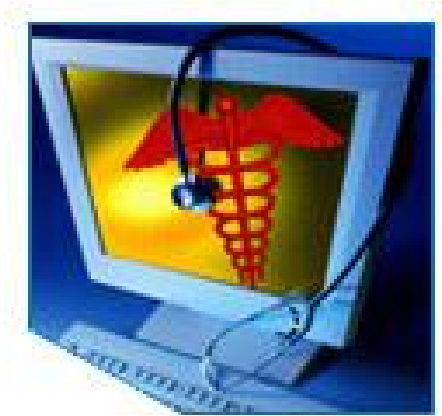


Healthcare Information Technology Standards Panel

Population Health – Biosurveillance



June 29, 2007

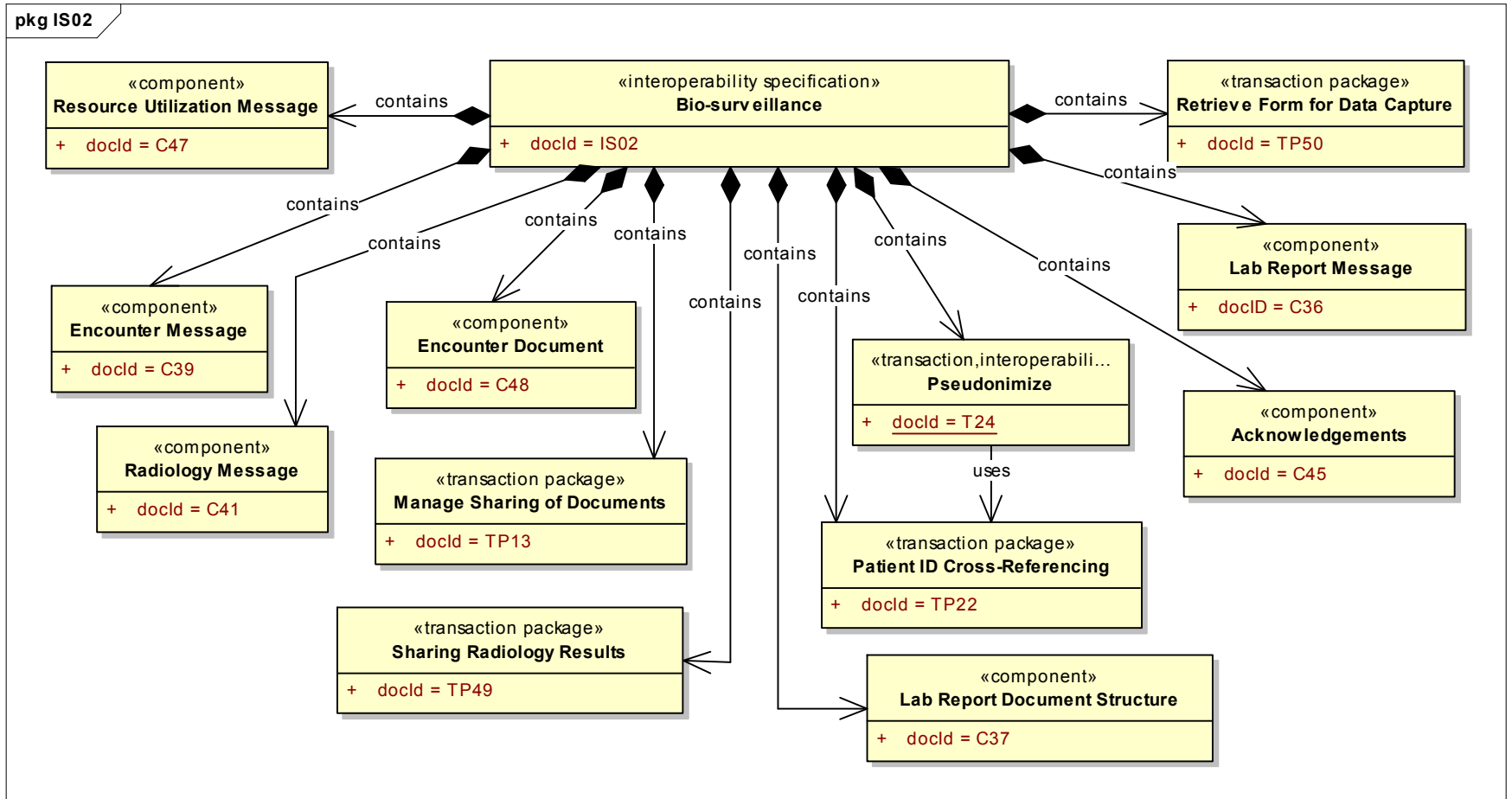
IS02- Biosurveillance

- ▶ Developed in support of the AHIC Biosurveillance Use Case
 - Communication of Visit data to authorized Public Health Authority from:
 - Inpatient
 - Emergency Department
 - Ambulatory
 - Communication of Result data to authorized Public Health Authority from:
 - Laboratory
 - Radiology
 - Communication of Resource Utilization Data for:
 - Bed Availability

- ▶ Key Requirements/Functionality Enabled by the IS
 - Support the communication of AHIC Biosurveillance Minimal Data Set
 - Minimize double-counting
 - Privacy Protection
 - Anonymization
 - Pseudonymization
 - Supports Message-based Communication and Document Sharing-based Communication



Biosurveillance



IS02 Biosurveillance Set of Constructs : *Communications*

Document	Document Description
HITSP/TP13	HITSP Manage Sharing of Documents Transaction Package <ul style="list-style-type: none"> - facilitates the registration, distribution and access of patient electronic health records across health enterprises - uses the <i>Cross-Enterprise Document Sharing (XDS)</i> Integrating the Healthcare Enterprise (IHE) Integration Profile - Based on ISO 15000
HITSP/C45	HITSP Acknowledgements Component <ul style="list-style-type: none"> - reports receipt of messages sent using transaction, transaction package, and interoperability messages - Acknowledgements may be either for successful receipt or unsuccessful receipt.
HITSP/T29	HITSP Notification of Document Availability Transaction <ul style="list-style-type: none"> - notifies its recipient that a document is available and provides the information needed to retrieve the document - leverages the IHE IT Infrastructure (ITI) Technical Framework (TF), Volume 2 (ITI TF-2) Supplement for Notification of Document Availability (NAV)
HITSP/TP-50	HITSP Retrieve Form for Data Capture Transaction Package <ul style="list-style-type: none"> - supports public health authority reportable conditions monitoring and management - enables capture of supplemental data variables not typically maintained in an electronic health record or laboratory information system - more seamless integration with the local electronic management system. - allows for the local system to retrieve a form specific to the identified potential public health threat.



IS02 Biosurveillance Set of Constructs : *Privacy Protection*

Document	Document Description
HITSP/IST-24	HITSP Pseudonymize Transaction <ul style="list-style-type: none"> - defined to support pseudonymization of protected health information - Pseudonymization: The process of supplying an alternative identifier that permits a patient to be referred to by a key that suppresses his/her actual identification information
HITSP/TP22	HITSP Patient ID Cross-Referencing Transaction Package <ul style="list-style-type: none"> – deals with identifying and cross-referencing different patient attributes for the same patient. – leverages the IHE IT Infrastructure (ITI) Technical Framework (TF), Volume 2 (ITI TF-2) for Patient ID Feeds and Patient ID Cross-referencing (PIX). – Based on HL7 V2.5
HITSP/C25	HITSP Anonymize Component <ul style="list-style-type: none"> - provides specific instruction for anonymizing data that is ready for transmission to a Biosurveillance Information System (BIS). - specified only within the context of the Biosurveillance AHIC Data variables - guidance is provided based upon identification risk assessment - any further use beyond those defined in the AHIC Biosurveillance Use Case should undergo a privacy risk assessment and assert mitigating privacy protection measures.



