



AHRQ QUALITY INDICATORS™ SOFTWARE INSTRUCTIONS, WINDOWS® APPLICATION (WinQI) v6.0

Corresponds With v6.0 Technical Specifications

Prepared for:

Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
540 Gaither Road
Rockville, MD 20850
<http://www.qualityindicators.ahrq.gov>

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Abstract

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators™ (QIs) were developed specifically to meet the short-term needs for information on health care quality using standardized, user-friendly methods and existing sources of data. The AHRQ QI program is unique in that it provides free, publicly available software tools that allow users to calculate the AHRQ QI rates based on their own administrative data using a standard personal computer. Each version of the QIs is released with software in two different platforms: a SAS®* application and a Windows® application. The SAS QI software was first released in the late 1990s. It consists of several modules of SAS code and requires a SAS license to run. The Windows-based software, known as WinQI, was first released in 2005. It was created to provide an easy-to-use, low-cost option for calculating the QIs that is not dependent on licensed software. Developed on Microsoft® Visual Studio using C# and .NET, AHRQ WinQI runs on the Windows operating system and requires only freely available software components: AHRQ-produced software, Microsoft .NET (for runtime environment and core software libraries), and Microsoft SQL Server® Express (for data storage and manipulation). [Table 1](#) lists the differences between SAS QI Version 6.0 and WinQI Version 6.0. Both the SAS QI v6.0 and WinQI v6.0 software are available as either 32-bit or 64-bit applications. The 32-bit applications are targeted for Windows XP operating systems, and the 64-bit applications are targeted for Windows 7 and Windows 8 operating systems.

Table 1. Differences Between SAS QI v6.0 and WinQI v6.0 (Corresponds with v6.0 of Technical Specifications)

SAS QI v6.0	WinQI v6.0
Requires licensed SAS software.	Requires free, downloadable software.
User can modify the software.	User is unable to modify the software.
Data load and error checking at the discretion of the user.	Includes data load and error-checking functions.
User must run a set of programs for each module, and all indicators in a module are displayed in output.	All indicators may be (but not required to be) calculated in a single program, and user can select which indicators to output.
Area-level indicator denominators are adjusted based on the combination of county, age, gender, and race in the numerator (adjustments are generally small [$<0.01\%$ in absolute terms]).	Area-level indicator denominators are not adjusted.
Condition-specific denominators can be used in place of overall population denominators for diabetes-related PQIs using data from the CDC National Diabetes Surveillance System,	Condition-specific denominators are not available for any of the PQIs.

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	Suppresses expected rate, risk-adjusted rate, and smoothed rate of PDI 06 RACHS-1 Pediatric Heart Surgery Mortality Rate.
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CDC: Centers for Disease Control and Prevention; PDI: Pediatric Quality Indicator; PQI: Prevention Quality Indicator; QI: Quality Indicator; RACHS: risk adjustment for congenital heart surgery; WinQI: QI Windows®

Both versions of the QI software are updated on an annual basis to reflect changes in the AHRQ QI technical specifications. New software versions and updated technical specifications are released simultaneously. Routine annual updates include yearly changes based on the International Classification of Diseases, Ninth revision (Tenth revision, going forward) , Clinical Modification (ICD-9-CM or ICD-10-CM), Medicare Severity Diagnosis-Related Groups (MS-DRGs), and Major Diagnostic Categories (MDC); an updated version of the 3M™ All Patient Refined Diagnosis-Related Group (APR-DRG) grouper; new Census population files; and newly derived risk adjustment parameters.

The AHRQ QIs are organized around four collections (modules) of indicators: Inpatient Quality Indicators (IQIs), Pediatric Quality Indicators (PDIs), Prevention Quality Indicators (PQIs), and Patient Safety Indicators (PSIs). Data captured by and characteristics of each of the modules are shown in [Figure 1](#). Detailed definitions of each indicator, with complete listings of ICD-9-CM (or ICD-10-CM) and MS-DRG codes specifically included or excluded, are contained in the *AHRQ QI Technical Specifications*. Additional data on the magnitude of each indicator across an aggregation of State Inpatient Databases (SID) files can be found in the Inpatient Quality Indicator v6.0 Benchmark Data Tables, Pediatric Quality Indicator v6.0 Benchmark Data Tables, Prevention Quality Indicator v6.0 Benchmark Data Tables, and Patient Safety Indicator v6.0 Benchmark Data Tables documents. See Appendix D for links to these documents as well as additional documentation on the AHRQ QIs.

Figure 1. Characteristics of AHRQ QI Modules

IQIs	PDIs	PQIs	PSIs
<ul style="list-style-type: none"> • Volume of certain intensive, high-technology, or highly complex procedures for which evidence suggests that institutions performing more of these procedures may have better outcomes • Mortality for inpatient procedures and for inpatient conditions • Utilization indicators, which examine procedures whose use varies significantly across hospitals and for which questions have been raised about overuse, underuse, or misuse 	<ul style="list-style-type: none"> • Selected indicators from the other three modules with adaptations for use among children and neonates to reflect quality of care inside hospitals, as well as geographic areas, and to identify potentially avoidable hospitalizations 	<ul style="list-style-type: none"> • Potential health care quality problem areas that might need further investigation • Measure of primary care access or outpatient services in a community using patient data found in a typical hospital discharge abstract 	<ul style="list-style-type: none"> • Potentially preventable complications and iatrogenic events for patients treated in hospitals • Screening tool for problems that patients experience as a result of exposure to the health care system and that are likely amenable to prevention by changes at the system or provider level

IQIs: Inpatient Quality Indicators; PDIs: Pediatric Quality Indicators; PQIs: Prevention Quality Indicators; PSIs: Patient Safety Indicators

This document contains instructions for the WinQI v6.0 software, which is provided for download on the AHRQ QI Web site (<http://www.qualityindicators.ahrq.gov/Software/WinQI.aspx>). The software can calculate results for all indicators (IQIs, PDIs, PQIs, and PSIs) in a single program, and the user can select which indicators to show in the output. The application is targeted for and tested on personal computers running the Microsoft Windows XP, Windows 7, and Windows 8 operating systems. AHRQ's goal, by making this tool publicly available, is to assist users in producing information on health care quality more cost effectively.

The AHRQ WinQI software is intended to be used with data that cover an entire patient population (e.g., all discharges from a hospital in a year) or that were sampled from a patient population using simple random sampling. The WinQI application does not support weighted QI estimates or standard errors for weighted estimates. Thus, analyses using data obtained from a complex sampling design will not produce accurate estimates for the population from which the data were sampled.

The use of the Prediction Module (PM) that estimated the prevalence of conditions when present on admission (POA) data were missing has been discontinued in WinQI v5.0. Beginning with fiscal year (FY) 2008 (October 1, 2007), the Uniform Billing Claim Form 04 (UB-04) data specification manual includes a POA indicator (http://www.cdc.gov/nchs/data/icd/icd9cm_guidelines_2011.pdf). POA data may impact the

prevalence of the outcome of interest and the risk-adjusted rates by excluding secondary diagnoses coded as complications from the identification of covariates. If the user's input file does not include POA data, the QI software will assume that the outcome of interest occurred in the hospital.

The reference population data used by the software are based on the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for 2013. These databases were used to create the regression coefficients applied to risk adjustment and the shrinkage factors used to calculate smoothed rates.

Acknowledgments

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators™ (QIs) program uses the Healthcare Cost and Utilization Project (HCUP) 2013 State Inpatient Databases (SID) to compute reference population data. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-industry partnership and sponsored by AHRQ. HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal Government to create a national information resource of encounter-level health care data. HCUP databases comprise the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels. The HCUP databases represent 97 percent of all annual discharges in the United States.

The AHRQ QI program would like to acknowledge the HCUP partner organizations that participated in the HCUP SID:

Alaska State Hospital & Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association (provides data for Minnesota and North Dakota)
Mississippi State Department of Health
Missouri Hospital Industry Data Institute
Montana MHA...An Association of Montana Health Care Providers
Nebraska Hospital Association

Nevada Department of Health and Human Services
New Hampshire Department of Health and Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Health Policy and Research
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Budget & Control Board
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

For more information on HCUP, visit <http://www.hcup-us.ahrq.gov>.

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1. Installation

1.1 Before You Begin

23. Make sure that you have Administrator permissions on your computer so that you can install the software. You may also need information technology (IT) support when installing the software. You will need to download the latest Windows® service pack and updates for your operating system.[†]
24. Check your system for minimum requirements (see [Section 1.2](#)).
25. Uninstall any previous versions of the Quality Indicators™ Windows (WinQI) software by going to **My Computer** and choosing **Add/Remove Programs** in Windows XP or **Uninstall or change programs** in Windows 7 and Windows 8. Then, reboot your computer to complete the uninstall step. You should **not** uninstall Microsoft® .NET Framework or SQL Server® Express if you already have them.

1.2 Hardware and Software Requirements

The WinQI software has been tested on the following configuration:

- 32-bit Microsoft Windows 2000 and Windows XP
- 64-bit Microsoft Windows 7 and Windows 8
- .NET Framework Version 4.0 and above
- Microsoft SQL Server Express 2005, 2008, and 2012 (Note: If the dataset contains more than about 4.5 million discharge records, then 2008 or 2012 is required.)

Approximate disk space requirements

- Microsoft .NET Framework v4.0: 850 MB
- Microsoft SQL Server Express 2005: 1.0 GB
- WinQI application: 250MB

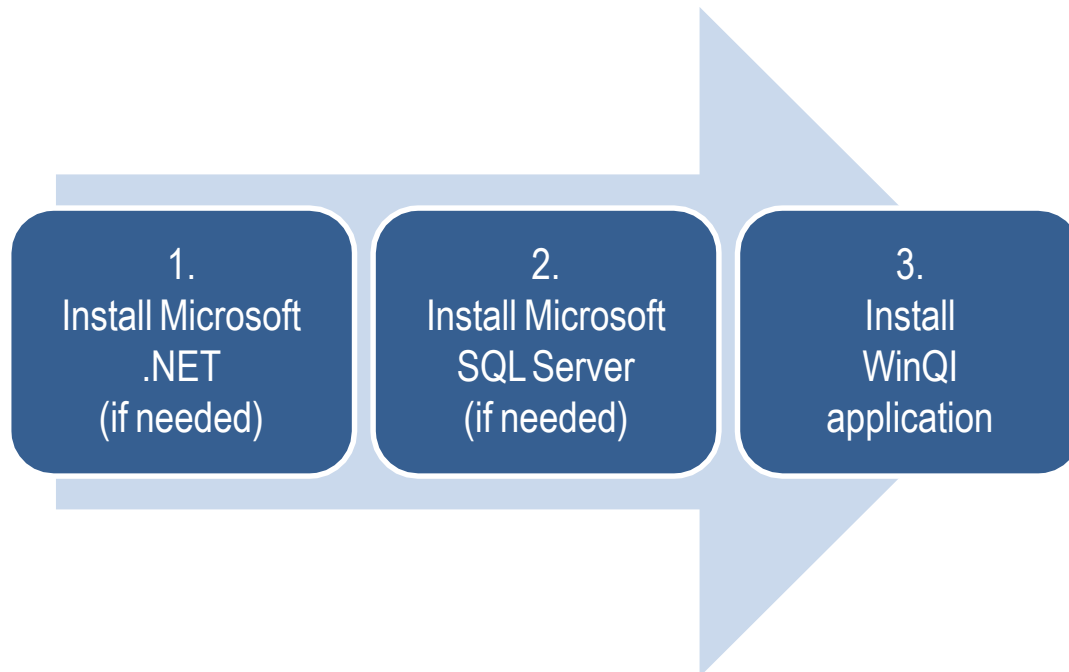
[†] The installer for WinQI will create a database called “qualityindicators” and then create all necessary database objects. If the database already exists on your system, WinQI can be installed with an account that has permissions to create and drop database objects. You may change passwords, rename the account, change permissions, or rename the database after the installation has completed. The database connection settings can be changed from within WinQI under Program Options. For ongoing operation, WinQI requires the ability to insert and delete data as well as to truncate tables, drop and create indexes, and drop and create tables.

- QI data: 100 MB is typical, but it can range up to 10 GB depending on the number of discharge records you wish to process. If the dataset is larger than 4 GB, then SQL Server Express 2008 or 2012 is required.

1.3 Installation Process

The installation process is depicted in [Figure 2](#).

Figure 2. Installation Process



1.3.1 Step 1: Microsoft .NET Installation

WinQI requires Microsoft .NET Framework v4.0 or higher. This is similar to the requirement for WinQI v4.3 or higher but represents a change from earlier versions of WinQI, which required only .NET Framework v2.0.

Before you begin:

To check whether your system already has the Microsoft .NET Framework v4.0 installed, go to Control Panel and select Programs and Features (Windows 7 and Windows 8) or Add/Remove Programs (Windows XP).

To install:

1. Click **Microsoft .NET Framework** on the WinQI Download Page (<http://www.qualityindicators.ahrq.gov/Software/WinQI.aspx>). This will take you to the .NET download Web site.

2. Click the **<Download>** button, choose to **<Save>** it to your desktop, and then **<Run>** it.
3. The program prompts you for confirmation and asks you to accept a license agreement. Afterwards, the installation will proceed on its own.
4. If you already have .NET v4.0 installed, the program will prompt you to **<Repair>** or **<Remove>**. Just click **<Cancel>**.

1.3.2 Step 2: SQL Server Installation

WinQI is a single-user desktop application that requires Microsoft SQL Server to store program data. You may choose from several different editions of SQL Server as long as it is 2005 or later, although the 2008 or 2012 editions are required for datasets larger than 4 GB (4.5 million discharge records). A SQL Server database instance can be installed locally on your personal computer (PC) or accessed over a network. Most users will prefer to use SQL Server 2008 or 2012 Express Edition installed on their PC unless local IT policies prohibit this setup.

If you choose to use an existing networked instance of SQL Server, contact your database or network administrator for the connection hostname, login, and password that will be required during the WinQI installation process.

Microsoft SQL Server 2008 or 2012 Express Editions are recommended for WinQI. A download is provided on the [WinQI software page](#) of the AHRQ QI Web site. See [Table 2](#) for guidance on when you will need to download SQL Server.

Table 2. User Configurations & SQL Server Versions

If you...	The best choice is...
Already installed a local database with a previous version of WinQI...	Retain current SQL Server installation.
Have IT rules that prefer a networked instance of SQL Server instead of desktop software...	Do not install SQL Server. Get connection information from your database administrator.
Have a PC with at least a 1 GHz processor, 512 MB RAM, and 600MB free disk space...	Download SQL Server 2008 or 2012 Express Editions,

To install SQL Server 2012 Express Edition:

1. Click **SQL Server 2012 Express Edition** on the [WinQI download page](#). This will take you to the [SQL Server download Web site](#).
2. Choose the **<Download>** button for the file called SQLEXPRESS_x64_ENU.exe (Windows 7/8 64-bit) or SQLEXPRESS_x86_ENU.exe (Windows XP/7/8 32-bit). Then choose **<Run>**, or **<Save>** it to your desktop and then **<Run>** it.

3. If you are running Windows 7 or Windows 8, you will see a User Access Control Panel prompt asking you if it should allow the installation software to make changes to your computer. Select <Yes>.
4. Accept the End User License Agreement, then click <Install> and <Next> on the next pages.
5. Complete setup and installation by choosing **All Default Options** in the SQL Server Installation Wizard. At the end of the Wizard, you will click <Install> and then <Finish> to complete the process.
6. The SQL Server folder is created automatically in your Program Files folder.

To install SQL Server 2008 Express Edition:

1. Click **SQL Server 2008 Express Edition** on the [WinQI download page](#). This will take you to the [SQL Server download Web site](#).
2. Choose the <Download> button for the file called SQLEXPRESS_x64_ENU.exe (Windows 7/8 64-bit) or SQLEXPRESS_x86_ENU.exe (Windows XP/7/8 32-bit). Then choose <Run>, or <Save> it to your desktop and then <Run> it.
3. If you are running Windows 7 or Windows 8, you will see a **User Access Control Panel** prompt, asking you if it should allow the installation software to make changes to your computer. Select <Yes>.
4. Accept the **End User License Agreement**, then click <Install> and <Next> on the next pages.
5. Complete setup and installation by choosing **All Default Options** in the SQL Server Installation Wizard. At the end of the Wizard, you will click <Install> and then <Finish> to complete the process.
6. The SQL Server folder is created automatically in your Program Files folder.

1.3.3 Step 3: WinQI Installation

To install under Windows XP:

1. Click **Combined Quality Indicators Modules Software for Windows** on the [WinQI download page](#).
2. Select the download that corresponds to the operating system and system type that you are using; e.g., Windows 7 64-bit or Windows XP 32-bit. To determine this on your local computer, choose **Start >Programs>Accessories> System Tools> System Information**. If you will run the software under a 32-bit operating system, then you must install WinQI 32-bit. If you will run the software under a 64-bit operating system, then you must install WinQI 64-bit.

Accept the 3M™ APR-DRG software license agreement. If you choose not to accept the agreement, you may download a version of the software that does not include the

- 3M™ APR-DRG grouper. Note: The ICD-10 component of v6.0 version does not perform risk adjustment. For WinQI V6.0, the APR-DRG grouper only applies to the ICD-9 component of the software.
3. Click **<Save>** to download the application to your desktop.
 4. You will then be prompted with a screen to **<Run>** the application. If you are running Windows XP, choose **<Run>** and continue to the next step.
 5. Click **<Next>**, accept the terms in the license agreement, and click **<Next>**.
 6. Choose the directory in which to install the software, and click **<Next>**.
 7. On the Database Server screen, enter the location and name of the SQL Server instance that was created during installation of SQL Server. If you are using an existing SQL Server instance, specify its location and name. If a default installation was performed, then this location will be “.\SQLEXPRESS.” Also, check the item associated with the standard Windows authentication process.
 8. Click **<Next>** to begin the installation. The installer will build the QI database and install files, and then it will run the “PopLoader” program to install the population table. Ensure that a message window appears showing the status of the “PopLoader” program as it loads records from the population file.
 9. At the Microsoft Visual C++ download wizard page, review and accept the license agreement, and click **<Next>**. If you already have the Microsoft Visual C++ Library installed and a dialog box appears asking whether to uninstall or repair the installation, click **<Repair>**.
 10. Click **<Finish>** when the program has completed. This completes the installation of the **WinQI** software.

To start the program, click **Start>Programs>Agency for Healthcare Research and Quality>AHRQ Quality Indicators>AHRQ Quality Indicators**. You can also pin the program to your desktop for easier access by creating a shortcut: Right-click on **<AHRQ Quality Indicators>** in the Program menu and choose **<Send to>... then <Desktop>**.

To install under Windows 7 and Windows 8:

1. Click **Combined Quality Indicators Modules Software for Windows** on the [WinQI download page](#). If you will run the software under a 64-bit operating system, then you must install WinQI 64-bit.
2. Accept the 3M™ APR-DRG software license agreement.
3. Click **<Save>** to download the application to your desktop.
4. Double-click on the **Quality Indicators** icon on your desktop to **<Run>**.
5. At the wizard welcome page, click **<Next>**, then again accept the terms in the 3M™ APR-DRG software license agreement, and click **<Next>**. The APR-DRG software is

- not applicable to the ICD-10 v6.0 WinQI software, as risk adjustments are not calculated. The ICD-9 v6.0 WinQI software can use the APR-DRG software.
6. Choose the destination folder in which to install the software, and click **<Next>**.
 7. On the Database Server screen, enter the location and name of the SQL Server instance that was created during installation of SQL Server. If you are using an existing SQL Server instance, specify its location and name. If a default installation was performed, then this location will be “.\SQLEXPRESS.” Also, check the item associated with the standard Windows authentication process.
 8. Click **<Next>** to begin the installation. The installer will build the QI database and install files, and then it will run the “PopLoader” program to install the US Census population table. Ensure that a message window appears showing the status of the “PopLoader” program as it loads records from the US Census population file.
 9. At the Microsoft Visual C++ download wizard page, review and accept the license agreement, and click **<Next>**. If you already have the Microsoft Visual C++ Library installed and a dialog box appears asking whether to uninstall or repair the installation, click **<Repair>**.
 10. Click **<Finish>** when the program has completed. This completes the installation of the **WinQI** software.

To start the program, click **Start > Programs > Agency for Healthcare Research and Quality > AHRQ Quality Indicators > AHRQ Quality Indicators**. You can also pin the program to your desktop for easier access by creating a shortcut: Right-click on **<AHRQ Quality Indicators>** in the Program menu and choose **<Send to>... then <Desktop>**.

Note: If you will be uploading data files in MS Access or MS Excel format, then before you continue, please double-check that you have the ‘Microsoft Access Database Engine 2010 Redistributable’ component installed on your computer. Else you will not be able to upload files of this format. You should install the 32-bit version of the component if you have the 32-bit version of WinQI and the 64-bit version of the component if you have the 64-bit version of WinQI.

2. Background

Each module of the AHRQ QI reflects quality of care measures to highlight potential quality concerns, identify areas that need further study and investigation, and track changes over time. The data required for measuring these indicators come from hospital discharge abstracts or billing claims (administrative data), which are readily available within hospitals or from many State data organizations. The AHRQ QI software is intended to be used with data that cover an entire patient population (e.g., all discharges from a hospital in a year) or that were sampled from a patient population using simple random sample. Beginning with WinQI Software Version 4.1, the software does not support weighted QI estimates or standard errors for weighted estimates. Thus, analyses using data obtained from a complex sampling design will not produce accurate estimates for the population from which the data were sampled. The residential population data for the area-level utilization indicators are from the U.S. Census Bureau (see *2015 Population File for Use with AHRQ Quality IndicatorsTM*).

The software generates observed, expected, risk-adjusted, and smoothed rates across the modules for most indicators. Observed rates are the raw rates, which are the count of discharge records including the health outcome of interest divided by the count of discharge records in the patient population at risk. Expected and risk-adjusted rates both acknowledge that individual providers (or areas of the country) are unique and differ in two important ways from the representative profile observed in the reference population. First, there is heterogeneity in the quality of care that is provided. Some providers and areas provide exemplary care. Others provide sub-standard care. This is an important dimension of differences. Second, most individual providers serve patients with a distribution of covariates (demographics and comorbidities) that differs from the reference population. Some providers serve populations that are at higher risk for adverse events, and some serve populations that are at lower risk. This is a dimension that makes it difficult to make meaningful comparisons of observed rates. The expected and risk-adjusted rates each peg one of these two dimensions (quality of care or patient mix) to that observed in the reference population and then comment on the second dimension, as observed in the local data.

The expected rate answers the question, “What rate of adverse events would we expect to see if this provider (or area) provided the average level of care observed in the reference population, but provided it to patients with the locally observed distribution of characteristics?” (i.e., average performance from the reference population of the universe of patients applied to locally observed mix of patients with their local risk profiles). When the observed rate is smaller than the expected rate (or the observed / expected ratio is < 1), then there is reason to think that the hospital (or area) is performing better than average on this indicator.

The risk-adjusted rate answers the converse question, “What rate of adverse events would we see in this provider (or area) if they provided the locally observed quality of care to patients whose distribution of characteristics matched those in the reference population?” (i.e., locally observed performance on a representative mix of patients from the reference population). Risk-adjusted rates are useful in comparisons between providers or areas. They are evaluated on an identical mix of patients, so calculating them is an attempt to remove the confounding influence of patient mix (different profiles of risk that are not related to care) from the comparison.

The smoothed rate is a weighted average of the reference population rate and the locally observed (provider or area) rate. If the data from the individual provider or area include many observations and provide a numerically stable estimate of the rate, then the smoothed rate will be very close to the risk-adjusted rate, and it will not be heavily influenced by the reference population rate. Conversely, the smoothed rate will be closer to the reference population rate if the provider or area rate is based on a small number of observations and may not be numerically stable, especially from year to year.

The software also calculates 95% intervals for some of the rates (confidence intervals in the case of risk-adjusted rates, probability intervals for composite and smoothed rates). These intervals can be used to test whether the computed rate is statistically different from a reference value. If the reference value is greater than the upper bound of the interval, then the computed rate is statistically lower than the reference value. If the reference value is less than the lower bound of the interval, then the computed value is statistically higher than the reference value. If the reference value falls between the lower and upper bounds, then there is no statistical difference between the computed rate and the reference value. For a more thorough explanation of risk-adjusted and smoothed rates, please see the technical documentation on the AHRQ QI Web site.

2.1 Inpatient Quality Indicators Background

The IQI module contains 33 indicators (plus two composite indicators) that reflect the quality of care inside hospitals. The six volume measures are intended to be paired with the corresponding mortality indicators. The indicators include three groups of measures that are based on hospital stays.

1. There are six volume indicators for inpatient procedures for which there is evidence that a higher volume of procedures is associated with lower mortality. A nontrivial number of these procedures are performed by institutions that do not meet recommended volume thresholds. The volume indicators are measured as counts of admissions in which particular procedures were performed.
2. There are 15 inpatient mortality indicators for medical conditions and surgical procedures that have been shown to have mortality rates that vary substantially across institutions and for which evidence suggests that high mortality may be associated with deficiencies in the quality of care. These indicators are measured as rates, the number of deaths divided by the number of admissions for the procedure or condition. Eight of these mortality indicators are for procedures, six of which are also measured by a volume indicator. The other seven mortality indicators are associated with medical conditions.
3. There are eleven utilization indicators for procedures for which there are questions of overuse, underuse, or misuse. The usage of the procedures being examined varies significantly across hospitals and areas, and high or low rates by themselves do not represent poor quality of care; rather, the information is intended to inform consumers about local practice patterns. Seven of these utilization indicators are rates based on the hospitalized population. Four other utilization indicators are rates based on an area's residential population. Two of these area-level utilization indicators, IQI 26 Coronary

Artery Bypass Graft (CABG) Rate and IQI 27 Percutaneous Coronary Intervention (PCI) Rate, have counterparts in the set of volume indicators.

4. There are five indicators that have stratified results reported in SAS QI v 6.0. Overall results for these measures as well as results for those discharges with specific medical conditions are reported. The results for IQI 02 Pancreatic Resection Volume and IQI 09 Pancreatic Resection Mortality Rate are reported separately for those patients that have pancreatic cancer and those that do not. The results for IQI 04 Abdominal Aortic Aneurysm (AAA) Repair Volume and IQI 11 Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate are reported separately for patients, depending on whether the AAA was ruptured or unruptured and whether the repair was open or endovascular. The results for IQI 17 Acute Stroke Mortality Rate are reported separately for patients with subarachnoid stroke, those with hemorrhagic stroke, and those with ischemic stroke. SAS QI v 6.0 does not report smoothed rates for the strata; all other results reported for the overall indicator are also reported for the strata.
5. The software does not report expected rates, risk-adjusted rates, and smoothed rates for the following indicators: IQI 21 Cesarean Delivery Rate, Uncomplicated; IQI 22 Vaginal Birth After Cesarean (VBAC) Delivery Rate, Uncomplicated; IQI 23 Laparoscopic Cholecystectomy Rate; IQI 24 Incidental Appendectomy in the Elderly Rate; IQI 25 Bilateral Cardiac Catheterization Rate; IQI 33 Primary Cesarean Delivery Rate, Uncomplicated; and IQI 34 Vaginal Birth After Cesarean (VBAC) Rate, All. These measures are not risk-adjusted, so only the numerators, denominators, and observed rates are reported.

2.2 Pediatric Quality Indicators Background

The PDI module contains 15 indicators that reflect the quality of care inside hospitals and eight indicators that reflect the quality of care outside hospitals. These indicators serve as flags for potential quality problems rather than definitive measures of quality of care. The indicators include two groups of measures that are based on hospital stays.

1. There are 15 provider-level PDI for medical conditions and procedures that have been shown to have complication/adverse event rates that vary substantially across institutions and for which evidence suggests that high complication/adverse event rates may be associated with deficiencies in the quality of care. There also are three indicators for neonates. These indicators are measured as rates—outcome of interest/adverse events divided by the population at risk for the procedure or condition. The adverse, event-related, provider-level indicators usually include only those cases where a secondary diagnosis code flags a potentially preventable complication. A few indicators are based on procedure codes that imply or infer a potential preventable adverse event. Four of the adverse event-related indicators are for surgical discharges and seven are for either medical or surgical discharges. Four of the provider-level PDI (PDI 02 Pressure Ulcer Rate, PDI 08 Perioperative Hemorrhage or Hematoma Rate, PDI 09 Postoperative Respiratory Failure Rate, and PDI 11 Postoperative Wound Dehiscence Rate) incorporate information about when procedures were performed (relative to the admission date) if this information is available. Note, however, that if the day of procedure information is missing, the computed rates for these indicators will be slightly lower than if the

information was available. Admission type and point of origin are used by two of the PDI (PDI 08 and PDI 9) to identify elective surgeries.

2. There are eight area-level PDI (five individual indicators and three composites).

Note that PQI 09 and PSI 17 are calculated using the PDI module because they are based on discharges of patients aged 17 years and younger. PQI 09 uses in-hospital live births as the denominator. PSI 17 uses all in-hospital newborns as the denominator. The PQI 09 Standalone Module and the PSI 17 Standalone Module calculate these two indicators, respectively, without the need to run the entire PDI module. These two standalone modules are available as separate downloads from the AHRQ QI Web site.

2.3 Prevention Quality Indicators Background

The PQI module contains 13 indicators and 4 composite indicators that measure adult hospital admissions for ambulatory care sensitive conditions (ACSC) across geographic areas. PQI 09 is calculated by the PDI module because it is based on pediatric discharges.

ACSCs represent conditions for which hospitalization could be avoided if the patient receives timely and adequate outpatient care. Many factors influence the quality of outpatient care once it is obtained, including access to care and adequately prescribed treatments. In addition, patient compliance with those treatments and other patient factors may play a role. Areas with lower socioeconomic status tend to have higher admission rates for ACSCs than areas with higher socioeconomic status. As with utilization indicators, there are no “right rates” of admission for these conditions. Very low rates could signal inappropriate underutilization of health care resources, whereas very high rates could indicate potential overuse of inpatient care.

Hospital admission for ACSCs therefore is not a measure of hospital quality but a potential indicator of outpatient and community health care need. For example, if an area has a relatively high hospital admission rate for diabetes complications, the local health care providers should work with the community to identify reasons and strategies to address the problem.

Except for perforated appendix, each indicator is measured as the number of hospital admissions for a particular ACSC divided by the residential population in an area.

2.4 Patient Safety Indicators Background

The PSI module contains 24 indicators that reflect the quality of care inside hospitals.

PSI 17 is calculated by the PDI module because it is based on pediatric discharges. The indicators include two groups of measures that are based on hospital stays.

3. There are 18 provider-level PSIs for medical conditions and surgical procedures that have been shown to have complication/adverse event rates that vary substantially across institutions and for which evidence suggests that high complication/adverse event rates may be associated with deficiencies in the quality of care. These indicators are measured as rates: the number of complications/adverse events divided by the number of admissions for the procedure or condition. The provider-level indicators include only those cases where a secondary diagnosis code flags a potentially preventable complication.

Eight of these indicators are for surgical discharges, eight are for either medical or surgical discharges, and four are for obstetric discharges. Six of the provider-level PSIs (PSI 03 Pressure Ulcer Rate, PSI 09 Perioperative Hemorrhage or Hematoma Rate, PSI 10 Postoperative Acute

Kidney Injury Requiring Dialysis Rate, PSI 11 Postoperative Respiratory Failure Rate, PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate, and PSI 14 Postoperative Wound Dehiscence Rate) incorporate information about when procedures were performed (relative to the admission date), if this information is available. Note, however, that if the day of procedure information is missing, the computed rates for these indicators will be slightly lower than if the information was available. Admission type is used by four of the PSIs (PSI 10, PSI 11, PSI 13 Postoperative Sepsis Rate, and PSI 17) to identify elective surgeries and newborn admissions.

Note that PSI 02 Death Rate in Low-Mortality Diagnosis Related Groups is reported as a single provider-level measure (observed and risk-adjusted). A single measure is necessary to insure adequate reliability of the provider-level rates by pooling an infrequent event over a large group of patients. However, the denominator for the indicator is very heterogeneous, and the mortality rate among the low mortality MS- DRGs varies by MS-DRG type. Users should compare the observed rate to the risk- adjusted rate, which accounts for differences among hospitals in patient case-mix (i.e., age, sex, MS-DRG, and comorbidities). For example, a hospital may have a high PSI 02 observed rate only because the hospital has a higher-than-average share of adult medical MS-DRGs.

The software does not report expected rates, risk-adjusted rates, and smoothed rates for the following indicators: PSI 17 Birth Trauma Rate – Injury to Neonate; PSI 18 Obstetric Trauma Rate – Vaginal Delivery With Instrument; and PSI 19 Obstetric Trauma Rate – Vaginal Delivery Without Instrument. These measures are not risk-adjusted, so only the numerators, denominators, and observed rates are reported.

4. There are seven **area-level** PSIs. These indicators are similar to provider-level indicators, except that the numerator uses principal diagnosis in addition to secondary diagnoses in order to capture all cases of the complication (as opposed to only those complications that develop during a given hospital admission). These measures are not risk-adjusted, so only the numerators, denominators, and observed rates are reported.
5. SAS QI v 6.0 stratifies PSI 04 Death Rate among Surgical Inpatients with Serious Treatable Complications by the five treatable complications contained in the overall indicator: deep vein thrombosis/pulmonary embolism, pneumonia, sepsis, shock/cardiac arrest, and gastrointestinal hemorrhage/acute ulcer. SAS QI v 6.0 does not report smoothed rates for the strata; all other results reported for the overall indicator are also reported for the strata. The strata results may not equal the sum of the overall results because the strata are not mutually exclusive.

3. Overview of the WinQI Software

This document describes the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators™ Windows® (WinQI) software (Version 6.0), a free tool that allows users to run AHRQ QI analyses with data that they provide. Anyone who has access to administrative discharge data can run this software.

3.1 Reference Populations

When applicable, the software calculates risk-adjusted and expected rates using a reference population that is an aggregation of 2013 discharges from all of the States that participate in the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID). For additional information on HCUP and SID, see the [Acknowledgments](#) section of this report and AHRQ's HCUP Web site (<http://www.ahrq.gov/data/hcup/>).

Regression coefficients from the reference population are applied to the individual cases in the risk adjustment process. These reference population file regression coefficients are provided as part of the WinQI v6.0 software. The risk-adjusted rates for the provider-level indicators will then reflect the age, sex, condition/severity, and comorbidity distribution in the reference population rather than the distribution for the hospitals in the user's data. Similarly, the risk-adjusted rates for the area-level indicators will reflect the age and sex distribution in the reference population rather than the distribution for the areas in the user's data. This approach will allow risk-adjusted rates produced by various users to be compared directly to one another. The regression coefficients were derived from the HCUP SID and, for area-level indicators, U.S. Census data. The code to generate these reference population coefficients is not part of the WinQI v6.0 software.

3.2 Data Included

The WinQI software does not include data for any individual hospitals or groups of hospitals.

The only QI rates included in the software are for the reference population (see [Section 3.1](#)). You cannot use this program unless you provide your own administrative discharge data to analyze. The data requirements and specifications are in [Appendix A](#).

In addition to the reference population rates, the software also includes risk adjustment coefficients and model parameters (e.g., signal variance estimates) based on a statistical analysis of the reference population. These data are populated in the respective tables of the QI database during installation and generally cannot be modified (an exception to this is the composite weights that you can modify before generating a composite report, as described in [Section 7.11.3.2](#)).

3.3 Benchmarks

Having calculated an observed rate for an indicator, the obvious next question is, "Compared to what?" Users typically want comparisons with other hospitals or a national rate. However,

neither of these is generally appropriate since hospitals vary in the patients they treat. For example, it would not be fair to compare mortality rates from a hospital that specializes in high-risk cases to an “average” hospital, nor would it be reasonable to compare a hospital that serves a largely elderly population with one that serves a more balanced area. An appropriate benchmark for a hospital is necessarily specific to the demographics and the types of cases it receives.

For most purposes, the most useful check is to compare the observed rate with the expected rate calculated from the same group of cases. The WinQI software calculates these rates (see Section 9.4).

For provider-level indicators, the expected rate takes into account the age, sex, comorbidities, severity, and other characteristics of the actual patients at risk for each outcome. For area-level indicators, the expected rate takes into account the mix of age and sex in each area. The WinQI software provides an option to risk-adjust based on poverty demographics in a given area along with age and sex for the Prevention Quality Indicators (PQIs) and the area-level Pediatric Quality Indicators (PDIs; see Section 7.6). The risk-adjusted rate calculated by the software is the observed rate divided by the expected rate times the reference population rate.[‡] The risk-adjusted rate is the rate that would be expected if the specific group of “at-risk” patients in a service area or hospital received the “average” expected treatment.[§]

3.4 Using the WinQI Software for Analysis

The WinQI software provides built-in tools to assist users in analyzing the rates that are produced.

3.4.1 Reviewing Individual Cases

The WinQI software includes tools to review the individual cases that are selected for each indicator. Once you have loaded your data and generated indicators for specific modules, select the module you would like to analyze and click **<Patient Level Report>** (see [Section 10.17](#)) on the Home Screen under the Create reports section of the screen. Further select the desired indicator on the Patient level report screen. This tool can be useful for selecting cases for chart review and further study.

Click on the row number of an individual case to get more information about that case. The Case Details screen traces an indicator for a single case, showing why each case was or was not included, excluded, or flagged (including which Medicare Severity Diagnosis-Related Group or International Classification of Diseases, Ninth revision (or Tenth Revision, if you

[‡] The reference population rate is only used in the calculation of the risk-adjusted rate when creating a report stratified by county or hospital or when no stratification is used. Otherwise, the risk-adjusted rate is equal to the observed-expected ratio.

[§] See the [Quality Indicator Empirical Methods, Revised November 2014](#) report.

are using the ICD-10 version of the software), Clinical Modification codes contributed to this assignment).

3.4.2 You may also drill down on the Observed Numerator or Observed Denominator values from the Provider-level or Area-level report summary screens to review corresponding individual cases for the specific indicator and selected stratifiers. Stratification

You may “drill into” QI rates by using the Report Wizard to generate reports that are stratified according to a particular data element, including up to three “custom” or user-supplied fields. Stratification allows you to divide the discharges into groups by attributes, such as age or race, and view the observed, expected, and risk-adjusted rates for each group. This tool helps to identify whether there are differences in quality of care for different groups and can be used to identify areas and opportunities for quality improvement.

