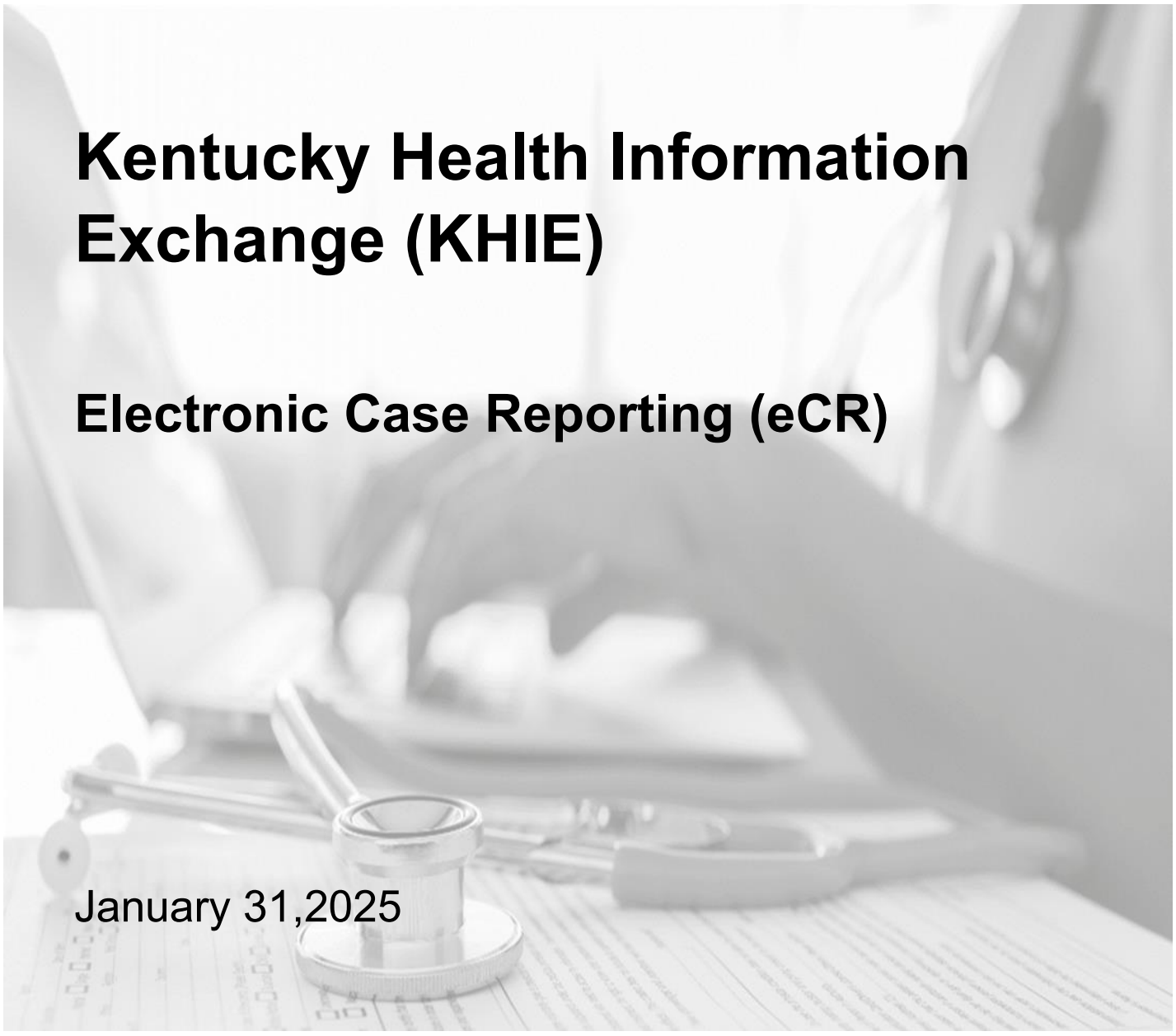
Kentucky Health Information Exchange (KHIE)

Electronic Case Reporting (eCR)



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Contents

1. Introduction

This Electronic Case Reporting (eCR) onboarding guide serves as a resource for best practice to ensure successful onboarding and submission to Kentucky Health Information Exchange (KHIE) and Kentucky Department for Public Health (KDPH). This guide serves as a companion to the Clinical Document Architecture provided by HL7 International Organization at Overview - Clinical Document Architecture v2.0.0-sd.

