

Arizona BioSense 2.0

Exploratory Analysis Work Group

April 23, 2015



Health and Wellness for all Arizonans

Introductions

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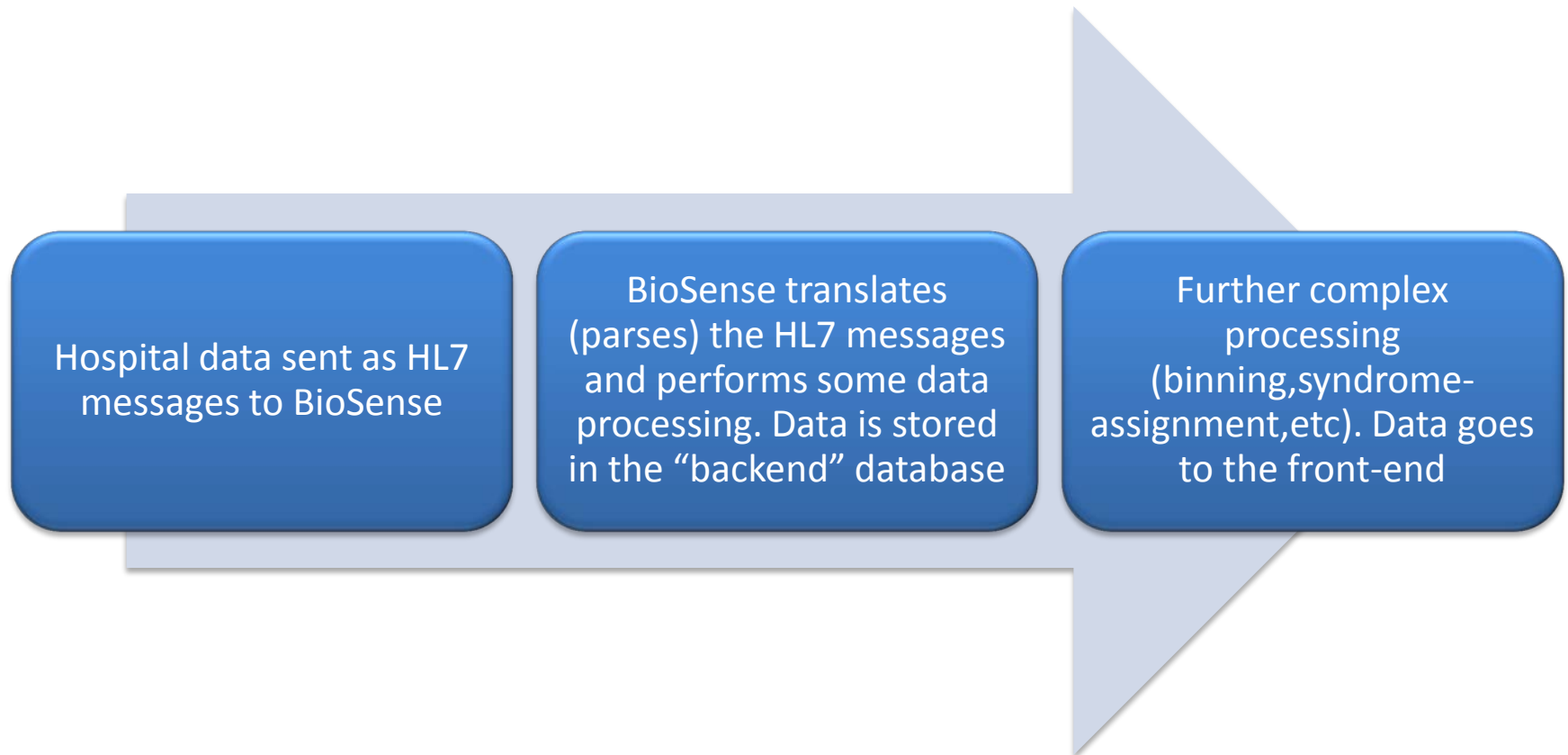
Objectives

- Introduction of the draft AZ SS Data Dictionary
- Discussion on the Data Dictionary
- Discussion on direction of future meetings

Introduction of the Draft AZ SS Data Dictionary

- Background
 - Arizona has adopted BioSense, a national syndromic surveillance system for hospital surveillance.
 - Main components
 - **“Front-end”**
 - Web-based interface which has basic analytics capabilities
 - **“Back-end”**
 - Database of the messages received from hospitals

