Implementing PHIN Case Notification Messaging

Mead Walker

Chair, HL7 Architecture Review Board

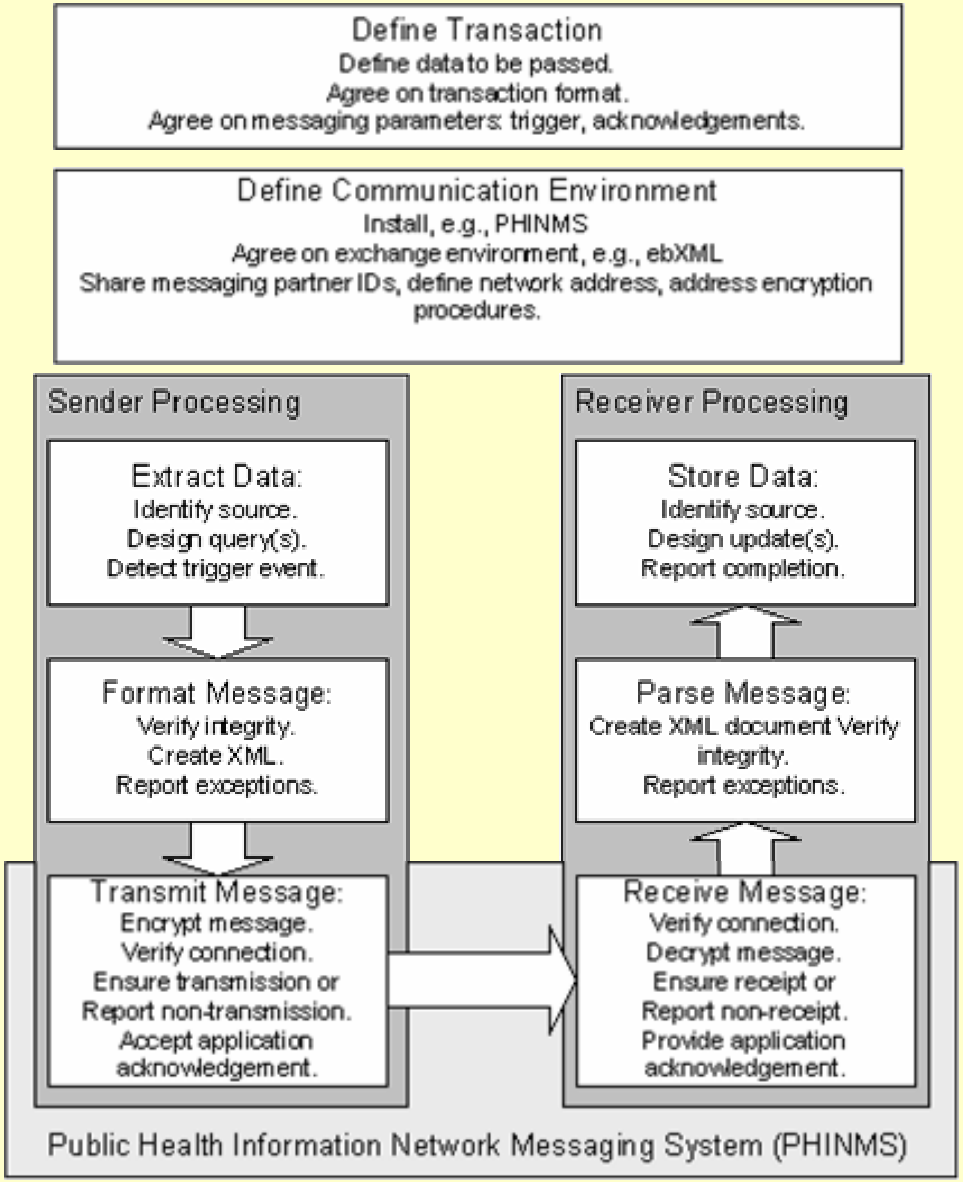
2nd Annual Public Health Information Network Stakeholders' Conference

May 26, 2004

Issues to Consider

- What are the key issues for implementation?
- What is the Case Notification Specification
- What material is available to assist in implementation?