IS02 Biosurveillance Set of Constructs : *Content (Document)*

Document	Document Description
HITSP/C35	HITSP Lab Terminology Component <ul style="list-style-type: none"> - defines the vocabularies and terminologies utilized by laboratories and clinicians to order and report the findings from laboratory tests.
HITSP/C37	HITSP Laboratory Report Document Structure Component <ul style="list-style-type: none"> - lab results and interpretations structured as an XML document for interchange to meet requirements for human and machine readability. - Leverages the IHE Laboratory Technical Framework Sharing Laboratory Reports (XD*-LAB)
HITSP/C48	HITSP Encounter Document Component <ul style="list-style-type: none"> - supports the process of sending patient encounter data (excluding laboratory, radiology) in a document sharing functional flow scenario. - Patient encounter data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics. - Leverages IHE Patient Care Coordination Medical Summary (XDS-MS)
HITSP/TP-49	HITSP Radiology Report Document Transaction Package <ul style="list-style-type: none"> - specifies sharing of imaging “documents” such as radiology images and reports; - it presents a solution for sharing imaging documents based on XDS. - XDS-I extends XDS by sharing, locating and accessing DICOM instances from its original local sources, e.g. for radiologists or oncologists. - Leverages IHE Radiology Technical Framework (XDS-I)

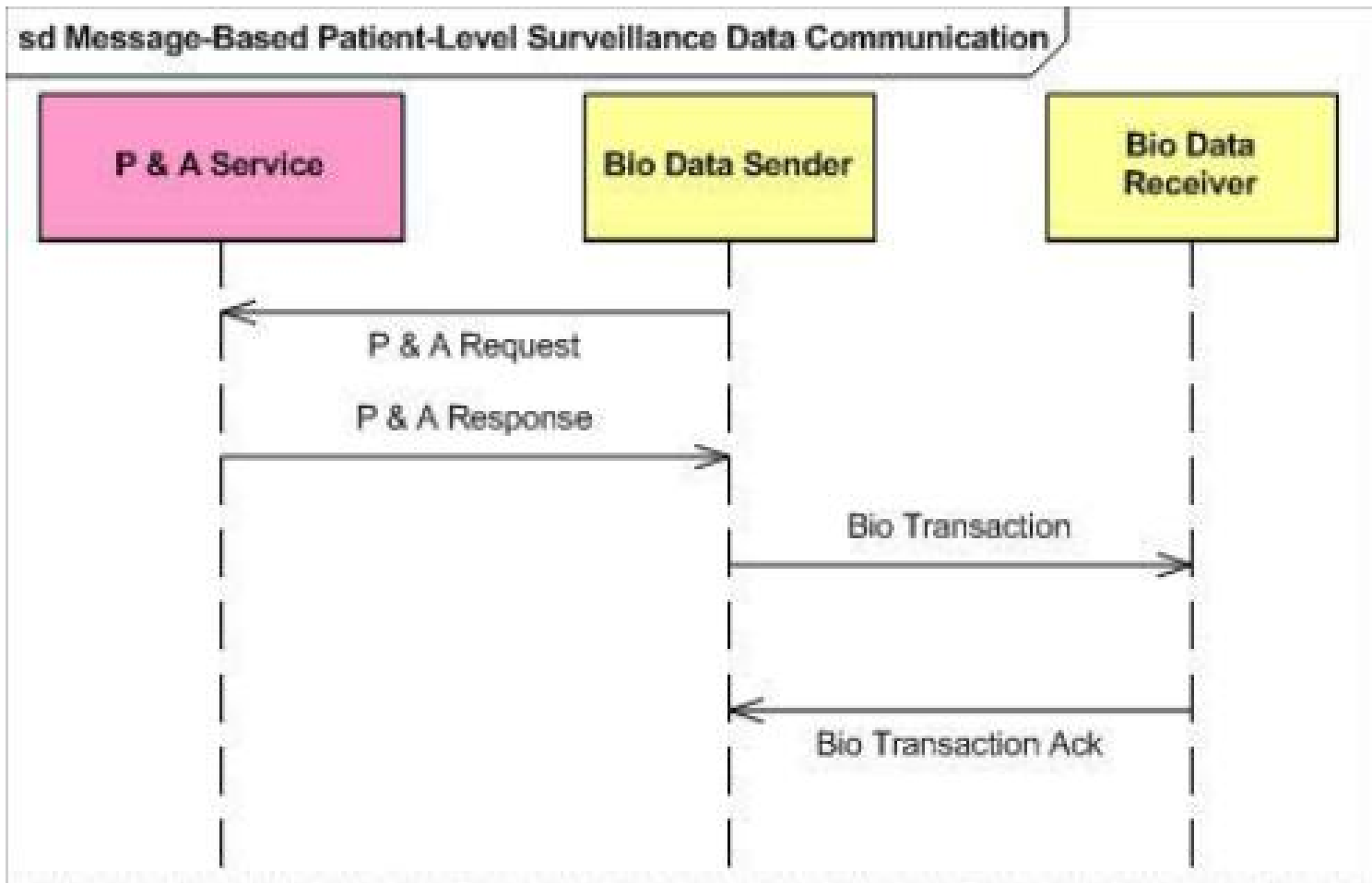


IS02 Biosurveillance Set of Constructs : *Content (Document)*

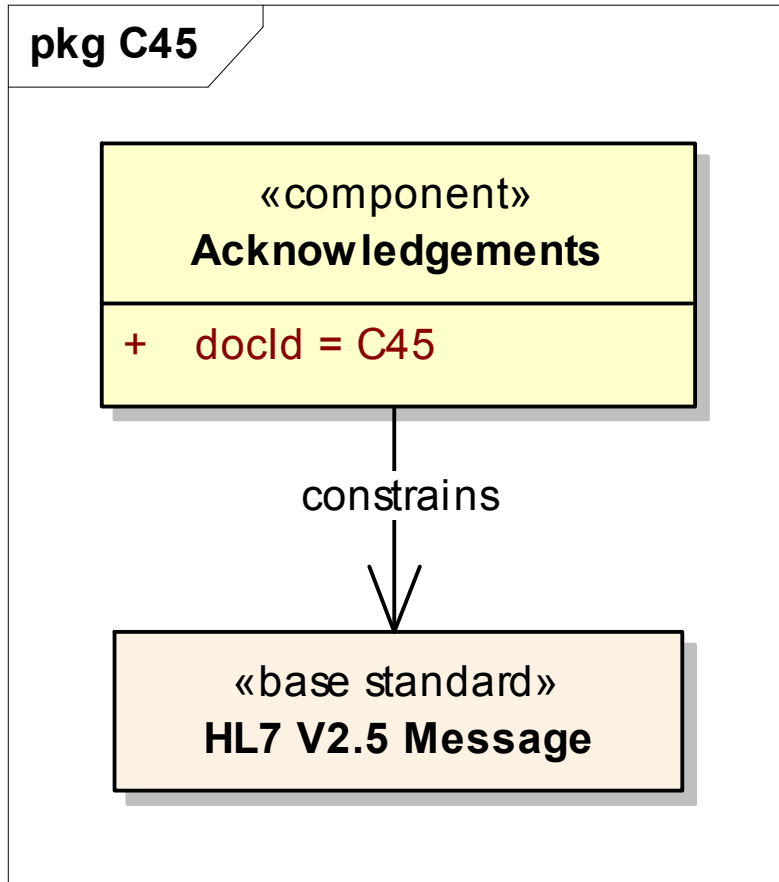
Document	Document Description
HITSP/C36	HITSP Laboratory Result Message Component <ul style="list-style-type: none"> - describes the structure and data fields for the HL7 Version 2.5.1 ORU – Unsolicited Observation Message – (Event R01) as constrained for the HITSP EHR and Biosurveillance Use Cases
HITSP/C39	HITSP Encounter Message Component <ul style="list-style-type: none"> - support the process of sending patient encounter data (excluding laboratory, radiology) from a Biosurveillance Message Sender to a Biosurveillance Message Receiver - Patient encounter data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics - Leverages HL7 V2.5 ADT data structure
HITSP/C41	HITSP Radiology Results Message Component <ul style="list-style-type: none"> - supports the process of sending radiology result data from a Biosurveillance Message Sender to a Biosurveillance Message Receiver. - Radiology result data are captured as part of the normal process of care performed by healthcare providers - Leverages the HL7 V2.5 ORU^R01 unsolicited result message
HITSP/TP49	HITSP Resource Utilization Message Component <ul style="list-style-type: none"> - specifies the message and content necessary to report utilization and status of health provider resources to public health agencies - reflects the current status of harmonization efforts between HL7 and OASIS.



IS-02 Biosurveillance



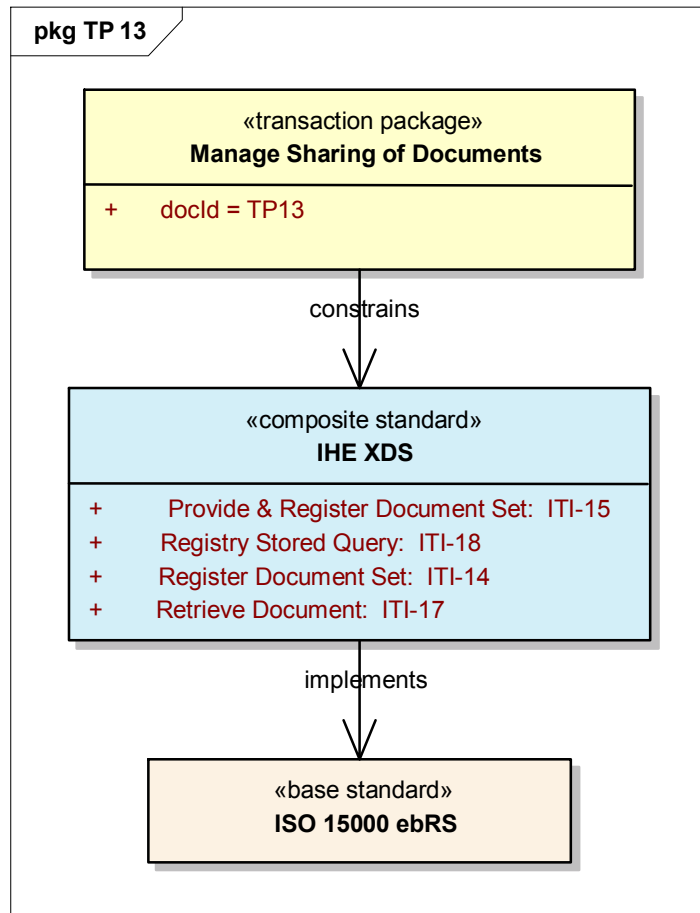
C45 – Acknowledgements



- ▶ reports receipt of messages sent using transaction, transaction package, and interoperability messages
- ▶ HL7 V2.5 Ack
- ▶ Key Concepts:
 - Acknowledgements may be either for successful receipt or unsuccessful receipt
- ▶ No constraints