In this onboarding guide, the use of the words *health care organization (HCO), facility, facilities, organization, organizations, provider, and providers* is interchangeable with KHIE Participant.

2. Kentucky Reportable Diseases and Conditions

As required by Kentucky regulation 902 KAR 0:020, health professionals and healthcare facilities meeting criteria for case reporting of Kentucky patients are required to submit the data to the KDPH. Please refer to Kentucky Reportable Diseases and Conditions for an overview of reportable diseases and conditions in Kentucky.

3. Electronic Case Reporting (eCR) vs. Electronic Laboratory Reporting (ELR)

Electronic Case Reporting (eCR) and Electronic Laboratory Reporting (ELR) are two distinct reporting mechanisms. In the context of public health reporting, Kentucky is a dual reporting state and, therefore, both ELR and eCR are required submissions.

- eCR is the automatic generation of an electronic initial case report (eICR) from an HCO's electronic health record system (EHR) and transmitted to KDPH for review and action.
- ELR is the transmission of laboratory results from an HCO's EHR, a Laboratory Information System (LIS), **or** from a commercial laboratory to public health agencies (PHAs).
- eCR does not replace ELR. Both are required reporting in Kentucky.

Electronic Lab Reporting is the transmission of laboratory reports that identify reportable conditions from laboratories to PHAs. Electronic case reporting is the automatic generation of an electronic initial case report (eICR) from an HCO's EHR system. The big difference is that since the eCR is sent from an EHR and not from a laboratory system, it doesn't require the presence of a lab result to send.

The purpose of this guide is to provide guidance for the eCR Onboarding.

For further information regarding ELR onboarding, please visit Electronic Laboratory Reporting - Kentucky Health Information Exchange.

4. Onboarding and Data Validation

A health care organization shall onboard and validate eCR data when the organization is a new KHIE participant that has never submitted eCR data previously or is an existing eCR participant that has undergone an EHR/EMR vendor change.

Participants currently submitting eCR shall inform KHIE's eCR Team at KHIESupport@ky.gov if any of the following occur in association with the connection to KHIE:

- EHR version or upgrade change, interface change or upgrade, interface connection is or has been down
- cyber incident occurs
- there is a chance of interruption of mapping within the EHR or other system(s) that could impact the data quality of eCR messages
- or any regulatory change(s) regarding reportable conditions that impact eCR reporting

These outlined conditions can impact the eCR data quality. KHIE and KDPH eCR teams may request a meeting to determine next steps to ensure the eCR data quality remains intact.

Participants may be notified by the KHIE eCR team of persistent data quality issues, failures in the state or federal platform, or other unresolved issues; upon recommendation by KDPH or the Centers for Disease Control and Prevention (CDC), KHIE reserves the right to request the participant to return to the test environment for data revalidation.

On behalf of KDPH, KHIE reserves the right to request the participant to onboard and validate eCR for any reason deemed to negatively impact data quality or any other issue within the KHIE or other state or federal platforms.

5. Preparations for eCR Onboarding

To ensure the KHIE onboarding process runs efficiently, the KHIE Participant should engage in the following preliminary preparation:

1. Sign the KHIE Participation Agreement and the eCR addendum.
2. Provide an excel spreadsheet (format below) with a list of all physical locations that will be reporting eCRs through the HCO.

Name	Address	City	State	Zip	Facility Phone Number	NPI (group or individual)	Facility Contact Name	Facility Contact Email

*Please note: The HCO should have at least one (1) geographic location in Kentucky to onboard for eCR.

3. Provide contact name(s) and email address(es) for the EHR vendor.
4. Confirm your EHR eCR vendor has the capability to submit an eCR and has completed the CDC onboarding approval process.
5. The HCO must complete the onboarding process through the CDC *prior* to onboarding with KHIE.
    a. This onboarding is conducted by the Association of Public Health Laboratories (APHL) platform known as APHL Informatics Messaging Services (AIMS).
    b. Contact ecr.cdc@gov to onboard with APHL AIMS platform.
6. Other considerations:

a. Weekly half hour (1/2) work sessions are required for eCR onboarding. Representatives from the EHR vendor and the HCO are strongly encouraged to attend. This is necessary for the successful advance through the onboarding and data validation process.
b. The HCOs that are hospitals and/or have a high volume of reportables will be given priority in eCR onboarding.
c. A large percentage of eCRs are triggered through laboratory test ordering or result submission. Therefore, HCOs are strongly encouraged to onboard for electronic laboratory reporting (ELR) with KHIE *prior* to initiating eCR onboarding. While eCR expands on the entire patient encounter and not just the laboratory data, ELR provides the LOINC and SNOMED code foundation that is essential to successful eCR reporting.
d. Live patient data is a KDPH requirement for eCR validation. Healthcare organizations with low volume or no volume (have not submitted an EPID 200 form or have submitted a small number of EPID 200 forms) may experience increased onboarding timelines.

6. Basic Onboarding Process Overview

When the preliminary work has been completed, the KHIE eCR Team will provide instruction on the onboarding and data validation route determined by KDPH. The DSM address for this environment will be shared with the HCO. The HCO may be required to submit eCRs to the test and/or production environment, depending on vendor capability, test patient production capability, and KDPH validation requirements. The KDPH data validation process will include sending eCR production data to the KHIE production environment. This is considered best practice for onboarding and data validation.

KHIE environments are set up to send data to AIMS/APHL, where the Reportable Conditions KY Management System (RCKMS) rules are validated to determine whether the case report meets the requirements for reportability response (RR). If the case report meets the RCKMS rules for reportability, the case report is passed along to the Kentucky Department for Public Health's (KDPH) National Electronic Disease Surveillance System (NEDSS) database.

The HCOs actively onboarding will configure their EHR to send ALL CONDITIONS. When the connection has been established with KHIE, the HCOs will participate in a ½ hour per week onboarding and data validation meeting with the KHIE eCR team. The purpose of the weekly meeting is to provide feedback and guidance until the data validation targets are met and permission is granted from KDPH. The KDPH requires the validation of each condition prior to moving the condition to KDPH's production environment.

KDPH plays an integral part of the eCR validation process. The KHIE's eCR team will validate data coming into KHIE and pass it on to AIMS, and if deemed reportable, the case report will be sent to Public Health for reportability. Under KDPH's leadership, KHIE's eCR team will validate case reports on a condition-by-condition basis for data accuracy. As case reports are validated through end-to-end testing, KDPH will approve HCOs to move into production for electronic submission. While KDPH determines final approval, HCOs will continue to report manually, in addition to their new electronic submissions. The process of final determination may take up to two weeks.

7. KHIE Connectivity for eCR Submission

7.1 Organizational Identifier (OID)

The OID is a unique identifier for each HCO that sends eCR messages to KHIE. Prior to onboarding, the HCO OIDs for both the UAT/Test and PROD/Production environments should be shared with the KHIE eCR Team. This allows for configuration and set up in the KHIE system.

OID's should be populated in these segments of the message:

- SourcePatient ID
- SourcePatient Info
- XDSDocumentEntry.patientId
- XDSSubmissionSet.patientId

7.2 Facility Name

The Facility Name is populated in the Organization Name field. This field is case sensitive. KHIE will need this prior to onboarding.

Example: KHIE HOSPITAL or khie hospital

7.3 Direct Secure Messaging

Direct Secure Messaging (DSM) is a technical standard for exchanging health information between health care entities in a trusted network. DSM is used by the HCO's EHR to submit real time eCRs to KHIE. The eCR is forwarded to APHL AIMS. The AIMS platform sends the eCR to KDPH.

To establish this trusted exchange route, HCOs should obtain their sending DSM addresses (testing and production) from their EHR vendor and share them with the KHIE eCR Team. The KHIE eCR Team will, depending on the onboarding route determined by KDPH, send the appropriate KHIE DSM address to the HCO.

7.4 Configured for ALL CONDITIONS

In response to the surveillance of COVID 19 and Monkeypox, early eCR EHR products implemented EHR systems that limited the eCR conditions that were sent to public health agencies. This meant that EHR vendors could limit conditions to send COVID 19 or Monkeypox eCRs. Current standards require HCOs to submit ALL CONDITIONS and should request their EHR vendors to configure for ALL CONDITIONS and not limit eCR transmission to a subset of conditions.