A context for interface implementation



- We have to define the context for messaging. This includes definition of
  - What is passed
  - How to pass it
- Data is:
  - Extracted/Stored
  - Transformed
  - Transmitted

HL7 = Model Based Messaging

- Reference Information Model (RIM) models clinical concepts and relevant data for HL7.
- The Case Notification message model (RMIM) models the concepts needed for notifiable condition reporting.
- HL7 provides tooling to generate the XML schema
- Message implementation involves additional schemas for common message elements.

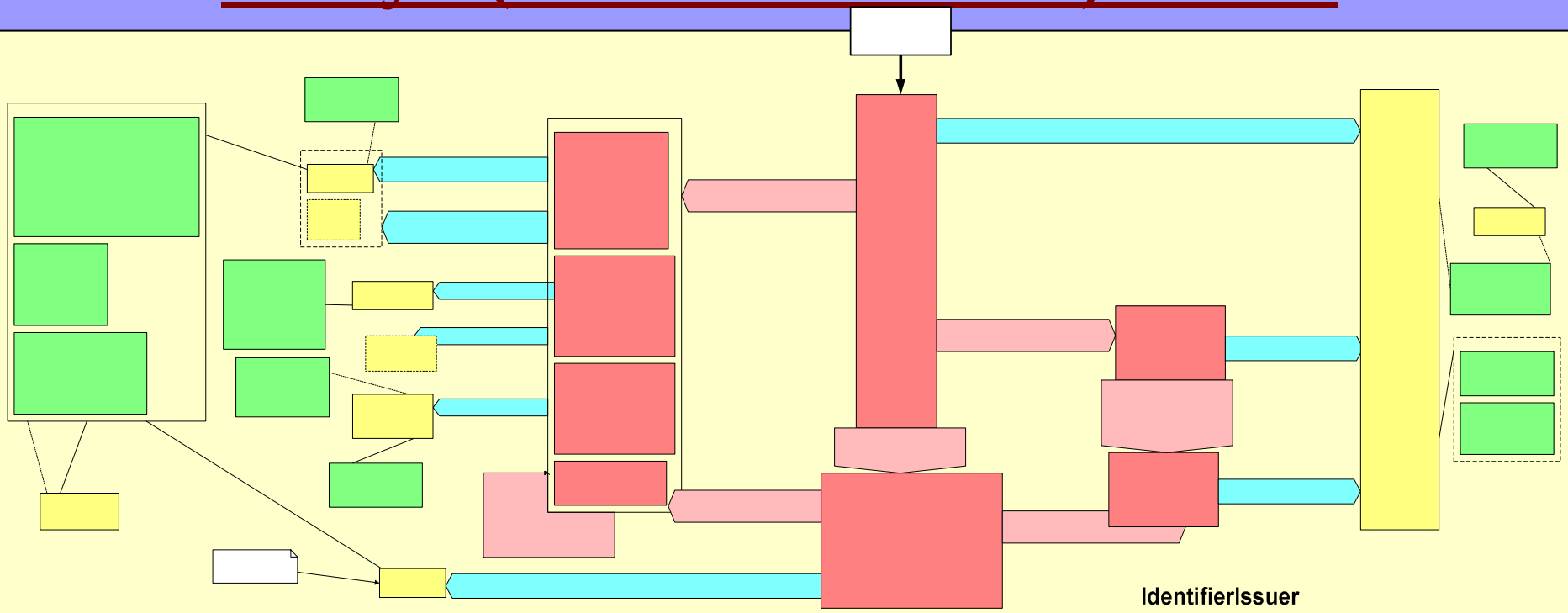
Focus on Disease Notification: What's in a case?

- Public health departments track "cases" of disease.
- For the most part, presence of a disease is confirmed through laboratory testing
- Information is collected to characterize the patient, and their way of life
- Additional information is collected to determine the source of the disease, and to identify those who are at risk of infection.
- The specific items of data vary tremendously from disease to disease.

