

INTEROPERABILITY SHOWCASE™



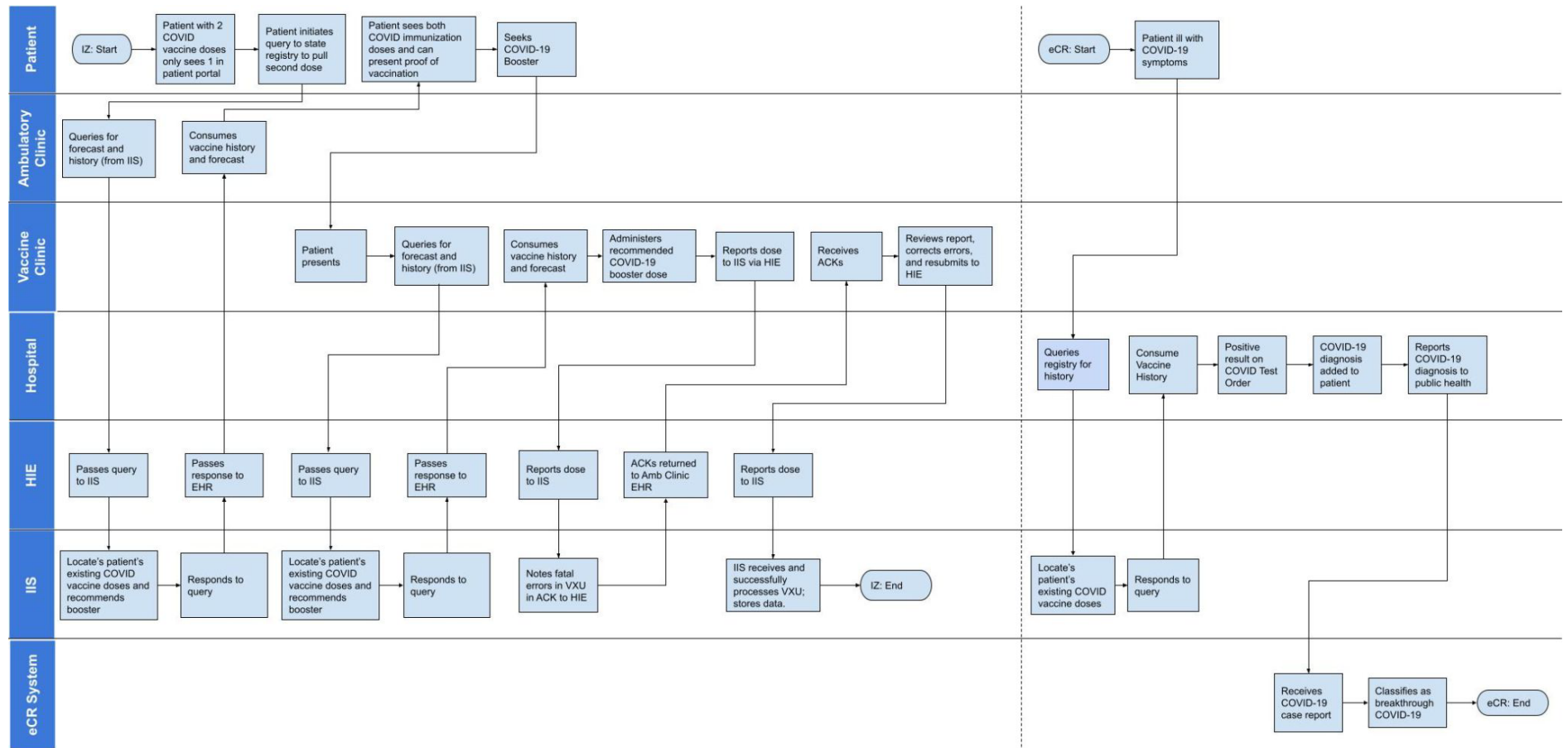
Use Case Title: Pandemic Response & Vaccine Coordination

