AIRA Interoperability Project Update

Community Webinars | Sept 10, 2015 – 11:00 am EST | Sept 11, 2015 – 3:30 pm EST

AIRA
AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

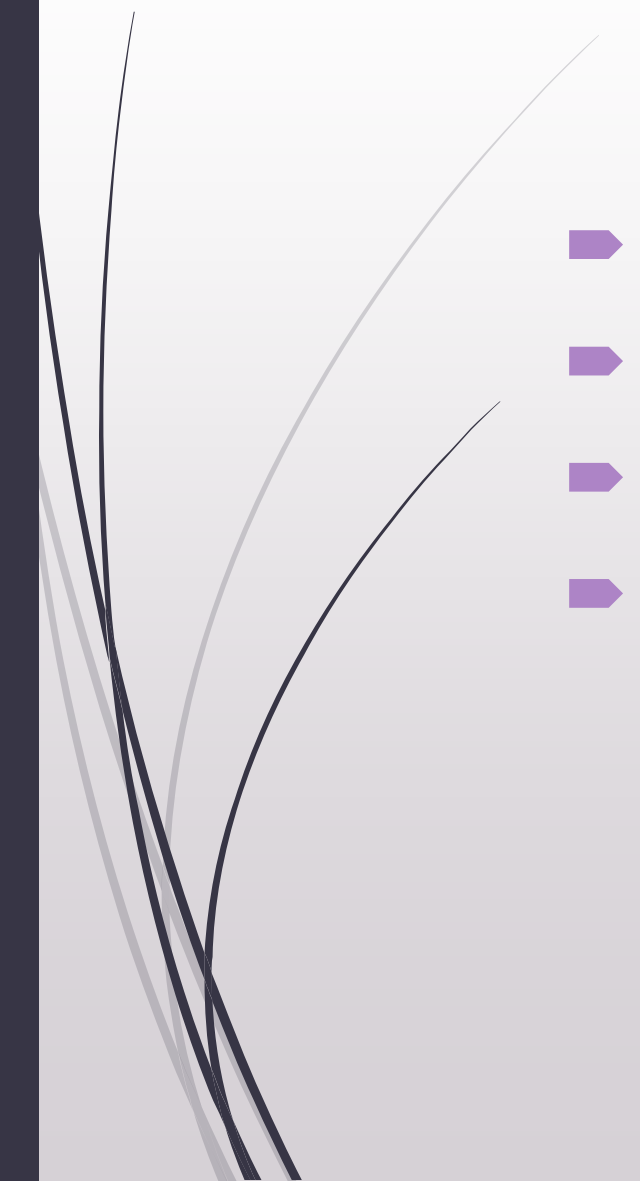Immunization Information Systems for a New Era

Agenda

- Introduction to Project Team
- Support for Standards
- Overview of Project & Status Update
- Review of Analysis Tool
- Major Findings to Date
- Rhode Island Perspective
- Q & A

Introduction to AIRA Project Team

- Mary Beth Kurilo, Policy and Planning Director
- Nichole Lambrecht, Sr. Project Manager
- Nathan Bunker, Sr. Technical Project Manager
- Eric Larson, Sr. Technical Project Manager

AIRA Standards Cooperative Agreement, 2014-2018

Standards Development
- Convene SMEs or Stakeholders to assess current practice or challenge, ID gaps, develop, refine standards

Evaluations
- Measure adoption of standards

Joint Development
- Coordinate and facilitate collaborative development of specific tools/technologies/enhancements

Repository
- Establish and maintain a repository for apps, source code, etc. that can be accessed and used by IIS Community