Item 3: Measles Related Information

Admission Date	Subject's admission date to the hospital for the condition covered by the investigation.
Discharge Date	Subject's discharge date from the hospital for the condition covered by the investigation.
Duration of Stay in days	Subject's duration of stay at the hospital for the condition covered by the investigation.
Date of Death	Date on which the individual died.
Did the patient have a rash?	Did the person being reported in this investigation have a rash?
Rash onset date	What was the onset date of the person's rash?
Rash Duration	How many days did the rash being reported in this investigation last?
Was the rash generalized?	Was the rash generalized? (Ocurring on more than one or two parts of the body?)
Did the patient have a fever?	Did the person have a fever? I.E., a measured temperature >2 degrees above normal
Date of fever onset	Date of fever onset.
Highest Measured Temperature	What was the person's highest measured temperature during this illness?
Temperature units	The units of measure of the highest measured temperature. This would be either Fahrenheit or Celsius.
Cough	Did the person develop a cough during this illness?
Croup	Did the person develop croup as a complication of measles?
Coryza (runny nose)	Did the person develop corysa(runny nose) during this illness?
Hepatitis	Did the person develop hepatitis after contracting measles?

Today's (March 2004 Ballot) RMIM



IdentifierIssuer
classCode*: <= *ORG*
determinerCode*: <= *INSTANCE*
id: SET<II> [0..*]
name: EN [0..1]

InvestigatedEntity

InvestigatedPerson
classCode*: <= *PSN*
determinerCode*: <= *INSTANCE*
id: SET<II> [0..*]
name: BAG<EN> [0..*]
telecom: BAG<TEL> [0..*]
administrativeGenderCode*: CE CWE [1..1] <= *AdministrativeGender*
birthTime*: TS [1..1]
deceasedInd: BL [0..1]
deceasedTime: TS [0..1]
addr*: BAG<AD> [1..*]
maritalStatusCode: CE CWE [0..1] <= *MaritalStatus*
educationLevelCode: CE CWE [0..1] <= *EducationLevel*
raceCode*: SET<CE> CWE [1..*] <= *Race*
ethnicGroupCode*: SET<CE> CWE [1..*] <= *Ethnicity*

0..1 identifiedInvestigatedInvestigatedEntity

StatementSubject

IdentifiedEntity
classCode*: <= *IDENT*

0..* identifiedEntity
recordTarget
typeCode*: <= *RCT*
contextControlCode: CS CNE <= *Cont*

0..1 roleName
CMET: (SPEC)
R_Specimen
[minimal]
(COCT_MT080100)

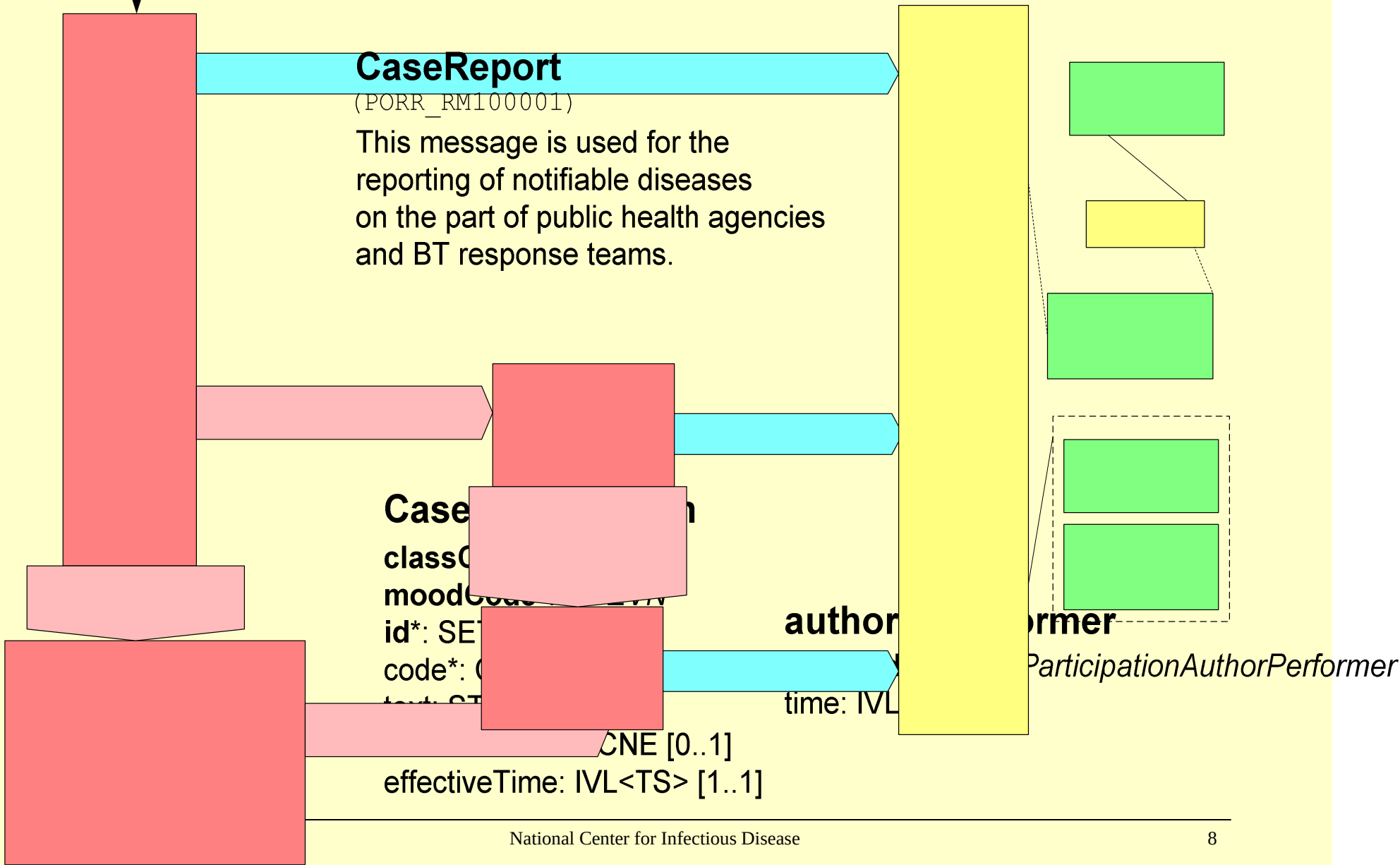
0..* participant
subject
typeCode*: <= *SBJ*
functionCode: CV CWE
time: IVL<TS>

