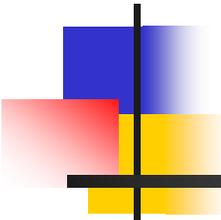
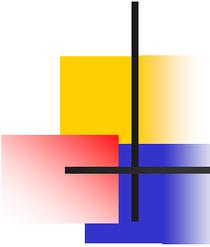


# Immunization Information Systems And Healthcare Systems Interoperability



2045.2 Evaluating Techniques in Public Health  
Informatics/Information Technology Posters  
APHA 136<sup>th</sup> Annual Meeting and Exposition  
Sunday, October 26, 2008: 4:30 PM

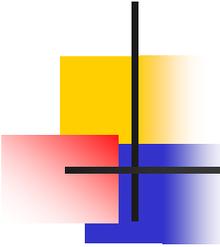
Susan M. Salkowitz, MGA  
Noam H. Arzt, PhD  
Ruth Gubernick, MPH



# Abstract

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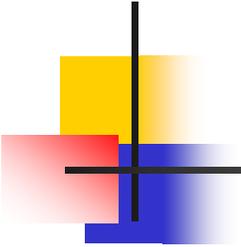
- Immunization Information Systems (IIS), originated in the 1990s are evolving from siloed registries to more integrated systems.
- The need for interaction with other public and private healthcare systems was central to their function, and spurred early standards adoption including CDC-endorsed functional standards early development of an HL7 immunization message implementation guide, now moving them into [interoperability](#).
- Development of public health IT initiatives and the emergence of health information exchanges (HIE), IIS participation in and contributions to standards development and experience with collaborating with private practices and health plans in bi-directional records exchange is instructive to the policy and technical development of these new initiatives.



## Abstract *(continued)*

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- IIS are emerging as the backbone of some HIEs due to their technical and policy maturity, as well as their successful deployment within public-private collaborations.
- IIS lessons learned can inform additional similar cases as RHIOs look for viable, existing implementations for their expansion.

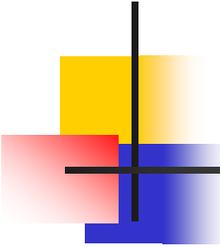


## What is an IIS?

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- By two years of age, over 20% of US children typically have seen more than one healthcare provider, resulting in scattered paper medical records.
- Immunization information systems (IIS) help providers and families by consolidating immunization information into one reliable source.
- IIS save money by ensuring that children get only the vaccines they need and improve office efficiency by reducing the time needed to gather and review immunization records.

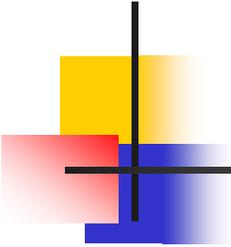
(<http://www.cdc.gov/vaccines/programs/iis/what-iis.htm>)