Training/TA
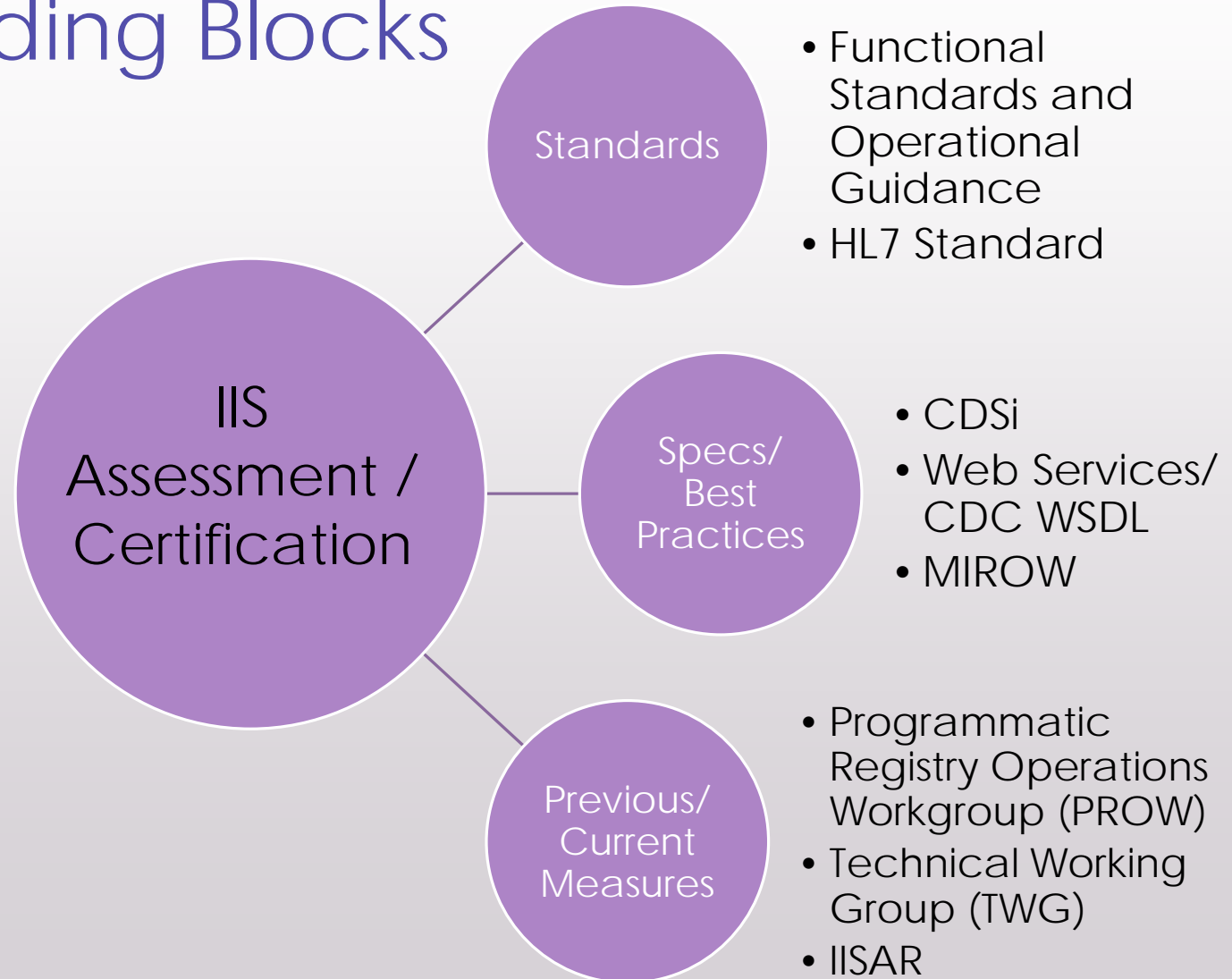- Provide communications, training, collaborative services as needed

Measuring Adoption of Standards: We Need…

Clear standards

Tool(s) to measure alignment with standards

Measuring Adoption of Standards: The Building Blocks

IIS Assessment / Certification

Standards
- Functional Standards and Operational Guidance
- HL7 Standard

Specs/ Best Practices
- CDSi
- Web Services/ CDC WSDL
- MIROW

Previous/ Current Measures
- Programmatic Registry Operations Workgroup (PROW)
- Technical Working Group (TWG)
- IISAR

Building a Process – Assessment/Certification Planning

- SME Panel Convenes: August-December, 2015
  - Charge:
    - To glean process components from Environmental Scan and Roundtable Feedback to chart course for Assessment/Certification
      - Procedures
      - Policy
      - Resources
    - To advise on make-up of Planning/Steering Committee
    - To determine triggers for exploring move toward Certification

