SELF HARM IN THE UNITED STATES:
WHAT WE CAN LEARN FROM NATIONAL AND STATE-LEVEL MEDICAL DATASETS

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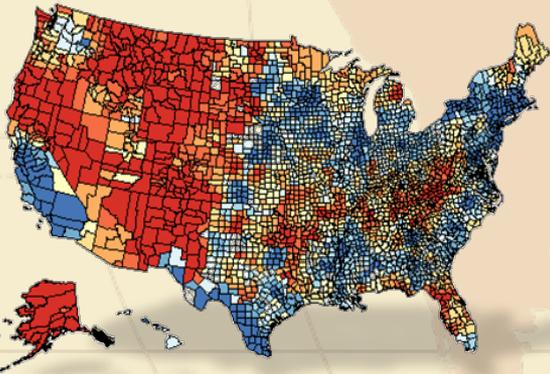**VETERANS ADMINISTRATION,
WASHINGTON, DC**

UNT | HEALTH SCIENCE CENTER

NATIONAL CONFERENCE ON HEALTH STATISTICS
2012

Acknowledgements

State HCUP datasets used in these analyses:

Arizona, California, Utah, Nebraska and Florida;

State Emergency Department Databases (SEDDs)

& State Inpatient Databases (SIDs);

Healthcare Cost and Utilization Project (HCUP)

Agency for Healthcare Research and Quality.

Why Surveillance of Self Harm?

"To address suicide as a public health problem requires the sustained and systematic collection, analysis and dissemination of accurate information on the incidence, prevalence and characteristics of suicide and suicide attempts. Surveillance is a cornerstone of public health, allowing realistic priority setting, the design of effective prevention initiatives, and the ability to evaluate such programs."
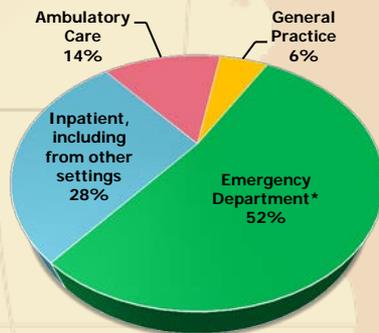
--Institute of Medicine (IOM), 2002
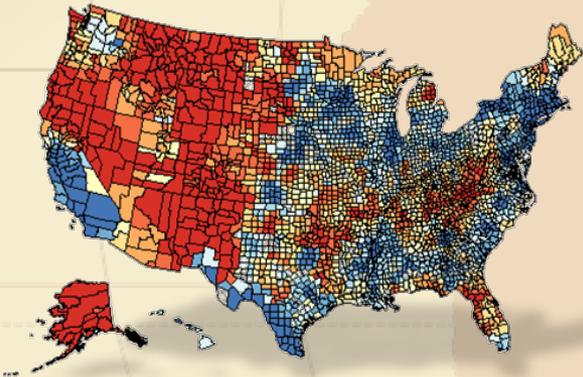
- *Self harm is a risk factor for suicide and suicide is a rare event. Accurate characterization of infrequent and rare events requires data collection among very large, representative groups.*

- *Nonfatal self harm in and of itself is an important public health concern.*

(IOM) Goldsmith, S, Pellmar, T, Kleinman, A and Bunney, W, eds., *Reducing Suicide: A National Imperative, ed. Institute of Medicine Committee on Pathophysiology and Prevention of Adolescent and Adult Suicide. 2002, Washington, DC: National Academy Press.*

The Study of Nonfatal
Self Harm in the United States

May or may not display the same patterns as self harm in Europe and Asia; systematic US investigations only recently begun.

- **Three primary types of self harm information** available in the US:

  - **Self-report data** collected via **household interviews**

  - **Medical encounter data**

    - collected via **hospital-based sampling**

    - collected via secondary analysis of comprehensive state, local or provider-based **administrative & claims datasets**

  - **Case histories** often collected via **mixed methods** that involve collection of both interview and medical data, as well as data from other sources.

Ambulatory Care 14%

General Practice 6%

Inpatient, including from other settings 28%

Emergency Department* 52%

Nationally Representative Emergency Department Samples

The National Center for Health Statistics
National Hospital Ambulatory Care Survey – Emergency Department database (NHAMCS-ED)

CDC's National Center for Injury Control & Prevention
National Electronic Injury Surveillance System—All Injury Program (NEISS-AIP)

Agency for Healthcare Research and Quality
Healthcare Cost and Utilization Project's (HCUP's) Nationwide Emergency Department Sample (NEDS) and National Inpatient Sample (NIS)

Sources of Data

- **NEDS, NHAMCS-ED and NEISS-AIP all capture visit-level information.**
  - NHAMCS data are derived from a sample of medical records during a randomly-assigned 4-week period of time
  - NEISS-AIP is a specialty data source focused on detailed information about nonfatal, first-time injuries as reported in a sample of medical records.
  - NEDS data are taken from a sample of the universe of billing records in a year

Owens, P, Barrett, M, Gibson, T, et al., *Emergency department care in the United States: A profile of national data sources. Annals of Emergency Medicine, 2010. **56: p. 150-156s.***

Comparison of National Estimates of Self Harm Visits from NEDS, NHAMCS-ED and NEISS-AIPz

Emergency Department Care in the United States   *Owens et al*

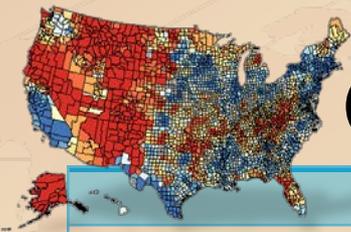**Table 9.** Number of ED visits (in thousands) for most common causes of injury treated in EDs, 2005.

| | Data Sources, 2005: Samples of EDs | | | | | |
| | NEDS | | NHAMCS* | | NEISS-AIP | |
Reasons for ED Visits	Number of Visits[†]	95% CI[†]	Number of Visits[†]	95% CI[†]	Number of Visits[†]	95% CI[†]
Number of nonfatal injury-related ED visits	27,703	26,564–28,842	41,937	38,093–45,781	29,259	25,951–32,567
Average number of E codes on injury record	1.7		1.6		1.0	
Maximum number of E codes on injury record	4.0		3.0		1.0	
Unintentional injuries	24,038	23,006–25,070	28,375	25,639–31,111	27,157	23,918–30,395
Mechanism of unintentional injuries						
Falls	6,916	6,597–7,236	8,728	7,836–9,620	7,938	6,899–8,978
Struck by/against	3,361	3,191–3,531	3,327	2,923–3,731	4,337	3,728–4,945
Motor vehicle traffic	2,962	2,815–3,110	4,241	3,694–4,788	4,370	3,700–5,040
Cut/Pierce	2,331	2,221–2,440	2,522	2,155–2,889	2,237	1,923–2,551
Other mechanism	7,194	6,852–7,536	9,409	—	7,596	—
Mechanism unspecified	1,275	1,181–1,368	—	—	679	527–831
Intentional injuries	1,411	1,324–1,499	2,198	1,879–2,517	2,102	1,807–2,397
Mechanism of intentional injuries						
Assault	1,057	985–1,129	1,744	1,472–2,016	1,661	1,388–1,933
Self-inflicted	313	294–333	420	316–524	373	305–440
Other causes of violence	41	35–46	—	—	69	50–87
Undetermined intent	100	86–114	269	181–357	—	—
No cause of injury code on record	2,081	1,504–2,657	7,460	6,435–8,485	—	—

Dashes indicate information either not collected or not applicable to data.
*Data from Nawar EW, Niska RW, Xu J. *National Hospital Ambulatory Medical Care Survey: 2005 Emergency Department Summary. Advance Data From Vital and Health Statistics; No. 386.* Hyattsville, MD: National Center for Health Statistics; 2007.
[†]In thousands.

Owens, P, Barrett, M, Gibson, T, et al., *Emergency department care in the United States: A profile of national data sources. Annals of Emergency Medicine, 2010.* **56: p. 150-156s.**

Comparison of Variables

	NEDS	NHAMCS-ED	NEISS-AIP
ED Utilization by Reasons for Visit			
Diagnoses (ICD-9-CM)	x	x	
Patient rpt of reason for Visit		x	
Procedures (ICD-90CM & CPT)	x		
Specific diagnostics & procedures		x	
Injuries	x	x	x
External cause of injury codes	x	x	x
Other			
Charges for ED Care	x		
ED visits resulting in admission	x	x	
Mode of Arrival		x	
Wait times		x	
Vital signs		x	
Medications		x	
Trends in Utilization			
Start Year	2006	1992	2000

Owens, P, Barrett, M, Gibson, T, et al., *Emergency department care in the United States: A profile of national data sources. Annals of Emergency Medicine, 2010.* **56: p. 150-156s.**
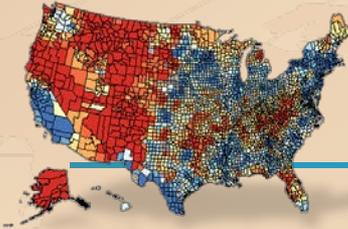
Conclusions from Owens, et al.
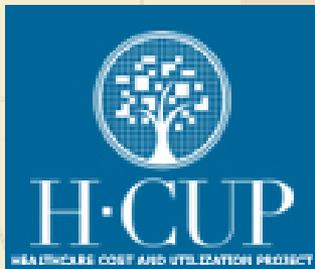
- **There is no one definitive source for ED-based analyses.**

- "Moreover, differences in estimates across these data sources are likely related to differences in target population, sampling design, operational definitions of constructs, and variation in reporting/ recording."

- "**Quality of care for relatively rare events or related conditions might best be conducted with the NEDS**, given its large sample size and greater number of diagnoses and E codes relative to NHAMCS."

Owens, P, Barrett, M, Gibson, T, et al., *Emergency department care in the United States: A profile of national data sources. Annals of Emergency Medicine, 2010. **56: p. 150-156s.***

Some of the Questions Current Sampling Approaches Cannot Answer
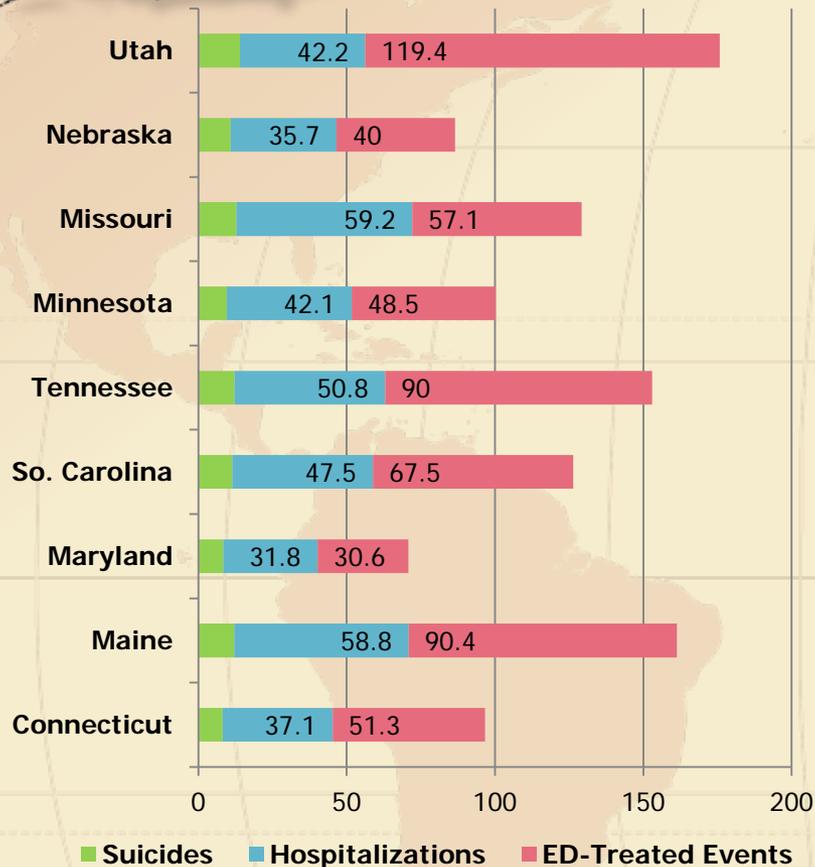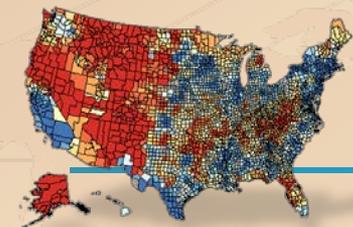
Contribution of Nonfatal ED-treated, Nonfatal Hospitalized and Fatal Intentional Self-Harm Events to Overall Event Rates by State, 2001: Crude Rates per 100,000

State	Suicides	Hospitalizations	ED-Treated Events
Utah		42.2	119.4
Nebraska		35.7	40
Missouri		59.2	57.1
Minnesota		42.1	48.5
Tennessee		50.8	90
So. Carolina		47.5	67.5
Maryland		31.8	30.6
Maine		58.8	90.4
Connecticut		37.1	51.3

- At present, **no national sampling strategy is constructed to follow patients longitudinally,** so medically-treated, repetitive self harm behavior cannot be characterized in these data.