# What are functions/features of IIS?

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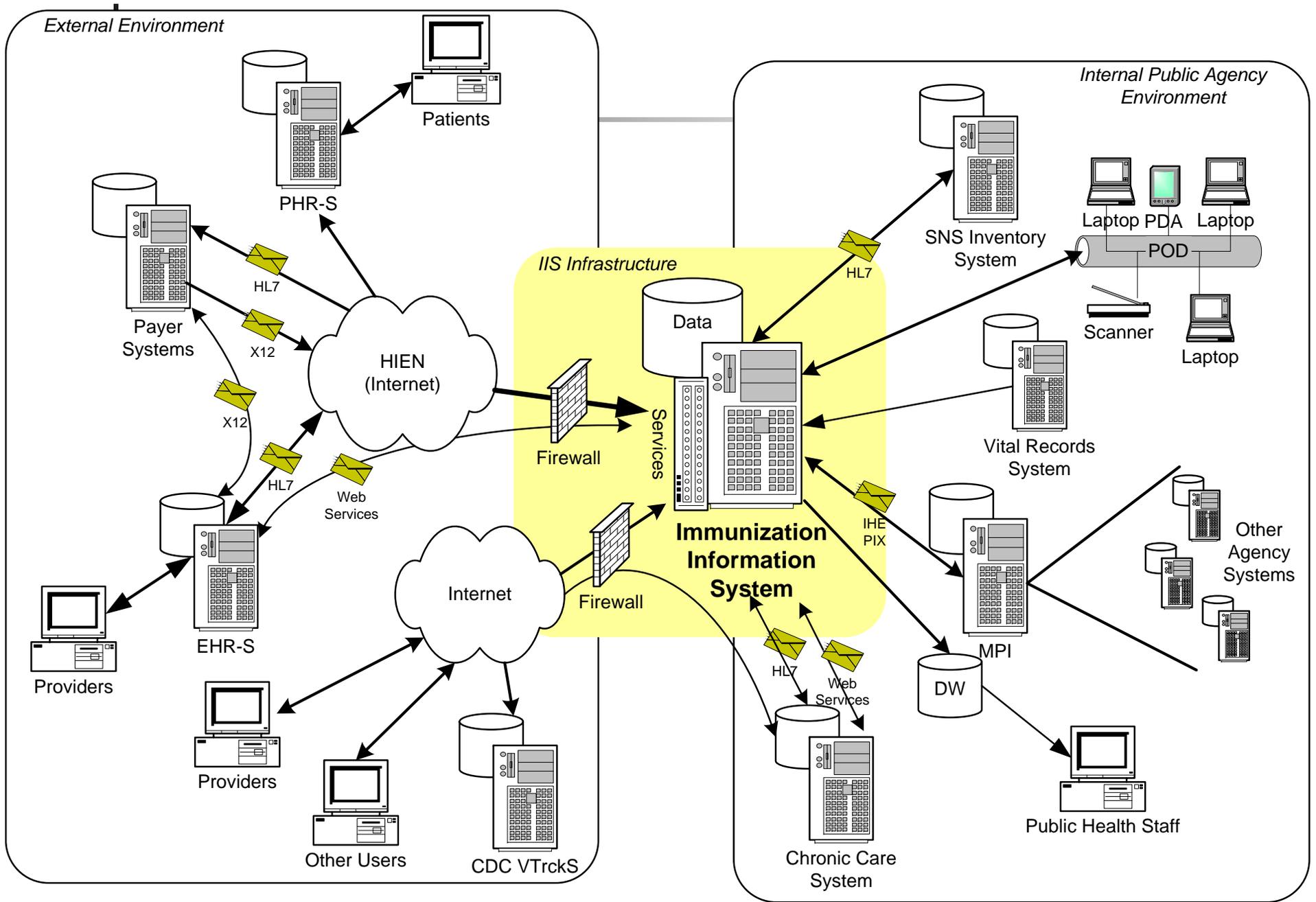
- **Immunization Program Support**
  - identify populations at high risk for vaccine-preventable diseases and target interventions and resources efficiently.
- **Consolidate Records**
  - immunization information from different sources into a single record and provide official immunization records for school, day care, and camp entry requirements.
- **Privacy and Confidentiality**
  - protect the privacy of all users, including children, families, and providers
- **Timely Immunization**
  - remind families when an immunization is due or has been missed.
- **Clinical Decision Support**
  - help providers and parents determine when immunizations are due and help ensure that children get only the vaccinations they need.
- **Data Exchange** with immunization healthcare providers

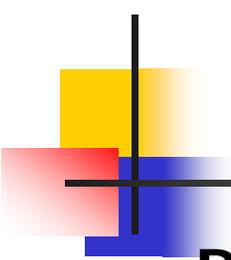


# IIS Infrastructure

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- Provides data and services to various healthcare activities, both in the public and private sectors.
- Usually a centralized system that contains a database and one or more applications for online access.
- A set of services may provide more transparent access to IIS data or features by outside systems.
- All access to IIS data is governed by strict privacy and security rules dictated by both Federal and state/local legislation.





