# INSTRUCTIONS
# IQI AND PSI RATES GENERATED BY THE AHRQ *SAS* PROGRAMS
## Guidance for Using the *SAS* Programs and an Example of Output for One Hospital

**What is this tool?** To work with the Inpatient Quality Indicators (IQIs) and Patient Safety Indicators (PSIs) for assessing its own performance, a hospital needs to calculate rates for these Indicators, using the SAS programs provided by the Agency for Healthcare Research and Quality (AHRQ). This tool provides three sets of information to help you work with the SAS programs to calculate rates for your hospital and use the output from those programs:

- An outline of the steps and programs used to calculate rates for the IQIs and PSIs.
- Notes for analysts and programmers on issues to manage in working with the SAS programs.
- An example of the output from the SAS programs for one hospital.

**Who are the target audiences?** The primary audience for this tool is the programmers or analysts who will perform the calculations of rates for the IQIs and PSIs.

**How can the tool help you?** The examples and guidance provided by this tool should help you work more easily with the SAS programs used to calculate the IQIs and PSIs for your hospital, and to read and use the output from the programs.

**How does this tool relate to others?** This tool should be used together with the B.1 tool on *Applying the Quality Indicators to Hospital Data*, which explains the different types of rates calculated for the IQIs and PSIs..

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# Indicator Data Generated by the *SAS* Programs

The following steps are taken to produce the rates for both the IQIs and PSIs:

1. Identify outcomes in inpatient records.
2. Identify populations at risk.
3. Calculate observed (raw) indicator rates.
4. Risk adjust the indicator rates (where applicable).
5. Create smoothed rates using multivariate signal extraction (where applicable).

The SAS programs provided by AHRQ for calculation of the IQIs and PSIs, as well as documentation on how to use the programs, can be found in zip files on the AHRQ QI Web site: www.qualityindicators.ahrq.gov/software/SAS.aspx and www.qualityindicators.ahrq.gov/Downloads/Software/SAS/V45/Software_Instructions_SAS_V4.5.pdf.

The documentation is provided in separate software documentation guides for the IQIs and PSIs. Each guide includes instructions for variable definitions and for calculating observed, expected, risk-adjusted, and smoothed rates for the indicators.

Rates for the IQIs and PSIs are calculated using the same six programming steps, each of which uses a separate SAS program. The names and descriptions of the SAS programs involved are summarized in the following table.

| IQI Programs | PSI Programs | Program Description |
|---|---|---|
| CONTROL_IQI.SAS | CONTROL_PSI.SAS | Contains SAS statements that run the remaining programs |
| IQFMTS | PSFMTS | Defines a format library that contains the diagnosis and procedure screens necessary for assigning outcomes for each Indicator |
| IQSAS1 | PSSAS1 | Processes hospital discharge abstract data and flags records if they contain the outcomes of interest for each Indicator |
| IQSASP2 | PSSASP2 | Calculates the observed (raw) rates for the Indicators |
| IQSASP3 | PSSASP3 | Calculates expected rates, risk-adjusted rates, and smoothed rates for each Indicator |
| IQI_COMPOSITE.SAS | PSI_COMPOSITE.SAS | Calculates the composite rate for the set of indicators (PSIs or mortality IQIs) |

PSI #17 Birth Trauma Rate – Injury to Neonate is calculated within the PDI module because it is based on the number of births. However, a standalone module was introduced with SAS QI v4.5. PSI #17 Standalone Module calculates this indicator without the need to run the entire PDI module. It is available as a separate download from the same Web page as the other software. The standalone module includes the same processing steps as the provider-level PDI module for PSI #17.

## *Notes for Analysts and Programmers*

The documentation provides guidance on how to set up the files and run the programs. However, as is usually the case when applying new programs to a data file, several issues have been identified that you will need to manage as you work with the AHRQ SAS programs. The identified issues are discussed here to help ease your first application of the programs to your data. Once you have run the programs successfully, any use of them on subsequent data should proceed smoothly.

One issue that affects the ability to begin to use the programs is the need to obtain a file that is not included in the zip files with the other AHRQ QI SAS programs. This is the population file, POPFILE

(pop95t13.txt), which is located in a compressed folder (1995-2013 Population Files_V4.5.zip) on the AHRQ QI Web site: www.qualityindicators.ahrq.gov/software/SAS.aspx.