3.5 Other Documentation

The QIs are separated into four modules: Patient Safety Indicators (PSIs), Inpatient Quality Indicators (IQIs), PQIs, and PDIs. Each module is documented separately in Technical Specifications documents that provide detailed definitions of specific QI inclusion and exclusion criteria.

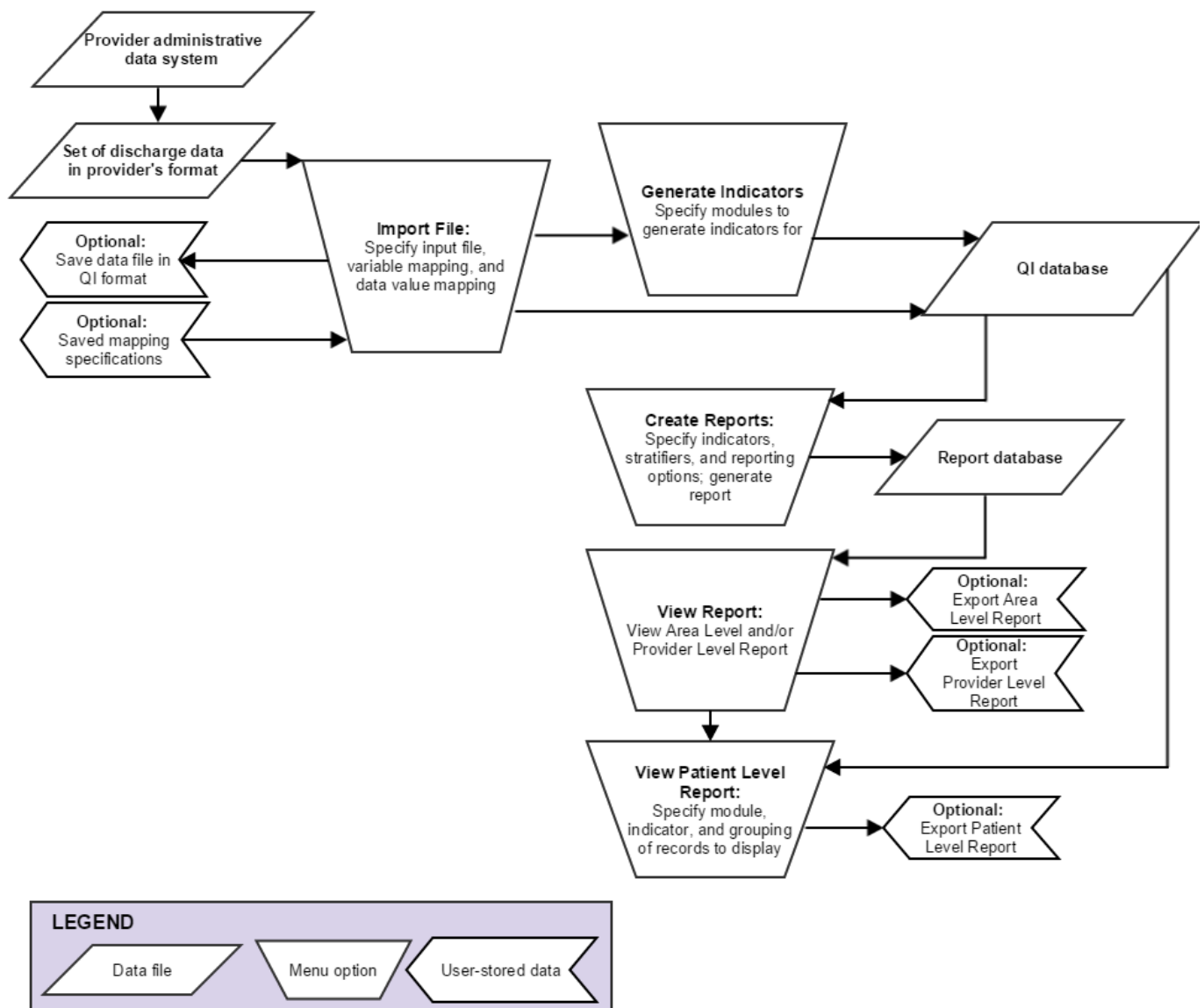
Each Technical Specifications document provides the codes for specific diagnoses and procedures, other criteria that are used to construct the denominator and numerator from discharge records, and the logical conditions under which records would be excluded. Other available downloads include the SAS^{®**} syntax and instructions, as well as a list of the coding changes made for each fiscal year by module (see change logs and release notes for details on WinQI v6.0 and SASQI v6.0).

^{**} SAS is a statistical software package distributed by the SAS Institute, Inc. (<http://www.sas.com>). The company may be contacted directly regarding the licensing of their products. The SAS Institute, Inc., has no affiliation with AHRQ or involvement in the development of the AHRQ QIs.

4. WinQI Flowchart

Figure 3 is a visual representation of the major processes included in the WinQI software. It also specifies the inputs and outputs of these processes. These processes, inputs and outputs are further detailed in the following sections.

Figure 3. Data Flow Diagram for AHRQ WinQI



5. Getting Started

5.1.1 Using WinQI

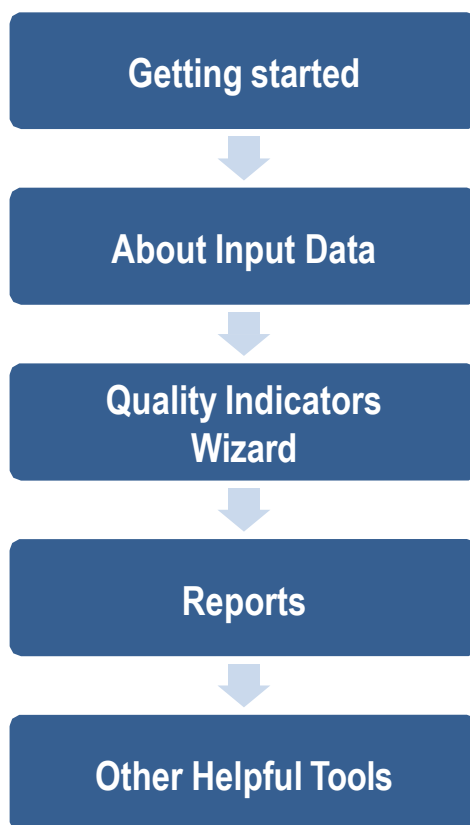
5.1.1.1 How do I start the WinQI software?

Click on your computer's <Start> button, point to **Programs**, point to the **Agency for Healthcare Research and Quality** folder, point to the **Quality Indicators** folder, and then double click on **AHRQ Quality Indicators**

5.1.1.2 How do I use this instruction manual?

The main part of this manual is organized into the sections shown in [Figure 4](#).

Figure 4. Data Flow Diagram for How to Use This Manual



Most of these sections show screenshots of each process step for each software function. The discussion of each screen's capabilities includes answers to the questions, "What is this screen for?"; "How is this screen organized?" and "What should I do here?"

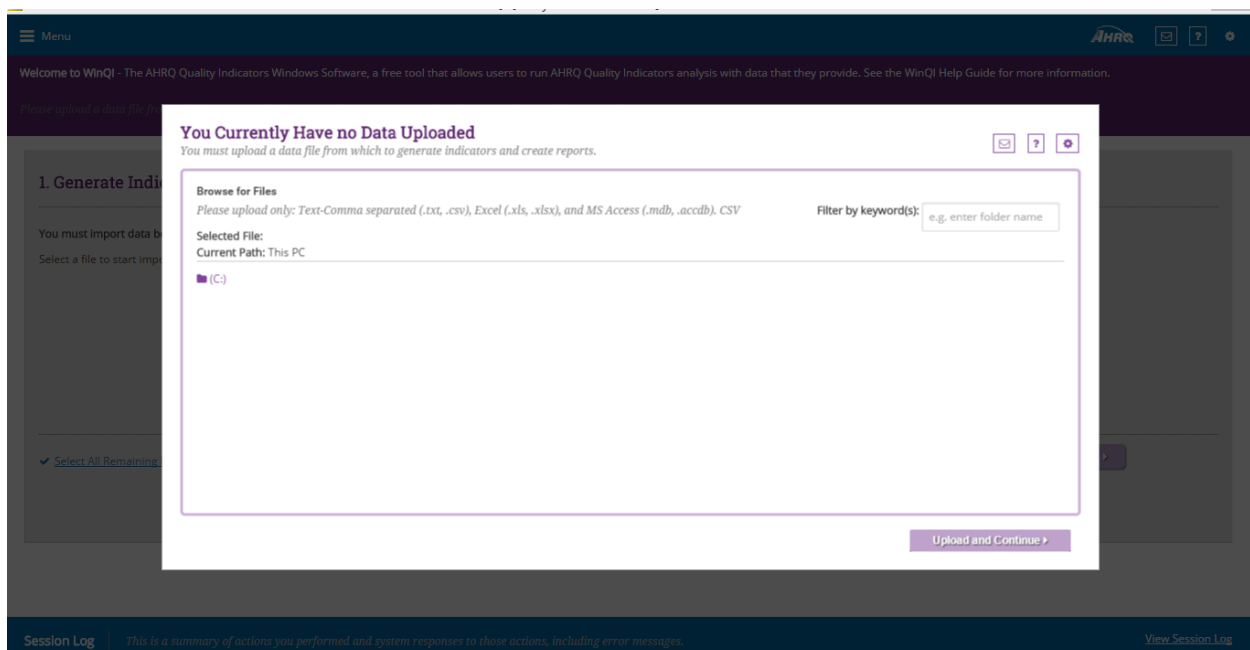
Timesaving tips and other questions may also be included in the discussion.

6. Home Screen

6.1.1 What is this screen for?

This screen (Screenshot 1) shows the initial Home Screen you will see on your first time logging into the application, or if you have logged in but not yet imported a data file. You have to upload and import a data file in order to perform any QI analysis.

Screenshot 1: Home Screen



6.1.2 How is this screen organized?

6.1.2.1 Help

When you click the Help button, a window pops up and brings you WinQI help guide.

6.1.2.2 Browse

Clicking the <**Browse**> button, will allow you to browse for and select a data input file to import into the application, thus starting the Import File process.

6.1.2.3 What should I do here?

Click <**Browse**> to select your input file and then <Upload and Continue> to begin the Import File process.

7. About Input Data

See [Appendix A](#) for a detailed description of the input data elements and coding conventions used by the Quality Indicators™ Windows® (WinQI) software.

7.1 Questions on Input Data

7.1.1 *Where do I begin?*

The first thing you need to do is obtain a file that contains the inpatient discharge records you want to analyze. Once you have this file, run the WinQI application, starting by clicking the **<Browse>** button to locate the file on your computer and begin the **Import File** process. The graphical user interface will guide you through the steps to load data, generate indicators, create reports, and review cases.

7.1.2 *What kind of input data can be used by the software?*

The software uses readily available hospital inpatient administrative data that provide demographics on the patient and the provider, diagnosis codes, procedure codes, and information about the admission, payer, and discharge.

7.1.3 *What format should the data be in?*

Two key formatting issues are that:

- Each row of data should represent a separate discharge record; and
- Each column of data should represent a single variable for all discharges. There is a limit of 200 columns.

The software accepts three common data formats:

- ◆ Text (comma-separated);
- ◆ Microsoft Access; and
- ◆ Microsoft Excel.

If the data file meets these requirements, the Import Data Wizard will assist users in transforming their data into the QI data format with flags for each indicator, clinical classifications flags, and comorbidity flags (see [Appendix C](#) for a definition of these flags).

7.1.4 *What is the easiest format to work with?*

If you have the flexibility to create your input file in any format, it is easiest to use comma-separated value format (CSV, or .csv) and use the variable names in the Data Elements table as column headers. For each *mapped* variable in the Data Elements table, use the numeric values listed. None of these suggestions are mandatory, but they will simplify data import.

Note that the CSV format can be problematic for international users who might use commas to denote the decimal place in numeric fields. The WinQI software is not able to properly interpret commas used as decimal separators. Users are required to reformat their data so that decimal points (i.e., “.”) are used as decimal separators.

7.1.5 What data must be included?

The WinQI Input Data Dictionary (see [Appendix A](#)) lists the data that should be included for each discharge.

7.1.6 What if I don't have all the data?

It is not necessary to create “dummy data” to fill the columns or create missing data elements. See the comments in the Data Elements table in the software and on the Data Mapping screen in the Quality Indicators Wizard to determine the consequences of leaving out any variable.

7.1.7 What if my data have additional variables that I want to use?

Your input file may contain extra data that are not required. Any variables that are not used in the Data Mapping screen will not be imported with your data.

The software allows you to use up to three “custom stratifiers.” These fields allow you to calculate rates for provider-level indicators using whatever custom grouping you wish. However, the application can only use variables in the first 200 fields of your data, so you should be sure that all required variables are in the first 200 fields.

7.1.8 My file does not have column headers. Do I need to put them in?

Column headers are required for Excel files but are not required for CSV files. The software Data Import Wizard allows you to map variables by name or by position. However, *it is generally easier and less error-prone to include column headers*. Though not required, we recommend that you include column headers in CSV files.

7.1.9 What are the different data types?

Numeric and string values must match the format specified.

Mapped variables have specific meanings according to the coding conventions in your organization, and they have specific meanings to the WinQI application. For example, the WinQI disposition value for “died” is “20.”

There are four types of data elements:

- ◆ Numbers;
- ◆ Dates;
- ◆ Strings; and
- ◆ Mapped variables.

Your data do not have to use “20” to mean “died,” but in order for the WinQI application to calculate mortality indicators, you will need to provide the translation in the Crosswalk screen.

7.1.10 What if I have commas in some of my data values?

CSV files use commas to separate the data values. If you have commas within any data values (e.g., “Private, incl. HMO”), then you will need to put double quotes around each data element. When selecting your file, check the appropriate box to have the quotes recognized.

And, as noted in [Section 7.1.4](#), the CSV format can be problematic for international users who might use commas to denote the decimal place in numeric fields. The WinQI software is not able to properly interpret commas used as decimal separators. Users are required to reformat their data so that decimal points (i.e., “.”) are used as decimal separators.

7.1.11 Can I use tabs instead of commas as a delimiter?

Yes. You can switch the delimiter to Tabs on the Program Options screen in the Quality Indicators Wizard.

7.1.12 What about external cause of injury codes (E-codes)?

External cause of injury codes (E-codes) are used to classify environmental events, circumstances, and conditions as the cause of injury, poisoning, or other adverse events. The use of E-codes is not always required by a State uniform billing committee or a State data organization. Users should be knowledgeable of the E-code requirements and practices of hospitals represented in the input data file. AHRQ has conducted some methodological work in understanding the completeness of E-coding in hospital billing data. Reports can be found at http://www.hcup-us.ahrq.gov/reports/methods/methods_topic.jsp.

E-code variables may be used in place of secondary diagnosis fields in the WinQI software. If your data have separate variables for E-codes, you can use the Data Mapping feature (see Section 5.4) in the Quality Indicators Wizard to map the QI variables to your E-code variables, starting with the first available (unmapped) secondary diagnosis QI variable. If the number of diagnosis fields plus the number of E-code fields in your input data exceeds 35, then you may wish to preprocess your data to fill in the gaps and get the maximum use of the 34 secondary diagnosis fields. If your data have a present on admission (POA) flag associated with an E-code variable, then map the E-code POA variable to the QI POA variable that corresponds to the secondary diagnosis to which the E-code was mapped.

7.1.13 What about All Patient Refined (APR) Medicare Severity Diagnosis-Related Group (MS-DRG) codes?

In addition to other factors like age, sex, and race, risk adjustment for some of the Inpatient Quality Indicators (IQIs) rely on results, such as the risk-of-mortality subclass, determined by the 3M™ APR-DRG software. This grouper has been reported to perform well in predicting death when compared to other DRG-based systems.

Users who want to report risk-adjusted IQI rates may use the built-in limited license version of the 3M™ APR-DRG grouper. The optional limited license grouper available with the AHRQ WinQI software is “multiversion;” i.e., Versions 20, 23–30, 32, 33, etc.). The software will apply the correct version based on the discharge year and quarter. Users who have their own APR-DRG grouper can use either the applicable MS-DRG version or the International Classification of Diseases, Ninth revision or Tenth revision (ICD-09 or ICD-10), Clinical Modification mapping to Version 33.

Information on the 3M™ APR-DRG system is available at:

http://solutions.3m.com/wps/portal/3M/en_US/3M_Health_Information_Systems/HIS/Products/APRDRG_Software/.

8. Import Data File

This section walks you through the process for importing your data file into WinQI. As mentioned previously, a data file (containing administrative discharge data) needs to be imported into the database prior to performing any QI analysis. An overview of the steps in the Importing process is below:

- **Specify Input File** – choose the appropriate file you’d like to import
- **Input File Option** – provide additional information about your data input file
- **Check File Readability** – the application will check your data input file to ensure each row can be read
- **Data Mapping** – map the variables from your data input file to the corresponding AHRQ QI variables
- **Mapping Quick Check** – review the variables that have and have not been mapped to your data file
- **Prepare for Crosswalk** – the application will process the values specified for crosswalk variables
- **Crosswalk** – review and confirm the crosswalk of the values in your input file to QI values for specific variables
- **Data Errors** – the application will report data errors or warnings that need to be addressed
- **Load Data** – the last step in the import process - your data file will be loaded into the application and a summary of the load process will be displayed.

At any step in the import process, you may exit the process and return to the Home Screen. This will result in all changes being discarded and will need to resume the import process from Step 1.

For additional information on the definition of input columns, compatible formats for your data, etc. refer to the Input Data Dictionary.

8.1 Specify Input File

8.1.1 *What is this screen for?*

The first step in importing an input file is to specify the file you want to upload and import.

8.1.2 *How is this screen organized?*

This screen (Screenshot 1) shows the Home Screen if this is your first time using the software with the current version. Since you have not uploaded any data, the screen will display a message saying “You currently have no data uploaded.”

However if a file has been uploaded in a previous session, you will see that file on this screen. Uploading a new file will override the previously uploaded file.

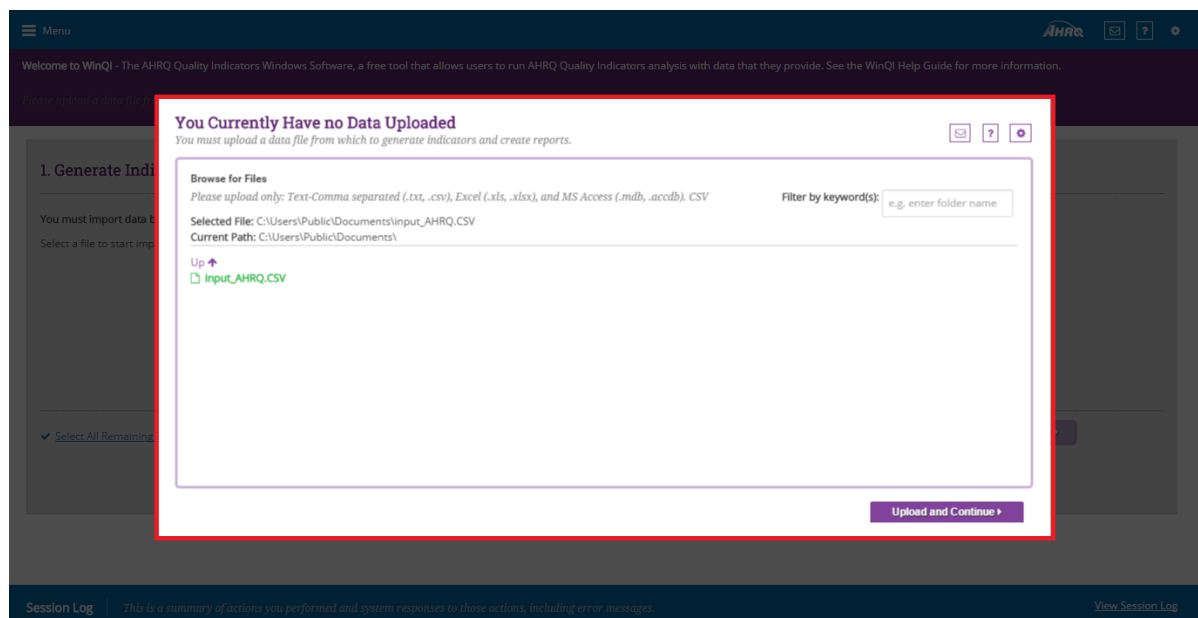
If at any time in the import process, you decide to edit and replace your data input file, you may also use the <**Cancel**> button to return to the **Home Screen** and begin the import process again. Any changes you have made before completing the process will not be saved.

8.1.3 What should I do here?

To upload your file, click the <**Browse**> button and select the appropriate file to upload (Screenshot 2). Only one file can be uploaded at a time. Your file can be in any of the formats listed below, however, we recommend that you use the .csv format if possible.

- Text-Comma separated (.txt, .csv)
- Excel (.xls, .xlsx)
- MS Access (.mdb, .accdb)

Screenshot 2: Browse and Upload File



Once you have located your file and are ready to move on to the next step in the import process, click <**Upload and Continue**> and you will be taken to the **Select File Options** step.

8.2 Select File Options

8.2.1 What is this screen for?

Use this screen (Screenshot 3) to provide information about your data format. You may also specify a mapping file on this screen. A mapping file describes the contents of your file to the application. See the description in [Section 8.2.2.2](#) for more information on mapping files.

Screenshot 3: Select File Options

Input Data | Input File Options

1. Input File Options 2. Check Readability 3. Data Mapping 4. Mapping Quick Check 5. Preparing for Crosswalk 6. Crosswalks 7. Data Errors 8. Load Data

Are you using a saved map?
WinQI allows you to save maps for future use. If you have a saved map you would like to use, you may select it below.

☒ I am not using a saved map. I need to map my new data.
☐ I am using a saved map

Edit Mapper Shortcuts

Tell us about your data file

☐ Values have quotes that must be removed (e.g. "value1", "value2")
☒ First row contains column headers

Additional Options

APR-DRG Grouper

☐ Use the built-in limited APR DRG Grouper provided by 3M™
☒ Load APR-DRG values from the data file. (if available)

Previous Next

8.2.2 How is this screen organized?

8.2.2.1 Navigation

Along the top of the screen from this step on, you will notice the sequence of steps in the import process. The step that is highlighted in purple will let you know where you are in the process at any given time.

The screen is separated into three sections:

8.2.2.2 Data Mapping and Crosswalk

In this section, you will specify whether you are using a mapping file (if so, which one) or whether you will be performing the mapping via the wizard. The mapping file specifies the mapping of variables in your input file to QI variables. It also specifies mapping of the crosswalk variables and other attributes of your file. This is important for the WinQI software to know how to process your data. The program will preselect the **“I am not using a saved map. I need to map my new data”** option by default. Once you have completed the import process and saved a mapping of your variables, you can reuse those

specifications with other data files in future sessions. Using a mapping file enables you to save time on the Import process.

There are two types of mapping files:

1. “By Position” mapping files define columns based on the exact order of columns. The column headings of text files imported with positional mappings are ignored and may be excluded. An error message will be displayed if you attempt to use a “By Position” mapping file with an MDB data file or ACCDB file.
2. “By Name” mapping files can only be used with files that have column names. These columns may be in any order. The program will not allow you to use a mapping file that is inappropriate for the type of file you have selected.

A saved mapping file may be used in two ways:

1. You may bypass the Readability Check, Data Mapping, and Crosswalk screens. If you have saved a mapping file in a previous session and would like to use it for this import, select the indicator to the left of **<I am using a saved map>** to access that file. A **<Browse>** button will appear which will then allow you to find and select the appropriate mapping file. Only Quality Indicators Mapping (.qim) files can be used here. If you are sure that you are uploading a valid mapping file that matches the data structure of your input file, you can check the **<Skip validation and mapping screens>** checkbox and then click the **<Next>** button to jump to the Load Data section of the process.
2. You may use a mapping file in which the specifications in the file (such as the variable mapping, crosswalk mapping and other input specifications) in the file do not perfectly match your input data specification. Make sure that **<Skip validation and mapping screens>** checkbox is not checked. This option will allow you to make desired changes in subsequent screens.

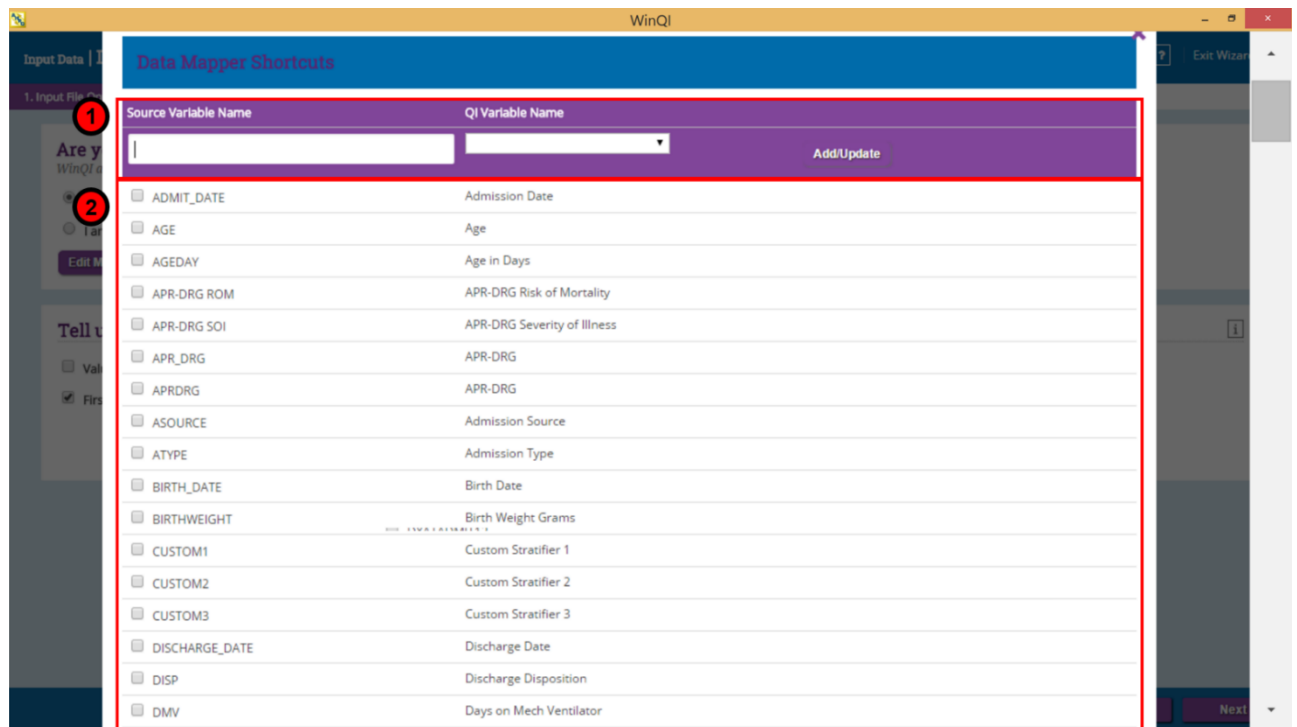
If you are not using a saved mapping file, the software may still determine a default mapping if your column headers match the default column names specified in the Input Data Dictionary. You can edit the default mapping by clicking the **<Edit Mapper Short Cut>** button.

8.3 Data Mapper Shortcuts

8.3.1 What is this screen for?

This screen (Screenshot 4), accessed by clicking the **<Edit Mapper Shortcuts>** button on the Data Import - Additional Options screen, allows you to map variables in the Data Mapper screen. If you load similar files but do not use a mapping file, this can save effort in the Quality Indicators Wizard.

Screenshot 4: Data Mapper Shortcuts



8.3.2 How is this screen organized?

1

8.3.2.1 Mapping Controls

The controls used to create new matches include the Source Variable Name, the QI Variable Name, and the **<Add/Update>** button.

2

8.3.2.2 Mapped Variables

The mapped variables are listed, along with checkboxes and a **<Delete Selected>** button to delete selected variables.

8.3.3 What should I do here?

To delete the association between a source variable and QI variable, click the checkbox next to the source variable and then click the **<Delete Selected>** button.

To create an association, type the variable name as it appears in the Input Data file into the “Source Variable Name” field, select a QI variable name from the drop-down menu, and then click the **<Add/Update>** button.

After all desired changes have been made, click the **<Save>** button at the bottom of the screen.

3

8.3.4 Tell us about your data

This section allows you to provide additional details about your data file (such as the use of quotes or column headers). Click on the corresponding filters to indicate whether any values in your input file have quotes that need to be removed or if the first row in your file contains the column headers. We recommend that you include column headers in your first row. Doing so will simplify the processing of your file and will help reduce errors. If you have specified a mapping file, then information in this section will be pre-populated from the mapping file.

4

8.3.5 Additional options

This section of the screen allows you to indicate if you will be using the built in APR-DRG Grouper (included in the WinQI software) or mapping the APR-DRG values from your input data file. APR-DRG values (user supplied or calculated by built-in grouper) are needed for calculating risk-adjusted rates. The application will select the “Use the built-in limited APR DRG Grouper provided by 3M™” option by default. If you have specified a mapping file, then information in this section will be pre-populated from the mapping file. Please note that if you did not install the version of the WinQI software containing the Grouper, this section of the screen will not appear.

Note: Since the ICD-10 component of v6.0 version does not perform risk adjustment, you will not see this section in the ICD-10 component of the software.

8.3.5.1.1 What should I do here?

Select the information you would like to provide about your data file. If you have provided all of the necessary information, click the <Next> button to continue on to the **Check File Readability** step. If you have uploaded a valid mapping file that matches the data structure of your input file, you can check the <Skip validation and mapping screens> checkbox and then click the <Next> button to jump directly to the Load Data section of the process. Remember that clicking <Cancel> will take you back to the **Home Screen** and all of the selections you have made in the import process will be lost.

8.3.6 Other Questions

8.3.6.1 Why can't I uncheck the “First row contains column headings” checkbox for an Excel file?

The Quality Indicators Wizard requires alphanumeric column headings for Excel files. You should make sure that all of your column names have alphabetical characters in them—otherwise data values may be misread and lost; e.g., external cause of injury codes (E-codes) and International Classification of Diseases, Ninth revision, Clinical Modification (ICD-9-CM) codes that look like numbers but are not purely numeric.

8.3.6.2 Why are alphabetical column headers so important for Excel?

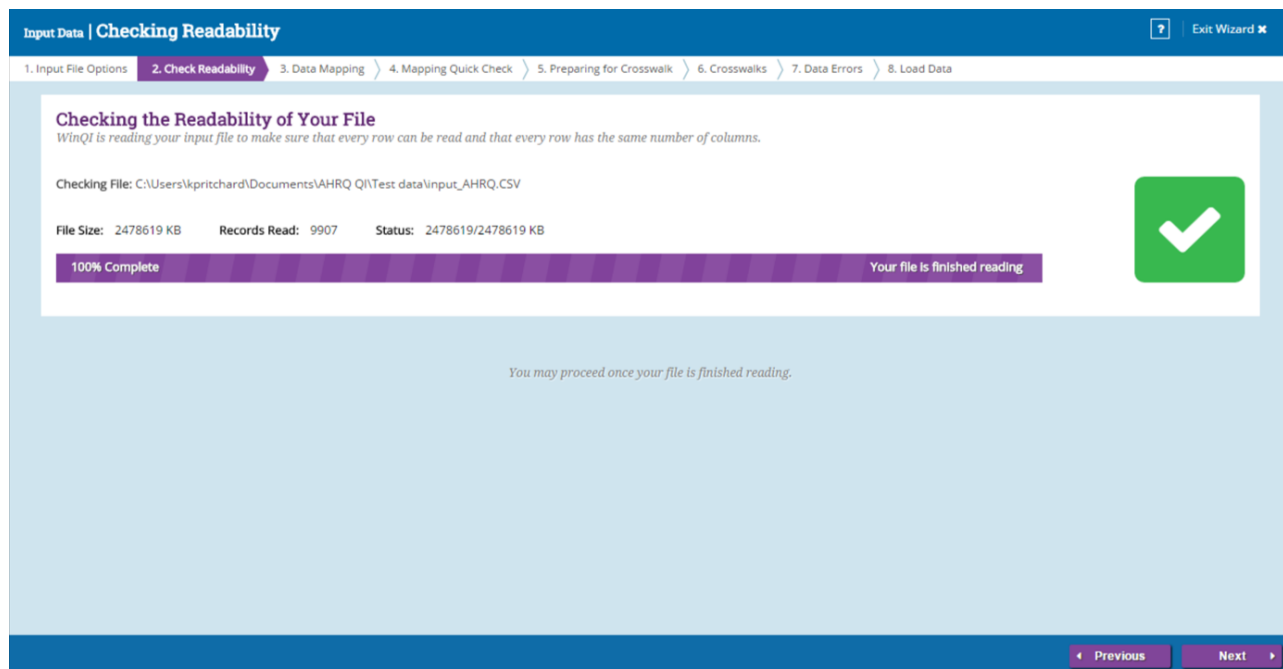
The driver that reads Excel files examines the first few rows of the file to determine whether each column should be interpreted as a column of text or as a column of numbers. If the driver decides to interpret the column as numeric, then it will cause an error or silently skip over any data that do not comprise a valid number. This error can easily happen if a column contains numeric ICD-9-CM codes mixed with E- or V-codes.

8.4 Check File Readability

8.4.1 What is this screen for?

This screen (Screenshot 5) displays the application's progress as it scans your input data file to ensure that each row can be read. It is important to ensure that the file is in readable format prior to performing any further processing.

Screenshot 5: Check File Readability



8.4.2 How is this screen organized?

The screen displays a progress bar indicating the percentage of your input file that has been read by the application. You can also use the number of records read or the status to gauge completeness of the readability check. When the scan is complete, a message will appear stating that “Your file is finished reading” and a check mark will appear to the right of the progress bar.

8.4.3 What should I do here?

Check to make sure that the correct data file has been specified and that the file has not become corrupted. Please note that an error in this step indicates a serious issue that is impeding the file from being read. If an error is found, click <Cancel> to exit the process, review your file for issues and then start the import process again.

Once the scan is complete and you have confirmed that no readability errors were found, click the <Next> button to continue on to the **Data Mapping** step.

8.5 Data Mapping

8.5.1 What is this screen for?

This screen (Screenshot 6) allows you to map variables from your data input file to the AHRQ QI variables. This is important for the WinQI software to know how to process your data. If you uploaded a mapping file in the **Select File Options** portion of the process, the variables on this screen will be mapped accordingly. If the column names in your input file match the names of the input variables as specified in the Input Data Dictionary, the auto mapper will map the variables according to the column headers.

Screenshot 6: Data Mapping

Input Data | Data Mapping

1. Input File Options > 2. Check Readability > 3. Data Mapping > 4. Mapping Quick Check > 5. Preparing for Crosswalk > 6. Crosswalks > 7. Data Errors > 8. Load Data

Quickfind Fields:

Show: ☒ Unmapped fields ☒ Mapped fields

Column Number	Input File Variable Name	Maps to QI Variable
1	KEY	Key
2	DRG	Diagnosis Related Group
3	MDC	Major Diagnostic Category
4	DRG VERSION	DRG Version
5	Year	Discharge Year

Show: ☒ All ☐ Required ☐ Recommended

AHRQ QI Variables	Importance
Patient State/County Code	Recommended
Days to Procedure 1	Recommended
Point of Origin	Recommended
Race	Other
Primary Payer	Other

Sample View of Input File Data

QI Variables

Key	Diagnosis Related Group	Major Diagnostic Category	DRG Version	Discharge Year	Birth Date	Admission Date	Discharge Date	
KEY	DRG	MDC	DRG VERSION	Year	BIRTH_DATE	ADMISSION DATE	Discharge_Date	FECINT
4086824	872	18	30	2014	11/13/1933	05/05/2014	05/15/2014	
4086856	774	14	30	2014	05/24/1983	05/18/2014	05/22/2014	
4086826	191	04	30	2014	11/25/1944	05/15/2014	05/21/2014	

Input File Variables

Quickfind Sample Fields:

Find

Previous Next

8.5.2 How is this screen organized?

The screen is divided in to three sections:

1

8.5.2.1 Input Variable

This section lists the names of all variables found in your data file along with the position of each variable (the column number) within each row. The view will default to show all variables – mapped and unmapped – however you can change the view by clicking the filters to the left of the **Show** field. Be sure to find all unmapped variables and map them to the appropriate QI variable. The Quickfind Field option allows you to search for a specific field by typing the first few letters of the variable in the text box. You can also sort the fields by column number, Input variable name or QI variable name. Note that your input data may contain variables that do not correspond to variables used by the WinQI software.

2

8.5.2.2 QI Variable

This section lists the names of all QI variables (see Appendix A) that have not been mapped to one of your data input file variables. Each variable will also indicate if it is Required, Recommended or Other. You can view different groups of variables using the filters at the top of the chart. The default view lists all of the QI variables, however you can also view required variables only to see if there are any you may have missed or you can view recommended variables only to see which variables you have not mapped that it would be worthwhile to go back and map.

Required variables must be mapped in order for you to continue on through the import process. The required variables include:

- Age
- Sex
- Discharge Year
- Discharge Quarter
- Principal Diagnosis

Recommended variables are not required to be mapped in order for you to move forward with the import process, but all of them are used in QI data analysis. Thus we highly recommend that you include these variables in your input file and map them to QI variables in order to get the most accurate results from the QI calculations.

To map QI variables, drag the desired QI variable from the table on the right and drop it in the field next to the intended input variable in the Input Variable table on the left. You can remove a mapping by dragging the QI variable back to the QI variable table. If you aren't sure how one of your variables matches up to a QI variable, look at the Sample Data View of your data to see what values are stored in the variable.

Recommended variables include:

- Discharge disposition
- Admission type
- Admission source

- Length of stay
- Point of origin
- APR DRG (if using ICD-09 component and these values are being loaded from the data file. Not available for ICD-10 component)
- APR-DRG Risk of Mortality (if using ICD-09 component and these values are being loaded from the data file. Not available for ICD-10 component)
- XPR-DRG Risk of Mortality (if using ICD-09 component and these values are being loaded from the data file. Not available for ICD-10 component)
- Age in days
- Birth Weight in grams
- Procedure code 1
- Patient State/County code
- Present on Admission flag variables (corresponding to Diagnosis code variables that have been mapped).
- Days to Procedure code variables (corresponding to Procedure codes that have been mapped).

