

This document summarizes testing results for Version 4.4 of the Agency for Healthcare Research and Quality's (AHRQ) Quality Indicator (QI) software for SAS® and WinQI, released in March, 2012.

Testing that compared the QI results calculated by SAS and WinQI was performed using data from AHRQ's Healthcare Cost and Utilization Project (HCUP): the 2009 intramural Nationwide Inpatient Sample (NIS) database and the 4th quarter 2010 State Inpatient Databases (SID). These comparison testing results are provided as information for QI software users.

There is one known consideration for the Version 4.4 software:

*Differences in Area Denominator Adjustment*

In Version 4.4 and previous versions, the SAS and WinQI software calculate area denominators differently for all but three indicators (PQI 02, PQI 09, and PDI 17). We believe that this difference between SAS and WinQI's calculations accounts for all of the denominator differences in area-level indicators seen in the comparison test results. In those cases, the denominator differences then lead to differences in many of the rates.

For all but three area-level indicators (PQI 02, PQI 09, and PDI 17), the denominators are related to county populations, which are derived from official U.S. Census Bureau data. However, for some combinations of county and demographic category, the Census data are missing or zero. In these cases, SAS makes an adjustment to include in the denominator any patient cases from the discharge record data set that fall within that county and demographic category. WinQI does not make this adjustment.

KEY		
Field Name	Description	Notes
QI	Quality Indicator	
TYPE	Provider-level or area-level indicator	
n_WinQI	The number of providers (or counties) for which a QI calculation was reported by WinQI	
n_SAS	The number of providers (or counties) for which a QI calculation was reported by SAS	
Max_Diff_Num	Maximum difference in the numerator counts that were calculated by SAS and WinQI for any one provider (or county)	
Max_Diff_Denom	Maximum difference in the denominator counts that were calculated by SAS and WinQI for any one provider (or county)	
Max_Diff_ObsRate	Maximum difference in the observed rate calculated by SAS and WinQI for any one provider (or county)	
Max_%Diff_ObsRate	Maximum difference in the observed rate calculated by SAS and WinQI for any one provider (or county) expressed as a percentage of the observed rate calculated by SAS	
Max_Diff_ExpRate	Maximum difference in the expected rate calculated by SAS and WinQI for any one provider (or county)	
Max_%Diff_ExpRate	Maximum difference in the expected rate calculated by SAS and WinQI for any one provider (or county) expressed as a percentage of the expected rate calculated by SAS	
Max_Diff_RARate	Maximum difference in the risk-adjusted rate calculated by SAS and WinQI for any one provider (or county)	
Max_%Diff_RARate	Maximum difference in the risk-adjusted rate calculated by SAS and WinQI for any one provider (or county) expressed as a percentage of the risk-adjusted rate calculated by SAS	
Max_Diff_SmoothRate	Maximum difference in the smoothed rate calculated by SAS and WinQI for any one provider (or county)	
Max_%Diff_SmoothRate	Maximum difference in the smoothed rate calculated by SAS and WinQI for any one provider (or county) expressed as a percentage of the smoothed rate calculated by SAS	
%<2Percentile_Diff_RARate	Percentage of total providers where the SAS risk-adjusted rate percentile and WinQI risk-adjusted rate percentile are different by more than two percentiles	The SAS (or WinQI) risk-adjusted rate percentile for a given provider is the percentage of total providers with a risk-adjusted rate less than or equal to the risk-adjusted rate for the given provider. For provider-level QI only.