**Getting Your Data Ready**

When preparing data for the SAS PSI and IQI software programs, you should be aware that a few steps are essential for running the programs without errors.

1. Format and structure your dataset so that it matches the structure specified in the documentation. If you try to run the program without first structuring and formatting the data to the exact specifications listed, the program will not run properly. All numeric variables must be specified as numeric, and all character variables must be specified as character.
2. In some cases, you may not have a variable in your dataset that is required by the program. If it is not essential for calculating the rates, you may create an empty variable so that the program will run (e.g., AGEDAY, DQTR, and PAY2 may be created and set to missing).
3. The KEY variable is the unique case identifier. It is important that this variable be a unique numeric identifier for each record. You may create this variable in SAS using the built-in case counter (KEY = _n_;).
4. For the IQI programs, to obtain risk-adjusted rates, you must run APR-DRG software first and indicate this with the flag variables APR_DRG, APRDRG_RISK_MORTALITY, and XPRDRG_RISK_MORTALITY. If you are not interested in obtaining risk-adjusted rates, you may adjust these variables so that the program will still run without errors. Specific directions are listed in the IQI documentation (Section 5.3).

**Modifying the AHRQ SAS Programs**

The control files used to specify the programs' parameters are CONTROL_PSI.SAS and CONTROL_IQI.SAS. Each command in this file is preceded by a comment and brief instructions. For some of the commands, the control file states that the user "MUST modify" the code. In other cases, the control file states that the user "MAY modify" the code. However, depending on the structure of your data, sometimes you *must* address these seemingly optional modifications. This is not clearly explained in the code.

For example, the number of diagnosis codes (Dx) or procedures *must* be changed if it does not match your data exactly. If you have 20 diagnosis code variables, the default number of diagnosis codes (30) must be changed or the program will not run properly.

Errors may not appear until you run the PSSAS1.SAS or IQSAS1.SAS files. When troubleshooting, check the structure of the data and the control file first.

**Example of SAS Program Output**

An example of the output from the SAS programs for the PSI rates is provided on the following pages. This output was generated from a run of the programs on the data for one large hospital, which had a large set of discharge records that would have the best chance of finding events for the numerators in the observed rates. Even in this case, however, you will see that zero events were found for some of the Indicators.

**NOTE: Refer to tool B.1, Applying the AHRQ QIs to Hospital Data, for definitions of the four types of rates.**

This output consists of three tables, each of which was generated by one of the following SAS programs: PSSASP2, PSSASP3, and PSI_COMPOSITE.SAS. In each table, the first line of output for each set of measures involved is highlighted in light gray, to assist you in navigating the table. For example, the line in the first table for TPPS02 DEATH IN LOW MORTALITY DRGS (numerator) is highlighted; this line is followed by additional numerator data for all the other PSIs. Then the line for the population (denominator) for this indicator is highlighted, again followed by data for the remaining PSIs.

The output from PSSASP3, which calculates the expected, risk-adjusted, and smoothed rates, first lists the numerators, denominators, and observed rates for the Indicators. This replicates the output from PSSASP2 (Note: When running the 4.5 version of the software, some indicators did not have the same numerator, denominator, and rates in PSSASP2 and PSSASP3. Some observations were dropped in P3.

The AHRQ QI team has been notified of this issue and it should be resolved in future releases of the software). Then the other rates are presented in a group for each indicator in turn.

The values reported on each line are the minimum, maximum, mean, and sum for each measure (numerator, population, rate). Because this output is for one hospital, all the values on each line are the same. If the programs had been run for a group of hospitals, these values would differ because the results would be for a distribution of results across hospitals.