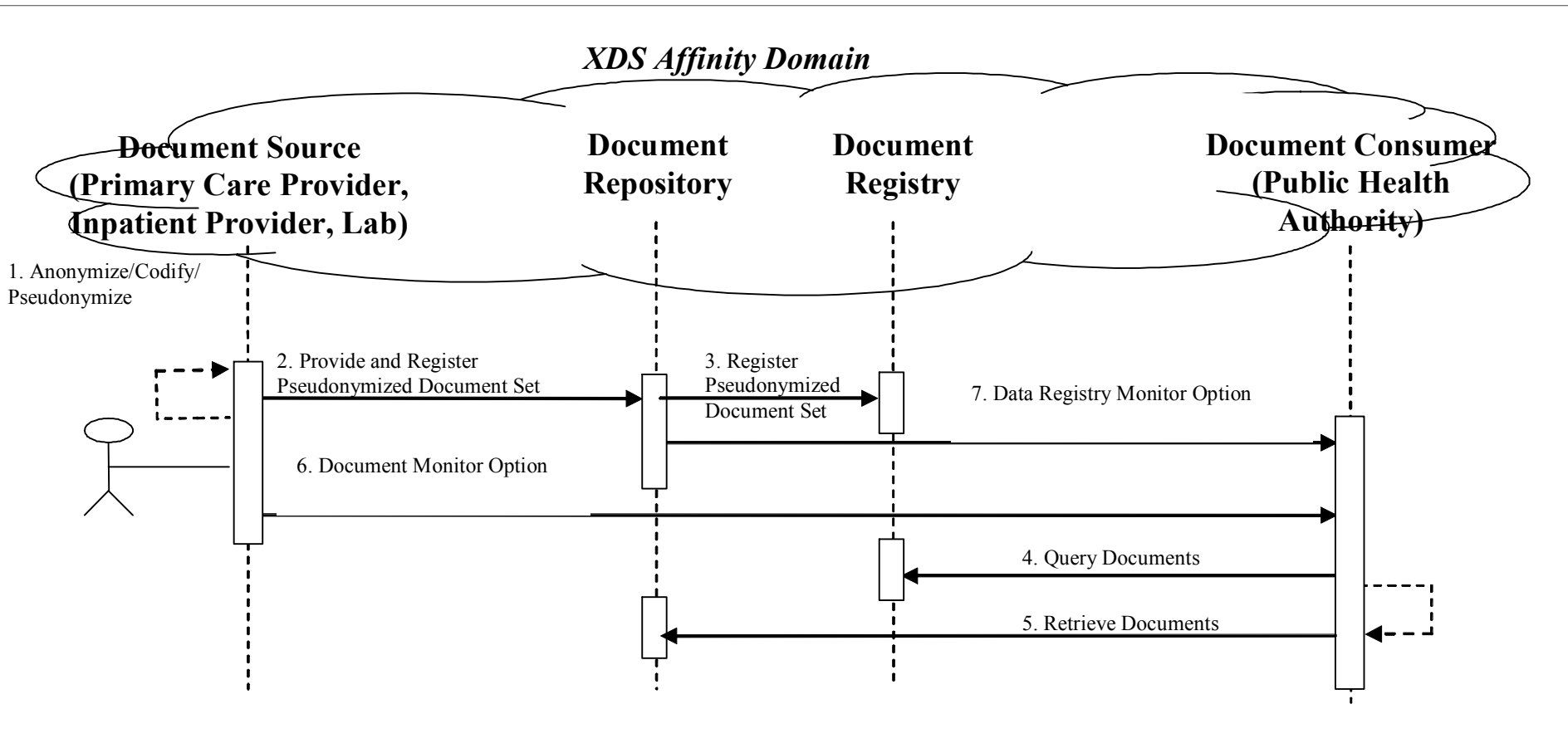
Transaction Package TP-13 – Manage Sharing of Documents



- ▶ Defines the methodology and metadata requirements for the registration, storage and retrieval of documents across repositories within an affinity domain
- ▶ Calls out a subset of transactions defined in the IHE XDS Cross Document Sharing Specification, Dec 2006
 - ITI 14 Register Document Set
 - ITI 15 Provide and Register Document Set
 - ITI 18 Registry Stored Query
 - ITI 17 Retrieve Document
 - ISO 15000 ebRS
- ▶ Key Concepts: Sharing of source attested documents, document content neutral, document registry, document repositories distributed or centralized.



Transaction Package TP-13 Manage Sharing of Documents

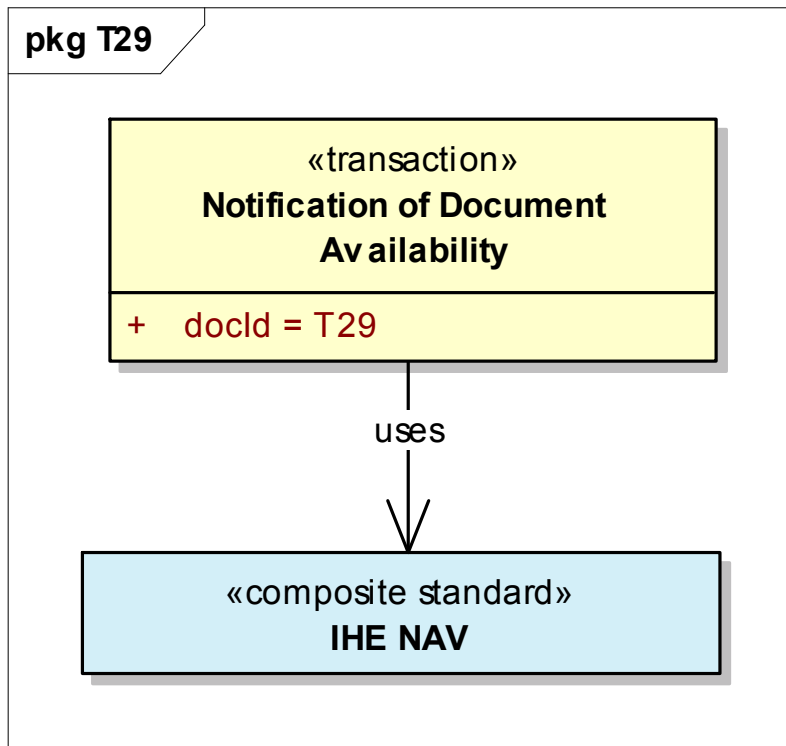


IS02 Constraints on TP13 – Manage Sharing of Documents

- ▶ **Support queries and stored queries for documents which do not require a patient id as a query parameter.**
- ▶ **XSDDocumentEntry.eventCodeList**
 - An XSDDocumentEntry.eventCodeList metadata element that contains a value from a controlled vocabulary describing reportable conditions should be required when there is a known condition as required by or of interest to public health authorities.
- ▶ **XSDDocumentEntry.confidentialityCode**
 - The confidentialityCode attribute shall contain the following OID when the submitted document has been pseudonymized according to HITSP/T24 Pseudonymize Transaction: 2.16.840.1.113883.3.88.5.2.1
- ▶ **XSDDocumentEntry.patientID and XDSSubmissionSet.patientID**
 - shall contain either the actual patient identifier used by the XDS registry, or shall contain a pseudonymized identifier generated during the HITSP/T24 Pseudonymize Transaction.
- ▶ **XSDDocumentEntry.sourcePatientID and XDSSubmissionSet.sourcePatientID**
 - shall contain either the actual patient identifier used by the document source, or shall contain a pseudonymized identifier generated during the HITSP/T24 Pseudonymize Transaction.