When onboarding to the AIMS platform, the CDC will guide the EHR vendor to load ALL CONDITIONS. The EHR should be able to create the all-condition, all-jurisdiction eCR.

8. eRSD Role in eCR Triggering

The Electronic Reporting and Surveillance Distribution (eRSD) is used to guide triggering and reporting of eCRs from HCOs and their EHRs. This eRSD system contains the trigger codes value sets, or Reportable Conditions Trigger Codes (RCTC).

8.1 Latest Version Required

eRSD is used to trigger an eCR when one of the specific trigger codes value sets is matched to a triggering event. There are six primary ways in which a triggering scenario can occur in an EHR system. EHR systems need to account for all these trigger scenarios by matching data recorded in the EHR against the trigger codes within the eRSD. All HCOs are ***required*** to be on the latest version of the eRSD system codes.

Keeping the latest eRSD version in EHRs is crucial. Without it, important public health reports may be missed and not sent to public health authorities. The eRSD's value sets will continually evolve, including the addition of codes and conditions reportable to public health. New codes might also be added for rapid use in public health emergencies, so EHRs need to handle both routine and emergent eRSD updates.

Sometimes, HCOs use local codes that aren't specified in the eRSD. Most major laboratories send results to EHRs using the nationally recognized SNOMED and LOINC terminologies. However, not all EHRs record these values as they are received. EHRs using local codes may need to map them to the nationally accepted SNOMED and LOINC terminologies to trigger reports correctly. This mapping process can be unique to individual healthcare providers; it's recommended that healthcare providers and EHR implementers collaborate to determine these needs.

8.2 eRSD Trigger Code Set Update Process

Not only should HCOs work with their EHR vendor to ensure the latest eRSD system code version is implemented, but also that there is an ongoing process for updating these code sets, as they are subject to change. To make that process easier, HCOs and EHR vendors can complete a no cost registration to subscribe and receive notifications of routine and emergent updates to the eRSD Trigger Code Set. Each update will include an effective start date. This date is the date the set of codes should be implemented and in use by reporting facilities and EHR vendors. This site can be found here Electronic Reporting and Surveillance Distribution.

8.3 Primary Ways an eCR is Triggered

There are six primary ways in which a triggering scenario can occur in an EHR system. For onboarding and data validation purposes with KDPH, each reportable condition may be validated for each of these triggering scenarios.

- Lab Orders (LOINC) – when a laboratory order is placed and the order matches a value set within the eRSD “Lab_Order_Test_Name” value set. Healthcare organizations should ensure that their laboratory information system is able to order reportable condition testing for conditions that are reportable to KDPH.
- Diagnoses and Suspected Diagnoses (SNOMED and ICD 10 CM) – when a diagnosis is recorded in the EHR that matches a value with the eRSD “ Diagnosis_Problem” value set. This data could be in the problem lists or diagnosis fields. If a suspected diagnosis is recorded in the EHR that matches

a value in the eRSD "Suspected_Disorder" value set, an eCR will also be triggered. The suspected diagnosis triggering may be used to replace lab order triggering for EHRs that cannot do lab order triggering.

- Lab Results (SNOMED) – when a laboratory result is received by the EHR where the lab result matches the value within the eRSD "Organism_Substance" value set.
- Lab Result Test Name (LOINC) – when a laboratory result is received by the EHR where the laboratory test name matches a value within the eRSD "Lab_Observation_Test_Name" value set.
- Medication (for version 3.X eCRs only) (CVX, RxNorm, SNOMED) – when a medication is administered or prescribed and matches a value within the eRSD "Medication" value set.

9. Reportability Responses (RR)

The Reportability Response (RR) is a consensus-based Health Level Seven International (HL7) standard developed for use in electronic case reporting (eCR) based on the HL7 Clinical Document Architecture (CDA). The RR is a companion document to the eICR, designed to pair one RR created for each eICR. The purpose of the RR is to allow for communication back to HCOs from public health agencies. For every eICR submitted by the HCO, there should be an RR back in return.

The Reportability Response (RR) file contains the diagnosed reportable condition(s), which is data not included in the eICR. A Document ID links the eICR and RR.

The RR serves as confirmation of the receipt of the case report from the HCO. The RR also communicates information on the status of reported conditions which includes the next steps an HCO may need to take for these conditions and their patients.