‘Other’ variables are not used for calculating QI rates. Some of them could be used for stratification or as a record identifier if you export the records for use in other software.

Other variables include (please see Appendix A: Input Data Dictionary for a detailed description of each of these variables):

- DRG
- MDC
- DRG Version
- Birth date
- Admission date
- Discharge date
- Remaining Diagnosis codes
- Present on Admission codes
- (Remaining) Procedure codes
- Days to Procedure codes
- APR-DRG Severity of Illness
- Race
- Primary Payer
- Hospital ID
- Days on Mechanical Ventilator
- Custom Stratifier 1
- Custom Stratifier 2
- Custom Stratifier 3 and
- Patient ID



8.5.2.3 Sample Data View

This section displays a snapshot of the first 50 rows your input file to give you an idea of the data that appears in each column. This data view is provided to aid you in mapping the QI variables to the appropriate variable in the input file. You can locate specific columns from your input file by typing part of the column name into the Quickfind Field. As you change which QI variables are mapped and unmapped, the corresponding header will update in this section. You have the ability to hide this data by clicking on the <**View/Hide Data**> button.

8.5.3 What should I do here?

Map a QI variable to the variable in your data file by clicking on a variable in the right-hand list, dragging it to the **Input File Variables** list on the left, and dropping it next to the corresponding variable name in your input data file. Remove a mapping by dragging the QI variable back to the QI variable tray.

If you aren't sure how one of your variables matches up to a QI variable, look at the **Sample View** of your data to see what values are stored in the variable.

EXAMPLE: The required variable “Sex” is listed under **Variables Used By QI Software**. You are not sure which of your variables corresponds to this. You look at the **Sample View**, and notice that a column labeled “GG” contains the values “m” and “f.” Therefore, you conclude that you need to drag the “Sex” variable to the empty spot next to “GG” in the **Input File Variables** area.

If you would like to go back and make changes to any of the selections you have made so far, click the <**Previous**> button to return to earlier steps in the process.

When you are finished mapping your data, click the <**Next**> button to continue on to the **Mapping Quick Check** step in the import process.

8.5.4 Timesaving Tips

8.5.4.1 Select variable names

If possible, use the QI variable names for the columns when you create your data file. If they are found (spelled exactly the same), they will be matched up automatically.

8.5.4.2 Data Mapper Shortcuts

Other column names can be matched automatically to QI variables. These include the SAS®-equivalent variable names and other common mappings such as “Ecode1” to “Diagnosis Code 31.” You may edit the shortcut table on the Data Mapper Shortcuts screen.

8.5.5 Other Questions

8.5.5.1 What is the difference between “required” “recommended” and “other” variables?

Required variables are critical to the proper flagging of discharges for the majority of the QIs. You will not be allowed to load a file that does not have all of these variables. Recommended variables, while not required to be mapped in order for you to move forward with the import process, it is highly recommend that you include them in your input file and map them to QI variables since all of them are used in QI analysis. Depending on what analysis you are interested in, your calculated QI rates may not be accurate unless these variables are included. Variables labeled “other” are used for optional reporting features, such as particular stratifiers. If you leave these variables unmapped, they will be treated as blanks in every record.

8.5.5.2 What if I have extra variables in my file?

The application only imports and processes variables that have been mapped. Any variables in your file that are not mapped will not be imported and will not affect the QI calculations.

8.5.5.3 What if I don't have inputs for all variables?

The QI calculations are based on the data inputs for mapped variables in your file. For best results, correct any issues identified during the import process and populate any blank fields with the proper inputs, if available. Normally, you should correct your input file to get the best results possible.

8.5.5.4 What if I have fewer than 35 diagnoses or 30 procedures?

You can map the number of diagnosis and procedure variables that are coded according to the conventions in your institution. Unmapped QI variables will be treated as blank.

8.5.5.5 What if I have more than 35 diagnoses or 30 procedures?

You may only use up to 35 diagnosis and 30 procedure codes. You may wish to preprocess your data to remove empty elements in order to get maximum efficiency out of the number of codes allowed. If you do preprocess your data, be careful to make sure that the procedures and procedure day fields are appropriately matched.

8.5.5.6 What is the proper format for diagnosis codes?

For ICD-9-CM format, diagnosis codes are always three, four, or five characters long. The first 3 digits range from "001" to "999." Some diagnoses require a fourth or even a fifth digit to be a valid code. V-codes and E-codes may also be supplied in the diagnosis fields. V-codes range from "V01" to "V85," and E-codes range from "E800" to "E999." V-codes and E-codes may also require additional digits.

For ICD-10-CM format, diagnosis codes are between three and seven characters alphanumeric characters. Please see the CMS website for additional information.

In all cases, you must remove the decimal point before loading the data.

The WinQI software does an exact textual comparison of all codes. Therefore, it is important not to pad any additional characters (such as trailing zeros) to the right of ICD-9-CM or ICD-10-CM codes. Similarly, if the rightmost and/or leftmost character is a zero, you should not remove this zero as it will change the meaning of the code.

8.5.5.7 What is the proper format for procedure codes?

For ICD-9 format, procedure codes are always two, three, or four characters. The first two digits range from "00" to "99," and they may require third or fourth digits to be valid codes. As with diagnosis codes, you should remove any decimal points, and you should not add or remove characters or zeros on the left side of the code. Procedure codes are always numbers.

For ICD-10 format, procedure codes consist of three to seven alphanumeric characters with no decimal point. Please see the CMS website for additional information on ICD-10 coding.

8.5.5.8 Why does my data view display quotation marks?

This indicates that your input data is separated by quotation marks. To remove the quotes, access the Input File Options screen, and enable the checkbox labeled "Values are enclosed

in quotes”. Selecting this checkbox will remove the quotation marks in your data upon import.

8.5.5.9 What if I have separate fields for E-Codes?

Diagnosis fields 31–35 are intended for E-codes; however, you may put E-codes in any secondary diagnosis field.

8.5.5.10 Why are none of my E-code variables mapped to a QI variable?

You may map any of the unused secondary diagnosis variables from the list of Variables used by QI Software to your data’s E-code variables.

8.5.5.11 How should I map my data element for the patient’s location?

If you intend to use the area-level rates, the recommended approach is to map the Federal Information Processing Standards (FIPS) State/county code for the patient’s residence to the data element labeled “Patient State/County Code.” If the FIPS State/county code of the patient’s residence is not available, then you may map the hospital FIPS State/county code to the data element labeled “Patient State/County Code.” However, we then recommend that you analyze the area rates at the State or metropolitan area level.

If the hospital FIPS code is used in PSTCO, users should be aware that rates may be biased for hospitals that serve as regional referral centers. These hospitals are likely to treat patients from outside the metropolitan area, county, or even the State in which the facility is located.

Using the patient FIPS state/county code for analysis may more accurately reflect the true population at risk. Using the hospital FIPS state/county code for analysis should be done with caution and with larger geographic areas to minimize bias from patients who come from a county that is different from the hospital’s location.

The software provides the user with the option of producing output by metropolitan area or by county. When metropolitan area is selected, urban areas are always defined by metropolitan areas. When county is selected, urban areas will be defined by county. Rural areas are always defined by county.

The metropolitan area definitions are from three different sources:

1. The “modified FIPS” definition is from the Area Health Resource File. The mapping is from county to modified FIPS county (e.g., Baltimore city to Baltimore County).
2. The “1999 OMB” definition is from OMB circular 99-04 (Last Revised May 6, 2002). The mapping is from county to Metropolitan Statistical Area (MSA) except in New England, where counties are assigned to New England County Metropolitan Area (NECMA). OMB defines NECMA as a county-based alternative to the city- and town-based New England MSA and Consolidated MSA (CMSA). For example, Hampden and Hampshire Counties in western Massachusetts are assigned to the Springfield, MA, NECMA, even though the town of Holland in Hampden County is part of the Boston MSA.

3. The “2003 OMB” definition is from OMB circular 03-04 (Last Revised December 4, 2005). The mapping is from county to either MSA or Micropolitan Statistical Area.

8.5.5.12 Can custom stratifiers be used for personal information?

Custom stratifiers are intended for grouping records; they are not intended to store patient information. For small datasets, it is feasible to store extra patient information (such as name), but doing so will cause the program to run slower and require more disk space. You can instead save information in the “Key” field or in the “Patient ID” field.

8.5.5.13 What’s the difference between “Key” and “Patient ID”?

The “Key” variable is intended to distinguish discharge records, while the “Patient ID” field is intended to help link patients across discharges. However, any data may be stored in either field. The “Key” field is displayed in several places in the application, but the “Patient ID” field is only included in the Export Data screen. Additionally, patient ID is stored in a separate table and requires additional disk space. The “Key” field and “Patient ID” can be used for tracking or printing results, but the software does not link records belonging to the same patient.

8.5.5.14 Can I use information from a complex survey design to obtain nationally representative results?

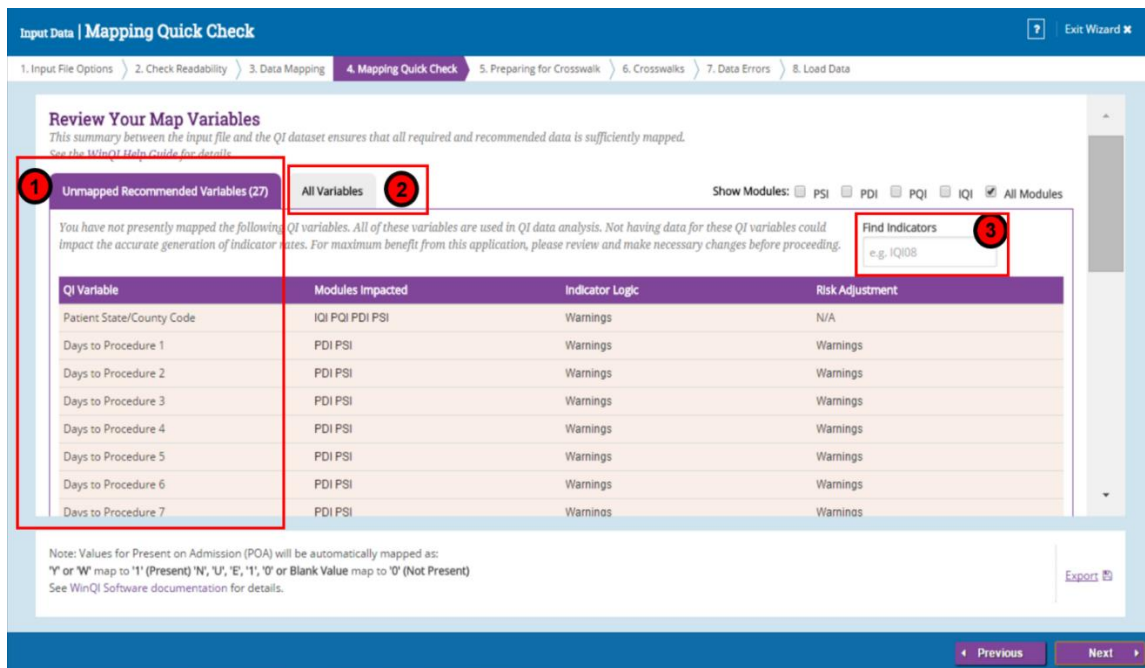
No. The software is intended to be used with data that cover an entire patient population (e.g., all discharges from a hospital in a year) or that were sampled from a patient population using simple random sampling. The software does not support weighted QI estimates or standard errors for weighted estimates. Thus, analyses using data obtained from a complex sampling design will not produce accurate estimates for the population from which the data were sampled.

8.6 Mapping Quick Check

8.6.1 What is this screen for?

This screen (Screenshot 7) summarizes the information from your data input file so that you can have a clear understanding of which QI variables have been mapped to your input variables and which have not been mapped. Unmapped recommended variables are especially called out since QI analysis may not be accurate unless these variables are included and mapped. This screen will help you see what impact unmapped variables in your file will have and if you wish to continue without mapping those variables or if you wish to go back and map these variables prior to continuing.

Screenshot 7: Mapping Quick Check



8.6.2 How is this screen organized?

1 8.6.2.1 Unmapped Recommended Variables

In the Unmapped Recommended Variables tab, you can see which QI modules and indicators are impacted by each unmapped recommended variable and learn more about whether or not each variable affects indicator logic or risk adjustment. Click on the text in any field under the Modules Impacted, Indicator Logic or Risk Adjustment columns for more information about the impacts of each QI variable. To know more about what a 'recommended variable' is, see above section. While the software will not stop you from moving forward without including and mapping all the recommended variables, it is highly recommended that you do so to allow for the most accurate reporting.

2 8.6.2.2 All Variables

By clicking the <All Variables> tab, you will see the full set of mapped and unmapped variables.

3 8.6.2.3 Module/Indicator Search

If you have an interest in knowing what variables impact a specific module, you have the ability to filter the information by one or more modules using the filters at the top of the chart. The default view will show information for all modules. If you are interested in knowing what variables impact a specific indicator, you can search for it by typing its number in the **Find Indicators** search box. Please do not include spaces in the Indicator

number. For example, to search for IQI08, type IQI08 (without space) and not IQI 08 (with space).

8.6.3 What should I do here?

Scan the list of warning messages to see if anything needs to be corrected. If you would like to go back and map the recommended QI variables to your data input file or otherwise edit your variable mapping, click <Previous> to return to the **Data Mapping** step.

When you are satisfied with your mapped variables, click the <Next> button to continue on to the **Prepare for Crosswalk** step in the import process.

8.7 Prepare for Crosswalk

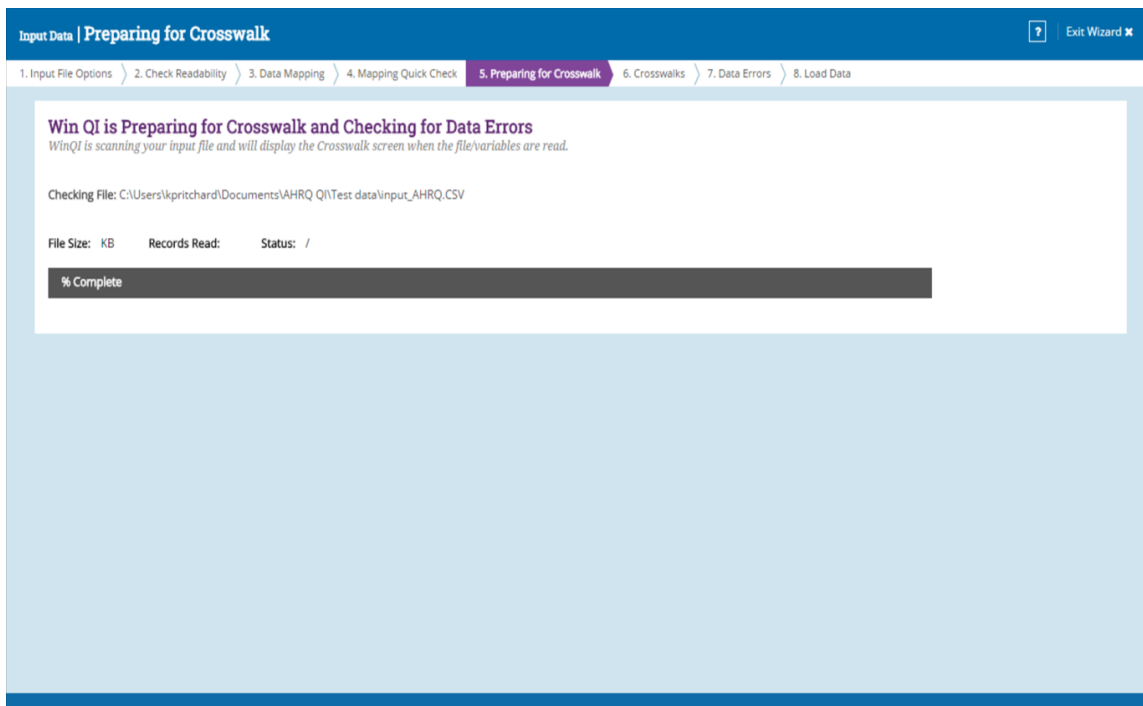
8.7.1 What is this screen for?

During this step in the import process, the application is reading your input file per the data mapping specified in the previous step. It is processing the values specified for the crosswalk variables and also determining errors in the data values specified in the file. Data errors will be displayed on the subsequent Data Errors screen.

8.7.2 How is this screen organized?

As Screenshot 8 shows, the progress bar indicates the percentage of your input file that has been read by the application. You can also use the number of records read or the status to gauge completeness of the readability check. When the scan is complete, a message will appear stating that “Your file is finished reading” and a check mark will appear to the right of the progress bar.

Screenshot 8: Prepare for Crosswalk



8.7.3 What should I do here?

Once the application has finished processing, click the **<Next>** button to proceed to the **Crosswalks** step.

8.8 Crosswalks

8.8.1 What is this screen for?

The purpose of this screen (Screenshot 9) is to allow you to review and confirm the crosswalk of the values in your input file to the values used by the WinQI software for the following variables:

- Admission Source
- Admission Type
- Discharge Disposition
- Primary Payer
- Race
- Sex

For more information about the values used by the WinQI software, please refer to the WinQI Input Data Dictionary.

Screenshot 9: Crosswalks

Crosswalks - Map Your Input Values to QI Variables

The values of the following variables have specific meaning. Choose the description that indicates the meaning of each value in your input file.

24 total values in 4 variables

Values will be set to missing (8): — Please Select —

Values will be excluded (0): — Please Select —

Jump to variable (4): — Please Select —

Export Data Mapping

Your Data: "ASOURCE" is mapped to QI data: "Admission Source"

Input Value	# of Occurrences	QI Value	Status
6	16	0: Missing	* For these records, the QI value will be considered Missing for indicators that rely on this field.
7	60	0: Missing	* For these records, the QI value will be considered Missing for indicators that rely on this field.
8	1787	0: Missing	* For these records, the QI value will be considered Missing for indicators that rely on this field.
9	3	0: Missing	* For these records, the QI value will be considered Missing for indicators that rely on this field.
10	7	0: Missing	* For these records, the QI value will be considered Missing for indicators that rely on this field.
1	7092	1: ER	
2	385	2: Another hospital	

Previous Next

8.8.2 How is this screen organized?

1

8.8.2.1 Input Variables, Occurrences, QI Value

For each variable, the table will display the input value, the number of occurrences of each input value, the corresponding QI value and an optional message indicating status of the mapping.

2

8.8.2.2 Filters to jump to a specific value or variable

There are three dropdowns at the top which allows to jump to a specific value of variable (missing or exclude) or a variable itself.

Also at the left corner it displays total number of variables in crosswalk and total number of distinct values in those variables.

8.8.3 What should I do here?

The WinQI software assigns specific meaning to these values and processes them a certain way, so it is important that the values accurately reflect their intended meaning (refer to the Input Data Dictionary for more information about each variable and corresponding values). Compare the Input Value to the proposed QI Value. Where an input value is not a valid QI value (or may be blank) the software may assign it by default to either “Missing” or “Exclude from Dataset”, based on the severity of having an invalid value for that variable. Please review each mapping and make changes if needed. To specify a different QI value, click the arrow next to the QI Value, and select one from the drop-down menu.

Before moving on to the next step in the import process, you may export your map settings by clicking the <Export> button. Mappings selections from **Specify Input Options**, **Data Mapping**, and **Crosswalk** screens will be included in the export. The mapping file can be used to specify the data structure of a future input file and save time in the import process.

If you would like to go back and review the summary of your mapped and unmapped variables, click the <Previous> button to go back to the **Mapping Quick Check** section.

Once you have reviewed the values for each input value and are ready to move on, click <Next> to go to the **Data Errors** section.

8.8.4 Other Questions

8.8.4.1 What effect does <Map to Missing> have?

Missing values affect different variables in different ways. Records with missing values for sex will not be loaded. You may map values to missing for admission type, admission source, and discharge disposition, but this will affect the assignment for some indicators. For example, a missing disposition code is a denominator exclusion criterion for some indicators. Primary payer is used solely for stratification; missing values will be displayed as “Missing” in any reports. Missing race values affect provider-level and area-level indicators differently. For provider indicators, a missing race may be used in stratification. However, race is required for obtaining the denominator of area-level indicators, and missing values cannot be used.

8.8.4.2 Why would I want to exclude cases from the dataset?

This option will depend on your knowledge of your input data. Particular values may be the result of data errors or they may be from cases that are incomplete.

You can also use this option to limit your analysis to a particular population of interest. For example, to get female-only rate reports, you can exclude all males.

8.9 Data Errors

8.9.1 What is this screen for?

Prior to loading the data, this screen (Screenshot 10) identifies any data errors your input file contains. You may want to review the number and severity of errors to determine if you want to continue with the data load process or exit the process at this time and fix the data issues prior to loading the data.

Screenshot 10: Data Errors

Data Errors / Warning Report

The following statistics describe the data within your file. Your QI Dataset may be different if rows are excluded during the next step (Data Load).

The following errors and warnings were encountered in your input file. Please review carefully. Based on the nature and extend of the issues, it could severely impact the QI data analysis. We recommend that you fix all necessary issues in the input file and re-import the input file prior to proceeding with QI generation.

Severity	Column	Records Affected	Errors / Warnings	System Actions Taken
Soft Error	Age in Days	9644	Age is greater than zero. Age in Days only applies for Age < 1.	
Soft Error	Birth Weight Grams	166	Value less than 200.	
Soft Error	Age in Days	9644	Value greater than 365.	
Warning	Present on Admission 28	31	Column has a value, but 'Diagnosis Code 28' column does not (warning)	
Warning	APR-DRG	9906	Column has a value, but 'APR-DRG Risk of Mortality' column does not (warning)	
Warning	Present on Admission 30	22	Column has a value, but 'Diagnosis Code 30' column does not (warning)	
Warning	Diagnosis Code 24		Column of ICD-9-CM codes does not have any leading zeros (warning)	
Warning	Diagnosis Code 26	1648	Column has a value, but 'Diagnosis Code 25' column does not (warning)	
Warning			Column of ICD-9-CM codes does not have any leading zeros (warning)	
Warning			Column of ICD-9-CM codes does not have any leading zeros (warning)	

Some of your errors may have mapping related errors. You may fix these in the data mapping section.

Export all error / warning messages

Previous Next

8.9.2 How is this screen organized?

1

8.9.2.1 Errors

Errors will be displayed in order of severity of the error. In some cases, it may be a warning only. You can determine the action that will be taken by the software as a result of each error by reviewing the field to the right of the error description field. Some potential actions are: the record will not be loaded or the value of the variable will be set to blank (missing).

2

8.9.2.2 Export Messages

You can export all error messages by clicking the **<Export all error / warning messages>** button at the bottom of the chart. You will want to export the error messages if you wish to review the data errors with someone other than the person running the software to determine next steps.

8.9.3 What should I do here?

Review the error messages (and the corresponding action that will be taken by the system) to see the impact of each error and decide whether you'd like to continue on through the import process or go back and fix the issues. Know your data. The warnings provided are intended to catch common errors. However, depending on the typical case mix and coding conventions in your institution, these warnings may or may not be significant. If you decide to move forward without addressing the errors or warnings, the system may change the value set to missing or exclude the record from analysis based on the severity of the issue. It is

recommended that you fix all necessary issues and reimport the updated file to ensure greater accuracy of the QI results.

If you choose not to address the errors and warnings and continue with loading the data, you may proceed to the **Load Data** section by clicking the <Next> button.

8.9.4 Other Questions

8.9.4.1 How can I find out what rows had problems?

Formatting errors due to individual values on records are written to the QI Session Log (see Section 8.1). You can view the error messages along with the line number if you view the Session Log. [Figure 5](#) shows an example screenshot of lines printed to the Session Log. The QI Session Log may be accessed from the Home Screen under the Tools section.

Figure 5. How to Identify Rows With Problems

Check For Data Errors

Reading column names from the first row in the file

Read 106 values from first row.

KEY column number = 1

Hospital ID column number = 34

Reading Text File (CSV)

File is 1046475 characters.

Row 4, COLUMN Age, KEY 94615. Not an integer: "abcdefg"

Row 6, COLUMN Age, KEY 94617. Missing or invalid required value

Row 7, COLUMN Age, KEY 94618. Missing or invalid required value

Read 1046475 characters from file, total of 3637 rows

8.9.4.2 Does the program check for invalid ICD-9-CM (or ICD-10-CM) codes?

No. The program only performs basic format checks; it does not check the reasonableness of the data. A three- to five-character string will be accepted as a diagnosis code regardless of whether it “looks like” an ICD-9-CM code. Similarly, a three-to-seven character string will be accepted as an ICD-10-CM diagnosis code. Users should verify the quality of their discharge data by some other means before loading the file with this program.

8.9.4.3 Why does it check for leading zeros in ICD-9-CM codes?

QI users often use a spreadsheet program such as Excel to calculate some fields prior to loading data into the WinQI software. Frequently, the spreadsheet will reformat text it considers numbers into the simplest format. For example it may remove a leading zero that it considers unnecessary from “04567,” thus changing the code to “4567.” This is a completely different diagnosis code and will result in errors in your QI results.

The diagnosis codes in the range of 001 to 100 are related to infectious diseases. Removing all leading zeros can result in a subtle error in which some of the QI are unaffected and some are incorrect.

Since most diagnosis codes do not have leading zeros, it is certainly possible a data file will not have any leading zeros in a column. If you see a message “Column of ICD-9-CM codes

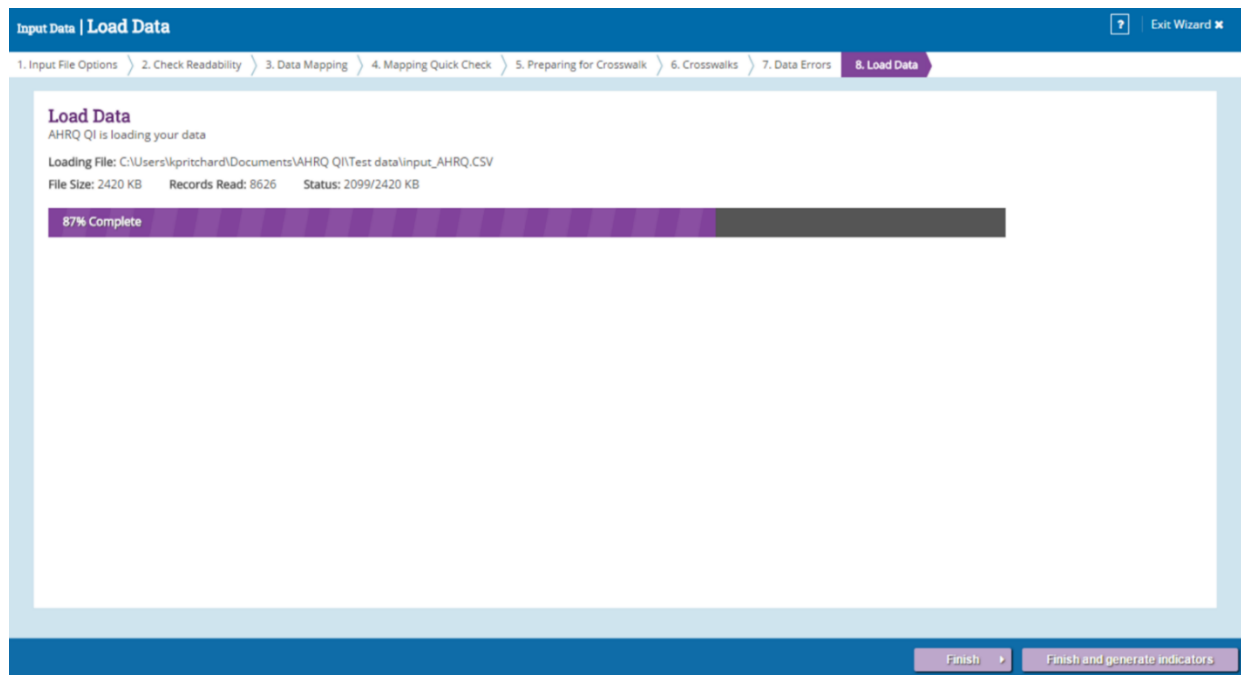
does not have any leading zeros (warning),” consider the number of diagnosis codes involved. The more codes found in a column, the more improbable it is that they will all happen to not having leading zeros. If all or most of the diagnosis and procedure code columns have this warning, it may signal that the zeros were stripped out of the entire file at some point prior to importing the file into the Quality Indicators Wizard.

8.10 Load Data

8.10.1 What is this screen for?

This screen (Screenshot 11) displays a progress bar as your data is loaded into the application. Upon completion, it will show some statistics of the loaded data and also any data errors that were encountered during the loading process.

Screenshot 11: Load Data



8.10.2 How is this screen organized?

8.10.2.1 Progress

This area lets you know how far along the read has progressed within your file. The number of records read increases incrementally as the check progresses. When the scan is complete, a “Your data is finished loading” message and a check mark will appear to the right of the progress bar.

8.10.3 What should I do here?

Upon completion of the data load, check the values displayed next to “Records Loaded” and “Records Not Loaded” to confirm that they match your expectations.

8.10.4 Other Questions

8.10.4.1 Why are records “not loaded”?

There are several reasons this might be true. Records may be excluded because you specified **<Exclude From Dataset>** in the Crosswalk screen. They may also be excluded due to data value errors, such as invalid numbers in the Age or DRG field. You will have an opportunity to review the reasons for excluded rows on the following screen.

8.10.4.2 What should I do if no records were loaded?

If no records were loaded, click **<Previous>** to return to the Crosswalk screen, and correct the value settings for records excluded from analysis. If you have errors in your data file, then you may need to exit the Import process, edit the file, and restart the Import Process.

8.11 Load Data Report

8.11.1 What are these screens for?

These screens (Screenshot 12 and Screenshot 13) provide a statistics of the data load process and summarize any errors or warnings encountered during the data load.

8.11.2 How are these screens organized?



8.11.2.1 Data Load Statistics Tab

This screen (Screenshot 12) will give you an idea of what the information in your imported data file looks like as a snapshot view of the data loaded in the QI database. When viewing the information under the Data Load Statistics tab, you will see a list of QI variables as well as the number and percent of records missing that value and the minimum and maximum values for each variable. This information that it reports should be checked for reasonableness based on your own knowledge of your data. For example, a file that has only adult patients should show 100 percent missing for “Age in Days,” but a file containing a mix of adults and children should reflect this mix by having “Age in Days” for every child under 1 year old.

Screenshot 12: Data Load Statistics

Load Data
AHRQ QI is loading your data

Loading File: C:\Users\kpritchard\Documents\AHRQ QI\Test data\input_AHRQ.CSV
File Size: 2420 KB Records Read: 9906 Status: 2420/2420 KB

100% Complete Your data is finished loading

Total Rows Loaded: 9906
Total Rows Excluded: 0
If you did not save your mapped settings at the crosswalk screen, or if you would like to export your cleaned data to use later you may do so below.

1 **Data Load Statistics** Errors/Warnings [Export this report for later use](#)

Column	Number Missing	% Missing	Min	Max
Admission Date	0	0%	-	-
Admission Source	0	0%	-	-
Admission Type	0	0%	-	-
Age	0	0%	0	110
Age in Days	9644	97%	0	335
APR-DRG	0	0%	3	988

[Export your map settings for later use](#) | [Export your cleaned data](#) [Export this report for later use](#)

Finish **Finish and generate indicators**

2 8.11.2.2 Errors and Warnings Tab

The Errors/Warnings tab (Screenshot 13) shows the data errors in the input file and what (if any) action was taken by the application when loading the corresponding records. Based on the severity of the error, certain records may get excluded from the data set entirely or the values of certain variables may be set to missing.

Screenshot 13: Errors and Warnings

Load Data
AHRQ QI is loading your data
Loading File: C:\Users\kpritchard\Documents\AHRQ QI\Test data\input_AHRQ.CSV
File Size: 2420 KB Records Read: 9906 Status: 2420/2420 KB

100% Complete Your data is finished loading

Total Rows Loaded: 9906
Total Rows Excluded: 0
If you did not save your mapped settings at the crosswalk screen, or if you would like to export your cleaned data to use later you may do so below.

Severity	Column	Records Affected	Errors / Warnings
Soft Error	Age in Days	9644	Age is greater than zero. Age in Days only applies for Age < 1.
Soft Error	Birth Weight Grams	166	Value less than 200.
Soft Error	Age in Days	9644	Value greater than 365.
Warning	Present on Admission 28	31	Column has a value, but 'Diagnosis Code 28' column does not (warning)
Warning	APR-DRG	9906	Column has a value, but 'APR-DRG Risk of Mortality' column does not (warning)

Export your map settings for later use | Export your cleaned data

Finish | Finish and generate indicators

8.11.2.3 What should I do here?

Scan this report to verify that your data were loaded correctly. You can export a summary of the Load Data process by clicking the **<Export your cleaned data>** button at the bottom of the table. You may also export the data that was loaded into the database by clicking the 'Save Data' button. For a description of the exported data, please see the Export Data Dictionary.

At this time, you will have an opportunity to save your mapping file for use at a later time. If you would like to save your mapping file, click **<Export your map settings for later use>** or **<Save Mappings>**.

Notice that once the load is complete, the application does not go straight to generating indicators. You have the opportunity to decide whether or not you would like to move on to this step at this time or save your data and generate indicators at a later time.

Clicking the **<Finish>** button will complete the import process and take you to the **Home Screen** where you will now see your imported file. If you decide to move on to **Generating Indicators** click the **<Finish and generate indicators>** button to complete the import process and move on to begin the indicator generation process.

8.11.3 Other Questions

8.11.3.1 Doesn't this tell me the same information as the Data errors screen?

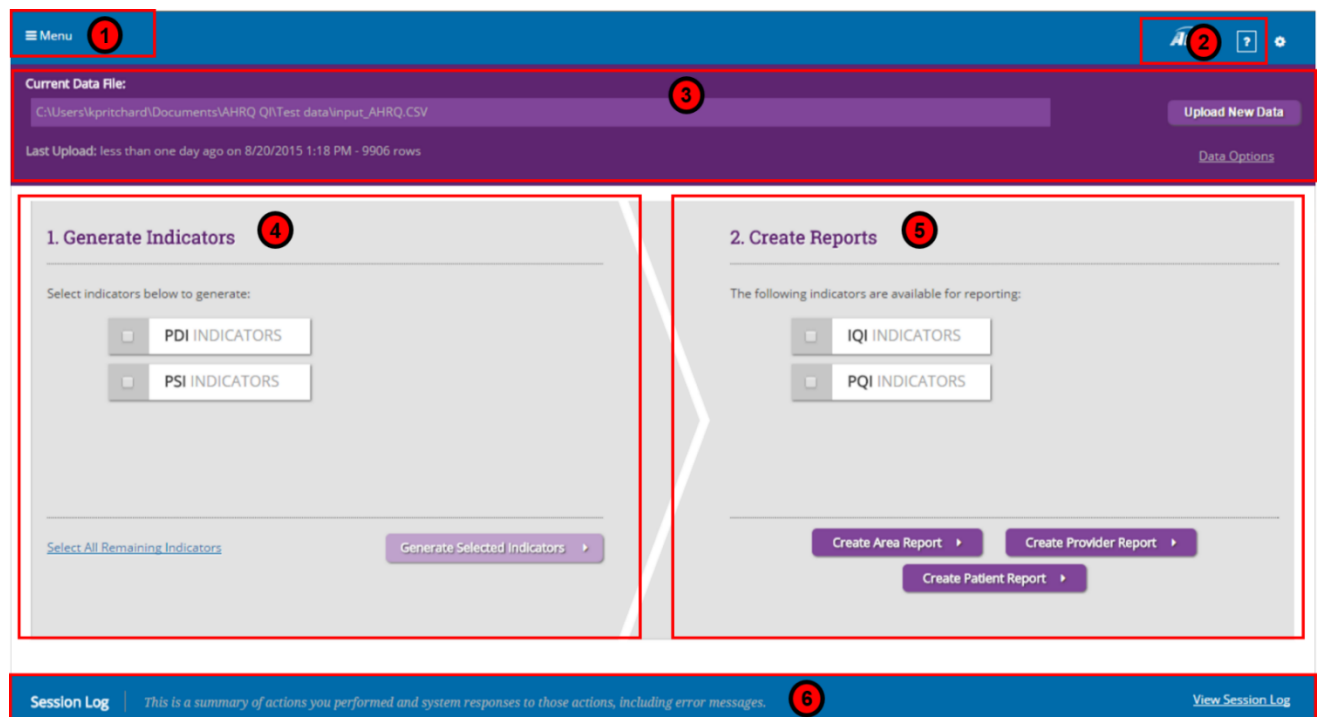
The Data errors screen tell you what will be loaded before the settings are finalized; this screen tells you what was actually loaded. The counts may be different when more than one error occurs on the same record.

8.12 Home Screen (after data import)

8.12.1 What is this screen for?

This screen (Screenshot 14) is what you will see after you have imported and saved a data file.

Screenshot 14: Home Screen (after data import)



8.12.2 How is this screen organized?



8.12.2.1 Menu

When you open the application after you have already imported and saved a data file, the menu options will expand to the following:

- **Home** – this will keep you on the current Home Screen
- **Data** – this will allow you to:
 - Import Data: launches the import file process so that you can upload another input data file that you would like to analyze.
 - Save Current Data: allows you to export the processed data in the QI format that was generated during the import process and currently saved in the database.
 - View Data Load Summary: displays the Data Load Report that appears at the end of the import file process for the data currently loaded in the database.
- **Indicators** – this allows you to view the module(s) for which indicators have not yet been generated and generate additional indicators.
- **Reports** – this allows you to create one of the following reports as long as you have you have generated indicators for one or more modules. You may also view the last run Provider or Area report.
 - Area Report
 - Provider Report
 - Patient Level Report
 - Quick Report
 - View Saved Report
- **Exit Program** – this option will exit the WinQI application
- **Close** – this option will close the menu



8.12.2.2 Help

When you click the <?> icon, you will have the option to either access the WinQI Help Guide.



8.12.2.3 Imported File Information

This section displays information about your most recent imported data file such as the name of the file, when it was uploaded and how many rows of data the file contains. If you would like to replace the data file with another, click the <Upload New Data> button and browse for the appropriate file. Remember that replacing your current data and importing a new file will cause the application to overwrite your existing data and all related indicator calculations.

If you would like to view the data load summary for the current import file or export the data, click the <Data Options> button.