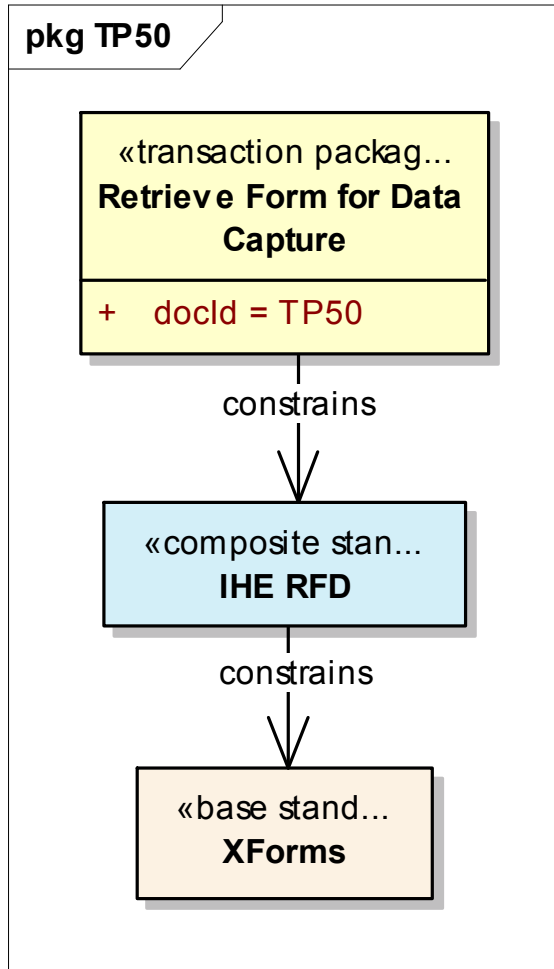
C29 – Notification of Document Availability



- ▶ notifies its recipient that a document is available and provides the information needed to retrieve the document
- ▶ IHE IT Infrastructure (ITI) Technical Framework (TF), Volume 2 (ITI TF-2) Supplement for Notification of Document Availability (NAV)
- ▶ Key Concepts:
 - Recommended a ‘publish and subscribe’ mechanism to IHE to make NAV a feasible tool
- ▶ No constraints



TP50 – Retrieve Form for Data Capture



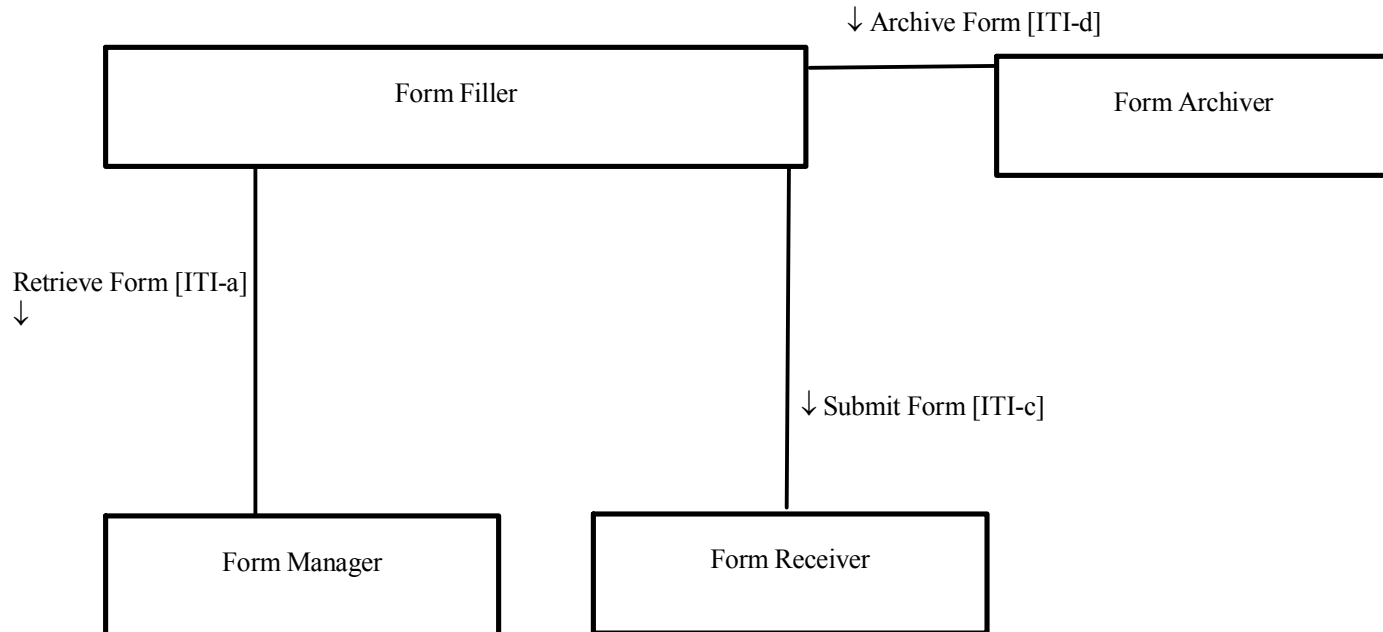
- ▶ Enables capture of supplemental data variables not typically maintained in an electronic health record or laboratory information system
- ▶ Underlying source material is from the IHE IT Infrastructure (ITI) Technical Framework (TF) Supplement, RFD
- ▶ supports public health authority reportable conditions monitoring and management

Key Concepts

- Form Manager
 - Form Filler
 - Form Retriever
 - Form Archiver
- ▶ No Constraints



Transaction Package TP50: Retrieve Form for Data Capture

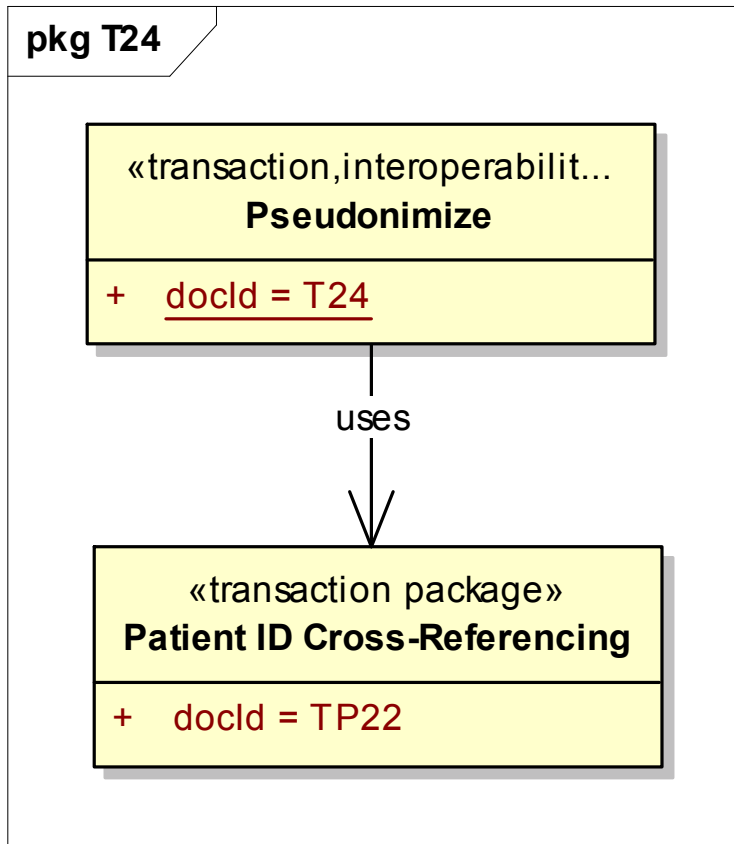


► Four Technical Actors and Three Transactions

- The Form Manager retrieves a form from the Form Filler containing the Public Health Information report form
- The EHR or Lab System allows the user to fill in the content
- The completed form is submitted to the Form Receiver
- The completed form is optionally archived



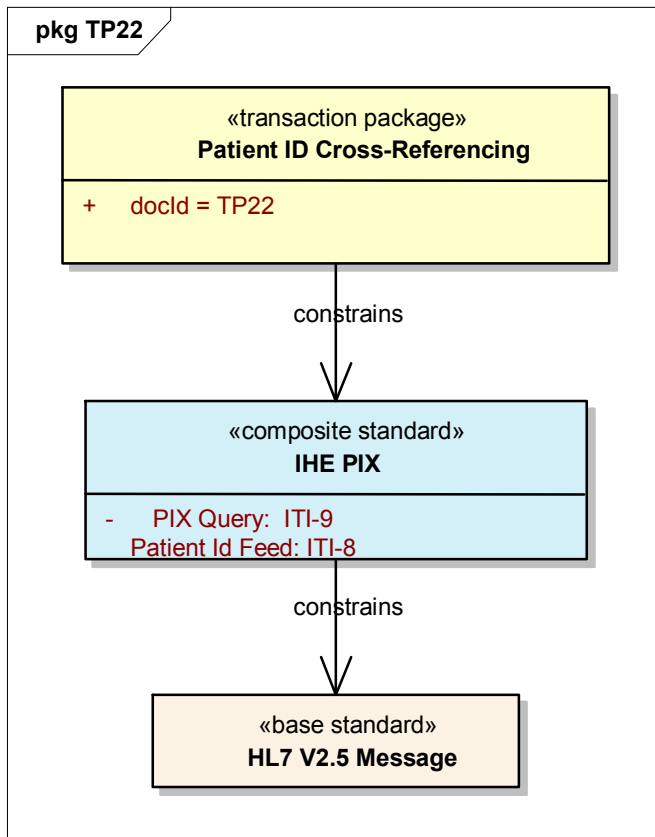
TP24 – Pseudonymize Transaction



- ▶ Defines the methodology for assigning a pseudoidentifier to patient-level data in lieu of the patient identifiers.
- ▶ Implements ISO TS23257 Health Informatics: Pseudonymize
- ▶ Relies upon transactions from the IHE IT Infrastructure (ITI) Technical Framework (TF), Volume 2 (ITI TF-2), specifically:
 - ITI-8: Patient Identity Feed [§3.8.1]
 - ITI-9: Pix Query [§3.9.1]
- ▶ Key Concepts
 - Leverages a the PIX manager to assign pseudoidentifiers
 - Constraints guided by HIPAA and Risk Analysis
 - Passes *patient demographic information* that is mapped using a cryptographic algorithm by Pseudonymization Service



