



Release of AHRQ Quality Indicators™ Software for SAS QI, v2022.0.1

Prepared for:

Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
5600 Fishers Lane
Rockville, MD 20857
<https://qualityindicators.ahrq.gov/>

Contract No. HHSA290201800003G

September 2022

Table of Contents

1.0	Introduction to Release Notes for v2022.0.1	1
1.1	Fixes Issue with Stratified Hospital-Level Risk-Adjusted Rates	1
1.2	Fixes Issue with Hospital-Level Risk-Adjusted Text Output	1
2.0	Previous Release Notes for v2022	1
3.0	Fiscal Year 2022 Coding Updates	2
4.0	Specification Changes	2
5.0	Population Files	2
6.0	Reporting Rates for Specific Measures	2
6.1	Risk-Adjustment Factors by Module	3
6.2	Major Diagnostic Category (MDC) Requirements	3
6.3	Procedure Day (PRDAY) Requirements	4
6.4	Calibration Options	4
6.5	COVID-19 Options	4
6.6	Stratification Options	5
6.7	Composite Output	5
7.0	Retired Area-Level Indicators	5
8.0	Retired Hospital-Level Indicators	5
9.0	Enhancements and Fixes	5

1.0 Introduction to Release Notes for v2022.0.1

The Agency for Healthcare Research and Quality (AHRQ) announces a minor release of the AHRQ Quality Indicators™ (QI) software for SAS QI Version 2022 (v2022.0.1, September 2022). This is an update to the v2022 SAS QI software that applies to the Inpatient Quality Indicators (IQI), Patient Safety Indicators (PSI), and Pediatric Quality Indicators (PDI) modules.

The following item summarizes the changes in v2022.0.1 from v2022.

1.1 Fixes Issue with Stratified Hospital-Level Risk-Adjusted Rates

Starting with version 2020 (v2020), stratified observed-to-expected (risk-adjusted) ratios were inadvertently capped at 1.0 when IQI, PSI, or PDI results were specified at the payer or race/ethnicity level. This was an unintentional consequence of capping risk-adjusted rates at 1.0 for results stratified by hospitals only. Users who specified stratified results for payer or race/ethnicity groups would not observe risk-adjusted ratios above 1.0 as a result of this capping. With the v2022.0.1 re-release, this unintentional capping is removed, and risk-adjusted ratios greater than 1.0 may now be observed. As a safeguard, the software will also limit the lower-bound confidence interval estimates for both risk-adjusted rates and ratios at 0.0 for all QI modules.

Users Impacted: Users of the IQI, PSI, and PDI modules, who generate hospital-level risk-adjusted ratios for any subgroups including the payer and race/ethnicity.

1.2 Fixes Issue with Hospital-Level Risk-Adjusted Text Output

Software v2022.0.1 also addresses an issue in the SAS QI text files output from the hospital-level risk-adjustment programs. Prior to v2022.0.1, text files produced in the PSI and PDI modules omitted columns for stratification variables and only included a column for the type of stratification. As a result, users were not able to determine which rows corresponded to a specific group or value within a given stratification type without separately consulting the SAS data file. In the v2022.0.1 release, this issue is resolved as the output text files now consistently include columns for stratification variables, such as age, sex, race, and payer.

Users Impacted: Users of the PSI and PDI modules who generate hospital-level risk-adjusted text output.

For more information, see the document “Stratification of Inpatient Quality Indicators (IQI), Patient Safety Indicators (PSI), and Pediatric Quality Indicators (PDI),” available here:

https://qualityindicators.ahrq.gov/Downloads/Resources/AHRQ_QI_v2022_Stratification_User_Note.pdf

Previous Release Notes for v2022 below also apply to v2022.0.1.

2.0 Previous Release Notes for v2022

The Agency for Healthcare Research and Quality (AHRQ) announces the release of the AHRQ Quality Indicators™ (QI) software for SAS QI Version 2022. These software updates apply to all four modules: Prevention Quality Indicators (PQI), Inpatient Quality Indicators (IQI), Patient Safety Indicators (PSI), and Pediatric Quality Indicators (PDI).

All of the relevant AHRQ QI software and documentation regarding v2022 can be found on the AHRQ QI website at <https://qualityindicators.ahrq.gov/>. The following sections summarize the major changes from Technical Specifications and QI Software v2021¹ to v2022.

3.0 Fiscal Year 2022 Coding Updates

The AHRQ QI software v2022 reflects coding changes based on fiscal year 2022 coding updates to the *International Classification of Diseases, Tenth Revision, Clinical Modification/Procedure Coding System* (ICD-10-CM/PCS). These coding changes impact all software modules.

4.0 Specification Changes

The AHRQ SAS QI v2022 software implements specification and programming changes that were developed through a detailed deliberation and assessment process with AHRQ staff and other AHRQ stakeholders.

