

User Manual for the NTDB National Sample

**National Sample Project of the National
Trauma Data Bank (NTDB), the American
College of Surgeons**

Draft April 2007

Contents

Section	Page
1. Introduction	4
2. Overview of National Sample	4
3. Getting Started	5
4. Analysis of the NTDB National Sample	6
5. NTDB National Sample contact	6
Appendixes	
Appendix A: Data elements in NTDB National Sample	7
Appendix B: Example of SAS Source Code for analyzing	21
Appendix C: example of Stata Source Code for analyzing	24
Appendix D: Comparison of NTDB national sample 2003 vs NIS 2003	27
Appendix E: Groupings for Presenting Injury Mortality and Morbidity Data	31

1. INTRODUCTION

The NTDB National Sample consists of a stratified sample of 100 hospitals. Stratification was based on U.S. Census region (four regions), level of trauma care designation (two categories), and NTDB reporting status (two categories). The sample consists of 90 hospitals that have contributed data to NTDB and 10 that have not contributed before 2003. The national sample is intended to reflect the universe of all trauma level I and II hospitals that provides trauma care. Detailed information on how the National Sample was created can be found in "Creation of the NTDB National Sample" and the various maintenance steps for the national sample is described in "Maintenance of NTDB National Sample".

2. OVERVIEW OF NATIONAL SAMPLE

The NTDB National Sample is a traumatic injury database from a nationally representative sample of trauma hospitals. The NTDB National Sample is intended to be used for producing national baseline estimates of variables and indices associated with hospitalized traumatic injuries such as pre-hospital diagnosis and management, trauma outcomes, and other variables that characterize the dimensions of trauma treatment.

The NTDB National Sample is a stratified sample of 100 hospitals, with sample hospitals drawn based on probability-proportional-to-size methodology, using number of ER visits from AHA 2005 data as the size measure. The sampling universe used to create the NTDB National Sample was the 453 level I or II trauma centers based on TIEP 2003 data. The strata used for the sampling were: 1) NTDB participation (NTDB, non-NTDB), 2) Trauma Level I or II, and 3) Region – Northeast, Midwest, West, and South.

The NTDB National Sample consists of incident-level records, hospital information and weights. Appendix A consists of the data elements that are found in the NTDB National Sample. Note that all records from the sample hospitals are provided with weights and data is not excluded due to bad data quality. It is advised to consult the NTDB reference manual for caveat when using NTDB data, "NTDB Reference Manual, background, caveats, and resources".

Currently only data for admission year 2003 is available. However, the NTDB National sample will be updated shortly to 2004 and 2005 data and thereafter yearly when data is submitted to the NTDB.

3. GETTING STARTED

In order to load and analyze the NTDB National Sample onto your computer, you will need about 60 MB bytes of space available. Please insert the CD and follow the instructions. There are a total of 18 data files. The files are in csv format (comma separated value), which can be easily imported to most statistical software. 15 files include a unique incidents identified (inc_key) that can be used for merging the files and 3 files (AISDESC, DIAGDESC, and PROCDESC) which are look-up tables of the description of the AIS code, ICD-9 Diagnosis code and ICD-9 procedure codes. The look-up tables can be merged with the AISCODE, DIAGNOS, and PROCEDUR files by the code number. Below is a listing of the files and a short description:

File name	Description
AISCODE	Information pertaining to an Abbreviated Injury Scale made about the trauma incident.
AISDESC	Look-up table of the description of the Abbreviated Injury Scale code.
COMORBID	Information pertaining to any pre-existing comorbid diseases the patient had upon arrival in the hospital.
COMPLIC	Information pertaining to any complications that arose during the course of patient treatment at the facility.
DEMO	Includes information about the patient and incident demographics
DIAGDESC	Look-up table of the description of the diagnosis made about the trauma incident.
DIAGNOS	ICD-9-CM Code of Diagnosis Information for the trauma incident
ED	Includes information pertaining events and measurements that take place in the ED.
FACILITY	Includes information about the participating facilities.
INTUB	Information indicates whether intubation was performed either at the scene or in the ED.
MECHDESC	Look-up table for the mechanism of injury
OUTCOME	Includes information pertaining to the outcome of the trauma incident.
PREHPROC	Information pertaining to the procedure performed for a trauma incident prior to arriving at the hospital.
PROCDESC	Look-up table for the procedure performed for a trauma incident.

File name	Description
PROCEDUR	Information pertaining to the procedure performed for a trauma incident.
SAFETY	Information pertaining to the safety equipment used or worn by the patient at the time of the injury.
SCENE	Includes information pertaining to the scene of the trauma incident including the ICD-9 external cause of injury code.
WEIGHTS	The final weights and Strata indicators for each incident

A detailed description on each of the data elements in each of these files can be found in Appendix A.

The SCENE table includes the primary (first listed) ICD-9 external cause of injury code. Hence, there is only one ICD-9 external cause of injury code per incident. The DIAGNOS table includes all of the ICD-9-CM Codes of Diagnosis for each incident. These diagnosis codes are not listed in hierarchical order and there is no way to identify the principal diagnosis.

4. ANALYSIS OF THE NTDB NATIONAL SAMPLE

The NTDB National Sample contains incidents-records and not patient-level records. This means that individual patients who are hospitalized multiple times in one year may be present in the NTDB National Sample multiple times. There is no uniform patient identifier available that allows a patient-level analysis with the NTDB national Sample.

To produce national estimates the weights in the weights file needs to be used. Because the NTDB national sample is a stratified sample, proper statistical techniques must be used to calculate standard errors and confidence intervals. Appendix B includes an example of SAS source code for estimating proportion with appropriate confidence intervals and means with appropriate confidence interval. Appendix C includes an example of Stata source code for estimating proportion with appropriate confidence intervals and means with appropriate confidence interval.

The NTDB national sample for admission year 2003 was compared for consistency with the NIS 2003 data. Details on this analysis and the results can be found in appendix D.

