

UIC Emergency Medicine Residency Research Course
Working with State and National Databases
Edward P. Sloan, MD, MPH, FACEP

**Conducting Successful EM Resident Research:
Working with Databases**

Edward P. Sloan, MD, MPH, FACEP



2008 UIC Research Course

UIC EM Residency Program
Chicago, IL
September 25, 2008

Edward P. Sloan, MD, MPH, FACEP



Edward P. Sloan, MD, MPH FACEP

Professor

Department of Emergency Medicine
University of Illinois College of Medicine
Chicago, IL

Edward P. Sloan, MD, MPH, FACEP



Attending Physician
Emergency Medicine

University of Illinois Hospital

Chicago, IL

Edward P. Sloan, MD, MPH, FACEP



Using CDC Databases

Edward P. Sloan, MD, MPH, FACEP



UIC Emergency Medicine Residency Research Course

Working with State and National Databases

Edward P. Sloan, MD, MPH, FACEP

Surveys and Data Collection Systems

Some NCHS data systems and surveys are ongoing annual systems while others are conducted periodically. NCHS has two major types of data systems: systems based on populations, containing data collected through personal interviews or examinations; and systems based on records, containing data collected from vital and medical records.

- National Health Interview Survey
- National Health and Nutrition Examination Survey (NHANES) I Epidemiologic Follow-up Study
- National Health Care Survey
- Ambulatory Health Care Data (NAMCS/NHAMCS)
- Hospital Discharge and Ambulatory Surgery Data
- National Home and Hospice Care Survey
- National Nursing Home Survey
- National Longitudinal Health Insurance Survey
- National Longitudinal Mortality System

Ambulatory Health Care Data

National Ambulatory Medical Care Survey (NAMCS)

National Hospital Ambulatory Medical Care Survey (NHAMCS)

Data Highlights - Selected Tables, Charts, and Graphics

- Physician Office Visit Data
- Outpatient Department Visit Data
- Emergency Department Visit Data
- Ambulatory Care Data from Health, United States, 2006

Survey Methodology

An overview of the 2005 survey methodology is presented here. Please note that complete survey documentation for all survey years can be easily downloaded using the link under Public-Use Data Files, below.

Survey Methodology

An overview of the 2005 survey methodology is presented here. Please note that complete survey documentation for all survey years can be easily downloaded using the link under Public-Use Data Files, below.

- Survey Instrument
- NAMCS
- NHAMCS
- Scope and sample design
- NAMCS
- NHAMCS
- Data collection and processing
- NAMCS
- NHAMCS
- Estimation procedures
- NAMCS
- NHAMCS
- Reliability of survey estimates
- NAMCS
- NHAMCS
- Classification systems used with the NAMCS and NHAMCS
- International Classification of Diseases
- National Drug Code Dictionary
- Reason for Visit Classification, Drug Entry List, Generic Ingredient List: These classifications are updated on an annual basis and printed in the documentation for each survey year. In addition, text formats for reason for visit, drug entry, and generic ingredient codes are all available in downloadable SAS formats for data years 1993-2006 and SPSS system files for 2002-2006. The SAS and SPSS formats also include text labels for the following codes: diagnosis, cause of injury, procedures, and therapeutic class of drug.
- List of survey items, 1993-2006
- NAMCS and NHAMCS Survey Content Brochure
- NAMCS
- NHAMCS
- Publications using NAMCS/NHAMCS data
- NAMCS/NHAMCS Publications List - This contains a complete chronological listing of citations for all NCHS reports, journal articles, and other publications using NAMCS and NHAMCS data. It is meant to be a reference document and does not provide links to downloadable reports. [View](#)