The fiscal year coding updates and specification changes were implemented across all modules and are detailed in the Log of Coding Updates and Revisions for each AHRQ QI module. These are available at the following URLs:

- PQI: https://qualityindicators.ahrq.gov/Downloads/Modules/PQI/v2022/ChangeLog_PQI_v2022.pdf
- IQI: https://qualityindicators.ahrq.gov/Downloads/Modules/IQI/v2022/ChangeLog_IQI_v2022.pdf
- PSI: https://qualityindicators.ahrq.gov/Downloads/Modules/PSI/v2022/ChangeLog_PSI_v2022.pdf
- PDI: https://qualityindicators.ahrq.gov/Downloads/Modules/PDI/V2022/ChangeLog_PDI_v2022.pdf

5.0 Population Files

The updated QI population file contains intercensal and postcensal estimates of county-level population by single-year age group, sex, race, and Hispanic origin covering the years 2000 through 2021 from the United States (U.S.) Census Bureau. The population file uses Census estimates for single year age population to create AHRQ age bands. Please see the details around the population file methodology at: http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V2022/AHRQ_QI_v2022_ICD10_Population_File.pdf.

6.0 Reporting Rates for Specific Measures

The AHRQ SAS QI v2022 software includes risk-adjustment, signal variance, reference population rates, and composite weights for PSI, IQI, PDI, and PQI modules using the 2019 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID). The non-risk adjusted numerators, denominators, and observed rates are also reported.

¹ In September 2021 AHRQ released v2021.0.1 of the software, to fix the toggle used to exclude COVID-positive patients from the IQI, PSI, and PDI modules. In March 2022, AHRQ released v2020.0.2 with an updated version of the limited-license grouper which will allow for the calculation of admission-based APR-DRGs. Version 2022 of those modules includes the fix instituted in both v2021.0.1 and v2021.0.2.

6.1 Risk-Adjustment Factors by Module

AHRQ SAS QI v2022 includes new and updated risk factors in the risk-adjustment models across modules.

In the IQI module,

- *New in v2022.* Added the Clinical Classifications Software Refined (CCSR) for ICD-10-PCS Procedures categories to risk adjust for the procedure-based IQIs for all procedures occurring on or prior to the day of the IQI denominator procedures.
- *New in v2022.* Removed the All-Patient Refined Diagnosis Related Groups (APR-DRGs) for the risk adjustment of procedure-based IQIs
- *New in v2022.* Added a flag for Do Not Resuscitate (DNR) to the condition based IQIs for potential feature selection.
- *New in v2022.* Added a risk category for non-ST-elevation myocardial infarction (non-STEMI) for potential feature selection to IQI 15 – Acute Myocardial Infarction (AMI) Mortality Rate.
- *New in v2022.* Added a risk category for cardiac arrest, cardiogenic shock, or anoxic brain injury that is present on admission (POA) for potential feature selection to IQI 12 – Coronary Artery Bypass Graft Mortality Rate and IQI 30 – Percutaneous Coronary Intervention Mortality Rate.

For hospital-level indicators in the PSI module,

- *New in v2022.* Added risk categories (HPPS15) based on the counts of minor and major diagnostic procedures and minor and major therapeutic procedures for PSI 15 – Abdominopelvic Accidental Puncture or Laceration Rate.
- *New in v2022.* Added risk categories (HPPS13) based on high-risk and intermediate-risk immune compromising conditions for PSI 13 – Postoperative Sepsis Rate.

6.2 Major Diagnostic Category (MDC) Requirements

The software will suppress expected rates, risk-adjusted rates, smoothed rates, and composites for hospital-level indicators for PSI and IQI modules when major diagnostic categories (MDC) are missing or incomplete. Users should set the MDC_PROVIDED macro variable to 0' in the CONTROL program when MDC is missing or incomplete on the input data. If MDC is available and fully coded, users should set the MDC_PROVIDED macro variables to "1". If users set the MDC_PROVIDED macro variable to "1" in the CONTROL program, but a few MDC values are missing on input data, the software will exclude those discharges with missing MDCs. Additionally, if users set the MDC_PROVIDED macro variable to "1" in the CONTROL program, but all MDC values are missing on input data, the software will output an error message – "ERROR: MDC_PROVIDED = 1 in CONTROL program but all MDC values are missing on input data". In this scenario, users should set the MDC_PROVIDED macro variable to 0' in the CONTROL program.

Users interested in calculating expected, risk-adjusted, smoothed, or composite values for hospital-level indicators must have MDCs assigned for each discharge on their input file. MDCs are used in measure specifications and risk adjustment. The AHRQ v2022 software no longer imputes MDC as in v2021 since the calculation was error-prone when the correct classification software is not applied to the input data. Different versions of the Medicare Severity-Diagnostic Related Group (MS-DRG) grouper produce slightly different results with respect to certain high resource intensity MS-DRGs. Specifically, MS-DRGs 001-019 and 981-989 are classified as "pre-MDC" MS-DRGs, which means that they are

associated with such high length of stay and/or cost that they supersede the usual assignment of MS-DRGs within body system or MDC categories. For records assigned to these MS-DRGs, some versions of the grouper software retain the MDC that would be assigned based on the principal diagnosis and procedure codes, whereas other versions of the grouper software overwrite the MDC assignment with a blank, missing, or nonnumeric value such as “PRE.” Thus, users **MUST PROVIDE** the MDC generated by the Centers for Medicare & Medicaid Services (CMS) MS-DRG grouper software, without imputing or mapping from MS-DRGs. For accurate results, all eligible records should have an MDC between 01 and 25. For those users who need to construct MDC, please view the documentation and software available here: <https://www.cms.gov/files/zip/icd-10-ms-drugs-v391-effective-april-1-2022.zip>.