# Immunization Data Exchange

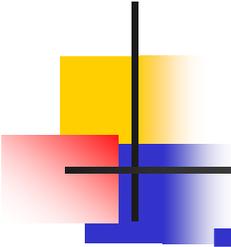
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## Public Health

- Immunization Program Staff
- Vital Records
- Vaccine-related
  - CDC VTrckS
  - SNS Inventory System
  - Point of Dispensing Support
- Other Agency Systems
- PHIN
- Chronic Care Management

## Healthcare Delivery

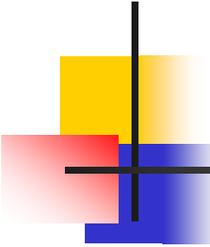
- Providers and provider organizations –
  - EHRs
  - Direct on-line Access
- Health plans-Payers
- Personal Health Records
- HIEs- Health Information Exchanges
- RHIOs- Regional Health Information Organizations



# Public Health: Immunization Program

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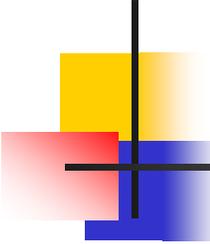
- IIS data supports Immunization Program functions, including
  - Surveillance
  - Coverage assessment
  - Quality assurance at provider sites (AFIX)
  - Communication with stakeholders
- The more widely available data is within the agency the more important this data management function
  - Some agencies deploy a data warehouse parallel to the production system to facilitate data query and reporting with less impact on operations.
- Most agencies have additional internal systems that manage other aspects of their programs to which IIS either interoperates or is integrated, like
  - WIC systems (for providing immunization history for assessment by WIC personnel)
  - Service-encounter systems (that support automation of services offered in public health clinics)
  - Master Patient Index (MPI) as a central registration point and clearinghouse for patient-related data



# Vaccine Management and Storage

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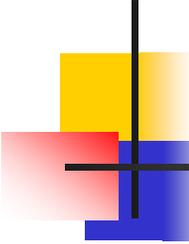
- **VTrckS:** CDC's replacement for VACMAN will automate the ordering and distribution of Federally-provided vaccines. IIS will be the primary interface for many providers to this new ordering system. In the short run, this may increase the use of direct online IIS applications; over time it is expected that service-based interfaces to these ordering functions will let primary systems interoperate with the IIS to support the necessary processes.
- **SNS:** Many jurisdictions have deployed an inventory system to support their potential use of the Strategic National Stockpile in the event of a large-scale emergency. Vaccine is just one type of materiel that might be involved in a public health response. The IIS may be called upon either during or after an event to store vaccine administration data. It may require an interface to the SNS Inventory System to support this activity.



# Emergency Preparedness

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- **Preparedness:** During an emergency response, jurisdictions use Points of Dispensing (POD) as the locations where vaccines and medications may be distributed to the population.
- These PODs are often temporary locations – schools, recreation centers, churches, or mobile locations – pressed into service during an emergency with little or no permanent public health infrastructure.
- PODs may support data management products of their own or may access the IIS directly through standard or special interfaces.

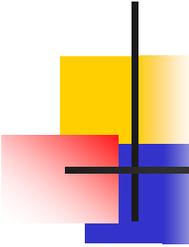


# Public Health: Chronic Disease Management

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## Chronic Care System:

- Many jurisdictions are deploying specific systems targeted at management of chronic conditions within the population. Typically focused on clinical support, these systems provide features that an EHR-S does not yet have.
- Chronic Care System exchanges immunization information and accesses vaccine forecast from IIS. Some users access through their EHR-S, some directly through a “lite” client. Chronic Care Systems should also be able to access IIS functions via Web Services for a more transparent integration of these capabilities into the system.



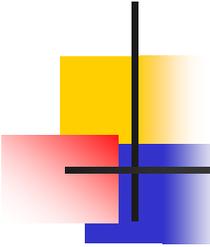
# Public Health: Vital Records, Other Systems

## Vital Records

- Children's records in the IIS are often initialized from Vital Records data within the jurisdiction which may or may not be housed within the same agency
  - This data transfer is usually conducted under a Memorandum of Agreement or similar instrument that dictates how and when this data can be used.
  - CDC Minimum Functional Standards stipulate that this transfer happen within six weeks of birth, but most IIS strive to have the data transfer occur more expeditiously.
  - IIS projects need to be careful to abide by state law related to disclosure of birth records under conditions of adoption or foster care, and also need to be diligent in updated official name changes and in recording deaths to prevent accidental transmission of reminder/recall information for a deceased child.