Implementing a Process – Assessment/Certification Planning

- Planning/Steering Committee Convenes: January 2016-ongoing?
  - Charge:
    - To continue developing process for Assessment/Certification
    - To oversee the development and testing of metrics
    - To evaluate triggers and answer outstanding questions about potential move toward external-facing Certification

High-Level Assessment/Certification Timeline – Early Steps

Start Interop (Transport and Format) Testing/ Discovery, Q2, 2015

Stand-Up SME Panel, Q3, 2015

Launch Assessment Process for Message Transport, 2016

Gather Community Input on Assessment/ Certification approach, Q2, 2015

Stand-Up Assessment Planning/ Steering Committee, Q1, 2016

But what does the standards development process really look like?

Implement

Improve

Create and Publish Standards

Implement

Test

Test

Refine

Implement
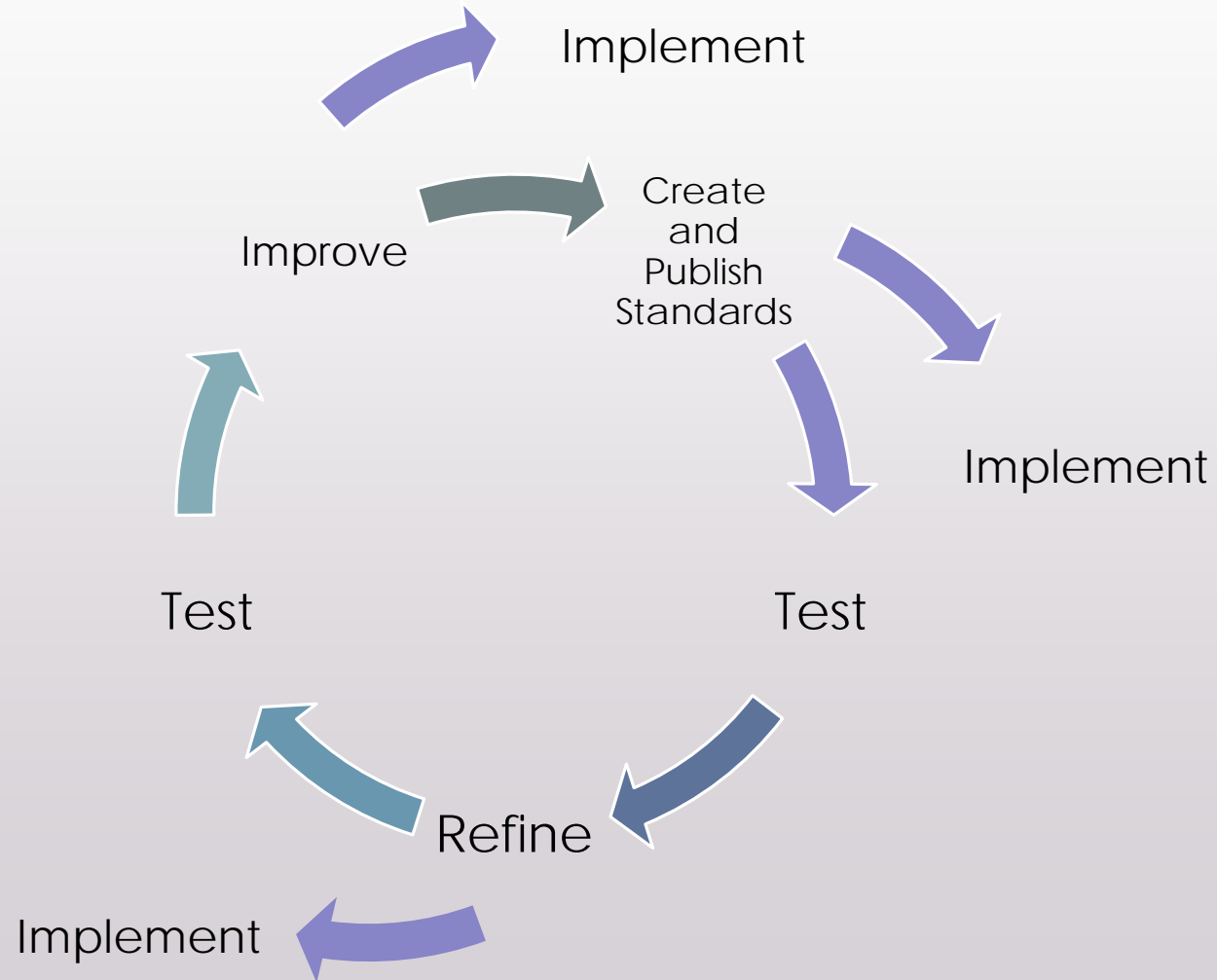
Interoperability Discovery/Testing: What Are We Testing?