InvestigatedPlace
classCode*: <= *PLC*
determinerCode*: <= *INSTANCE*
id: SET<II> [0..*]
code: CV CWE [0..1]

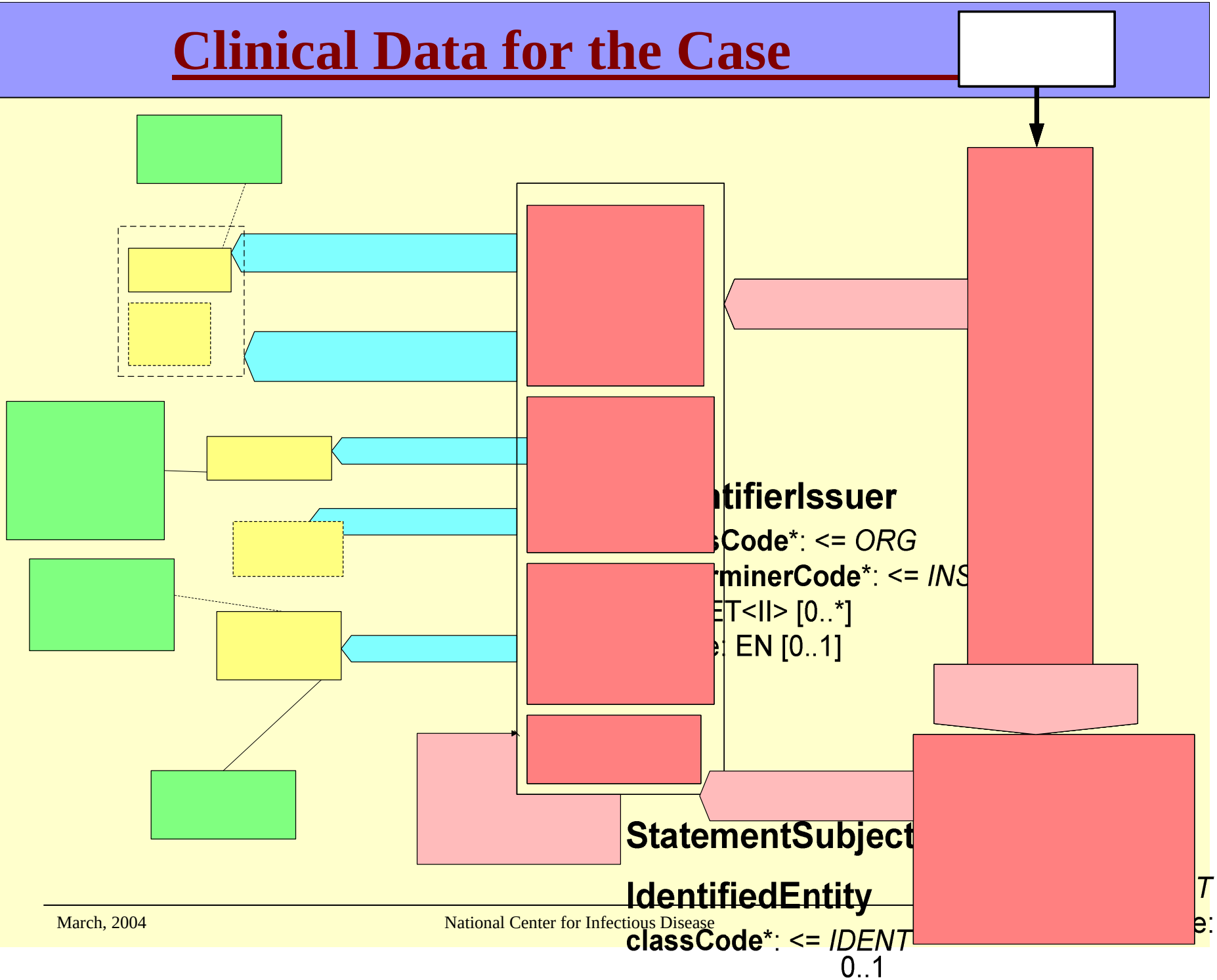
ManufacturedMaterial
classCode*: <= *MMAT*
determinerCode*: <= *INSTANCE*