5. NTDB NATIONAL SAMPLE CONTACT

For questions or comments, please contact:

Sandra Goble
 Statistician, NTDB
 American College of Surgeons
 633 N St. Clair, Chicago IL 60611
 phone: (312) - 202 5255
 email: sgoble@facs.org

Melanie L. Neal
 Manager, NTDB
 American College of Surgeons
 633 N St. Clair, Chicago IL 60611
 phone: (312) - 202 5536
 email: mneal@facs.org

APPENDIX A: DATA ELEMENTS IN NTDB NATIONAL SAMPLE

File Name: AISCODE
Definition: Information pertaining to an Abbreviated Injury Scale made about the trauma incident.
Frequency: Unlimited number of records per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	AISCODE	Represents the AIS Full Code that describes the diagnosis.	C	10	
3	AISDESCR	Description pertaining to the AIS Code.	C	254	
4	AISSCORE	This represents the severity portion of the AIS Full Code.	N	10	
5	BODYREGION	Body region based on the AAAM (Association for the Advancement of Automotive Medicine)	C	1	1: Head 2: Face 3: Neck 4: Thorax 5: Abdomen 6: Spine 7: Upper Extremity 8: Lower Extremity 9: Unspecified

File Name: AISDESC
Definition: Look-up table of the description of the Abbreviated Injury Scale code.
Frequency: One record per AIS code.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
2	AISCODE	Represents the AIS Full Code that describes the diagnosis.	C	10	
3	AISDESCR	Description pertaining to the AIS Code.	C	254	

File Name: COMORBID
Definition: Information pertaining to any pre-existing comorbid diseases the patient had upon arrival in the hospital.
Frequency: Unlimited number of per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	PREXCOMOR	Pertaining to a pre-existing comorbid factor present at the point	C	100	<i>A valid code as listed in Appendix A.</i>

		of patient arrival in the ED.			
--	--	-------------------------------	--	--	--

File Name: COMPLIC
Definition: Information pertaining to any complications that arose during the course of patient treatment at the facility.
Frequency: Unlimited number of records per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	COMP_DESCR	Pertaining to a complication description that arose during the course of treatment.	C	100	A valid code as listed in Appendix B

File Name: DEMO
Definition: Includes information about the patient and incident demographics.
Frequency: One record per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key (Primary key to identify an incident)	N	10	
2	YOBirth	Year Of Birth. Patients with age > 89 are presented with age = -1.	N	4	
3	AGE	The age of the patient on arrival to the hospital. Patients with age > 89 are presented with age = -1.	N	10,1	
4	GENDER	Gender	C	7	Male Female
5	RACE	Race	C	50	Black, not of Hispanic origin Hispanic Native American or Alaskan Native Asian or Pacific Islander White, not of Hispanic Origin Other

File Information Record					
6	PAYMENT	Principal Payment Source	C	50	"Blue Cross/Blue Shield" "Managed Care Organization" "Other Commercial Indemnity Plan" "Medicare" "Medicaid" "MCH and Crippled Children's" "CHAMPUS" "Worker's Compensation" "Government/Military Insurance" "Automobile Insurance" "Organ Donor Subsidy" "No Charge" "Other" "Liability Insurance/Under Litigation" "No Fault Insurance" "None" "Not Done/Not Doc" "Private Charity" "Pending" "Shriners" "Self Pay"
7	FAC_KEY	Facility Key (Primary key to identify a facility)	N	10	

File Name: DIAGDESC

Definition: Information pertaining to a diagnosis made about the trauma incident.

Frequency: One record per Diagnosis code.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
2	DCODE	ICD-9-CM Code of Diagnosis. <i>Related Definitions:</i> ICD-9-CM Code: Issued by the U.S. Department of Health and Human Services to describe why services were rendered.	C	7	
3	DCODEDESCR	Description pertaining to the ICD-9-CM Code of Diagnosis.	C	254	
4	DIAGTYPE	Indicates whether the dcode is a trauma code per the NTDB inclusion criteria, or other dcode	C	10	TRMA, COMOR COMP, OTHER

File Name: DIAGNOS

Definition: ICD-9-CM Code of Diagnosis Information for the trauma incident.

Frequency: Unlimited number of records per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	DCODE	ICD-9-CM Code of Diagnosis. <i>Related Definitions:</i> ICD-9-CM Code: Issued by the U.S. Department of Health and Human Services to describe why services were rendered.	C	7	

File Name: ED

Definition: Includes information pertaining events and measurements that take place in the ED.

Frequency: One record per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key (Primary key to identify an incident)	N	10	
2	YOAdmit	Year of First Recorded Patient's Arrival At Reporting Hospital ED	N	4	
3	ED_ARRTIME	First Recorded Time Of Patient's Arrival At Reporting Hospital ED	C	5	
4	TIMELY	Was Trauma Surgeon Arrival In ED Timely	C	10	Yes No
5	DAYTOADMIT	Days Between Injury And Admission	N	10	
6	FSBP	The initial assessment in the ED of the systolic blood pressure	N	10	Any integer between 0 and 300.
7	FURR	First Unassisted Respiratory Rate In ED	N	10	Any integer between 0 and 99.
8	RRAQ	Respiratory Rate Assessment Qualifier In ED	C	30	"T" = Patient intubated when initially assessed in ED. "TP" = Patient intubated and chemically paralyzed when initially assessed in ED. "S" = Patient chemically sedated when initially assessed in ED. "L" = Initial respiratory rate in ED is a legitimate value, without interventions such as intubation and sedation.
9	EDTEMP	First Temperature In ED	N	10,1	Any real number between 0 and 110.
10	TEMPSCALE	Temperature Scale	C	1	"C" = Celsius "F" = Fahrenheit