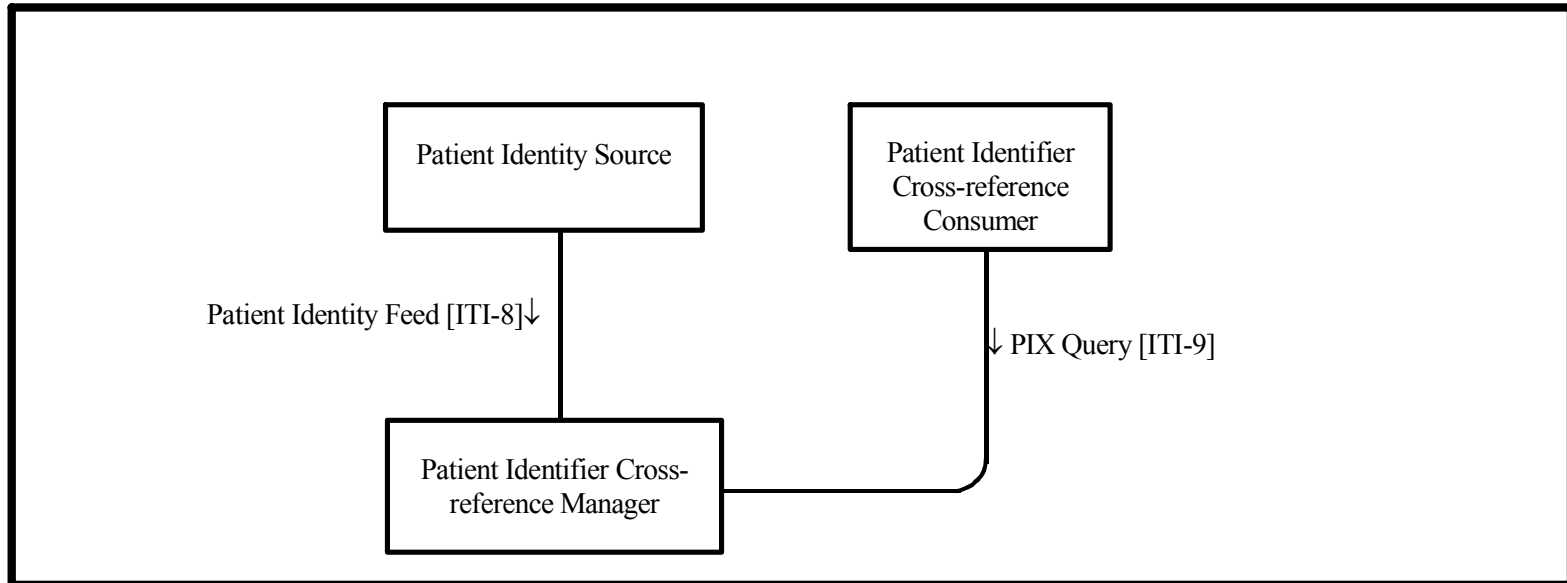
TP22 – Patient Identity Cross-Referencing



- ▶ Defines the methodology for identifying and cross-referencing different patient attributes for the same patient.
- ▶ Underlying source material is from the IHE IT Infrastructure (ITI) Technical Framework (TF), Volume 2 (ITI TF-2), specifically:
 - ITI-8: Patient Identity Feed [§3.8.1]
 - ITI-9: Pix Query [§3.9.1]
 - used by any system capable of performing real-time HL7 query and response and/or unsolicited patient demographic feed transactions.
- ▶ Key Concepts
 - Patient Identity Demographics, HL7 Query/Response



Transaction Package TP22: Patient ID Cross-Referencing

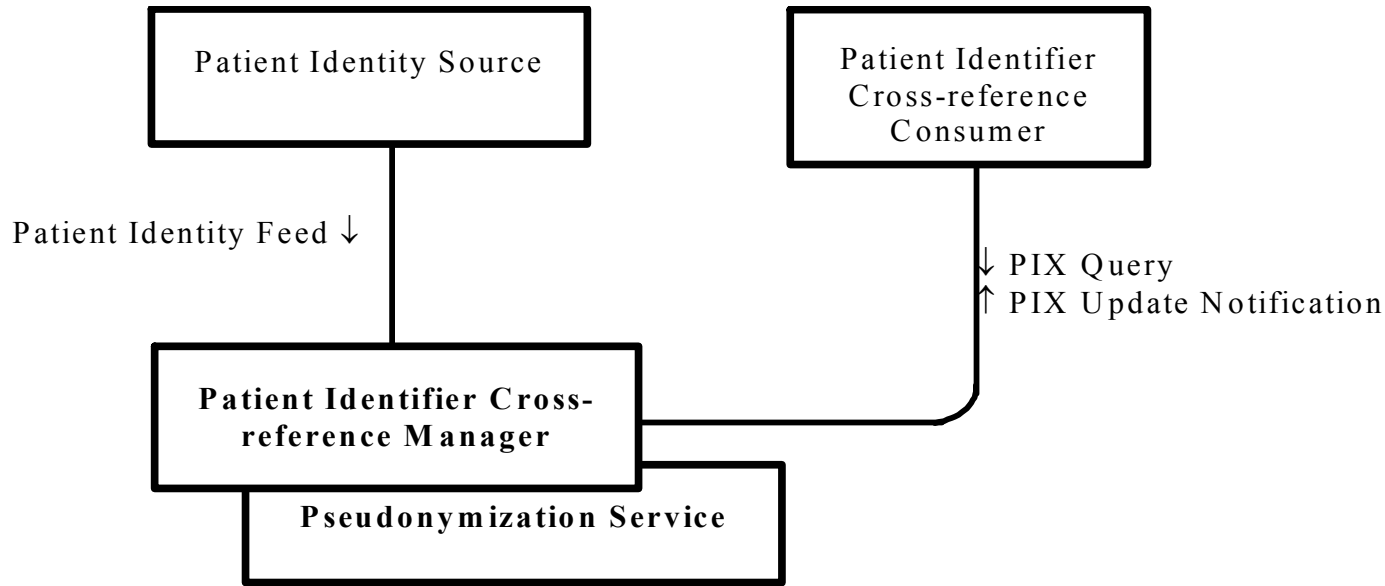


▶ Three Technical Actors and Two Transactions

- The Patient Identity Source which creates, updates or merges Identities and communicates them with the Patient Id Cross-Reference Manager
- The Patient Id Cross-Reference Manager that manages those identities and links them across identification domains (Process and Algorithm are not specified by HITSP as they are an application function within the Technical Actor).
- The Patient Id Cross-Reference Consumer which queries to link on Id in one identification domain to Ids in one or more other identification domains.



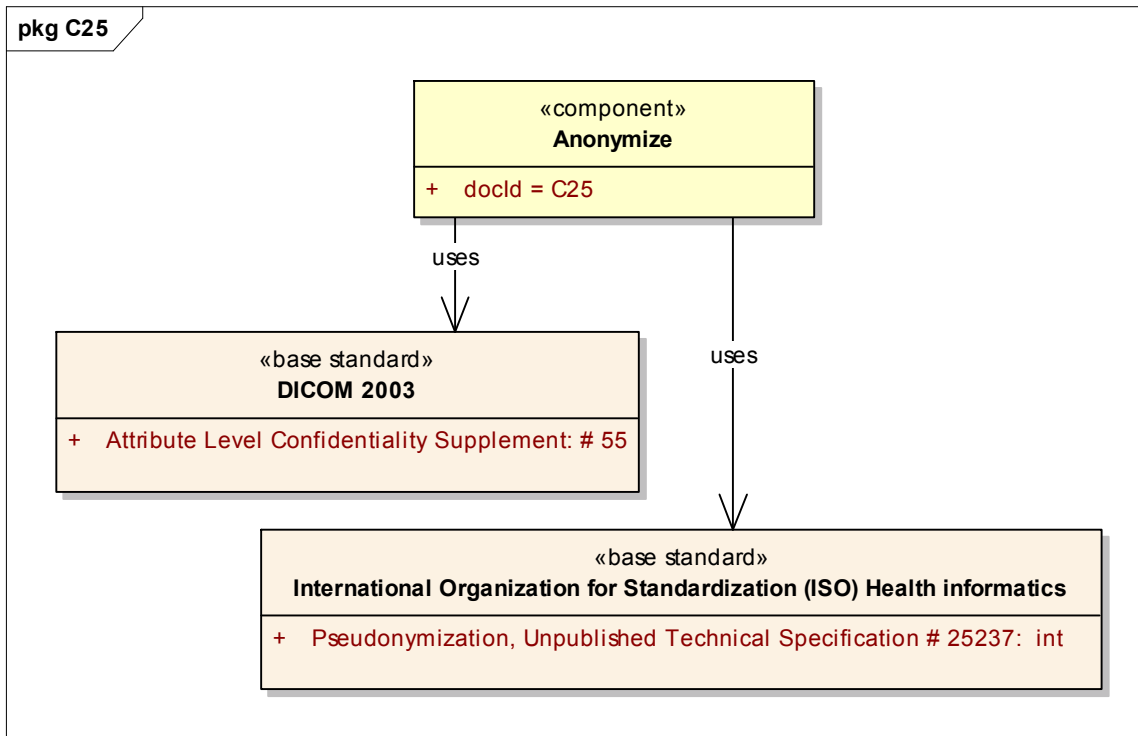
Transaction Package TP22: Patient ID Cross-Referencing



To obtain pseudo-identifying information for a patient, Patient Identifier Cross-Reference Manager invokes Pseudonymization Service via a remote procedure call (RPC) to which it passes *patient demographic information* that is mapped using a cryptographic algorithm by Pseudonymization Service to the pseudo-identifying information that is returned to the caller.