- It is difficult to appreciate the **apparent unevenness of the geographic distribution of nonfatal suicidal behavior** in the US in these datasets, and analyses of why this is true are not possible in these data.

Claassen, C and Trivedi, M, *Datapoints: Rates of nonfatal intentional self-harm in nine states, 2001. Psychiatr Serv, 2006. **57(3): p. 313.***

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"Boundaried" High-Risk Populations
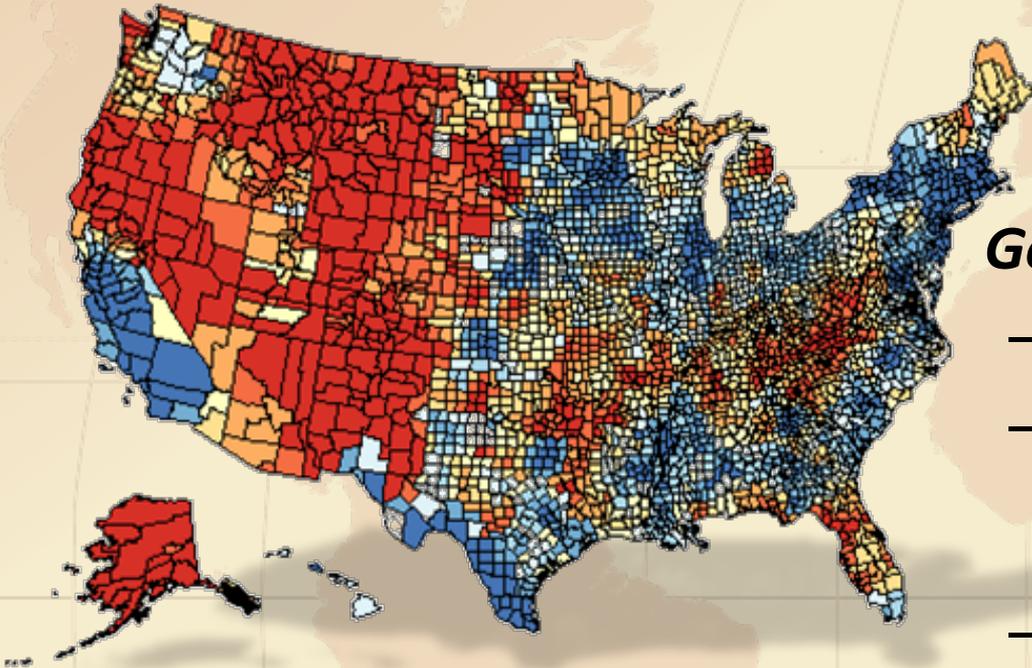
Goal:

- *To locate settings*

- *with concentrations of individuals at high risk for self harm*

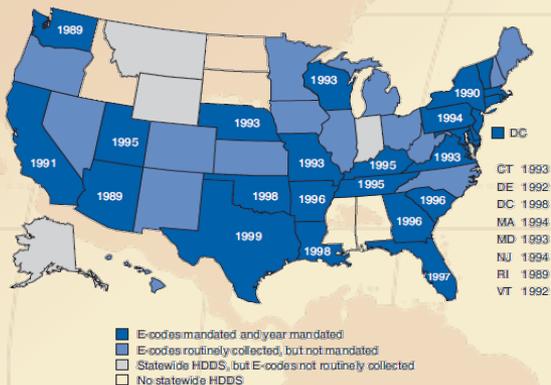- *who are accessible for suicide prevention (risk-lowering) interventions.*
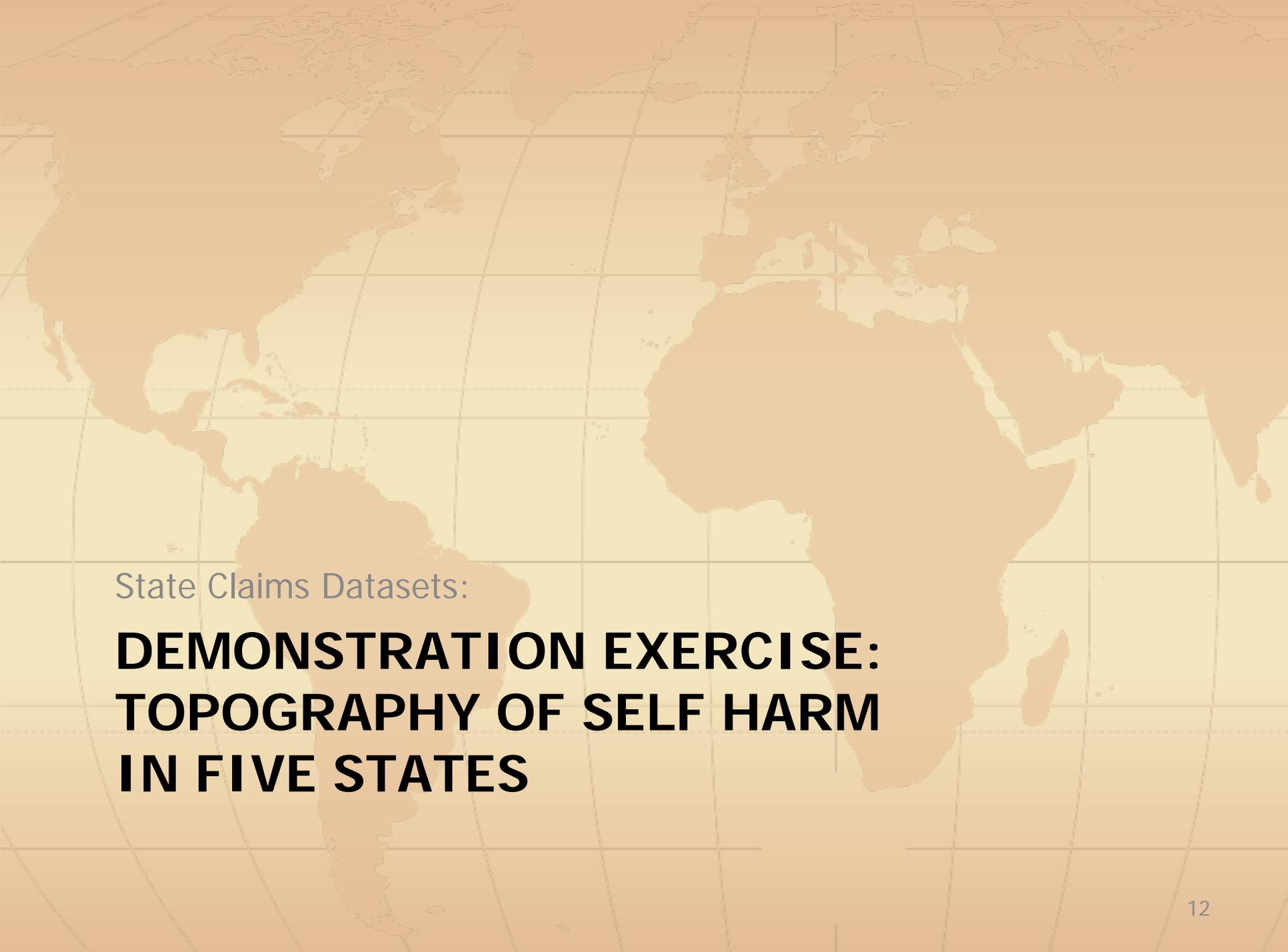
State Claims Datasets:

# DEMONSTRATION EXERCISE: TOPOGRAPHY OF SELF HARM IN FIVE STATES

State-Level Administrative Claims Data

*States with Centralized Collection Processes for Inpatient (Hospital Discharge) Data Classified by E-Code Collection Status, 2007*

- A number of US states now **have systems in place to collect data on all inpatient, ambulatory care and ED treated-and-released medical encounters occurring within the state annually.** Therefore, for those states, information **on the universe of medically-treated self harm acts is now available**.

States with Centralized Collection Processes for Emergency Department (Discharge) Data Classified by E-Code Collection Status, 2007
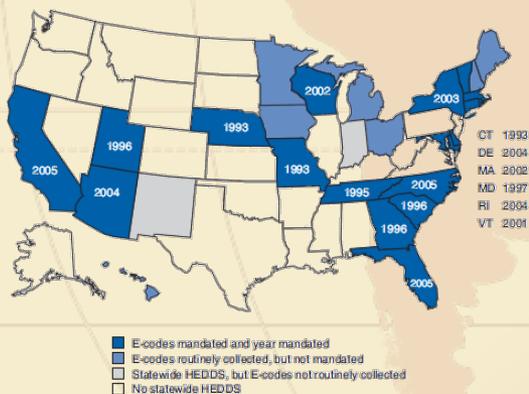
- A portion of these state datasets contain **E-code diagnoses and a patient-level encrypted identifier,** permitting both identification of self-inflicted injury episodes and patient-level linkage across visits.
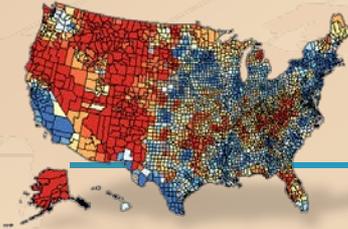
DEMONSTRATION EXERCISE CASE STATE SELECTION & CASE IDENTIFICATION

CASE STATES:

1) Mandatory (legislated) reporting of inpatient and ED encounters

2) Mandatory E-coding of all injury events included with reporting

3) States ≥ 3 years data collection prior to study time frame

4) AHRQ quality check indicating E-Code completeness of > 85% on BOTH inpatient and ED datasets, using the STIPDA-defined injury ICD codes

5) Participation in the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project (HCUP) Revisit Analysis program

CASES:

Any encounter with self harm E-Code

States Used in 2006-2007 Self Harm Analyses

California
Arizona
Utah
Nebraska
Florida
South Carolina
New York
Maine
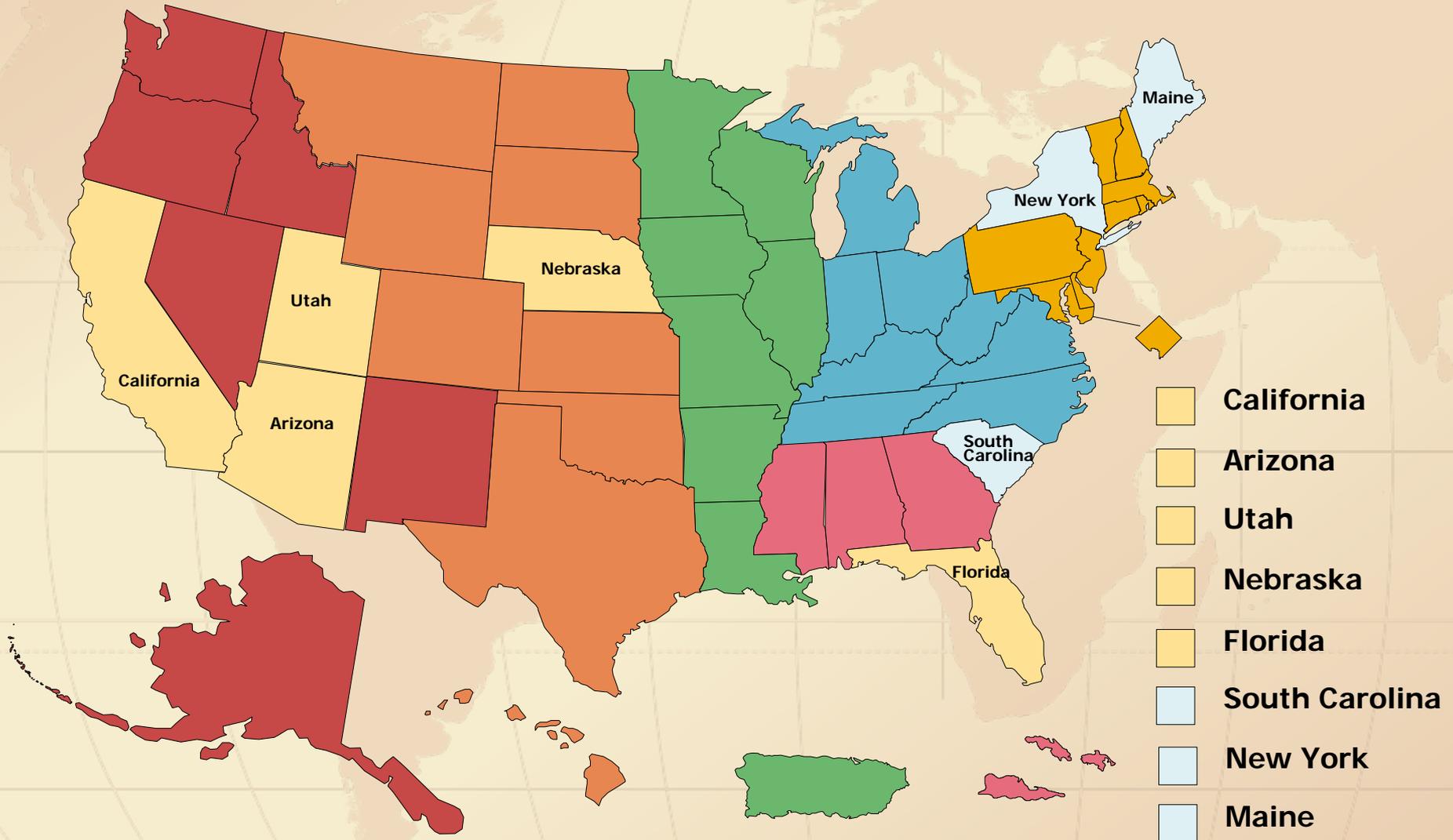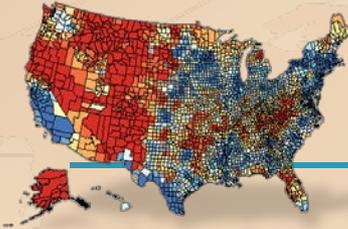
Data Quality Issues in Administrative Claims Data Used for Self Harm Surveillance

1. PRESENCE/ABSENCE OF ESSENTIAL SURVEILLANCE DATA ELEMENTS

2. MATURITY OF DATA COLLECTION SYSTEM

3. OVERALL HOSPITAL REPORTING CONSISTENCY

4. NUMBER OF E-CODE FIELDS ON CLAIMS FORM (VARIES BY STATE)

5. E-CODE FIDELITY:

   1. % INJURY EPISODES IN DATASET

   2. % MISSING ECODES

   3. % THREE DIGIT ONLY E-CODES

   4. % INVALID E-CODES

6. COMPLETENESS OF RECORD LINKAGE

7. OTHER INCONSISTENT /MISSING DATA
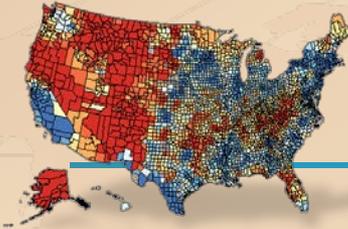
ESSENTIAL SURVEILLANCE DATA ELEMENTS (Hawton, 2006)

- ❖ **Gender**
- ❖ **Date of Birth**
- ❖ **Geographic Indicator**
- ❖ **Marital Status**
- ❖ **Race/Ethnicity**
- ❖ **Date of self-inflicted injury**
- ❖ **Date of presentation for care**
- ❖ **Time of presentation for care**
- ❖ **ED discharge status**
- ❖ **Psychosocial assessment conducted (Yes, No)**
- ❖ **Method of self-injury**
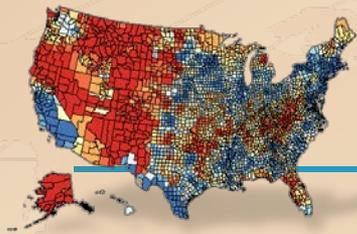
Technical Analysis of Data Quality

- **MATURITY OF DATA COLLECTION SYSTEM:**

  - *All states > 2 prior years data collection before study time frame.*

- **OVERALL REPORTING CONSISTENCY BY HOSPITAL:**

  - *(Completed for three states with both hospital ID and month of visit variables for hospitals with > 20 self harm visits per month.)*

  - *Three California hospitals had missing data for at least one complete month.*

  – **E-CODE FIDELITY: % INJURY EPISODES IN DATASET***)*

  - *Percent injury visits in dataset: 22.3%   vs.*
  - *NEDS, 2005: 23.8%; NHAMCS-ED, 2005: 25.4%*
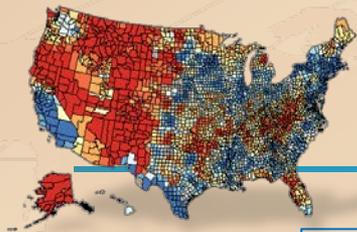
Technical Analysis of Data Quality

% MISSING E-CODE (COMPLETENESS):

- *Completeness: 91.7%*
- *Sensitivity: 0.92*
- *Specificity: 0.96*
- *Positive Predictive Value: 0.84*
- *Negative Predictive Value: 0.098*

CASE DEFINITION: INJURY-RELATED MEDICAL ENCOUNTER	
Inclusion/ Exclusion for ICD-9 CM diagnostic Codes:	**Inclusion:** Medical records with principal diagnosis of ICD-9 CM 800 – 994, 995.5 and 995.80 – 995.85, **Exclusion:** ICD-9 CM 909.3 and 909.5, plus: 363.31, 370.24, 371.82, 388.11, 760.5, 995.5, 995.80–995.85
Inclusion/ Exclusion ICD-9 External Cause of Injury Codes:	**All E-Codes except the following:** E849 -E967 - E869.4 - E870 – 879 - E930 – 949
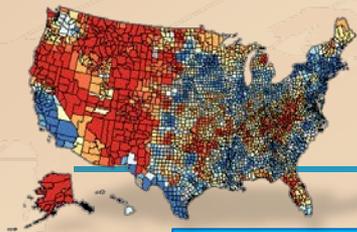
Technical Analysis of Data Quality

COMPLETENESS OF RECORD LINKAGE (SELF HARM VISITS)

	WITHIN ROW % MISSING	% OF ALL MISSING
ARIZONA	4.18%	3.33%
CALIFORNIA	19.14%	69.70%
FLORIDA	8.42%	19.94%
NEBRASKA	0.62%	0.12%
UTAH	13.75%	6.91%
(ALL VISITS) % MISSING PIDS		7.14%
9<AGE<15=	35.11%	11.57%
14<AGE<25=	20.23%	47.97%
24<AGE<35 =	11.20%	17.28%
34<AGE<45=	8.35%	12.04%
44<AGE<55=	6.61%	7.67%
54<AGE<65	6.07%	2.47%
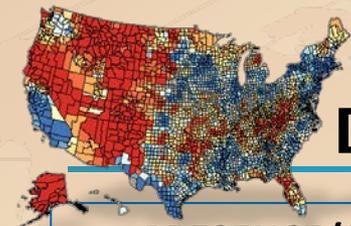
Summary: Data Quality in the Administrative Dataset Used for Recurrent Self Harm Analysis

- **PRESENCE/ABSENCE OF ESSENTIAL SURVEILLANCE DATA ELEMENTS**

- **MATURITY OF DATA COLLECTION SYSTEM**

- **OVERALL HOSPITAL REPORTING CONSISTENCY**

- **NUMBER OF E-CODE FIELDS ON CLAIMS FORM (VARIES BY STATE)**

- **E-CODE FIDELITY:**

  - **% INJURY EPISODES IN DATASET**

  - **% MISSING ECODES**

  - **% THREE DIGIT ONLY E-CODES**

  - **% INVALID E-CODES**

- **COMPLETENESS OF RECORD LINKAGE**

- **OTHER INCONSISTENT /MISSING DATA**

Summary:

- *Missing date of injury, hour of admission, marital status & reliable indicator of psychosocial intervention for ED pts.*

- *Data collection mature and assumed reliable for 661 of 664 hospitals with at least one suicide attempt reported in two-year period.*

- *Three-six E-Code fields available, with only < 5 in Florida only.*

- *% injuries in data set is consistent with national norms; % missing E-Codes/3-digit E-Codes/Invalid E-Codes is negligible*

- *Record linkage a problem for CA data (19.1% missing PIDs) and FL data (8.4% missing PIDs).*

- *Other inconsistencies negligible.*

Operationalized Definitions

(Intentional) Self Harm: ICD-9 E-coded event designating new episode of intentional self harm (E950-E958) occurring in an E-Code field in the dataset for either ED-treated or inpatient episodes of care.

- Occurring to an individual 10 years of age or older
- Treated in one of the hospitals included in the 5-state HCUP dataset.
- *Note that E959 (late effects) not used because this code does not necessarily designate a new event.*

Self Harm 'Event:' Database observation representing a care for self harm occurring in a single setting at a single point in time.

Self Harm 'Episode of Care:' All dataset observations that represent care for the same self harm event – an episode may encompass one or more 'events,' depending on whether the pt was treated in the ED, on an Inpatient Service, or one or more of both types of settings.
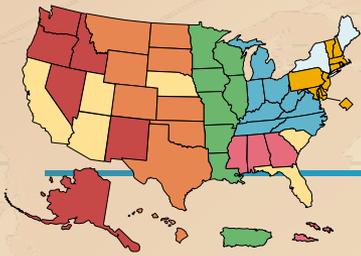
2006-2007 Data Overview

Total Medical Encounters in Dataset:	50,194,411	
Arizona – Total Medical Events	4,971,822	9.9%
California – Total Medical Events	25,330,759	50.5%
Florida– Total Medical Events	16,734,312	33.3%
Nebraska – Total Medical Events	1,244,327	2.5%
Utah– Total Medical Events	1,913,191	3.8%
Total ED-based Events	42,351,062	84.4%
Total Inpatient Events	7,843,349	15.6%
Total E-Coded Events (Injury Events)	11,172,003	22.3%
Total E950-E958 Events (Self Harm) >9 yo	175,587	0.3%
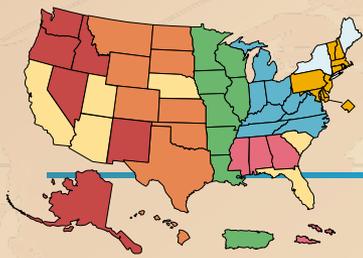
Final Analytic Dataset

|	
Number of Self-Harm 'Events' for Patients > 9 yo	**175,587**
Number of Intentional Self-Harm 'Events' with PID	**147,908**
Number of Self-Harming Patients in analytic Dataset	**122,769**
Number of Hospitals Treating Self-Harming Patients	**662**
Number of Episodes of Self Harm Tx'd by Hospital (Range)	**1 – 1600**
Number Hospitals Tx'ing > 2 'Events' /week (>207 events)	**298 (45%)**

Approx 75% of Self Harm Pts were treated in 40% of the hospitals
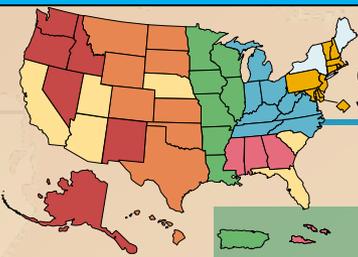
State-level Event & Person Comparisons