4

8.12.2.4 Generate Indicators

This section allows you to generate indicators for the module(s) that have not yet been generated. Choose the module(s) that you would like to generate indicators for, or click **<Select All Remaining Indicators>**, then click the **<Generate Selected Indicators>** button to begin the Generate Indicators process. Please see Section <insert number> for a detailed description of the Generate Indicators process.

5

8.12.2.5 Create Reports

This section allows you to create reports for any module that indicators have already been generated for. One or more module can be selected to run Area or Provider reports, however, only one module can be selected to run a Patient Level report. Select your desired module(s) and choose the report you would like to create to begin the Create Report process.

6

8.12.2.6 Session Log

In this section you can view your session log. The Session Log provides a record of all activities during the session. It also records any errors that might be generated during the session. This information can be useful when trying to solve problems.

There are several ways to save your session log:

1. A cumulative Session Log is stored automatically in a text file that has the “.log” extension.
2. There is a **<Save QI Session Log>** button on the Home Screen, located under the tools menu. Selecting this control allows you to specify a different location (such as your desktop) to save a snapshot of the log information for the current session. This information is saved in Rich Text Format.
3. You can also select the save session log option in the left menu.

8.12.3 What should I do here?

Click one of the options in the Menu bar or on the main screen. You can generate indicators and create reports based on the current data import file or you can replace the current data file with another that you would like to analyze.

8.12.4 What happens to the data after the application is closed?

The most recent set of imported data and indicator calculations are saved between sessions. Once a new data file is loaded, the previous data file is replaced.

8.12.5 What if I forget to save a report?

The latest report will stay in the database until you go through the Create Reports process to generate a new report. You can use the **<View Saved Report>** option in the menu to access the report, and then use the **<Export this report for later use>** button on that screen to save the report to a file.

8.12.6 What if I have a problem?

You may contact qisupport@ahrq.hhs.gov if you have problems running the WinQI application. To provide context for your questions, please include a copy of the QI Session Log and a copy of your column mapping—either the .qim mapping file or the contents of the Mapping Quick Check screen

9. Generating Indicators

Once you have completed the import process, the next process is to begin Generating Indicators. Generating indicators goes through your loaded discharge data and performs all the QI analysis and indicator calculations necessary for creating reports. You do not need to generate indicators at the same time as importing the file. You may safely exit the application and return at a later time. As long as you have finished loading the data, your data will be saved in the database and available for you to generate indicators at a later time.

The process of generating indicators includes the following steps:

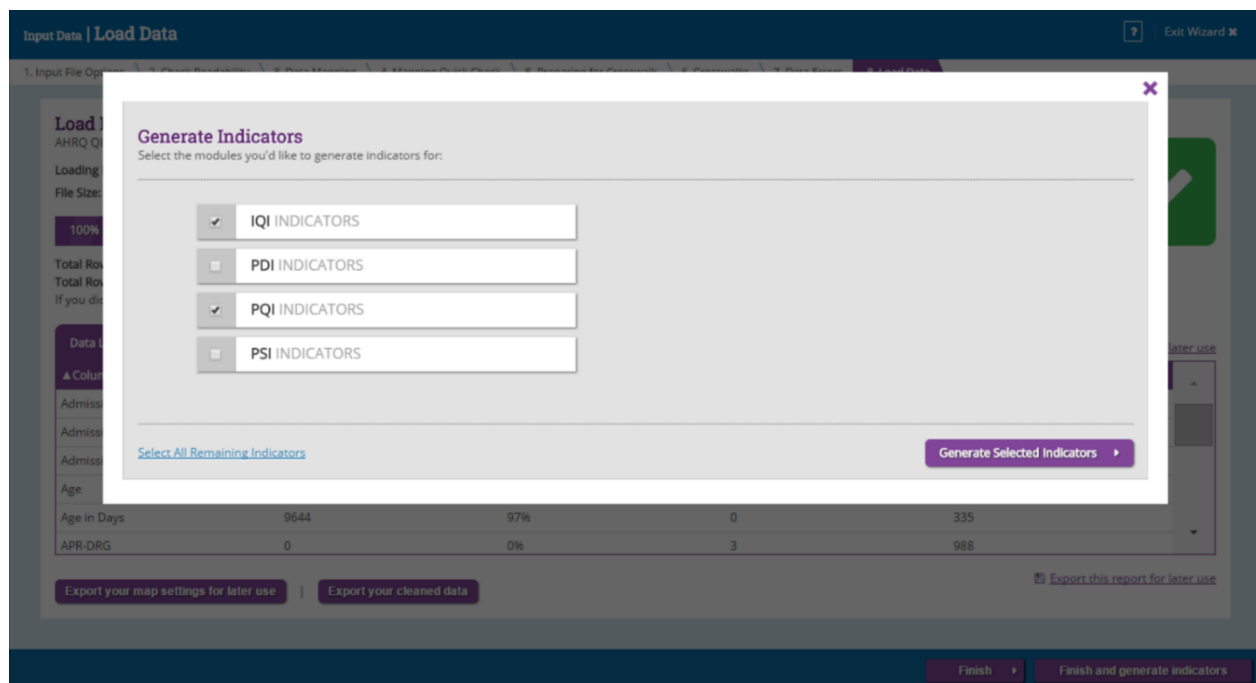
- Select Modules to Generate Indicators - allows you to select one or more modules (PQI, IQI, PSI, PDI) that you would like to generate indicators for.
- Generate Indicators - generates the indicators for the module(s) you have chosen to analyze.
- Display Quick Report - shows the total numerator and, where applicable, the denominator and observed rate for each indicator.

9.1 Select Modules to Generate Indicators

9.1.1 What is this screen for?

This screen (Screenshot 15) allows you to choose the module(s) that you would like to generate indicators for.

Screenshot 15: Select Modules to Generate Indicators



9.1.1.1 How is this screen organized?

Options for PQI, IQI, PSI, PDI and Select All will appear alongside checkboxes.

9.1.1.2 *What should I do here?*

You have the option to generate indicators for all modules or you can select the specific modules you are interested in analyzing. If you wish, you may return at a later time and generate indicators for subsequent modules as long as your input file hasn't changed. Selecting only some of the modules at a time also shortens the indicator generation process in any given session.

The application does not allow you to generate individual indicators within a module. If you are interested in a specific indicator, for example PSI 6, you must generate all PSI indicators. However when you begin creating reports, you will have the option to select specific indicators.

Once you have selected your desired module(s), click the **<Generate Selected Indicators>** button to move on to begin Generating Indicators.

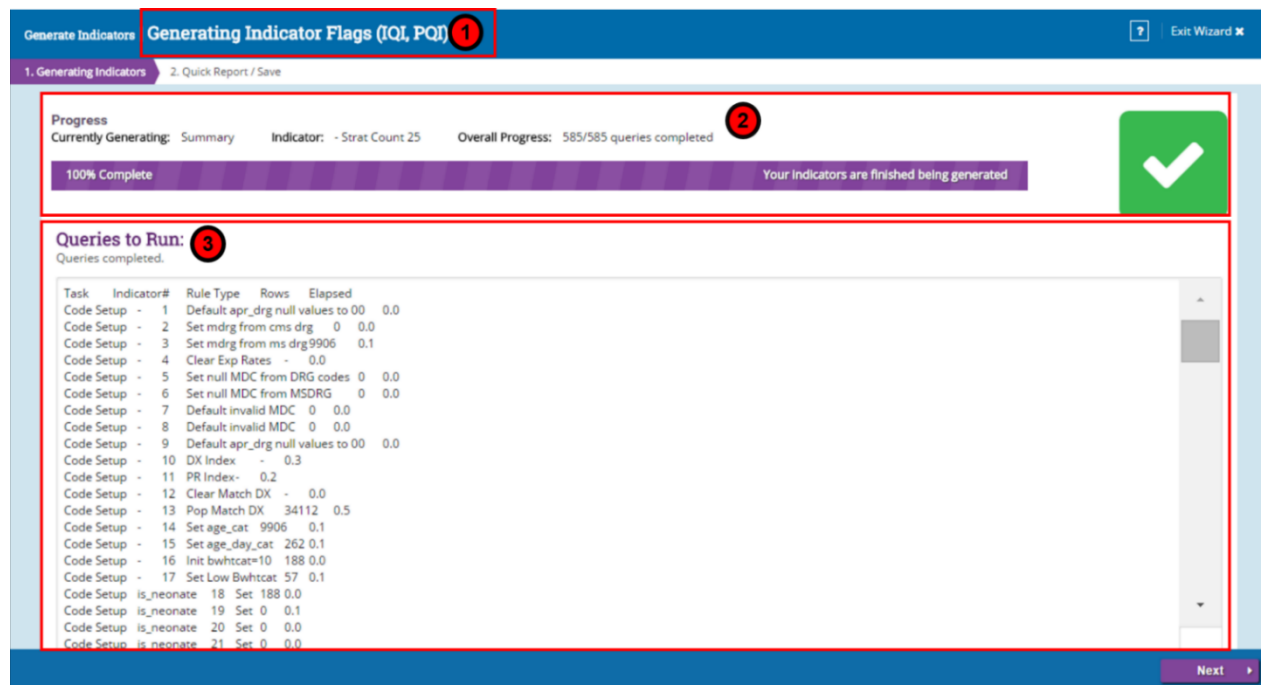
Throughout the Generating Indicators process, clicking the **<Cancel>** button will exit the screen and take you back to the Generating Indicators selection screen. If you have not completed the indicator generation process, any selections you have made will not be saved.

9.2 *Generate Indicators*

9.2.1 *What is this screen for?*

This screen (Screenshot 16) shows progress as the application works to generate indicators for the module(s) you selected in the Select Modules to Generate Indicators step. Generating indicators is a multi-step process and could take a few minutes to several hours based on the size of your input file.

Screenshot 16: Generate Indicators



9.2.2 How is this screen organized?

1 9.2.2.1 Modules

At the top of the screen, you will see the module(s) you have chosen to generate.

2 9.2.2.2 Progress

The progress bar tracks the application's progress generating the indicators for the module(s) you selected. When the generation has completed, the progress bar will display 100% Complete as well as a message saying "Your indicators are finished being generated." When the generation is 100% complete, you may proceed to the next screen.

3 9.2.2.3 Queries to Run

This section of the screen displays a list of all the work that the WinQI software is doing. Queries correspond to specific inclusion or exclusion rules listed in the *Technical Specifications* for each indicator. This information may also be helpful to AHRQ QIs support if you have questions about your results.

9.2.3 What should I do here?

Be patient during this process as some indicators are complex and the analysis may take several minutes or hours. When the queries are completed, a completed message will appear. If no errors were found, you will also see a message displayed indicating that no errors were encountered. If the application encountered any errors, an "Errors were encountered" message will appear as well as a link that will allow you to view the errors.

The <Next> button will be unavailable until after all the queries have been run, but when the generation is complete, you can move on to view a quick report of your data.

If you click the <Cancel> button at this stage, all the indicator calculations will be discarded and you will be taken you back to the Home Screen.

9.2.4 Other Questions

9.2.4.1 What's a "Query"?

This term is an instruction to the database. There is roughly one query per inclusion or exclusion rule listed in the AHRQ QI *Technical Specifications*.

9.2.4.2 What should I do if I get an error?

If you have an SQL error on this screen, your entire results should be considered invalid.

Check the QI Session Log to see what the error was. The error may be due to your database server being shut down; in that case, retry the data load at another time. Other errors should be sent to AHRQ QI support for assistance.

9.2.4.3 What should I do if I'm loading millions of rows and an SQL query times out?

You may edit the maximum amount of time each query is permitted to run on the Program Options screen. The default setting for "Indicator Query Timeout" is 7,200 seconds (2 hours). Normally, this is more than sufficient, but for very large datasets, you may need to increase this value. This timeout is the maximum allowed time for each query to complete without error; most queries will run much faster.

9.2.4.4 Why are there so many queries?

There are approximately 100 indicators, each with multiple rules. Additionally, there are queries to assign categories to discharges and to calculate risk-adjusted rates.

9.2.4.5 Why does it run all indicators when I am only interested in a few?

You only need to generate indicator flags once. The results are then summarized for quick reporting. Once this screen has completed, you may go through the create reports process multiple times to prepare reports that display as many or as few indicators as you wish. The entire indicator flagging analysis must run for a module before you can generate any reports for that module.

9.3 Display Quick Report

9.3.1 What are these screens for?

The purpose of the Quick Report screen (Screenshot 17 and Screenshot 18) is to give you an understanding of how your data translates into a report and allow you to check to see if your data appear to have been loaded properly.

9.3.2 How are these screens organized?

9.3.2.1 Provider Level Indicators

Screenshot 17: Provider Level Indicators

Generate Indicators | Quick Report (IQI, PQI) Done

1. Generating Indicators 2. Quick Report / Save

Quick Report
Filename: C:\Users\kpritchard\Documents\AHRQ QI\Test data\input_AHRQ.CSV
Number of records: 9,906 Has POA Flags: YES

Indicator	Name	Num.	Den.	Rate	Pop. Rate
IQI1	IQI 1 Esophageal Resection Volume	3	-	-	-
IQI2	IQI 2 Pancreatic Resection Volume	4	-	-	-
IQI4	IQI 4 Abdominal Aortic Aneurysm (AAA) Repair Volume	5	-	-	-
IQI5	IQI 5 Coronary Artery Bypass Graft (CABG) Volume	156	-	-	-
IQI6	IQI 6 Percutaneous Coronary Intervention (PCI) Volume	126	-	-	-
IQI7	IQI 7 Carotid Endarterectomy Volume	5	-	-	-

Your indicators have been generated.

Save Reports Save Data

Finish Finish and Generate Reports

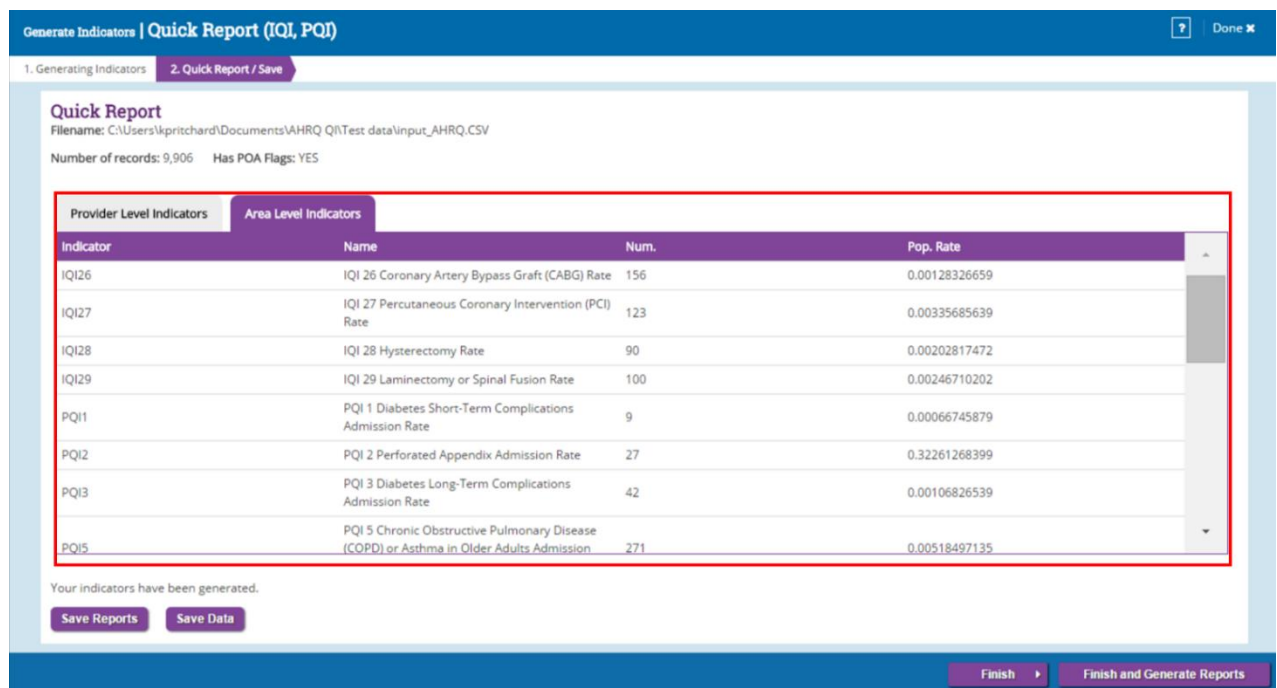
This area (Screenshot 17) displays the observed numerator, denominator, observed rate, and population rate for all provider-level indicators.

- **Numerator** - This term is the numerator for the observed rate. It is defined as the total number of cases that do meet the inclusion criteria as well as the flag criteria but do not meet the exclusion criteria.
- **Denominator** - This term is the denominator for the observed rate. It is defined as the total number of cases that meet the inclusion criteria but do not meet the exclusion criteria. Volume indicators are not reported as a rate and do not have a denominator.
- **Observed Rate** - This term is the observed rate for the indicator. This term is equal to the numerator divided by the denominator (Num/Den).

- Population Rate - This term is the overall rate for this indicator in the reference population. The reference population is pooled discharges from the 2013 SID. This rate is used in the calculation of the risk-adjusted rate (observed rate divided by the expected rate, multiplied by the population rate), and it is not affected by the currently loaded data. Please note that Population rate will not be available in the ICD-10 component of v6.0 version.

9.3.2.2 Area Level Indicators

Screenshot 18: Area Level Indicators



Generate Indicators | Quick Report (IQI, PQI) Done

1. Generating Indicators 2. Quick Report / Save

Quick Report
Filename: C:\Users\kpritchard\Documents\AHRQ QI\Test data\input_AHRQ.CSV
Number of records: 9,906 Has POA Flags: YES

Indicator	Name	Num.	Pop. Rate
IQI26	IQI 26 Coronary Artery Bypass Graft (CABG) Rate	156	0.00128326659
IQI27	IQI 27 Percutaneous Coronary Intervention (PCI) Rate	123	0.00335685639
IQI28	IQI 28 Hysterectomy Rate	90	0.00202817472
IQI29	IQI 29 Laminectomy or Spinal Fusion Rate	100	0.00246710202
PQI1	PQI 1 Diabetes Short-Term Complications Admission Rate	9	0.00066745879
PQI2	PQI 2 Perforated Appendix Admission Rate	27	0.32261268399
PQI3	PQI 3 Diabetes Long-Term Complications Admission Rate	42	0.00106826539
PQI5	PQI 5 Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission	271	0.00518497135

Your indicators have been generated.

Save Reports Save Data

Finish Finish and Generate Reports

This area (Screenshot 18) displays the number of cases found for each indicator in your discharge data along with the overall population rate.

- Numerator - This term is the numerator for the observed rate. It is defined as the total number of cases that do meet the inclusion criteria as well as the flag criteria but do not meet the exclusion criteria.
- Population Rate - This term is the overall rate for this indicator in the reference population. The reference population is pooled discharges from the SID data for the latest available year. This rate is used in the calculation of the risk-adjusted rate (observed rate divided by the expected rate, multiplied by the population rate), and it is not affected by the currently loaded data. Please note that Population rate will not be available in the ICD-10 component of v6.0 version.

9.3.3 What should I do here?

Pay close attention to the data in this report! This is your opportunity to perform a quality check of the report to make sure the values are what you expected or if you need to go back and make changes to your data before you begin creating detailed reports. If you would like to save this report, click the **<Save Reports>** button.

When you are satisfied with the information the quick report is showing, you can click the **<Finish and Generate Reports>** button to begin creating your reports. A window will appear that allows you to select the module(s) you would like to generate reports for. Select the appropriate module(s), then select whether you would like to create an area, provider or patient level report. Only one module may be selected when creating a patient level report.

Click the **<Finish>** button if you would like to create your reports at a later time. You will be returned to the Home Screen which will display the module(s) you can create reports for when you are ready to do so. The Home Screen will also display the modules for which indicators have not yet been generated and hence are not yet available for creating reports. You can also use the **<Finish>** button if you decide that you need to go back and make changes to your data. This will take you back to the Home Screen. Once there, you can click the **<Upload New Data>** button to upload a new input file with your edited data.

NOTE: The application will not allow you to create reports for the modules you have not already generated indicators for.

9.3.4 Other Questions

9.3.4.1 Why is the Population Rate inappropriate for comparison?

The population rate is based on the reference population, which is based on the universe of hospital discharges in 45 States (see [Acknowledgments](#)). It would only be fair to compare your observed rate with the population rate if your hospital(s) perfectly matched the average demographics and severity of cases in this sample. A more appropriate rate with which to compare is the expected rate, which can be calculated during the [Create Reports](#) process. If you are using data from a State, the State rate is included when you do a provider report as a total for all hospitals with the indicator. The State rate can be compared with the population rate or individual hospital rates.

9.3.4.2 Why is the population rate displayed?

It can be useful to see if your observed rates are “in the same ballpark” as the population rate to determine whether the data load was correct. You can use the population rate to verify the calculation of the risk-adjusted rates that are calculated during the create reports process.

Note: Population rate will not be displayed for the ICD-10 component of v6.0 version.

9.3.4.3 *Why are no denominators or rates displayed for area-level indicators?*

It is necessary to go through the create reports process to select the correct census population to get a denominator for area-level indicators. Also, many discharge files will contain a few out-of-State discharges that can inflate the total population counts if the proper stratifiers are not selected.

10. Create Reports

10.1 Report Basics

This section describes the type of reports the WinQI Software provides and walks you through the process of generating each report. The reports you can create include the Provider report, Area report, Patient level report, Case level details, and Quick Report.

This Screen (Screenshot 18) allows you to choose the type of report you would like to create and select the module(s) you would like to create the report for. You can reach this screen in two ways: by continuing on to create reports immediately after you have completed generating indicators or by choosing your reports and module(s) on the homepage after indicators have been generated during follow-on sessions.

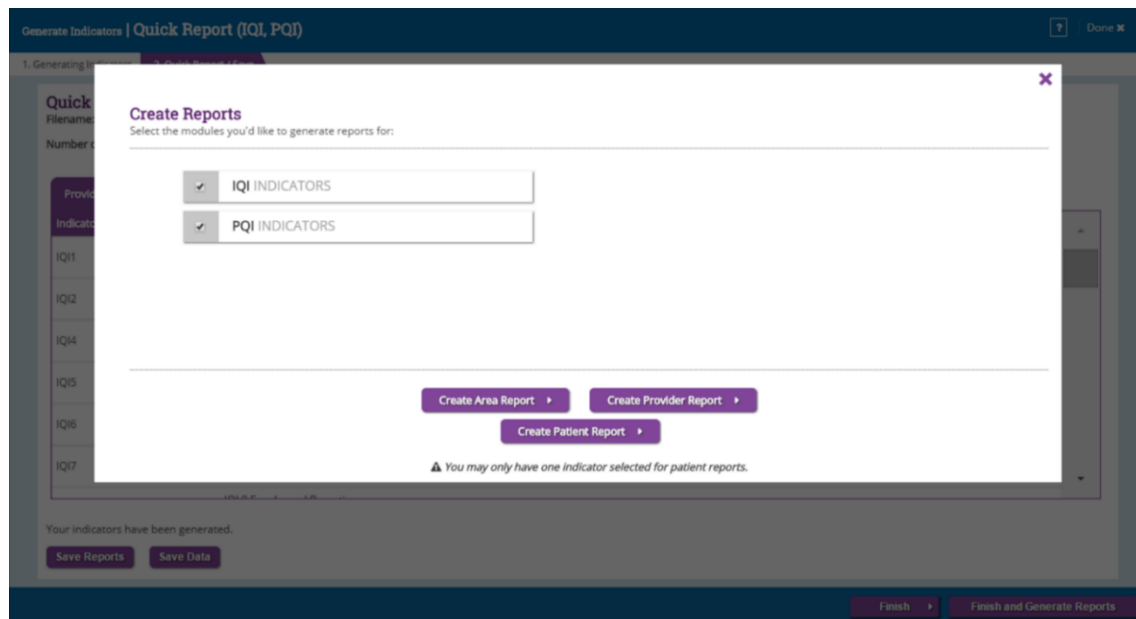
The WinQI software provides reporting that takes you through the following steps:

- **Quality Indicators** - Select QIs to include in a report;
- **Filter Criteria** - Select the hospitals, quarters, and/or years by which you wish to select records;
- **Stratifiers** - Select stratifiers for your report;
- **Additional Options** - Select additional options for data analysis; and

Create Reports - Generate and view provider-level and area-level reports.

Additional Reports - Drill down to corresponding patient level and case level details report.

Screenshot 19: Create Reports



NOTE: The application will not allow you to create reports for the modules you have not already generated indicators for.

10.2 What kinds of reports can I generate?

The Quality Indicators™ Windows® (WinQI) software provides several types of reports. The list in [Table 3](#) specifies the kinds of reports that WinQI can generate and the instruction manual sections that cover them.

Table 3. Types of Reports Provided by WinQI Software

AREA-LEVEL RATES REPORT	
Section 7.3	Select Indicators and Composite Measures
Section 7.4	Select Date Range
Section 7.5	Select Stratifiers for Use With Area Indicators
Section 7.6	Additional Options for Data Analysis
Section 7.7	Create Report
Section 7.8	View Report
PROVIDER-LEVEL RATES REPORT	
Section 7.10	Select Indicators
Section 7.11	Select Filter Criteria (Hospitals, Date Ranges, and Composite Indicators)
Section 7.12	Select Stratifiers for Use With Provider Indicators
Section 7.13	Additional Options for Data Analysis
Section 7.14	Create Report

Section 7.15	View Report
Section 7.16	Composite Report
PATIENT-LEVEL REPORT	
Section 7.17	Patient Level Report
Section 7.18	Case Details
QUICK REPORT ON INPUT DATA	
Section 6.3	Quick Report

10.3 Area-Level Report

This section explains the process for creating an area report from your data. The Area-level report shows calculated QI rates for Area-level indicators. Area-level indicators identify hospital admissions that evidence suggests might have been avoided through access to high-quality outpatient or preventative care. Population estimates from a U.S. Census Bureau dataset are usually used to calculate area-level rates. Please refer to the Empirical Methods document

(http://www.qualityindicators.ahrq.gov/Downloads/Resources/Publications/2015/Empirical-Methods_2015.pdf) for more details on calculating area-level rates.

When calculating the report, you may select specific indicators and filter or group by specific criteria. Details are noted in the steps below. The steps for running this report include:

- Select Indicators
- Select Date Range
- Select Stratifiers
- Additional Options for Data Analysis
- Create report
- Display Report

10.3.1 Select Indicators (Area-level Report)

Use this screen (Screenshot 20) to specify the indicators to include in the report. You can also select whether to include the composite measures. Beginning with WinQI Version 4.5, six provider-level indicators have been stratified into two to five mutually exclusive sub-indicators:

- IQI 02 Pancreatic Resection Volume
- IQI 04 Abdominal Aortic Aneurysm (AAA) Repair Volume
- IQI 09 Pancreatic Resection Mortality Rate
- IQI 11 Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate
- IQI 17 Acute Stroke Mortality Rate

PSI 04 Death Rate among Surgical Inpatients with Serious Treatable Complications

The software reports observed, expected, and risk-adjusted rates for the overall indicator and for the individual strata. Smoothed rates are not reported for the strata.

Indicators on this screen are listed by module then number. Strata results are listed by module and number of the overall indicator, followed by another number matching the order of the strata; i.e., “1” for stratum A, “2” for stratum B, etc. [Table 4](#) lists the stratified indicators, the strata names, and the number convention used on the selection screen.

Table 4. List of Stratified Indicators Introduced in Version 4.5

MODULE AND NUMBER ON SELECTION SCREEN	INDICATOR TITLE
IQI2	IQI 02 Pancreatic Resection Volume
IQI201	IQI 2A Pancreatic Resection Volume – Stratum A
IQI202	IQI 2B Pancreatic Resection Volume – Stratum B
IQI4	IQI 04 Abdominal Aortic Aneurysm (AAA) Repair Volume
IQI401	IQI 4A Abdominal Aortic Aneurysm (AAA) Repair Volume – Stratum A
IQI402	IQI 4B Abdominal Aortic Aneurysm (AAA) Repair Volume – Stratum B
IQI403	IQI 4C Abdominal Aortic Aneurysm (AAA) Repair Volume – Stratum C
IQI404	IQI 4D Abdominal Aortic Aneurysm (AAA) Repair Volume – Stratum D
IQI9	IQI 09 Pancreatic Resection Mortality Rate
IQI901	IQI 9A Pancreatic Resection Mortality Rate – Stratum A
IQI902	IQI 9B Pancreatic Resection Mortality Rate – Stratum B
IQI11	IQI 11 Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate
IQI111	IQI 11A Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate – Stratum A
IQI112	IQI 11B Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate – Stratum B
IQI113	IQI 11C Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate – Stratum C
IQI114	IQI 11D Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate – Stratum D
IQI17	IQI 17 Acute Stroke Mortality Rate
IQI171	IQI 17A Acute Stroke Mortality Rate – Stratum A
IQI172	IQI 17B Acute Stroke Mortality Rate – Stratum B
IQI173	IQI 17C Acute Stroke Mortality Rate – Stratum C
PSI4	PSI 04 Death Rate among Surgical Inpatients with Serious Treatable Complications
PSI42	PSI 4A Death Rate among Surgical Inpatients with Serious Treatable Complications – Stratum A
PSI43	PSI 4B Death Rate among Surgical Inpatients with Serious Treatable Complications – Stratum B
PSI44	PSI 4C Death Rate among Surgical Inpatients with Serious Treatable Complications – Stratum C
PSI45	PSI 4D Death Rate among Surgical Inpatients with Serious Treatable Complications – Stratum D
PSI46	PSI 4E Death Rate among Surgical Inpatients with Serious Treatable Complications – Stratum E

To ensure that the strata are mutually exclusive within each indicator, the strata were prioritized in order of their relative prevalence in the reference population data. In the event that a discharge record meets the denominator criteria for several strata, the software assigns the record to the one (and only one) candidate stratum whose outcome is most prevalent in the reference population.

For IQI 02 and 09, strata are prioritized to ensure mutual exclusivity by determining whether the criteria for stratum A is met and, if not, testing whether the criteria for stratum B are met. The mutual exclusivity prioritization for IQI 02 and IQI 09 is as follows:

STRATUM A: PANCREATIC CANCER
STRATUM B: BENIGN

For IQI 04 and IQI 11, the mutual exclusivity prioritization is as follows (listed from highest mortality to lowest mortality):

STRATUM A: OPEN – RUPTURED
STRATUM C: ENDOVASCULAR – RUPTURED
STRATUM B: OPEN – UNRUPTURED
STRATUM D: ENDOVASCULAR – UNRUPTURED

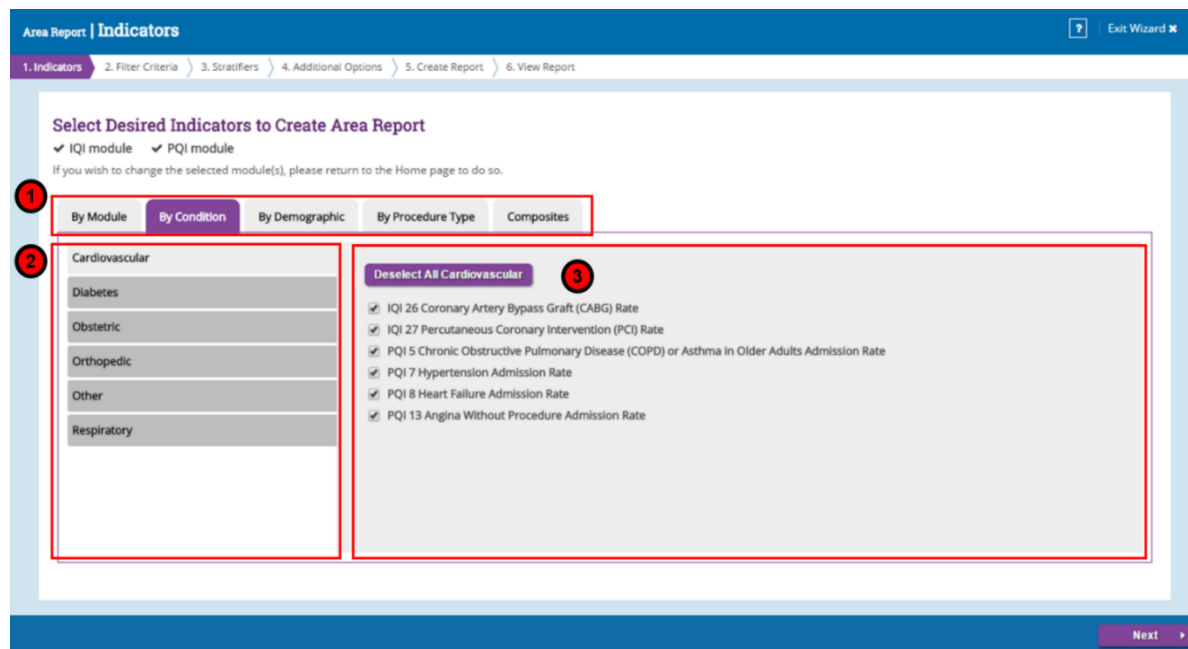
For IQI 17, the mutual exclusivity prioritization is as follows (listed from highest mortality to lowest mortality):

STRATUM B: INTRACEREBRAL HEMORRHAGE
STRATUM A: SUBARACHNOID HEMORRHAGE
STRATUM C: ISCHEMIC STROKE

For PSI 04, the mutual exclusivity prioritization is as follows:

STRATUM D: SHOCK/CARDIAC ARREST
STRATUM C: SEPSIS
STRATUM B: PNEUMONIA
STRATUM A: DVT/PE
STRATUM E: GI HEMORRHAGE/ACUTE ULCER

Screenshot 20: Select Indicators (Area-level Report)



10.3.2 How is this screen organized?

Indicators are organized according to categories that may be of interest to different types of users. Each indicator is listed in several different tabs. Stratified indicators will also appear on this screen and are labeled accordingly; e.g., Stratum A, Stratum B, etc.

NOTE: If you have created reports previously, all of your selections have been saved. To specify a new group of Indicators, deselect and select the indicators as desired.

1

10.3.2.1 Top-Level Tabs

- **By Module**—the traditional way of finding indicators; separate tabs for the PSIs, IQIs, PQIs, and PDIs. Only those modules that you selected on the earlier screen will be shown here.
- **By Condition**—screens for indicators that are grouped by the particular condition.
- **By Demographic**—screens for each of several interesting demographic groupings.
- **By Procedure Type**—separate screens for indicators related to medical, surgical, and obstetric cases.
- **Composite Measures**—the area-level composite measures. A checkbox appears next to each of the composite measures. The indicators comprising the composite measure are listed below the composite measure name.

2

10.3.2.2 Subtabs

Each of the tabs contains a number of screens as described above that are accessed via the subtabs.



10.3.2.3 Indicators

Each screen (subtab) contains a list of indicators with checkboxes. All indicators apply to that category and sub-category. For example, the ‘Cardiovascular’ sub-tab under the ‘By Condition’ tab will list all area-level indicators for the Cardiovascular condition for the selected modules.

There is also a checkbox above the list that can be used to select all indicators in that category.

10.3.3 What should I do here?

Click on one of the tabs in the top row to select a category. When a tab in the top row is clicked, subtabs are displayed below the main tabs.

Select the indicators you would like to run a report for. You can use the tabs and subtabs to locate specific indicators. There is no need to search through all of the tabs if you know exactly which indicators you are looking for. Instead, it may be more useful for you to search in the “By Module” tab.

Click <Next> when the desired indicators and composites have been selected.

10.3.4 Timesaving Tips

10.3.4.1 Selecting/Deselecting Everything

You have the option to “Select All” or “Deselect All” indicators within modules. The first time you run the application, all of the indicators for selected modules will be preselected by default. If you are only interested in running a report on a small number of indicators, you should deselect all indicators and then select the few you would like to analyze.

10.3.4.2 Clearing a Screen

Click the “Select All...” checkbox to select the entire screen, and then click it again to deselect the entire screen.

10.3.5 Other Questions

10.3.5.1 Why can't I find an indicator that used to be on this screen?

Area- and provider-level indicators pertain to different populations and are completely separated into two different processes. You will only see area-level indicators under area-level report. Additionally, only indicators for the modules you have chosen will appear on

this screen. If you would like to view indicators from a different module, you will have to return to the main screen and generate indicators for additional modules.

10.3.5.2 Why can't I find indicators for a certain module?

Only modules that you have selected on the previous screen will be available to use to create a report. If a desired module does not show up on the previous screen, this is likely because indicators have not been generated for that particular module. In order to create a report for a module that indicators have not been generated for, go back to the home screen and go through the Generate Indicators process for the desired module.

10.3.5.3 What if I just want to see the cases for each indicator?

You don't need to go through the full reports process to see the individual cases for each indicator. After you have imported your data file, you can view the cases using the Patient Level Report option (see Section 7.17).

10.3.5.4 Where can I find more information about the use of composite measures?

The AHRQ QI team conducted several workgroups on composite measures, one for each of the QI modules ([PQIs](#), [IQIs](#), [PSIs](#), [PDIs](#)). The reports from these workgroups can be downloaded from the respective QI resource screens.

PQI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PQI/PQI_Composite_Development.pdf

IQI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/IQI/IQI_Composite_Development.pdf

PSI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/PSI_Composite_Development.pdf

PDI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/PDI_Composite_Development.pdf

10.4 Select Date Range (Area Reports)

10.4.1 What is this screen for?

This screen (Screenshot 21) allows you to limit the discharge records you wish to include on your report to only those that occurred during the selected quarters. Additionally, in this screen you may select a different denominator for each year.

Screenshot 21: Select Date Range (Area Reports)

Area Report | Modify filter criteria for your report

1. Indicators 2. Filter Criteria 3. Stratifiers 4. Additional Options 5. Create Report 6. View Report

Modify filter criteria for:

Date Ranges [Select all Dates](#) [Clear all Dates](#)

☒ Discharges from 2014

☒ Quarter 1 (3371 discharges) ☒ Quarter 2 (4490 discharges) ☒ Quarter 3 (2045 discharges)

Numerator = Count of Flagged 2014 Discharges

Denominator = County population(s) from 2014

Previous Next

10.4.2 How is this screen organized?

10.4.2.1 Discharge Year

Each year represented in the input data is listed.

10.4.2.2 Quarters

The quarters in the input data are listed below the corresponding year.

