

PDI RATES GENERATED BY THE AHRQ *WINDOWS* QI SOFTWARE

Guidance for Using the *Windows* QI Software and an Example of Output for One Hospital

Note: This tool has *not* been updated for AHRQ’s new ICD-10ⁱ WinQI Software (v6.0), as neither the final nor a test version of the software was available at the time of this tool’s revision (March 2016). Feel free to use the information in this tool if you are continuing to use an earlier version of the WinQI software.

What is the purpose of this tool? To work with the Pediatric Quality Indicators (PDIs) for assessing its own performance, a hospital needs to calculate rates for these indicators, using the Windows software provided by the Agency for Healthcare Research and Quality (AHRQ). This tool provides three sets of information to help you work with the Windows software to calculate rates for your hospital and use the output from the software:

- An outline of the steps used to calculate PDI rates.
- Notes for analysts and programmers on issues to manage in working with the Windows software.
- An example of the output from the Windows software for one hospital.

Who are the target audiences? The primary audience for this tool is the programmers or analysts who will calculate PDI rates.

How can the tool help you? The examples and guidance provided by this tool should help you work more easily with the Windows software used to calculate the PDIs for your hospital, and to read and use the output from the software.

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 PDIs.

ⁱICD-10 = International Classification of Diseases, 10th Revision.

Software Installation

Before installing and running the Windows QI software, you must first determine whether you have the requisite programs and permissions. Due to the security settings and firewalls on some networks, you may have trouble downloading and installing the software without support from your information technology (IT) department. In addition, you may not have the option to install and run the setup or software as an administrator; this restriction also necessitates assistance from the IT department and may delay or complicate installation and utilization of the software.

If you are unfamiliar with database structures, involve the IT department immediately. This will save you time and eliminate some frustrations.

Installation instructions are available on the AHRQ QI Web site:

http://www.qualityindicators.ahrq.gov/Downloads/Software/WinQI/V50/Software_Inst_WinQI_V50_May_2015.pdf.

Reading this file and following the steps listed will address many of the issues related to software installation.

Make sure your Windows OS has the latest Service Pack and updates applied. The Windows QI software has been tested on the following configurations: Microsoft SQL Server 2005 or 2008 (if the dataset contains more than about 4.5 million discharge records, then 2008 is required).

Hospitals that need to use a local networked instance of SQL Server may run into problems if the network version of SQL Server is not compatible with the QI software.

Your IT department's policies pertaining to SQL servers may affect your ability to install and use the Windows software. If so, you will need to contact your IT department's personnel for help accessing the server. Because each hospital's IT department's policies differ, we cannot effectively address all the issues that arise during this process.

Indicator Data Generated by the Windows Software

The Windows software provided by AHRQ for calculation of the PDIs, as well as documentation on how to use the software, can be found on the AHRQ QI Web site:

www.qualityindicators.ahrq.gov/Software/WinQI.aspx.

Once the software is installed, it will guide you through the following steps to produce the rates for the PDIs:

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).

Notes for Analysts and Programmers

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

Getting Your Data Ready

When preparing data for the Windows QI software program, you should be aware that a few steps are essential for running the program correctly.

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 (string). Diagnosis codes should not have a decimal point (and they will need to be removed prior to importing). Variable names do NOT need to match those in the table.
2. The KEY variable is the unique case identifier. This variable is not required by the software but is useful for merging discharge records in the patient-level report with the input data.
3. Not all variables are required to determine your rates, but some are necessary for stratification and other analyses. See Appendix A to determine whether you have the necessary variables for your intended analyses.
4. Some users found that their datasets were too large to use with the software and their available computing capacity. These individuals found it necessary to use only a subset of their data at a time in order to run the program.
5. An APR-DRG Grouper is built into the software if your data lack APR-DRG values. Use of this grouper is optional. You may use your institution's APR-DRG values if they are available and you choose to do so.

Running the Software

If you are running the software using the Windows 7 operating system, it is important to install and run the software as an administrator. Failing to do so will result in errors.

Once your data are ready, there is an Import Wizard that will allow you to map your variables with those required by the software. This map can be saved so that you do not need to repeat this step the next time you run the program.

There is an option to check the readability of your data to ensure that every row can be read and that every row has the same number of columns.

Rows with missing data for required variables will not be included in the analysis.

Once the variables have been identified and the data have been verified, indicator flags are created by the software. Data can then be saved as a CSV file if desired and will remain until new data are uploaded. Mapping files can also be saved at this time.

The user can then use the toolbar on the left side of the screen to generate reports and rates. Below are examples of two tables that can be created. Many other report options are available in the software that your hospital may find useful, but we only illustrate two basic examples here.

Example of Windows Software Output

An example of the output from the Windows software (using WinQI v4.5) is provided on the following pages. This output was generated in November 2013 using WinQI v4.5, based on data adapted from a hospital that participated in the first field test of the QI Toolkit. The program was run on 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 Pediatric Quality Indicators to Hospital Data, for definitions of the four types of rates.