In the example below:

TPPS = number of events for a given indicator (identified by the PSI number)

PPPS = the number of individuals in the population at risk for the event

OPSS = the observed rate of a given event

EPPS = the expected rate of a given event

RPPS = the risk-adjusted rate of a given event

VPPS = the variance for the risk-adjusted rate of a given event

SPPS = the smoothed rate of a given event

XPPS = the standard error of the smoothed rate of a given event

LPPS = the lower confidence interval for the smoothed rate

UPPS = the upper confidence interval for the smoothed rate

***PSSASP2.SAS***

PROGRAM: P2
AHRQ PATIENT SAFETY INDICATORS: CALCULATE OBSERVED PROVIDER RATES
SUMMARY OF PROVIDER-LEVEL RATES (_TYPE_=16)

The MEANS Procedure

| Variable | N | N Miss | Minimum | Maximum | Mean | Sum |
|---|---|---|---|---|---|---|
| **hospid** | 1 | 0 | 1 | 1 | 1 | 1 |
| **AGECAT** | 0 | 1 | . | . | . | . |
| **SEXCAT** | 0 | 1 | . | . | . | . |
| **PAYCAT** | 0 | 1 | . | . | . | . |
| **RACECAT** | 0 | 1 | . | . | . | . |
| **_TYPE_** | 1 | 0 | 16 | 16 | 16 | 16 |
| **TPPS02** | 1 | 0 | 8 | 8 | 8 | 8 |
| **TPPS03** | 1 | 0 | 5 | 5 | 5 | 5 |
| **TPPS04** | 1 | 0 | 3 | 3 | 3 | 3 |
| **TPPS04A** | 1 | 0 | 0 | 0 | 0 | 0 |
| **TPPS04B** | 1 | 0 | 0 | 0 | 0 | 0 |
| **TPPS04C** | 1 | 0 | 1 | 1 | 1 | 1 |
| **TPPS04D** | 0 | 1 | . | . | . | . |
| **TPPS04E** | 1 | 0 | 1 | 1 | 1 | 1 |
| **TPPS05** | 0 | 1 | . | . | . | . |
| **TPPS06** | 1 | 0 | 0 | 0 | 0 | 0 |
| **TPPS07** | 1 | 0 | 9 | 9 | 9 | 9 |
| **TPPS08** | 1 | 0 | 0 | 0 | 0 | 0 |
| **TPPS09** | 1 | 0 | 2 | 2 | 2 | 2 |
| **TPPS10** | 0 | 1 | . | . | . | . |
| **TPPS11** | 0 | 1 | . | . | . | . |
| **TPPS12** | 1 | 0 | 3 | 3 | 3 | 3 |
| **TPPS13** | 0 | 1 | . | . | . | . |
| **TPPS14** | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **TPPS15** | 1 | 0 | 6 | 6 | 6 | 6 |
| **TPPS16** | 0 | 1 | . | . | . | . |
| **TPPS18** | 0 | 1 | . | . | . | . |
| **TPPS19** | 0 | 1 | . | . | . | . |
| **PPPS02** | 1 | 0 | 132 | 132 | 132 | 132 |
| **PPPS03** | 1 | 0 | 1147 | 1147 | 1147 | 1147 |
| **PPPS04** | 1 | 0 | 18 | 18 | 18 | 18 |
| **PPPS04A** | 1 | 0 | 4 | 4 | 4 | 4 |
| **PPPS04B** | 1 | 0 | 8 | 8 | 8 | 8 |
| **PPPS04C** | 1 | 0 | 4 | 4 | 4 | 4 |
| **PPPS04D** | 0 | 1 | . | . | . | . |
| **PPPS04E** | 1 | 0 | 2 | 2 | 2 | 2 |
| **PPPS05** | 0 | 1 | . | . | . | . |
| **PPPS06** | 1 | 0 | 4777 | 4777 | 4777 | 4777 |
| **PPPS07** | 1 | 0 | 7007 | 7007 | 7007 | 7007 |
| **PPPS08** | 1 | 0 | 425 | 425 | 425 | 425 |
| **PPPS09** | 1 | 0 | 750 | 750 | 750 | 750 |
| **PPPS10** | 0 | 1 | . | . | . | . |
| **PPPS11** | 0 | 1 | . | . | . | . |
| **PPPS12** | 1 | 0 | 785 | 785 | 785 | 785 |
| **PPPS13** | 0 | 1 | . | . | . | . |
| **PPPS14** | 1 | 0 | 346 | 346 | 346 | 346 |
| **PPPS15** | 1 | 0 | 5071 | 5071 | 5071 | 5071 |
| **PPPS16** | 0 | 1 | . | . | . | . |
| **PPPS18** | 0 | 1 | . | . | . | . |
| **PPPS19** | 0 | 1 | . | . | . | . |
| **OPPS02** | 1 | 0 | 0.060606 | 0.060606 | 0.060606 | 0.060606 |
| **OPPS03** | 1 | 0 | 0.004359 | 0.004359 | 0.004359 | 0.004359 |
| **OPPS04** | 1 | 0 | 0.166667 | 0.166667 | 0.166667 | 0.166667 |
| **OPPS04A** | 1 | 0 | 0 | 0 | 0 | 0 |
| **OPPS04B** | 1 | 0 | 0 | 0 | 0 | 0 |