## Other agencies and programs

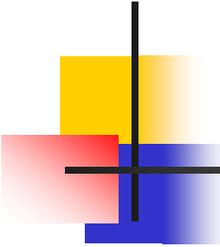
- IIS often possesses a fairly complete, population-based set of person data which can be useful for many programs and systems. For example, linking IIS, Newborn Screening, Early Hearing Detection and Intervention, Lead Screening into a Child Health Information System.



# Provider Electronic Health Records Systems

## **Providers use an Electronic Health Record System (EHR-S) to automate their clinical practice and serve as an electronic version of their patients' records**

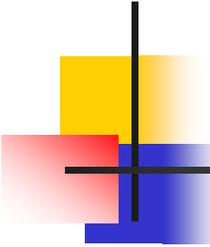
- EHR-S exchanges data with the IIS via HL7 and, if so equipped, can access its services through a published Web Services interface.
- Services might include an immunization forecast scheduler whose algorithm can be applied to EHR-S data independent of the IIS, or tools such as practice assessment or reminder/recall capabilities.
- A typical EHR-S system does not contain these special features and may welcome the ability to access them from the IIS via Web Services.
- The EHR-S may also provide insurance claims directly to a payer system via X12. Providers access an EHR-S in their offices through many types of interfaces, including web-based application, client/server applications, and even Personal Digital Assistants (PDA).
- Web services refers to a set of technologies that implement a Services-oriented architecture (SOA) which features software components that are assembled in a modular way to facilitate reuse and standard interfaces.



## Direct on-line Access

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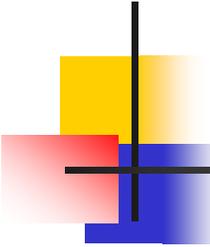
- Providers who do not have an EHR-S, as well as other users from schools, pharmacies, visiting nurse associations, and others access an IIS directly using an online application (usually web-based or web-presented) provided by the IIS project.
- For commercially- or public health-acquired IIS software these applications are provided with the system; for others these products are developed in-house.
- Over time, it might be expected that use of these stand-alone applications will diminish as more and more stakeholders acquire primary systems of their own that can interface with the IIS to provide access to its data.



# Health Plan/Payer Systems

## **Payers have always played a big part in IIS activities:**

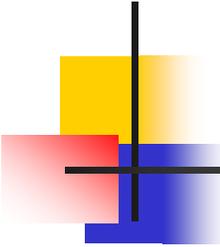
- Collect data from IIS for HEDIS measures or to support other quality improvement activities.
- Source of data for an IIS when their records are considered accurate and complete enough.
- Some claims data received from providers may not have all the required data for an immunization event (e.g., sometimes the type of vaccine administered is not included in the claims data).
- Payer systems receive claims in X12 format but need to be prepared to also receive immunization data eventually in HL7 format from IIS and other sources.
- For the near term, many of these interactions will take place through the use of flat files whose format and contents are defined for specific purposes.



## Personal Health Record (PHR)

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- Patients and their guardians may access immunization data through a Personal Health Record System (PHR-S).
- Those systems provided by an organization with which the patient has an affiliation (health plan or insurer, employer) are referred to as “tethered” systems; those provided by an independent entity are referred to as “un-tethered.”
- A PHR-S may acquire its data directly from the patient, from provider EHR systems, or even from IIS.
- It is important for IIS managers to recognize the potentially growing important these systems may have in the system landscape.



## The Future...

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- How quickly will EHR-S deployment expand?
- How quickly will interoperability proliferate?
- Will the action shift to the HIEN?
- Will IIS *applications* become a thing of the past, replaced by other styles of data access?

# Additional Information



**HLN's "Insights" at**

<http://www.hln.com/resources/index.php>

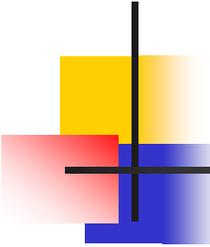
**HLN's "Evolution of Public Health  
Information Systems:  
Enterprise-wide Approaches" at**

[http://www.hln.com/assets/pdf/  
UT-White-Paper-Final.pdf](http://www.hln.com/assets/pdf/UT-White-Paper-Final.pdf)



**HLN's "Guide to Immunization-related  
Electronic Data Exchange" at**

<http://www.hln.com/assets/pdf/IZ-DataX-Guide.pdf>



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