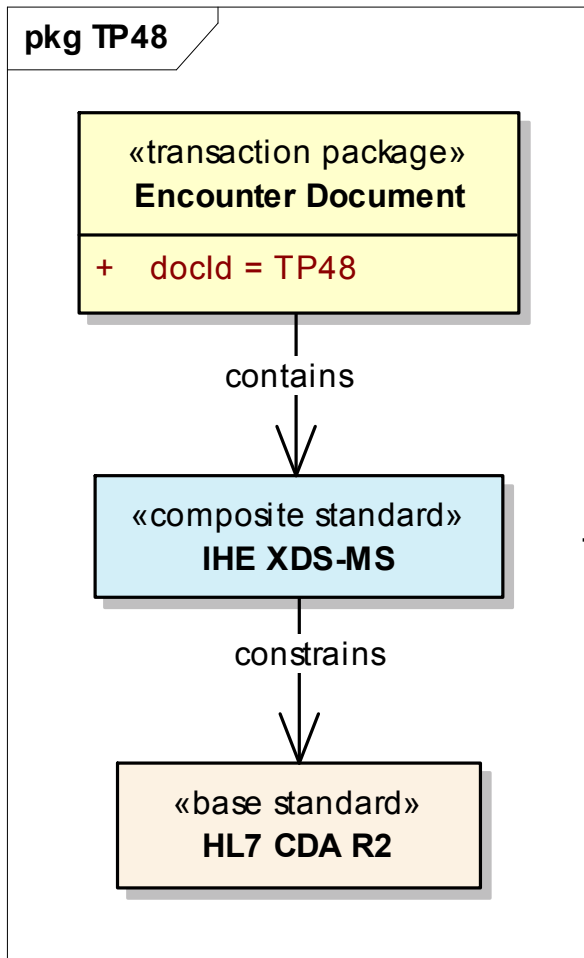
C25 – Anonymize



- ▶ Specifies requirements for anonymizing AHIC Biosurveillance Minimal Data Set Content based upon risk analysis
- ▶ ISO TS23257 Health Informatics: Pseudonymization (anonymization specifications)
- ▶ Key Concepts
 - Specifies data element anonymization restrictions (e.g. HIPAA data element removal/roll-up)
 - Specifies requirements for encoding Freeform text
 - Specifies access protections for risks related to multi-variable and outliers



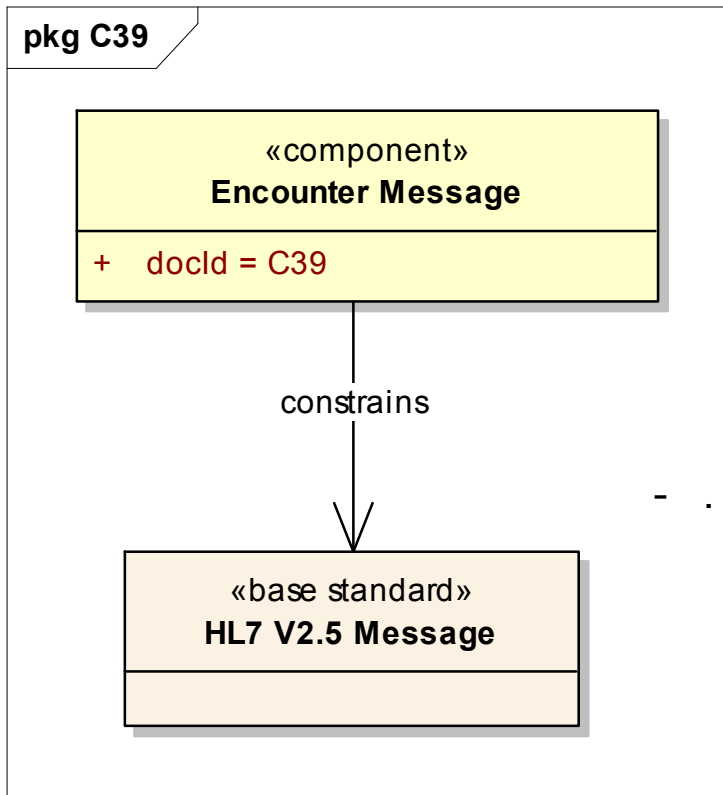
Documents Conveying AHIC Minimum Dataset ISC-48 Encounter Document



- ▶ Specifies content for patient encounter data (excluding laboratory, radiology) in a document sharing functional flow scenario
- ▶ IHE Patient Care Coordination Medical Summary (XDS-MS)
- ▶ HL7 CDA R2
- ▶ Key Concepts
 - Patient encounter data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.
 - Anonymized if required by jurisdiction
 - Constrained to AHIC Biosurveillance Minimum Data Set Standards Selection



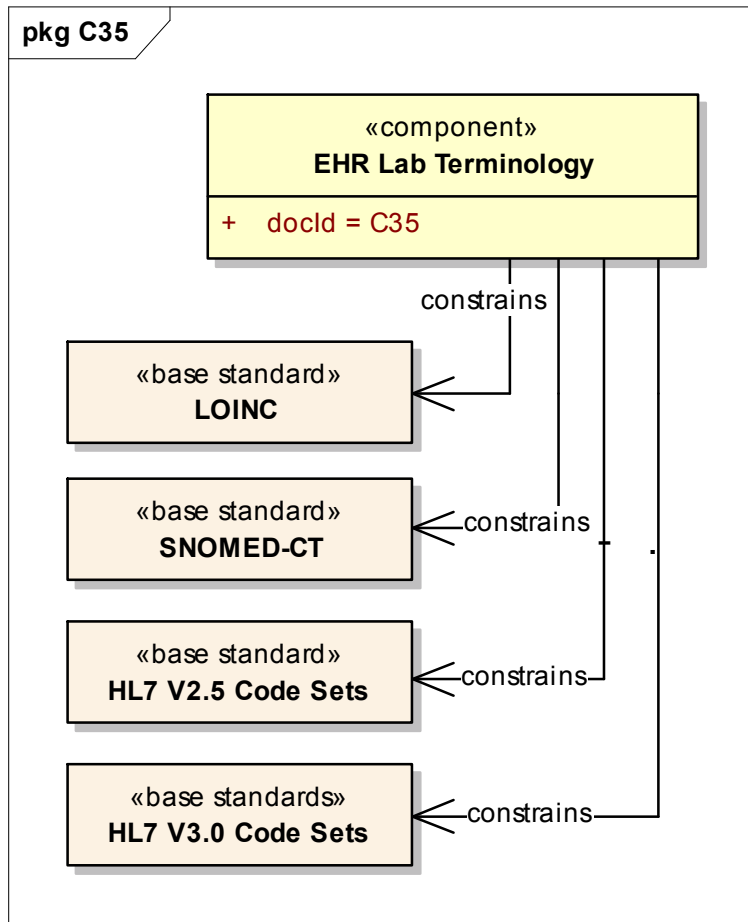
Documents Conveying AHIC Minimum Dataset ISC-39 Encounter Message



- ▶ Specifies content for patient encounter data (excluding laboratory, radiology) in a message-based functional flow scenario
- ▶ HL7 V2.5 ADT data structure
- ▶ Key Concepts
 - Patient encounter data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.
 - Anonymized if required by jurisdiction
 - Constrained to AHIC Biosurveillance Minimum Data Set Standards Selection