Field Name	Description	Notes
%Diff_StatSig_RARate	Percentage of total providers where the SAS and WinQI significance determination based on the risk-adjusted rate do not agree	For provider-level QI only.
%<2Percentile_Diff_SmoothRate	Percentage of total providers where the SAS smoothed rate percentile and WinQI smoothed rate percentile are different by more than 2 percentiles	The SAS (or WinQI) smoothed rate percentile for a given provider is the percentage of total providers with a smoothed rate less than or equal to the smoothed rate for the given provider. For provider-level QI only.
%Diff_StatSig_SmoothRate	Percentage of total providers where the SAS and WinQI significance determination based on the smoothed rate do not agree	For provider-level QI only.
Max_Diff_Comp	Maximum difference in the composite rate calculated by SAS and WinQI for any one provider (or county)	For composites only.
Max_%Diff_Comp	Maximum difference in the composite rate calculated by SAS and WinQI for any one provider (or county) expressed as a percentage of the composite rate calculated by SAS	For composites only.
Max_Diff_Comp_SE	Maximum difference in the composite rate standard error calculated by SAS and WinQI for any one provider (or county)	For composites only.
Max_%Diff_Comp_SE	Maximum difference in the composite rate standard error calculated by SAS and WinQI for any one provider (or county) expressed as a percentage of the composite rate standard error calculated by SAS	For composites only.
%<2Percentile_Diff_Comp	Percentage of total providers where the SAS composite rate percentile and WinQI composite rate percentile are different by more than two percentiles	The SAS (or WinQI) composite rate percentile for a given provider is the percentage of total providers with a composite rate less than or equal to the composite rate for the given provider. For provider-level composites only.
%Diff_StatSig_Comp	Percentage of total providers where the SAS and WinQI significance determination based on the composite rate do not agree	For provider-level composites only.

INDIVIDUAL QI																	
QI	TYPE	n_WinQI	n_SAS	Max_Diff_Num	Max_Diff_Denom	Max_Diff_ObsRate	Max_%Diff_ObsRate	Max_Diff_ExpRate	Max_%Diff_ExpRate	Max_Diff_RARate	Max_%Diff_RARate	Max_Diff_SmoothRate	Max_%Diff_SmoothRate	%<2_Percentile_Diff_RARate	%Diff_StatSig_RARate	%<2_Percentile_Diff_SmoothRate	%Diff_StatSig_SmoothRate
<b>Inpatient Quality Indicators (IQI)</b>																	
IQI01	Provider	555	555	0	.	.	.	.	.	.	.	.	.	.	.	.	.
IQI02	Provider	601	601	0	.	.	.	.	.	.	.	.	.	.	.	.	.
IQI04	Provider	1,372	1,372	0	.	.	.	.	.	.	.	.	.	.	.	.	.
IQI05	Provider	1,017	1,017	0	.	.	.	.	.	.	.	.	.	.	.	.	.
IQI06	Provider	1,465	1,465	0	.	.	.	.	.	.	.	.	.	.	.	.	.
IQI07	Provider	1,780	1,780	0	.	.	.	.	.	.	.	.	.	.	.	.	.
IQI08	Provider	483	483	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI09	Provider	536	536	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI11	Provider	1,364	1,364	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI12	Provider	1,014	1,014	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI13	Provider	1,226	1,226	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI14	Provider	2,721	2,721	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI15	Provider	3,331	3,331	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI16	Provider	4,095	4,095	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI17	Provider	3,722	3,722	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI18	Provider	3,748	3,748	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI19	Provider	3,060	3,060	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI20	Provider	4,253	4,253	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI21	Provider	2,776	2,776	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI22	Provider	2,706	2,706	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI23	Provider	3,366	3,366	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI24	Provider	3,393	3,393	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI25	Provider	1,846	1,846	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI26	Area	6,140	6,168	0	46	0.000021	0.46	0.00002	1.00	0.000054	1.41	0	0	NA	NA	NA	NA
IQI27	Area	6,142	6,170	0	254	0.000055	0.63	0.000021	0.40	0.000092	1.01	0	0	NA	NA	NA	NA
IQI28	Area	6,169	6,169	0	62	0.00004	0.56	0.000233	2.53	0.000065	1.13	0	0	NA	NA	NA	NA
IQI29	Area	6,171	6,171	0	52	0.000011	0.34	0.000006	0.19	0.000012	0.46	0	0	NA	NA	NA	NA
IQI30	Provider	1,453	1,453	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI31	Provider	1,775	1,775	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI32	Provider	1,624	1,624	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI33	Provider	2,772	2,772	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IQI34	Provider	2,713	2,713	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Neonatal Quality Indicators (NQI)</b>																	
NQI01	Provider	2,380	2,380	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NQI02	Provider	2,800	2,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NQI03	Provider	1,837	1,837	1	1	0.004503	19.63	0.000158	0.54	0.003079	19.20	0.002776	16.8443	0.09	0	0.09	0
<b>Pediatric Quality Indicators (PDI)</b>																	
PDI01	Provider	4,036	4,036	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0
PDI02	Provider	2,387	2,387	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI03	Provider	14	14	0	.	.	.	.	.	.	.	.	.	.	.	.	.
PDI05	Provider	4,027	4,027	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI06	Provider	207	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI07	Provider	276	276	0	.	.	.	.	.	.	.	.	.	.	.	.	.
PDI08	Provider	1,613	1,613	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI09	Provider	1,571	1,571	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI10	Provider	1,273	1,273	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI11	Provider	1,780	1,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PDI12	Provider	3,878	3,878	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0
PDI13	Provider	1	1	0	.	.	.	.	.	.	.	.	.	.	.	.	.
PDI14	Area	5,625	5,624	0	6	0.000021	0.48	0.000006	0.41	0.000022	0.43	0	0	NA	NA	NA	NA
PDI15	Area	5,622	5,624	0	2	0.000064	0.36	0.000003	0.71	0.000002	0.10	0	0	NA	NA	NA	NA
PDI16	Area	5,625	5,624	0	3	0.00002	0.43	0.00001	0.98	0.000069	1.43	0	0	NA	NA	NA	NA
PDI17	Area	2,635	2,635	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA
PDI18	Area	5,625	5,624	0	2	0.000003	0.14	0.000002	0.42	0.000005	0.30	0	0	NA	NA	NA	NA