File Information Record					
11	HEADCT	Head CT Results	C	20	Positive Negative
12	ABDEVAL	Abdominal Evaluation	C	25	Positive Negative
13	ABDETYPE	Abdominal Evaluation Type	C	15	"CT" "DPL" "Ultrasound"
14	EDBASEDEF	Base Deficit/Excess In ED	N	10,1	Any integer between -80 and +80.
15	EDEYE	Lowest Glasgow Eye Component In ED	N	10	Values for Adults (>5 years old): 4 = Spontaneous Eye Opening 3 = Opens Eyes to Commands 2 = Opens Eyes to Pain 1 = Does Not Open Eyes Values for Infants and Children: 4 = Spontaneous 3 = Verbal Stimuli 2 = Pain 1 = No Response
16	EDVERBAL	Lowest Glasgow Verbal Component In ED	N	10	Values for Adults (>5 years old): 5 = Oriented 4 = Confused 3 = Inappropriate Words 2 = Incomprehensible words 1 = None Values for Child: 5 = Oriented 4 = Confused 3 = Inappropriate Cries 2 = Incomprehensible sounds 1 = No Response Values for Infant: 5 = Coos, Babbles 4 = Irritable Cries 3 = Cries to Pain 2 = Moans to Pain 1 = No Response
17	EDMOTOR	Lowest Glasgow Motor Component In ED	N	10	Values for Adults (>5 years old): 9 = Not Done/Not Documented 6 = Obeys commands with appropriate motor response 5 = Localization of painful stimulation 4 = General withdrawal in response to painful stimulation 3 = Flexor posturing in response to painful stimulation 2 = Extensor posturing in response to painful stimulation 1 = None Values for Infants and Children:

File Information Record					
					9 = Not Done/Not Documented 6 = Normal Spontaneous Movement 5 = Withdraws to touch 4 = Withdraws to pain 3 = Abnormal flexion (decerebrate) 2 = Abnormal flexion (decerebrate) 1 = None
18	EDGCSAQ	GCS Assessment Qualifier In ED	C	24	"T" = Patient intubated when GCS components assess in ED. "TP" = Patient intubated and chemically paralyzed when GCS components assessed in ED. "S" = Patient chemically sedated when initial GCS components assessed in ED. "L" = Initial GCS components in ED are legitimate values, without interventions such as intubation and sedation.
19	EDGCSTOTAL	Glasgow Coma Scale Total In ED	N	10	Any integer between 3 and 15.
20	EDRTS	Revised Trauma Score In ED	N	10,4	Any real number between 0 and 8.
21	ALCOHOLPRE	Alcohol Present In Blood?	C	20	Yes No
22	DRUGPRESEN	Drugs Present?	C	17	Yes No
23	ADMITSERVI	Admitting Service	C	20	
24	EDDISP	Emergency Department Disposition	C	20	
25	ISS	Total Injury Severity Score	N	10	An integer between 0 and 75.
26	PROBOFSURF	TRISS Survival Probability	N	10,4	Any real number between 0.00 and 1.00
27	ACS_EDRTS CALCULATED	Recalculated Revised Trauma Score In ED by ACS	N	10,4	Any real number between 0 and 8.
28	ACS_PS CALCULATED	Recalculated TRISS Survival Probability by ACS.	N	10,4	Any real number between 0.00 and 1.00
29	EDITCHECK CALCULATED	Contains a flag for each field with invalid data per edit checks. See Appendix for guide to the code for each field.	C	50	Values shown in Appendix C.
30	SCALESCORE CALCULATED	Total number of flags for six critical fields: Age, LOS, ISS, Ecode, Discharge Status/Discharge Disposition, and Gender.	N	10	Zero to 6
31	EDITSCORE CALCULATED	Total number of edit check flags for this record.		10	
32	FAC_KEY	Facility Key (Primary key to identify a facility)	N	10	

File Name: FACILITY
Definition: Includes information about the participating facilities.
Frequency: One record per facility.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	FAC_KEY	Facility Key (Primary key to identify a hospital)	N	10	
4	NO_ADU_BED	Number of Adult Hospital Beds	N	10	
5	NO_PED_BED	Number of Pediatric Hospital Beds	N	10	
6	NO_BUR_BED	Number of Burn Hospital Beds	N	10	
7	NO_TRA_ICU	Number of ICU Beds Available for Trauma Patients	N	10	
8	NO_BUR_ICU	No of ICU Beds for Burn Patients	N	10	
9	TEAC_STATU	Hospital Teaching Status	C	20	"University" "Community" "Non-Teaching"
10	TEACH_TYPE	Hospital Type	C	15	"Public" "Private"

File Name: INTUB
Definition: Information indicates whether intubation was performed either at the scene or in the ED.
Frequency: Unlimited number of records per incident record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	INTUB_LOC	Intubation Location Indicator. Indicates whether the intubation took place at the scene or in the ED.	C	30	"Scene" "ED"
3	INTUB_TYPE	Intubation Type. Indicates the type of mechanical or surgical airway placed.	C	100	

File Name: MECHDESC
Definition: Look-up table for the mechanism of injury
Frequency: One record per mechanism code.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
	ECODE	External cause of injury code	C	5	
	PASSENGER	Indicates if patient was drive or passenger	C	1	Y/N
	EXCLUDED		C	1	
	DESCR	Ecode description	C	254	
	MECH_CDC	CDC external cause of injury	C	50	Shown in Appendix E
	INTENT		C	30	Intentional/Unintentional