This output consists of two tables: Quick Report provider level and Provider Report. The Quick Report provides a summary of the numerators, denominators, and observed rates for the uploaded data. This report is generated by the software and can be saved in rich text format (RTF).

Users may choose to stratify based on a number of variables, including hospital, age category, sex, year, quarter, payer, race, or any other custom indicator they have in their dataset. This sample Provider Report gives the observed numerator, observed denominator, observed rate, expected rate, risk-adjusted rate, and smoothed rate for the PDIs without any stratification. Data and rates generated using the Provider Report option can be saved in comma separated value (CSV) format.

Quick Report

This is a summary of the numerators, denominators and observed rates for your currently loaded data.

Num. (numerator) refers to the number of events. Den. (denominator) refers to the number of individuals in the population at risk for the event. The rate refers to the observed rate. Pop. (population) rate refers to the population rate that is used for risk adjustment.

Filename: C:\Users\Desktop\AHRQinputFile.csv
Number of records: 11246
Has POA Flags: Y

Provider Level Indicators

Indicator	Name	Num.	Den.	Rate	Pop. Rate
NQI 1	NQI #1 Neonatal Iatrogenic Pneumothorax Rate	0	0	-	0.00200000
NQI 2	NQI #2 Neonatal Mortality Rate	-	0	-	-
NQI 3	NQI #3 Neonatal Blood Stream Infection	0	0	-	2.46621024
PDI 1	PDI #1 Accidental Puncture or Laceration Rate	1	2	0.5	0.05664000
PDI 2	PDI #2 Pressure Ulcer Rate	0	1	0	0.15210459
PDI 3	PDI #3 Retained Surgical Item or Unretrieved Device Fragment	0	0	-	-
PDI 5	PDI #5 Iatrogenic Pneumothorax Rate	3	54	0.05555556	0.15105490
PDI 6	PDI #6 RACHS-1 Pediatric Heart Surgery Mortality Rate	0	17	0	40.9102564
PDI 7	PDI #7 RACHS-1 Pediatric Heart Surgery Volume	0	52	-	-
PDI 8	PDI #8 Perioperative Hemorrhage or Hematoma Rate	6	454	0.01321586	2.48210598
PDI 9	PDI #9 Postoperative Respiratory Failure Rate	24	180	0.13333333	11.3162479
PDI 10	PDI #10 Postoperative Sepsis Rate	1	165	0.00606061	19.8884023
PDI 11	PDI #11 Postoperative Wound Dehiscence Rate	0	32	0	0.96714253
PDI 12	PDI #12 Central Venous Catheter-Related Blood Stream Infection	7	175	0.04	1.00410523
PDI 13	PDI #13 Transfusion Reaction County	0	0	-	-

Provider indicator population rates used in risk adjustment are based on the pooled discharges from the 2011 SID database. Population rates are only included for those indicators that use these rates in risk adjustment. One year empirical rates for indicators that are not risk adjusted may be found in the QI documentation.

Provider Level Report

Report from 07/17/2014 11:21:59 AM
 Provider report created 07/17/2014 11:22:21 AM
 Report from 07/17/2014 11:21:59 AM
 Rates Per case

Name	Observed Numerator	Observed Denominator	Observed Rate	Expected Rate	O-E Ratio	Reference Pop Rate	Risk-Adjusted Rate	Smoothed Rate
NQI #3 Neonatal Iatrogenic Pneumothorax Rate	0	0	0	0.001046	57.95983	0.000282	0.016343	0.007641
NQI #2 Neonatal Mortality Rate	-	0	0	0.000832	0	0.000405	0	0.000379
NQI # 3 Neonatal Blood Stream Infection		0				0.117371		
PDI #1 Accidental Puncture or Laceration	1	2	0.5			0.05664000		
PDI #2 Pressure Ulcer Rate	0	1	0	0.000251	0	0.15210459	0	0.000436
PDI #3 Retained Surgical Item or Unretrieved Device Fragment Count	0	0	0	0.000743	0	0.000409	0	0.000347
PDI #5 Iatrogenic Pneumothorax Rate	3	54	0.05555556			0.15105490		
PDI #6 RACHS-1 Pediatric Heart Surgery Volume	0	17	0			40.9102564		
PDI #7 RACHS-1 Pediatric Heart Surgery Volume						-		
PDI #8 Perioperative Hemorrhage or Hematoma Rate	6	454	0.01321586			2.48210598		
PDI #9 Postoperative Respiratory Failure Rate 24		180	0.13333333			11.3162479		
PDI #10 Postoperative Sepsis Rate	1	165	0.00606061			19.8884023		
PDI #11 Postoperative Wound Dehiscence Rate	0	32	0	0.001265	0	0.96714253	0	0.001665
PDI #12 Central Venous Catheter-Related Blood Stream Infection Rate	7	175	0	0.001144	0	0.002428	0	0.002309
PDI #13 Transfusion Reaction Count								