ambulatory care patients in the year 2001... emergency department visits...
 Cardo G, Leader S, Woodfin J. Antibiotic prescribing rates in the US ambulatory care setting for patients diagnosed with influenza, 1997-2001. *Respiratory Medicine* (2004) 98, 1093-1101.
 Coates DM, Emond HA. Comparison of inappropriate medication prescriptions to the newly ill elderly: a nationwide emergency department study, 1992-2000. *J Am Geriatr Soc*, 2004 Nov; 52(11):147-55.
 Cook EF, Ford MD, Wright DW, Miller M. Dersailing the myth of the disorganized doctor. *Annals of Emergency Medicine*, October 2004, 44:4-599.
 Edwards DM, Sloan EP, Elder S, Chao S. Analysis Use in Emergency Department Patients with Abdominal Pain. *Annals of Emergency Medicine*, October 2004, 44:4-559.
 Edwards DM, Sloan EP, Elder S, Chao S. Analysis Use in Emergency Department Patients with Trauma. *Annals of Emergency Medicine*, October 2004, 44:4-558.
 Edwards DM, Sloan EP, Elder S, Chao S. Analysis Use in Emergency Department Patients with Head Collar. *Annals of Emergency Medicine*, October 2004, 44:4-558.
 Leader S, Cardo G. Antibiotic prescribing during RVN-associated ambulatory care visits by children age <6 years. *US, 1995-2001*. *Pediatric Research*, April 2004, 15 (135).
 McCoy L, Zell E, Devar R. Antimicrobial prescribing for otitis externa in children. *Pediatric Infectious Diseases Journal*, 2002, 25(2), February 2004, 181-183.
 Hales NB, Gentry MR, Zhu Y, Edwards DM. Differences in antibiotic prescribing patterns in children younger than five years in the emergency department setting. *J Pediatr* 2004; 144:206-5.
 Thomsen PH, Smith SR, Trappatz TK. Trends in Emergency Department Antibiotic Prescribing for Acute Respiratory Tract Infections (Abstract). *Ann Pharmacother*, 2004 Apr 21 [Epub ahead of print].
 Gouling MR. Inappropriate medication prescribing for elderly ambulatory care patients. *Arch Intern Med*, 2004; 164:101-112.
 Thompson-Sawyer JE, Hines SW, Cychala RK, Baker DW. Racial disparities in emergency department antibiotic prescriptions. *Am J Public Health* 2003; 93:1005-1009.

Public-Use Data Files (micro-data) (1973-2006)

Downloadable data files:
 Note: Currently, NAMCS and NHAMCS public-use files for 1993-2006 contain sample design variables in masked form. The initial release of the 2000-2006 public-use files included masked sample design variables. We re-released the 1993-99 NAMCS and NHAMCS files to include these variables. For re-released files, file names and layouts are essentially the same, but the design variables were appended to each file according to a generic file layout that is available for downloading below. Public-use files for previous years of data will be re-released with masked sample design variables on an ongoing basis.

However, data users should note that, beginning with the 2002 public use files, two new masked design variables were added to the file, for use with statistical software that assumes a single stage of sampling. For the 2003 public use file and beyond, the decision was made to include only these two masked design variables for variance estimation. Therefore, data users who wish to combine years of data from 2003 and beyond with years prior to 2003 will need to create these two variables for each file prior to 2003. A technical paper, using Ultimate Cluster Models with NAMCS and NHAMCS Public Use Files, gives instructions. [View](#)

- NAMCS, 1973-1992
- NAMCS, 1993-2006
- NHAMCS, 1993-2006
- Public Use Data File Updates
- Downloadable documentation:
- Notice: For data years 1993-99, be sure to download not only the original file documentation for each year, but also the supplemental files that explain the new sample design variables that have been added to each file. The supplemental files also include descriptions of any revisions that may have been made to the original data files.
- NAMCS, 1993-2006
- NAMCS, 1992-1999
- NHAMCS, 1992-2006
- Documentation Updates
- Methodology Used to Create "Initial Visit" for 2005 and 2006 NHAMCS
- NAMCS and NHAMCS data can also be downloaded from the Inter-University Consortium for Political and Social Research (ICPSR).

SAS Documentation:

Note: We now have SAS input statements, variable labels, value labels, and format assignments available for NAMCS and NHAMCS data years 1993-2006.

- NAMCS
 - SAS Input Statements
 - SAS Variable Labels and Format Assignments
 - SAS Value Labels
- NHAMCS
 - SAS Input Statements
 - SAS Variable Labels and Format Assignments
 - SAS Value Labels
- SAS Code to Produce Aggregated Visit Statistics at the Physician or Facility Level
- SPSS Documentation:
- NAMCS
- NHAMCS
- Stata Documentation and Datasets:
- NAMCS
- NHAMCS
- Data on CD-ROM:
 - NAMCS (1990-2005)
 - NHAMCS (1992-2005)
- Index: SPSS, SAS, CD-ROM Users
- Data on public use tape:
 - NAMCS (1973-97)
 - NHAMCS (1992-97)

Additional NAMCS and NHAMCS Data Available at the Research Data Center

The NAMCS and NHAMCS datasets that are available to approved users of the NCHS Research Data Center contain additional variables not included on the public use datasets. [View](#)

Ambulatory Care Drug Database System

Trend Analysis Using NAMCS and NHAMCS Data

Census: 2000 Population Estimates - How Do They Affect Visit Rates?