State	'06-'07 Nonfatal Self Harm Event Rate per 100,000	'06-'07 Suicide Crude Rate per 100,000*	'06-'07 Ratio of All Self-Harm Events to Suicides
Arizona	147.2	15.9	11 : 1
California	116.8	9.6	12 : 1
Florida	150.8	13.8	11 : 1
Nebraska	127.6	10.9	12 : 1
Utah	222.7	14.1	16 : 1

U.S Average Crude Suicide rate per 100,000, 2006-2007 = 11.31
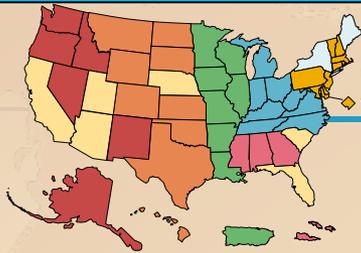
State-level Event & Person Comparisons

State	'06-'07 Event % Female	'06-'07 Mean Event Age	'06-'07 Event % Rural*	'06-'07 Event % Lowest SES quartile (50%)**	'06-'07 Event % Poisoning
Arizona	59.1%	32.5	3.4%	17.3% (43.4%)	72.4%
California	59.3%	34.9	1.6%	19.1% (43.5%)	66.9%
Florida	56.3%	35.6	2.6%	19.7% (43.6%)	70.6%
Nebraska	63.0%	30.8	24.6%	20.9% (43.7%)	69.3%
Utah	62.4%	31.1	3.9%	20.9% (46.7%)	68.1%

* Definition, per 2003 Urban Influence Codes: Non-metro, noncore, adjacent / not adjacent to small metro

** Overall Event-level % lowest SES quartile by state in dbase:
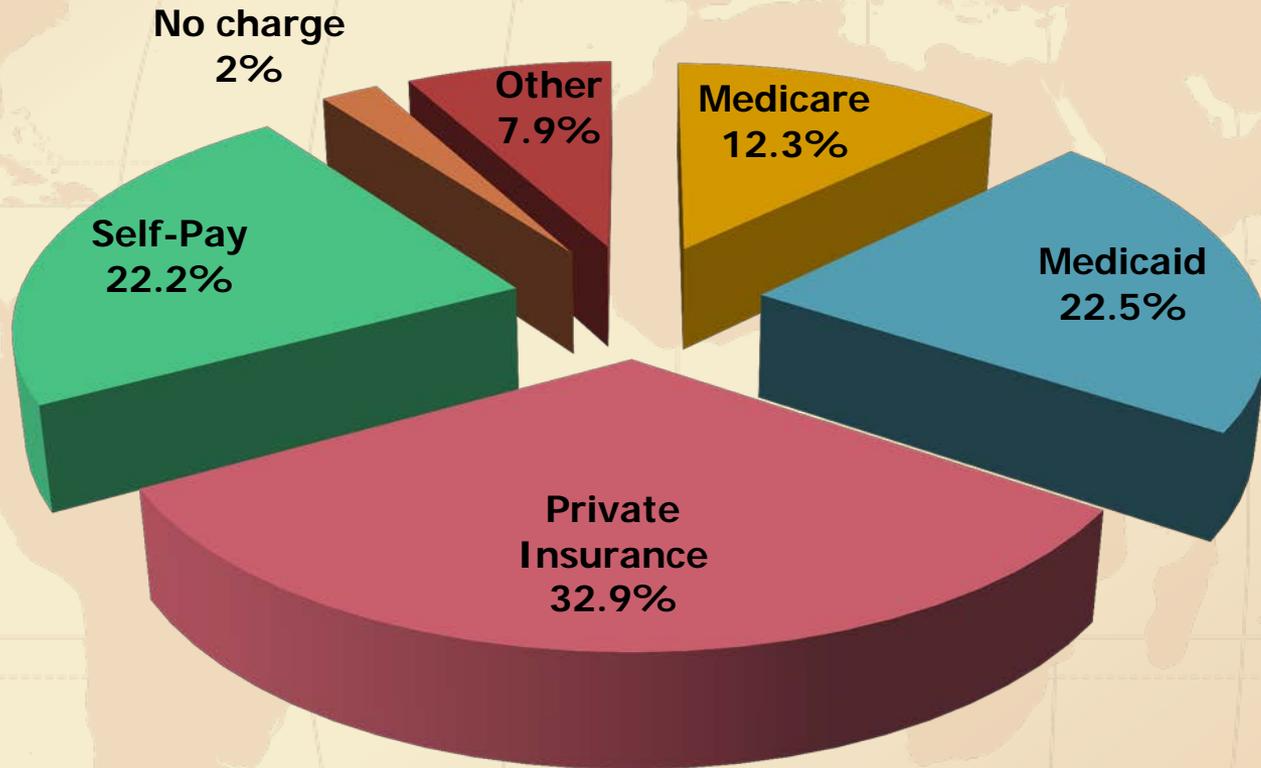30.1% lowest quartile; 56.6% lowest half
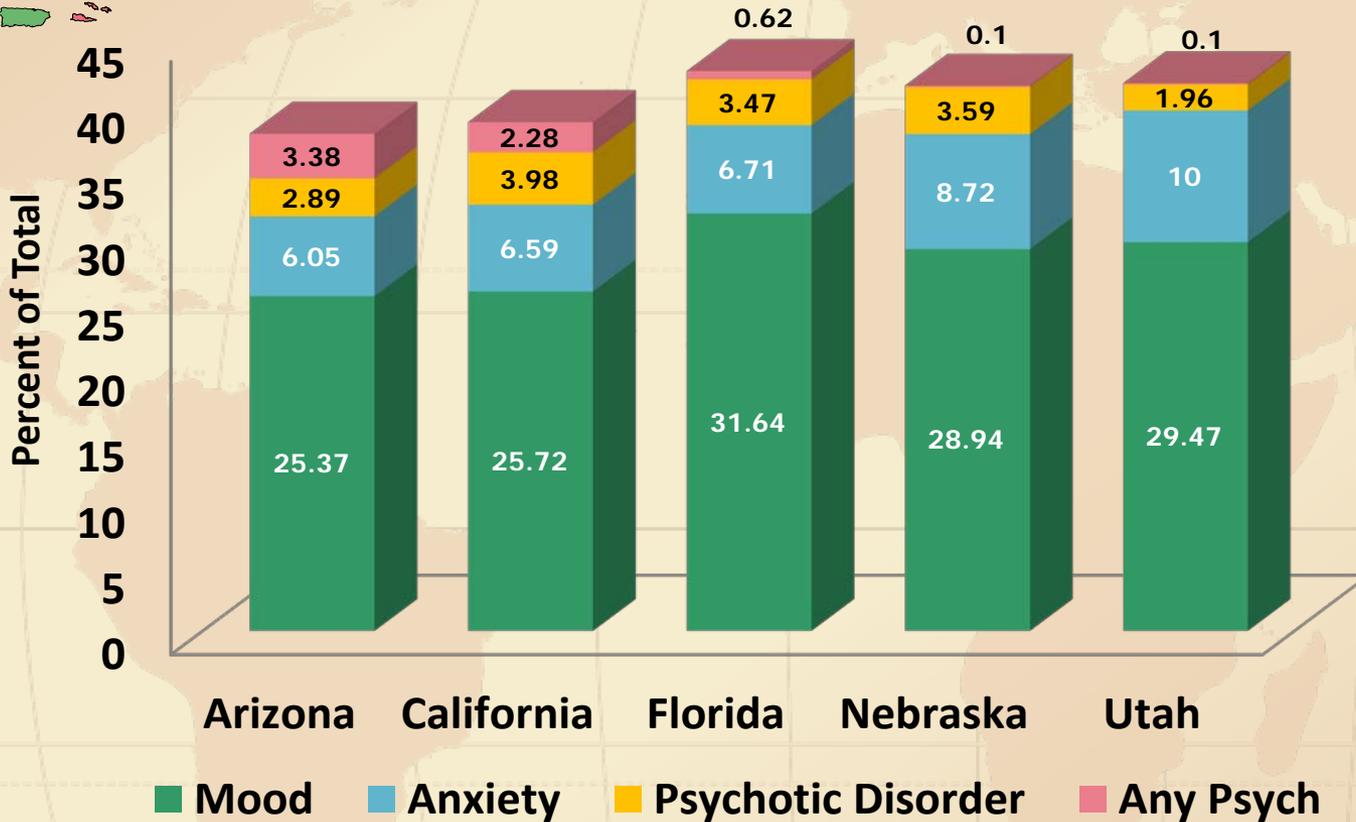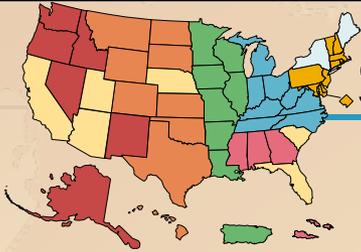
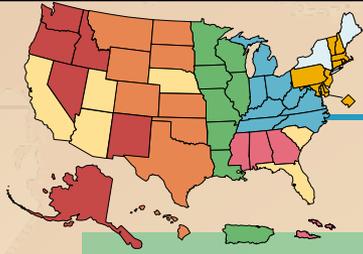# State-level Event & Person Comparisons
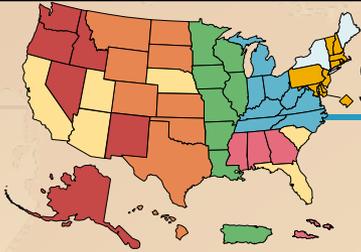
5-State Average: Payor Source

Description of Recurrent Self Harm

State	Number of Repeaters	% of All Self Harming Pts	Number Repeat Episodes by State (Range)
Arizona	1,094 / 17,4620	6.3%	1 – 15
California	7304 / 66816	10.9%	1 – 18
Florida	4,971 / 49,298	10.1%	1 – 22
Nebraska	1249 / 4391	12.8%	1 – 8
Utah	1,249 / 9766	12.8%	1 – 12
Total	12,596 / 122,769	10.3%	1 - 22

Description of Recurrent Self Harm
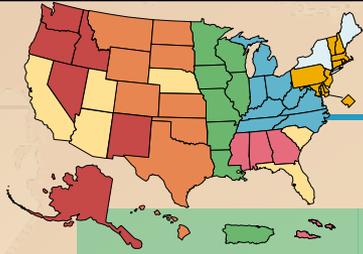
State	% Female	Mean Age (SD)	% Under 30 Years of Age	% Rural**	% Lowest quartile
Arizona	59.5%	34.1 (12.7)	44.8%	3.5%	15.1%
California	58.4%	36.0 (14.1)	40.7%	1.5%	18.3%
Florida	55.5%	37.2 (15.1)	38.4%	2.9%	19.9%
Nebraska	66.2%	31.4 (13.8)	54.0%	28.5%	22.3%
Utah	63.2%	31.7 (12.1)	55.9%	4.2%	21.3%

