

## Analysis of NIS 2003 and NSP 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:

<b>Variables</b>	<b>NSP 2003 Sample</b>	<b>NIS 2003 Sample</b>
<b>Age</b>	Mean = 38.2 year 95% CI (37.1, 39.3)	Mean = 42.8 year 95% CI (41.3, 44.3)
<b>Gender</b>		
Female	32.9% (SE = 0.64)	35.6% (SE = 0.84)
Male	67.1% (SE = 0.64)	64.4% (SE = 0.84)
<b>Race</b>		
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)
<b>Dead</b>		
Alive	95.1% (SE = 0.62)	96.6 % (SE = 0.15)
Dead	4.9 % (SE = 0.62)	3.4 % (SE = 0.15)
<b>LOS*</b>	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: 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 subsetting 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 Methods 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;**

## **Section 2: 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;
```