UIC Emergency Medicine Residency Research Course

Working with State and National Databases

Edward P. Sloan, MD, MPH, FACEP

NATIONAL HOSPITAL AMBULATORY MEDICAL CARE SURVEY LIST OF DATA ITEMS, 1992-2004

The NHAMCS public use data set for each year comprises two separate files—one for outpatient department visits and another for emergency department visits. Each record on the file contains a complete description of the ambulatory care visit, based on information provided on the Patient Record forms. Additionally, each record contains the statistical weight for inflating the sample visit to reflect annual utilization of hospital outpatient departments or emergency departments in the United States. Diagnosis, cause of injury, and procedure data are coded using the International Classification of Diseases, Ninth Revision, Clinical Modification. Patient's reason for visit and medications provided or prescribed are coded using internal systems developed by the National Center for Health Statistics.

Emergency Department Visit Data

Annual Number of Visits to Hospital Emergency Departments: United States, 1992-2004

State from the 2003 NHAMCS

Using State of Illinois Databases

Edward P. Sloan, MD, MPH, FACEP

emergency medical systems and highway safety

Home	Mortality	Hospital Discharge	Traffic Crash	Trauma Registry
Home	Mortality	Hospital Discharge	Traffic Crash	Trauma Registry

Trauma Registry Database

Database Description

Among all Illinois hospitals, approximately one-third are designated by the Illinois Department of Public Health (IDPH) as either Level I or Level II Trauma Centers. These hospitals must submit data to IDPH on patients who (a) sustain traumatic injuries that require treatment at a trauma center and are then admitted to a trauma center, (b) are transferred to a trauma center, or (c) are dead-on-arrival or die in the emergency department. One of the strengths of the Trauma Registry is that it captures information on the external causes of injury (E-codes).

The following are **NOT** included in the Trauma Registry:

- Patients admitted to a hospital that is not designated as a trauma center
- Those who die at the scene of the traumatic injury but are not transported to a trauma center
- Patients treated in the emergency department of a designated trauma center for less than twelve hours, who are not transferred to or from another hospital.

Note: For a complete list of IDPH-designated Trauma Center hospitals please [click here](#).

Database Limitations

It is important to emphasize (as noted above) that the Trauma Registry does not contain all fatal and non-fatal injury occurrences within the state of Illinois. The database maintains information on those fatally injured cases brought to a trauma center or those whose injuries required inpatient admission to a trauma center.

Data Dictionary

The data available for querying in this reporting system is a subset of the entire Trauma Registry database. Note data elements are filtered in this system. The data is aggregated in groups to protect record confidentiality and facilitate querying (for example, individuals age "55 years old" will be in the age grouping of "45-54" years old, while injuries that occurred in "February 1999" will be located in the time period of "1999 - Quarter One"). A brief description of each of the Trauma Registry data elements that can be queried in this system is listed below:

- Age** - Provides specific age range groupings (e.g., age "1-4") for the patients contained in the database. The age is the patient's age on the date the admission occurred.
- Gender** - Identifies the gender of the patients using categories of "male," "female" or "unknown."
- Race/Ethnicity** - Identifies the race or ethnic origin of patients.
- Cause of Injury** - Describes the underlying mechanism of injury. These groupings are based on external codes (E-Codes) from the World Health Organization, 9th Revision, and International Classification of Diseases (ICD-9).
- Prehospital Transport** - Describes the type of vehicle that transported the patient to the trauma center.
- Payor** - Identifies the primary source of payment for the hospitalization charges.
- Discharge Status** - Denotes the destination status of the patient upon discharge from the hospital.
- Time Period** - Denotes the time frame (by quarter) when the hospital admission occurred. **NOTE: In order to query data for an entire year, all four quarters for that year need to be selected.**
- EMS Region** - Designates the geographic location of the trauma center by EMS region (Illinois is divided into 11 EMS regions). **NOTE: "Select ALL" is the default category for this data element. To submit a query for the entire state of Illinois, select every option except the last one in the search box (i.e., "Out of Illinois"). To see a map detailing the EMS regions, [click here](#).**

For a more detailed description of the data elements, please check the [Data Dictionary](#) page.

For help on query instructions, please review the [Tutorial](#) page.

To run a trauma registry database query, please [click on Query Form](#) option.

emergency medical systems and highway safety

Home	Mortality	Hospital Discharge	Traffic Crash	Trauma Registry
Home	Mortality	Hospital Discharge	Traffic Crash	Trauma Registry

DESCRIPTIVE STATISTICS OF AGGREGATE TRAUMA REGISTRY DATA

QUARTERLY DATA FOR 1994 - 2005

Illinois Department of Public Health
Division of Emergency Medical Services and Highway Safety
Trauma Registry Database

Note: To select more than one specific category within each data element, click on a category and then hold down the control key while clicking on additional categories.