Short Description: Riku, a fully vaccinated patient, needs proof of vaccination to enter a concert venue and has lost his CDC vaccination card. He logs into his EHR's patient portal and notices that only his first vaccine dose is visible but is easily able to query the local immunization registry from within the portal to pull in his second vaccine dose. He uses QR codes generated directly in the patient portal following the Verifiable Clinical Information standard as the proof of vaccination he needs to enter the concert venue. When Riku later goes to get his booster, his PCP's EHR unsuccessfully reports the dose to the immunization registry. Clinic staff can see the errors returned from the registry and correct the issues to successfully report Riku's booster vaccination. After receiving his booster, Riku starts to develop symptoms that are consistent with COVID-19. As his symptoms worsen, he goes to the hospital for immediate help. Upon registration, the hospital EHR queries the state immunization registry and directly saves the response to Riku's vaccine history in the EHR. A PCR test is ordered to test for COVID-19, and upon positive result, a case report is generated and sent outbound, including vaccine information indicating a breakthrough case. The Association of Public Health Laboratories (APHL) receives the case report, routes to the right public health jurisdiction, and sends a reportability response back to the EHR end-user.

Value: Public health agencies play a vital role in the pandemic response and rely on timely, accurate and complete data to prevent, monitor, and control the spread of disease. Health IT provides essential functionality to support the efficient capture of demographic and clinical data and securely share patient information with public health agencies. Seamless data exchange with immunization information systems (IIS), patient access, and automated electronic case reporting (eCR) facilitate timely, informed, and coordinated pandemic response activities. Giving patients easy access to standards-based, trusted certification of their vaccination status empowers them to participate in community activities with peace of mind.

Participating Vendors: American Immunization Registry Association, Cerner, Epic, Nextgen, Shasta Networks, STCHHealth

Aggregate acknowledgment (ACK) reports generated by the intermediary HIE that are understandable to both technical and non-technical users can help improve data timeliness, accuracy and completeness. The information contained within ACK reports can assist healthcare providers and administrators in knowing what happens to patient data after it is sent to an IIS. Comparing reports over time will enable healthcare staff to examine error trends and confirm error reductions.



Scenario	Vendor	Products	Standards
<p>Introduction</p> <p>Riku is a 34-year-old living in Orlando who has already received 2 COVID-19 vaccines. He is going to a Killers concert and needs proof of vaccination for entry but has lost his CDC vaccine card. He contacts his provider about what he can do and is recommended to use the information from his patient portal. This use case will demonstrate how interoperability streamlines the access to and the quality of information effortlessly from Riku's perspective.</p>			
<p>Patient Portal</p>			
<p>Riku logs into his patient portal, MyChart, and sees that there's only one dose of the COVID-19 vaccine present on his chart. Using the COVID-19 Activity in MyChart, he kicks off a query to the state immunization registry.</p>	Epic	MyChart	HL7® v2 QBP^Q11 message
<p>HIE</p>			
<p>The HIE acts as the intermediary between the EHR and the IIS registry to forward the query and response data.</p>	Shasta Networks	Ascent	HL7v2 QBP^Q11 and RSP^K11 messages
<p>IIS Registry</p>			
<p>Riku's immunization information is in the state registry. EHRs and HIE have direct connections via an electronic interface and can send and receive real time information for all of their patients using an exchange of HL7 messages.</p> <p>In addition to viewing the complete patient immunization record, the STChealth platform provides immunization forecasting information to indicate when the next vaccine in a series is due, while also validating that all vaccines received to this point are valid and were given within the correct time intervals. Should a patient need an adjusted forecast due to an existing condition that affects their vaccine schedule, the forecaster can accommodate and make the adjustments needed.</p>	STC	STChealth Immunization Registry Platform	HL7 2.5.1
<p>Patient Portal</p>			
<p>Epic receives the response (HL7v2 RSP message) containing the missing COVID-19 vaccination record, which automatically reconciles into the patient's chart.</p>	Epic	MyChart	HL7v2 RSP^K11 message
<p>The reconciled vaccination data is used to generate a vaccine credential, that includes a QR code, following the Verifiable Clinical Information (VCI) standard directly in the MyChart app or in a printable PDF to use as proof of vaccination for the concert.</p>	Epic	MyChart	SMART Health Cards Verifiable Clinical Information (VCI)