0..* manufacture

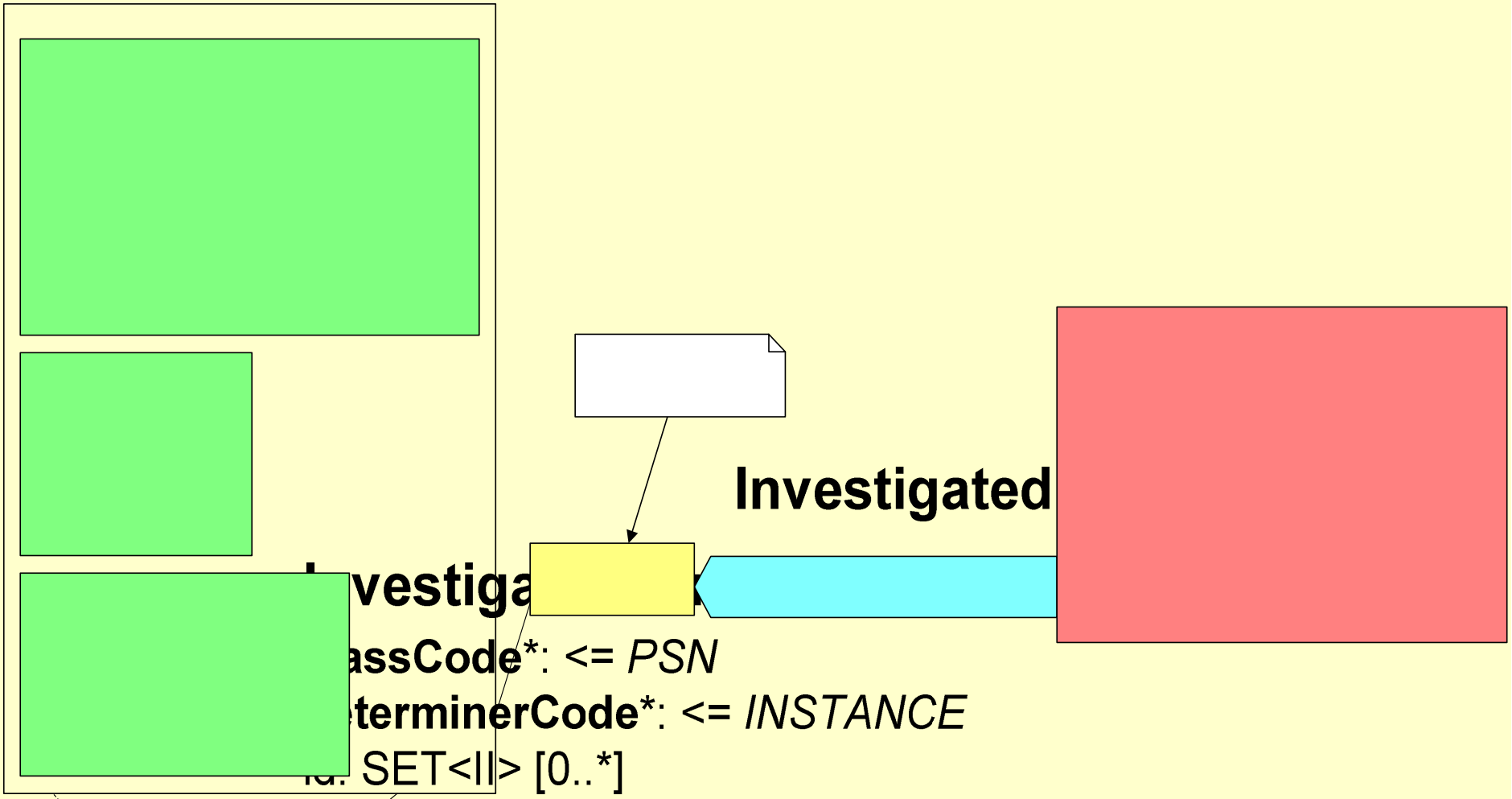
stigation, Case, and Prior Notifications