Phase I

- Repeat of 2013 Status Check
  - 7 VXU NIST Test Cases

Phase II

- Transport Compatibility
- Local IIS Requirements
- EHR Example Acceptance
- Recognize Valid Codes
- Tolerance Tests
- Performance
- ACK Conformance
- Coming Soon - QBP

Interoperability Discovery/Testing: Where Are We?

Participation

- 2 Vendors

- 46 IIS Programs

- Of these
  - 23 Connected
  - 5 In Queue for Connection
  - 10 Waiting on Credentials
  - 2 Connection Problem
  - 8 Manual Reporters

- ~12 Need to Participate
  - Some of these are migrating to a new system.

2015 IIS Interoperability Testing Project

Testing In Progress
Pending
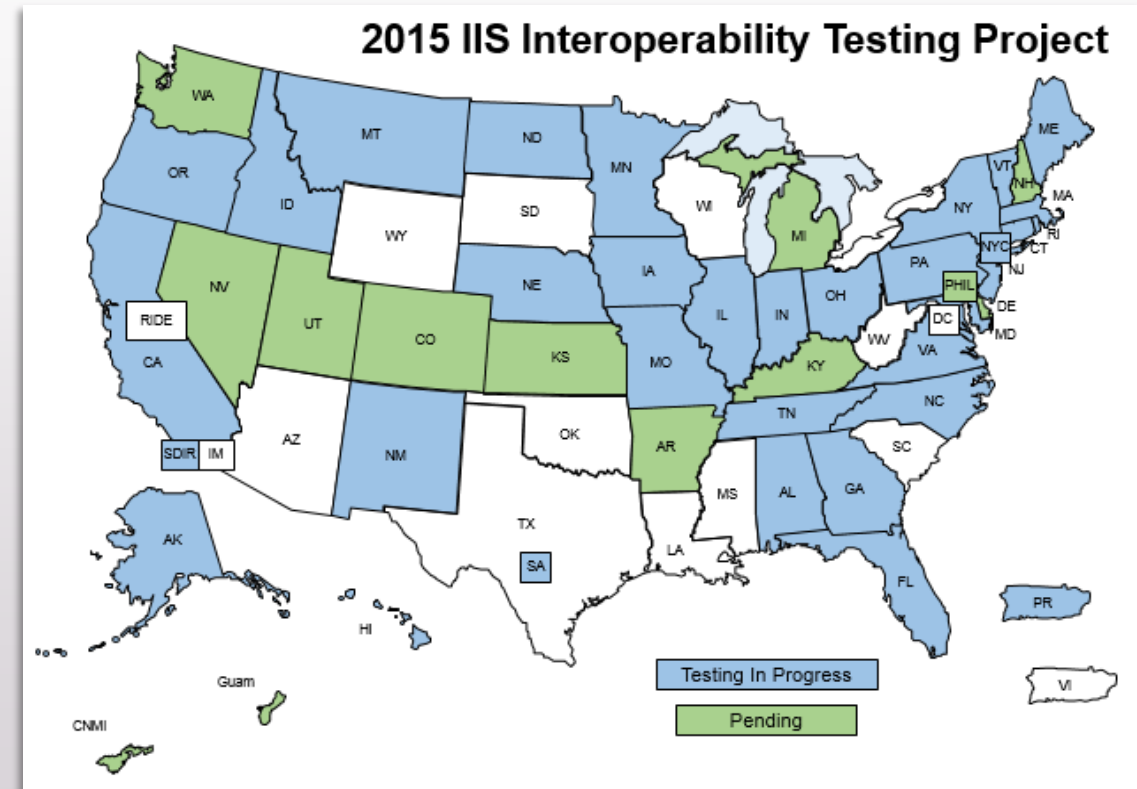
Last Updated: September 9, 2015

Review of Analysis Tool

- Links to Dashboard have been sent out.
- Any IIS reporting manually previously now has an opportunity to participate in Phase II.
  - AIRA can either access your batch upload process and complete the analysis for you, OR
  - AIRA can send you the batch files for you to run.