Ambulatory Vaccine Clinic			
<p>Following the concert, Riku visits his primary care physician to get his COVID-19 booster dose. He informs the medical staff he received his second COVID-19 dose from the local pharmacy.</p> <p>NextGen initiates a query to the state immunization registry which returns historical immunization confirming he received his second COVID-19 dose and is due for his booster dose.</p>	NextGen	NextGen Enterprise EHR; NextGen Enterprise Rosetta	HL7 V2 QBP/RSP
<p>The second COVID-19 dose is reconciled to the patient’s chart and the COVID-19 booster is ordered and administered. The VXU message is sent to the state immunization registry.</p>	NextGen	NextGen Enterprise EHR; NextGen Enterprise Rosetta	HL7 V2 VXU
<p>Data entry issues caused by the intake staff, i.e. missing phone number, missing ethnicity and incorrect date of birth ‘2998’ have caused the state immunization registry to return ACKs with warnings of the missing data.</p> <p>The medical staff is able to monitor the order, update the missing data and resend the immunization.</p>	NextGen	NextGen Enterprise EHR; NextGen Enterprise Rosetta	HL7 V2 VXU
HIE and State Public Health Registry			
<p>The message is forwarded to the state registry through the HIEs public health gateway. The IIS recently required the inclusion of Race and Ethnicity in the VXU, but that training has not filtered down to the staff at the clinic and they skipped over entering some of the info into the report. The message is processed at the registry and returns an ACK noting rejection for the missing race and ethnicity, and warnings for the missing phone. The HIE generates a report for the facility indicating the rejected submissions. The pattern of missing information is visible in the dashboard, and feedback is supplied to the facility to help them with updating training efforts to enter complete reports.</p> <p>According to the latest HIMSS-AIRA IIP ACK and data quality guidance, “While [] errors are currently communicated [individually], they are most helpful when they are summarized, reviewed and acted upon. The information contained within acknowledgment reports can assist healthcare providers and administrators in knowing what happens to patient data after it is sent to an IIS. Comparing reports over time will enable healthcare staff to examine error trends and confirm error reductions. Using acknowledgment message summary reports and addressing [] errors are opportunities to ensure immunization data is accurate, keep patients and communities properly vaccinated and conserve limited resources. Public health, healthcare and health information intermediaries all play an important role in improving data quality.”</p>	Shasta Networks	Ascent Public Health Gateway and Inform Module	HL7 V2 VXU



<p>The ambulatory clinic circles back to the form to locate Riku’s Race, Ethnicity, Phone, and updates the patient’s record with the complete demographic information. The submission is successfully submitted which is apparent in the ACK dashboard from the HIE.</p>			
<p>When the state registry initially received the messages with limited data, they were flagged with error notices and returned to the sender. Medical organizations and jurisdictions can configure the settings in the registry to identify data elements that are incorrect or incomplete, flag those messages and return a notice to the sender to warn them that the data was not in best practice, or error the message altogether and return for correction.</p> <p>In this case, the message errored and was returned to the provider for correction.</p> <p>After receiving the corrected information, the message will then be stored in the registry and contain improved data; therefore, improving the capabilities for correct identity matching and appropriate display of correct and complete vaccine information on patient portals or 3rd party applications, such as STChealth’s MyIR app that displays a consumer’s vaccination information.</p>	STC	STChealth Immunization Registry Platform	HL7 2.5.1
<p>Hospital</p>			
<p>After receiving his booster dose, Riku develops symptoms that align with COVID-19, and so he starts isolation. During isolation his symptoms worsen, and he decides he needs to visit the Emergency Room at his nearest hospital.</p> <p>After being registered, the Hospitals Cerner Millennium system triggers a query to the state immunization registry and receives a response (QBP/RSP) for Riku’s immunization history and forecast. His immunization history directly writes to the local record as the state registry is a trusted source.</p> <p>Upon intake, the care team is able to see that Riku is fully vaccinated for COVID-19 even though his doses were administered outside the health system, but due to his symptoms decide to order a PCR test to see if he might be a breakthrough case and add his diagnosis to the chart.</p>	Cerner	Cerner Millennium, Immunizations Hub Query and Import	HL7 V2 QBP/RSP
<p>The results of the PCR test come back positive for SARS-CoV-2 and are signed in the EMR. An initial case report is generated, with details including Riku’s COVID-19 vaccination status and positive test result and is sent to the AIMS platform and APHL to determine the proper public health jurisdictions for the case report to be sent.</p> <p>A Reportable Response is sent back to the EMR.</p>	Cerner	Cerner eCR	eICR