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|---|---|---|---|---|---|---|
| **OPPS04C** | 1 | 0 | 0.25 | 0.25 | 0.25 | 0.25 |
| **OPPS04D** | 0 | 1 | . | . | . | . |
| **OPPS04E** | 1 | 0 | 0.5 | 0.5 | 0.5 | 0.5 |
| **OPPS05** | 0 | 1 | . | . | . | . |
| **OPPS06** | 1 | 0 | 0 | 0 | 0 | 0 |
| **OPPS07** | 1 | 0 | 0.001284 | 0.001284 | 0.001284 | 0.001284 |
| **OPPS08** | 1 | 0 | 0 | 0 | 0 | 0 |
| **OPPS09** | 1 | 0 | 0.002667 | 0.002667 | 0.002667 | 0.002667 |
| **OPPS10** | 0 | 1 | . | . | . | . |
| **OPPS11** | 0 | 1 | . | . | . | . |
| **OPPS12** | 1 | 0 | 0.003822 | 0.003822 | 0.003822 | 0.003822 |
| **OPPS13** | 0 | 1 | . | . | . | . |
| **OPPS14** | 1 | 0 | 0 | 0 | 0 | 0 |
| **OPPS15** | 1 | 0 | 0.001183 | 0.001183 | 0.001183 | 0.001183 |
| **OPPS16** | 0 | 1 | . | . | . | . |
| **OPPS18** | 0 | 1 | . | . | . | . |
| **OPPS19** | 0 | 1 | . | . | . | . |

***PSSASP3.SAS***

PROGRAM P3 PART II

AHRQ PATIENT SAFETY INDICATORS: PROVIDER-LEVEL MERGED FILES

SUMMARY OF PROVIDER-LEVEL RATES (_TYPE_=16)

The MEANS Procedure

| Variable | N | N Miss | Minimum | Maximum | Mean | Sum |
|---|---|---|---|---|---|---|
| **hospid** | 1 | 0 | 1 | 1 | 1 | 1 |
| **AGECAT** | 0 | 1 | . | . | . | . |
| **SEXCAT** | 0 | 1 | . | . | . | . |

| | | | | | | |
|---|---|---|---|---|---|---|
| **PAYCAT** | 0 | 1 | . | . | . | . |
| **RACECAT** | 0 | 1 | . | . | . | . |
| **_TYPE_** | 1 | 0 | 16 | 16 | 16 | 16 |
| **TPPS05** | 0 | 1 | . | . | . | . |
| **TPPS16** | 0 | 1 | . | . | . | . |
| **TPPS18** | 0 | 1 | . | . | . | . |
| **TPPS19** | 0 | 1 | . | . | . | . |
| **PPPS18** | 0 | 1 | . | . | . | . |
| **PPPS19** | 0 | 1 | . | . | . | . |
| **OPPS18** | 0 | 1 | . | . | . | . |
| **OPPS19** | 0 | 1 | . | . | . | . |
| **TPPS02** | 1 | 0 | 8 | 8 | 8 | 8 |
| **PPPS02** | 1 | 0 | 132 | 132 | 132 | 132 |
| **EPPS02** | 1 | 0 | 0.002049 | 0.002049 | 0.002049 | 0.002049 |
| **OPPS02** | 1 | 0 | 0.060606 | 0.060606 | 0.060606 | 0.060606 |
| **RPPS02** | 1 | 0 | 0.008342 | 0.008342 | 0.008342 | 0.008342 |
| **VPPS02** | 1 | 0 | 2.91E-07 | 2.91E-07 | 2.91E-07 | 2.91E-07 |
| **SPPS02** | 1 | 0 | 0.005319 | 0.005319 | 0.005319 | 0.005319 |
| **XPPS02** | 1 | 0 | 0.000427 | 0.000427 | 0.000427 | 0.000427 |
| **LPPS02** | 1 | 0 | 0.007285 | 0.007285 | 0.007285 | 0.007285 |
| **UPPS02** | 1 | 0 | 0.0094 | 0.0094 | 0.0094 | 0.0094 |
| **TPPS03** | 1 | 0 | 5 | 5 | 5 | 5 |
| **PPPS03** | 1 | 0 | 1147 | 1147 | 1147 | 1147 |
| **EPPS03** | 1 | 0 | 0.000384 | 0.000384 | 0.000384 | 0.000384 |
| **OPPS03** | 1 | 0 | 0.004359 | 0.004359 | 0.004359 | 0.004359 |
| **RPPS03** | 1 | 0 | 0.0046 | 0.0046 | 0.0046 | 0.0046 |
| **VPPS03** | 1 | 0 | 3.73E-07 | 3.73E-07 | 3.73E-07 | 3.73E-07 |
| **SPPS03** | 1 | 0 | 0.002272 | 0.002272 | 0.002272 | 0.002272 |
| **XPPS03** | 1 | 0 | 0.000407 | 0.000407 | 0.000407 | 0.000407 |
| **LPPS03** | 1 | 0 | 0.003404 | 0.003404 | 0.003404 | 0.003404 |
| **UPPS03** | 1 | 0 | 0.005796 | 0.005796 | 0.005796 | 0.005796 |