Review of Analysis Tool and Report

Introduction to Report

Limitations of Report

- Report is preliminary and exploratory
  - Some tests point to the need for more standardization
  - Some tests take logical assumptions based on current standards
- Report has technical issues in some areas
  - Many parts of the report are working well
  - There are known issues, these are being fixed
  - We expect to find more
- Report is largely based on the system's ability to understand ACK
  - Report tries to differentiates between Accept and Not Accept
 - Wide variance in how this concept is messaged

Purposes of Report

- Provide information at the national level on how IIS are currently operating
- Use as justification for making recommendations for improvements to national standard
- IIS may also use information to inform changes at the local level
  - This report is preliminary, all issues raised need to be reviewed carefully before action is taken to address them
- This report is just the first step in a multi-year project.

Testing Milestones
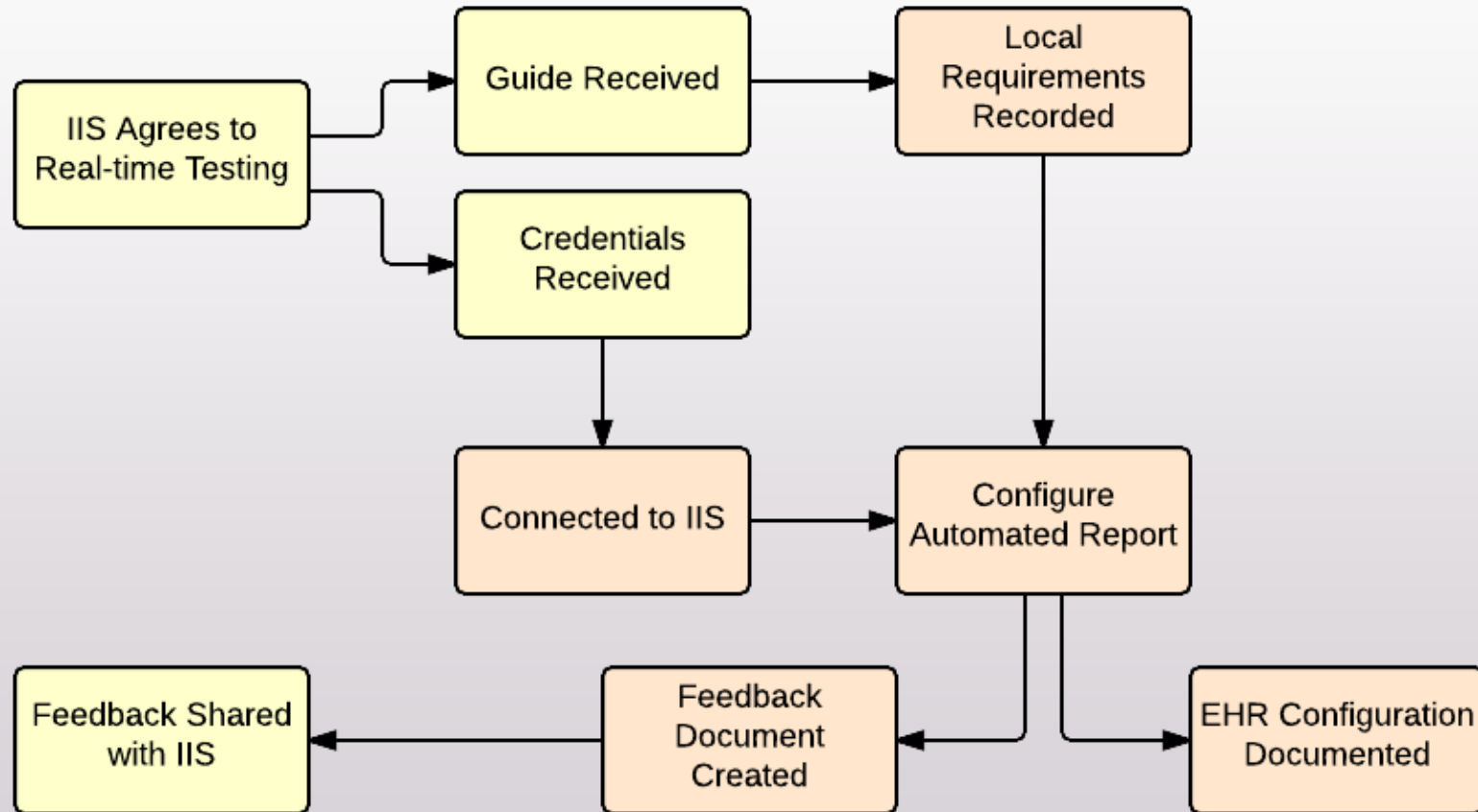
Overall Score

- Designed to
  - show changes over time
  - point to areas that need to be reviewed (nationally or locally)
  - have a wide range (most IIS are not expected to receive a high score)
- Current limitations
  - Arbitrary scoring metrics
  - Subject to change at any time as report improves

Scoring of Core Sections

Core Section	Weight	Description
Interoperability	50%	IIS must accept all 7 NIST test message (original Interoperability Status Check)
