Outcomes Matter

Linking EMS Records to Hospital Diagnoses

Joe Graw, Vice President of Client Services, ImageTrend

Objective

To deterministically link the Arizona Prehospital Information & EMS Registry System (AZ-PIERS) to the Arizona Hospital Discharge Database (HDD) in order to obtain information on patient hospital outcomes.

Why?

→ **EMS receives little outcome information**
  - Lack of standardization
  - Legal/Privacy challenges
  - Complexity/Cost

→ **Knowledge gap restricts:**
  - Evaluation of protocols
  - Procedures and assessments
  - Implementation of benchmarks based on outcomes
  - Feedback to field personnel
  - Patient outcomes matter

Methods

Data

- Queried from AZ-PIERS (NEMSIS)
- and HDD(UBS)

Inclusion

- 911 calls with patient disposition "treated and transferred" or "treated and transported"
- Patients transported to facilities not reporting to HDD and those located outside of Arizona were excluded

Data Linkage

- Link AZ-PIERS to HDD using SAS 9.4

Variables

- Last name
- First name
- Date of birth
- SSN
- Gender
- Date of incident/date of admission
- Hospital ID

Matches

- Record pairs ≠ first set of match criteria passed to second set of match criteria
- Match = record pair met all criteria in any given step

Linkage Criteria

Step	Linkage Criteria	n	%
	EMS 2014	**290,902**	
1	LN, FN, Sex, DOB, DOI	188,245	64.71%
2	LN, FN, Sex, SSN, DOI	1721	0.59%
3	LN, FN, Sex, DOB or SSN, DOI +2 days	17,403	5.98%
4	LN, FN, Sex, Facility, DOI +2 days	4,552	1.56%
5	LN, FN, DOB or SSN, DOI +2 days	6,441	2.21%
6	LN, Soundex FN, Sex, DOB or SSN, DOI +2days	9,701	3.33%
7	LN, Soundex FN, Sex,Facility, DOI +2days	377	0.13%
8	LN, Soundex FN, DOB or SSN, DOI +2days	338	0.12%
9	Soundex LN, FN, Sex, DOB or SSN, DOI +2 days	7,388	2.54%
10	Soundex LN, FN, Sex,Facility, DOI +2 days	324	0.11%
11	Soundex LN, Soundex FN, Gender, DOB or SSN, DOI +2 days	658	0.23%
12	SSN, DOB, Sex, DOI +2 days	4,869	1.67%
13	LN, SSN/DOB, Sex, DOI and facility	5,452	1.87%
14	LN, FN, SSN/DOB, Gender, DOI + or - 2 days	2,701	0.93%
15	LN=FN, FN=LN, SSN/DOB, Gender, DOI + or - 2 days	1,033	0.36%
	Total cases linked	**251,203**	**86.35%**

Results

318,783 records reported to AZ-PIERS in 2014

2,953,519 discharge records reported to HDD in 2014

AZ-PIERS and HDD records matched

Step 1:
Linkage of 64.7%

Steps 2-15:
Linkage of 21.7%

**Total linkage:
86.4%**

Application: Quality Assurance

→ Local agencies can **mine through data** made available from the state

→ **Compare** provider's impression in the field to final diagnosis

→ Determine **probability of survivability** based on types of calls

→ Drill in to the data to **determine trends at the agency level**

→**How can we use this to improve patient/healthcare**

Application: EMS Compass

→ Hospital Data/Linked data sources are critical as measures are defined

→ With data exchange, opportunity for Compass to build measures around and incorporate hospital data
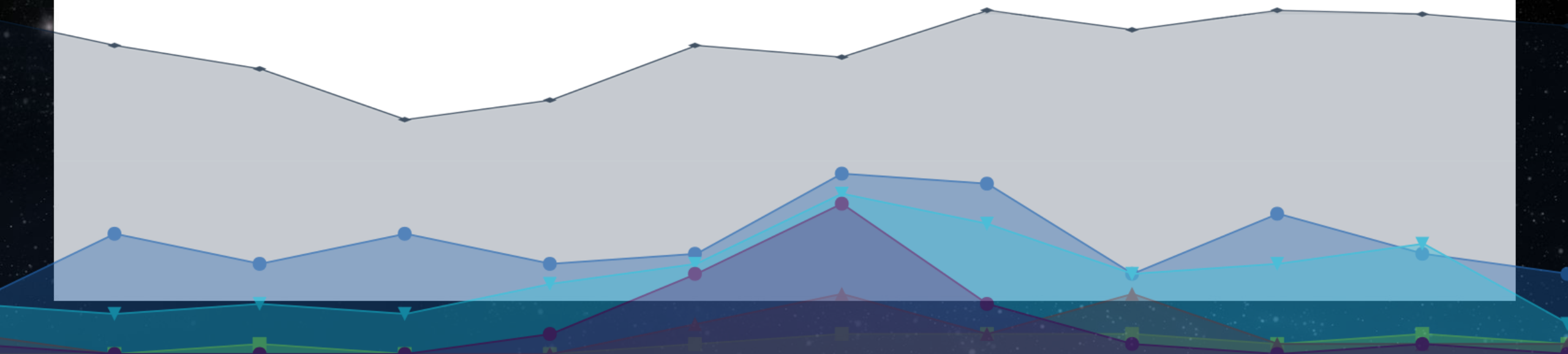
Application: Influence Community Actions

→ Develop community initiatives/programs based on data

→ Share scientific evidence on how certain interventions affect survivability

→ Scientific data can lead to greater funding

Application: Community Paramedicine

→ Develop Community Paramedicine/Mobile Integrated Healthcare programs with definitive data

Identify high utilizers

Understand the cost to hospitals

Gain support from hospitals and other influencers

Conclusion

→ Successfully linked a high percentage of EMS records to respective outcomes in HDD

→ Step towards developing a standard methodology for linking health information at the state level

→ Future linkage projects involving other registries and states may help validate the presented template

Contacts

→ Vatsal Chikani: vatsal.Chikani@azdhs.gov

→ Robyn Blust: robyn.blust@azdhs.gov

→ Anne Vossbrink: anne.vossbrink@azdhs.gov

→ Joe Graw: jgraw@imagetrend.com