File Name: OUTCOME
Definition: Includes information pertaining to the outcome of the trauma incident.
Frequency: Unlimited number of records per facility record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key (Primary key to identify an incident)	N	10	
2	LOS	Length Of Stay In Hospital	N	10	
3	ICUDAYS	Days Of Total Stay In ICU	N	10	
4	VENTDAYS	Ventilator Support Days	N	10	
5	FIMFEED	FIM Self-feeding Score At Discharge	N	10	4 = Independent 3 = Independent with Device 2 = Dependent-Partial Help Required 1 = Dependent-Total Help Required 8 = Not Applicable (e.g., patient < 7 yrs. old or died)
6	FEEDSTATUS	Status Of FIM Self-feeding Score	C	20	"T" = Temporary "P" = Permanent
7	FIMLOCOMOT	FIM Locomotion Score At Discharge	N	10	4 = Independent 3 = Independent with Device 2 = Dependent-Partial Help Required 1 = Dependent-Total Help Required 8 = Not Applicable (e.g., patient < 7 yrs. old or died)
8	LOCOMSTATU	Status Of FIM Locomotion Score	C	20	"T" = Temporary "P" = Permanent
9	FIMEXPRESS	FIM Expression Score At Discharge	N	10	4 = Independent 3 = Independent with Device

File Information Record					
					2 = Dependent-Partial Help Required 1 = Dependent-Total Help Required 8 = Not Applicable (e.g., patient < 7 yrs. old or died)
10	EXPRESTATU	Status Of FIM Expression Score	C	20	"T" = Temporary "P" = Permanent
11	FIMSCORE	Total FIM Score	N	10	Any integer between 1 and 12.
12	YODisch	Year Of Discharge Or Death	N	4	
13	DISCHDISP	Discharge Disposition	C	30	
14	CHARGES	Billed Hospital Charges in U.S. dollars.	N	10,4	
15	DISSTATUS	Discharge Status	C	17	"Alive" "Dead"
16	FAC_KEY	Facility Key (Primary key to identify a facility)	N	10	

File Name: PREHPROC

Definition: Information pertaining to the procedure performed for a trauma incident prior to arriving at the hospital.

Frequency: Unlimited per incident record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	PREHOSPPRO	Information pertaining to the prehospital procedure information	C	30	

File Name: PROCDESC

Definition: Look-up table for the procedure performed for a trauma incident..

Frequency: One record per procedure record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
2	PCODE	ICD-9-CM Code of Procedure. The ICD-9-CM code that describes the procedure.	C	4	
3	PCODEDESCR	Description pertaining to the ICD-9-CM Code of Procedure.	C	100	

File Name: PROCEDUR
Definition: Information pertaining to the procedure performed for a trauma incident.
Frequency: Unlimited per incident record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	PCODE	ICD-9-CM Code of Procedure. The ICD-9-CM code that describes the procedure.	C	4	
6	YOPROC	Year the patient underwent the operation or procedure.	N	4	
7	PROC_TIME	The time the patient underwent the operation or procedure.	C	5	
8	DAYS CALCULATED	The number of days after arrival the procedure was done.	N	10	
9	HOURS CALCULATED	The number of hours after arrival the procedure was done.	N	10	
10	MINUTES CALCULATED	The number of minutes after arrival the procedure was done.	N	10	

File Name: SAFETY
Definition: Information pertaining to the safety equipment used or worn by the patient at the time of the injury.
Frequency: Unlimited per incident record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	10	
2	SAFETY_DES	Safety equipment used. Identifies the protective/safety device(s) in use or worn by the patient at the time of injury.	C	50	

File Name: SCENE
Definition: Includes information pertaining to the scene of the trauma incident.
Frequency: Unlimited number of records per facility record.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key (Primary key to identify an incident)	N	10	
2	YOINJ	Year of Injury	N	4	
3	INJCOUNTRY	Country In Which Injury Occurred	C	31	
4	HOSPTRANF	Inter-hospital Transfer	C	50	"Emergency: NOS"

File Information Record					
					"Emergency: Trauma Level 1" "Emergency: Trauma Level 2" "Emergency: Trauma Level 3" "Emergency: Trauma Level 4" "Inpatient: Acute/Rehabilitation Facility" "Home Health: NOS"
5	WORKRELATE	Work Relatedness Of Injury	C	27	3 = Paid Work (Work Related) 4 = Unpaid Work (Non-work related)
6	INJSITE	Site At Which Injury Occurred	C	200	Home Farm Mine and Quarry Industrial Places and Premises Place for Recreation and Sport Street and Highway Public Building Residential Institution Other Specified Places Unspecified Places
7	ECODE	ICD-9 External cause of injury code.	C	10	
9	SCENEEYE	Lowest Glasgow Eye Component At The Scene	N	10	Values for Adults (> 5 years old): 4 = Spontaneous 3 = Voice 2 = Pain 1 = None Values for Children and Infants: 4 = Spontaneous 3 = Verbal Stimuli 2 = Pain 1 = No Response
10	SCENEVRB	Lowest Glasgow Verbal Component At The Scene	N	10	Values for Adults (>5 years old): 5 = Oriented 4 = Confused 3 = Inappropriate Words 2 = Incomprehensible words 1 = None Values for Child: 5 = Oriented 4 = Confused 3 = Inappropriate Cries 2 = Incomprehensible sounds 1 = No Response Values for Infant: 5 = Coos, Babbles 4 = Irritable Cries 3 = Cries to Pain 2 = Moans to Pain 1 = No Response
11	SCENEMOTOR	Lowest Glasgow Motor Component	N	10	Values for Adults (>5 years old):

File Information Record					
		At The Scene			<p>9 = Not Done/Not Documented 6 = Obeys commands with appropriate motor response 5 = Localization of painful stimulation 4 = General withdrawal in response to painful stimulation 3 = Flexor posturing in response to painful stimulation 2 = Extensor posturing in response to painful stimulation 1 = None</p> <p>Values for Infants and Children: 9 = Not Done/Not Documented 6 = Normal Spontaneous Movement 5 = Withdraws to touch 4 = Withdraws to pain 3 = Abnormal flexion (decerebrate) 2 = Abnormal flexion (decerebrate) 1 = None</p>
12	SCENEGCSA	GCS Assessment Qualifier At The Scene	C	27	<p>"T" = Patient intubated when GCS components assess at scene. "TP" = Patient intubated and chemically paralyzed when GCS components assessed at scene "S" = Patient chemically sedated when initial GCS components assessed at scene. "L" = Initial GCS components at scene are legitimate values, without interventions such as intubation and sedation.</p>
13	SCENEGCSTO	Glasgow Coma Scale Total At The Scene	N	10	Any integer between 3 and 15.
14	INJTYPE	Injury Type	C	10	<p>"Blunt" = Blunt injury, primarily "Burn" = Burn injury "Penetrating" = Penetrating injury, primarily</p>
15	FAC_KEY	Facility Key (Primary key to identify a facility)	N	10	

FILE INFORMATION RECORD**File Name:** WEIGHTS**Definition:** The final weights and Strata indicators for each incident**Frequency:** One record per incident.