Coded Values	10%	IIS should accept codes defined by CDC in the implementation guide
Tolerance	5%	IIS should tolerate some expected or common issues
EHR Examples	5%	IIS should accept messages typically sent by certified EHR systems
Performance	5%	IIS should respond to VXU messages within a reasonable amount of time
Acknowledgment Conformance	25%	IIS should send ACK messages that conform to national requirements.

Core Section: Interoperability

- Automated version of the IIS Interoperability Test
- Seven NIST test messages for Meaningful Use 2 are submitted
- Score is the percentage of messages that were:
  - Not significantly changed
  - Positively accepted
- A perfect score has limitations:
  - Does not mean IIS is necessarily interoperability with EHR systems
  - Modifications made to message may still be road blocks to EHR systems

Core Section: Coded Values

- Most of the coded values from the CDC Guide release 1.4 submitted
- Scoring is logarithmic
- Caution:
  - This test assumes that an IIS will support every value listed in the release 1.4 guide
  - However, that version of the guide contains codes from the base HL7 standard that IIS would never be expected to implement:
    - Person ID Type (PID-3.5) can be set to indicate a patient's MasterCard number
  - This report is being used to provide information for guidance that will be in 1.6 release of the guide about which codes an IIS will use
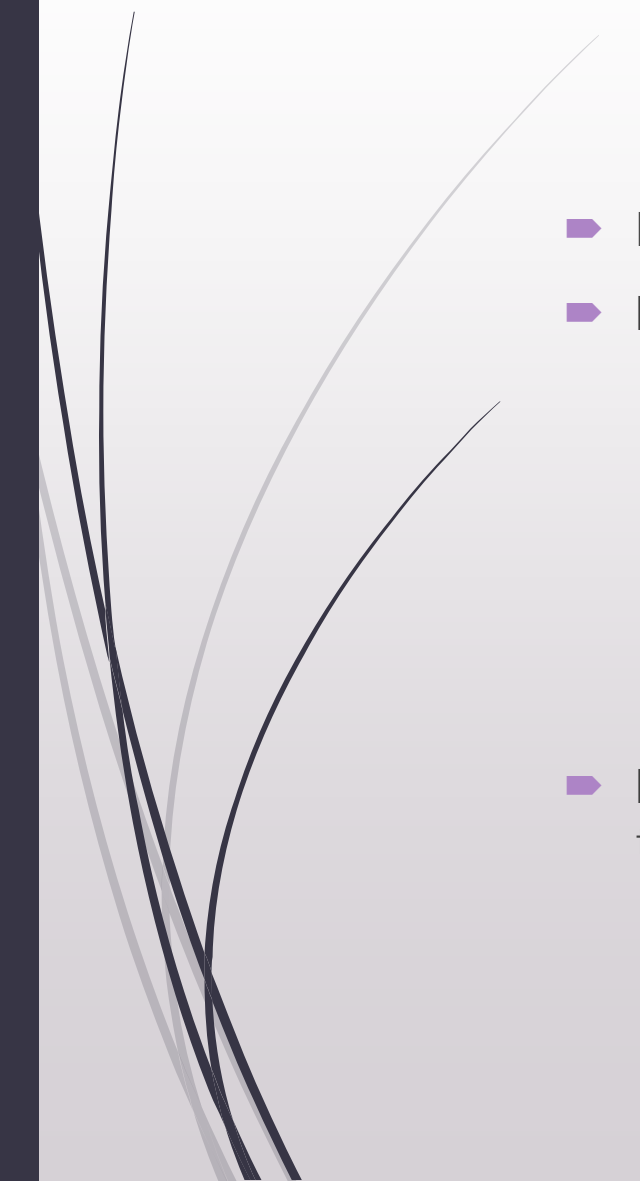
Core Section: Tolerance