Clinical Data for the Case



Subject(s) of the case



Investiga

assCode*: <= *PSN*

terminerCode*: <= *INSTANCE*

id: SET<II> [0..*]

name: BAG<EN> [0..*]

telecom: BAG<TEL> [0..*]

administrativeGenderCode*: CE CWE [1..1] <= *AdministrativeGen*

birthTime*: TS [1..1]

deceasedInd: BL [0..1]

deceasedTime: TS [0..1]

Summarizing the Notification Solution

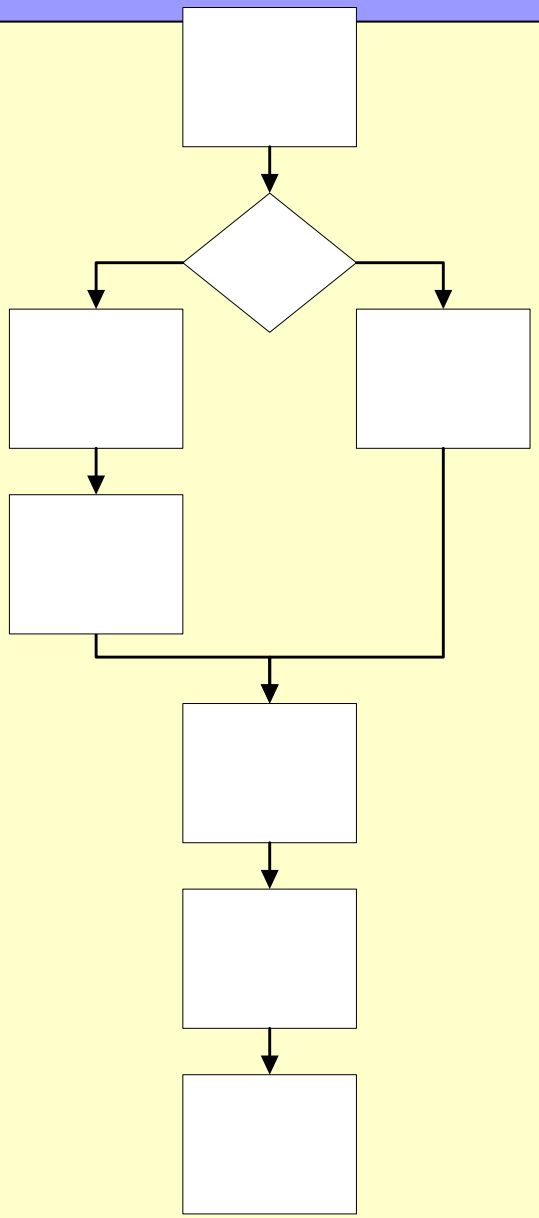
- Capture Information directly Related to a Case
- Record related clinical data as acts (observations, procedures, substance administrations, encounters)
- Also track:
  - persons related to the case: investigator, patient, contacts (note PH has its own definition here)
  - related notifications

Implementation Challenges

- Supporting the XML Schema
- Agreement on concepts, not just structure
- Consistent identification
- Efficiently marshalling the data

Introducing the Simplified Transitional Format

- Requirement to overcome:
  - Limitations in XML tooling
  - Lack of XML sophistication
  - Lack of deep V3 familiarity



The role of the Implementation Guide

- To define the requirements specific to a disease or condition.
- To provide additional assistance for the implementation process.
- To provide background information for those who don’t access the official standard documentation.