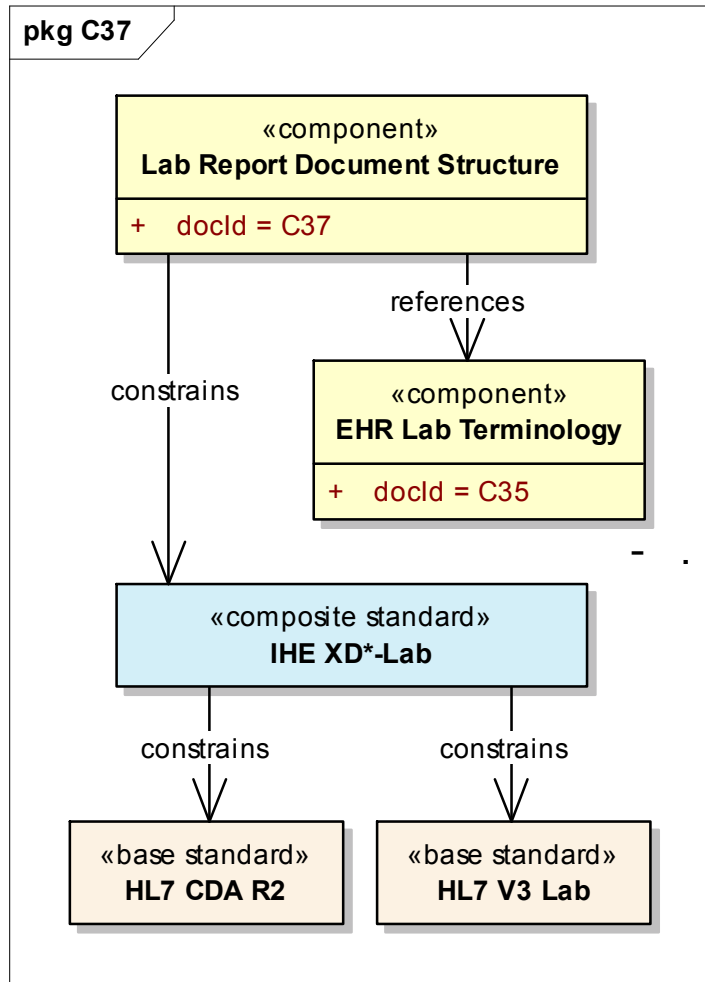
Documents Conveying AHIC Minimum Dataset ISC-35 EHR Lab Terminology



- ▶ Specifies vocabulary for Laboratory Results data
- ▶ LOINC, SNOMED-CT, HL7 V2.5 Code Sets, HL7 V3.0 Code Sets
- ▶ Key Concepts
 - Constrained to harmonize AHIC Biosurveillance Minimum Data Set Standards Selection



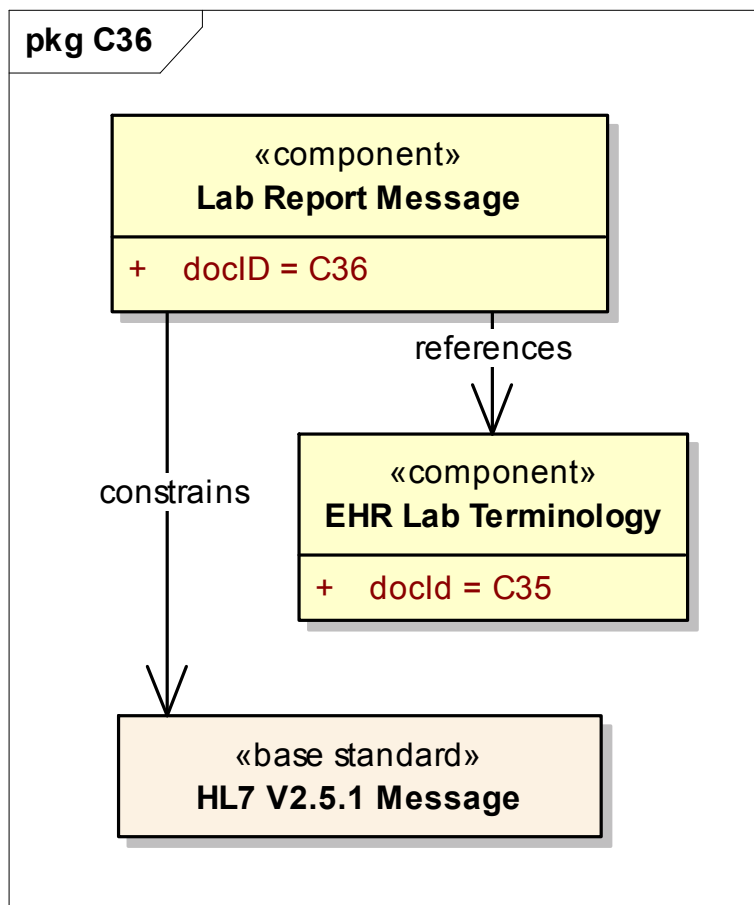
Documents Conveying AHIC Minimum Dataset ISC-37 Laboratory Report Document



- ▶ Specifies content for Laboratory Results data in a document-based functional flow scenario
- ▶ IHE Laboratory Technical Framework Sharing Laboratory Reports (XD*-LAB)
- ▶ HL7 CDA R2
- ▶ Key Concepts
 - Patient Laboratory data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.
 - Anonymized if required by jurisdiction
 - Constrained to AHIC Biosurveillance Minimum Data Set Standards Selection



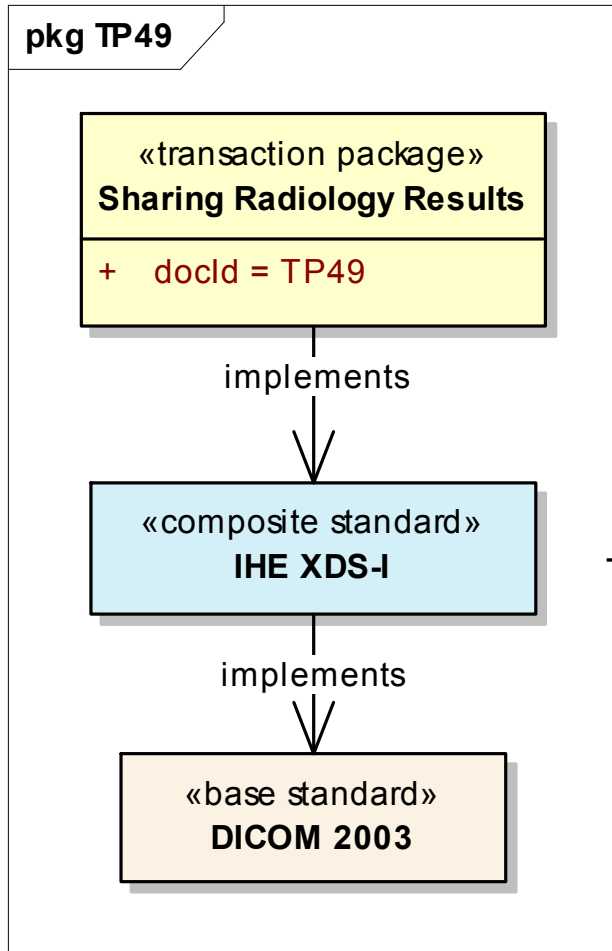
Documents Conveying AHIC Minimum Dataset ISC-36 Laboratory Message



- ▶ Specifies content for Laboratory Results data in a message-based functional flow scenario
- ▶ HL7 Version 2.5.1 ORU – Unsolicited Observation Message – (Event R01) as constrained for the HITSP EHR and Biosurveillance Use Cases
- ▶ Key Concepts
 - Patient Laboratory data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.
 - Anonymized if required by jurisdiction
 - Constrained to AHIC Biosurveillance Minimum Data Set Standards Selection



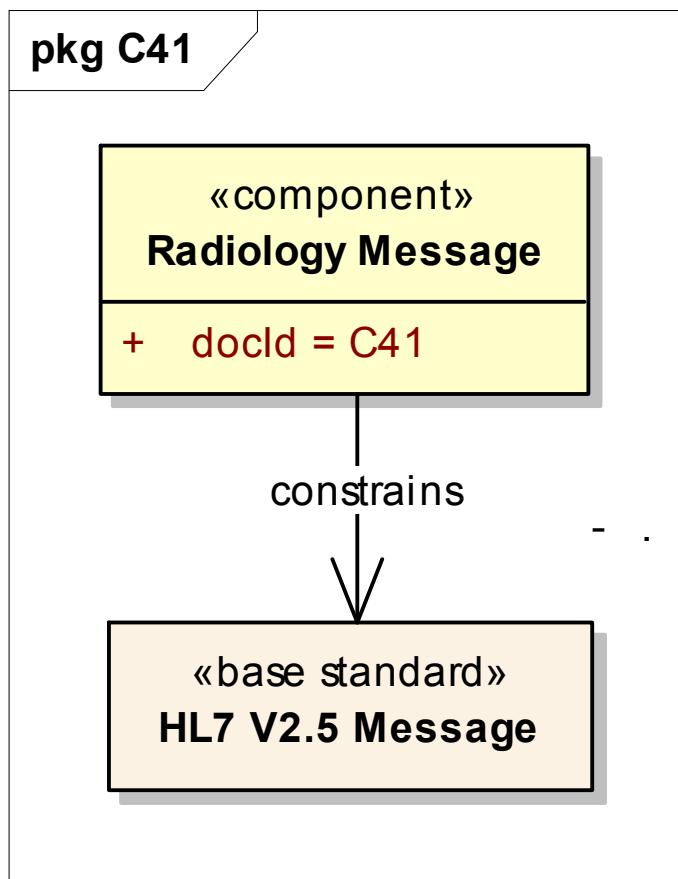
Documents Conveying AHIC Minimum Dataset ISC-49 Sharing Radiology Results



- ▶ Specifies content for patient radiology results in a document sharing functional flow scenario
- ▶ IHE Radiology Technical Framework (XDS-I)
- ▶ DICOM 2003
- ▶ Key Concepts
 - Patient radiology results data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.
 - Anonymized if required by jurisdiction
 - Constrained to AHIC Biosurveillance Minimum Data Set Standards Selection