- A small set of messages with issues that should or could be ignored by IIS
- The purpose is to address an issue seen in 2013 testing:
  - Some IIS were unprepared for new OBX codes that certified EHR systems would b sending
- The general idea is that HL7 interfaces should tolerate new concepts
- Current list of tests is a start in the direction at looking at this issue
  - But not all IIS are expected to accept all the messages in this section
  - Examples are hypothetical
- Do you have examples that you can add to our list?

Core Section: EHR Examples

- Example messages sent to us by EHR systems
- Limitations
  - These are test messages from real test systems
  - Not asserting that these messages are necessarily correct and following standard
  - Not asserting that IIS should accept all of these messages
  - Can have data quality problems
  - We need more examples
- If you have more examples of test messages from EHR systems, please send them!

Core Section: Performance

- No standards set for performance
- The report is measuring because it is known and easy to report
- Arbitrary performance metric set at 3 seconds average response time
  - Many IIS take less than 3 seconds to respond
  - Performance depends on many factors, this core measure is only of limited use
- Report will show these measurements:
  - Average
  - Fastest
  - Slowest
  - Std Dev

Core Section: Ack Conformance

- Measuring conformance against release 1.4 standards
  - There are improvements in release 1.5, but mostly to tightening down definitions and adding new coded values
- We will talk about ACK conformance a little bit later

Additional Section: Local Requirement Implementation

- Comparing the documented usage in the local guide against how the IIS interface is operating

- For each field in your guide we have to determine a status of whether the message will be accepted or not:
  - Must be present
  - May or may not be present
  - Must be absent

- We are essentially testing support for R, RE, O and X requirements

- We can't tell the difference between RE or O since operationally these behave the same way

Additional Section: Local Requirement Implementation

- Conditional Status
  - Testing is built off of R, RE, O, and X
  - Guides use conditional usage, such as: C(R/X) and C(R/O)
  - Testing process does not directly support conditionals, all usages must be converted to R, RE, O or X.
  - Conditional fields are broken into sets of tests to cover each possibility
  - Example: PID-25 Birth Order is C(RE/O)
    - PID-25 Single, status O
    - PID-25 Multiple, status RE

Additional Section: Local Requirement Implementation

- Special Usage Values
  - R* Required, but not enforced
  - RE* Required, but may be empty and is not read
  - O* Optional, and is not read
  - X* Not supported, but not enforced
  - R! Required, and enforced event thought it is contained in an RE or O element
- Do not use these statuses in your local guide!
- These are temporary only for this report.

Additional Section: Local Requirement Implementation

- Strict reading of R and X, the testing tool makes the assumption:
  - An R field in an R section, means that the IIS will not accept the message if it is not populated
  - An X field, means the IIS will not accept the message if it is populated
- In reality there are good reasons for an IIS to accept a message when:
  - A R field is missing (IIS typically accept when PID-1 if missing)
  - A X field is not missing (IIS typically ignore unsupported fields)
- This report takes the most extreme assumption and then shows where this does not hold true

Additional Section: National Compatibility

- Compares the detected local requirements from the previous section against the national standard, release 1.5
- Categorizes compatibility issues:
  - Local Standard has Major Conflict with National Standards
  - Local Standard Conflicts with National Standards
  - Local Standard Defines Hard Constraint on National Standard
  - Local Standard Defines Constraint on National
  - Local Standard Loosens National Constraints

Conformance of Ack Message

Conformance of ACK Messages

- Two messages were submitted to 21 IIS participating in the AIRA Interoperability Testing Project.