Percent / Risk of Self Harm Repetition within 12 months
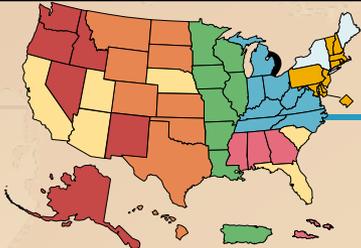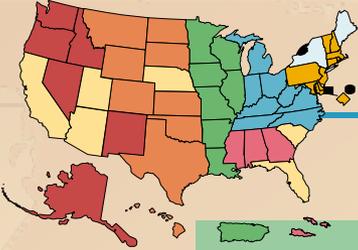
% Methods by Event Count
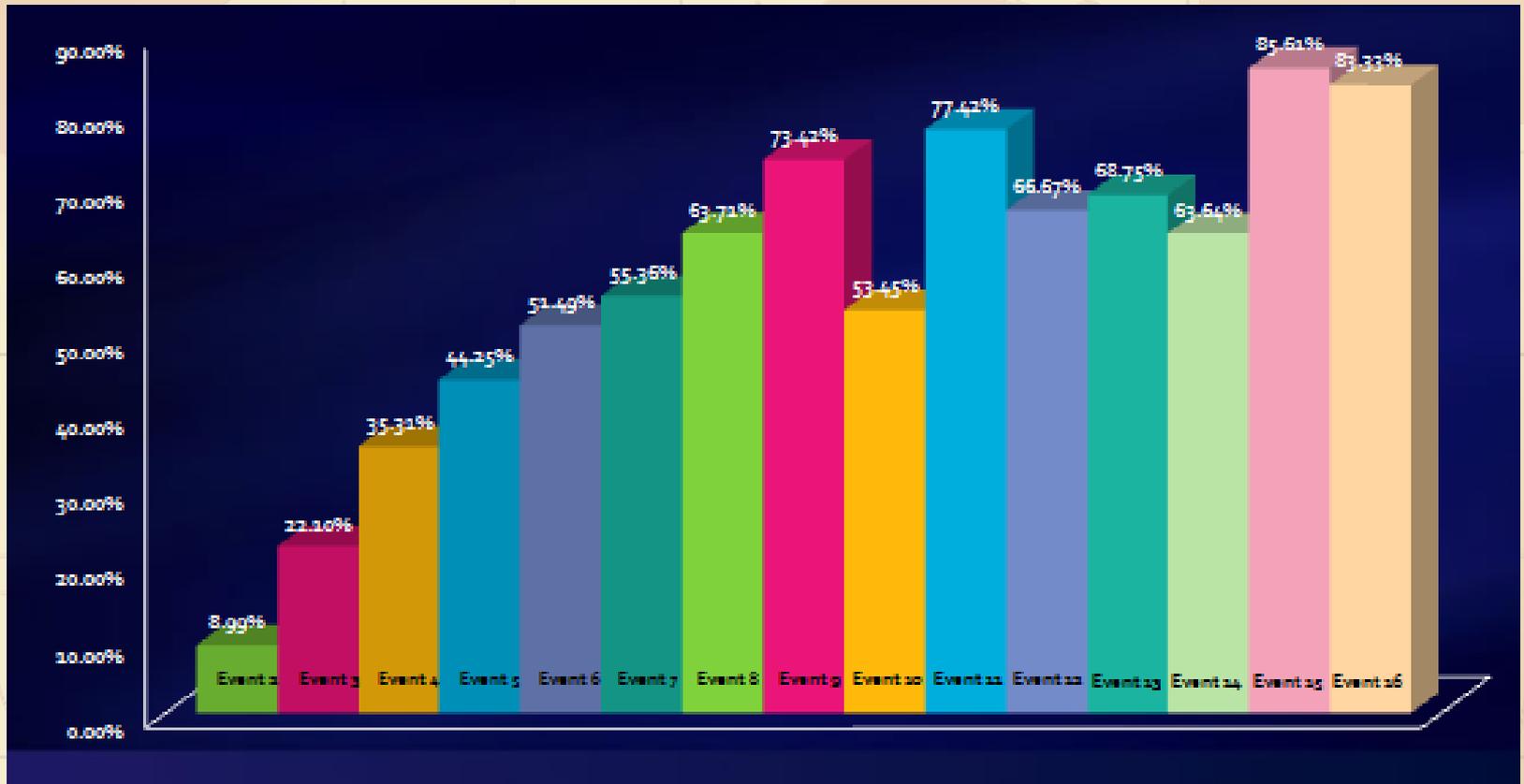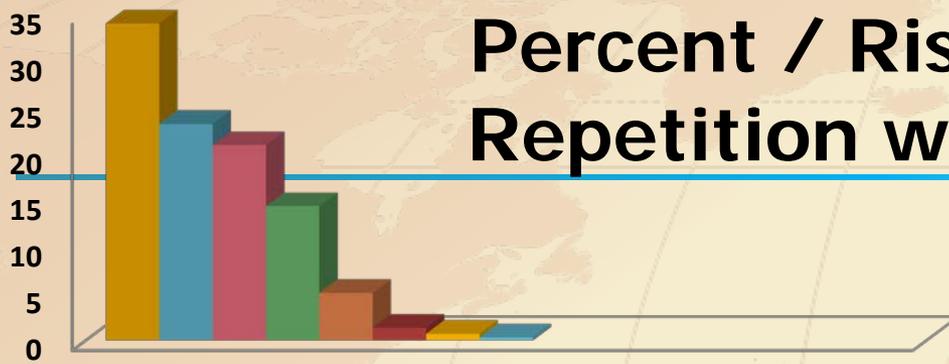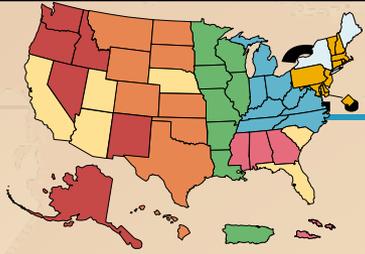
SELF-HARMING PATIENTS AND TREATMENT
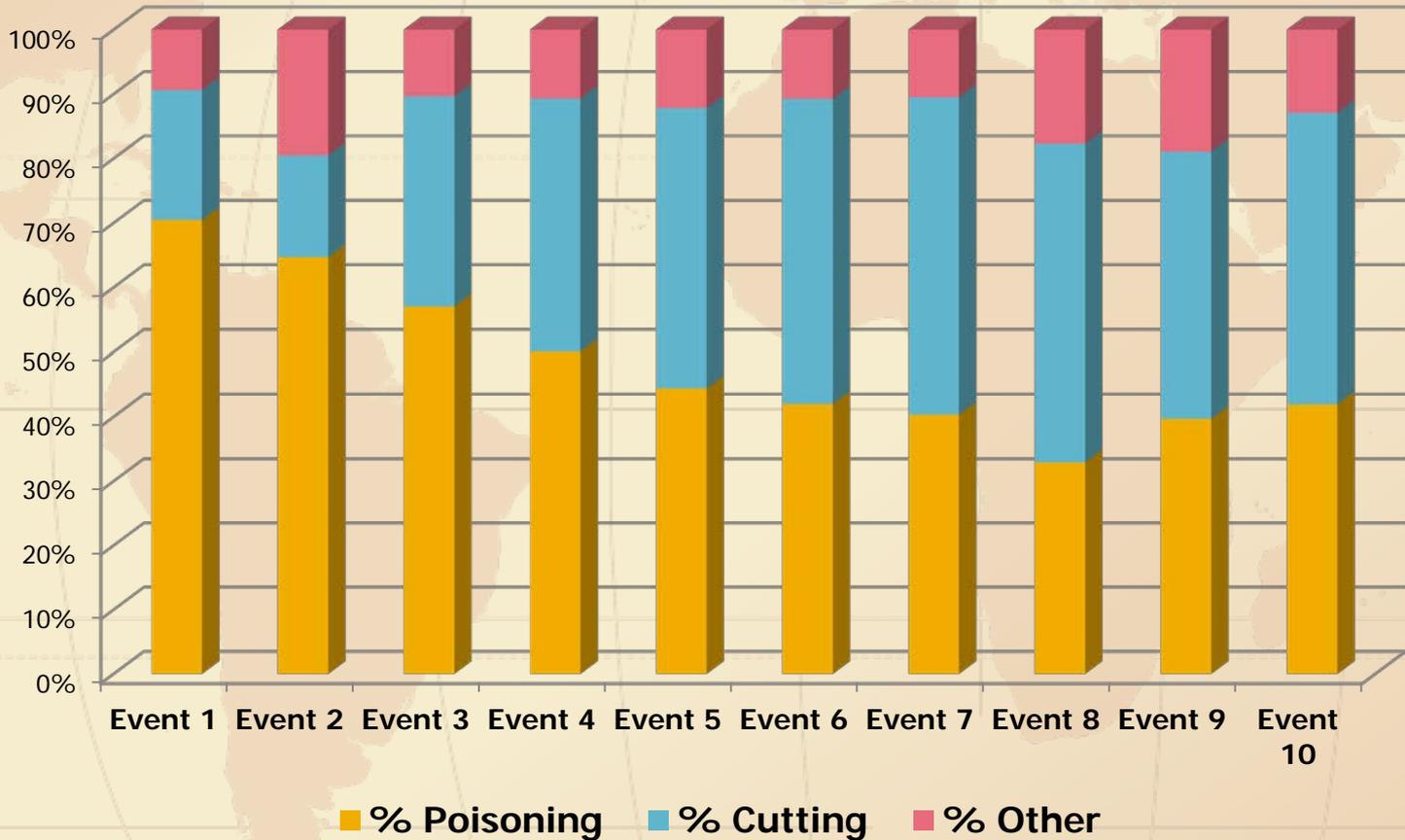
Hospitalization Rates by Event Number
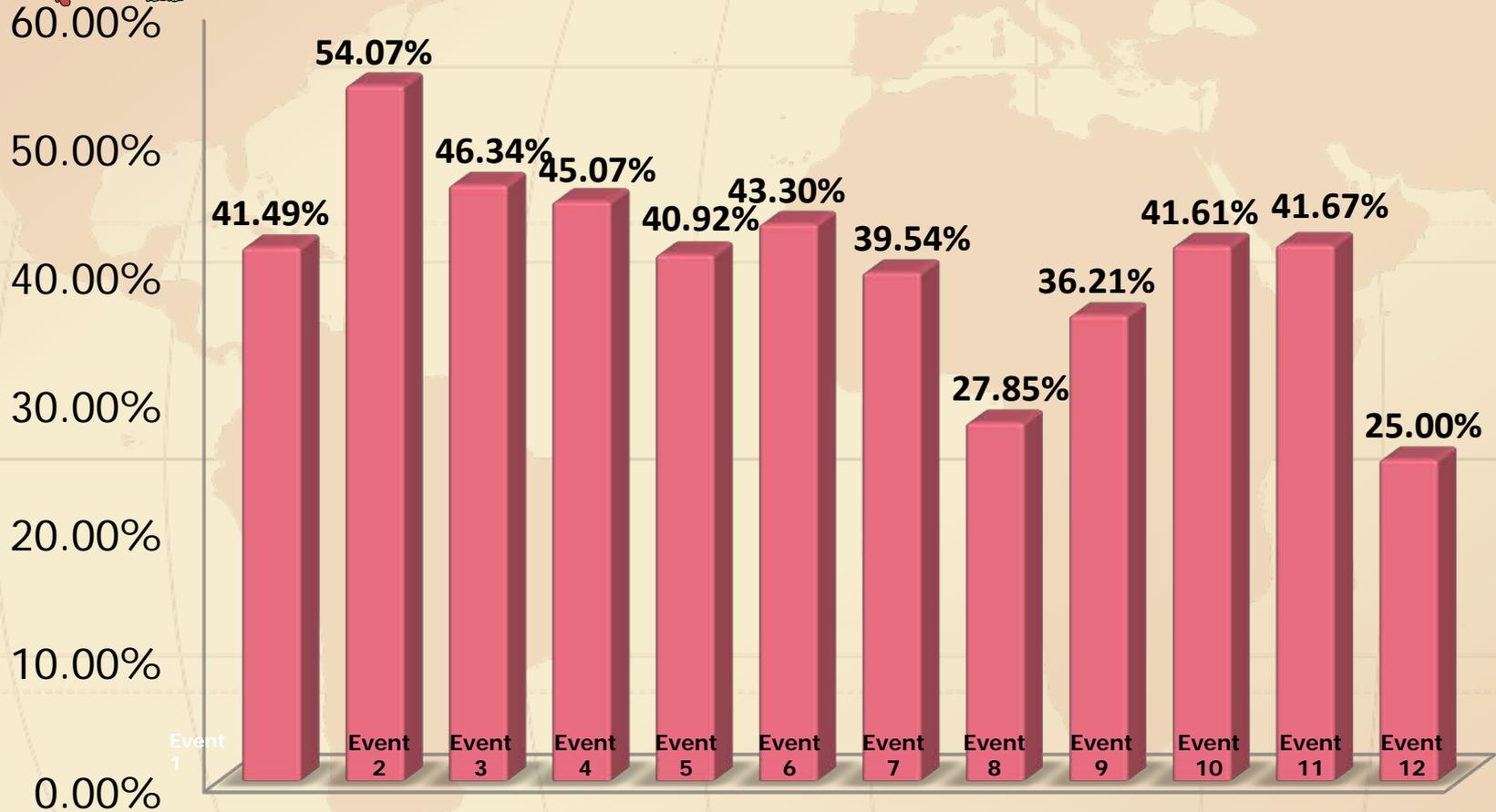
Time to Second Nonfatal Event

|	% with 2nd event within 4 wks of 1st	% with 2nd event within 8 wks of 1st	% with 2nd event within 12 wks of 1st	% with 2nd event within 12 mos of 1st
California	44.6%	55.3%	63.8%	100.0%
Arizona	33.9%	46.7%	56.4%	100.0%
Utah	44.4%	53.5%	61.7%	100.0%
Nebraska	46.0%	55.6%	63.3%	100.0%
Florida	45.8%	56.6%	64.4%	100.0%
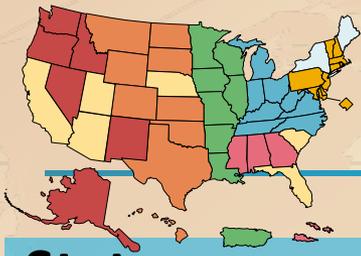
How Representative are the Data?