The RR contains the following information:

- The reportability status of conditions identified in an eICR.
- If there are reportable conditions, the jurisdiction(s) that were reported to, along with contact information for the PHAs.
- Information about reported conditions.
- Necessary follow-up testing or condition management information, including suggested or required clinical follow-up activities from the responsible PHA(s), including any additional reporting needs or infection control activities.
- Other relevant information such as clinical support resources suggested by the PHA(s) responsible for identified reportable conditions (e.g., treatment guidelines, fact sheets).

10. Test Case Development- Required Elements

If part of the eCR validation process includes the development of test patients, the list below includes the required elements.

1. **Sending System Information** – Message Type, Sending Facility, Message Creation Date, Sending System ID, Sending System, Message Status
2. **Patient Information** – Patient Name, Date of Birth, Race, Sex, Sending System Patient ID, Reporting Age, Ethnicity, Contact Info

3. **Social History Information** – Birth Sex, Is this person deceased?
4. **Clinical Information** – Investigation ID, Condition, Admission Date, Hospital, Physician(s), Reporting Organization
5. **Encounter Details** – Date, Type, Department, Care Team, Description, Encounter, Date(s), Discharge Disposition, Location, Problem Type, Date(s), Initial Case Report Trigger Code Problem Observation, Problem, Trigger Code (CodeSystem), RCTC OID (Version), Date(s)
6. **Social History** – Smoking Status, Birth Gender, Sexual Behavior
7. **Immunizations** – Vaccine, Date, Status, Route, Dose, Lot No., Manufacturer Organization, Performer Organization, Performer Person
8. **Plans of Treatment** – Scheduled Orders, Initial Case Report Trigger Code Lab Test Order, Trigger Code (CodeSystem), RCTC OID (Version), Ordered Date
9. **Results** – Lab Results, LOINC, Test, Flag, Result, Ref Range, Updated By
10. **Results Panel** – Results, Date(s), Initial Case Report Trigger Code Result Observation, Trigger Code (CodeSystem), RCTC OID (Version), Interpretation, Date(s), Reference Range, Reference Range Interpretation
11. **Problems** – Concern, Concern Status, Date(s), Problem Type, Problem, Date(s)
12. **Miscellaneous Notes**
13. **Administered Medications**
14. **Reason for Visit –** Reason, Comments

10.1 Pregnancy Status Reporting Data Elements

For submission of pregnancy related data, Relevant Clinical Info is captured in OBR-13 and Reason for Study/Test is captured in OBR-31 in the HL7 message. Reason for Study/Test are ICD-10 code sets in the electronic message.

Feed Type	Element Name	Recommended Value	Comments
OBR-13	Relevant Clinical Info	O	Relevant Clinical Info is captured in OBR-13.
OBR-31	Reason for Test/Study	RE	Reason for Test/Study, if populated, must contain an ICD-10 code.

11. Other Data Validation Tips

The following information contains common data validation points that frequently need correction during the eCR validation process.

11.1 Naming Guidance for Test Patients

When creating and using test messages “Test” is used as the patient first name followed by the facility name and condition for last name.

Example: First Name: Test; Last Name: KHIECOVID

11.2 Baby Name Guidance

For the baby names in eCR, “Baby” followed by the sex-specific suffix “Babyboy” or “Babygirl” is used as the first name and the mother’s last name is used as the baby’s last name.

Example: First Name: Babygirl; Last Name: Smith

11.3 AuthorInstitution Field

AuthorInstitution field is a required field.

Example:

```
<Slot name="authorInstitution">
    <ValueList>
      <Value>ECR WEBSITE TESTCASE
HOSPITAL^^^^^^^^^^2.16.840.1.111111.3.1579.777277729874.84.500</Value>
    </ValueList
```

12. Validation Tool

Attached is the link to the HealthIT message validator that the facility and EHR vendor can use to validate messages to correct any issues or missing information in case reports. Prior to moving forward with KHIE onboarding, run the messages through the validator tool and check the scorecard to assure achieving at least 80-85% success rate. https://site.healthit.gov/c-cda/scorecard

13. Resource Guide Grid

Location	Transaction
Overview - Clinical Document Architecture v2.0.0-sd	Clinical Document Architecture - Overview
General Guidance - Consolidated CDA (C-CDA) v4.0.0-ballot	C-CDA Guidance
eCR Companion Guide.pdf	eCR Companion Guide

Location	Transaction
https://site.healthit.gov/c-cda/scorecard	HealthIT Message Validator Tool
https://apps.legislature.ky.gov/law/kar/titles/902/002/020/	eCR Regulation
Getting Started with eCR | eCR | CDC	To start the onboarding process with CDC
Sample XML Document	Sample XML Document

14. Standard Coding Guides

Appropriate use of standardized codes is essential for the capture of accurate eCR data.