Data exchange standards:

Vendor	Product	Category	Protocol	Interop Body	Interop Profile	Interop Actor	Interop Message	Send or Receive	Transaction Description
Cerner	Cerner PowerChart, Cerner Hub Immunizations Query and Import, Cerner eCR	Electronic Health Records	HL7v2	HL7	Z34	Electronic Health Record System	QBP^Q11	Send	Request Vaccination History
			HL7v2	HL7	Z32	Electronic Health Record System	RSP^K11	Receive	Receive Vaccination History
			HL7 FHIR®	HL7	eICR	Electronic Health Record System	CDA	Send	Send Initial Case Report
Epic		Electronic Health Record and Patient Portal	HL7v2	HL7	Z44	Electronic Health Record System (EHR-S)	QBP^Q11	Send	Request Vaccination History and Forecast
			HL7v2	HL7	Z42	Electronic Health Record System (EHR-S)	RSP^K11	Receive	Receive Vaccination History and Forecast
			W3C VC	SMART Health IT	SMART Health Cards	Credential Issuer	Proof of Vaccination	N/A	Generate a SMART Health Card as proof of COVID vaccination
NextGen	NextGen Enterprise EHR NextGEN Enterprise Rosetta	Electronic Health Records; Rosetta HL7 Interface	HL7v2	HL7	Z34/Z44	Electronic Health Record System	QBP^Q11	Send	Request Vaccination History and Forecast
			HL7v2	HL7	Z42	Electronic Health Record System	RSP^K11	Receive	Receive Vaccination History and Forecast
			HL7v2	HL7	Z22	Electronic Health Record System	VXU^V04	Send	Submit immunization

			HL7v2	HL7	Z23	Electronic Health Record System	ACK V04	Receive	Acknowledgement Received
			HL7v2	HL7	Z22	Electronic Health Record System	VXU^V04	Send	Submit immunization
Shasta	Ascent Interoperability platform	Public Health Gateway	HL7v2	HL7	Z44	HIE Interface Engine	QBP^Q11	Receive	Receive QBP patient query
			HL7v2	HL7	Z44	HIE Interface Engine	QBP^Q11	Send	Send QBP patient query
			HL7v2	HL7	Z42	HIE Interface Engine	RSP^K11	Receive	Receive RSP query response
			HL7v2	HL7	Z42	HIE Interface Engine	RSP^K11	Send	Send RSP query response
			HL7v2	HL7	Z22	HIE Interface Engine	VXU^V04	Receive	Receive immunization
			HL7v2	HL7	Z22	HIE Immunization Reporter	VXU^V04	Send	Submit immunization
			HL7v2	HL7	Z23	HIE Immunization Reporter	ACK^V04	Receive	Analyze VXU Acks
STC	Immunization Information System Software Platform	IIS	HL7 v. 2.5.1	HL7	Z22	Immunization Administration Message	VXU	Receive	Administered Immunization
			HL7 v. 2.5.1	HL7	Z34 / Z44	Immunization Administration Message	QBP	Receive	Immunization Query
			HL7 v. 2.5.1	HL7		Immunization Administration Message	ACK	Send	Immunization Acknowledgment

References:

eICR

[https://hl7.org/fhir/us/ecr/electronic initial case report eicr transaction and profiles.html](https://hl7.org/fhir/us/ecr/electronic%20initial%20case%20report%20eicr%20transaction%20and%20profiles.html)

eCR CDA

https://www.hl7.org/implement/standards/product_brief.cfm?product_id=519

HL7v2 Immunization Messaging

https://www.hl7.org/implement/standards/product_brief.cfm?product_id=490

SMART Health Cards

<https://www.w3.org/TR/vc-data-model/>