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|---|---|---|---|---|---|---|
| **TPPS04** | 1 | 0 | 3 | 3 | 3 | 3 |
| **PPPS04** | 1 | 0 | 18 | 18 | 18 | 18 |
| **EPPS04** | 1 | 0 | 0.080796 | 0.080796 | 0.080796 | 0.080796 |
| **OPPS04** | 1 | 0 | 0.166667 | 0.166667 | 0.166667 | 0.166667 |
| **RPPS04** | 1 | 0 | 0.242115 | 0.242115 | 0.242115 | 0.242115 |
| **VPPS04** | 1 | 0 | 0.008283 | 0.008283 | 0.008283 | 0.008283 |
| **SPPS04** | 1 | 0 | 0.129034 | 0.129034 | 0.129034 | 0.129034 |
| **XPPS04** | 1 | 0 | 0.027828 | 0.027828 | 0.027828 | 0.027828 |
| **LPPS04** | 1 | 0 | 0.063734 | 0.063734 | 0.063734 | 0.063734 |
| **UPPS04** | 1 | 0 | 0.420495 | 0.420495 | 0.420495 | 0.420495 |
| **TPPS04A** | 1 | 0 | 0 | 0 | 0 | 0 |
| **PPPS04A** | 1 | 0 | 4 | 4 | 4 | 4 |
| **EPPS04A** | 1 | 0 | 0.064225 | 0.064225 | 0.064225 | 0.064225 |
| **OPPS04A** | 1 | 0 | 0 | 0 | 0 | 0 |
| **RPPS04A** | 1 | 0 | 0 | 0 | 0 | 0 |
| **VPPS04A** | 1 | 0 | 0.02287 | 0.02287 | 0.02287 | 0.02287 |
| **SPPS04A** | 0 | 1 | . | . | . | . |
| **XPPS04A** | 0 | 1 | . | . | . | . |
| **LPPS04A** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS04A** | 1 | 0 | 0.296409 | 0.296409 | 0.296409 | 0.296409 |
| **TPPS04B** | 1 | 0 | 0 | 0 | 0 | 0 |
| **PPPS04B** | 1 | 0 | 8 | 8 | 8 | 8 |
| **EPPS04B** | 1 | 0 | 0.036189 | 0.036189 | 0.036189 | 0.036189 |
| **OPPS04B** | 1 | 0 | 0 | 0 | 0 | 0 |
| **RPPS04B** | 1 | 0 | 0 | 0 | 0 | 0 |
| **VPPS04B** | 1 | 0 | 0.034404 | 0.034404 | 0.034404 | 0.034404 |
| **SPPS04B** | 0 | 1 | . | . | . | . |
| **XPPS04B** | 0 | 1 | . | . | . | . |
| **LPPS04B** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS04B** | 1 | 0 | 0.363544 | 0.363544 | 0.363544 | 0.363544 |
| **TPPS04C** | 1 | 0 | 1 | 1 | 1 | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **PPPS04C** | 1 | 0 | 4 | 4 | 4 | 4 |
| **EPPS04C** | 1 | 0 | 0.105699 | 0.105699 | 0.105699 | 0.105699 |
| **OPPS04C** | 1 | 0 | 0.25 | 0.25 | 0.25 | 0.25 |
| **RPPS04C** | 1 | 0 | 0.559157 | 0.559157 | 0.559157 | 0.559157 |
| **VPPS04C** | 1 | 0 | 0.11461 | 0.11461 | 0.11461 | 0.11461 |
| **SPPS04C** | 0 | 1 | . | . | . | . |
| **XPPS04C** | 0 | 1 | . | . | . | . |
| **LPPS04C** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS04C** | 1 | 0 | 1 | 1 | 1 | 1 |
| **EPPS04D** | 0 | 1 | . | . | . | . |
| **RPPS04D** | 0 | 1 | . | . | . | . |
| **LPPS04D** | 0 | 1 | . | . | . | . |
| **UPPS04D** | 0 | 1 | . | . | . | . |
