# Reference Section

If you have questions concerning the purchase of HCUP databases, please contact the
HCUP Central Distributor by:

| | |
|---|---|
| Email: | HCUPDistributor@ahrq.gov |
| Phone: | (toll-free) (866) 556-HCUP (4287) |
| Fax: | (866) 792-5313 |

## Contacting Technical Assistance

If you have questions about HCUP databases, software tools, supplemental files, or other products, please contact HCUP User Support by email at hcup@ahrq.gov or call (toll-free) 1-866-290-HCUP (4287). International users, please contact HCUP User Support by email. HCUP research staff is trained in epidemiology, health services research, statistics, and economics, and is available to answer questions regarding the application of an HCUP tool or product to your work. Senior programming staff can also advise you on technical questions related to HCUP data and tools. Staff reviews messages daily and responds to inquiries within 3 business days.

## *Merging the NIS Trends (NIS-Trends) Files and the NIS Core Files*

You obtained the complete NIS 1996-2005 and also the NIS Trend files associated with all of these complete NIS. You are planning to run trend analysis on the 10 years of the NIS using SAS.

1. Use the SASload_NIS_Trends_Supplemental_YYYY.SAS program to load the NIS Trend File into SAS. This load program is provided to you when you purchase the trend file.

2. Save the NIS Trend files in the same folder as you saved the NIS Core files.

3. Find the two programs associated with the NIS Trend file for a given year. These programs are also provided to you when you purchase the trend file.
   - NIS_Trends_Supplemental_Merge_Driver.sas
   - NIS_Trends_Supplemental_Merge_Macro.sas

4. Modify these programs to work with your computer and use them to merge the Trend Files and the Core Files. Examples of how to modify the programs are presented below:

## Modifying NIS_Trends_Supplemental_Merge_Driver.sas

### *For the NIS prior to 1998:*

Please note that prior to 1998, the NIS Core was called "NCORE". Please modify the %LET year_ =, %LET corepath_ =, %LET corename_ =, %LET mrgpath_ =, and %LET mrgname_ = statements as needed.  Also modify the %INCLUDE statement as needed to specify the location of the NIS_Trends_Supplemental_Merge_Macro.sas file.  Detailed instructions about how to modify them can be found in the "User Guide for the NIS Trends Supplemental Files" at https://www.hcup-us.ahrq.gov/db/nation/nis/UserGuideNISTrendsSupplementalFilesv8.pdf

```
Options source2
        mprint
        macrogen
        compress = yes
        OBS = MAX
        ;

%LET year_    = 1996;  * Update year value to year of NIS files to be merged;
%LET corepath_ = C:\NIS\&year_.\sasdata\; * Update to path location of current core data set;
%LET corename_ = NCORE;   * Update to name of current core data set;
%LET mrgpath_  = C:\Analysis\Trends_Supplemental; * Update to location to output the merged
data set;
%LET mrgname_  = NIS_Trends_Supplemental_&year_.; * Update to new name of output merged data
set;


%INCLUDE C:\Analysis\Trends_Supplemental\NIS_Trends_Supplemental_Merge_Macro.sas";
* Update to location of the macro program;


%NIS(&year_.,&corepath_.,&corename_.,&mrgpath_.,&mrgname_.);

RUN;
```

### *For the NIS beginning in 1998:*

The original program sets the value of the corename_ macro to "NIS_CORE_&year_;". Please change the value to "NIS_&year_._CORE". Also modify the %INCLUDE statement as needed to specify the location of the NIS_Trends_Supplemental_Merge_Macro.sas file.

```
Options source2
        mprint
        macrogen
        compress = yes
        OBS = MAX
        ;

%LET year_    = 2002;  * Update year value to year of NIS files to be merged;
%LET corepath_ = C:\NIS\&year_.\SASDATA; * Update to path location of current core data set;
%LET corename_ = NIS_&year_._CORE; * Update to name of current core data set;
%LET mrgpath_  = C:\Analysis\Trends_Supplemental;  * Update to location to output the merged
data set;
%LET mrgname_  = NIS_Trends_Supplemental_&year_.; * Update to new name of output merged data
set;
```

```
%INCLUDE "C:\Analysis\Trends_Supplemental\NIS_Trends_Supplemental_Merge_Macro.sas";
* Update to location of the macro program;


%NIS(&year_.,&corepath_.,&corename_.,&mrgpath_.,&mrgname_.);

RUN;
```