File Information Record					
Position Number	Field Name (DBF only)	Definition	Data Type	Length	Standard Option
1	INC_KEY	Incident Key. This field is the Primary key to identify an incident in the incident record.	N	8	
2	STRATA	Stratification variable	N	8	
3	WEIGHTS	Weights	N	8	
4	FAC_KEY	Facility Key (Primary key to identify a facility)	N	8	

APPENDIX B: EXAMPLE OF SAS SOURCE CODE FOR ANALYZING

```

/*****
/*
/* Title:          trauma_estimate.sas
/* Author:         S. Goble, Statistician NTDB
/* Project:        National Sample Project (NSP)
/*
/* Purpose: Create statistical estimates for valid trauma cases,
/*              excluding hip fractures, analyzing the weighted data
/*              taking into account the sample design.
/*
/* Input data: 1.   The final weights and Strata indicators
/*                  for each incident
/*                  Name: Weights
/*                  Variables needed:      Name:
/*                  Incident ID           INC_KEY
/*                  Facility ID           FAC_KEY
/*                  Strata                 STRATA
/*                  Weights               WEIGHTS
/*
/*                  2. Information pertaining to a diagnosis
/*                      made about the trauma incident.
/*                      Name: Diagnosis
/*                      Variables needed:   Name:
/*                      Incident ID       INC_KEY
/*                      Diagnosis code    DCODE
/*
/*                  3. Includes information about the patient
/*                      and incident demographics.
/*                      Name: Demo
/*                      Variables needed:   Name:
/*                      Incident ID       INC_KEY
/*                      Age               AGE
/*                      Gender            GENDER
/*                      Race              RACE
/*
/*                  4. Includes information pertaining to the outcome
/*                      of the trauma incident.
/*                      Name: Outcome
/*                      Variables needed:   Name:
/*                      Incident ID       INC_KEY
/*                      Discharge status  DISSTATUS
/*                      Hospital length of stay  LOS
/*                      ICU length of stay  ICU day
/*
/* Output: Frequency estimate of gender, race and discharge status
/*          Mean estimate of Age, LOS and ICU days
/*
/* Created: April, 2007
/* **There are 8 weighting strata that are combinations of
/* 4 Census regions and 2 designated levels of trauma care
/* level I or level II. (non-ntdb data not available for 2003 data)
*****/

```

```

* Change the following: 'D:\data\NSP\Files_sent_out\Data_Sets' to
'\yourpathname\';
/*folder for saving input and output Data_Sets*/

*** Import the weights ***;
PROC IMPORT FILE="D:\data\NSP\Files_sent_out\Data_Sets\Weights.csv"
OUT=WT2003 DBMS=csv REPLACE;
GETNAMES=YES;
RUN;

**** GET THE VALID TRAUMA CODES ***;
PROC IMPORT DATAFILE="D:\data\NSP\Files_sent_out\Data_Sets\DIAGNOS.csv"
OUT=DIAGNOS DBMS=csv REPLACE;
GETNAMES=YES;
RUN;

*** GET ONLY THE VALID TRAUMA RECORDS ***;
DATA DIAGNOS;
  SET DIAGNOS;
  IF 800<=DCODE<960;
  IF 905<=DCODE<910 THEN DELETE;
  IF 910<=DCODE<925 THEN DELETE;
  IF 930<=DCODE<940 THEN DELETE;
  KEEP INC_KEY DCODE;
RUN;

***** EXCLUDE CASES WITH HIP-FRACTURE *****;
DATA DIAGNOS;
  SET DIAGNOS;
  IF 820<=DCODE<=820.9 THEN DELETE;
RUN;

***** DEMOGRAPHICS *****;
PROC IMPORT DATAFILE="D:\data\NSP\Files_sent_out\Data_Sets\DEMO.csv" OUT=DEMO
DBMS=csv REPLACE;
GETNAMES=YES;
RUN;

**** OUTCOME DATA *****;
PROC IMPORT DATAFILE="D:\data\NSP\Files_sent_out\Data_Sets\OUTCOME.csv"
OUT=OUTCOME DBMS=csv REPLACE;
GETNAMES=YES;
RUN;

PROC SORT DATA=DIAGNOS NODUPKEY;
BY INC_KEY;
RUN;
PROC SORT DATA=WT2003;
BY INC_KEY;
RUN;
PROC SORT DATA=DEMO;
BY INC_KEY;
RUN;
PROC SORT DATA=OUTCOME;
BY INC_KEY;
RUN;

```

```

**** DATASET READY TO ANALYZE ****;
DATA ANALYZE;
  MERGE WT2003(IN=IN1) DIAGNOS(IN=IN2) DEMO OUTCOME;
  BY INC_KEY;
  IF IN1 AND IN2;          /* CASES WITH WEIGHTS AND TRAUMA CODE OF
INTEREST */;
RUN;

***** STATISTICAL ANALYSES *****;
PROC SURVEYFREQ DATA=ANALYZE;
  CLUSTER FAC_KEY;          *** FACILITY ID IS THE
CLUSTER VARIABLE;          *** THE VARIABLE WITH STRATA FOR
  STRATA STRATA;          *** VARIABLES ANALYZED;
THE DESIGN;                *** WEIGHTS;
  TABLES GENDER RACE DISSTATUS;
  WEIGHT WEIGHTS;
run;

PROC SURVEYMEANS DATA=ANALYZE;
  WEIGHT WEIGHTS;          *** WEIGHTS;
  CLUSTER FAC_KEY;      *** FACILITY ID IS THE CLUSTER
VARIABLE;                *** THE VARIABLE WITH STRATA
  STRATA STRATA;
FOR THE DESIGN;
  VAR AGE LOS ICUDAYS;
run;