International Classification of Diseases ICD-10CM – Diagnoses for a patient's visit are recorded using standardized coded values outlined by the International Classifications of Diseases ICD-10th Revision code sets. The diagnosis codes are used by healthcare facilities throughout the United States for medical coding, reporting, and billing purposes. Reporting of ICD-10 values to KHIE and KDPH provides additional information on a patient's health care visit. These codes must be mapped correctly within the messages to ensure the KDPH data quality standards are met.

ICD-10 codes as the following: PHVS Administrative Diagnosis ICD-10CM

Logical Observation Identifiers Names and Codes (LOINC) are the international standard for identifying health measurements, observations, and documents. LOINC codes are utilized for observations and measurements, such as laboratory tests, physical findings, radiology studies, and claim attachments. LOINC and SNOMED codes are strongly encouraged for use in observation reporting.

Download LOINC – LOINC

Systematized Nomenclature of Medicine-Clinical Terms (SNOMED CT) is a systematically organized computer-processable collection of medical terms providing codes, terms, synonyms, and definitions used in clinical documentation and reporting. SNOMED CT comprehensive coverage includes clinical findings, symptoms, diagnoses, procedures, body structures, organisms and other etiologies, substances, pharmaceuticals, devices, and specimens. http://www.ihtsdo.org/snomed-ct/

Current HL7 Standard Code Set CVX – Vaccines Administered – The CDC's National Center of Immunization and Respiratory Diseases (NCIRD) developed and maintains the CVX (vaccine administered) code set. The link has the most up-to-date values. It includes both active and inactive vaccines available in

the US. The CVX codes for inactive vaccines allow transmission of historical immunization records. When an MVX (manufacturer) code is paired with a CVX (vaccine administered) code, the specific trade named vaccine may be indicated. These codes should be used for immunization messages using either HL7 Version 2.3.1 or HL7 Version 2.5.1. The version of the CVX code set for certification can be found on the archive page.

RxNorm provides normalized names for clinical drugs and links its names to many of the drug vocabularies commonly used in pharmacy management and drug interaction software, including those of First Databank, Micromedex, Multum, and Gold Standard Drug Database. By providing links between these vocabularies, RxNorm can mediate messages between systems not using the same software and vocabulary. It is administered by the National Library of Medicine (NLM). RxNorm

15. Common Acronyms

AIMS	APHL Informatics Messaging Services
APHL	Association of Public Health Laboratories
CCDA	Consolidated Clinical Document Architecture
CDC	Centers for Disease Control and Prevention
Data Element	The basic unit of information within messages. Data elements have requirements and standards for how they are sent.
DDE	Direct Data Entry
eCR	Electronic Case Reporting
EHR	Electronic Health Record
eICR	Electronic Initial Case Report
EMR	Electronic Medical Record
eRSD	Electronic Reporting and Surveillance Distribution
Field	A slot for information within an HL7 message; a segment could have many fields; a field could have many components.
HCO	Healthcare Organizations
HISP	Health Information Service Provider
HL7	Health Level Seven
KDPH	Kentucky Department for Public Health
KHIE	Kentucky Health Information Exchange
LHD	Local Health Department
LOINC	Logical Observation Identifiers Names and Codes
NEDSS	National Electronic Disease Surveillance System
NPI	National Provider Identifier
OID	Organizational Identifier
Onboarding	Onboarding is the process of enabling healthcare organizations to submit electronic case reports to public health agencies.
PHA	Public Health Agencies
RCKMS	Reportable Conditions KY Management System
RCTC	Reportable Conditions Trigger Codes
RR	Reportable Response

Segment	The divisional units of HL7 messages; each HL7 message consists of several segments (example, MSH is the Message Handler segment).
SNOMED CT	Systemized Nomenclature of Medicine, Clinical Terms
XML	Extensible Markup Language