10.4.2.3 Numerator and Denominator

The numerator (count of all flagged discharges for the corresponding year) and denominator appear below the quarters. The default denominator is the population from the corresponding year.

10.4.3 What should I do here?

Modify or select the checkboxes next to the years and quarters that you wish to include in your report. If desired, you may also change the default denominator for some or all of the years in your data. The following options are available:

- **County population(s) from [year]** - The default option. This option is the total population from the selected year for all counties in your input file.
- **Adjusted [year] population** - The denominator of each rate will be scaled down based on the number of quarters selected for that year. This option is useful if you want to get annualized rates but only have a partial year's data.

- **Population from a different year** - You may specify a different year's population to go with your input data. This option may be useful if the year field is incorrect or missing.

None - No population data will be included to match this year in your input file. This option may be appropriate if you have records with an invalid year field but still wish to count these records as part of the total. You should not use this option in combination with a stratification selection that includes year.

10.4.4 Other Questions

10.4.4.1 How does the program determine the numerator and denominator for each rate?

The program first gets a list of all of the discharge year and quarter values that you have selected. This selection includes the records with a missing year or quarter value if you have checked the appropriate box.

The program then totals the numerators for the selected indicators for each year grouped by the selected stratifiers.

For the denominator, the program totals the census population that you have selected for each discharge year. These are also grouped by the selected stratifiers. Unless you have selected "none" above, you will have a separate total population for each discharge year.

The indicator numerators and denominators are joined together to get the observed rate grouped by the selected stratifiers.

10.4.4.2 Why should you not stratify by discharge year when you have selected "None" for a discharge year?

These records will be grouped by the discharge year, but they will not have a denominator.

10.4.4.3 When is it useful to select "None" for a denominator?

This option may be appropriate in two instances: (1) You have incorrect year data for some records, or (2) you want a 1-year rate that spans multiple calendar years.

In the first case, suppose you have many discharges that occurred in "2006," but a few are incorrectly recorded as "206." If you select "County population for 2006" as the denominator for the 2006 records and "None" as denominator for the "206" records, the total numerator will include all records and the total denominator will include the population for 2006. (If you stratify by year, then the numerator cases will be separated and "206" records will have no denominator.)

In the second case, if you want a 12-month rate that spans 2 calendar years, you would select the population to go with one discharge year and not select a population for the other year.

10.4.4.4 How is an annualized rate calculated?

When selecting the denominator to go with a discharge year, the population is divided by four times the number of selected quarters. So if you only select three quarters but want an annualized rate, you would get the following:

- Total numerator = sum of the cases from three quarters
- Total denominator = three times one-quarter of the population (If you stratify by quarter, this will be three lines.)

Total observed rate = three-quarters of cases divided by three-quarters of the total population. Multiplied through, this is four times the rate per quarter.

10.4.4.5 How does denominator selection compare with the options in the AHRQ SAS® QI syntax?

To use the SAS QI software for area-level indicators, you must select the population year in your control file. Your data file is assumed to be a full year of discharges, and thus, the observed rate is calculated as the numerator total divided by the population for the selected year. It does not matter what data you have populated in the “Year” field in the discharge records—if you have several different “Year” values, these are treated as though they are all the same.

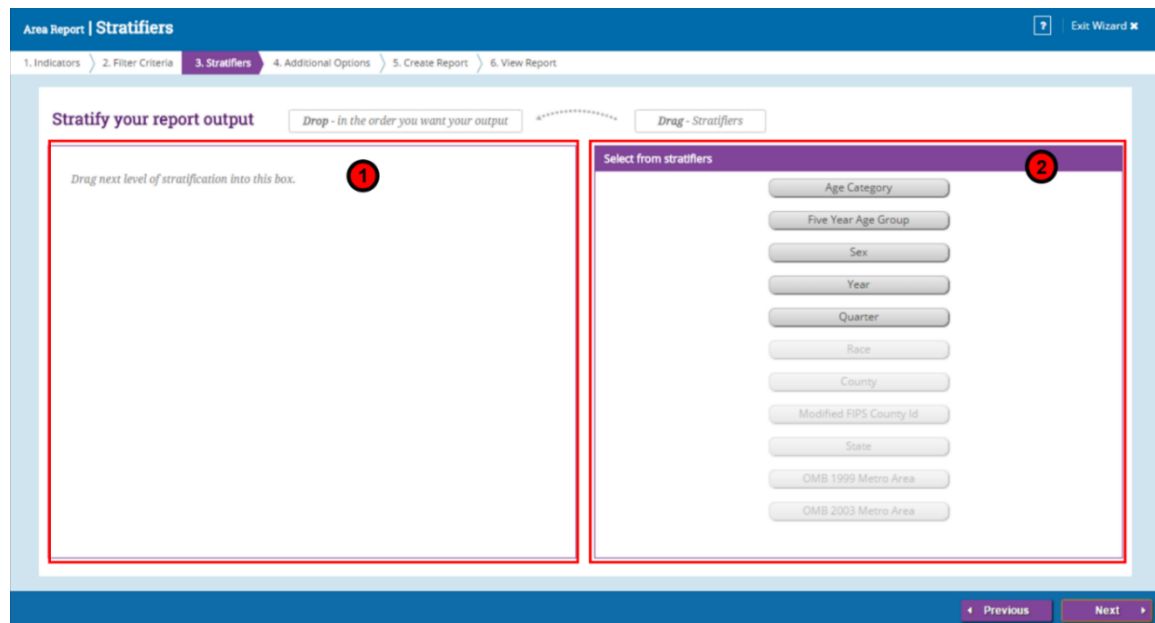
To get the same result from WinQI, you should select the year from the list. If you have more than one discharge year, you should select the year as the denominator only once and select “None” for the other discharge years.

10.5 Select Stratifiers for Use with Area Indicators

10.5.1 What is this screen for?

This screen (Screenshot 22) is used to build a hierarchy of stratification for area-level indicators. On this screen, you will indicate to the WinQI software what variables you want your report output grouped by. You will also indicate the order of the group-by variables.

Screenshot 22: Select Stratifiers (Area Reports)



10.5.2 How is this screen organized?

1

10.5.2.1 Selected Stratifiers

This area displays the area-level stratifiers (variables to group the report by) currently selected in the hierarchical order in which they will be sorted.

2

10.5.2.2 Select From Stratifiers

This area displays a list of available stratifiers (variables to group the report by) that can be used for reports on area-level indicators.

10.5.3 What should I do here?

Click on a desired stratifier in the 'Select from Stratifiers' box, drag it to the selected stratifiers' area, and drop it in the desired position. Area stratifiers are: Age category, Five year age group, Sex, Year, Quarter, Race, County, Modified FIPS County ID, State, OMB 1999 Metro area, and OMB 2003 Metro area. Only those variables that are in your input file and have been mapped to QI variables will be available for stratification.

To remove a selected stratifier, click and drag it back to the "Select From Stratifiers" list.

To reposition a stratifier, click and drag it up or down in the list of selected stratifiers. You will see a line that shows you where the stratifier will be placed.

10.5.4 Other Questions

10.5.4.1 What's the difference between provider- and area-level stratifiers?

The population used to calculate area-level indicators is based on the U.S. Census. In that context, some fields do not make sense, such as “Hospital ID.”

10.5.4.2 What is a “stratifier”?

A stratifier is how your data will be broken down. In database parlance, this is equivalent to an item in a “group by” clause.

10.5.4.3 What if I just want the totals for each indicator?

Do not select any stratifiers.

10.5.4.4 Does the order matter?

Yes, it determines the order in which the stratifiers are listed on the reports and the order in which the rows are sorted.

10.5.4.5 How do I know which stratifiers to select?

Select stratifiers that will provide you with useful information. For example, if you are processing data from a single provider, selecting a single stratifier for “County” will not provide you with any useful information. If your data do not separate patients by race, then the “Race” stratifier will be of no use.

10.5.4.6 Can I display the names of each county?

Yes. Select the “State/County” stratifier, then choose the option “Show the names of each county, state, or metro area” on the Additional Options for Data Analysis screen. The county will be the patient county of residence.

10.5.4.7 What are the definitions of the metro areas?

The Office of Management and Budget defines metropolitan and micropolitan statistical areas. Refer to [Unites States Census Bureau](#) for more information.

10.5.4.8 What is the Modified Federal Information Processing Standards (FIPS) stratifier?

FIPS codes are a standardized set of numeric or alphabetic codes issued by the National Institute of Standards and Technology to ensure uniform identification of geographic entities through all Federal Government agencies. The entities covered include States and statistically equivalent entities, counties and statistically equivalent entities, named populated and related location entities (such as places and county subdivisions), and American Indian and Alaska Native areas.

The modified FIPS stratifier aggregates the independent cities with the counties that surround them. This table can be viewed at <http://www.nist.gov/itl/fips.cfm>

Users no longer need to use the modified FIPS codes assignment for area denominators. However, that option is still available. In the modified FIPS codes, certain independent cities (e.g., Baltimore City, Carson City, and St. Louis City), and areas within Hawaii and Virginia, are assigned to different area groupings in the modified FIPS categories.

10.6 Select Additional Options for Data Analysis

10.6.1 What is this screen for?

This screen (Screenshot 23) lets you choose additional calculation and display options before generating reports.

Screenshot 23: Select Additional Options for Data Analysis

The screenshot displays the 'Additional Options For Data Analysis' screen. It features a blue header with navigation tabs: 1. Indicators, 2. Filter Criteria, 3. Stratifiers, 4. Additional Options (selected), 5. Create Report, and 6. View Report. The main content area is divided into several sections, each highlighted with a red box and a numbered circle:

- Report Title (7):** A text field containing 'Report from 8/21/2015 3:26:35 PM'.
- Rates (1):** A section with checkboxes for 'Observed Rates' (checked), 'Expected Rates', 'Observed/Expected (OE) Ratio', 'Reference Population Rate', 'Risk Adjusted Rates', 'Smoothed Rates', 'Report Confidence Intervals' (with a radio button for '95%'), and 'Include Indicator Totals' (checked).
- Scaling (2):** A section with a checked 'Display Raw Rates' option, a 'Scale To Outcomes Per:' dropdown set to '100', and a 'Number of Decimals' dropdown set to '6'.
- Report Layout (3):** A section with checkboxes for 'Show Indicators in Rows' (checked), 'Show Indicators in Columns', 'Include Title in Exported Files' (checked), and 'Show Names of Indicators'.
- Cell Suppression (4):** A section with a checked 'Exclude results that are based on too few patients?' option and a 'Minimum patients per cell' input field set to '25'.
- Geography Stratifiers (5):** A section with a checked 'Show Numeric FIPS Codes' option and an unchecked 'Show the names of each county, state, or metro area' option.
- Area Report Options (6):** A section with checkboxes for 'Include only the population of counties with discharge records' (checked), 'Use the total population of each state or metro area', and 'Risk adjust for SES poverty decile'.

At the bottom of the screen, there are 'Previous' and 'Next' buttons.

10.6.2 How is this screen organized?



10.6.2.1 Rates

This area provides checkboxes to select which rate values you want included in your report. You may also decide whether or not to include the overall totals for each indicator here. If the Composite Measures have been selected, be sure to select

“Smoothed Rates.” Please note that if the reference population rate is not selected, then you should disable reporting of the expected rate and observed/expected ratio (see following section). If not, the software will report erroneous values for the expected rate and observed/expected ratio. The observed/expected ratio is the observed rate divided by the expected rate. This ratio is the most appropriate benchmark of performance. A ratio of one indicates performance is as expected. A ratio over one is performance that is higher (usually worse) than expected, and a ratio less than one is performance that is lower (usually better) than expected.

[Table 5](#) provides definitions for the observed, risk-adjusted, smoothed, expected, and reference population rates reported by the software. For more information, see [Section 9.4](#).

Table 5. Definition of Rates Reported by Software

TYPE OF RATE	DEFINITION
Observed	The rates as initially calculated applying the indicator definitions (see Section 9.4) to the set of data for the numerator (outcome of interest) and denominator (population at risk).
Expected	Rates that assume an “average” performance for each patient group based on the reference population but the provider’s actual case mix. The reference population is based on all States participating in the most recently available HCUP SID.
Reference Population	The rate for the current reference population (see Section 9.3.4.2).
Risk-adjusted	The estimated performance of providers or areas if those providers or areas had an “average” case mix. This average case mix is estimated using proportional indirect standardization: risk-adjusted rate=(observed rate/expected rate)×reference population rate.
Smoothed	Estimated using multivariate signal extraction (MSX). MSX smoothing estimates the effect of random differences in the observed rate across providers or areas. In essence, smoothing describes how persistent a rate would be from year to year. Smoothing is a useful tool to “level the playing field” for providers or areas with a small numbers of cases.

HCUP: Healthcare Cost and Utilization Project; MSX: multivariate signal extraction; SID: State Inpatient Databases

The AHRQ WinQI application calculates rates as raw rates. When you are creating your reports, you may report rates using optional multipliers in order to facilitate interpretation and analysis and to compare user rates to published national rates. Recommended multipliers are based on having rates expressed in whole numbers per multiplier units rather than decimal fractions. Please select the desired multipliers in the Scaling section of the Additional Options screen.

Table 6. Rate Unit Definitions

TERM	DEFINITION	EXAMPLE
Raw rate	Numerator divided by denominator	0.0255
Multiplier	A unit of “per X”	1,000
Reported rate	Raw rate x multiplier	25.5 per 1,000

The risk-adjusted rate is disabled if certain stratifiers are selected. Change your stratification to enable risk-adjusted rates.

The risk-adjusted rate is only appropriate at the hospital level or above. Age and sex are attributes of the patients that affect the expected outcome. Thus, it would be inappropriate to calculate a risk-adjusted rate based on the total reference population but observed rates and expected rates that are only based on a segment of the population.

Beginning with WinQI v4.5, the software no longer reports expected rates, risk-adjusted rates, and smoothed rates for the following measures: IQI 21 Cesarean Delivery Rate, Uncomplicated; IQI 22 Vaginal Birth After Cesarean (VBAC) Delivery Rate, Uncomplicated; IQI 23 Laparoscopic Cholecystectomy Rate; IQI 24 Incidental Appendectomy in the Elderly Rate; IQI 25 Bilateral Cardiac Catheterization Rate; IQI 33 Primary Cesarean Delivery Rate, Uncomplicated; IQI 34 Vaginal Birth After Cesarean (VBAC) Rate, All; PSI 17 Birth Trauma Rate – Injury to Neonate; PSI 18 Obstetric Trauma Rate – Vaginal Delivery With Instrument; and PSI 19 Obstetric Trauma Rate – Vaginal Delivery Without Instrument. These measures are not risk adjusted, and so, only the numerators, denominators, and observed rates are reported.



10.6.2.2 Scaling

This area allows you to select the scale that rates are reported in and the number of decimal places to use.

[Table 7](#) provides the recommended multiplier for the different categories of AHRQ QIs. For more information, consult the *Technical Specifications* for a specific indicator.

Table 7. Recommended Multipliers for Different Categories of Indicators

PROVIDER OR AREA	TYPE OF INDICATOR	EXAMPLE	RECOMMENDED MULTIPLIER
Area	Avoidable hospitalization	PQI 08 Heart Failure Admission Rate	100,000
Area	Potentially preventable adverse event	PSI 23 Central Venous Catheter-Related Blood Stream Infection Rate	100,000
Area	Utilization	IQI 26 Coronary Artery Bypass Graft (CABG) Rate	100,000
expProvider	Mortality	IQI 15 Acute Myocardial Infarction (AMI) Mortality Rate	1,000

Provider	Potentially preventable adverse event	PSI 03 Pressure Ulcer Rate	1,000
Provider	Utilization	IQI 22 Vaginal Birth After Cesarean (VBAC) Delivery Rate, Uncomplicated	1,000
Provider	Volume	IQI 05 Coronary Artery Bypass Graft (CABG) Volume	None

3

10.6.2.3 Report Layout

This area allows you to select whether to display the indicators as rows (creating a long report format) or as columns (creating a wide report format). You may also select whether to include the title when exporting the report.

4

10.6.2.4 Cell Suppression

This area provides the option to blank out rates for cells that are based on a small population or a small number of cases.

In performance measurement work, it is often recommended that rates be suppressed (i.e., not reported) when there are fewer than 20 cases in the denominator. This exclusion rule helps to protect the identities of hospitals and patients.

Rates will be suppressed (set to null) in the resulting report if:

- There are fewer than N people or cases in the denominator (where N is the value you supply for “Cell size to suppress”);
- There are fewer than N cases of interest in the numerator; and
- There are fewer than N cases that are in the denominator less the numerator.

5

10.6.2.5 Geography Stratifiers

This area allows you to select whether to display FIPS codes or the name of the county, State, or metro area.

6

10.6.2.6 Area Report Options

This area allows you to select the population to be included in the denominator and whether risk adjustment of area rates includes adjustment for socioeconomic status (“SES”).



10.6.2.7 Report Title

This area allows you to change the default report title, which includes the date and time the report was generated.

10.6.3 What should I do here?

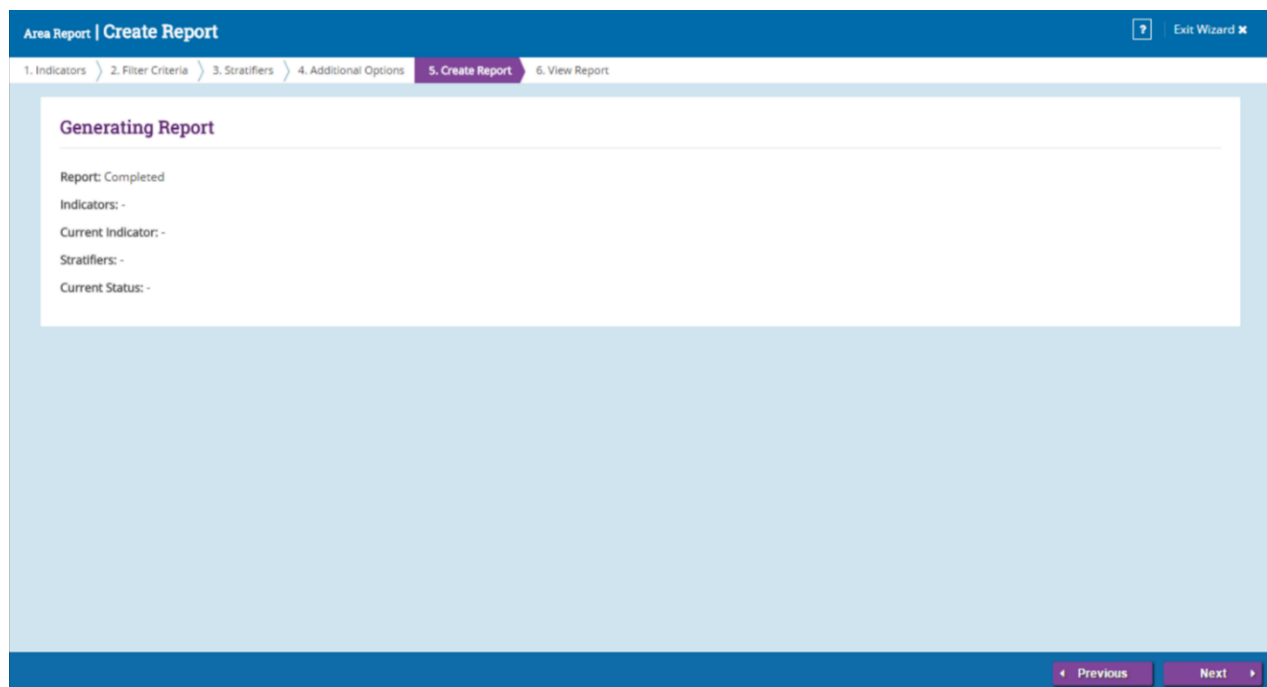
Change any of the options for your report on this screen.

10.7 Create Report

10.7.1 What is this screen for?

This screen (Screenshot 24) displays the progress of the process as your report is created. When completed, you may proceed to view the report.

Screenshot 24: Create Report



10.7.2 How is this screen organized?

The window displays its current processing so that you can track its progress.

10.7.3 What should I do here?

You don't need to do anything on this screen until the processing is complete. Once the progress bar has reached 100%, click <Next> to view the report. This report can be viewed

later from the main window using the <**View Saved Report**> button. The report will be saved until you generate another report.

10.8 View Report

10.8.1 What is this screen for?

This screen (Screenshot 25) displays the area- and provider-level reports that have been generated. The last generated report is shown. You can access this window from the main menu, or you may access it immediately after creating a report. Once a report has been generated, it stays in the database until another report is generated. You can export the report to save the data permanently. See [Appendix C](#) for detailed information about the export format.

Screenshot 25: View Report

Area Report | View Area Report

1. Indicators > 2. Filter Criteria > 3. Stratifiers > 4. Additional Options > 5. Create Report > 6. View Report

Report Summary

Report Title: Report from 8/21/2015 12:37:45 PM
Source Data: ...itthard\Documents\AHRQ QI\Test data\input_AHRQ.CSV
Rate Per: population Created: 8/21/2015 12:38:08 PM Rows in Report: 21

Rows Per Page: 20

Export this report for later use

Indicator	Observed Numerator	Observed Denominator	Observed Rate
IQI 26	156	0	0.000000
IQI 27	123	0	0.000000
IQI 28	90	0	0.000000
IQI 29	100	0	0.000000
PQI 1	9	0	0.000000
PQI 2	27	116	0.232759
PQI 3	42	0	0.000000
PQI 5	271	0	0.000000
PQI 7	22	0	0.000000
PQI 8	404	0	0.000000

1 2 Next Page

Export this report for later use

Previous Done

10.8.2 How is this screen organized?



10.8.2.1 Report Summary

The report provides the following information about the displayed report:

- Source Data—complete path to the data file that was used to generate the report.
- Rates Per—the report scale; depends on the level of report displayed.
 - Area-level report = “case”
 - Provider-level report = “population”
- Date Created—date and time the report was generated.

- Rows in Report—total number of rows in report being displayed.



10.8.2.2 Rows Per Page Control

The <**Rows per Page**> control defines the maximum number of rows displayed per page while viewing the report online. The default of 20 allows you to view the report without scrolling; a different value may be more appropriate for a faster computer or if you wish to sort the data.



10.8.2.3 Report Window

The large area in the center of the Reports screen displays the report data. Data displayed may include any of the following columns:

- Indicator
- Stratifier(s)
- Observed Numerator
- Observed Denominator
- Observed Rate
- Expected Rate
- O/E Ratio
- Population Rate
- Risk-Adjusted Rate
- Smoothed Rate^{††}
- Risk Adj Conf Int Low
- Risk Adj Conf Int High

Note: Population rate, Risk-adjusted rate, Smoothed rate, and Risk Adj Conf Int Low and High will not be available for the [ICD-10 component of v6.0 version](#)



10.8.2.4 Screen Controls

The <**Export this report for later use**> button at the top and bottom of the screen can be used to export the report in .csv format that can be read by Excel

^{††} Smoothed rates will not be calculated for strata within stratified indicators. Only the overall indicator will have smoothed rates.

and other programs. If you would like to go back and make changes to the “Additional Options for Data Analysis” screen, click the <Previous> button. If you are satisfied with the report, click <Done>.

10.8.3 What should I do here?

If the report requires more than one page, you may use the <Next Page> and <Previous Page> buttons under the report to see more data. Or go directly to a page number.

To see more records, use the Page Controls, or use the <Rows per Page> control at the top of the screen.

10.8.4 Other Questions

10.8.4.1 My report has missing values for the composite measures. Why?

Missing values for the composite measures can be attributed to any of the following issues:

1. “Calculate Smoothed Rates” was not selected on the Additional Options for Data Analysis screen. If smoothed rates are blank, then the above formula will result in a missing value.
2. All component measures that contribute to the composite measures were not selected. If any of the necessary component measures are left out, this will result in a missing value.
3. The necessary stratifiers were not selected. Selected Year and Quarter will produce composite measures. Any stratifiers chosen outside of these will result missing values.
4. You are running the **ICD-10 component of v6.0 version**

10.9 Provider-Level Report

This section explains the process for creating a provider report from your data. The Provider-level report shows calculated QI rates for provider-level indicators. Provider-level indicators address questions such as: “Did the patient experience an adverse quality-related event while in the care of a specific healthcare provider?” Or “did the patient have an inpatient procedure for which there are questions of overuse, underuse, or misuse?” You can refer to the Empirical Methods document

(http://www.qualityindicators.ahrq.gov/Downloads/Resources/Publications/2015/EmpiricalMethods_2015.pdf) for more information on calculating provider-level rates.

When calculating the report, you may select specific indicators and filter or group by specific criteria. Details are noted in the steps below. The steps for running this report include:

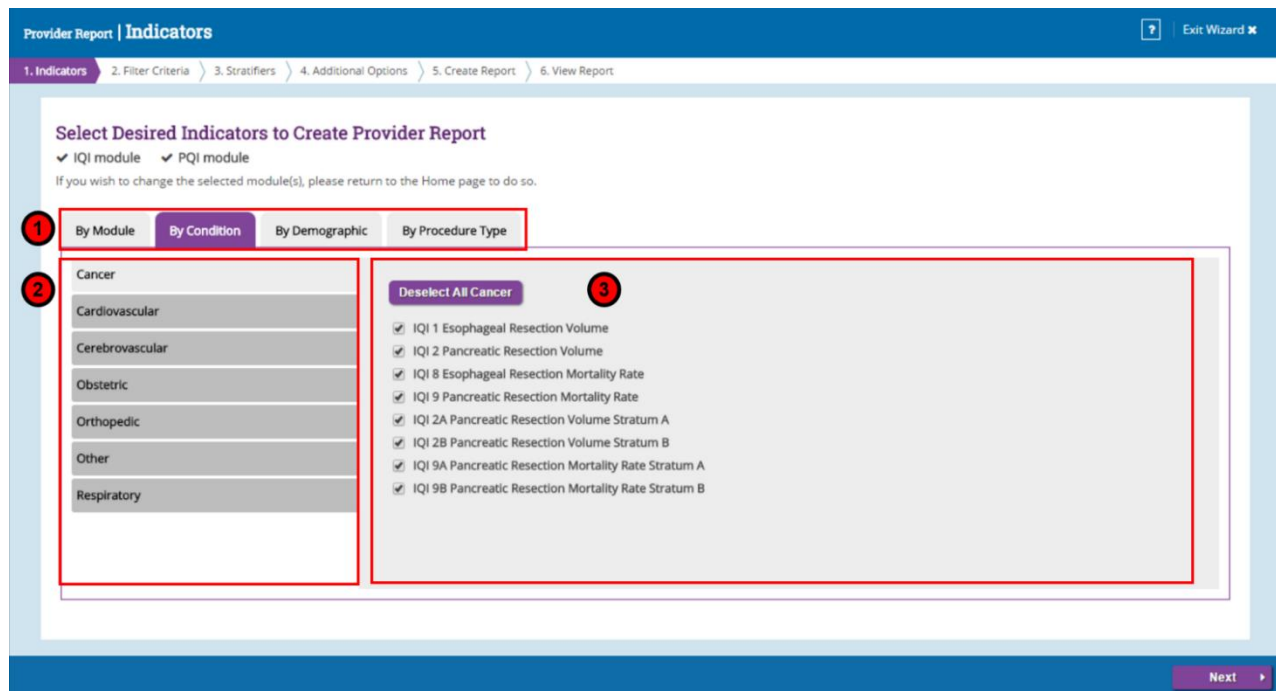
- Select Indicators
- Select Filter Criteria (Hospitals, Date Range, and Composite Measures)
- Select Stratifiers

- Additional Options for Data Analysis
- Create report
- Display Report

10.10 Select Indicators

Use this screen (Screenshot 26) to specify the indicators to include in the report.

Screenshot 26: Select Indicators (Provider Report)



10.10.1 How is this screen organized?

Indicators are organized according to categories that may be of interest to different types of users. Each indicator is listed in several different tabs. Stratified indicators will also appear on this screen and are labeled accordingly; e.g., Stratum A, Stratum B, etc.

NOTE: If you have created reports previously, all of your selections have been saved. To specify a new group of Indicators, deselect and select the indicators as desired.



10.10.1.1 Top-Level Tabs

- **By Module**—the traditional way of finding indicators; separate tabs for the PSIs, IQIs, PQIs, and PDIs. Only those modules that you selected on the earlier screen will be shown here.
- **By Condition**—screens for indicators that are grouped by the particular condition.

- **By Demographic**—screens for each of several interesting demographic groupings.
- **By Procedure Type**—separate screens for indicators related to medical, surgical, and obstetric cases.



10.10.1.2 Subtabs

Each of the tabs contains a number of screens as described above that are accessed via the subtabs.



10.10.1.3 Indicators

Each screen (subtab) contains a list of indicators with checkboxes. All indicators apply to that category and sub-category. For example, the ‘Cardiovascular’ sub-tab under the ‘By Condition’ tab will list all area-level indicators for the Cardiovascular condition for the selected modules.

10.10.2 What should I do here?

Click on one of the tabs in the top row to select a category. When a tab in the top row is clicked, subtabs are displayed below the main tabs.

Select the indicators you would like to run a report for. You can use the tabs and subtabs to locate specific indicators. There is no need to search through all of the tabs if you know exactly which indicators you are looking for. Instead, it may be more useful for you to search in the “By Module” tab.

Click <Next> when the desired indicators and composites have been selected.

10.10.3 Other Questions

10.10.3.1 Why can’t I find an indicator that used to be on this screen?

Area- and provider-level indicators pertain to different populations and are completely separated into two different processes. You will only see area-level indicators under area-level report. Additionally, only indicators for the modules you have chosen will appear on this screen. If you would like to view indicators from a different module, you will have to return to the main screen and generate indicators for additional modules.

10.10.3.2 What if I just want to see the cases for each indicator?

You don’t need to create a full report to see the individual cases for each indicator. After you have run the imported your data file, you can view the cases using the Patient Level Report option (see [Section 7.17](#)).

10.11 Select Filter Criteria (Provider Reports Only)

This screen (Screenshot 27) lets you limit the discharge records that will be included in your report. Using the tabs on the screen, you can select hospitals, date ranges and composite measures to include in your report.

Screenshot 27: Select Filter Criteria (Provider Reports)

The screenshot shows the 'Provider Report | Modify filter criteria for your report' interface. At the top, a blue header bar contains the title and a 'Exit Wizard' button. Below the header, a breadcrumb trail shows the steps: 1. Indicators, 2. Filter Criteria (highlighted), 3. Stratifiers, 4. Additional Options, 5. Create Report, and 6. View Report. The main content area is titled 'Modify filter criteria for:' and features three tabs: 'Hospitals' (selected), 'Date Ranges', and 'Composites'. A red circle with the number '1' is placed over the 'Hospitals' tab. Below the tabs, there is a 'Jump To:' dropdown menu with 'Please Select' as the current selection. A checkbox labeled 'Include discharges with no state information?' is checked. Below this, a red box highlights a section titled 'Deselect All Unknown/Missing Hospitals' with a red circle and the number '2' next to it. This section contains a checkbox labeled 'Hospital # (9906 discharges)' which is also checked. At the bottom right of the interface, there are 'Previous' and 'Next' buttons.

10.11.1 Select Hospitals

When the hospitals tab is selected, there will be a list displayed of all of the States represented in the input data, and each hospital is listed under the State.

10.11.1.1 How is this screen organized?

1

10.11.1.1.1 States in Input Data

Checkboxes allow you to select (or deselect) all the hospitals in a State at once. If you are interested in hospitals in a specific state, you should deselect all state hospitals then use the “Jump To” control to choose the state you are interested in and select all hospitals in that state.

2

10.11.1.1.2 Hospitals in Each State

The hospitals and number of discharges are displayed here under their State.

10.11.1.2 What should I do here?

Check the States and hospitals you want to include in your report. By default all hospitals in all states will be selected. For each of the tabs, there will be a “Clear All” and a “Select All” option. These controls are a quick way to deselect all hospitals and select the few you are interested in. The next time you log into the application to run a provider report, the selections you chose in the previous session will be the new default selections.

10.11.1.3 Other Questions

10.11.1.3.1 How is the hospital’s State determined?

During the data load, the program collects a list of hospitals from the “Hospital ID” and “Patient State/County Code” from the discharge records. The default hospital county is the first county (in the patient state/county field) read for that hospital. You may change the hospital county code

10.11.1.3.2 What is done with records from hospitals that are not checked?

These discharge records will not be included in your report. This feature allows you to generate different provider-level reports with different data without having to edit and reload your data file.

10.11.2 Select Date Range (Provider Reports)

10.11.2.1 What is this screen for?

When the date ranges tab is selected (Screenshot 28), you can limit the discharge records you wish to include on your report to only those that occurred during the selected quarters.

Screenshot 28: Select Date Range (Provider Reports)

Provider Report | Modify filter criteria for your report

1. Indicators 2. Filter Criteria 3. Stratifiers 4. Additional Options 5. Create Report 6. View Report

Modify filter criteria for:

Hospitals Date Ranges Composites

Select all Dates Clear all Dates

☒ Discharges from 2014

☒ Quarter 1 (3371 discharges) ☒ Quarter 2 (4490 discharges) ☒ Quarter 3 (2045 discharges)

Previous Next

10.11.2.2 How is this screen organized?

10.11.2.2.1 Discharge Year

Each year represented in the input data is listed.

10.11.2.2.2 Quarters

The quarters for each year in the input data are listed under the corresponding year.

10.11.2.3 What should I do here?

Select the checkboxes next to the quarters that you wish to include in your report.

10.11.2.4 Other Questions

10.11.2.4.1 How can I generate a “rolling year” report?

A “rolling year” report is a report in which the results reported for each quarter include the previous three quarters of data (e.g., 2003 Q1 includes discharges from 2003 Q1 and 2002 Q2–Q4, 2003 Q2 includes discharges from 2003 Q1–Q2 and 2002 Q3–Q4).

You cannot generate this report in a single pass since each discharge record would have to be included in the total for different quarters. However, you can run through the reports process several times and select a different rolling set of quarters for each report. (Do not select year

or quarter as stratifiers.) You will still need to merge these reports using a spreadsheet program.

10.11.3 Composite Measures (Provider Reports)

When the composites tab is selected (Screenshot 29) you can choose whether to include the composite measures and, if so, what weight to assign to each indicator that makes up the composite. Composite measures are weighted averages of individual component measures.

Note: This tab will not be present for the ICD-10 component of v6.0.

Screenshot 29: Composite Measures (Provider Reports)

Modify filter criteria for:

Hospitals | Date Ranges | **Composites** | [Select all Composites](#) | [Clear all Composites](#)

Indicator	Weight
<input checked="" type="checkbox"/> IQI 14 Hip Replacement Mortality Rate	0.2151
<input checked="" type="checkbox"/> IQI 30 Percutaneous Coronary Intervention (PCI) Mortality Rate	0.38387
<input checked="" type="checkbox"/> IQI 31 Carotid Endarterectomy Mortality Rate	0.06774

Your Custom Composite Weight Changes [View/Hide Data](#)

[Reset all Custom Values](#)

Indicator	With POA Rates		Without POA Rates	
	Default Value	Your Value	Default Value	Your Value
IQI 14 Hip Replacement Mortality Rate	0.23151	0.2151	0.23151	0.23151
IQI 30 Percutaneous Coronary Intervention (PCI) Mortality Rate	0.38387	0.38387	0.38387	0.383
IQI 31 Carotid Endarterectomy Mortality Rate	0.067745	0.06774	0.067745	0.067745

[Previous](#) [Next](#)

10.11.3.1 How is this screen organized?

1

10.11.3.1.1 Measures and Components

A checkbox appears next to each of the composite measures. The indicators comprising the composite measure are listed below the composite measure name.

2

10.11.3.1.2 Weights for Component Indicators

3

A field for the relative weight appears next to each indicator. Default weights for With POA and Without POA are displayed. You have the ability to make

changes to the composite weights. Please do so with due deliberation. If you change a weight, the total (for the indicator w/POA and for the indicator w/o POA) must still add up to 1.

10.11.3.1.3 Your Custom Composite Weight Changes

This area displays the default weight and the new weight for any value you have changed. If you did not make any changes to the default values, you will not see this section.

10.11.3.2 What should I do here?

Check the composite measures you wish to include in your report. You may increase or decrease the weight assigned to each indicator as desired, or you can set the weight to zero to exclude the indicator from the composite altogether. However, the weights for each of the component QIs must be between zero and one, and the weights across the entire component QIs must sum to one. Also, you must assign weights to every component QI, including weights of zero for all component QIs that are to be excluded from the composite. Changing weights is not generally recommended. Please do so with due deliberation.

If you would like to reset the composite measures back to the default weights, click on the **<Reset all Custom Values>** control.

10.11.3.3 Other Questions

10.11.3.3.1 How are the composite measures calculated?

The provider level composite measures are calculated from the following formula:

$$\frac{\sum_1^n \text{Smoothed rate}_i \times \text{Weight}_i}{\text{Population rate}_i \times \sum_1^n \text{Weight}_i}$$

where $i = 1, 2 \dots n$, where n is the number of indicators composing the composite measure.

10.11.3.3.2 My report has missing values for the composite measures. Why?

Missing values for the composite measures can be attributed to any of the following issues:

1. “Calculate Smoothed Rates” was not selected on the Additional Options for Data Analysis screen (see Section 7.6). If smoothed rates are blank, then the above formula will result in a missing value.

2. All component measures that contribute to the composite measures were not selected. If any of the necessary component measures are left out, this will result in a missing value.
3. The necessary stratifiers were not selected. Selected Year and Quarter will produce composite measures. Any stratifiers chosen outside of these will result missing values.
4. You are running the ICD-10 component of v6.0 version.

10.11.3.3.3 Where can I find more information about the use of composite measures?

The AHRQ QI team conducted several workgroups on composite measures, one for each of the QI modules ([PQIs](#), [IQIs](#), [PSIs](#), [PDIs](#)). The reports from these workgroups can be downloaded from the respective QI resource screens.