```

APPENDIX C: EXAMPLE OF STATA SOURCE CODE FOR ANALYZING

```

/*****
/*
/* Title:          trauma_estimate.do
/* Author:         S. Goble, Statistician NTDB
/* Project:       National Sample Project (NSP)
/*
/* Purpose: Create statistical estimates for head injuries
/*              by analyzing the weighted data taking into account
/*              the sample design.
/*
/* Input data: 1.   The final weights and Strata indicators
/*                  for each incident
/*                  Name: Weights
/*                  Variables needed:      Name:
/*                  Incident ID           INC_KEY
/*                  Facility ID           FAC_KEY
/*                  Strata                 STRATA
/*                  Weights               WEIGHTS
/*
/*              2. Information pertaining to a diagnosis
/*                  made about the trauma incident.
/*                  Name: Diagnosis
/*                  Variables needed:      Name:
/*                  Incident ID           INC_KEY
/*                  Diagnosis code        DCODE
/*
/*              3. Includes information about the patient
/*                  and incident demographics.
/*                  Name: Demo
/*                  Variables needed:      Name:
/*                  Incident ID           INC_KEY
/*                  Age                   AGE
/*                  Gender                 GENDER
/*                  Race                   RACE
/*
/*              4. Includes information pertaining to the outcome
/*                  of the trauma incident.
/*                  Name: Outcome
/*                  Variables needed:      Name:
/*                  Incident ID           INC_KEY
/*                  Discharge status      DISSTATUS
/*                  Hospital length of stay LOS
/*                  ICU length of stay    ICU day
/*
/* Output: Frequency estimate of gender, race and discharge status
/*          Mean estimate of Age, LOS and ICU days
/*
/* **There are 8 weighting strata that are combinations of
/* 4 Census regions and 2 designated levels of trauma care
/* level I or level II. (non-ntdb data not available for 2003 data)
/*****

```

```

clear
set memory 700000

* Change the following: 'D:\data\NSP\Files_sent_out\Data_Sets' to
'\yourpathname\';
/*folder for saving input and output Data_Sets*/

* WEIGHTS
insheet using D:\data\NSP\Files_sent_out\Data_Sets\Weights.csv
save D:\data\NSP\Temp\Weights.dta, replace
clear

* VALID TRAUMA RECORDS EXCLUDING HIP FRACTURES
insheet using D:\data\NSP\Files_sent_out\Data_Sets\Diagnos.csv
* KEEP VALID TRAUMA D-CODE
drop if dcode<800
drop if dcode>=960
drop if dcode>=905 & dcode<910
drop if dcode>=910 & dcode<925
drop if dcode>=930 & dcode<940
* EXCLUDE HIP-FRACTURES
drop if dcode>=820 & dcode<821
sort inc_key
* KEEP ONE RECORD PER INCIDENT
by inc_key: gen idkey=1 if _n==1
keep if idkey==1
save D:\data\NSP\Temp\Diagnos.dta, replace
clear

* DEMOGRAPHICS
insheet using D:\data\NSP\Files_sent_out\Data_Sets\Demo.csv
sort inc_key
save D:\data\NSP\Temp\Demo.dta, replace
clear

* OUTCOME
insheet using D:\data\NSP\Files_sent_out\Data_Sets\Outcome.csv
sort inc_key
save D:\data\NSP\Temp\Outcome.dta, replace
clear

*MERGE FILES
use D:\data\NSP\Temp\Weights.dta
sort inc_key

** KEEP ONLY RECORDS WITH WEIGHT AND VALID TRAUMA CODE
merge inc_key using D:\data\NSP\Temp\Diagnos.dta
keep if _merge==3
drop _merge

sort inc_key
merge inc_key using D:\data\NSP\Temp\Demo.dta
keep if _merge==3
drop _merge

sort inc_key

```

```

merge inc_key using D:\data\NSP\Temp\Outcome.dta
keep if _merge==3
drop _merge

* REFORMAT FILES FOR PROPORTIONAL ESTIMATES
gen dead=0
replace dead=1 if disstatus=="Dead"
replace dead=. if disstatus==" "

gen racecat=0
replace racecat=1 if race=="White, not of Hispanic Origin"
replace racecat=2 if race=="Black"
replace racecat=3 if race=="Asian or Pacific Islander"
replace racecat=4 if race=="Hispanic"
replace racecat=5 if race=="Native American or Alaskan Nati"
replace racecat=6 if race=="Other"
replace racecat=. if race==" "

gen male=0
replace male=1 if gender=="Male"
replace male=. if gender==" "

drop dcodedescr
save D:\data\NSP\Temp\analyze.dta, replace

* STATISTICAL ANALYSES
svyset fac_key [pweight=weights], strata(strata)
*ESTIMATING MEAN OF AGE LOS AND ICUDAYS
svy: mean age
svyset fac_key [pweight=weights], strata(strata)
svy: mean los
svyset fac_key [pweight=weights], strata(strata)
svy: mean icudays

svyset fac_key [pweight=weights], strata(strata)
svy: prop dead
svyset fac_key [pweight=weights], strata(strata)
svy: prop male
svyset fac_key [pweight=weights], strata(strata)
svy: prop racecat

```

APPENDIX D: COMPARISON OF NTDB NATIONAL SAMPLE 2003 VS NIS 2003

Purpose: The purpose of this document is to describe the analysis of the NSP 2003 data and NIS 2003 data. We are hoping that the analysis results from these two national representative samples will be consistent. The summary of NIS 2003 analysis with SAS code is described in Section 1 and NSP 2003 is described in Section 2 below.