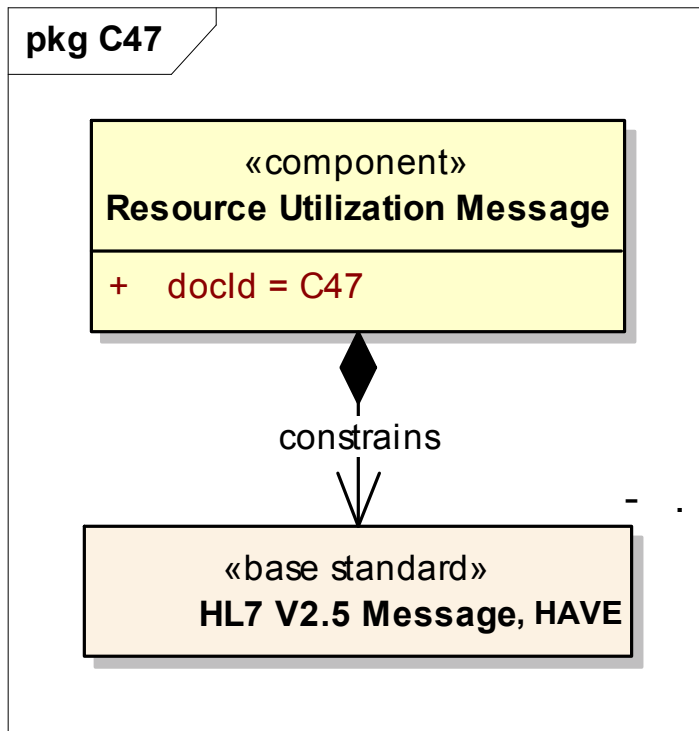
Documents Conveying AHIC Minimum Dataset ISC-41 Radiology Message



- ▶ Specifies content for patient radiology results in a message-based sharing functional flow scenario
- ▶ IHE HL7 V2.5 ORU^R01 unsolicited result message
- ▶ Key Concepts
 - Patient radiology results data are captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.
 - Anonymized if required by jurisdiction
 - Constrained to AHIC Biosurveillance Minimum Data Set Standards Selection



Documents Conveying AHIC Minimum Dataset ISC-47 Resource Utilization Component



- ▶ Specifies content for patient encounter data (excluding laboratory, radiology) in a message-based sharing functional flow scenario
- ▶ IHE HL7 V2.5 ORU^R01 unsolicited result message
- ▶ Hospital Availability Exchange (HAVE) dataset XML option
- ▶ Key Concepts
 - specifies the message and content necessary to report utilization and status of health provider resources to public health agencies
 - reflects the current status of harmonization efforts between HL7 and OASIS



IS02 AHIC Biosurveillance Minimum Dataset Vocabulary Constraints

▶ **Umbrella specification and Component Constructs used to communication Biosurveillance data requires vocabulary constraints:**

- Base Facility Data Elements
- Patient Data Elements
- Clinical Data Elements
- Facility Summary Report Elements for Bed Availability
- Laboratory and Radiology Test Orders
- Laboratory and Radiology Test Results

▶ The document and message content is constrained to anonymize as required by the jurisdiction

▶ Applies to:

- ISC-36 HITSP Laboratory Result Message Component
- ISC-39 HITSP Encounter Message Component
- ISC-41 HITSP Radiology Results Message Component
- ISC-37 HITSP Laboratory Report Document Structure Component
- ISC-48 HITSP Encounter Document Component
- ISTP-49 HITSP Sharing Radiology Results



AHIC Minimum Data Set Content Constraints

BASE FACILITY DATA ELEMENTS <i>[Submitted at baseline and when changes occur]</i>				
AHIC Data Element	Definition	Data Type	Selected Standards	Comments
Facility Identifier	Unique facility identifier.	Numeric	CMS IDs	“Organization ID” in HAVE document This is not necessarily a numeric data type.
Facility Name	Name of facility	String		“Organization Name” in HAVE document
Facility Location	City and State <i>[May use FIPS county codes]</i>	String	FIPS	“Organization Location” in HAVE document City and State are Coded data type.
Number of Facility Beds	All facility beds regardless of licensing status.	Numeric		Not routinely messaged
Number of Licensed Beds	All facility beds considered licensed in that jurisdiction.	Numeric		Not routinely messaged



AHIC Minimum Data Set Content Constraints

Daily Facility Summary Report Elements

AHIC Data Element	Data Type	Selected Standards
Admissions, Discharges, Deaths last 24 hours	Numeric	
Clinical Status	Coded	OASIS/HAVE Values as in definition
Facility Status	Coded	OASIS/HAVE Values as in definition
Facility Operations	Coded	OASIS/HAVE Values as in definition
Staffing	Coded	OASIS/HAVE Values as in definition
Decontamination Capacity	Coded	OASIS/HAVE Values as in definition
EMS Traffic Status	Coded	OASIS/HAVE Values as in definition
EMS Capacity	Numeric with text/comments	OASIS/HAVE Values:
EMS Census	Numeric with text/comments	OASIS/HAVE Values:

•Numeric Data type for Bed Types:

Adult ICU

Medical Surgical

Burn

•Pediatrics

Negative Flow Isolation

Available Ventilators

Pediatric ICU



AHIC Minimum Data Set Content Constraints

Patient Data Elements

AHIC Data Element	Data Type	Selected Standards	Comments
Pseudonymized Data Linker	Alphanumeric		Patient ID/MRN used to create the randomized linker patient ID.
Encounter Date/Time	Date/time field		
DOB (month and year of birth)	Date field		Proposed definition: "Date of Birth, limited to month and year for privacy purposes" May not be passing DOB for age over 89 due to HIPAA requirements.
Age	Numeric value	Unified Code for Units of Measure (UCUM) for Age Units	Proposed definition: Patient age, which may be calculated from full date of birth before the days are removed.
Gender	Coded	HL7 2.5 Administrative Sex Codes	Proposed definition: "Patient sex" May want to limit to M, F, U
Zip	String		Not ZIP plus Four, but will not aggregate to the first 3 characters
State	String	FIPS State codes	Data type should be coded.
Date/time last update	Date		



AHIC Minimum Data Set Content Constraints

Clinical Data Elements

AHIC Data Element	Data Type	Selected Standards
Diagnosis/Injury Code	String	ICD-9/10 CM Or SNOMED CT
Diagnosis Type	String	HL7 2.5 Diagnosis Type Codes
Diagnosis Date/Time	Date	
Discharge Disposition	String	Universal Billing codes
Patient Class	String	HL7 2.5 Patient Class Codes
Date and Time Illness Onset	Date	
Chief Complaint	String	SNOMED-CT and/or Clinical Care Classification recommended for codifying of free-form text
Temperature	Numeric	Unified Code for Units of Measure (UCUM) units
Pulse Oximetry	Numeric	
Nursing/Triage Notes	String	SNOMED-CT and/or Clinical Care Classification recommended for codifying of free-form text
Provider Identifier	Alphanumeric	



AHIC Minimum Data Set Content Constraints Laboratory/Radiology Orders

AHIC Data Element	Data Type	Selected Standards	Comments
Order number	Alphanumeric		<p><scoped out> TC Comment: This number is usually assigned by the Order Entry system. Order number is NOT the accession or specimen number. GAP: Universally agreed upon meaning of order number; Request clarification from HL7</p>
Test/Procedure Name	String		<p><scoped out> TC Comment: This will be the name of the ordered radiology or laboratory service as the ordering system knows it.</p>
Test/Procedure Code	Alphanumeric		<p><scoped out> GAP: Recommend to LOINC, SNOMED-CT, and CPT to develop AND harmonize a suitable coded value set to express order test name and code values.</p>



AHIC Minimum Data Set Content Constraints Laboratory/Microbiology Result Data

AHIC Data Element	Data Type	Selected Standards
Reporting Lab Identifier	Alphanumeric	CLIA Unique Laboratory ID
Performing laboratory	Alphanumeric	CLIA Unique Laboratory ID
Report date/time	Date	HL7 Timestamp
Report status	Coded	HL70123 Result Status
Collection date	Date	HL7 Timestamp
Collection method	Coded	HL70488 – Recommend SNOMED-CT align subset with Table 488
Specimen Source	Coded	SNOMED –CT
Specimen	Coded	HL70487 Specimen or SNOMED-CT
Ordered test code	Coded	Recommend SNOMED-CT, LOINC, CPT, HCPCS and others (get together to establish a suitable vocabulary)
Resulted test	Coded	LOINC Laboratory Test Identifiers
Result		SNOMED-CT + NCCLS for granularity expression +Local codes for newly identified organisms that are not yet assigned codes
Method type	Alphanumeric	V3 Observation Method as a starter set. May be extended locally
Result unit	Alphanumeric	Unified Code for Units of Measure (UCUM) Expressions
Test interpretation	String	HL70078 Abnormal Flags
Test status	Alphanumeric	HL70123 Result Status
Ordering Provider Identifier	Alphanumeric	