PQI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PQI/PQI_Composite_Development.pdf

IQI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/IQI/IQI_Composite_Development.pdf

PSI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/PSI_Composite_Development.pdf

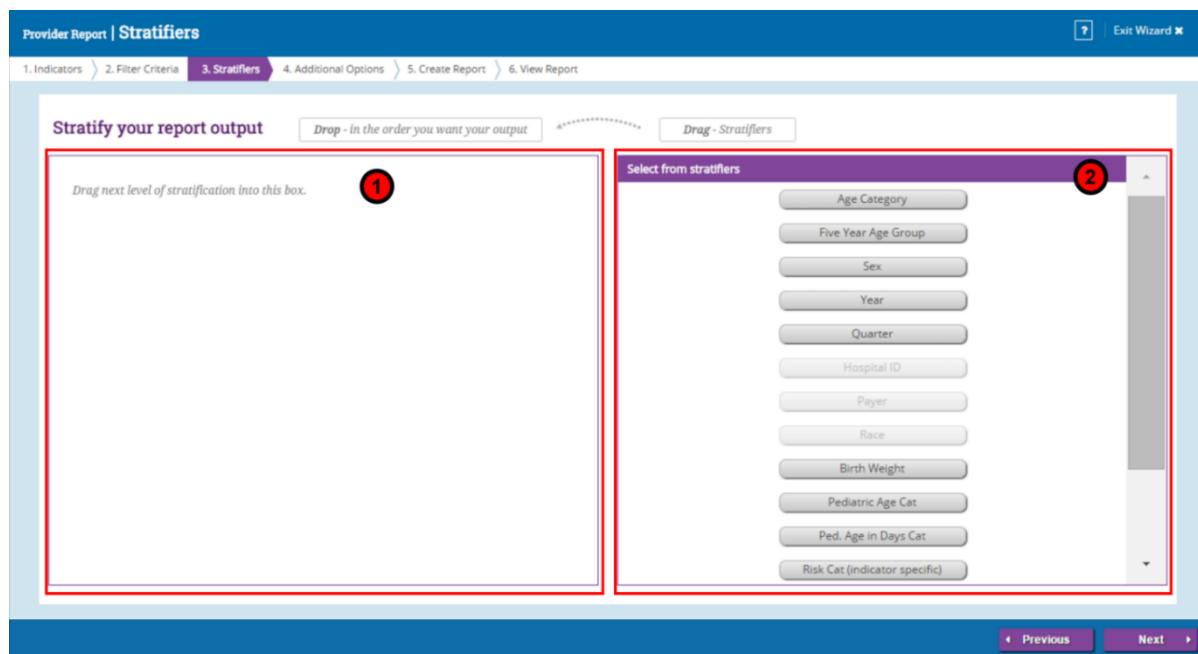
PDI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/PDI_Composite_Development.pdf

10.12 Select Stratifiers for Use with Provider Indicators

This screen (Screenshot 30) is used to build a hierarchy of stratification (grouping) for provider-level indicators. On this screen, you will indicate to the WinQI software what variables you want your report output grouped by. You will also indicate the order of the group-by variables.

Screenshot 30: Select Stratifiers (Provider Reports)



10.12.1 How is this screen organized?

1

10.12.1.1 Selected Stratifiers

Displays the provider-level stratifiers (variables to group the report by) currently selected, in the hierarchical order in which they will be sorted.

2

10.12.1.2 Select From Stratifiers

This area displays a list of available stratifiers (variables to group the report by) that can be used for reports on provider-level indicators.

10.12.2 What should I do here?

Click on a desired stratifier in the ‘Select from Stratifiers’ box, drag it to the selected stratifiers’ area, and drop it in the desired position. Provider-level stratifiers include: Age category, Five year age group, Sex, Year, Quarter, Hospital ID, Payer, Race, Birth weight, Pediatric age category, Pediatric age in days category, Risk category (indicator specific), Custom 1, Custom 2, Custom 3. Of these columns, only those that are available in the input file (and mapped to QI variables) are available for stratification.

To remove a selected stratifier, click and drag it back to the “Select From Stratifiers” list.

To reposition a stratifier, click and drag it up or down in the list of selected stratifiers. You will see a line that shows you where the stratifier will be placed.

10.12.3 Other Questions

10.12.3.1 What is a “stratifier”?

A stratifier is how your data will be broken down. In database parlance, this is equivalent to an item in a “group by” clause.

10.12.3.2 What if I just want the totals for each indicator?

Do not select any stratifiers.

10.12.3.3 Does the order matter?

Yes, it determines the order in which the stratifiers are listed on the reports and the order in which the rows are grouped/sorted.

10.12.3.4 How do I know which stratifiers to select?

Select stratifiers that will provide you with useful information. For example, if you are processing data from a single provider, selecting the stratifier “Hospital ID” will not provide you with any useful information. If your data do not separate patients by race, then the “Race” stratifier will be of no use.

10.12.3.5 How many stratifiers may I select?

You may not select more than 10 stratifiers. In practice, you will generally not want more than a few stratifiers. Selecting too many will subdivide your populations and reduce the statistical significance of the calculated rates.

10.12.3.6 What are “Custom 1,” “Custom 2,” and “Custom 3”? Why can’t I select them?

These are custom stratifiers that may contain any information you wish. Each field will only be enabled if you provided a data mapping on the Data Mapping screen (see Section 5.4). Common custom stratifiers are physician name and hospital type.

10.12.3.7 How large will my report be?

You can get a rough estimate of the number of rows in your file by multiplying the number of distinct values for each of your selected stratifiers. The number of values will be shown in a tool tip when you point to the stratifier name in the right panel with your mouse. If you are doing a hospital report with 120 hospitals and 14 indicators, the report will be 1,680 rows for the hospital/indicator combinations plus 14 additional rows for the indicator totals for all the hospitals. Reports can be exported to and from the report generator and loaded into other software such as Excel. Only a limited number of lines can be viewed at one time in a report.

10.13 Additional Options for Data Analysis

Please see section 7.6 for Additional Options for Data Analysis.

10.14 Create Report

Please see section 7.7 for information on how to create your report.

10.15 View Report

Please see section 7.8 for information on how to view your report.

10.16 Composite Report

10.16.1 What is this screen for?

This screen (Screenshot 30) displays rates (or ratios) for provider-level composite indicators. The screen can be accessed by clicking the “Composites” button on the Provider Level report.

Note: The ‘Composites’ button (and the corresponding Provider composite report) will not be available for the [ICD-10 component of v6.0 version](#)

The composite report shows calculated rates for provider-level composite measures. A composite measure can be defined as a weighted average of its corresponding component indicators. Composite measures are defined for each module. Please see the Technical Specifications screen on the [AHRQ QI website](#) for a definition of all composite measures.

The Empirical methods document (http://www.qualityindicators.ahrq.gov/Downloads/Resources/Publications/2015/Empirical-Methods_2015.pdf) provides a detailed explanation of how composite measures are estimated. Rates shown on the composite report screen are stratified (grouped) by stratifiers selected by the user on previous screens.

Screenshot 31: Composite Report

Provider Composite Report
Created 8/21/2015 4:06:11 PM

composite_name	Age Category	Five Year Age Group	COMP1	COMP1VAR	COMP1SE	COMP1WHT	COMP1LB	COMP1UB
IQI Proc	0 to 17	15-17 Years	0.9899871	0.0374053	0.1934046	0.0000	0.6109141	1.3690601
IQI Proc	18 to 39	18-24 Years	0.9899871	0.0374053	0.1934046	0.0000	0.6109141	1.3690601
IQI Proc	18 to 39	25-29 Years	0.9899871	0.0374053	0.1934046	0.0000	0.6109141	1.3690601
IQI Proc	18 to 39	30-34 Years	0.9899871	0.0374053	0.1934046	0.0000	0.6109141	1.3690601
IQI Proc	18 to 39	35-39 Years	0.9899871	0.0374053	0.1934046	0.0000	0.6109141	1.3690601
IQI Proc	40 to 64	40-44 Years	0.9881164	0.0372150	0.1929120	0.6945	0.6100089	1.3662239
IQI Proc	40 to 64	45-49 Years	0.9548816	0.0365663	0.1912231	2.2878	0.5800843	1.3296790
IQI Proc	40 to 64	50-54 Years	0.9491822	0.0364461	0.1909087	3.4394	0.5750012	1.3233631
IQI Proc	40 to 64	55-59 Years	0.8998695	0.0351796	0.1875624	10.1776	0.5322473	1.2674917
IQI Proc	40 to 64	60-64 Years	0.8768794	0.0345156	0.1857838	10.2297	0.5127433	1.2410156
IQI Proc	65+	65-69 Years	0.8571527	0.0338633	0.1840197	10.3315	0.4964741	1.2178314
IQI Proc	65+	70-74 Years	0.8502266	0.0334494	0.1828919	12.5815	0.4917585	1.2086947
IQI Proc	65+	75-79 Years	0.8503145	0.0340907	0.1846367	11.0245	0.4884265	1.2122025
IQI Proc	65+	80-84 Years	0.8694145	0.0342012	0.1849356	8.9393	0.5069407	1.2318883
IQI Proc	65+	85+ Years	0.9899871	0.0374053	0.1934046	0.0000	0.6109141	1.3690601
IQI Cond	0 to 17	15-17 Years	0.9999890	0.0267257	0.1634800	0.0000	0.6795682	1.3204098
IQI Cond	18 to 39	18-24 Years	0.9999890	0.0267257	0.1634800	0.0000	0.6795682	1.3204098
IQI Cond	18 to 39	25-29 Years	0.9999890	0.0267257	0.1634800	0.0000	0.6795682	1.3204098
IQI Cond	18 to 39	30-34 Years	0.9999890	0.0267257	0.1634800	0.0000	0.6795682	1.3204098
IQI Cond	18 to 39	35-39 Years	0.9845660	0.0263073	0.1621951	2.6165	0.6666635	1.3024684
IQI Cond	40 to 64	40-44 Years	0.9600132	0.0261822	0.1618092	2.7534	0.6628672	1.2971592
IQI Cond	40 to 64	45-49 Years	0.9891417	0.0264970	0.1627790	2.3007	0.6700948	1.3081885
IQI Cond	40 to 64	50-54 Years	0.9577257	0.0255751	0.1599221	6.2135	0.6442784	1.2711729
IQI Cond	40 to 64	55-59 Years	0.9291916	0.0244796	0.1564597	9.0542	0.6225367	1.2358526
IQI Cond	40 to 64	60-64 Years	0.9268238	0.0247647	0.1573680	8.9561	0.6183925	1.2352752
IQI Cond	65+	65-69 Years	0.8636179	0.0221451	0.1488123	14.5061	0.5719437	1.1552901
IQI Cond	65+	70-74 Years	0.8150249	0.0198918	0.1410382	21.1210	0.5385900	1.0914598
IQI Cond	65+	75-79 Years	0.7767915	0.0185472	0.1361882	27.5554	0.5098627	1.0437203
IQI Cond	65+	80-84 Years	0.7695241	0.0182590	0.1351259	29.6551	0.5046772	1.0343709
IQI Cond	65+	85+ Years	0.6412174	0.0134685	0.1160539	39.5709	0.4137518	0.8686831

Save Report Close

10.16.2 How is this screen organized?

10.16.2.1 Report

This area provides the following information about the displayed report:

- Title of the report.

Date and time the report was generated.

The large area in the center of the Reports screen displays the report data. Data are displayed in the following columns:

- Composite indicator name (“composite_name”);
- Composite rate or ratio (“COMP1”);
- Variance (“COMP1VAR”);
- Standard error (“COMP1SE”);
- Weight (“COMP1WHT”);
- Lower bound of the rate/ratio confidence interval (“COMP1LB”); and
- Upper bound of the rate/ratio confidence interval (“COMP1UB”).

10.16.2.2 Screen Controls

The buttons at the bottom of the Reports screen can be used to export the report and to close the report window.

10.17 Patient Level Report

10.17.1 What is this screen for?

This screen (Screenshot 32) provides a view of the individual cases flagged for each indicator. This screen can be useful for exploring which cases were actually included in the numerator and denominators for each indicator. There are two ways to access this report: by drilling down on the observed numerator or observed denominator of a record on the area-level report or provider-level report; or creating the patient level report by selecting a module on the Home Screen.

Screenshot 32: Patient Level Report

Row in File	Key	Hospital ID	Age	Sex	MDC	DRG	DRG Ver	Den	Num
524	4095769		61	1	10	639	30	1	1
1847	4087555		84	2	10	638	30	1	1
1986	4087495		26	1	10	638	30	1	1
2817	4088390		70	1	10	637	30	1	1
6913	4092699		53	1	10	637	30	1	1
7077	4093300		80	1	10	637	30	1	1
7943	4090659		49	2	10	638	30	1	1
8243	4090880		88	2	10	638	30	1	1
9736	4085723		18	1	10	639	30	1	1

10.17.2 How is this screen organized?



10.17.2.1 Report Controls

Controls at the top of the screen allow you to select a QI module, an indicator from that module, a grouping of records to display, and the number of rows per page to display in the report.

- **Module** – allows you to choose which of the modules you would like to view information for. You will only be able to choose between modules you have already generated indicators for. When drilling down from the

area-level report or provider-level report, the selected module cannot be changed.

- **Indicator** – allows you to choose a specific indicator to view records for. When drilling down from the area-level report or provider-level report, the selected indicator cannot be changed.
- **Total Records** – displays the total number of records the report contains for a particular indicator
- **Rows per Page** – this control defines the maximum number of rows displayed per page while viewing the report online. The default of 20 allows you to view the report without scrolling; a different value may be more appropriate for a faster computer or if you wish to sort the data.
- **Outcome of Interest**—all records that are included in the numerator of the selected indicator.
- **Population at Risk**—all records that are included in the denominator of the selected indicator
- **All discharges**—all records loaded in the database for the data file.
- **Show Exclusions** – show numerator (outcome of interest) or denominator (population at risk) records with exclusions. ‘With exclusions’ shows corresponding records prior to any exclusion rules being applied.



10.17.2.2 Report Area

This area displays a list of the actual discharges meeting the criteria of the Report Controls selections. The “Key” field and several other useful identifying columns are included.



10.17.2.3 Screen Controls

Buttons at the bottom of the screen allow you to export the records and to navigate between screens of data in the Patient Level Report.

10.17.3 What should I do here?

Find the indicator that you are interested in by selecting the **Module** and then the **Indicator** from the drop-down lists. When drilling down from the area-level report or provider-level report, the selected module or indicator cannot be changed. The drop-down list of indicators shows the number of cases included in the numerator, as well as the number of cases in the denominator (the denominator does not apply to all indicators).

“Outcome of Interest” is selected for display by default, so after an <**Indicator**> is selected, all records that were included for the selected indicator are displayed. You can select a different value for display if desired.

You may quickly search for a particular case by entering its Key value in the Search box and then selecting “All Discharges.” Records are returned if your search term can be found anywhere in the Key value.

Use the <**Save This Report For Later Use**> button to export all records in the report.

You may drill into any one row of this report to show the reasons why any particular case was flagged for this indicator. Click on the ‘Row in file’ field to open the Case Details screen (see [Section 10.18](#)).

10.17.4 Other Questions

10.17.4.1 What data are displayed?

Columns displayed on all reports include “Row in File,” “Key,” “Age,” “Sex,” “MDC,” “DRG,” “Num,” and “Den.” A value of “1” under “Num” or “Den” indicates that the record was included in the rate calculation of the selected indicator, and “0” indicates the record was not included.

10.17.4.2 How can I see why a case was flagged?

Click on the “**Row in File**” column to open up the Case Details screen (see [Section 10.18](#)).

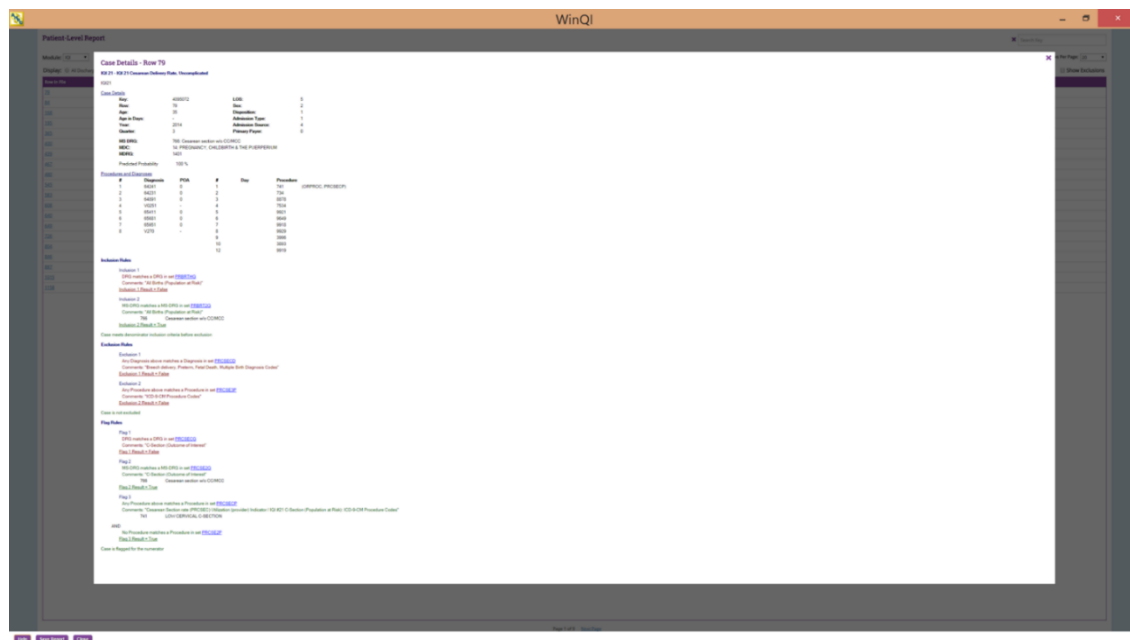
NOTE: Records excluded from the Population at Risk (denominator) are, by definition, also excluded from the Outcome of Interest (numerator) as well. In all QIs, the numerator is a subset of the denominator.

10.18 Case Details

10.18.1 What is this screen for?

This screen (Screenshot 33), accessed by clicking on the “**Row in File**” column on the **Patient Level Report**, lets you see exactly why a particular case was or was not flagged for a particular indicator.

Screenshot 33: Case Details



10.18.2 How is this screen organized?

10.18.2.1 Case Details

This area displays information from the discharge record that may be used in some indicators.

10.18.2.2 Inclusion Rules

This area displays the rules for including a case in the denominator of this indicator.

10.18.2.3 Exclusion Rules

This area displays the rules for excluding a case from both the numerator and denominator of this indicator.

10.18.2.4 Flag Rules

This area displays the rules for including this case in the numerator of this indicator.

10.18.3 What should I do here?

You can view one case using the scrollbar to display the entire report. Save this report as an RTF file that can be emailed or printed.

Click on any underlined set name to get a list of all the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM or ICD-10-CM) procedure codes, ICD-9-CM (or ICD-10-CM) diagnosis codes, or Medicare Severity Diagnosis-Related Groups (MS-DRGs) that apply.

10.18.4 What data are displayed?

The number and complexity of rules vary per indicator. Each rule may be based on a list of procedures, a list of MS-DRGs, a list of diagnoses, or a Boolean expression. See the *Technical Specifications* applicable to this indicator to interpret each rule. If there are procedure or diagnosis codes that match any of the lists referenced, the ICD-9-CM codes and descriptions will be displayed along with the rule.

10.18.5 Example

In the example shown in Screenshot 33, the following information can be seen for Inpatient Quality Indicator (IQI) 21:

- **Inclusion Rules:** This case is “true” for inclusion rule 2 and is therefore included in the denominator of IQI 21. The inclusion rule specifies that the case has MS-DRG matching an MS-DRG in set PRBRT2G. The set name can be clicked to see a list of codes that comprise the set.
- **Exclusion Rules:** This case is “false” for all of the exclusion rules, and it thus remains in the denominator.

Flag Rules: This case is “false” for all flag rules. In order to satisfy the indicator, it is necessary that at least one of the flag rules is true. Since no flag rule is true, the case is not flagged for inclusion in the numerator.

10.18.6 Other Questions

10.18.6.1 What does ORPROC mean?

The ICD- codes for operating room (OR) procedures are denoted by “ORPROC.” This term may be helpful in interpreting some of the exclusion rules for some Patient Safety Indicators (PSIs) and Pediatric Quality Indicators (PDIs). The complete list of OR procedures can be found in the QIs *Technical Specifications*.

10.18.6.2 What other covariates are applicable to this indicator?

You may view the entire table of covariates for each QI module on the AHRQ QI Web site. See the parameter estimates link per module:

Prevention Quality Indicator (PQI) Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PQI/V50/Parameter_Estimates_PQI_50.pdf

IQI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/IQI/V50/Parameter_Estimates_IQI_50.pdf.pdf

PSI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V50/Parameter_Estimates_PS_I_50.pdf

PDI Module:

http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/V50/Parameter_Estimates_PDI_50_Final.pdf

10.18.6.3 How can an individual covariate be interpreted?

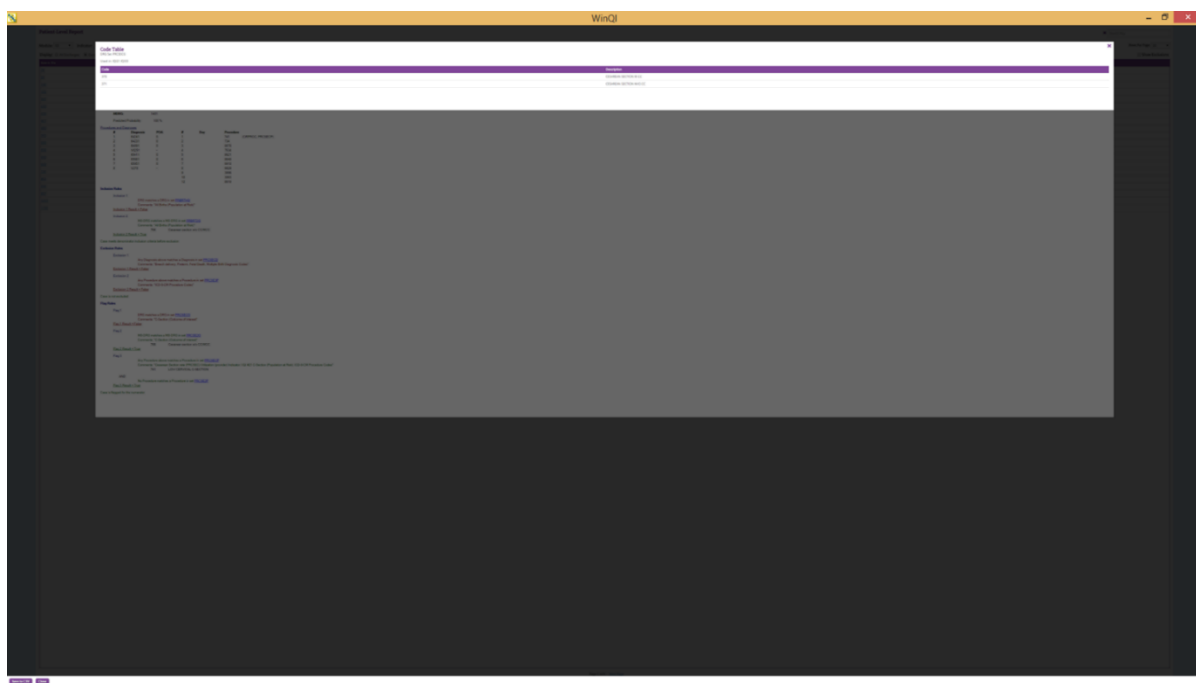
You can often see the relative importance of different covariates from the magnitude of the coefficient; however, individual covariates are not intended to be interpreted in isolation.

10.19 Code List

10.19.1 What is this screen for?

This is a popup window (Screenshot 34) that displays the International Classification of Diseases codes or Medicare Severity (MS)–DRGs that are used in indicator definitions. You can view these lists by clicking on the blue links on the **Case Details** screen. Each set corresponds to a list of codes that can be found in the *Technical Specifications*.

Screenshot 34: Code List



10.19.2 How is this screen organized?



10.19.2.1 Set Name

This area displays the name for this set of codes. This set of codes corresponds to the SAS® format name in the formats library.



10.19.2.2 *Used In*

This area displays the indicators that directly use this set of codes.



10.19.2.3 List of Codes

This area displays the list of MS-DRG or ICD-9-CM (ICD-10-CM) codes. Where available, the descriptions of each code are listed.



10.19.2.4 Save to CSV

This option allows you to save a list of codes to a separate file that can be used with other programs.

NOTE: Indicators that indirectly make use of a set of codes are not listed. Lists that are indirectly used include the list of surgical DRGs and operating room procedures.

10.19.3 What should I do here?

You can scroll through a list of codes here. Also, if you wish to import the list into another program, you may click on the <Save to CSV> button to save this list.

10.19.4 Other Questions

10.19.4.1 What is the significance of the name?

The name of each “code set” corresponds to the same set of codes in the SAS format library. This name is a succinct way of referring to a group of codes that may be used by more than one indicator.

11. Helpful Tools

The Quality Indicators™ Windows® (WinQI) software includes several helpful tools ([Figure 6](#)). A few of those tools are discussed in more detail here:

Figure 6. Tools



11.1.1 Program Options

11.1.1.1 What is this screen for?

This screen (Screenshot 35), accessed by clicking the <Program Options> control under Tools on the Home Screen, allows you to change your database options and to save the Session Log.

Screenshot 35: Program Options

The screenshot shows the 'Program Options' window in WinQI. The window is divided into several sections, each with its own set of controls:

- Database:** Includes fields for Server (set to (local)), Authentication Type (Windows NT), Database (qualityindicators), Username (ss), and Password (masked). A note states: "Do not change these settings unless instructed by your database administrator." Buttons for 'Edit' and 'Test and Save' are present.
- Logging:** Includes a checked 'Save QI Session Log' checkbox, a 'Log File' field (C:\ProgramData\WinQI\session.log), and a 'Select File' button. Other fields include 'Maximum log file size (at program start): 200000', 'Error messages to print per column: 10', 'Total error messages to log: 150', and 'Frequency of "rows loaded" messages: 25000'. There is also an unchecked checkbox for 'Log report generation queries. (not recommended)'.
- Text Files:** Includes a 'Column Separator Character' dropdown set to 'Comma'.
- Import Options:** Includes a dropdown for 'APR(tm) DRG Birth Weight Option for Grouper' set to '5 - Coded only; default available'.
- Hospitals:** Includes a 'Maximum Number of Hospitals for Report Selection' input field set to '400'.
- Performance:** Includes input fields for 'Indicator Flag Query Timeout' (43200), 'Short Query Timeout' (60), and 'Long Query Timeout' (600). It also has a 'Max Rows in Readability Check' input field set to '0' and a 'no max (0)' option. A note at the bottom states: "You should use the default values unless advised to edit these timeouts by AHRQ QI Support."

At the bottom of the window are 'Save', 'Cancel', and 'Help' buttons. A 'Session Log' section at the very bottom provides a summary of actions performed and system responses.

1

11.1.1.1.1 Database

You may change the database connection information here. This change should only be done when your database password has changed or if the database server has been renamed. Only make changes if you are instructed to do so by your database administrator. You cannot simply change to a blank database because it would not contain the tables necessary for the program to run.

2

11.1.1.1.2 Logging

Specify a file to save the information written to the WinQI Session Log. The Session Log will be appended to the specified file until the file reaches 200 KB. At 200 KB, the file will be truncated and started again. When writing to the Agency for Healthcare Research and Quality (AHRQ) QI support, please include the relevant portions of your Session Log.

During the data error check screen, messages will be written to the log if certain types of data errors are found; for example, an invalid number in a numeric column. This option may be helpful if you wish to make corrections to your input file. You may adjust the number of errors saved.

3

11.1.1.1.3 Text Files

You may change the separator between the values in a row of data to Tab instead of Comma.

4

11.1.1.1.4 Import Options

Used by the 3M™ All Patient Refined Diagnosis-Related Group (APR-DRG) grouper. The default value of five should be used in most cases. Do not modify this value without consulting 3M APR-DRG grouper documentation.

5

11.1.1.1.5 Performance

It is not recommended that you change any of these settings without consulting the AHRQ QI support. One user requested that a change be made to the WinQI software to increase the connection time before a timeout occurs. This change was not made, and it is an example of the type of issue that should be discussed with AHRQ QI support.

2



11.1.1.1.6 Hospitals

You may change the maximum number of hospitals shown on the “Select Hospitals” portion of the Provider Report Wizard. While setting this number higher will result in more user control, it will slow the report generation process.

11.1.2 What should I do here?

It is recommended that you do not change the database options unless your database administrator instructs you to do so. If you wish to change the location for the Session Log, use the options under “Logging” to do so.

11.2 Hospital Table

11.2.1 What is this screen for?

This screen (Screenshot 36), accessed by clicking the <**Hospital Table**> control under “Tools” on the Main screen, allows you to specify a name and to change the county code for any hospital in the input data.

Screenshot 36: Edit Hospital Table

ID	Name	Discharges	County Code	County Name (from code)
41082		10	41063	OR - Wallowa
41077		81	41061	OR - Union
41033		37	41053	OR - Polk
41051		930	41051	OR - Multnomah
41053		211	41051	OR - Multnomah
41058		58	41051	OR - Multnomah
41040		752	41047	OR - Marion
41003		29	41031	OR - Jefferson
41068		50	41029	OR - Jackson
41010		26	41011	OR - Coos
41019		6	41011	OR - Coos
41056		284	41007	OR - Clatsop
41048		382	41003	OR - Benton
41011		41	41001	OR - Baker
41071		49	29113	MO - Lincoln
41001		145	8014	CO - Broomfield
41024		323	8014	CO - Broomfield
41086		221	6113	CA - Yolo



11.2.1.1 ID and Name

This area lists each of the hospital ID numbers and provides a field for entering the hospital name.



11.2.1.2 Discharges

This area displays the number of discharge records from the corresponding hospital.



11.2.1.3 County Code and County Name

This area displays the county code for the corresponding hospital in a field that can be edited and the county name associated with the displayed county code.

11.2.2 What should I do here?

You can type a name for a hospital in the field next to the ID. You can replace the county code for a hospital with a different county code. The hospital data can be loaded from an external data file.

11.3 Automation Script

The automation script allows the user to run the WinQI software to import data, generate rates, and create reports via the command line. The user configures certain parameters once from the WinQI user interface to generate the automation script, and following that, can run the software without having to open the user interface. This feature is useful for users who run the software frequently with the same parameters (name/location/structure of input file, name/structure of mapping file, modules, etc.) and are comfortable using the command line instead of the user interface.

The user interface to generate the automation script is accessible from the Tools menu from both the null (before importing a data file) and non-null (after importing a data file) home screens. Once the automation script is generated, it needs to be run from command prompt.

The syntax to run the automation script from the command prompt is,

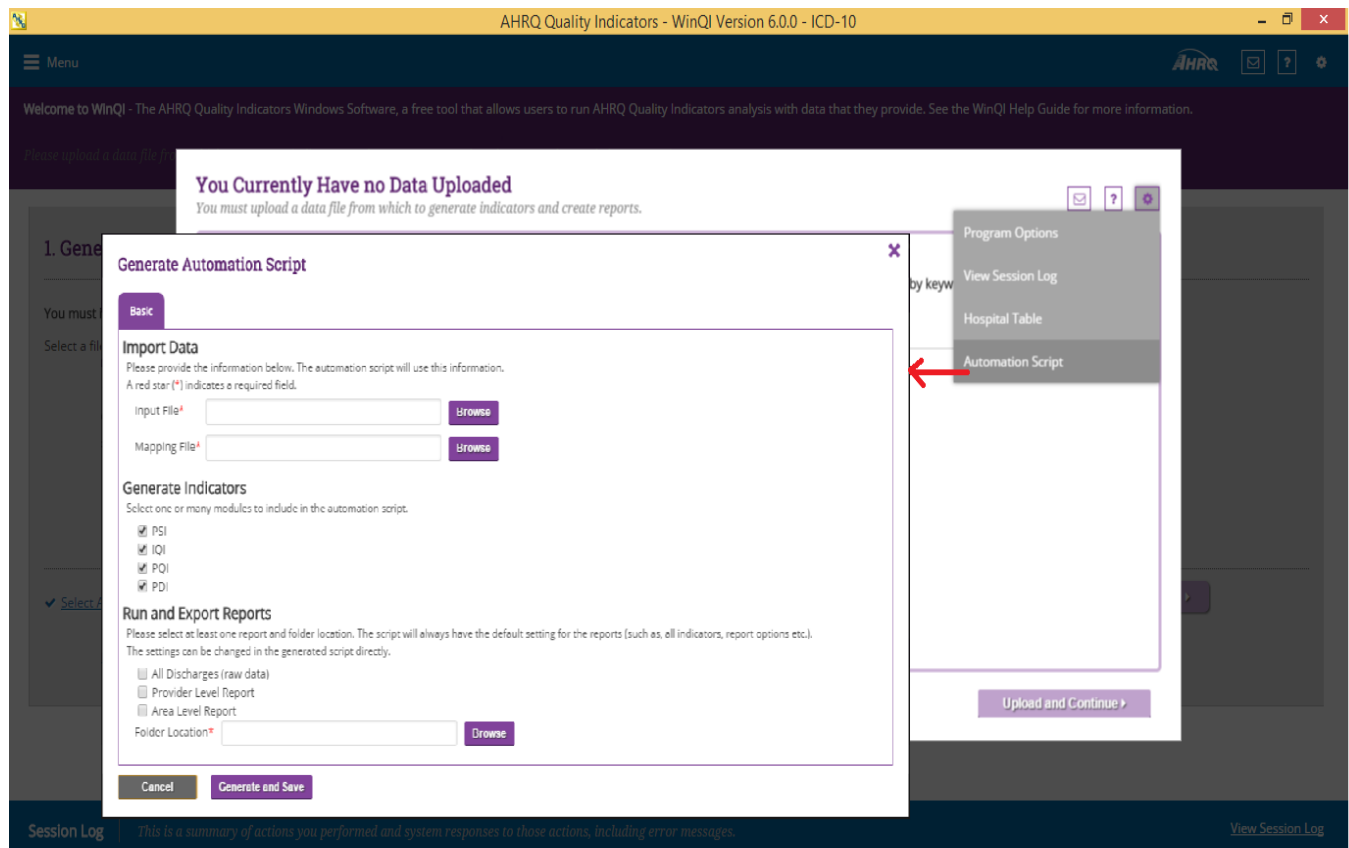
ahrqautomation -automationfile <filename>

where <filename> is the file containing the automation script.

Example:

ahrqautomation -automationfile automationscript_05102016.ahrq

Screenshot 37: Access to Automation Script UI



11.3.1 Generate Automation Script:

11.3.2 What is this screen for?

This screen allows the user to configure certain parameters (settings) and generate the Automation script. The script will be generated with the given settings on this screen like the input file, mapping file, modules to generate indicators for, and reports to export. The script is saved at the user mentioned location.

Screenshot 38: Automation script UI

Generate Automation Script

Basic

Import Data
Please provide the information below. The automation script will use this information.
A red star (*) indicates a required field.

Input File* **Browse**

Mapping File* **Browse**

Generate Indicators
Select one or many modules to include in the automation script.

☒ PSI
☒ IQI
☒ PQI
☒ PDI

Run and Export Reports
Please select at least one report and folder location. The script will always have the default setting for the reports (such as, all indicators, report options etc.).
The settings can be changed in the generated script directly.

☐ All Discharges (raw data)
☐ Provider Level Report
☐ Area Level Report

Folder Location* **Browse**

Cancel **Generate and Save**

11.3.3 How is this screen organized?

The screen has three sections as described below.

1

11.3.3.1 Import Data

In this section please select your input file and the corresponding mapping file. Use the Browse button to navigate to and select the appropriate files. Please note that the mapping file should be correct for the selected input file.

It is required to specify both input file and mapping file in order to generate the automation script.

2

11.3.3.2 Generate Indicators

PSI, IQI, PQI and PDI are available to select. The selected modules will be included in the automation script and when the script is run only the indicators for the selected modules will be generated.

At least one module is required to be selected in order to generate the script.



11.3.3.3 Run and Export Reports

This section allows the user to select the reports to be exported and the folder to save these exports. At least one export from 'All Discharges', 'Provider level report', and 'Area level report' must be selected. It is required to specify the output folder as well. Please browse to and select the appropriate folder.

11.3.4 What should I do here?

Click the browse button and select an appropriate input file. Once you have selected the input file, click on the Browse button to select an appropriate mapping file that matches the data structure of your input file. Only Quality Indicators Mapping (.qim) files can be selected. .qim files can be produced from the WinQI software after importing a data file and specifying corresponding data mapping one time via the user interface. After selecting the mapping file, please select the module/s to generate indicators using the automation script. At least one module must be selected

At the end, choose the reports you would like to export from the automation script and the location where you would like to export them. At least one report needs to be selected.

Once you have entered the required information click the 'Generate and Save' button. Browse the folder where you want to save the generated automation script. The Automation script will be saved at the selected location. Run this script from the command prompt.

Below is the syntax of the command to run the automation script from the command prompt.

ahrqautomation -automationfile <filename>

Example:

ahrqautomation -automationfile automationscript_05102016.ahrq

12. Technical Questions

This section provides answers to frequently asked questions about the Quality Indicators™ Windows® (WinQI) software, data security and privacy, input data, specifying and viewing reports, and using different types of QI rates.

12.1 Software Installation and Data Security

12.1.1 What software needs to be purchased in order to run the Quality Indicators?

The WinQI software is provided free of charge by the Agency for Healthcare Research and Quality (AHRQ) and is available for download from <http://www.qualityindicators.ahrq.gov/software/default.aspx>.

No additional software is required for purchase in order to use the WinQI software. The software does require Microsoft® .NET Framework and Microsoft SQL Server. Both are available for download along with the WinQI application.

To calculate risk-adjusted rates for some of the Inpatient Quality Indicators (IQIs), the 3M™ All Patient Refined Diagnosis-Related Group APR-DRG grouper must be used (see [Section 9.2](#)). A limited license version of the 3M APR-DRG system can be installed at no cost with the AHRQ WinQI software. If users prefer, they may use their own copy of the software to preprocess the data. However, the user must run the grouper software twice—once with all diagnosis codes and once excluding diagnosis codes not present on admission. Full versions of the product are available commercially. See the 3M Web site for more information:

12.1.2 How many discharges can be processed?

The WinQI software is only limited by the SQL Server maximum database size. For Express Edition installations, the limit is 4 GB (10 GB for SQL Server 2008 R2), which comes to approximately 4 million discharge records (10 million for SQL Server 2008 R2). There is no limit to the database size in a full version of SQL Server.