- AIRA first submitted a message which was accepted by the IIS.
  - Simple, clean message
  - 3 Immunizations

- Then AIRA removed data from RXA-5 (CVX code) and resubmitted.
  - Same simple message, one field changed from populated to empty.

Conformance of ACK Messages

- MSA – Required (1..1)
  - Field 1 – R – (Acknowledgement Code - AA, AE, AR)
  - Field 3 – X – (Free Text Message)
- ERR – RE (0..*)
  - Field 1 – X – (Error Code and Location)
  - Field 2 – RE – (Error Location in Submitted Message)
  - Field 3 – R – (HL7 Error Code – Table 0357)
  - Field 4 – R – (Severity of Error – I, W, E)
  - Field 5 – RE – (Application Error Code – SISC defined this table)
  - Field 8 – RE – (User Message – Locally specified informative text)

MSA Conformance

MSA Segment

MSA Segment	Missing	1 MSA	Multiple
R (1..1)	0	18	3

MSA Fields

MSA-1	AA	AE	AR
R - Ack Code	9	6	6
MSA-3	Valued	Empty	
X – Free Text Message	12	9	

ERR Conformance

ERR Segment

ERR Segment	Yes	No
RE (0..*)	13	8

ERR Fields

ERR-1	Valued	Empty			
X - Err Code & Loc.	2	11			
ERR-2	**Empty**	**RXA^0^5^1**	**RXA^5^1**	**RXA^1^5**	**RXA^1^5^1^1**
RE - Error Location	2	1	1	7	2
ERR-3	**Empty**	**Value – "101"**	**Value – "102"**		
R - HL7 Error Code	2	10	1		
ERR-4	**Empty**	**I**	**W**	**E**	
R - Severity	8	0	1	4	
ERR-5	**Empty**	**Valued - No Code**	**Value – "4"**	**Value – "7"**	
RE - App Error Code	10	1	1	1	
ERR-8	**Empty**	**Valued**			
RE - User Message	7	6			

Conformance to National IG

Key ACK Fields Used by IIS	Number of IIS	Conforms to CDC IG Usage
MSA-1; MSA-3	5	**- NO -** Uses MSA-3
MSA-1; ERR-1	2	**- NO -** Uses ERR-1; Missing ERR-3 and ERR-4
MSA-1; ERR-2; ERR-3	1	**- NO -** Missing ERR-4
MSA-1; MSA-3; ERR-2; ERR-3	5	**- NO -** Uses MSA-3; Missing ERR-4
MSA-1; MSA-3; MSA-6	2	**- NO -** Uses MSA-3 and MSA-6
MSA-1	1	**- YES -**
MSA-1; ERR-2; ERR-3; ERR-4	2	**- YES -**
MSA-1; ERR-2; ERR-3; ERR-4; ERR-5	3	**- YES -**

Conformance of Field Values

	MSA-1	ERR-2	ERR-3	ERR-4	ERR-5
System 1	AE	RXA^0^5^1	101	W	Empty
System 2	AR	RXA^1^5^1^1	101	E	Valued - No Code
System 3	AE	RXA^5^1	102	E	4
System 4	AE	RXA^1^5	101	E	Empty
System 5	AE	RXA^1^5^1^1	101	E	7
System 6	AE	No ERR segment provided by this IIS			

Immediate Next Steps - ACK

- IIS
  - Come up to release 1.5 conformance
    - 1 and only 1 MSA Segment per ACK
    - Stop using MSA-3 and ERR-1
    - Always use ERR-3 and ERR-4 when sending an ERR Segment

- AIRA
  - Work with SISC to develop pointed guidance on ACKs which meets 1.5 conformance

Rhode Island Experience

- Lessons learned from the analysis
  - Unknown Errors –
    - ethnicity processing
    - PID-8 Administrative Sex –RI IG Correction
  - Performance
- Things that were missed in report
  - Interoperability – Messages accepted but not processed (ACKs-AA)
  - Data fields that are ignored

Q & A

- To join the project contact:
  - Nichole Lambrecht at nlambrecht@immregistries.org