Introduction of the Draft AZ SS Data Dictionary



Back-end Databases

Raw data (MUB table)

- One row per HL7 message
- Has all raw data available
- Contains MRN

Binned data (CC – Chief Complaint)

- Deduplicated by visit
- Syndromes assigned based on Chief Complaint
- Does not contain all data elements
- Contains ID that links to front-end data (Analysis Visit ID)
- Data used for front-end

Binned data (DX – Diagnosis)

- Deduplicated by visit
- Syndromes assigned based on Diagnosis
- Does not contain all data elements
- Contains ID that links to front-end data (Analysis Visit ID)
- Data used for front-end

Raw Data

The screenshot displays the phpMyAdmin web interface in a browser window. The address bar shows the URL: `https://adm.biosen.se/dbadmin/index.php?target=main.php&server=3&token=56427431b20541362994b43ea27da0c6`. The interface is for the 'data3.biosen.se' database, specifically the 'LockerDB' schema and the 'AZDOH' table. The left sidebar lists various tables, including 'AZDOH', 'AZDOH_Exceptions', and several 'AZ_AZDOH_*' tables. The main panel shows a SQL query editor with the following query:

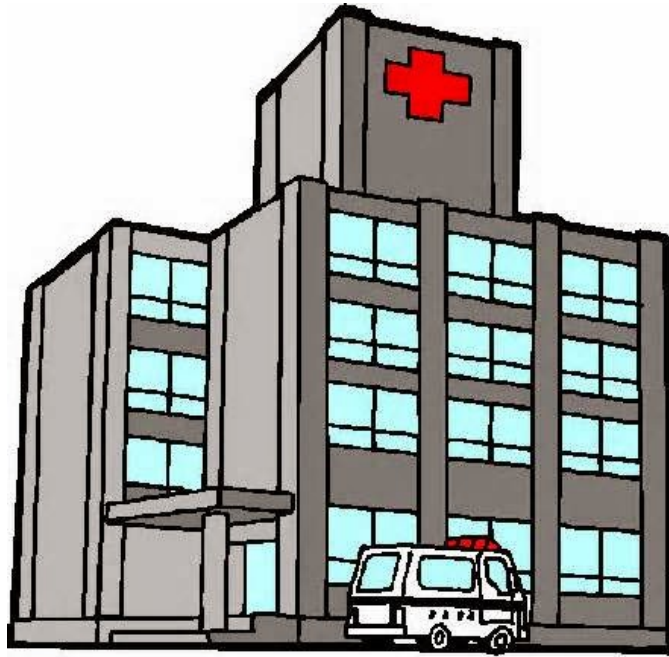
```
SELECT *  
FROM 'AZDOH'  
LIMIT 0, 30
```

Below the query editor, a status bar indicates 'Showing rows 0 - 29 (1,000,000 total, Query took 0.0054 sec)'. The 'Page number' is set to 1. The 'Show' dropdown is set to 30, indicating '30 row(s) starting from row # 30 in horizontal mode and repeat headers after 100 cells'. The bottom of the interface shows a table header with columns: 'Row_Number', 'Create_Date_Time', 'Create_Date', 'Update_Date_Time', 'Update_Date', 'Source_Filename', 'Feed_Name', 'Channel_Name', and 'Unique_Visiting_ID'.

Binned Data

The screenshot shows a web browser window with the URL `https://adm.biosense.se/dbadmin/index.php?server=5&token=07912341345e78e2a59470e4abb9abc8`. The browser tabs include "BioSense 2.0" and "adm.biosense.se / adm2.bio". The phpMyAdmin interface is displayed, with the "adm2.biosense.se" database selected. The "BinLocker" table is expanded, showing the "AZDOH_CC" table. The "Browse" tab is active, displaying a green status bar: "Showing rows 0 - 29 (1,000,000 total, Query took 34.2531 sec)". Below this, a SQL query is shown: `SELECT * FROM 'AZDOH_CC' LIMIT 0, 30`. The query result is displayed in a table with columns: `visityr`, `visityrmo`, `analysisvisitid`, `patientid`, `dateofvisit`, `analysisvisitdate`, `patientcounty`, `patientzip`, `age`, `ageunit`, `birthdate`, `ethnicity`, `gender`, `racecode`, `deceasedflag`, and `deathd`. The table is currently empty, showing only the column headers. The interface includes a left sidebar with a "filter tables by name" search bar and a list of tables including `AZDOH_Apache_DX`, `AZDOH_CC`, `AZDOH_Cochise_CC`, `AZDOH_Cochise_DX`, `AZDOH_Coconino_CC`, `AZDOH_Coconino_DX`, `AZDOH_DX`, `AZDOH_Gila_CC`, `AZDOH_Gila_DX`, `AZDOH_Graham_CC`, `AZDOH_Graham_DX`, and `AZDOH_Greenlee_CC`. The bottom of the interface features a "Page number" dropdown set to 1, a "Show" dropdown set to 30, and a "row(s) starting from row # 30 in horizontal mode and repeat headers after 100 cells" configuration.