Common Outcome Variables in both NIS and NSP:

Age
Gender
Race
Mortality (Dead/ Alive)
Discharge Disposition
LOS
Mechanism of Injury (E-Code)
Procedure code

Analysis: Summary statistics (mean/proportions) of all trauma incidents from these two samples on common variables.

Results:

Variables	NSP 2003 Sample	NIS 2003 Sample
Age	Mean = 38.2 year 95% CI (37.1, 39.3)	Mean = 42.8 year 95% CI (41.3, 44.3)
Gender		
Female	32.9% (SE = 0.64)	35.6% (SE = 0.84)
Male	67.1% (SE = 0.64)	64.4% (SE = 0.84)
Race		
White	69.1 % (SE = 3.10)	62.5 % (SE = 3.62)
Black	13.0 % (SE = 2.02)	15.7 % (SE = 2.02)
Hispanic	10.3 % (SE = 1.47)	15.6 % (SE = 2.47)
Asian/Pac Islander	1.4 % (SE = 0.23)	2.1 % (SE = 0.41)
Native American	0.8 % (SE = 0.30)	0.2 % (SE = 0.06)
Other	5.4 % (SE = 2.40)	3.8 % (SE = 0.95)
Dead		
Alive	95.1% (SE = 0.62)	96.6 % (SE = 0.15)
Dead	4.9 % (SE = 0.62)	3.4 % (SE = 0.15)
LOS*	Mean = 5.7 days 95% CI (5.4, 6.1)	Mean = 5.9 year 95% CI (5.4, 6.3)

***:** In the NIS the *LOS* variable is an integer with a range between 0-365 calculated by subtracting the date of admission from the date of discharge with same day stays coded as zero. In the NTDB the data submission file derives *LOS* by subtracting the date of admission from the date of discharge with same date discharged coded as one day. However, not all hospitals comply with this standard.

Section 1: NSP 2003 data:

Description:

A stratified sample of 100 hospitals in the frame, with sample hospitals drawn based on probability-proportional-to-size methodology, using number of ER visits from AHA 2003 data as the size measure.

Sampling Frame:

453 level I or II trauma centers based on TIEP 2003 data.

Stratum:

- 1) NTDB participation (NTDB, non-NTDB)
- 2) Trauma Level I or II
- 3) Region – Northeast, Midwest, West, and South

Resulting NSP 2003 sample:

100 hospitals, whereof 90 were NTDB centers with contributing data. However, there were only 63 hospitals that had non-negative weights out of these 90, since 27 centers were adjusted for non-response (i.e. they had less than 30 incident cases in a month).

Subsetting for “similar” Trauma incidents in NSP 2003

The NSP 2003 includes 105,985 incidents. This data was subsetting for incidents with valid trauma diagnoses, which were identified by using the primary diagnosis code and checking the inclusion criteria for NTDB data, which is ICD-9 code of 800 – 960, excluding 905 – 924.99 and 930-939.99. Patients with isolated hip fractures (ICD-9-CM 820-820.9) were excluded as these patients are not uniformly included in trauma registries. Finally, In the NTDB, patients with an emergency department (ED) disposition classified as either died in ED, dead on arrival, home, jail, discharged or transferred were excluded as these patients would not have met criteria for an administrative admission and would be excluded from the NIS. After these exclusions there was 78,333 incidents used for analyses.

SAS code:

```
PROC SURVEYFREQ DATA=SAMPLE;  
cluster FAC_KEY;  
strata NSPSTRATA;  
tables Gender Race DISSTATUS;  
weight FINALWT;;  
run;
```

```
PROC SURVEYMEANS data=SAMPLE;  
weight FINALWT;  
cluster FAC_KEY;  
strata NSPSTRATA;  
var Age LOS ;  
run;
```

Section 2: NIS 2003 data:

Description:

A stratified probability sample of hospital in the frame, with sampling probabilities calculated to select 20% of the universe contained in each stratum.

Sampling Frame:

All community, non-rehabilitation hospitals in SID that could be matched to corresponding AHA data, based on 37 states => 3,763 hospitals. Target universe includes all 4,836 acute care discharges from community, non-rehabilitation hospitals in US.

Stratum:

- 1) Region – Northeast, Midwest, West, and South
- 2) Control – public, private not-for-profit, and proprietary
- 3) Location – urban or rural
- 4) Teaching status – teaching of non-teaching
- 5) Bed size – small, medium, and large

Resulting 2003 sample:

994 hospitals (representing 20.6% of total universe of 4,836 hospitals)

Trauma centers in NIS 2003

The NIS 2003 data includes 994 community, non-rehabilitation hospitals. We create an indicator variable for each of the hospitals in NIS 2003 sample that were also in the NSP Sampling Frame, which consist of 453 trauma centers of level 1 and level 2 using 2003 TIEP data. There were 85 hospitals that were in both NIS 2003 and in NSP frame.

Subsetting for “similar” Trauma incidents in NIS 2003

The NIS 2003 includes 7,977, 728 incidents, which of 309,250 incidents are valid trauma diagnoses. The valid trauma diagnoses were identified by using the primary diagnosis code and checking the inclusion criteria for NTDB data, which is ICD-9 code of 800 – 960, excluding 905 – 924.99 and 930-939.99. Patients with isolated hip fractures (ICD-9-CM 820-820.9) were excluded as these patients are not uniformly included in trauma registries. All NIS records with an admission type listed as “elective” were excluded. There were a total of 215,514 records which met the criteria above and 86,091 of these records were from trauma centers in NSP frame and used for analysis.