QI	TYPE	n_WinQI	n_SAS	Max_Diff_Num	Max_Diff_Denom	Max_Diff_ObsRate	Max_%Diff_ObsRate	Max_Diff_ExpRate	Max_%Diff_ExpRate	Max_Diff_RARate	Max_%Diff_RARate	Max_Diff_SmoothRate	Max_%Diff_SmoothRate	%<2 Percentile_Diff_RARate	%Diff_StatSig_RARate	%<2 Percentile_Diff_SmoothRate	%Diff_StatSig_SmoothRate
<b>Prevention Quality Indicators (PQI)</b>																	
PQI01	Area	6,166	6,166	0	9	0.000001	0.12	0	0.02	0.000001	0.12	0	0	NA	NA	NA	NA
PQI02	Area	3,906	3,906	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA
PQI03	Area	6,166	6,166	0	13	0.00003	0.55	0.000003	0.18	0.000033	0.73	0	0	NA	NA	NA	NA
PQI05	Area	6,139	6,167	0	256	0.001821	4.13	0.000039	0.63	0.001943	4.55	0.001756	4.31	NA	NA	NA	NA
PQI07	Area	6,167	6,167	0	6	0.000001	0.11	0.000002	0.20	0.000003	0.30	0	0	NA	NA	NA	NA
PQI08	Area	6,169	6,169	0	404	0.000062	0.68	0.000165	2.87	0.000212	3.52	0.00021	2.66	NA	NA	NA	NA
PQI09	Area	5,157	5,157	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA
PQI10	Area	6,166	6,166	0	61	0.000036	0.60	0.000029	1.25	0.000084	1.87	0	0	NA	NA	NA	NA
PQI11	Area	6,168	6,168	0	232	0.000711	2.70	0.000124	2.17	0.000972	3.26	0.000262	3.03	NA	NA	NA	NA
PQI12	Area	6,167	6,167	0	184	0.000147	1.22	0.000056	5.00	0.001646	6.55	0.000108	2.15	NA	NA	NA	NA
PQI13	Area	6,166	6,166	0	11	0.000002	0.09	0	0.09	0.000002	0.17	0	0	NA	NA	NA	NA
PQI14	Area	6,166	6,166	0	7	0.000003	0.17	0	0.13	0.000001	0.10	0	0	NA	NA	NA	NA
PQI15	Area	5,913	6,166	0	19	0.00007	0.84	0.000002	0.33	0.000088	1.01	0	0	NA	NA	NA	NA
PQI16	Area	6,166	6,166	0	4	0.000003	0.16	0.000001	0.28	0.000005	0.44	0	0	NA	NA	NA	NA
<b>Patient Safety Indicators (PSI)</b>																	
PSI02	Provider	4,361	4,361	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0
PSI03	Provider	4,559	4,559	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI04	Provider	3,128	3,128	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI05	Provider	271	271	0	.	.	.	.	.	.	.	.	.	.	.	.	.
PSI06	Provider	4,743	4,743	0	0	0	0.00	0	0.00	0	0.00	0	0	0	0	0	0
PSI07	Provider	4,743	4,743	0	0	0	0.00	0	0.00	0	0	0	0.00	0	0	0	0
PSI08	Provider	3,972	3,972	0	0	0	0	0	0.00	0	0	0	0.00	0	0	0	0
PSI09	Provider	4,026	4,026	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI10	Provider	3,239	3,239	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0
PSI11	Provider	3,215	3,215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI12	Provider	4,028	4,028	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI13	Provider	2,970	2,970	0	1	0.000067	0.34	0.000016	0.11	0.000033	0.23	0.000014	0.11	0	0	0	0
PSI14	Provider	3,625	3,625	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI15	Provider	4,743	4,743	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI16	Provider	31	31	0	.	.	.	.	.	.	.	.	.	.	.	.	.
PSI17	Provider	2,767	2,767	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI18	Provider	2,523	2,523	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI19	Provider	2,774	2,774	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSI21	Area	6,166	6,166	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA
PSI22	Area	6,168	6,168	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA
PSI23	Area	6,166	6,166	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA
PSI24	Area	6,166	6,166	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA
PSI25	Area	6,167	6,167	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA
PSI26	Area	6,166	6,166	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA
PSI27	Area	6,167	6,167	0	0	0	0	.	.	.	.	.	.	NA	NA	NA	NA