Documentation to support the message

- Implementation guide contents
  - Introduction
  - OID management
  - Message vocabulary items
  - Mapping table
  - Implementation notes
- Related documentation
  - Notification Message Basic Description
  - ISO OIDs Description and Use
  - PHIN-VS User Documentation

Mapping Table Contents

- **Unique ID**: A mnemonic identifier for each attribute within the message. These are the same identifiers used within the NEDSS Base System Information Model.
- **Label**: A text name for each attribute.
- **Description**: Descriptive text for the data element
- **SRT Reference**: An indication of the System Reference Table (SRT) that contains the allowable values for coded attributes.
- **Comment**: Descriptive comments to assist the mapping process.
- **Attribute**: The attribute within the HL7 message that the element is mapped to. This is an attribute within one of the classes defined by the message Refined Message Information Model (RMIM)
- **Element**: The XML attribute or element that is valued within the context of the HL7 data type that is relevant for the attribute.
- **Xpath**: This lists the XML elements to be traversed in order to locate the attribute within the message structure. This entry is designed to help the mapping process by unambiguously locating the point within the HL7 message specification that an element is located.
- **Value Type**: The HL7 data type that is assigned to the value within the message structure. Only relevant for items mapped to Observation.value.
- **Additional**: Contains additional information to be used in the mapping.

Mapping Table Fragment

BMD100	ABCSCASE	Does the investigation fit the case definition for an ABCs case?Required Attribute: No	YN	Act.code = BMD100 (Case Fits Case Definition for an ABCs Case) Observation datatype is CE.	value	code	caseInvestigation/component/caseRelatedStatement/Observation[act.code="BMD100"]	CE	
BMD101	STATEID (ABCs)	The state ABCs case ID.Required Attribute: No		Where the OID (root property) within the II datatype indicates this is an ABCs case ID.	id	extension	caseInvestigation		
BMD102	HOSPID	The hospital or lab ID number where the cuture was identified.Required Attribute: No		R_AssignedEntity ID, where the role participates as performer in the BMIRD test.	id	extension	caseInvestigation/component/caseRelatedStatement/Observation[act.code="??"]/authorOrPerformer/assignedEntity		
BMD103	TRANSFER	Was the patient transferred from another hospital?Required Attribute: No	YNU	Act.code = IBMD103 (Patient Transferred from another Hospital). Observation datatype is CE.	value	code	caseInvestigation/component/caseRelatedStatement/Observation[act.code="BMD103"]	CE	
BMD104	TRANSID	The hospital ID of the initial hospital, if the patient was transferred from another hospital.Required Attribute: No		Where the entity is listed as performer for INV131 (Patient Transferred from another Hospital)	id	extension	caseInvestigation/component/caseRelatedStatement/Observation[act.code="INV131"]/authorOrPerformer/assignedEntity		
BMD105	DAYCARE	If <6 year s of age is the patient in daycare?Required Attribute: No	YNU	Act.code = BMD105 (Patient in Daycare). Observation datatype is CE.	value	code	caseInvestigation/component/caseRelatedStatement/Observation[act.code="BMD105"]	CE	
BMD106	FACNAME	The name of the daycare facility.Required Attribute: No		Where the entity is listed as performer for BMD111 (Patient in Daycare).	name		caseInvestigation/component/caseRelatedStatement/Observation[act.code="INV111"]/authorOrPerformer/assignedEntity/assignee/assigneeOrganization		

Vocabulary in the Guide

- List of all value sets (aka SRT) that appear in the message
  - Value set name & OID
  - Coding system(s) name and OID
- Instructions for accessing codes in the PHIN VS (vocabulary services)