State	'06-'07 Five-State	'06-'07 NEISS-AIP
Person Rate per 100,000	133.0 / 100,000	132.7 / 100,000
M : F Ratio	1 : 1.4	1 : 1.4
Mean Age	32.2	32.1
% Poisoning	68.94%	69.06%
Completions : Nonfatals	1 : 11	1 : 11

* Eliminates E-code 959.0 – Late effects, in order to compare to NEISS-AIP
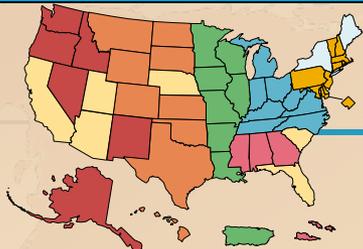
Conclusions

The informed use of event-based medical data may well represent the most powerful approach currently available for answering a host of previously unanswerable epidemiological questions about intentional self-injury in the United States, such as:

- *In what communities are rates of self harm behavior rising or declining among the very young or other demographic groups?*

- *How do large, community-based training initiatives such as Gatekeeper Training impact rates of presentation for care among high risk groups?*

- *Does post-injury medical care impact the risk of near-term repetition?*

- *What specific provider/healthcare system factors are associated with lower or higher rates of near-term self harm?*

36

New Episode *v.* Continuation: Coding Rules

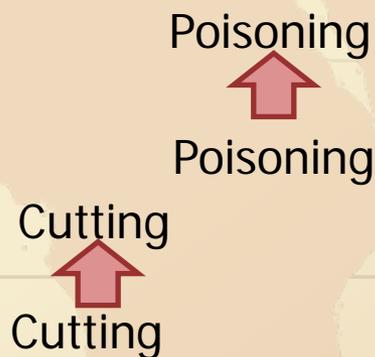*For Events Occurring within Two Days of Prior Event*

If First to Second Event Sequence is:	And First Event Disposition was:	Then Second Event Is:
ED to Inpt	To Inpt	Continuation of Care
ED to Inpt	To Outpt	New Episode
ED to ED	To Inpt	Continuation of Care
ED to ED	To Outpt	New Episode
Inpt to ED	To Inpt	Continuation of Care
Inpt to ED	To Outpt	New Episode
Inpt to Intp	To Inpt	Continuation of Care
Inpt to Inpt	To Outpt	New Episode

"Trading Up" in Mechanism across Repetitions:

Between Method Trade-Ups

Firearms

Drowning / Hanging

Cutting /
Poisoning

Within Method Trade-Ups

Poisoning

Poisoning

Cutting

Cutting

2. Average Time Between Nonfatal Events: All Methods

State	State	Index to 2nd	2nd to 3rd	3rd to 4th	4th to 5th	Fifth to Sixth	Sixth to Seventh	Seventh to Eight
California	California	82 ± 95	72 ± 77	58 ± 64	53 ± 58	44 ± 58	43 ± 57	30 ± 46
Arizona	Arizona	97 ± 95	78 ± 78	48 ± 55	44 ± 52	47 ± 63	32 ± 43	20 ± 29
Utah	Utah	90 ± 100	72 ± 78	58 ± 68	56 ± 69	31 ± 51	50 ± 60	36 ± 53
Nebraska	Nebraska	82 ± 97	69 ± 72	57 ± 59	73 ± 59	40 ± 61	46 ± 18	44 ± 49
Florida	Florida	83 ± 98	64 ± 74	61 ± 65	42 ± 46	42 ± 49	39 ± 42	28 ± 36

Note: The column headers in the colored header row read: State, (blank), Index to Second, Second to Third, Third to Fourth, Fourth to Fifth, Fifth to Sixth, Sixth to Seventh, Seventh to Eight.

## 2. Who "Trades Up" in Method of Injury across Repetitions:

Logistic Regression Results

Test of Model Coefficients : $x^2_{(15)}$ = 1451.02, p < 0.0005

Hosmer & Lemeshow Goodness of Fit: $x^2_{(8)}$ = 8.63, p = 0.37

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	-.01	.01	1.22	1	.270	.987
Gender (Female)	-.80	.34	5.42	1	.020	.449
Race:			4.67	3	.198	
White	-1.28	.61	4.48	1	.034	.278
Black	-17.58	1983.59	.00	1	.993	.000
Hispanic	-1.39	.78	3.17	1	.075	.250
Primary Diagnosis:			36.51	4	.000	
Anxiety	18.82	2242.04	.00	1	.993	.000
Mood	16.21	2242.04	.00	1	.994	.000
Psychoses	16.51	2242.04	.00	1	.994	.000
Adjustment	16.28	2242.04	.00	1	.994	.000
Index Visit Length of Stay	.09	.03	8.23	1	.004	1.091
First Episode Method			.04	5	1.000	
Cutting	56.80	10455.68	.00	1	.996	.000
Poisoning	17.95	10139.97	.00	1	.999	.000
Suffocation	-.63	12698.40	.00	1	1.000	.534
Firearm	.53	15761.24	.00	1	1.000	1.707
Fall	17.73	10139.97	.00	1	.999	.000
Constant	-36.18	10384.88	.00	1	.997	.000

Horizontal bar

44
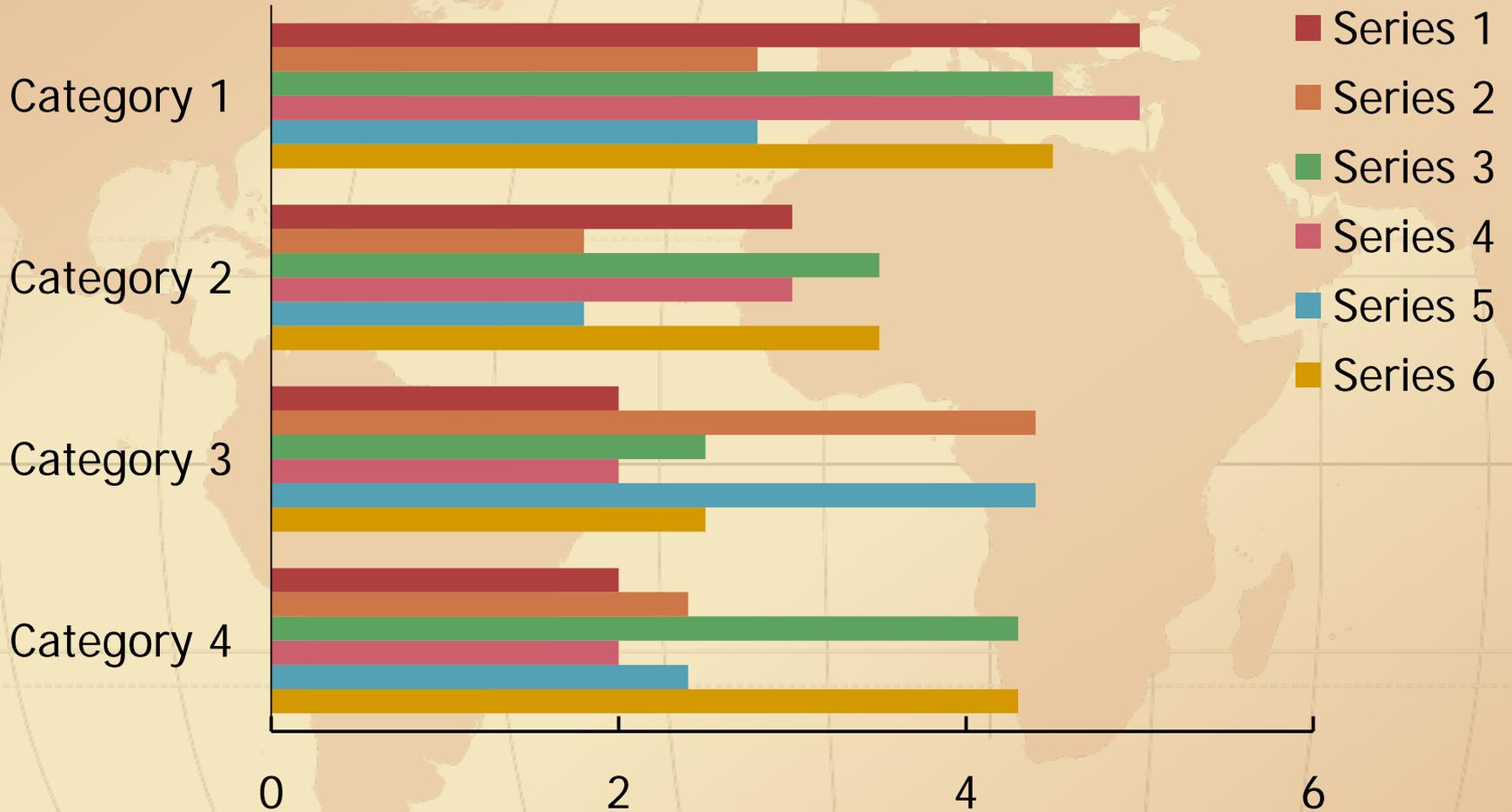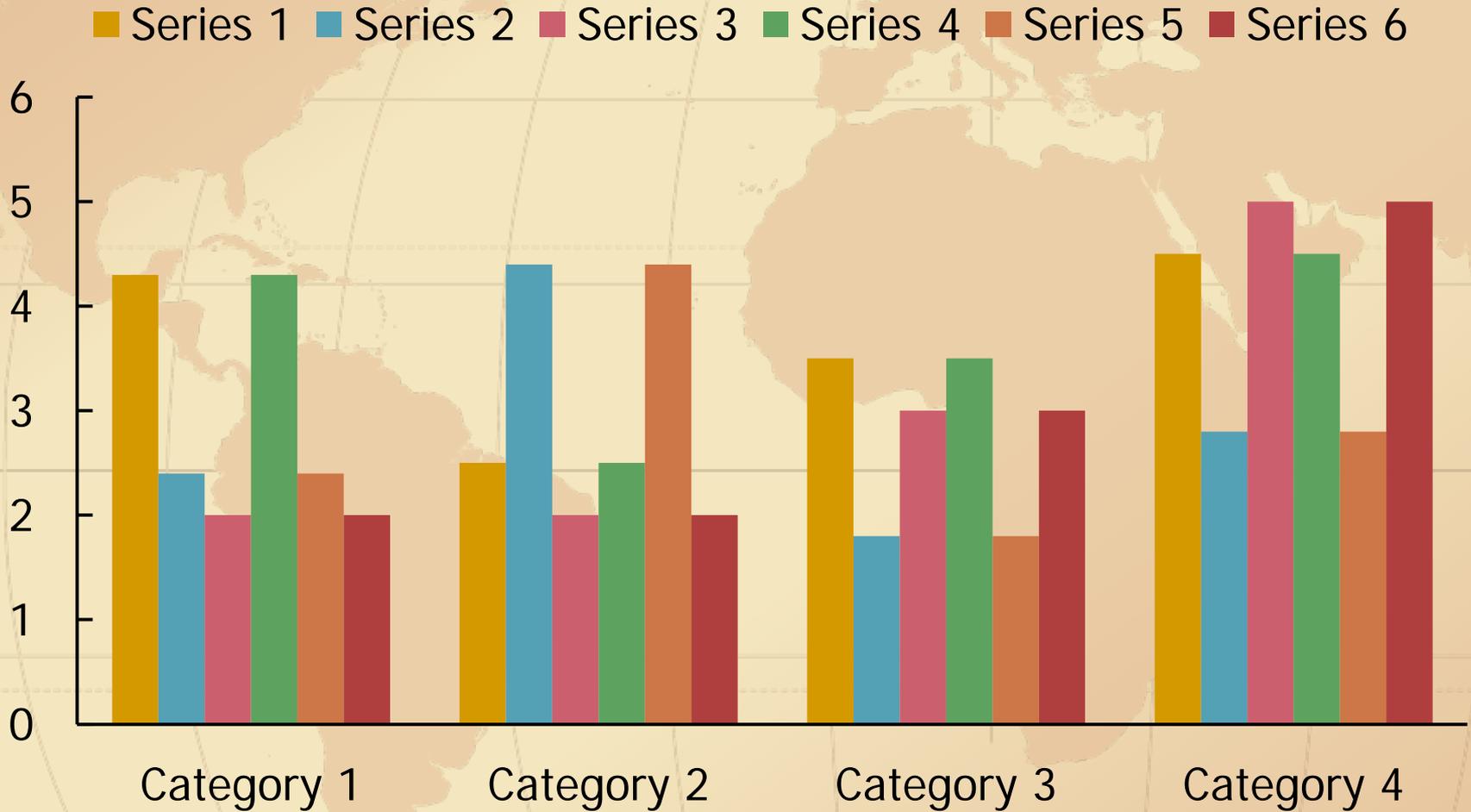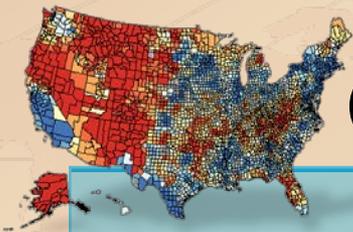
Comparison of Variables