Data Flow Example



Patient visit at ED department for treatment

A 35 year old female is taken to the emergency department of a Maricopa hospital on March 17, 2014 at 11:30 AM. The patient is registered by a clerical assistant who records the patient's name, age, race, smoking status, ethnicity and records that the patient's reason for visit is "abdominal pain, fever, painful urination."



HL7 A04



ADT A04 message is generated for admission:

- Facility name
- Date of birth, Race, Ethnicity, Gender, patient Address, MRN
- Onset date, Chief complaint, smoking status, problem list, Age
- Admit Date

Diagnosis

At 12:00 PM a nurse practitioner examines the patient and takes the vitals for the patient and updates in the EHR system. The nurse practitioner then diagnoses the patient with a urinary tract infection.



HL7 A08



ADT A08 message is generated for updates:

- Triage Note, Height, Weight, Temperature, Clinical Impression, Blood Pressure, Pulse Oximetry
- Working Diagnosis
- And previous information

Discharge

The patient is discharged from hospital to home at 12:30 PM



HL7 A03



ADT A03 message is generated for discharge:

- Discharge Date
- Discharge disposition
- Discharge diagnosis if available
- And previous information

Coding of final Diagnosis:

All the final diagnosis codes and procedure codes are entered by coders for services received by the patient during the visit.

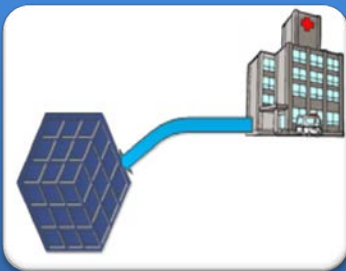


HL7 A08

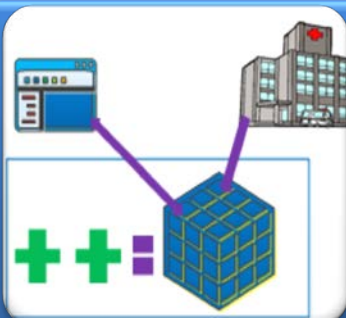


ADT A08 message is generated for updates:

- Final Diagnosis code
- Procedure code
- And previous information



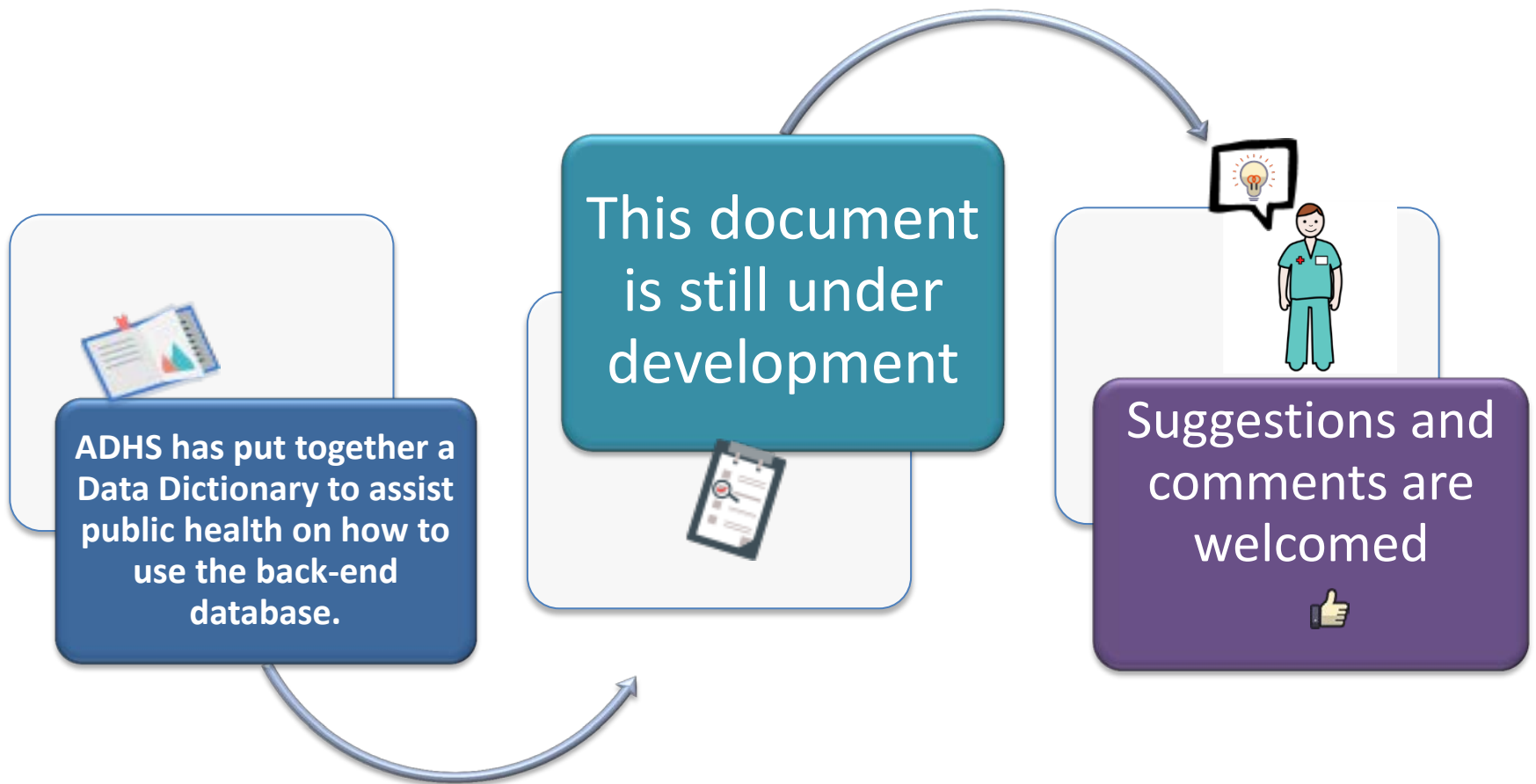
The back-end database best represents the data sent by facilities before processing by BioSense



It contains additional data elements which may not be present at the front end.



Provides best opportunity for public health to further delve into the syndromic data set





KEYS TO THE DATA DICTIONARY

Data Element
Number

BioSense
Data Element

Value Set

Length

Usage

HL7 Location

User Notes

BioSense 2.0 System Raw Data Dictionary (Updated Draft: 1/22/2015)

Data Element Number	BioSense Data Element	Description of Data Elements	Value Set	Length	USAGE	HL7 Location	User Notes
1	Row_Number	BioSense Generated Field for each patient visit		20	R	SYSTEM GENERATED	Sequential row number
2	Create_Date_Time	BioSense Generated Field. Represents the date that the row was created in BioSense.	Date/Time reported as: YYYYMMDDHHMM	12	R	SYSTEM GENERATED	Date and time BioSense processed the message
3	Create_Date	Same as Create Date Time, without the time component	Date reported as: YYYYMMDD			SYSTEM GENERATED	Date BioSense processed the message
4	Update_Date_Time	This field contains the last update date and time for the patient's/person's identifying and demographic data, as defined in the PID segment.	Date/Time reported as: YYYYMMDDHHMM	12	R	SYSTEM GENERATED	
5	Update_Date	Same as Update Date Time, without the time component	Date reported as: YYYYMMDD			SYSTEM GENERATED	
6	Stage_1_Row_Numbers	To be added to view, awaiting more information from BioSense		800	R	SYSTEM GENERATED	
7	Source_Filename	Name of the file sent from the senders.		800	R		Name of the original file containing the HL7 messages
8	Feed_Name	Name of SFTP data feed				SYSTEM GENERATED	Name of SFTP data feed
9	Channel_Name	Name of data group in BioSense	AZ_FP			SYSTEM GENERATED	
10	Unique_Visiting_ID	Unique identifier for a patient visit. A visit is defined as a discrete or unique clinical encounter within a service department or location	Unique Visiting ID is a concatenation of the following variables: Sending Facility and First Patient ID. For a full set of values, please refer to: PHVS_IdentifierType_SyndromicSurveillance	400	R	PV1 - 19	Unique Visiting ID can be used as a key for looking at the same data in different views within BioSense.
		The system calculates the earliest of all the dates and enters the data in the EDT	Date/Time reported as: YYYYMMDDHHMM				Earliest date in the message based on Observation Date/Time, Discharge Date/Time, Admit Date/Time, Procedure