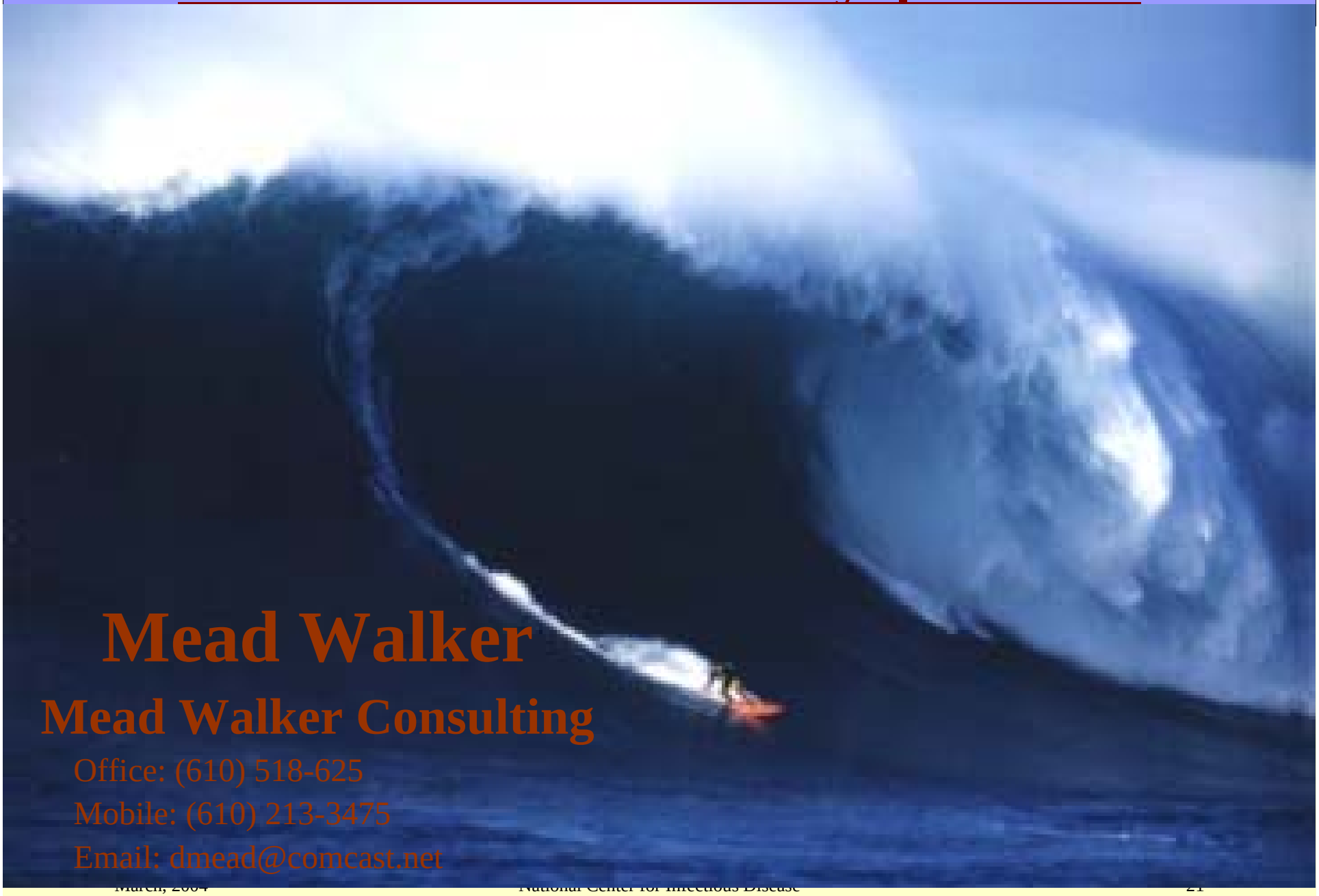
OIDs and OID Management

- OIDS are used to identify coding systems and identifier name spaces
- For our purposes, there are two kinds:
  - Static - coding systems, national namespaces
  - Dynamic – local namespaces
- OID construction archtypes

Implementation Issues for Senders

- Marshalling the data
- Manipulating the XML
- Constructing dynamic OIDs
- Managing change

Thank You – Are there any questions?



Mead Walker

Mead Walker Consulting

Office: (610) 518-625

Mobile: (610) 213-3475

Email: dmead@comcast.net