Users who have access to a Microsoft SQL Server for data storage may be limited by any local hardware or storage allocations, which may be controlled by your local information technology (IT) office. Users should check with their local database administrator.

12.1.3 What type of data is required by the AHRQ WinQI software?

The AHRQ WinQI software is provided with no data. The AHRQ WinQI software is a tool that calculates the AHRQ QIs based on an input data file containing discharge-level data from your organization. The software populates an SQL Server database with the data elements and data values in a format expected by the indicator logic. See the Input Data Dictionary ([Appendix A](#)) for detailed descriptions of each required data element.

12.1.4 What information is collected by AHRQ?

No user registration is required to run this software. AHRQ does not collect or store data from users of this software. Users who wish to provide feedback may contact the AHRQ QI support team by emailing qisupport@ahrq.hhs.gov.

12.1.5 What kind of individually identifiable health information is required by the AHRQ WinQI software?

The AHRQ WinQI software does not require any direct identifiers. However, the software does require detailed information for each discharge, including demographic data elements, like age and gender, and relevant diagnosis and procedure codes. Use of this information must comply with the Health Insurance Portability and Accountability Act privacy and security policies of your organization.

12.1.6 What fields contain personal identifying information?

There are five optional data elements to help identify particular cases. None of these fields is used in any QI definitions, and all five may be omitted if desired. The field “Key” is printed on the Patient Level Report and on the Case Details Report. There are four other fields that are not displayed at all within the WinQI application but can be included on the data import and the data export to identify cases as part of other analyses. These are “Date of Birth,” “Admit Date,” “Discharge Date,” and “Medical Record Number/Patient ID.” These four fields were introduced in Version 4.1. For maximum patient privacy, it is not recommended that you import these fields at all unless required for your analysis.

12.1.7 What information is stored in the “Key” data element?

The “Key” data element is optional and is not used in the AHRQ QIs flagging or rate calculation. The “Key” data element could be left blank or populated with a blind identifier for each discharge or patient, a medical record number, or a random sequence number. The intent is to provide quality improvement staff the ability to conduct further analysis on individual cases that are flagged for specific indicators. The “Key” data element may be populated with any text or it may be left unmapped in the Data Mapping screen without affecting the flagging or rate calculation of the AHRQ QIs. The “Key” data element is not required to be unique.

12.1.8 What types of data files are used or generated by the AHRQ WinQI software?

The AHRQ WinQI software uses or generates the following types of files:

- **Input Data File**—The discharge-level file that the user prepares outside the AHRQ WinQI software for loading with the Quality Indicators Wizard. After the data load has completed, this file is no longer required.
- **Patient Level Report**—Users may export a file from the Patient Level Report screen that contains the discharge-level indicator flags for the selected indicator

and basic demographic data for each patient. This report allows users to see which cases were excluded, if desired.

- **Stratified Rate Report**—Users may export a file from the View Report screen that contains the stratified rates for selected area-level or provider-level indicators. When the report is generated, users may select not to report rates with less than a specified number of cases in the numerator.
- **Case Details Report**—Users may save a copy of this report as a Rich Text Format (RTF) file for later viewing. This contains individual medical information.
- **Data Load Reports**—Users may choose to save copies of the Data Load reports in RTF. These reports contain descriptive statistics about the input file and do not contain personal information.
- **Export QI File**—After using the Import Data Wizard, users may export a file that includes only those data elements used by the AHRQ WinQI software as well as the indicator flags for each record. This file may be exported from the wizard or by using the <Export Data> option on the Main Menu. See [Appendix C](#) for a list of all the variables included in the exported data file.
- **Database Files**—Each time the user runs the Import Data Wizard, the discharge-level data are populated into a SQL Server database, which stores data in its own database file. Each time the Report Wizard is used, the resulting area-level and/or provider-level reports are stored in the SQL Server database. These are overwritten the next time the user runs the wizard.

QI Session Log—This is a log of debugging information generated by the software. You may change the location of this file in the Program Options screen.

12.1.9 Where is the SQL Server database file located?

The SQL Server database file may be located on the same personal computer (PC) as the AHRQ WinQI software, or it may be located on a remote server, depending on the options the administrator selected when installing the AHRQ WinQI software.

If the administrator elected to install the SQL Server instance locally, then the SQL Server database is physically located on the user's hard drive. If using Windows 7 or Windows 8, the file is located at "C:\Program Files (x86)\Microsoft SQL Server\MSSQL.X\MSSQL\Data" and should be called "qualityindicators.mdf." If using Windows XP or an older version of Windows, the file will be located at "C:\Program Files\Microsoft SQL Server\MSSQL.X\MSSQL\Data."

In either case, the file is machine readable only and the location may be changed. However, care must be taken to secure the database system and database files as appropriate given applicable medical information privacy laws, regulations, and policies. See the question on "How do I customize SQL Server?" in [Section 12.1.13](#).

12.1.10 Does the AHRQ WinQI Software require any data sharing or Internet connection?

No. The AHRQ WinQI software does not share data with any other computer and does not require any Internet connection. Moreover, if the administrator selects a local database on the user's PC, it is not necessary to have any network connection at all.

12.1.11 What sort of password protection is used by the AHRQ WinQI Software?

The AHRQ WinQI software relies on the Windows authentication and permissions of the local PC. See the local IT administrator for the relevant policies and procedures.

Also, see the question on “How do I customize the SQL Server?” in Section 9.1.13.

12.1.12 What permissions are required to install and run the AHRQ WinQI software?

The AHRQ WinQI software must be installed by a user with Windows administrator access. All users with access to the PC may run the AHRQ WinQI software after it is installed. If the SQL Server database is installed with Windows NT authentication, then only users with sufficient access will be able to run the software. See the answer to “How do I customize the SQL Server?” in [Section 12.1.13](#).

12.1.13 How do I customize SQL Server?

SQL Server can be configured using various tools such as the “Configuration Manager” and “SQL Server Management Studio Express.” These are free tools provided by Microsoft that allow users to add/modify accounts, change database names, create backups, etc. It is generally advised to seek the help of your IT staff before attempting to modify permissions and other connection settings in SQL Server.

12.1.14 Can I change the database password?

Yes. You may specify a different database password when you install the program or by specifying the login information to use in the “Database” section in “Program Options.” See Section 8.1.

12.2 Input Data

12.2.1 What is the difference between this specification and the Uniform Bill 04 (UB-04) specification?

The data elements in the AHRQ QIs are based on the coding specifications used in the State Inpatient Databases (SID) in the Healthcare Cost and Utilization Project (HCUP). The SID coding specifications are similar to the UB-04 but not identical. For data elements used in the AHRQ QIs, crosswalks between the SID and UB-04 coding specifications are included in the SID documentation available at <http://hcup-us.ahrq.gov/db/state/sidbdbdocumentation.jsp>.

12.2.2 What if my ICD codes are in a different format?

You will need to translate your ICD codes into the required format for the software to interpret them properly. The software uses exact text comparison of procedure and diagnosis codes with the list of expected values to indicate each condition. If leading or trailing zeros are missing from the input file, the codes will not match.

12.2.3 Please give examples of correct ICD-9-CM codes.

Consider “011.0,” a tuberculosis diagnosis. The required format for the WinQI software is “0110,” which is the complete code with the decimal point removed. The following are incorrect:

- “011.0”—wrong because the decimal point must be removed.
- “110”—wrong because the leading zero has been lost. This code would be interpreted as “110.”—this is a completely different family of diseases.

“011”—wrong because the required fourth digit is missing. This is not a complete diagnosis code.

In cases where a specific fourth or fifth digit is required by the ICD-9-CM definition, the complete code is required by the AHRQ QI definitions. For example, “8081” (acetabulum fracture) is a complete code; however, “8084” is not a complete code without a fifth digit that indicates the location of the fracture. These codes are used to exclude trauma cases and could result in inflated rates for some Patient Safety Indicators (PSIs).

Similarly, you should not include additional digits where they are not required. In the previous example, the incorrect code “80810” will not match the correct “8081” code.

Procedure codes are handled in the same manner as diagnosis codes except that procedure codes have one fewer digit. Valid diagnosis codes are a minimum of three digits, with fourth or fifth digits required for some diagnoses. Valid procedure codes are a minimum of two digits with third or fourth digits required for some procedures.

12.2.4 Must Centers for Medicare & Medicaid Services or MS-DRG grouper software be run before the data load?

Though the MS-DRG is not technically required to run the software, without it the risk-adjusted results for the PSIs and Pediatric Quality Indicators (PDIs) will be problematic and surgical MS-DRGs will not be identified. To ensure that the correct MS-DRG version is mapped, the MS-DRG version should be provided and mapped.

12.2.5 Must the 3M APR-DRG grouper software be run before the data load?

No. APR-DRG variables are used for IQI risk adjustment. A limited licensed grouper is packaged with this software and can be run during the data load. Users who already have APR-DRG values in their input file may choose to use those values instead.

12.2.6 Why might it be preferable to run the 3M APR-DRG grouper prior to the data load?

The license agreement for the limited license 3M APR-DRG grouper only permits its use for the calculation of IQI expected rates. APR-DRG values are only calculated for the minority of discharge records where it is required. The exported data file will therefore not contain APR-DRG data for all records.

12.2.7 Can external cause of injury codes (E-codes) be placed in diagnosis columns other than Dx31 through Dx35?

Yes. You may place E-codes in any diagnosis column except the primary diagnosis.

Diagnoses 31–35 were created as a convenience to allow up to 30 diagnoses as well as up to 5 E- codes.

12.2.8 Can I use ZIP Code™ instead of patient State/county code?

No. In order to calculate rates for area-level indicators, the WinQI software contains a table of population figures for each county. If you do not have valid State/county codes, the population cannot be used for the denominator of area rates. If you are not interested in area rates, you can leave out the State/county code.

12.2.9 Why is the patient's State/county preferred to the hospital's State/county code?

Area-level indicators are designed to measure overall quality of care and access to care within the health system of a geographic area, such as a county. Patients in the numerator for an area-level indicator should be counted with the denominator based on the county in which they reside, and this location may not necessarily be the county where they seek care.

12.2.10 What if my data don't contain "Days to Procedure"?

The days-to-procedure variables are used to determine the proper ordering of procedures relative to the operating room procedures. For example, PSI 08 excludes hip fracture repairs that occurred before any other operating room procedure since the hip fracture cannot be attributed to the operating room. Alternate specifications exist for each indicator if "Days to Procedure" data are not loaded.

12.2.11 What if I can't determine the correct crosswalk for a variable?

Consult the SID documentation (<http://hcup-us.ahrq.gov/db/state/siddbdocumentation.jsp>) for a detailed discussion of each data element. Also, check the AHRQ QI *Technical Specifications* for the indicators in which you are interested. For most of the mapped variables, only a few of the crosswalk values are of interest to the WinQI software. For example, disposition codes of 2 and 20 are referenced in the logic of some indicators to identify transfers to another short-term hospital and patients who died in the hospital.

12.2.12 Shouldn't "Admission Source=4" indicate transfers instead of 2?

It is important that the crosswalk for this variable be set to the SID specification. If your data are in an alternate format, you can change the crosswalk during the data load.

12.2.13 What about "Present on Admission"?

"Present on Admission" (POA) fields were first incorporated in the QIs in Version 3.1. The present-on-admission indicator in hospital administrative data distinguishes medical conditions that are present when patients enter the hospital (i.e., comorbidities or pre-existing conditions) from those that first occur during the hospital stay (complications or in-hospital adverse events). Beginning with FY 2008 (October 1, 2007), the UB-04 data specification manual includes a POA indicator (<http://www.cdc.gov/nchs/data/icd9/icdguide09.pdf>).

POA indicators can be reported with principal and secondary diagnoses, in addition to external cause of injury codes. The coding guidelines for POA are available online in Appendix I of the ICD-9-CM Official Guidelines (http://www.cdc.gov/nchs/data/icd/icd9cm_guidelines_2011.pdf).

The reporting of POA indicators may vary by hospital. For example, CMS considers certain types of hospitals exempt from POA reporting. Some examples include critical access hospitals, children's hospitals, and cancer hospitals. Although these hospitals may be exempt for reporting POA data to CMS, there may be State-specific mandates that require POA reporting. Users should be knowledgeable of the POA reporting requirements and practices of hospitals represented in the input data file.

The ICD-9-CM Official Guidelines for Coding and Reporting identifies some diagnoses that are exempt from POA reporting for one of the following reasons: (1) they represent circumstances regarding the health care encounter, (2) they indicate factors influencing health status that do not represent a current disease or injury, or (3) they are always present on admission. Some examples of the exempt diagnosis codes include old myocardial infarction, normal delivery, congenital anomalies, "V" diagnosis codes indicating a history of disease, and external cause of injury codes specific to accidents. For the diagnoses that are exempt from POA reporting, the WinQI v6.0 software assumes that the diagnosis is present on admission and did not occur during the hospital stay.

In general, cases where the outcome of interest is present on admission will be excluded from the denominator, as these cases are no longer in the population at risk of having the outcome of interest occur during the hospitalization.

The use of POA fields can uniformly impact PSI and PDI rates by reducing the times that "false-positives" occur—diagnoses being identified as complications from the current hospitalization instead of a prior hospitalization or preexisting comorbidities. Prior to WinQI v5.0, if you did not use POA data, an estimation procedure was used to adjust the prevalence of the outcome of interest and covariates for risk adjustment. In WinQI v5.0, the use of the Prediction Module was discontinued to estimate the prevalence of conditions when POA data are missing. When using the WinQI v6.0 software, the user must specify whether the input

data has POA information or not by mapping the POA variables in the input file to the corresponding QI variables. The POA data may impact the prevalence of the outcome of interest and the risk-adjusted rates by excluding secondary diagnoses coded as complications from the identification of covariates. If the user's input file does not include POA data and the user does not map the POA variables, the WinQI software will assume the outcome of interest occurred in the hospital.

If POA information is available on the input data, it is used to identify whether a diagnosis is present on admission or not using the following criteria:

The diagnosis is identified as present on admission if either of the following conditions exist:

- The diagnosis code is expected to have present on admission reported based on ICD-9-CM coding guidelines and the associated POA value is either “Y” for present on admission or “W” for clinically undetermined.
- The diagnosis code is exempt from POA reporting according to the ICD-9-CM coding guidelines.

In all other cases, the diagnosis is identified as not present on admission. This includes cases in which POA information is unavailable; i.e., the data field on the record is blank.

If POA information is unavailable on the input data, it is assumed the diagnosis is not present on admission for all nonexempt diagnoses. For the diagnoses that are exempt from POA reporting, the software assumes that the diagnosis is present on admission and did not occur during the hospital stay.

12.2.14 What about “Do not Resuscitate”?

“Do not Resuscitate” (“DNR”) status is not imported nor used in the AHRQ QIs because it is not universally available or applied in a uniformly unbiased manner. Risk-adjusted and expected rates take into account the overall health of the inpatient population.

12.2.15 What is the purpose of the patient identification fields?

The fields “Date of Birth,” “Admission Date,” “Discharge Date,” and “Patient ID” are passthrough fields in the WinQI application. These are available to identify patients in the QI export file as part of other studies, such as the Collaborative Validation Pilot. In the interests of preserving privacy, they should not be used if these are not required for your study.

12.2.16 Can length of stay be calculated from the admission and discharge dates?

No. “Length of Stay” data must be present in the input file. “Admission Date” and “Discharge Date” are only pass-through fields.

12.2.17 What is length of stay for a same-day discharge?

Length of stay should be “0” if the patient is discharged on the same day as admission.

12.2.18 My State has different crosswalk values. How can I determine the mapping?

If your State participates in HCUP SID, you may wish to consult the State-specific HCUP documentation found at <http://www.hcup-us.ahrq.gov/db/state/siddbdocumentation.jsp>.

12.3 Specifying and Viewing Reports

12.3.1 Can provider-level and area-level reports be combined?

No. Rates are expressed differently. Area-level indicators use the population of the county as the denominator. Provider-level indicators use the total number of at-risk patient discharge records as the denominator. The stratifiers available for reporting are limited by the information appropriate to each group.

12.3.2 Can I stratify area-level Indicators by hospital?

No. Area-level indicators are designed to measure potentially avoidable hospitalizations for the residents of a county. Although it could be possible to classify patients by the hospital they went to (stratify a numerator), it is not possible to classify the residents by the hospital they did not go to (stratify the denominator).

12.3.3 Can reports be viewed after closing the Report Wizard?

Yes. The View Report option on the main menu opens the Reports screen, displaying the data from the last set of reports generated using the Report Wizard.

12.3.4 What happens if a new report is generated?

The existing set of reports will be overwritten.

12.3.5 Is there a way to save reports for later viewing?

Immediately following generation, a report can be exported to a .csv or .txt file and viewed in other software such as Microsoft Excel. After a different report is generated, there is no way to view an earlier report from within the WinQI software.

12.3.6 How can I get a list of cases that contributed to my rate for an indicator?

Use the Patient Level Report (see [Section 10.17](#)).

12.3.7 Why was a particular case flagged by a particular indicator?

Use the Case Details Report to show you the definition of an indicator and how it is applied to a case (see [Section 10.18](#)).

12.4 Using Different Types of QI Rates

When should you use the observed, expected, risk-adjusted, and/or smoothed rates generated by the AHRQ WinQI software? Here are some guidelines. For additional information, see the technical documentation on the AHRQ QI Web site.

Note that beginning with WinQI v4.5, the software no longer reports expected rates, risk-adjusted rates, and smoothed rates for the following measures: IQI 21 Cesarean Delivery Rate, Uncomplicated; IQI 22 Vaginal Birth After Cesarean (VBAC) Delivery Rate, Uncomplicated; IQI 23 Laparoscopic Cholecystectomy Rate; IQI 24 Incidental Appendectomy in the Elderly Rate; IQI 25 Bilateral Cardiac Catheterization Rate; IQI 33 Primary Cesarean Delivery Rate, Uncomplicated; IQI 34 Vaginal Birth After Cesarean (VBAC) Rate, All; PSI 17 Birth Trauma Rate – Injury to Neonate; PSI 18 Obstetric Trauma Rate – Vaginal Delivery With Instrument; and PSI 19 Obstetric Trauma Rate – Vaginal Delivery Without Instrument. These measures are not risk adjusted, and so, only the numerators, denominators, and observed rates are reported.

12.4.1 Observed Rate

If the user's primary interest is to identify cases for further follow-up and quality improvement, then the observed rate would help to identify them. The observed rate is the raw rate generated by the WinQI software from the data the user provided. Areas for improvement can be identified by the magnitude of the observed rate compared to available benchmarks and/or by the number of patients affected.

Additional breakdowns by the default patient characteristics used in stratified rates (e.g., age, gender, or payer) can further identify the target population. Target populations can also be identified by user-defined patient characteristics supplemented to the case/discharge-level flags. Trend data can be used to measure change in the rate over time.

12.4.2 Expected Rate

Another approach to identify areas to focus on is to compare the observed and expected rates.

The expected rate is the rate the provider would have if it performed the same as the reference population given the provider's actual case mix; e.g., age, gender, MS-DRG, and comorbidity categories).

If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0 or observed minus expected is positive), then the implication is that the provider performed worse than the reference population for that particular indicator. Users may want to focus on these indicators for quality improvement.

If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0 or observed minus expected is negative), then the implication is that the provider

performed better than the reference population. Users may want to focus on these indicators for identifying best practices.

12.4.3 Population Rate

Users can also compare the expected rate to the population rate reported in the v6.0 Benchmark Data Tables to determine how their case mix compares to the reference population. The population rate refers to the overall rate for the reference population. The reference population is defined in the Benchmark Data Tables documents available on the AHRQ QI Web site for each module. If the population rate is higher than the expected rate, then the provider's case mix is less severe than the reference population. If the population rate is lower than the expected rate, then the provider's case mix is more severe than the reference population.

We use this difference between the population rate and the expected rate to “adjust” the observed rate to account for the difference between the case mix of the reference population and the provider's case mix. This is the provider's risk-adjusted rate.

If the provider has a less severe case mix, then the adjustment is positive (population rate > expected rate) and the risk-adjusted rate is higher than the observed rate. If the provider has a more severe case-mix, then the adjustment is negative (population rate < expected rate) and the risk-adjusted rate is lower than the observed rate. The risk-adjusted rate is the rate the provider would have if it had the same case-mix as the reference population given the provider's actual performance.

12.4.4 Risk-Adjusted Rate

The AHRQ QIs use indirect standardization to calculate the risk-adjusted rate:

$\text{Risk adjusted Rate} = (\text{Observed Rate} \div \text{Expected Rate}) * \text{Reference Population Rate}]$

$$\text{Risk adjusted rate} = \frac{\text{observed rate}}{\text{expected rate}} \times \text{reference population rate}$$

Note that for the reference population, the observed rate equals the expected rate equals the reference population rate equals the risk-adjusted rate. A risk-adjusted rate is the rate the hospital would have if it had an average case mix. In other words, it holds the hospital's performance on the QI constant and compares that to an average case mix.

12.4.5 Smoothed Rate

Finally, users can compare the risk-adjusted rate to the smoothed, or “reliability-adjusted,” rate to determine whether this difference between the risk-adjusted rate and reference population rate is likely to remain in the next measurement period. Smoothed rates are weighted averages of the population rate and the risk-adjusted rate, where the weight reflects the reliability of the provider's risk-adjusted rate.

A ratio (smoothed rate - population rate) / (risk-adjusted rate - population rate) greater than 0.80 suggests the difference is likely to persist (whether the difference is positive or negative). A ratio of less than 0.80 suggests that the difference may be due in part to random differences in patient characteristics (patient characteristics that are not observed and controlled for in the risk adjustment model). In general, users may want to focus on areas where the differences are more likely to persist.

13. User Support

Technical assistance for the QI software is available through an electronic user support system monitored by the AHRQ QI support team. The same email address may be used to communicate to AHRQ any suggestions for QI enhancements, general questions, and any QI related comments you may have. AHRQ welcomes your feedback. The email address for user support and feedback is qisupport@ahrq.hhs.gov.

AHRQ also offers a listserv to keep you informed on the Quality Indicators. The listserv is used to announce any QI changes or updates as well as new tools and resources. It also is used to distribute other QI related information. This is a free service. Simply follow the process described below to begin receiving important QI information. All you need is a computer, Internet access, and an email address. The listserv operates like other electronic distribution lists. To register for the listserv, follow this process:

1. Send an email message to listserv@qualityindicators.ahrq.gov.
2. On the subject line, type Subscribe.
3. In the body of the message, type sub Quality_Indicators-L and your full name. For example: **sub Quality_Indicators-L John Doe**
4. You will receive a message confirming that you are enrolled.

If you have any questions, contact AHRQ QI Support at the email noted above. You should receive an automatic response email message confirming receipt. If you do not receive a confirmation message, please call (888) 512-6090.

14. Notes on the ICD-10-CM AHRQ QI Software

14.1 Using the AHRQ QI ICD-10-CM software

The ICD-10 CM QI software for v6.0 represents an initial view of how the Quality Indicators are implemented using ICD-10 coded data. For version 6.0, the ICD-10 software computes numerators, denominators and observed rates for the Quality Indicators. Programs to compute risk adjusted rates and weighted composite measures will be available in a subsequent release when sufficient ICD-10 coded data are available to develop risk adjustment models. WinQI screens that reference population rate, risk adjustment or related rates (such as expected rate, risk adjusted rate, and smoothed rate), provider composite measures will not have that information available in [ICD-10 component of v6.0 version](#).

14.2 Relationship of ICD-9-CM AHRQ QI Software to ICD-10-CM Software

The specification of Quality Indicators using ICD-10 codes takes advantage of enhancements in ICD-10-CM that were not available in ICD-9-CM. Therefore, the specifications for the ICD-10 indicators are not expected to map directly to ICD-9 specifications, but rather best capture the intended purpose of the indicator. Moreover, the creation of the ICD-10 specifications does not map individual ICD-9 codes to ICD-10, but rather maps code groups (e.g. hemorrhage, asthma) from ICD-9-CM code groups to ICD-10 code groups. More details about the translation of the QIs to ICD-10 are available at [AHRQ ICD-10_CM/PCS Conversion Project](#), Nov 2013.

Appendix A: WinQI Input Data Dictionary

Table A–1. WinQI Input Data Dictionary

VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Key (KEY)	Sequence number; unique case identifier	String up to 20 characters	User-defined unique numeric identifier for each discharge record	Not required by the AHRQ WinQI software but available to allow users to link the discharge records in the Patient Level Report back to the input data.
Age (AGE)	Age in years at admission	Numeric	Age in years	If this data element is missing, the discharge record will be excluded from the analysis.
Age in Days (AGEDAY)	Age in days at admission (coded only when the age in years is less than 1)	Numeric 0–364 ¹ days	Age in days	Used in the inclusion and exclusion criteria for several indicators. If this data element is missing (and age is 0), then generally an alternative specification applies.
Race (RACE)	Race of patient	Numeric	1 = White 2 = Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American 6 = other	Used to stratify the AHRQ QI rates. For the area-level indicators, ² all the input data values must be mapped to one of the listed values. For provider-level indicators, user-defined values may be retained.
Sex (SEX or GENDER)	Gender of patient	Numeric	1 = male 2 = female	If this data element is missing, the discharge record will be excluded from the analysis.
Primary Payer (PAY1)	Expected primary payer, uniform	Numeric	1 = Medicare 2 = Medicaid 3 = private, incl. HMO 4 = self-pay 5 = no charge 6 = other	Used to stratify the AHRQ QI rates. Not used for the area-level indicators. The values of 1–5 are used directly in the QI software. All other payer codes are mapped to an 'other' category. This data element is used to stratify only the provider-level IQIs (01 to 25 and 30 to 34); provider-level PDIs (01 to 13); and provider-level PSIs (02 to 19).
Patient State/County Code (HOSPSTCO or PSTCO)	FIPS State/county code of patient's residence (Use hospital's State/county if the patient's is unavailable; however, patient's is recommended. ³)	Numeric; two-digit State code followed by three-digit county code (ssccc)	Modified FIPS State/county code ⁴	Available at: https://www.census.gov/popest/about/geocodes.html . If this data element is missing, the discharge record will be excluded from area-level rate calculations. This variable may be renamed in the future to reflect the preference for the location of the patient rather than the hospital.
Hospital ID (HOSPID)	Data source hospital ID	String up to 12 characters	Hospital identification number	Used to facilitate data exploration and possible troubleshooting. May also be selected as a stratifier for provider-level indicators.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Discharge Disposition (DISP)	Disposition of patient	Numeric	1 = routine 2 = short-term hospital 3 = SNF 4 = intermediate care 5 = another type of facility 6 = home health care 7 = against medical advice 20 = died in the hospital	The values 2 and 20 are referenced by the QI code (to identify transfers to another short-term hospital and patients who died in the hospital). Values 1 through 7 and 20 are used in APR-DRG assignment. Other values are recoded to missing by the software unless the user explicitly recodes them in the Crosswalk screen. This convention is different from the AHRQ QI SAS® application. Not used for PQIs.
Admission Type (ATYPE)	Admission type	Numeric	1 = emergency 2 = urgent 3 = elective 4 = newborn 5 = delivery (1988–1997) 5 = not used (1998–2002) 5 = trauma center (2003–) 6 = other	The values 3 and 4 are referenced by the AHRQ QI code (to identify elective surgeries and newborn admissions). PSI 10, 11, 13, and 17 and PDI 08 and 09 will be affected if admission type values are missing. Used for PQIs in newborn definition. Not used for IQIs.
Admission Source (ASOURCE)	Admission source	Numeric	1 = ER 2 = another hospital 3 = another facility, incl. LTC 4 = court/law enforcement 5 = routine/birth/other	The values 2 and 3 are referenced by the PSI, IQI, PQI, and PDI code (to identify transfers from another hospital or facility).
POINTOFORIG INUB04 (POINTOFORIGIN 04)	Point of origin	Numeric	4 = transfer from a hospital 5 = transfer from an SNF or ICF 6 = transfer from another health care facility IF ATYPE = 4, then: 5 = born inside this hospital 6 = born outside of this hospital	Only these values are used by the QI programs.
Length of Stay (LOS)	Length of stay	Numeric	Number of days from admission to discharge	Same-day discharges are coded as 0 days stay. Not used for PQIs or IQIs.
APR-DRG (APRDRG or APR_DRG)	APR-DRG category	Numeric	3M™ APR-DRG software	Optional. Currently the AHRQ WinQI software uses a multiversionII (i.e., Versions 20, 23–30, 32, 33) APR-DRG grouper to risk-adjust the IQIs. A free version of the software is packaged with this program and can be run during the data load. Not used for PQIs, PSIs, or PDIs. Not used for the ICD-10 component of v6.0.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
APR-DRG Severity of Illness (SEVERITY or APR-DRG SOI)	APR-DRG severity score	Numeric	3M™ APR-DRG software severity score	Optional. Currently the AHRQ WinQI software uses APR-DRG Versions 20, 23–29, 32, 33. A free version of the software is packaged with this program and can be run during the data load. Not used for IQIs, PQIs, PSIs, or PDIs. Not used for the ICD-10 component of v6.0.
APR-DRG Risk of Mortality (RISKMORT or APR-DRG ROM)	APR-DRG risk-of- mortality score	Numeric	3M™ APR-DRG software risk-of-mortality score	Optional. Currently the AHRQ WinQI software uses APR-DRG Versions 20, 23–30, 32, 33 to risk-adjust the IQIs. A free version of the software is packaged with this program and can be run during the data load. Not used for PQIs, PSIs, or PDIs. Not used for the ICD-10 component of v6.0.
XAPR-DRG Risk of Mortality (XRISKMORT)	APR-DRG mortality score excluding diagnoses that are not present on admission	Numeric	3M™ APR-DRG software risk-of-mortality score	Optional. Currently the AHRQ WinQI software uses APR-DRG Versions 20, 23–30, 32,33 to risk-adjust the IQIs. A free version of the software is packaged with this program and can be run during the data load. Not used for PQIs, PSIs, and PDIs. Not used for the ICD-10 component of v6.0 version
Diagnosis Related Group (DRG or MS_DRG)	MS-DRG	Numeric	DRG from Federal (CMS) grouper	Required for generating most indicators. For Version 24 and earlier, this is the CMS DRG. For Version 25 and later, this is the MS-DRG.
Diagnosis-Related Group Version (DRG_VER)	DRG version	Numeric	Version of Federal (CMS) DRG grouper	For example, Version 25 for FY 2008 or Version 33 for FY 2016.
Major Diagnostic Category (MDC)	Major Diagnostic Category	Numeric	DRG from Federal (CMS) grouper	Required for processing. WinQI generates it if not passed by the user, but DRG value is required for WinQI to assign MDC.
Principal Diagnosis (DX1)	ICD-9-CM or ICD- 10-CM diagnosis code. Diagnosis 1 is the principal diagnosis.	For ICD-9-CM - String; three, four, or five characters. For ICD-10- CM - String; three to seven characters (do not include decimal point)	Diagnosis code	Required field for processing any indicator analysis. If this data element is missing, the discharge record will be excluded from the analysis.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Diagnosis Code 2– Diagnosis Code 35 (DX2–DX35) (up to 34 fields). ECODE1 through ECODE5 for E-codes in Diagnosis 31 through 35.	ICD-9-CM diagnosis codes or E-codes. Diagnosis codes 2–35 are secondary diagnoses.	For ICD-9-CM - String; three, four, or five characters. For ICD-10- CM - String; three to seven characters (do not include decimal point)	Diagnosis codes	NOTE: Seven of the PSIs rely on E- codes. If the dataset contains E-codes in user-defined variables, these variables should be remapped to secondary diagnosis codes. See instructions for using the Data Mapping screen in the Quality Indicators Wizard. Diagnosis codes may also contain V- codes.
Present on Admission 1– Present on Admission 35 (DXATADMIT1 or POA 1– DXATADMIT35 or POA 35) (up to 35 fields)	POA indicator for each diagnosis code	String	“Y” and “W” indicate present at the time of inpatient admission “N,” “U,” “O,” “E,” and “1” indicate not present at the time of inpatient admission In v5.0 and higher, a blank POA value is interpreted as indicating that the corresponding diagnosis was not present on admission unless the diagnosis code is exempt from POA reporting.	These are equivalent to the DXATADMITn fields in the UB-04 specification. Having the POA fields may eliminate “false-positives” from PSI and PDI results. POA flags associated with E-codes can be mapped to these variables.
Principal Procedure 10.1 (PR1) 10.2 Procedure Code 2–Procedure Code 30 10.3 (PR2–PR30) 10.4 (up to 29 different columns)	ICD-9-CM or ICD- 10-CM procedure codes. Procedure code 1 is the principal procedure.	For ICD-9 String; two, three, or four characters For ICD-10 String; three to seven characters (do not include decimal point)	Procedure code	Decimal points, if any, must be removed before loading data.
	ICD-9-CM procedure codes. Procedure codes 2–30 are secondary procedures.	For ICD-9 String; two, three, or four characters For ICD-10 String; three to seven characters (do not include decimal point)	Procedure codes	Include up to 30 procedures. It is not necessary to have 30.
Days to Procedure 1–Days to Procedure 30 (PRDAY1– PRDAY30) (up to 30 fields)	Days from admission to procedure. Procedure 1 is the principal procedure; procedures 2–30 are secondary procedures.	Numeric	Days from admission to procedure ⁵	It is expected that the number of days- to-procedure variables agrees with the number of procedure codes present. Valid values may be negative or zero. Only applies to PSI and PDI postoperative patient safety indicators.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Year (YEAR)	The patient's year of discharge. For example, a patient discharged on July 7, 2004, would have a discharge year of 2004.	Numeric	YYYY Discharge year should be within the range of 1997 to present year.	Required data element and used to apply the proper fiscal year coding and to assign the APR-DRG if the limited license grouper is used. If this data element is missing, the discharge record will be excluded from the analysis.
Discharge Quarter (DQTR)	The calendar quarter of the patient's discharge. For example, a patient discharged on July 7, 2004 would have a discharge quarter of 3.	Numeric	1 = January–March 2 = April–June 3 = July–September 4 = October–December	Required data element and used to apply the proper fiscal year coding and to assign the APR-DRG if the limited license grouper is used. If this data element is missing, the discharge record will be excluded from the analysis.
Custom Stratifier 1– Custom Stratifier 3	Custom stratification values	String; 1–20 characters	Any custom value you wish to stratify by.	This can be used for a variety of purposes; e.g., groups of hospitals or groups of records with a hospital.
Days on Mechanical Ventilator (DMV)	Number of days the patient spent on a mechanical ventilator	Numeric		Optional data element that is passed directly to the APR-DRG grouper.
Birthweight in Grams (BIRTHWEIGHT)	Birthweight for newborns	Numeric		Optional data element that is passed directly to the APR-DRG grouper. This field is not used for pediatric birthweight categories. ICD-9-CM diagnosis codes are used to indicate birthweight.
Date of Birth (BIRTH_DATE)	Patient date of birth	Date	MM/DD/YYYY	Optional (NOT RECOMMENDED). For identification purposes only on the data export. It is not recommended that you use this field unless required for external analysis.
Admission Date (ADMIT_DATE)	Date of patient admission	Date	MM/DD/YYYY	Optional (NOT RECOMMENDED). For identification purposes only on the data export. It is not recommended that you use this field unless required for external analysis.
Discharge Date (DISCHARGE_DATE)	Date of patient discharge	Date	MM/DD/YYYY	Optional (NOT RECOMMENDED). For identification purposes only on the data export. It is not recommended that you use this field unless required for external analysis.
Patient ID (PATIENT_ID)	Patient ID or medical record number	String; 1–20 characters		Optional (NOT RECOMMENDED). For identification purposes only on the data export. It is not recommended that you use this field unless required for external analysis.

AHRQ: Agency for Healthcare Research and Quality; APR-DRG: All Patient Refined Diagnosis-Related Group; CMS: Centers for Medicare & Medicaid Services; E-code: external cause of injury code; ER: emergency room; FIPS: Federal Information Processing Standards; FY: fiscal year; HMO: health maintenance organization; ICD-9-CM: International Classification of Diseases, Ninth revision, Clinical Modification; ICF: intermediate care facility; IQIs: Inpatient Quality Indicators; LTC: long-term care; MS-DRG: Medicare Severity Diagnosis-Related Group; PDIs: Pediatric Quality Indicators; POA: present on admission; PQIs: Prevention Quality Indicators; PSIs: Patient Safety Indicators; QI: Quality Indicators™; SNF: skilled nursing facility; UB-04: Uniform Bill 04; WinQI: Quality Indicators™ Windows®

¹ The 365-day range is to allow for leap years.

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² Area-level indicators are all the PQIs, IQIs 26–29, PDIs 14–18, and PSIs 21–27. Provider-level indicators are IQIs 01–25 and 30–34, PDIs 01–13, Neonatal Quality Indicators (NQIs) 01–03, and PSIs 02–19.

³ See “How should I map my data element for the patient's location?” in Section 5.4.5.11.

⁴ Federal Information Processing Standard, as defined by the U.S. Department of Commerce, National Institute of Standards and Technology (formerly National Bureau of Standards). Note: Certain independent cities (Baltimore City, Carson City, and St. Louis City), and areas within Hawaii and Virginia, are assigned to different area groupings in the Modified FIPS categories as compared to the U.S. Census Bureau groupings. The AHRQ QI software uses the Modified FIPS code assignment of these areas. Failure to use the Modified FIPS codes assignment will result in the use of incorrect denominator estimates for area-level indicators.

⁵ Variables Days to Procedure 1 to Days to Procedure 30 are defined as the number of days from date of admission to date of procedure for each procedure. For example, if the patient was admitted on June 15 and had two procedures—the principal procedure on June 15 and a second procedure on June 18—then the value of Days to Procedure 1 would be zero (0) and the value of Days to Procedure 2 would be three (3). For more information, consult the Healthcare Cost and Utilization Project data documentation at <http://www.hcup-us.ahrq.gov/db/vars/prdayn/nisnote.jsp>.