For details regarding each data element in this database, [see data dictionary](#).

Query Criteria

Age	Gender	Race/Ethnicity
Quarter 1 1994	Female	Asian/Pacific Island
1 to 4	Male	Black non Hispanic
5 to 9		Hispanic
10 to 14		Native American

Cause of Injury

1 (a) (Extracranial)
Fire and Explosions (Extracranial)
Motor Vehicle/Pedestrian (Extracranial)

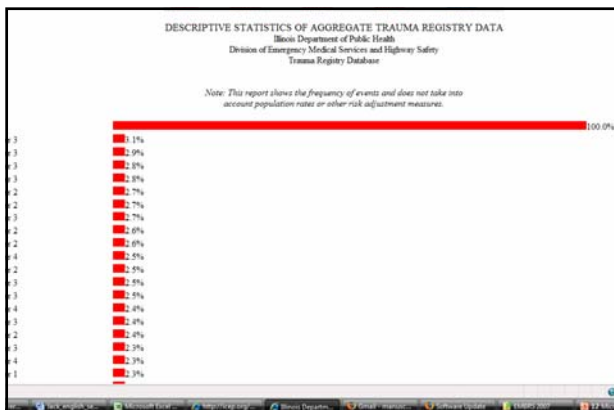
Prehospital Transport

Ground Ambulance
Air transport
Ground - Police

UIC Emergency Medicine Residency Research Course

Working with State and National Databases

Edward P. Sloan, MD, MPH, FACEP



Time Period	Number of Trauma Admissions	Percent
2002 Quarter 3	132	3.1
2001 Quarter 3	124	2.9
2000 Quarter 3	117	2.8
1997 Quarter 3	117	2.8
2001 Quarter 2	115	2.7
2003 Quarter 2	114	2.7
2003 Quarter 3	113	2.7
1999 Quarter 2	111	2.6
1998 Quarter 2	110	2.6
1997 Quarter 4	105	2.5
2005 Quarter 2	105	2.5
2005 Quarter 3	104	2.5
2004 Quarter 3	104	2.5
2001 Quarter 4	103	2.4
1999 Quarter 3	101	2.4
2002 Quarter 2	101	2.4
1998 Quarter 3	97	2.3
2002 Quarter 4	96	2.3
1998 Quarter 1	96	2.3
1999 Quarter 4	94	2.2
1994 Quarter 3	92	2.2
2003 Quarter 4	91	2.2
2004 Quarter 2	88	2.1
2000 Quarter 4	88	2.1
1998 Quarter 4	86	2
1995 Quarter 3	85	2
1997 Quarter 2	83	2

1999 Quarter 2	111	2.6
1999 Quarter 3	101	2.4
1999 Quarter 4	94	2.2
2000 Quarter 1	73	1.7
2000 Quarter 2	81	1.9
2000 Quarter 3	117	2.8
2000 Quarter 4	88	2.1
2001 Quarter 1	56	1.3
2001 Quarter 2	115	2.7
2001 Quarter 3	124	2.9
2001 Quarter 4	103	2.4
2002 Quarter 1	64	1.5
2002 Quarter 2	101	2.4
2002 Quarter 3	132	3.1
2002 Quarter 4	96	2.3
2003 Quarter 1	81	1.9
2003 Quarter 2	114	2.7
2003 Quarter 3	113	2.7
2003 Quarter 4	91	2.2
2004 Quarter 1	83	2
2004 Quarter 2	88	2.1
2004 Quarter 3	104	2.5
2004 Quarter 4	75	1.8
2005 Quarter 1	75	1.8
2005 Quarter 2	105	2.5
2005 Quarter 3	104	2.5
2005 Quarter 4	82	1.9
Total	4,217	100.0

emergency medical systems and highway safety

Home Mortality Hospital Discharge Traffic Crash Trauma Registry

DESCRIPTIVE STATISTICS OF AGGREGATE HOSPITAL DISCHARGE DATA
QUARTERLY DATA 1994 - 2007
Illinois Hospital Association
Hospital Discharge Database

Note: To select more than one specific category within each data element, click on a category and then hold down the control key while clicking on additional categories.

For details regarding each data element in this database, see data dictionary.