Quality Indicator Composites											
QI	TYPE	n_WinQI	n_SAS	Max_Diff_Comp	Max_%Diff_Comp	Max_Diff_Comp_SE	Max_%Diff_Comp_SE	%<2 Percentile_Diff_Comp	%Diff_StatSig_Comp		
IQI90	Provider	4,763	4,746	0.000914	0.09	0	0	0	0	IQI90	IQI provider-level composite measure for mortality for selected procedures
IQI91	Provider	4,763	4,746	0.006661	0.66	0	0.00	0.06	0	IQI91	IQI provider-level composite measure for mortality for selected conditions
PDI19	Provider	4,763	4,058	0	0	0	0	0	0	PDI19	PDI provider-level composite measure for pediatric patient safety for selected indicators
PDI90	Area	2,866	2,866	0.000099	0.65	0.000006	0.34	NA	NA	PDI90	PDI area-level overall composite measure
PDI91	Area	2,042	2,042	0.00001	0.43	0.000003	0.21	NA	NA	PDI91	PDI area-level acute composite measure
PDI92	Area	2,344	2,344	0.000035	0.62	0.000005	0.28	NA	NA	PDI92	PDI area-level chronic composite measure
PQI90	Area	5,599	5,601	0.007853	12.50	0.000351	5.34	NA	NA	PQI90	PQI area-level overall composite measure
PQI91	Area	5,261	5,262	0.001567	6.02	0.000284	2.84	NA	NA	PQI91	PQI area-level acute composite measure
PQI92	Area	5,381	5,382	0.002792	6.82	0.000053	2.98	NA	NA	PQI92	PQI area-level chronic composite measure
PSI90	Provider	4,763	4,746	0.000359	0.05	0.000002	0.00	0	0	PSI90	PSI provider-level composite measure for patient safety for selected indicators
Please note that 'n' differs between SAS and WinQI for some area-level indicators and some composites.											
NA - not applicable											
"." - insufficient data to calculate a result											