## Modifying NIS_Trends_Supplemental_Merge_Macro.sas

### *For the NIS 1996 and 1997:*

Please insert "v6" after "LIBIN" in the LIBNAME statement. This tells SAS that the NIS Core 1996 and 1997 files were created using Version 6 of SAS.

```
%MACRO NIS(yyyy_,inpath_,inname_,outpath_,outname_);

TITLE "Merging NIS Trends Supplemental &yyyy_. file to original NIS data set";

LIBNAME LIBIN v6  "&INPATH_.";
LIBNAME LIBOUT  "&OUTPATH_.";

* List contents of NIS Trends Supplemental file ;
PROC CONTENTS DATA= LIBIN.NIS_Trends_Supplemental_&yyyy_.;
TITLE2 "Contents of SAS data set NIS_Trends_Supplemental_&yyyy_.";
RUN;
```

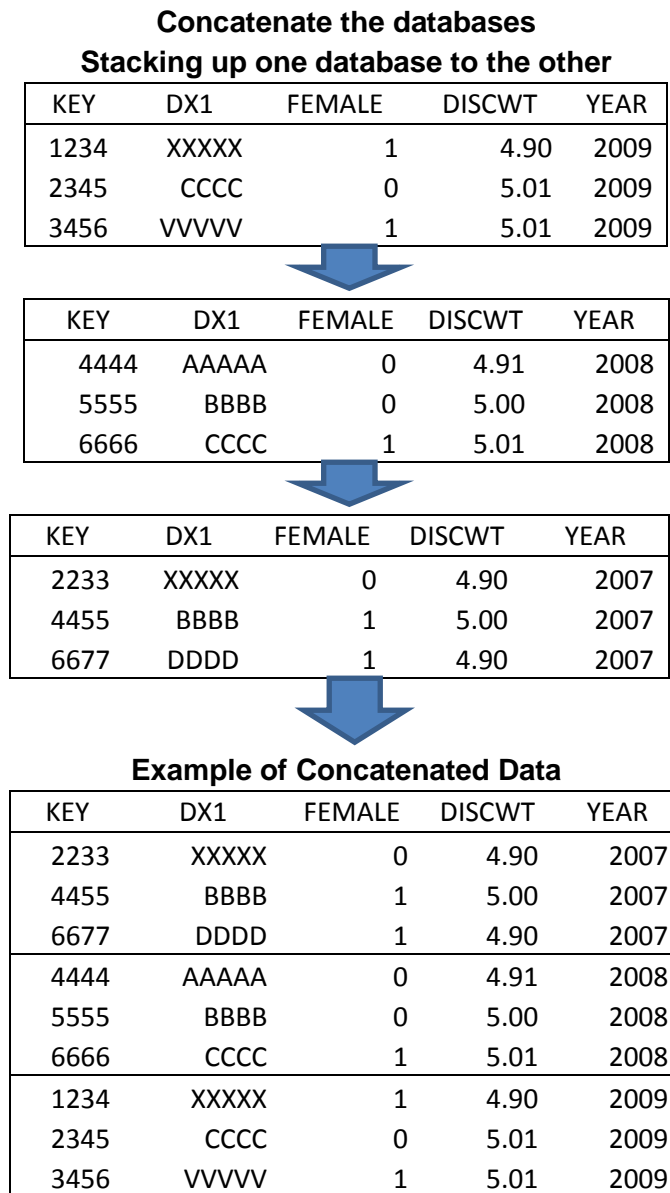### *For other years of the NIS (prior to 1996 or beginning in 1998):*

No changes are usually necessary on the NIS_Trends_Supplemental_Merge_Macro.sas

### Running the NIS_Trends_Supplemental_Merge_Driver.sas

5. Run the modified NIS_Trends_Supplemental_Merge_Driver.sas program for each year from 1996-2002 to merge the NIS Trend file with the corresponding NIS Core file. (You do not need to manually run the NIS_Trends_Supplemental_Merge_Macro.sas macro since it is called by the driver program.) This will create the following files in the path specified by the mrgpath_ parameter:
    NIS_Trends_Supplemental_1996
    NIS_Trends_Supplemental_1997
    NIS_Trends_Supplemental_1998
    NIS_Trends_Supplemental_1999
    NIS_Trends_Supplemental_2000
    NIS_Trends_Supplemental_2001
    NIS_Trends_Supplemental_2002

6. The next step is to concatenate all these trend files and the complete NIS 2003-2005. The size of the combined NIS data for 10 years will be large. Consider dropping unnecessary data elements to minimize the file size.