| **PPPS04D** | 0 | 1 | . | . | . | . |
| **SPPS04D** | 0 | 1 | . | . | . | . |
| **XPPS04D** | 0 | 1 | . | . | . | . |
| **VPPS04D** | 0 | 1 | . | . | . | . |
| **TPPS04D** | 0 | 1 | . | . | . | . |
| **OPPS04D** | 0 | 1 | . | . | . | . |
| **TPPS04E** | 1 | 0 | 1 | 1 | 1 | 1 |
| **PPPS04E** | 1 | 0 | 2 | 2 | 2 | 2 |
| **EPPS04E** | 0 | 1 | . | . | . | . |
| **OPPS04E** | 1 | 0 | 0.5 | 0.5 | 0.5 | 0.5 |
| **RPPS04E** | 0 | 1 | . | . | . | . |
| **VPPS04E** | 0 | 1 | . | . | . | . |
| **SPPS04E** | 0 | 1 | . | . | . | . |
| **XPPS04E** | 0 | 1 | . | . | . | . |
| **LPPS04E** | 0 | 1 | . | . | . | . |
| **UPPS04E** | 0 | 1 | . | . | . | . |
| **TPPS06** | 1 | 0 | 0 | 0 | 0 | 0 |
| **PPPS06** | 1 | 0 | 72 | 72 | 72 | 72 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **EPPS06** | 1 | 0 | 0.003013 | 0.003013 | 0.003013 | 0.003013 |
| **OPPS06** | 1 | 0 | 0 | 0 | 0 | 0 |
| **RPPS06** | 1 | 0 | 0 | 0 | 0 | 0 |
| **VPPS06** | 1 | 0 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 |
| **SPPS06** | 1 | 0 | 0.000427 | 0.000427 | 0.000427 | 0.000427 |
| **XPPS06** | 1 | 0 | 0.000152 | 0.000152 | 0.000152 | 0.000152 |
| **LPPS06** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS06** | 1 | 0 | 0.001839 | 0.001839 | 0.001839 | 0.001839 |
| **TPPS07** | 1 | 0 | 9 | 9 | 9 | 9 |
| **PPPS07** | 1 | 0 | 7007 | 7007 | 7007 | 7007 |
| **EPPS07** | 1 | 0 | 0.002858 | 0.002858 | 0.002858 | 0.002858 |
| **OPPS07** | 1 | 0 | 0.001284 | 0.001284 | 0.001284 | 0.001284 |
| **RPPS07** | 1 | 0 | 0.000184 | 0.000184 | 0.000184 | 0.000184 |
| **VPPS07** | 1 | 0 | 8.31E-09 | 8.31E-09 | 8.31E-09 | 8.31E-09 |
| **SPPS07** | 1 | 0 | 0.00019 | 0.00019 | 0.00019 | 0.00019 |
| **XPPS07** | 1 | 0 | 8.99E-05 | 8.99E-05 | 8.99E-05 | 8.99E-05 |
| **LPPS07** | 1 | 0 | 5.15E-06 | 5.15E-06 | 5.15E-06 | 5.15E-06 |
| **UPPS07** | 1 | 0 | 0.000362 | 0.000362 | 0.000362 | 0.000362 |
| **EPPS08** | 0 | 1 | . | . | . | . |
| **RPPS08** | 0 | 1 | . | . | . | . |
| **LPPS08** | 0 | 1 | . | . | . | . |
| **UPPS08** | 0 | 1 | . | . | . | . |
| **PPPS08** | 0 | 1 | . | . | . | . |
| **SPPS08** | 0 | 1 | . | . | . | . |
| **XPPS08** | 0 | 1 | . | . | . | . |
| **VPPS08** | 0 | 1 | . | . | . | . |
| **TPPS08** | 0 | 1 | . | . | . | . |
| **OPPS08** | 0 | 1 | . | . | . | . |
| **TPPS09** | 1 | 0 | 2 | 2 | 2 | 2 |
| **PPPS09** | 1 | 0 | 750 | 750 | 750 | 750 |
| **EPPS09** | 1 | 0 | 0.015777 | 0.015777 | 0.015777 | 0.015777 |