File Home Insert Page Layout Formulas Data Review View Developer

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Conditional Formatting Format as Table

Normal Bad Good Neutral Calculation Check Cell

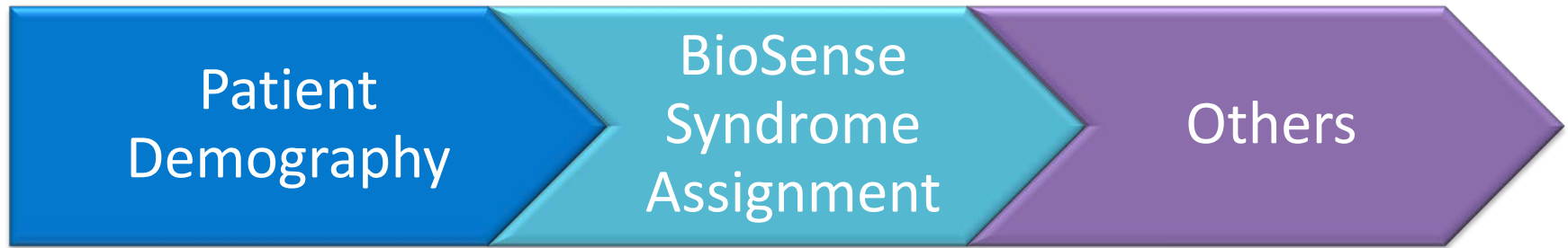
Styles

C10 This field is extracted from the earliest_date_time in the Raw Locker. It represents the earliest date and time of all messages in the Raw locker for a unique Patient.

Click to add header

BioSense 2.0 Binned Locker Data Dictionary (Updated 8/21/2014)				
Data Element	BioSense Data Element	Description of Data Elements	Value Set	Length
1	visityr	Year of patient's visit.	Year of visit reported as: YYYY	int(4)
2	visityrmo	Year and month of patient's visit.	Year and month of visit reported as: YYYYMM	int(4)
3	analysisvisitid	BioSense-generated unique visit identifier. Multiple visits on the same day by a single individual are bundled together.	Numeric	bigint(8)
4	patientid	This field is extracted from the Patient_Visit_ID in the Raw Locker. The visitID is unique identifier of all patients' encounters.	Alpha-numeric	varchar(100)
5	dateofvisit	Date of visit to the health facility.	Date reported as: YYYY-MM-DD	NA
6	analysisvisitdate	This field is extracted from the earliest_date_time in the Raw Locker. It represents the earliest date and time of all messages in the Raw locker for a unique Patient_Visit_ID.	Date/time reported as: YYYY-MM-DD HH:MM:SS	NA
7	patientcounty	County of residence of patient.	Reported as a 4 digit numeric ID	int(4)
8	patientzip	US Postal Service zone improvement plan number of patient	Reported as a 5 digit numeric USPS value	varchar(10)
9	age	Patient's age at time of visit.	Numeric	int(4)

Main Variable Groups





Introduction of the Draft AZ SS Data Dictionary

- Patient Demography

AGE

GENDER

ETHNICITY

RACE

DOB

Introduction of the Draft AZ SS Data Dictionary

- BioSense Syndrome Assignment

CHIEF COMPLAINTS

DIAGNOSIS TEXT

DIAGNOSIS CODE

PROCEDURE

TRIAGE NOTES

Introduction of the Draft AZ SS Data Dictionary

- Other (selected)

DATA OVER FLOW	PROBLEM LIST
PATIENT CLASS	TYPE OF VISIT
MEDICAL RECORD NUMBER	PATIENT'S MRN
DEATH INDICATOR	STATUS OF PATIENT
PATIENT VISIT ID	UNIQUE IDENTIFIER OF THE VISIT
ADMIT DATE TIME	DATE AND TIME OF ENCOUNTER

Discussions



Discussion on direction of future meetings

- What are the next steps for this meeting?
 - Format
 - Duration/frequency
 - Topics