## Concatenating Multiple years of the NIS and Using Weights to Calculate Estimates

Concatenating databases is like "stacking up one database on the other database."  See the following example:

**Concatenate the databases**
**Stacking up one database to the other**

| KEY | DX1 | FEMALE | DISCWT | YEAR |
|---|---|---|---|---|
| 1234 | XXXXX | 1 | 4.90 | 2009 |
| 2345 | CCCC | 0 | 5.01 | 2009 |
| 3456 | VVVVV | 1 | 5.01 | 2009 |

| KEY | DX1 | FEMALE | DISCWT | YEAR |
|---|---|---|---|---|
| 4444 | AAAAA | 0 | 4.91 | 2008 |
| 5555 | BBBB | 0 | 5.00 | 2008 |
| 6666 | CCCC | 1 | 5.01 | 2008 |

| KEY | DX1 | FEMALE | DISCWT | YEAR |
|---|---|---|---|---|
| 2233 | XXXXX | 0 | 4.90 | 2007 |
| 4455 | BBBB | 1 | 5.00 | 2007 |
| 6677 | DDDD | 1 | 4.90 | 2007 |

**Example of Concatenated Data**

| KEY | DX1 | FEMALE | DISCWT | YEAR |
|---|---|---|---|---|
| 2233 | XXXXX | 0 | 4.90 | 2007 |
| 4455 | BBBB | 1 | 5.00 | 2007 |
| 6677 | DDDD | 1 | 4.90 | 2007 |
| 4444 | AAAAA | 0 | 4.91 | 2008 |
| 5555 | BBBB | 0 | 5.00 | 2008 |
| 6666 | CCCC | 1 | 5.01 | 2008 |
| 1234 | XXXXX | 1 | 4.90 | 2009 |
| 2345 | CCCC | 0 | 5.01 | 2009 |
| 3456 | VVVVV | 1 | 5.01 | 2009 |

```
/* You would like to use the data elements, FEMALE YEAR DISCWT HOSPID NIS_STRATUM DX1, for
your analysis. There is an issue: NIS_STRATUM is not included in the NIS core files for 1998
and 1999. It is included in the NIS hospital files for these two years */
```

```
/* Merging the Core files with the Trend Files does not take care of this change */

/* Solution: You need to merge hospital file with the merged NIS Core file and Trend file */


%Let Obs_ = MAX;

Options Obs=&Obs_
        FormChar='|----|+|---+=|#/\<>*'
                ;
Libname TREND96 "\\Server\NIS\1996\SASData\Longitudinal";
Libname TREND97 "\\Server\NIS\1997\SASData\Longitudinal";
Libname TREND98 "\\Server\NIS\1998\SASData\Longitudinal";
Libname TREND99 "\\Server\NIS\1999\SASData\Longitudinal";
Libname TREND00 "\\Server\NIS\2000\SASData\Longitudinal";
Libname TREND01 "\\Server\NIS\2001\SASData\Longitudinal";
Libname TREND02 "\\Server\NIS\2002\SASData\Longitudinal";
Libname NIS98 "\\Server\NIS\1998\SASData";
Libname NIS99 "\\Server\NIS\1999\SASData";
Libname NIS03 "\\Server\NIS\2003\SASData";
Libname NIS04 "\\Server\NIS\2004\SASData";
Libname NIS05 "\\Server\NIS\2005\SASData";
Libname OUT "\\Server\Trends_Supplemental";

/* Merge the 1998 Core_Trend file with the hospital file */

PROC SORT DATA=TREND98.nis_core_trends_supp_1998 OUT=S_CORE_TREND98;
    BY HOSPID;
RUN;

PROC SORT DATA=NIS98.nis_1998_hospital OUT=S_HOSP98;
    BY HOSPID;
RUN;

DATA OUT.CORE_TREND98;
    MERGE S_CORE_TREND98 (in=a) S_HOSP98;
        BY HOSPID;
        IF a;
RUN;

PROC PRINT DATA=OUT.CORE_TREND98 (OBS=10);
    VAR KEY HOSPID NIS_STRATUM;
    TITLE "Check Merged file";
RUN;

/* Merge the 1999 Core_Trend file with the hospital file */

PROC SORT DATA=TREND99.nis_core_trends_supp_1999 OUT=S_CORE_TREND99;
    BY HOSPID;
RUN;

PROC SORT DATA=NIS99.nis_1999_hospital OUT=S_HOSP99;
    BY HOSPID;
RUN;

DATA OUT.CORE_TREND99;
    MERGE S_CORE_TREND99 (in=a) S_HOSP98;
        BY HOSPID;
        IF a;
RUN;

PROC PRINT DATA=OUT.CORE_TREND99 (OBS=10);
    VAR KEY HOSPID NIS_STRATUM;
```

```
        TITLE "Check Merged file";
Run;


/* Concatenate the merged NIS Core_Trend Files 1996 - 2005 */
/* For 1998 and 1999, use CORE_TREND98 and CORE_TREND99 just created */
/* Concatenate the merged Trend_Core files for 1996-2002. No trend files are available for
the NIS 2003-2005 */
/* Subset the data: Keep discharges with Female=1*/

DATA OUT.MULTI_NIS;
        SET TREND96.nis_core_trends_supp_1996 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID
            NIS_STRATUM DX1)
            TREND97.nis_core_trends_supp_1997 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID
            NIS_STRATUM DX1)
            OUT.CORE_TREND98 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID NIS_STRATUM DX1)
            OUT.CORE_TREND99 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID NIS_STRATUM DX1
            In=F99)
            TREND00.nis_core_trends_supp_2000 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID
            NIS_STRATUM DX1)
            TREND01.nis_core_trends_supp_2001 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID
            NIS_STRATUM DX1)
            TREND02.nis_core_trends_supp_2002 (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID
            NIS_STRATUM DX1)
            NIS03.nis_2003_core (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID NIS_STRATUM DX1)
            NIS04.nis_2004_core (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID NIS_STRATUM DX1)
            NIS05.nis_2005_core (KEEP=TOTCHG FEMALE YEAR DISCWT HOSPID NIS_STRATUM DX1);

        IF FEMALE=1;
        IF F99 AND YEAR ^= 1999 THEN DELETE; /* The NIS 1999 includes some discharges
                                             with YEAR=1998. We exclude them */

        IF DX1="4280" THEN CHF=1; /* Flag discharges with DX1="4280" */
        ELSE CHF=0;
Run;

PROC FREQ DATA=OUT.MULTI_NIS;
        TABLES YEAR*CHF/LIST MISSING;
        TITLE "Check the Concatenated Data";
RUN;


ODS LISTING CLOSE;
ODS HTML FILE="\\Server\Trends_Supplemental\ANALYSIS_NIS_TREND.xls" RS=NONE  STYLE=MINIMAL;
PROC MEANS DATA=OUT.MULTI_NIS;
        CLASS YEAR CHF;
        WEIGHT DISCWT;
        VAR TOTCHG;
        TITLE "Total charges - patients with DX1, CHF";

/* YEAR must be included in the design because the samples were drawn separately for each
year */

DATA MULTI_NIS2;
        SET OUT.MULTI_NIS2;
        NEW_YEAR=YEAR; /* Coping YEAR to NEW_YEAR */
RUN;

PROC SURVEYFREQ DATA=OUT.MULTI_NIS MISSING;
        WEIGHT DISCWT;
        CLUSTER HOSPID;
        STRATA NIS_STRATUM NEW_YEAR; /* Use NEW_YEAR here since PROC SURVEYFREQ does not allow
          to have YEAR in both STRATA and TABLES statements */
        TABLES YEAR*CHF;
```

```
        TITLE "Total discharge - patients with DX1, CHF";
RUN;
ODS HTML CLOSE;
ODS LISTING;
```