Appendix B: WinQI Output Report Dictionary

Table B–1. WinQI Provider-Level Indicator Output

VARIABLE GROUP	VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Indicator Identification (present if the user chooses to show indicators in rows)	Module	Indicator module identifier	Text	One of IQIs, PDIs, PQIs, or PSIs	
	Indicator Number	Identifier of the indicator within the module	Numeric		
	Name	Full name of the indicator	Text		
Stratifiers (the user may select between 0 and 10 of these variables in any order)	Age Category	Age category in years at admission	Numeric range	#-# OR "TOTAL"	Age categories as defined in Benchmark tables (0–17, 18–39, 40–64, 65–74, 75+)
	Five Year Age Group	5-year age group in years at admission	Numeric range	#-# years	00–04, 05–09, 10–14, 15–17, 18–24, 25–29, and so on, ending with 85+
	Sex	Gender of patient	Numeric	1 = male 2 = female	
	Year	Year of discharge	Numeric		
	Quarter	Quarter of discharge	Numeric	1–4	
	Hospital ID	Data source hospital ID	Text	Up to 12 characters	
	Payer	Expected primary payer, uniform	Numeric	1 = Medicare 2 = Medicaid 3 = private, incl. HMO 4 = self-pay 5 = no charge 6 = other	If user had a value outside of these predefined values in the input file and user selects "Retain value" on the Crosswalk screen, then the retained value will be also be reported on stratification. If user maps to "Missing" on the Crosswalk screen, then "0" will be reported.
	Race	Race of patient	Numeric	1 = White 2 = Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American 6 = other	If user had a value outside of these predefined values in the input file and user selects "Retain value" on the Crosswalk screen, then the retained value will be reported on stratification. If user maps to "Missing," then "0" will be reported.
	Pediatric Age Category	Pediatric age category in years at admission	Numeric range		<1 year, 1–2, 3–5, 6–12, 13–17
	Pediatric Age In Days	Pediatric age category in days at admission	Numeric range		0–28, 29–60, 61–90, 91–365 days
	Risk Category				The categories are indicator specific.

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VARIABLE GROUP	VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
	Custom 1	Custom stratifier 1	Text	Up to 20 characters	
	Custom 2	Custom stratifier 2	Text	Up to 20 characters	
	Custom 3	Custom stratifier 3	Text	Up to 20 characters	
Calculated Values (always present, column names are prefixed with module and indicator number when the user chooses to show indicators in columns)	Observed Numerator	The number of discharge records included in the numerator (outcome of interest) as defined for the indicator	Numeric		
	Observed Denominator	The number of discharge records included in the denominator (population at risk) as defined for the indicator	Numeric		
	Observed Rate	The rate (observed numerator/observed denominator) as defined for the indicator	Numeric		
	Expected Rate	Rate calculated by assuming an "average" performance for each patient group based on the reference population, but with the provider's actual case mix	Numeric		The reference population is based on all States participating in the most recently available HCUP SID. Not applicable to ICD-10 component of v6.0.
	O-E Ratio	The ratio of the observed to the expected rate	Numeric		Not applicable to ICD-10 component of v6.0.
	Reference Pop Rate	The rate for the current reference population	Numeric		Not applicable to ICD-10 component of v6.0.
	Risk Adjusted Rate	The estimated rate calculated by adjusting to an "average" case mix	Numeric		This average case mix is estimated using proportional indirect standardization: risk-adjusted rate = (observed rate/expected rate)×reference population rate. Not applicable to ICD-10 component of v6.0.
	Risk Adj Conf Int. Low	The lower confidence bound of the risk-adjusted rate	Numeric		Not applicable to ICD-10 component of v6.0.

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VARIABLE GROUP	VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
	Risk Adj Conf Int. High	The upper confidence bound of the risk-adjusted rate	Numeric		Not applicable to ICD-10 component of v6.0.
	Smoothed Rate	The smoothed rate calculated using multivariate signal extraction (MSX)	Numeric		MSX smoothing estimates the effect of random differences in the observed rate across providers or areas. In essence, smoothing describes how persistent a rate would be from year to year. Smoothing is a useful tool to “level the playing field” for providers or areas with a small number of cases. Not applicable to ICD-10 component of v6.0.

HCUP: Healthcare Cost and Utilization Project; HMO: health maintenance organization; IQIs: Inpatient Quality Indicators; MSX: multivariate signal extraction; PDIs: Pediatric Quality Indicators; PQIs: Prevention Quality Indicators; PSIs: Patient Safety Indicators; SID: State Inpatient Databases

Table B–2. WinQI Provider-Level Composite Indicator Report

Note: This report is not available for ICD-10 component of v6.0.

VARIABLE GROUP	VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Composite_name	Composite indicator name for provider-level composites		Text	IQI Proc (IQI90 - Mortality for Selected Procedures) IQI Cond (IQI91 - Mortality for Selected Conditions) PSI Comp (PSI90 - Patient Safety for Selected Indicators) Ped Safety (PDI19 - Pediatric Patient Safety for Selected Indicators)	
COMP1	Indicator rate or ratio		Numeric		
COMPVAR1	Variance		Numeric		
COMP1SE	Standard error		Numeric		
COMP1WHT	Weight		Numeric		

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VARIABLE GROUP	VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
COMP1LB	Lower bound	Lower bound of the rate/ratio confidence interval	Numeric		
COMP1UB	Upper bound	Upper bound of the rate/ratio confidence interval	Numeric		

Table B–3. WinQI Area-Level Indicator Output

VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Module	Indicator module identifier	Text	One of IQIs, PDIs, PQIs, or PSIs	
Indicator Number	Identifier of the indicator within the module	Numeric		
Name	Full name of the indicator	Text		
Age Category	Age category in years at admission	Numeric range	#-# OR "TOTAL"	Age categories as defined in Benchmark tables (0–17, 18–39, 40–64, 65–74, 75+)
Five Year Age Group	5-year age group in years at admission	Numeric range	#-# Years	00–04, 05–09, 10–14, 15–17, 18–24, 25–29, and so on, to 85+
Sex	Gender of patient	Numeric	1 = male 2 = female	
Year	Year of discharge	Numeric		
Quarter	Quarter of discharge	Numeric	1–4	
Race	Race of patient	Numeric	1 = White 2 = Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American 6 = other	If user had a value outside of these predefined values in the input file and user selects "Retain value" on the Crosswalk screen, then the retained value will be reported on stratification. If user had mapped to "Missing," then "0" will be reported.
County	County FIPS code (with independent areas left separate)	Numeric	Five-digit numeric identifier	
Modified FIPS County ID	County FIPS code (with independent areas combined)	Numeric	Five-digit numeric identifier	
State	State FIPS code	Numeric	Two-digit numeric identifier	
OMB 1999 Metro Area	OMB 1999 metropolitan statistical area identifier	Numeric	Five-digit numeric CBSA identifier	
OMB 2003 Metro Area	OMB 2003 metropolitan statistical area identifier	Numeric	Five-digit numeric CBSA identifier	
Observed Numerator	The number of discharge records included in the numerator (outcome of interest) as defined for the indicator	Numeric		

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Observed Denominator	The number of discharge records included in the denominator (population at risk) as defined for the indicator	Numeric		
Observed Rate	The rate (observed numerator/observed denominator) as defined for the indicator	Numeric		
Expected Rate	Rate calculated by assuming an “average” performance for each patient group based on the reference population, but with the provider’s actual case mix	Numeric		The reference population is based on all States participating in the most recently available HCUP SID databases. Not available for ICD-10 component of v6.0.
O-E Ratio	The ratio of the observed to the expected rate	Numeric		Not available for ICD-10 component of v6.0.
Reference Pop Rate	The rate for the current reference population	Numeric		Not available for ICD-10 component of v6.0.
Risk Adjusted Rate	The estimated rate calculated by adjusting to an “average” case mix	Numeric		This average case mix is estimated using proportional indirect standardization: risk-adjusted rate = (observed rate/expected rate)*reference population rate. Not available for ICD-10 component of v6.0.
Risk Adj Conf Int. Low	The lower confidence bound of the risk-adjusted rate	Numeric		Not available for ICD-10 component of v6.0.
Risk Adj Conf Int. High	The upper confidence bound of the risk-adjusted rate	Numeric		Not available for ICD-10 component of v6.0.
Smoothed Rate	The smoothed rate calculated using multivariate signal extraction (MSX)	Numeric		MSX smoothing estimates the effect of random differences in the observed rate across providers or areas. In essence, smoothing describes how persistent a rate would be from year to year. Smoothing is a useful tool to “level the playing field” for providers or areas with a small number of cases. Not available for ICD-10 component of v6.0.

Appendix C: WinQI Export Data Dictionary

Table C–1. WinQI Export Data Dictionary

VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Key				
Age	Age in years at admission	Numeric	Age in years	If this data element is missing, the discharge record will be excluded from the analysis.
Age in Days	Age in days at admission (coded only when the age in years is less than 1)	Numeric (0–364 ¹ days)	Age in days	Used in the inclusion and exclusion criteria for several indicators. If this data element is missing (and age is 0), then generally an alternative specification applies.
Race	Race of patient	Numeric	1 = White 2 = Black 3 = Hispanic 4 = Asian or Pacific Islander 5 = Native American 6 = other	Used to stratify the AHRQ QI rates. For the area-level indicators, ² all the input data values must be mapped to one of the listed values. For provider-level indicators, user-defined values may be retained.
Sex	Gender of patient	Numeric	1 = male 2 = female	If this data element is missing, the discharge record will be excluded from the analysis.
Primary Payer	Expected primary payer, uniform	Numeric	1 = Medicare 2 = Medicaid 3 = private, incl. HMO 4 = self-pay 5 = no charge 6 = other	Used to stratify the AHRQ QI rates. Not used for the area-level indicators. For provider-level indicators, user-defined values may be retained.
Patient State/County Code	FIPS State/county code of patient's residence	Numeric; two-digit State code followed by three-digit county code (ssccc)	Modified FIPS State/county code ³	Available at: https://www.census.gov/popest/about/geo/codes.html
Hospital ID	Data source hospital ID	String; up to 12 characters	Hospital identification number	Used to facilitate data exploration and stratification.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Discharge Disposition	Disposition of patient	Numeric	1 = routine 2 = short-term hospital 3 = SNF 4 = ICF 5 = another type of facility 6 = home health care 7 = against medical advice 20 = died in the hospital	The values 2 and 20 are referenced by the QI code (to identify transfers to another short-term hospital and patients who died in the hospital). Values 1 through 7 and 20 are used in APR-DRG assignment. Other values are recoded to missing by the software unless the user explicitly recodes them in the Crosswalk screen. This convention is different from the AHRQ SAS® QI application. Not used for PQIs.
Admission Type	Admission type	Numeric	1 = emergency 2 = urgent 3 = elective 4 = newborn 5 = delivery (1988–1997) 5 = not used (1998–2002) 5 = trauma center (2003) 6 = other	The values “3” and “4” are referenced by the AHRQ QI code (to identify elective surgeries and newborn admissions). PSIs 10, 11, 13, and 17 and PDIs 08 and 09 will be affected if admission type values are missing. Used for PQIs in newborn definition. Not used in IQIs.
Admission Source	Admission source	Numeric	1 = ER 2 = another hospital 3 = another facility, incl. LTC 4 = court/law enforcement 5 = routine/birth/other	The values “2” and “3” are referenced by the PSI, IQI, PQI and PDI code (to identify transfers from another hospital or facility).
Length of Stay	Length of stay	Numeric	Number of days from admission to discharge	Same-day discharges are coded as “0” days stay. Not used for PQIs and IQIs.
APR-DRG	APR-DRG category	Numeric	3M™ APR-DRG software	Optional. Currently, the AHRQ WinQI software uses a multiversion (i.e., Versions 20, 23–30, 32, 33) APR-DRG to risk-adjust the IQIs. Not used for PQIs, PSIs, or PDIs. Not available for ICD-10 component of v6.0.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
APR-DRG Severity of Illness	APR-DRG severity score	Numeric	3M™ APR-DRG severity score	Currently, the AHRQ WinQI software uses APR-DRG Versions 20, 23–29, 32, and 33. Not used for IQIs, PQIs, PSIs, or PDIs. Not available for ICD-10 component of v6.0.
APR-DRG Risk of Mortality	APR-DRG mortality score	Numeric	3M™ APR-DRG risk-of-mortality score	Currently, the AHRQ WinQI software uses APR-DRG Versions 20, 23–30, 32, and 33 to risk-adjust the IQIs. Not used for PQIs, PSIs, or PDIs. Not available for ICD-10 component of v6.0.
XPR-DRG Risk of Mortality	APR-DRG mortality score excluding diagnoses that are not present on admission	Numeric	3M™ APR-DRG risk-of-mortality score	Currently, the AHRQ WinQI software uses APR-DRG Versions 20, 23–30, 32 and 33 to risk-adjust the IQIs. Not used for PQIs, PSIs, or PDIs. Not available for ICD-10 component of v6.0.
DRG Version	Diagnosis-Related Group version	Numeric	Version of Federal (CMS) DRG grouper	For example, Version 25 for FY 2008.
Diagnosis Related Group	Diagnosis-Related Group	Numeric	DRG from Federal (CMS) grouper	For Version 24 and earlier, this is the CMS DRG. For Version 25 and later, this is the MS-DRG.
MS DRG	Diagnosis-Related Group	Numeric	DRG from Federal (CMS) grouper	This replaces CMS DRG for DRG Version 25 and later. DRG value is copied to MS-DRG, and DRG value is correspondingly set to blank in the export file.
Discharge Year	The patient's year of discharge. For example, a patient discharged on July 7, 2004, would have a discharge year of 2004.	Numeric	YYYY Discharge year should be within the range of 1997 to present year.	Used to apply the proper fiscal year coding and to assign the APR-DRG if the limited license grouper is used.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Discharge Quarter	The calendar quarter of the patient's discharge. For example, a patient discharged on July 7, 2004, would have a discharge quarter of 3.	Numeric	1 = January–March 2 = April–June 3 = July–September 4 = October–December	Required data element and used to apply the proper fiscal year coding and to assign the APR-DRG if the limited license grouper is used.
Days on Mech Ventilator	Number of days the patient spent on a mechanical ventilator	Numeric		Data element that is passed directly to the APR-DRG grouper.
Birth Weight Grams				
Custom Stratifier 1– Custom Stratifier 3	Custom stratification values	String; 1–20 characters	The value as was specified on the input file for the corresponding stratifier.	
Patient ID	Patient ID or medical record number	String; 1–20 characters		For identification purposes only on the data export for external analysis.
Discharge Date	Date of patient discharge	Date	MM/DD/YYYY	For identification purposes only on the data export for external analysis.
Point of Origin	Point of origin	Numeric	4 = transfer from a hospital 5 = transfer from an SNF or ICF 6 = transfer from another health care facility IF ATYPE = 4, then: 5 = born inside this hospital 6 = born outside of this hospital	Only these values are used by the QI programs.
ICD VER	ICD version number; calculated based on year and quarter	Numeric	Values range from 12 (1994) to 32 (2015)	http://www.who.int/classifications/icd/en/
has_medical_drg	Indicator flag denoting whether discharge has Diagnosis-Related Group: Medical	Numeric	1=true	Only included if “Temporary Flag Variables” is selected during export.
has_surgical_drg	Indicator flag denoting whether discharge has Diagnosis-Related Group: Surgical	Numeric	1 = true	Only included if “Temporary Flag Variables” is selected during export.
has_adult_drg	Indicator flag denoting whether discharge has Diagnosis-Related Group: Adult	Numeric	1 = true	Only included if “Temporary Flag Variables” is selected during export.
has_or_proc	Indicator flag denoting whether discharge has an operating room procedure	Numeric	1 = true	Only included if “Temporary Flag Variables” is selected during export.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
has_pediatric_or_proc	Indicator flag denoting whether discharge has an operating room procedure: Pediatric	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
has_pediatric_medical_drg	Indicator flag denoting whether discharge has Diagnosis-Related Group: Pediatric Medical	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
is_neonate	Indicator flag denoting whether discharge is neonate	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
is_newborn	Indicator flag denoting whether discharge is newborn	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
mdc	Major Diagnostic Category	Numeric	If this is not provided in the input file, then the value of MDC is calculated based on the value of DRG.	Only included if "Temporary Flag Variables" is selected during export.
bwhcat	Birth weight category	Numeric	9 = 2500+ grams 8 = 2000–2499 grams 7 = 1750–1999 grams 6 = 1500–1749 grams 5 = 1250–1499 grams 4 = 1000–1249 grams 3 = 750–999 grams 2 = 500–749 grams 1 = <500 grams	Only included if "Temporary Flag Variables" is selected during export.
OR_Procedure_Count	Total number of procedures on the discharge that are also on the Operating Room Procedures list	Numeric		Only included if "Temporary Flag Variables" is selected during export.
Cardiac_Count	Count of total cardiac procedures	Numeric		Only included if "Temporary Flag Variables" is selected during export.
Cardiac_PDA	Indicator flag that denotes if any cardiac procedure is performed	Numeric	0 - False 1 - True	Only included if "Temporary Flag Variables" is selected during export.
hpd1	Accidental puncture or laceration rate Risk category for PDI 01	Numeric	1, 2, 3, 4, 5, 6, 7 (See http://www.qualityindicators.ahrq.gov/Downloads/Mo dules/PDI/V50/Parameter Estimates_PDI_50_Final .pdf for definitions)	Only included if "Temporary Flag Variables" is selected during export.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
hpd6	Risk category for PDI 06; RACHS-1 risk category	Numeric	1, 2, 3, 4, 5, 6 (See http://www.qualityindicator.s.ahrq.gov/Downloads/Modules/PDI/V50/Parameter_Estimates_PDI_50_Final.pdf for definitions)	Only included if "Temporary Flag Variables" is selected during export.
hpd10	Risk category for PDI 10	Numeric	1 = low 2 = intermediate 3 = high (See http://www.qualityindicator.s.ahrq.gov/Downloads/Modules/PDI/V50/Parameter_Estimates_PDI_50_Final.pdf for definitions)	Only included if "Temporary Flag Variables" is selected during export.
rachs_multiple	Flag indicating multiple heart surgeries; used to identify RACHS risk category	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
premature_mdx4d	Flag indicating premature infant	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
strcabn	Indicator flag for noncardiac structural anomalies	Numeric	1 = true	Only included if "Temporary Flag Variables" is selected during export.
pdi1_risk_cat	Risk category stratification for PDI 01	Numeric	1, 2, 3, 4, 5, 6, or 9 (see <i>Technical Specifications</i> at http://www.qualityindicator.s.ahrq.gov/Downloads/Modules/PDI/V50/TechSpecs/PDI_01_Accidental_Puncture_or_Laceration_Rate.pdf)	Only included if "Temporary Flag Variables" is selected during export.
pdi2_risk_cat	Risk category stratification for PDI 02	Numeric	1 = low 2 = high (see <i>Technical Specifications</i> at http://www.qualityindicator.s.ahrq.gov/Downloads/Modules/PDI/V50/TechSpecs/PDI_02_Pressure_Ulcer_Rate.pdf)	Only included if "Temporary Flag Variables" is selected during export.
pdi8_risk_cat	Risk category stratification for PDI 08	Numeric	1 = low 2 = high (see <i>Technical Specifications</i> at http://www.qualityindicator.s.ahrq.gov/Downloads/Modules/PDI/V50/TechSpecs/PDI_08_Periooperative_Hemorrhage_or_Hematoma_Rate.pdf)	Only included if "Temporary Flag Variables" is selected during export.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
pdi10_risk_cat	Risk category stratification for PDI 10	Numeric	1, 2, 3, 4, or 9 (see <i>Technical Specifications</i> at http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/V50/TechSpecs/PDI_10_Postoperative_Sepsis_Rate.pdf)	Only included if "Temporary Flag Variables" is selected during export.
pdi11_risk_cat	Risk category stratification for PDI 11	Numeric	1, 2, 3, 4, or 9 (see <i>Technical Specifications</i> at http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/V50/TechSpecs/PDI_11_Postoperative_Wound_Deherence_Rate.pdf)	Only included if "Temporary Flag Variables" is selected during export.
pdi12_risk_cat	Risk category stratification for PDI 12	Numeric	1 = low 2 = intermediate 3 = high (see <i>Technical Specifications</i> at http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/V50/TechSpecs/PDI_12_Central_Venous_Catheter-Related_Blood_Stream_Infection_Rate.pdf)	Only included if "Temporary Flag Variables" is selected during export.
Principal Diagnosis (DX1)	ICD-9-CM or ICD-10-CM diagnosis code; diagnosis 1 is the principal diagnosis	For ICD-9-CM - String; three, four, or five characters. For ICD-10-CM - String; three to seven characters	Diagnosis code	Valid codes range from 001 to 999 in the first three digits. Some diagnoses require fourth and fifth digits.
Diagnosis Code 2–Diagnosis Code 35 (DX2–DX35)	ICD-9-CM or ICD-10-CM diagnosis codes; diagnosis codes 2–35 are secondary diagnoses	For ICD-9-CM - String; three, four, or five characters. For ICD-10-CM - String; three to seven characters	Diagnosis codes	NOTE: Seven of the PSIs rely on E-codes. See Appendix A .
Principal Procedure (PR1)	ICD-9-CM or ICD-10-CM procedure codes; procedure code 1 is the principal procedure	For ICD-9-CM - String; three, four, or five characters. For ICD-10-CM - String; three to seven characters (do not include decimal point)	Procedure code	Valid codes range from 00 to 99 in the first two digits and may require a third or fourth digit. Decimal points, if any, must be removed before loading data.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
Procedure Code 2– Procedure Code 30 (PR2–PR30) (up to 29 different columns)	ICD-9-CM or ICD-10- CM procedure codes; procedure codes 2–30 are secondary procedures	For ICD-9-CM - String; three, four, or five characters. For ICD-10-CM - String; three to seven characters (do not include decimal point)	Procedure codes	Include up to 30 procedures. It is not necessary to have 30.
Days to Procedure 1– Days to Procedure 30 (PRDAY1–PRDAY30) (up to 30 fields)	Days from admission to to procedure. Procedure 1 is the principal procedure; procedures 2–30 are secondary procedures.	Numeric	Days from admission to procedure ⁴	It is expected that the number of days-to- procedure variables agree with the number of procedure codes present. Valid values may be negative or zero. Only applies to PSI and PDI postoperative patient safety indicators.
IQlxx PQlxx PSlxx PDlxx	Indicator flag values for appropriate QIs	Boolean (0,1, or null)	1 = true (flagged for numerator) 0 = false (not flagged for numerator; included in denominator) Null = not flagged for denominator or numerator	Only included if “Indicator Flags” is selected during export. Not available for ICD- 10 component of v6.0.
IQlxx_expected PQlxx_expected PSlxx_expected PDlxx_expected	Predicted value (i.e., probability of the outcome of interest given demographics, comorbidities, and risk of mortality) for appropriate QIs	numeric (float); value between 0 and 1		Only included if “Discharge Level Predicted Probabilities” is selected during export. Not available for ICD- 10 component of v6.0.
AIDS	Comorbidity category code flag: acquired immune deficiency syndrome	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD- 10 component of v6.0.
ALCOHOL	Comorbidity category code flag: alcohol abuse	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD- 10 component of v6.0.
ANEMDEF	Comorbidity category code flag: deficiency anemia	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD- 10 component of v6.0.
ARTH	Comorbidity category code flag: rheumatoid arthritis/collagen vas	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD- 10 component of v6.0.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
BLDLOSS	Comorbidity category code flag: chronic blood loss anemia	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
CHF	Comorbidity category code flag: congestive heart failure	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
CHRNLUNG	Comorbidity category code flag: chronic pulmonary disease	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
COAG	Coagulopathy flag	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
DEPRESS	Comorbidity category code flag: depression	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
DM	Comorbidity category code flag: diabetes without chronic complications	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
DMCX	Comorbidity category code flag: diabetes with chronic complications	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
DRUG	Comorbidity category code flag: drug abuse	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
HTN_C	Comorbidity category code flag: hypertension	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
HYPOTHY	Comorbidity category code flag: hypothyroidism	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
LIVER	Comorbidity category code flag: liver disease	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
LYMPH	Comorbidity category code flag: lymphoma	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
LYTES		numeric	1=true 0=false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
METS	Comorbidity category code flag: metastatic cancer	numeric	1=true 0=false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
NEURO	Comorbidity category code flag: other neurological disorders	numeric	1=true 0=false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
OBESE	Comorbidity category code flag: obesity	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
PARA	Comorbidity category code flag: paralysis	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
PERIVASC	Comorbidity category code flag: peripheral vascular disease	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
PSYCH	Comorbidity category code flag: psychoses	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
PULMCIRC	Comorbidity category code flag: pulmonary circulation disease	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
RENLFAIL	Comorbidity category code flag: renal failure	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
TUMOR	Comorbidity category code flag: solid tumor without metastasis	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
ULCER	Comorbidity category code flag: peptic ulcer disease x bleeding	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
VALVE	Comorbidity category code flag: Valvular disease	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.

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VARIABLE NAME	DESCRIPTION	FORMAT	VALUE DESCRIPTION	COMMENTS
WGHTLOSS	Comorbidity category code flag: weight loss	numeric	1 = true 0 = false	Used in risk adjustment. Not available for ICD-10 component of v6.0.
CCSxx	CCS categories	numeric		AHRQ Clinical Classification Software categories used in risk adjustment for PDIs. Not available for ICD-10 component of v6.0.

AHRQ: Agency for Healthcare Research and Quality; APR-DRG: All Patient Refined Diagnosis-Related Group; CCS: Clinical Classifications Software; CMS: Centers for Medicare & Medicaid Services; E-code: external cause of injury code; ER: emergency room; FIPS: Federal Information Processing Standards; FY: fiscal year; HMO: health maintenance organization; ICD-9-CM: International Classification of Diseases, Ninth revision, Clinical Modification; ICF: intermediate care facility; IQIs: Inpatient Quality Indicators; LTC: long-term care; MDC: Major Diagnostic Category; MS-DRG: Medicare Severity Diagnosis-Related Group; PDIs: Pediatric Quality Indicators; PQIs: Prevention Quality Indicators; PSIs: Patient Safety Indicators; QI: Quality Indicators™; RACHS: risk adjustment for congenital heart surgery; SNF: skilled nursing facility; WinQI: Quality Indicators™ Windows®

¹ The 365-day range is to allow for leap years.

² Area-level indicators are all the PQIs, IQIs 26–29, PDIs 14–18, and PSIs 21–27. Provider-level indicators are IQIs 01–25 and 30–34, PDIs 01–13, Neonatal Quality Indicators (NQIs) 01–03, and PSIs 02–19.

³ Federal Information Processing Standards, as defined by the U.S. Department of Commerce, National Institute of Standards and Technology (formerly National Bureau of Standards). Note: Certain independent cities (Baltimore City, Carson City, and St. Louis City), and areas within Hawaii and Virginia, are assigned to different area groupings in the Modified FIPS categories as compared to the U.S. Census Bureau groupings. The AHRQ QI software uses the Modified FIPS code assignment of these areas. Failure to use the Modified FIPS codes assignment will result in the use of incorrect denominator estimates for area-level indicators.

⁴ Variables Days to Procedure 1 to Days to Procedure 30 are defined as the number of days from date of admission to date of procedure for each procedure. For example, if the patient was admitted on June 15 and had two procedures—the principal procedure on June 15 and a second procedure on June 18—then the value of Days to Procedure 1 would be zero (0) and the value of Days to Procedure 2 would be three (3). For more information, consult the Healthcare Cost and Utilization Project data documentation at <http://www.hcup-us.ahrq.gov/db/vars/prdayn/nisnote.jsp>.

Appendix D: Links

The following links may be helpful to users of the AHRQ Quality Indicators:

http://www.qualityindicators.ahrq.gov/modules/iqu_resources.aspx

http://www.qualityindicators.ahrq.gov/modules/pdi_resources.aspx

http://www.qualityindicators.ahrq.gov/modules/pqi_resources.aspx

http://www.qualityindicators.ahrq.gov/modules/psi_resources.aspx

<http://www.qualityindicators.ahrq.gov/software/default.aspx>.

Table D-1. AHRQ Quality Indicators Version 6.0 Documents and Software

TITLE	DESCRIPTION
IQI Technical Specifications PDI Technical Specifications PQI Technical Specifications PSI Technical Specifications	Provide detailed definitions of each indicator (including composites), including all ICD-9-CM and MS-DRG codes that are included in or excluded from the numerator and denominator. Note that exclusions from the denominator are automatically applied to the numerator.
IQI v5.0 Benchmark Data Tables PDI v5.0 Benchmark Data Tables PQI v5.0 Benchmark Data Tables PSI v5.0 Benchmark Data Tables	These documents provide the average volume, provider rate, and population rate, as appropriate, for each indicator.
Log of Changes to IQI Documents and Software Log of Changes to PDI Documents and Software Log of Changes to PQI Documents and Software Log of Changes to PSI Documents and Software	The Change Log document provides a cumulative summary of all changes to the software, software documentation, and other documents made since the release of version 2.1 of the software in March 2003. This document also summarizes changes to indicator definitions resulting from all fiscal year changes to ICD-9-CM coding and MS-DRG changes. Changes to indicator specifications that were not a result of new ICD-9-CM and MS-DRG codes are also described in the Change Log.
IQI Risk Adjustment Coefficient Tables PDI Risk Adjustment Coefficient Tables PQI Risk Adjustment Coefficient Tables PSI Risk Adjustment Coefficient Tables	Tables for each indicator provide the stratification and coefficients used to calculate the risk-adjusted rate for each stratum.
Quality Indicators Software Instruction	This software documentation provides detailed instructions on how to use the WinQI version of the software, including data preparation, calculation of the rates, and interpretation of output.

TITL	DESSCRIPTIO
AHRQ QI Population File	Population data that are constructed from public-use Census data and provided for use with the Quality Indicators syntax for area-level analyses.
Version 6.0 Listserv announcement	This document announces the release of Version 6.0 of the AHRQ QI software and documentation, and provides a summary of changes and links to relevant screens.
IQI User Guide: Composite Measures PDI User Guide: Composite Measures PQI User Guide: Composite Measures PSI User Guide: Composite Measures	These user guides provide technical overviews of the composite measures.

SAS QI Software Version X.X

The SAS QI Software (SAS IQI Software, SAS PQI Software, SAS PSI Software, and SAS PDI Software) Version X.X calculates rates for the respective AHRQ QI modules. It is available at <http://www.qualityindicators.ahrq.gov/software/default.aspx>. Requires the SAS statistical program distributed by the SAS Institute, Inc. The company may be contacted directly regarding the licensing of its products: <http://www.sas.com>

Additional Documents

A number of documents are cataloged within the *Archive* section of the AHRQ QI Web page for historical purposes: <http://www.qualityindicators.ahrq.gov/Archive/default.aspx>

Additional documents may be accessed at the AHRQ QI Modules Web page:

<http://www.qualityindicators.ahrq.gov/modules/Default.aspx>

Examples of documents available at this link include:

- AHRQ QI Measure Development, Implementation, Maintenance and Retirement
- ICD-9-CM to ICD-10-CM/PCS Conversion of AHRQ QI, March 2011
- AHRQ QI Empirical Methods, May 2011
- Guidance for Using the AHRQ Quality Indicators for Hospital-level Public Reporting or Payment, August 2004
- AHRQ Summary Statement on Comparative Hospital Public Reporting, December 2005
- Comparison of Recommended Evaluation Criteria in Five Existing National Frameworks
- List of AHRQ QI Endorsed by the National Quality Forum

Other documents, including newsletter archives, can be viewed or downloaded from the AHRQ QI News Web page:

<http://www.qualityindicators.ahrq.gov/news/default.aspx>

<http://www.qualityindicators.ahrq.gov/Archive/News.aspx>

Other Tools and Information

QI rates can be calculated using the modified Federal Information Processing Standards (FIPS) state/county code. A list of codes is available at <http://www.census.gov/popest/about/geo/codes.html>
AHRQ provides a free, online query system based on HCUP data that provides access to health statistics and information on hospital stays at the national, regional, and State levels. It is available at <http://hcupnet.ahrq.gov/>

Information on the 3M™ APR-DRG system is available at
http://solutions.3m.com/wps/portal/3M/en_US/3M_Health_Information_Systems/HIS/?WT.mc_id=www.3m.com/us/healthcare/his/

The CDC National Diabetes Surveillance System provides State-level estimates of diabetes prevalence by age: <http://apps.nccd.cdc.gov/DDTSTRS/default.aspx>

Appendix E: Provider-Level and Area-Level Indicators

Table E-1. List of Provider-Level Indicators

INDICATOR NAME
IQI 01 Esophageal Resection Volume
IQI 02 Pancreatic Resection Volume
IQI 04 Abdominal Aortic Aneurysm (AAA) Repair Volume
IQI 05 Coronary Artery Bypass Graft (CABG) Volume
IQI 06 Percutaneous Coronary Intervention (PCI) Volume
IQI 07 Carotid Endarterectomy Volume
IQI 08 Esophageal Resection Mortality Rate
IQI 09 Pancreatic Resection Mortality Rate
IQI 11 Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate
IQI 12 Coronary Artery Bypass Graft (CABG) Mortality Rate
IQI 13 Craniotomy Mortality Rate
IQI 14 Hip Replacement Mortality Rate
IQI 15 Acute Myocardial Infarction (AMI) Mortality Rate
IQI 16 Heart Failure Mortality Rate
IQI 17 Acute Stroke Mortality Rate
IQI 18 Gastrointestinal Hemorrhage Mortality Rate
IQI 19 Hip Fracture Mortality Rate
IQI 20 Pneumonia Mortality Rate
IQI 21 Cesarean Delivery Rate, Uncomplicated
IQI 22 Vaginal Birth After Cesarean (VBAC) Delivery Rate, Uncomplicated
IQI 23 Laparoscopic Cholecystectomy Rate
IQI 24 Incidental Appendectomy in the Elderly Rate
IQI 25 Bilateral Cardiac Catheterization Rate
IQI 30 Percutaneous Coronary Intervention (PCI) Mortality Rate
IQI 31 Carotid Endarterectomy Mortality Rate
IQI 32 Acute Myocardial Infarction (AMI) Mortality Rate, Without Transfer Cases
IQI 33 Primary Cesarean Delivery Rate, Uncomplicated
IQI 34 Vaginal Birth After Cesarean (VBAC) Rate, All
IQI 90 Mortality for Selected Procedures
IQI 91 Mortality for Selected Conditions
NQI 01 Neonatal Iatrogenic Pneumothorax Rate
NQI 02 Neonatal Mortality Rate
NQI 03 Neonatal Blood Stream Infection Rate
PDI 01 Accidental Puncture or Laceration Rate
PDI 02 Pressure Ulcer Rate
PDI 03 Retained Surgical Item or Unretrieved Device Fragment Count
PDI 05 Iatrogenic Pneumothorax Rate
PDI 06 RACHS-1 Pediatric Heart Surgery Mortality Rate
PDI 07 RACHS-1 Pediatric Heart Surgery Volume
PDI 08 Perioperative Hemorrhage or Hematoma Rate
PDI 09 Postoperative Respiratory Failure Rate
PDI 10 Postoperative Sepsis Rate
PDI 11 Postoperative Wound Dehiscence Rate
PDI 12 Central Venous Catheter-Related Blood Stream Infection Rate
PDI 13 Transfusion Reaction Count
PDI 19 Pediatric Patient Safety for Selected Indicators
PSI 02 Death Rate in Low-Mortality Diagnosis Related Groups (DRGs)
PSI 03 Pressure Ulcer Rate

INDICATOR NAME
PSI 04 Death Rate among Surgical Inpatients with Serious Treatable Complications
PSI 05 Retained Surgical Item or Unretrieved Device Fragment Count
PSI 06 Iatrogenic Pneumothorax Rate
PSI 07 Central Venous Catheter-Related Blood Stream Infection Rate
PSI 08 In-hospital Fall with Hip Fracture Rate
PSI 09 Perioperative Hemorrhage or Hematoma Rate
PSI 10 Postoperative Acute Kidney Injury Requiring Dialysis Rate
PSI 11 Postoperative Respiratory Failure Rate
PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate
PSI 13 Postoperative Sepsis Rate
PSI 14 Postoperative Wound Dehiscence Rate
PSI 15 Unrecognized Abdominopelvic Accidental Puncture or Laceration Rate
PSI 16 Transfusion Reaction Count
PSI 17 Birth Trauma Rate – Injury to Neonate
PSI 18 Obstetric Trauma Rate – Vaginal Delivery With Instrument
PSI 19 Obstetric Trauma Rate – Vaginal Delivery Without Instrument
PSI 90 Patient Safety and Adverse Events Composite

Table E-2. List of Area-Level Indicators

INDICATOR NAME
IQI 26 Coronary Artery Bypass Graft (CABG) Rate
IQI 27 Percutaneous Coronary Intervention (PCI) Rate
IQI 28 Hysterectomy Rate
IQI 29 Laminectomy or Spinal Fusion Rate
PDI 14 Asthma Admission Rate
PDI 15 Diabetes Short-Term Complications Admission Rate
PDI 16 Gastroenteritis Admission Rate
PDI 17 Perforated Appendix Admission Rate
PDI 18 Urinary Tract Infection Admission Rate
PDI 90 Pediatric Quality Overall Composite
PDI 91 Pediatric Quality Acute Composite
PDI 92 Pediatric Quality Chronic Composite
PQI 01 Diabetes Short-Term Complications Admission Rate
PQI 02 Perforated Appendix Admission Rate ¹
PQI 03 Diabetes Long-Term Complications Admission Rate
PQI 05 Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate
PQI 07 Hypertension Admission Rate
PQI 08 Heart Failure Admission Rate
PQI 09 Low Birth Weight Rate
PQI 10 Dehydration Admission Rate
PQI 11 Bacterial Pneumonia Admission Rate
PQI 12 Urinary Tract Infection Admission Rate
PQI 14 Uncontrolled Diabetes Admission Rate
PQI 15 Asthma in Younger Adults Admission Rate
PQI 16 Lower-Extremity Amputation among Patients with Diabetes Rate
PQI 90 Prevention Quality Overall Composite
PQI 91 Prevention Quality Acute Composite
PQI 92 Prevention Quality Chronic Composite
PQI 93 Prevention Quality Diabetes Composite(Numerator)
PSI 21 Retained Surgical Item or Unretrieved Device Fragment Rate
PSI 22 Iatrogenic Pneumothorax Rate
PSI 23 Central Venous Catheter-Related Blood Stream Infection Rate
PSI 24 Postoperative Wound Dehiscence Rate
PSI 25 Accidental Puncture or Laceration Rate
PSI 26 Transfusion Reaction Rate
PSI 27 Perioperative Hemorrhage or Hematoma Rate

Note: PQI 13 has been removed from v6.0 and PQI 93 has been added in v6.0.