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|---|---|---|---|---|---|---|
| **OPPS09** | 1 | 0 | 0.002667 | 0.002667 | 0.002667 | 0.002667 |
| **RPPS09** | 1 | 0 | 0.00097 | 0.00097 | 0.00097 | 0.00097 |
| **VPPS09** | 1 | 0 | 2.71E-06 | 2.71E-06 | 2.71E-06 | 2.71E-06 |
| **SPPS09** | 1 | 0 | 0.003287 | 0.003287 | 0.003287 | 0.003287 |
| **XPPS09** | 1 | 0 | 0.001181 | 0.001181 | 0.001181 | 0.001181 |
| **LPPS09** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS09** | 1 | 0 | 0.004198 | 0.004198 | 0.004198 | 0.004198 |
| **EPPS10** | 0 | 1 | . | . | . | . |
| **RPPS10** | 0 | 1 | . | . | . | . |
| **LPPS10** | 0 | 1 | . | . | . | . |
| **UPPS10** | 0 | 1 | . | . | . | . |
| **PPPS10** | 0 | 1 | . | . | . | . |
| **SPPS10** | 0 | 1 | . | . | . | . |
| **XPPS10** | 0 | 1 | . | . | . | . |
| **VPPS10** | 0 | 1 | . | . | . | . |
| **TPPS10** | 0 | 1 | . | . | . | . |
| **OPPS10** | 0 | 1 | . | . | . | . |
| **EPPS11** | 0 | 1 | . | . | . | . |
| **RPPS11** | 0 | 1 | . | . | . | . |
| **LPPS11** | 0 | 1 | . | . | . | . |
| **UPPS11** | 0 | 1 | . | . | . | . |
| **PPPS11** | 0 | 1 | . | . | . | . |
| **SPPS11** | 0 | 1 | . | . | . | . |
| **XPPS11** | 0 | 1 | . | . | . | . |
| **VPPS11** | 0 | 1 | . | . | . | . |
| **TPPS11** | 0 | 1 | . | . | . | . |
| **OPPS11** | 0 | 1 | . | . | . | . |
| **TPPS12** | 1 | 0 | 3 | 3 | 3 | 3 |
| **PPPS12** | 1 | 0 | 785 | 785 | 785 | 785 |
| **EPPS12** | 1 | 0 | 0.005542 | 0.005542 | 0.005542 | 0.005542 |
| **OPPS12** | 1 | 0 | 0.003822 | 0.003822 | 0.003822 | 0.003822 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **RPPS12** | 1 | 0 | 0.003014 | 0.003014 | 0.003014 | 0.003014 |
| **VPPS12** | 1 | 0 | 4.34E-06 | 4.34E-06 | 4.34E-06 | 4.34E-06 |
| **SPPS12** | 1 | 0 | 0.003637 | 0.003637 | 0.003637 | 0.003637 |
| **XPPS12** | 1 | 0 | 0.001532 | 0.001532 | 0.001532 | 0.001532 |
| **LPPS12** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS12** | 1 | 0 | 0.007095 | 0.007095 | 0.007095 | 0.007095 |
| **EPPS13** | 0 | 1 | . | . | . | . |
| **RPPS13** | 0 | 1 | . | . | . | . |
| **LPPS13** | 0 | 1 | . | . | . | . |
| **UPPS13** | 0 | 1 | . | . | . | . |
| **PPPS13** | 0 | 1 | . | . | . | . |
| **SPPS13** | 0 | 1 | . | . | . | . |
| **XPPS13** | 0 | 1 | . | . | . | . |
| **VPPS13** | 0 | 1 | . | . | . | . |
| **TPPS13** | 0 | 1 | . | . | . | . |
| **OPPS13** | 0 | 1 | . | . | . | . |