SAS SOURCE CODE;

Since we are not analysis the entire NIS, but a non-random subset of trauma incidents I used the recommended approach for calculating standard errors. The data was subseted for trauma incidents, then this subset was augmented with “dummy” observations for each NIS hospital to ensure that the proper formula is used to calculate standard errors. This approach “tricks” the software into believing that all NIS hospitals are in the analysis, even though not all hospitals may have a trauma event (*see. HCUP Mehods Series, Calculating Nationwide Inpatient Sample Variances, Report 2003-2, Appendix B*)

****AUGMENT THE SUBSET OF TRAUMA PATIENTS WITH HOSPITAL - LEVEL OBSERVATION **;**

DATA TRAUMA2;

SET TRAUMA

NSPDAT.nis_2003_hospital_sub (IN=INHOSP KEEP=HOSPID NIS_STRATUM);

INSUBSET=1;

IF INHOSP THEN DO;

INSUBSET=0; **VALUES OUTSIDE SUBSET ***;

DISCWT=0;

DIED=0;

DISCHARGS=0;

AGE=0;

```
    LOS=0;  
    GENDER=0;  
    RACE=0;  
END;
```

```
RUN;
```

```
PROC SURVEYFREQ data=TRAUMA2;  
strata NIS_stratum;  
cluster HOSPID;  
weight DISCWT;  
TABLE IN_NSPFRAME *INSUBSET*GENDER      IN_NSPFRAME *INSUBSET*RACE  
       IN_NSPFRAME *INSUBSET*DIED;  
run;
```

```
PROC SURVEYMEANS data=TRAUMA2;  
strata NIS_stratum;  
cluster HOSPID;  
weight DISCWT;  
var AGE LOS;  
DOMAIN INSUBSET*IN_NSPFRAME;  
run;
```

APPENDIX E: GROUPINGS FOR PRESENTING INJURY MORTALITY AND MORBIDITY DATA (FEB 1, 2007)

This matrix contains the ICD-9 external-cause-of-injury codes used for coding of injury mortality data and additional ICD-9-CM external-cause-of-injury codes, designated in bold, only used for coding of injury morbidity data.

Mechanism/Cause	Manner/Intent				
	Unintentional	Self-inflicted	Assault	Undetermined	Other ¹
Cut/pierce	E920.0-.9	E956	E966	E986	E974
Drowning/submersion	E830.0-.9, E832.0-.9 E910.0-.9	E954	E964	E984	
Fall	E880.0-E886.9, E888	E957.0-.9	E968.1	E987.0-.9	
Fire/burn³	E890.0-E899, E924.0-.9	E958.1,.2,.7	E961, E968.0,.3, E979.3	E988.1,.2,.7	
Fire/flame³	E890.0-E899	E958.1	E968.0, E979.3	E988.1	
Hot object/substance	E924.0-.9	E958.2,.7	E961, E968.3	E988.2,.7	
Firearm³	E922.0-.3,.8, .9	E955.0-.4	E965.0-4, E979.4	E985.0-.4	E970
Machinery	E919 (.0-.9)				
Motor vehicle traffic^{2,3}	E810-E819 (.0-.9)	E958.5	E968.5	E988.5	
Occupant	E810-E819 (.0,.1)				
Motorcyclist	E810-E819 (.2,.3)				
Pedal cyclist	E810-E819 (.6)				
Pedestrian	E810-E819 (.7)				
Unspecified	E810-E819 (.9)				
Pedal cyclist, other	E800-E807 (.3) E820-E825 (.6), E826.1,.9 E827-E829(.1)				
Pedestrian, other	E800-807(.2) E820-E825(.7) E826-E829(.0)				

Transport, other	E800-E807 (.0,.1,.8,.9) E820-E825 (.0- .5,.8,.9) E826.2-.8 E827-E829 (.2- .9), E831.0-.9, E833.0-E845.9	E958.6		E988.6	
Natural/environmental	E900.0-E909, E928.0-.2	E958.3		E988.3	
Bites and stings³	E905.0-.6,.9 E906.0-.4,.5,.9				
Overexertion	E927				
Poisoning	E850.0-E869.9	E950.0-E952.9	E962.0-.9, E979.6,.7	E980.0-E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973, E975
Suffocation	E911-E913.9	E953.0-.9	E963	E983.0-.9	
Other specified and classifiable^{3,4}	E846-E848, E914-E915 E918, E921.0- .9, E922.4,.5 E923.0-.9, E925.0-E926.9 E928(.3-.5) , E929.0-.5	E955.5,.6,.7,.9 E958.0,.4	E960.1, E965.5-.9 E967.0-.9, E968.4,.6, .7 E979 (.0- .2,.5,.8,.9)	E985.5,.6,.7 E988.0,.4	E971, E978, E990-E994, E996 E997.0-.2
Other specified, not elsewhere classifiable	E928.8, E929.8	E958.8, E959	E968.8, E969, E999.1	E988.8, E989	E977, E995, E997.8 E998, E999.0
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
All injury³	E800-E869, E880-E929	E950-E959	E960-E969, E979 , E999.1	E980-E989	E970-E978, E990- E999.0
Adverse effects					E870-E879 E930.0- E949.9
Medical care					E870-E879
Drugs					E930.0- E949.9
All external causes					E800-E999

¹Includes legal intervention (E970-E978) and operations of war (E990-E999).

²Three 4th-digit codes (.4 [occupant of streetcar], .5 [rider of animal], .8 [other specified

person]) are not presented separately because of small numbers. However, because they are included in the overall motor vehicle traffic category, the sum of these categories can be derived by subtraction.

³Codes in bold are for morbidity coding only. For details see table 2.

⁴E849 (place of occurrence) has been excluded from the matrix. For mortality coding, an *ICD-9* E849 code does not exist. For morbidity coding, an *ICD-9-CM* E849 code should never be first-listed E code and should only appear as an additional code to specify the place of occurrence of the injury incident.

Note: ICD-9 E codes for coding underlying cause of death apply to injury-related death data from 1979 through 1998. Then there is a new ICD-10 external cause of injury matrix that applies to death data from 1999 and after. This can be found on the [National Center for Health Statistics website](#).