6.3 Procedure Day (PRDAY) Requirements

Starting with AHRQ SAS QI v2021 and in v2022, the PSI and PDI modules suppresses expected rates, risk-adjusted rates, smoothed rates, and composites for measures that use PRDAYn information (PSI 04, 09, 10, 11, 12, 14, 15, and PDI 08 and 09) when PRDAYn is missing or incomplete. Users should set the PRDAY macro variable to ‘0’ in the PSI and PDI CONTROL programs when PRDAYn is missing or incomplete on the input data. Note that input data with missing or incomplete PRDAYn may impact numerators, denominators, and observed rates for these PSIs and PDIs that use PRDAYn information.

In v2022, the IQI module requires PRDAYn to assign AHRQ Clinical Classifications Refined (CCSR) for ICD-10-PCS Procedures. These categories are a feature in the risk-adjustment of procedure-based indicators (IQI 08, 09, 11, 12, 30, 31, 90). Missing or incomplete PRDAYn information will impact risk-adjusted rates for these indicators. Thus, PRDAYn must be supplied on the input data in the IQI module.

6.4 Calibration Options

In the AHRQ SAS QI v2022, the user has two options to calibrate smoothed rates and composite values using observed to expected ratio:

- Option 1: Set Calibration_OE_to_ref_pop to 1 in SAS QI CONTROL programs to calibrate using the 2019 HCUP reference population observed-to-expected (O-E) ratio. This is recommended and is therefore the default choice.
- Option 2: Set Calibration_OE_to_ref_pop to 0 in SAS QI CONTROL programs to calibrate to the O-E ratio of the user’s input data. This option is provided to large health care systems or states who want to calibrate the predicted QI rates within the system. Starting with AHRQ SAS QI v2022, there is a new step in the software to rescale the predicted probabilities if the O/E calibration pushes them above 1.0. The caveat is that the interpretation of the rates may be different since the software would still use 2019 reference population rate as multiplier for risk adjustment rates.

For more details about the O-E ratio adjustment, please refer to the Empirical Methods document available at:

https://qualityindicators.ahrq.gov/Downloads/Resources/Publications/2022/Empirical_Methods_2022.pdf

6.5 COVID-19 Options

The AHRQ SAS QI v2022 includes methodology to account for COVID-19 discharges for hospital-level indicators. In modules that include hospital-level indicators (IQI, PDI, PSI), the user has the following options to specify how to handle COVID discharges in the CONTROL program for each module:

- Option 1: The user can exclude COVID discharges. This is recommended and is therefore the default choice. The software will calculate risk-adjusted rates, smoothed rates, and composites.
- Option 2: The user can include all discharges, with and without COVID. The software will only calculate numerators, denominators, and observed rates.
- Option 3: The user can include only COVID discharges. The software will only calculate numerators, denominators, and observed rates.

Because the 2019 HCUP reference population pre-dates the public health emergency, the software will suppress expected rates, risk-adjusted rates, smoothed rates, and composites for hospital indicators when a user includes COVID-19 discharges. In other words, users can only calculate expected, risk-adjusted, smoothed rates, or composites when they select the default to exclude COVID-19 discharges. This approach is consistent with the previously published user guidance. We will continue to monitor the published evidence on COVID and update user guidance as necessary.

See previously released COVID-19 User Guidance, available here:

https://qualityindicators.ahrq.gov/Downloads/Resources/COVID19_UserNote_July2021.pdf

6.6 Stratification Options

AHRQ SAS QI software users continue to have the option to produce stratified rates. Starting in AHRQ SAS QI v2021, expected rates, risk-adjusted rates, smoothed rates, and composites are suppressed in certain situations for hospital level indicators, including all PSIs, IQIs, and hospital level PDIs. Because age, gender, age in days, and birth weight are used in risk adjustment models, it is inappropriate to produce risk-adjusted rates for any stratum that includes these variables.

6.7 Composite Output

AHRQ SAS QI software users now have the option to produce a text file from the COMPOSITE programs of the IQI and PSI modules. The COMPOSITE program now retains data elements used in the calculation of the composite which are printed in the text file to provide users more information on the calculation.

7.0 Retired Area-Level Indicators

No area-level indicators were retired in the AHRQ SAS QI v2022 software.

8.0 Retired Hospital-Level Indicators

No hospital-level indicators were retired in the AHRQ SAS QI v2022 software.

9.0 Enhancements and Fixes

The AHRQ SAS QI v2022 software includes enhancements and issue resolution from the v2021 ICD-10-CM/PCS software. To learn more about changes made to the QI software, access the module-specific Log of Changes documents are available on the AHRQ QI website and links can be found in Section 4 above.

For questions, please contact the QI Technical Support Team at QISupport@ahrq.hhs.gov. Messages are responded to within three business days.