Query Criteria

Age: 0, 1 to 4, 5 to 9, 10 to 14

Gender: Female, Male

Cause of Hospitalization: Appendicitis, Asthma, Cancer, Child Abuse and Maltreatment

Length of Stay: 1 to 5 days, 6 to 13 days, 14 to 29 days, 30+ days

Hospital Charges: Payor

2001 Quarter 2	4,977	2
2001 Quarter 3	4,662	1.9
2001 Quarter 4	4,720	1.9
2002 Quarter 1	4,712	1.9
2002 Quarter 2	4,345	1.7
2002 Quarter 3	4,332	1.7
2002 Quarter 4	4,175	1.7
2003 Quarter 1	3,948	1.6
2003 Quarter 2	4,260	1.7
2003 Quarter 3	4,223	1.7
2003 Quarter 4	4,061	1.6
2004 Quarter 1	4,082	1.6
2004 Quarter 2	4,247	1.7
2004 Quarter 3	4,164	1.7
2004 Quarter 4	4,067	1.6
2005 Quarter 1	4,044	1.6
2005 Quarter 2	4,055	1.6
2005 Quarter 3	3,954	1.6
2005 Quarter 4	3,955	1.6
2006 Quarter 1	4,075	1.6
2006 Quarter 2	4,116	1.6
2006 Quarter 3	4,020	1.6
2006 Quarter 4	3,853	1.5
2007 Quarter 1	3,844	1.5
2007 Quarter 2	3,911	1.6
2007 Quarter 3	3,825	1.5
2007 Quarter 4	3,842	1.5
Total	250,766	100.0

2007 Quarter 3	3,825	1.5
2007 Quarter 4	3,842	1.5
Total	250,766	100.0

SEARCH CRITERIA

Age: ALL

Gender: ALL

Cause of Hospitalization: Stroke

Length of Stay: ALL

Hospital Charges: ALL

Payor: ALL

Time Period: 1994 Quarter 1, 1994 Quarter 2, 1994 Quarter 3, 1994 Quarter 4, 1995 Quarter 1, 1995 Quarter 2, 1995 Quarter 3, 1995 Quarter 4, 1996 Quarter 1, 1996 Quarter 2, 1996 Quarter 3, 1996 Quarter 4, 1997 Quarter 1, 1997 Quarter 2, 1997 Quarter 3, 1997 Quarter 4, 1998 Quarter 1, 1998 Quarter 2, 1998 Quarter 3, 1998 Quarter 4, 1999 Quarter 1, 1999 Quarter 2, 1999 Quarter 3, 1999 Quarter 4, 2000 Quarter 1, 2000 Quarter 2, 2000 Quarter 3, 2000 Quarter 4, 2001 Quarter 1, 2001 Quarter 2, 2001 Quarter 3, 2001 Quarter 4, 2002 Quarter 1, 2002 Quarter 2, 2002 Quarter 3, 2002 Quarter 4, 2003 Quarter 1, 2003 Quarter 2, 2003 Quarter 3, 2003 Quarter 4, 2004 Quarter 1, 2004 Quarter 2, 2004 Quarter 3, 2004 Quarter 4, 2005 Quarter 1, 2005 Quarter 2, 2005 Quarter 3, 2005 Quarter 4, 2006 Quarter 1, 2006 Quarter 2, 2006 Quarter 3, 2006 Quarter 4, 2007 Quarter 1, 2007 Quarter 2, 2007 Quarter 3, 2007 Quarter 4

County of Residence: ICDIC

Data Element Reported By: Time Period

Sort Order of Results: Data Element Categories

If you have any questions regarding the hospital discharge database, please send an E-mail to zmcrc@icdhw.org

For questions or comments regarding the reporting system, please [click here](#).

Thank you for using the Illinois Department of Public Health EMS Reporting System.

[Back to Previous Page](#)

[Back to Top](#)

Questions/Issues

- Data Depth?
- Publishability?
- Access to database?
- Permission?

Edward P. Sloan, MD, MPH, FACEP



Utility of Database Approach

- Easy
- Recognized
- Legitimate
- Provides public health perspective

Edward P. Sloan, MD, MPH, FACEP



Other Databases

- Nexus
- Asthma consortium
- EMR systems
- Medicare data?

Edward P. Sloan, MD, MPH, FACEP



Conclusions

- Databases exist
- Allows for simple story telling
- Can be done by a resident MD
- Queries on line
- Further analysis needs to be explored

Edward P. Sloan, MD, MPH, FACEP



Recommendations

- Consider database use
- Do queries
- See if there is something to publish
- Get access to data or get the data analyzed by those who built the database
- Collaborate
- Publish your public health findings

Edward P. Sloan, MD, MPH, FACEP



Thank you.

www.ferne.org
ferne@ferne.org

edsloan@uic.edu
312 413 7490

ferne_2008_research_lecture_sloan_working_databases_092508_final
10/14/2008 6:07 PM

Edward P. Sloan, MD, MPH, FACEP