## *Output: Total charges - patients with DX1 of CHF*

The MEANS Procedure

| Analysis Variable : TOTCHG I:Total charges (cleaned) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Calendar year | CHF | N Obs | N | Mean | Std Dev | Minimum | Maximum |
| 96 | 0 | 3743494 | 3662168 | 9569.12 | 107780.64 | 1 | 70000000 |
| | 1 | 95361 | 94234 | 11041.97 | 37213.86 | 1 | 1222405 |
| 97 | 0 | 4105194 | 4017931 | 10140.08 | 43430.96 | 1 | 5706195 |
| | 1 | 106194 | 105098 | 11610.83 | 40562.85 | 15 | 1479883 |
| 1998 | 0 | 3924574 | 3839809 | 10616.01 | 42570.88 | 25 | 1000000 |
| | 1 | 104150 | 102572 | 12357.57 | 40339.64 | 25 | 799171 |
| 1999 | 0 | 4128335 | 4018897 | 11203.76 | 46232.37 | 25 | 1000000 |
| | 1 | 105434 | 103444 | 13059.82 | 45934.97 | 25 | 904431 |
| 2000 | 0 | 4305767 | 4004853 | 12429.75 | 60771.38 | 25 | 1000000 |
| | 1 | 111145 | 104117 | 14587.89 | 55793.14 | 45 | 1000000 |
| 2001 | 0 | 4300448 | 4246071 | 13463.9 | 54843.15 | 25 | 1000000 |
| | 1 | 111347 | 110478 | 16044.26 | 56049.85 | 28 | 962788 |
| 2002 | 0 | 4546683 | 4433950 | 15405.54 | 61753.34 | 25 | 999791 |
| | 1 | 112363 | 110649 | 19271.95 | 69930.6 | 54 | 994328 |
| 2003 | 0 | 4596096 | 4498603 | 17584.42 | 70828.84 | 25 | 999945 |
| | 1 | 111650 | 110315 | 21822.46 | 73891.03 | 39 | 980478 |
| 2004 | 0 | 4607065 | 4516251 | 18290.63 | 69477.21 | 25 | 999891 |
| | 1 | 106888 | 105640 | 23406.46 | 75953.42 | 30 | 928162 |
| 2005 | 0 | 4593024 | 4520102 | 19918.71 | 76462.56 | 25 | 999720 |
| | 1 | 99620 | 98804 | 24961.23 | 82514.8 | 29 | 995531 |