	NEDS	NHAMCS-ED	NEISS-AIP
ED Utilization by Period (In Addition to Annual)			
Monthly	x	x	
Day of Week	x	x	
ED Utilization by Hospital Characteristic			
Region	x	x	
Trauma center	x	x	
Urban/rural location	x	x	
Ownership	x	x	
Teaching status	x		
ED Utilization by Pt Characteristic			
Age	x	x	x
Sex	x	x	x
Payer	x	x	
Race/ethnicity		x	x
Urban/rural location	x		
Community-level income quartile	x		

Owens, P, Barrett, M, Gibson, T, et al., *Emergency department care in the United States: A profile of national data sources. Annals of Emergency Medicine, 2010.* **56: p. 150-156s.**

NHAMCS-ED

- **Started in 1992;** a stratified, representative sampling of visits to US emergency departments weighted to generate annual national and regional estimates.

- **Sampling Frame:** generally includes 400-500+ hospitals / yr
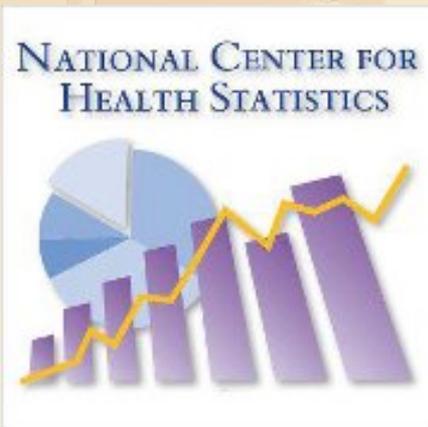
  Hospitals are divided into 16 data collection subsets of 37-41 hospitals each, and data is collected from **a random sample of 100 patient visits during a randomly assigned 4-week period.**

  The entire cohort of hospitals therefore assumes this role on a rotating basis, with each hospital collected one month's worth of data approximately every 15 months.

- Small number of "raw" self harm visits in annual datasets sometimes weighted very heavily.

- For these reasons, NHAMCS data are never used to characterize self harm behavior below the regional level, and multiple years of data should be used to establish rates.

- Case definition of self harm event is via diagnostic E-Code and medical record review.
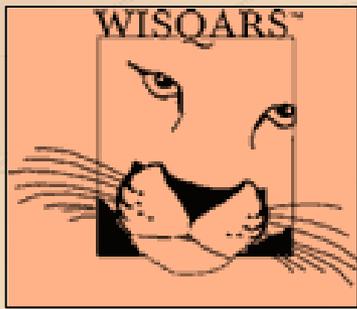
NEISS-AIP

- Operated jointly by the CDC's National Center for Injury Prevention and Control and the US Consumer Product Safety Commission.

- Data collection is done continuously in 66 hospitals, stratified in 5 levels by hospital size based on annual ED visits, plus one stratum for children's hospitals.

- NEISS-AIP can be used in national, regional or state-level surveillance activities.

- Suicidal intent is confirmed during structured review of data extraction forms based on explicit criteria
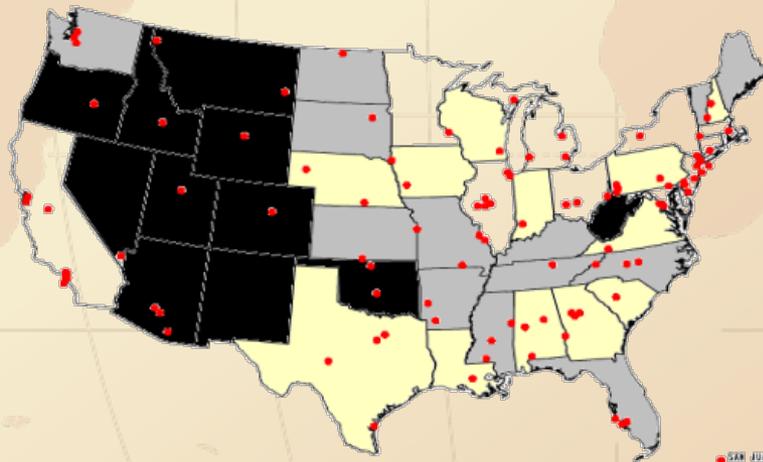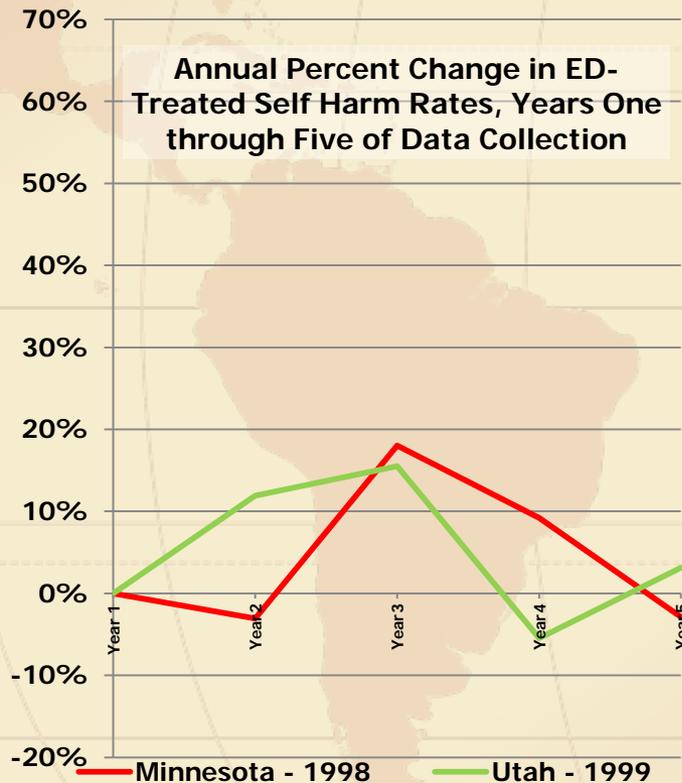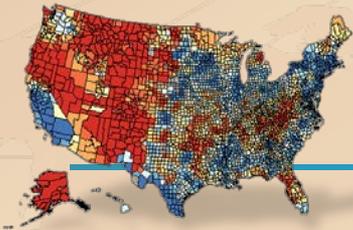
HCUP'S NEDS

- **Started in 2006**, annual datasets contain over 25 million unweighted ED medical records from over 950 hospitals for each year of data collection and **approximates a 20-percent stratified sample of U.S. hospital-based EDs**.

- Derived from state-level administrative claims datasets which comprise the **universe** of ED medical encounters occurring within 24-29 states.

- If an ED is selected for the NEDS sample, then all of the ED admissions for that year are included in the NEDS.

- Stratification protocol considers the following hospital characteristics: geographic region, teaching status, control, urban-rural location and trauma center designation.

- Does not include state identifiers, so can be used in national studies but not state- or local analyses or in analyses that require patient-level tracking across time.

- Case definition of self harm event is user-defined, based on available data – E-Codes.

Data Quality Issues in Administrative Claims Data Used for Self Harm Surveillance

Annual Percent Change in ED-Treated Self Harm Rates, Years One through Five of Data Collection

Legend: Minnesota - 1998, Utah - 1999

- PRESENCE/ABSENCE OF ESSENTIAL SURVEILLANCE DATA ELEMENTS

- MATURITY OF DATA COLLECTION SYSTEM

- OVERALL HOSPITAL REPORTING CONSISTENCY

- NUMBER OF E-CODE FIELDS ON CLAIMS FORM (VARIES BY STATE)

- E-CODE FIDELITY:

  – % INJURY EPISODES IN DATASET

  – % MISSING ECODES

  – % THREE DIGIT ONLY E-CODES

  – % INVALID E-CODES

- COMPLETENESS OF RECORD LINKAGE

- OTHER INCONSISTENT /MISSING DATA

The HCUP "Revisit Analysis" Files

- Each record in the database represents one discharge abstract from a hospital setting, which can be an inpatient, emergency department or ambulatory surgery visit.

- The Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project State databases contain the necessary variables to track patients over time, including:

  - A synthetic person-level identifier that has been verified against the patient's date of birth and gender and examined for completeness.