| **TPPS14** | 1 | 0 | 0 | 0 | 0 | 0 |
| **PPPS14** | 1 | 0 | 23 | 23 | 23 | 23 |
| **EPPS14** | 1 | 0 | 0.001373 | 0.001373 | 0.001373 | 0.001373 |
| **OPPS14** | 1 | 0 | 0 | 0 | 0 | 0 |
| **RPPS14** | 1 | 0 | 0 | 0 | 0 | 0 |
| **VPPS14** | 1 | 0 | 0.00011 | 0.00011 | 0.00011 | 0.00011 |
| **SPPS14** | 1 | 0 | 0.001852 | 0.001852 | 0.001852 | 0.001852 |
| **XPPS14** | 1 | 0 | 0.000982 | 0.000982 | 0.000982 | 0.000982 |
| **LPPS14** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS14** | 1 | 0 | 0.020589 | 0.020589 | 0.020589 | 0.020589 |
| **TPPS15** | 1 | 0 | 6 | 6 | 6 | 6 |
| **PPPS15** | 1 | 0 | 5071 | 5071 | 5071 | 5071 |
| **EPPS15** | 1 | 0 | 0.004709 | 0.004709 | 0.004709 | 0.004709 |
| **OPPS15** | 1 | 0 | 0.001183 | 0.001183 | 0.001183 | 0.001183 |
| **RPPS15** | 1 | 0 | 0.00061 | 0.00061 | 0.00061 | 0.00061 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **VPPS15** | 1 | 0 | 2.42E-07 | 2.42E-07 | 2.42E-07 | 2.42E-07 |
| **SPPS15** | 1 | 0 | 0.000904 | 0.000904 | 0.000904 | 0.000904 |
| **XPPS15** | 1 | 0 | 0.000451 | 0.000451 | 0.000451 | 0.000451 |
| **LPPS15** | 1 | 0 | 0 | 0 | 0 | 0 |
| **UPPS15** | 1 | 0 | 0.001575 | 0.001575 | 0.001575 | 0.001575 |
| **EPPS18** | 0 | 1 | . | . | . | . |
| **EPPS19** | 0 | 1 | . | . | . | . |
| **RPPS18** | 0 | 1 | . | . | . | . |
| **RPPS19** | 0 | 1 | . | . | . | . |
| **SEPS18** | 0 | 1 | . | . | . | . |
| **SEPS19** | 0 | 1 | . | . | . | . |
| **VPPS18** | 0 | 1 | . | . | . | . |
| **VPPS19** | 0 | 1 | . | . | . | . |
| **SNPS18** | 0 | 1 | . | . | . | . |
| **SNPS19** | 0 | 1 | . | . | . | . |
| **SPPS18** | 0 | 1 | . | . | . | . |
| **SPPS19** | 0 | 1 | . | . | . | . |
| **XPPS18** | 0 | 1 | . | . | . | . |
| **XPPS19** | 0 | 1 | . | . | . | . |
| **LPPS18** | 0 | 1 | . | . | . | . |
| **LPPS19** | 0 | 1 | . | . | . | . |
| **UPPS18** | 0 | 1 | . | . | . | . |
| **UPPS19** | 0 | 1 | . | . | . | . |

***PSI_COMPOSITE.SAS***

PATIENT SAFETY INDICATOR COMPOSITE

The MEANS Procedure

| Variable | Label | N | Mean |
|---|---|---|---|
| **COMP1** | **PSI #90 Patient Safety for Selected Indicators** | 2 | 0.7152431 |
| **COMP1VAR** | **PSI #90 Patient Safety for Selected Indicators (Variance)** | 2 | 0.0191418 |
| **COMP1SE** | **PSI #90 Patient Safety for Selected Indicators (SE)** | 2 | 0.1383537 |
| **COMP1WHT** | **PSI #90 Patient Safety for Selected Indicators (Weighted Denominator)** | 2 | 3184.12 |