## Output: Total discharges - patients with DX1 of CHF

The SURVEYFREQ Procedure

| Data Summary | |
|---|---|
| Number of Strata | 643 |
| Number of Clusters | 9887 |
| Number of Observations | 43914832 |
| Number of Observations Used | 43896290 |
| Number of Obs with Nonpositive Weights | 18542 |
| Sum of Weights | 216174393 |

| Table of YEAR by CHF | | | | | | |
|---|---|---|---|---|---|---|
| YEAR | CHF | Frequency | Weighted Frequency | Std Dev of Wgt Freq | Percent | Std Err of Percent |
| 96 | 0 | 3735731 | 19584176 | 373841 | 9.0594 | 0.167 |
| | 1 | 95267 | 512015 | 10932 | 0.2369 | 0.0051 |
| | Total | 3830998 | 20096191 | 379452 | 9.2963 | 0.1696 |
| 97 | 0 | 4094624 | 19931379 | 393381 | 9.22 | 0.1747 |
| | 1 | 106079 | 522520 | 11211 | 0.2417 | 0.0052 |
| | Total | 4200703 | 20453899 | 400151 | 9.4618 | 0.1777 |
| 1998 | 0 | 3924574 | 20019830 | 367129 | 9.261 | 0.1644 |
| | 1 | 104150 | 530890 | 11814 | 0.2456 | 0.0054 |
| | Total | 4028724 | 20550719 | 374959 | 9.5065 | 0.1679 |
| 1999 | 0 | 4128335 | 20318577 | 666576 | 9.3992 | 0.2839 |
| | 1 | 105434 | 520607 | 15931 | 0.2408 | 0.0069 |
| | Total | 4233769 | 20839185 | 679294 | 9.64 | 0.2892 |
| 2000 | 0 | 4305767 | 21034558 | 422743 | 9.7304 | 0.1863 |
| | 1 | 111145 | 545782 | 11315 | 0.2525 | 0.0052 |
| | Total | 4416912 | 21580340 | 429360 | 9.9828 | 0.1892 |
| 2001 | 0 | 4300448 | 21430409 | 362903 | 9.9135 | 0.1633 |
| | 1 | 111347 | 554440 | 11044 | 0.2565 | 0.0051 |
| | Total | 4411795 | 21984848 | 369117 | 10.17 | 0.1662 |
| 2002 | 0 | 4546683 | 21853932 | 401509 | 10.1094 | 0.1781 |
| | 1 | 112363 | 543992 | 12439 | 0.2516 | 0.0057 |
| | Total | 4659046 | 22397925 | 409757 | 10.361 | 0.1818 |
| 2003 | 0 | 4596096 | 21997655 | 412605 | 10.1759 | 0.1824 |
| | 1 | 111650 | 536049 | 12744 | 0.248 | 0.0058 |

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|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
|  | **Total** | 4707746 | 22533704 | 420631 | 10.4239 | 0.186 |
| **2004** | **0** | 4607065 | 22241173 | 429986 | 10.2885 | 0.1892 |
|  | **1** | 106888 | 516385 | 12050 | 0.2389 | 0.0055 |
|  | **Total** | 4713953 | 22757558 | 437598 | 10.5274 | 0.1925 |
| **2005** | **0** | 4593024 | 22491063 | 465242 | 10.4041 | 0.2028 |
|  | **1** | 99620 | 488962 | 11444 | 0.2262 | 0.0052 |
|  | **Total** | 4692644 | 22980025 | 472618 | 10.6303 | 0.206 |
| **Total** | **0** | 42832347 | 210902752 | 1384490 | 97.5614 | 0.0141 |
|  | **1** | 1063943 | 5271641 | 38495 | 2.4386 | 0.0141 |
|  | **Total** | 43896290 | 216174393 | 1409407 | 100 |  |