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# Immunization Information Systems

**Laura J. Pabst, MPH** and **Warren Williams, MPH**
National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia

The use of electronic health information to support clinical and public health services has increased in recent years. One of the leaders in advancing this field is immunization information systems (IISs). Immunization information systems are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area. They began to be established in the 1970s mostly as local or regional systems that were intended primarily to consolidate childhood vaccination histories to support immunization delivery at the point of pediatric clinical care. In recent years, IISs have evolved to utilize emerging interfacing technology and industry standards to facilitate the exchange of information among a more diverse set of clinical and public health immunization partners within and outside their respective jurisdictions. They have developed a multitude of functions and features that have made them essential components of immunization service delivery and management to clinicians, public health, and other stakeholders such as schools and health plans for individuals of all ages. With the growing exchange of electronic health information and the increased demand on IIS data and services, IISs face new opportunities and challenges to ensure the complete, accurate, and timely capture and availability of immunization information.

Multiple new electronic systems are emerging for the collection and sharing of health information, including IISs, health information exchanges, industry hubs such as Surescripts, and networks of electronic health records (EHRs). Coordination is required to determine roles and responsibilities to ensure that health information is protected and utilized effectively and efficiently to serve patients, providers, and public health functions. Decisions such as which system should be responsible for obtaining immunization information, providing a forecast of needed immunizations for clinical decision support, and maintaining vaccine inventory have yet to be fully determined. This requires the establishment of new relationships and collaboration across diverse stakeholders representing government, private industry, and nonprofit entities at the federal and state/local levels. Immunization information systems have been leaders in fostering these relationships and promoting adherence to electronic communication standards to facilitate the exchange

Correspondence: Laura J. Pabst, MPH, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, 1600 Clifton Rd NE, MS A-19, Atlanta, GA 30329 (lnw9@cdc.gov).

of information. This is perhaps most notable in the promotion of IISs in the Centers for Medicare & Medicaid Services Meaningful Use initiative, which requires providers that give immunizations to connect electronically to their jurisdictional IIS. The IIS community has greatly improved interoperability between public health and clinical systems by standardizing an implementation guide that can be used by all jurisdictions to send data from EHRs to IISs. This high level of interoperability allows IISs to obtain more complete and higher-quality data from EHRs. In addition, the IIS community has developed standards-based methods for bidirectional exchange of immunization data with EHRs in anticipation of future stages of the Meaningful Use program. This will allow not only for IISs to receive data but also for IISs to send back complete histories and immunization forecasts to EHRs.

In addition to data exchange among health information systems within a state, there is a growing need to facilitate the exchange of information across state borders, to serve individuals who seek care in multiple jurisdictions. The standards built for bidirectional exchange of data provide technical solutions for cross-jurisdictional data exchange between IISs. However, IISs are typically developed and maintained by state health departments and are subject to both state and federal laws and policies for the protection of health information, which can limit interstate data sharing. Immunization information systems are actively working to identify operational and policy solutions to ensure that clinical providers can access the information needed to provide the best care for their patients, regardless of their state of residence.

In addition to advancements in the exchange of immunization information, IISs are expanding the functions and features offered to stakeholders to support the entire immunization delivery system. In doing so, they are becoming the primary information tool to support immunization program operations. The development of standards for IIS operations promotes consistent implementation and can reduce resource burdens on individual IIS through shared technology and operational best practices. Two emerging IIS functions that are experiencing widespread adoption and standardization are the use of IISs for vaccine ordering and inventory management and the use of IISs to produce provider-level immunization assessments and feedback. Immunization information systems are now the primary mechanism for order and inventory management services, thus providing a single unifying portal for providers who communicate data with the IIS and receive information from the state immunization program. In 2013, 47 of 64 federally funded immunization programs were using or planned to use their IIS for public purchase vaccine ordering and inventory services, representing 92% of provider sites participating in the Vaccines for Children Program. Since that time, 10 additional programs have deployed or expressed their intention to implement this functionality. In addition, the Centers for Disease Control and Prevention is publishing requirements for immunization programs to transition away from chart-pull methodologies to conduct provider assessments and feedback to using IISs for this service. It is anticipated that all immunization programs will use their IIS to conduct Assessment, Feedback, Incentives and eXchange (AFIX) visits with providers enrolled in the Vaccines for Children Program in the near future. Vaccine ordering and inventory control as well as IIS-generated AFIX assessments will be key IIS functions in immunization programs, in addition to other IIS services described more fully in the literature review conducted by the Task Force on Community Preventive Services included in this issue.

These opportunities do not come without challenges. Increased demand for immunization information contained in the IIS by clinical and public health programs, health care organizations, and other stakeholders places new demands on the IIS including the need for more uniform standardization of functions, implementation of bidirectional data exchange with other health systems, the maintenance of high data quality, and system and program capacity to fulfill data queries from multiple stakeholders and onboard new providers to initiate data reporting. Management of these challenges requires new levels of coordination and collaboration with a growing stakeholder community.

Immunization information systems are embracing the opportunity to be leaders in the development of strong integrated health information systems that serve clinical, public health, and other immunization stakeholders. These opportunities, while not without challenges, offer the chance to build a world in which real-time, consolidated immunization data and services for patients of all ages are available to authorized clinical, administrative, and public health users and consumers, anytime and anywhere. The literature review conducted by the Task Force on Community Preventive Services and the accompanying articles presented in this issue of the *Journal of Public Health Management and Practice* provide a framework to better understand how IISs impact the immunization delivery system to ultimately improve immunization coverage and reduce vaccine-preventable disease.