to Dr. Stapel, there could be other factors beyond cost and access contributing to lower vaccine rates in rural communities.

“It does seem from the literature that there may be more cultural belief components that come into the rural health disparity but yes, rural areas, according to the National Immunization Survey data, have up to a 20% lower vaccination rates, especially looking at specific vaccines such as adolescent vaccines.”

Research shows mobile clinics improve preventive services, bridge people to care and help address social determinants of health obstacles. These grants will build on work already done by [OSF Faith Community Nurses](#), the [OSF Care-A-Van](#), and [street medicine teams](#) which have partnered with churches, community centers, schools and harm reduction agencies to address the unique issues within a neighborhood.

Albers says mobile clinics also increase vaccination rates because they allow kids to receive their shot in a setting where they are comfortable, familiar and where there are trusted leaders who have paved the way.

“We really are cautious when entering a new community and we know that there are trust issues, especially with vaccines and we really focus on making sure that we built trust with a community before we come in and offer services like vaccines.”

Flu vaccination clinics have also provided education to counter misinformation, and Dr. Stapel believes that has laid the foundation to help communities be “more vaccine ready.”

Barrows also thinks the grant work could provide a roadmap for dealing with COVID-19 vaccinations once they become available for children. The end goal is to have enough mobile clinics to positively impact kids’ health which, in turn, could ultimately lower health care costs by reducing care delivered at its costliest point – the hospital emergency department.