  - A timing variable that can be used to determine the days between hospital events for an individual without the use of actual dates (admission, discharge or birth).
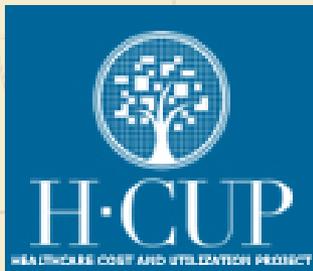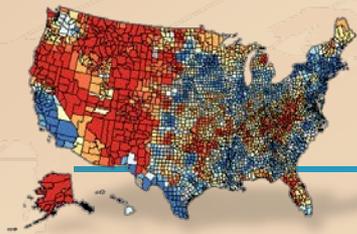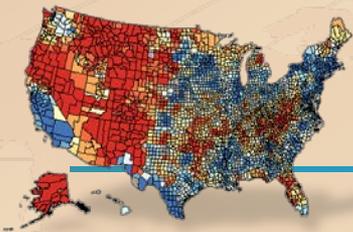
Technical Analysis of Data Quality

E-CODE FIDELITY: THREE-DIGIT ONLY & INVALID CODES

|	# INVALID ECODES	% THREE DIGIT ONLY	TOTAL 'n'
ARIZONA	**0**	**0**	**18634**
CALIFORNIA	**0**	**0**	**85210**
FLORIDA	**29**	**0**	**55422**
NEBRASKA	**1**	**0**	**4550**
UTAH	**0**	**0**	**11771**

Technical Analysis of Data Quality

**INCONSISTENCIES BETWEEN GENDER OR AGE
AND DIAGNOSIS OR PROCEDURE**

| MEDICARE-Designated Gender, Neonate, Adult Codes	
Maternal Codes (Assigned only to females, aged 12 to 55)	**(See Medicare Publication, "Definitions of Medicare Code Edits," for more information.)**
Neonate Codes (Assigned only to infants under the age of 1 year)	**(See Medicare Publication, "Definitions of Medicare Code Edits," for more information.)**
Adult Codes (Assigned only to patients of either sex, aged 15 through 124)	**(See Medicare Publication, "Definitions of Medicare Code Edits," for more information.)**

Sources: Healthcare Cost and Utilization Project (2008) HCUP Quality Control Procedures and Medicare Code Editor, Definitions of Medicare Code Edits. 2011, Centers for Medicare and Medicaid Services: Washington, DC.
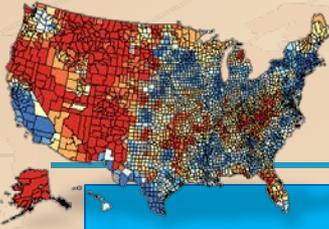
Technical Analysis of Data Quality
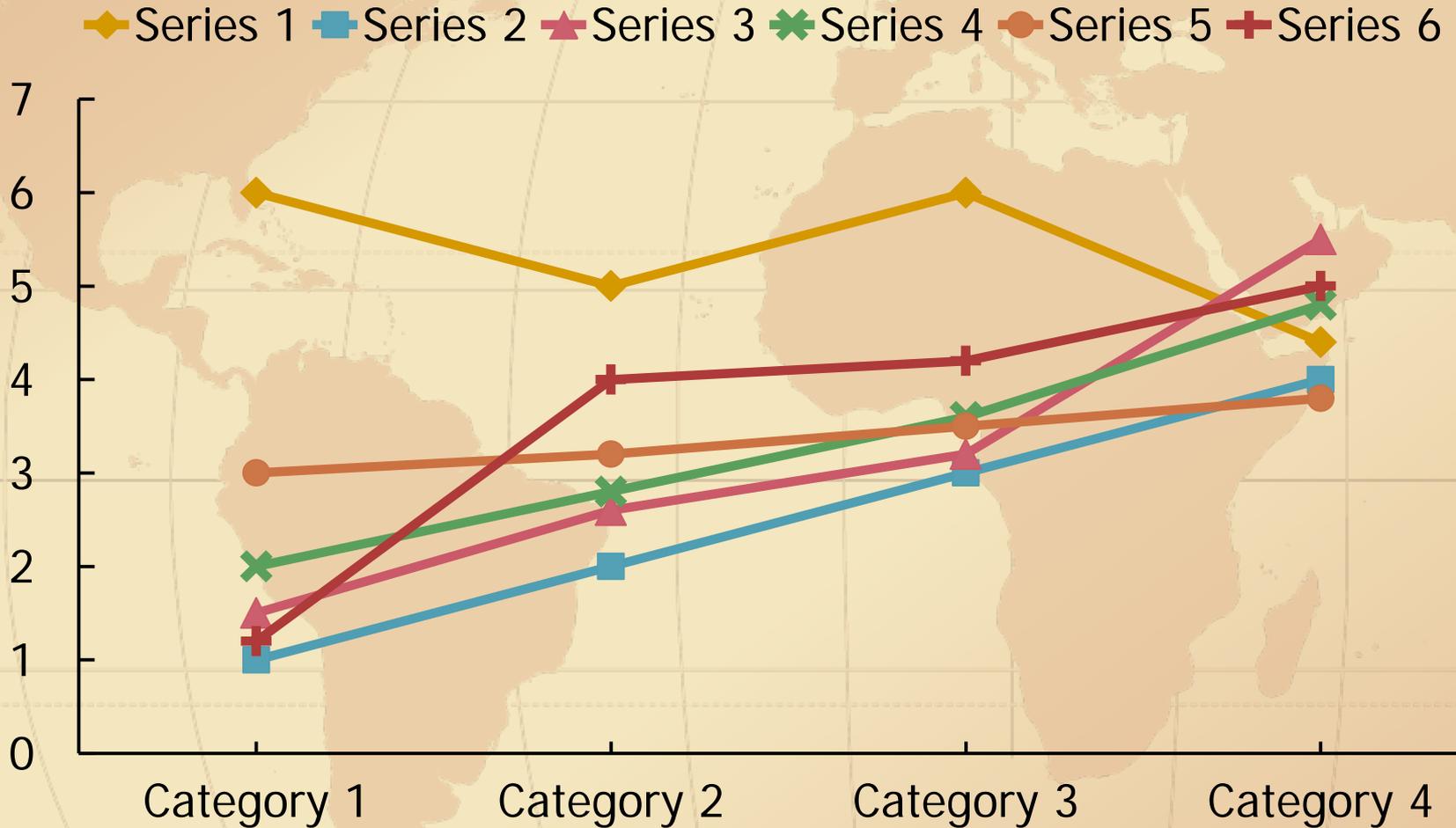
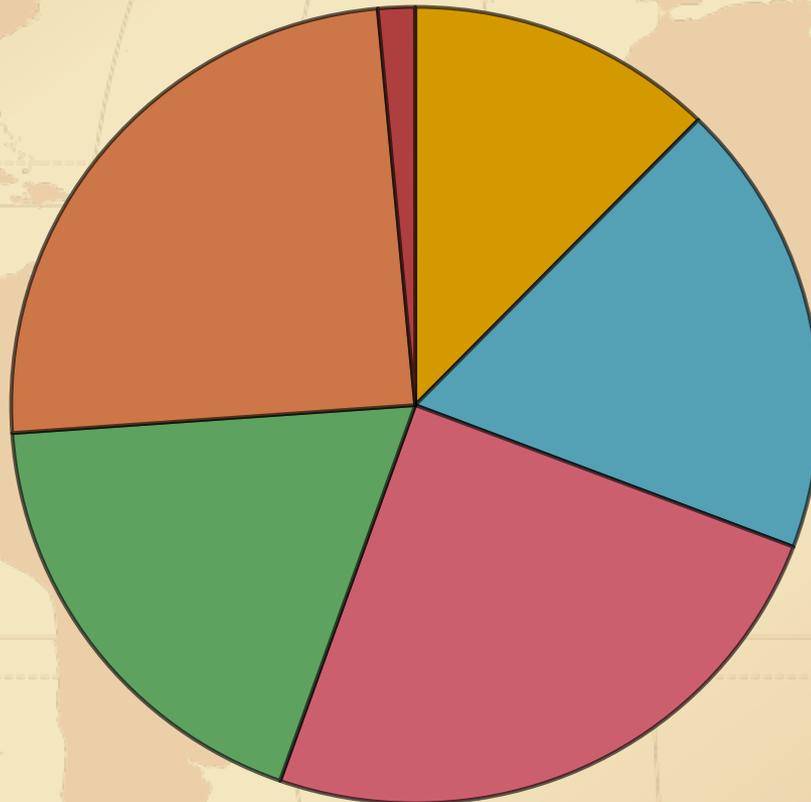| PERCENT MISSING OR INCONSISTENT DATA		
	MISSING	**INVALID**
AGE	0.00%	
GENDER	0.84%	
INCOME STRATA	4.42%	
RURAL-URBAN CODE	1.91%	
RACE	15.69%	
INCOME QUARTILE	3.2%	
ADMISSION HOUR	61.23%	26.75%
WEEKEND ADMISSION	0.00%	
ADMISSION MONTH	31.56%	
DISPOSITION	0.00%	
PAYOR SOURCE	0.00%	
TOTAL CHARGE	30.70%	0.01%
HOSPITAL ID	2.59%	0.68%
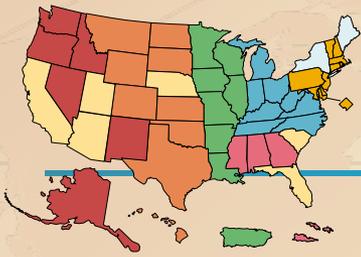
Questions Addressed in these Analyses:

1) What do these data say about self-harming patients and episodes of care for treatment of self harm?

2) What do data say about patients with multiple episodes of care for self harm within 12 months?

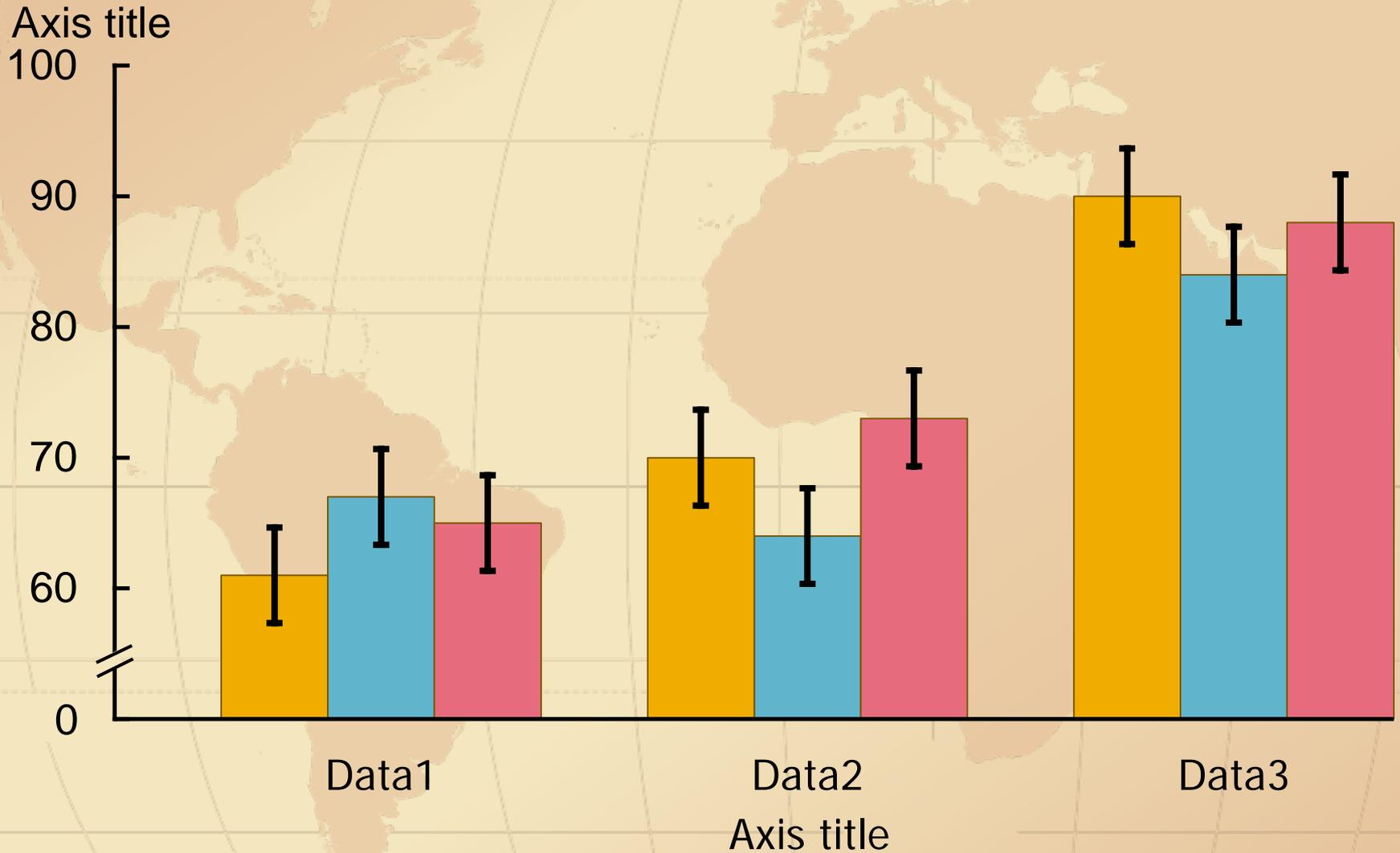3) What do data day about impact of care on re-injury?

Line with markers

Pie

Map

Category 1
Category 2
Category 3
Category 4
Category 5
Category 6