Hospital Inpatient Quality Reporting (IQR) Program

Support Contractor

Hospital Quality Star Ratings on *Hospital Compare*
December 2017 Methodology Enhancements

Questions and Answers

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PART I: Questions and Responses from Live National Provider Call (NPC)

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The following questions were asked, and subject matter experts gave responses, during the live webinar. Questions and answers may have been edited.

Question 1: **When is the date that the December Preview Report will be published on *Hospital Compare*?**

CMS intends to publicly report the December Star Rating results on December 20. **NOTE:** The *Hospital Compare* website was updated on December 21, 2017. The decision to delay the posting was determined after the NPC.

Question 2: **Congratulations to CMS and Yale for making needed changes to correct some original issues with the methodology. It is so important that, if CMS is going to publish Star Ratings, it is done as well as possible, including fidelity to the correct use of sophisticated statistical methods. Will CMS have a response, or you'll have a response to that comment?**

We really thank you (Nancy) for all of your support with making these enhancements. CMS is committed to transparency and an iterative approach to improvement, including in this case, with new information that led to the enhancements in methodology.

Question 3: **Will the hospital summary scores and/or measure group scores be available for all hospitals on *Data.Medicare.gov*?**

CMS reports the group categorical information (better than, worse than, same as) on Data.Medicare.gov. This information will be made available along with the *Hospital Compare* release. Distribution of the Star Rating and Group Performance Categories for the Nation can be found in the December 2017 Quarterly Updates and Specifications Report in Table 3. The report is posted on the *QualityNet* Overall Hospital Ratings web page.

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Question 5: **Is the updated methodology the only difference between the October 2017 preview of Star Ratings and the December 2017 preview of Star Ratings?**

There were two new measures added to the Hospital Outpatient Quality Reporting Program, which are included in the Star Rating. Information on the measures is included in the educational materials on the *QualityNet* website, as well as a list of the measures included and excluded from the Star Rating calculation.

Question 6: **What is a score difference between one, two, three, four and five stars? Would 0.02 points move hospitals from two stars to one star?**

I am assuming that the question asking about a 0.02 change refers to the hospital summary score, which is calculated before hospitals are clustered into the five-star categories. It is possible that any small change in a hospital summary score could result in an increase or a decrease in their Star Rating if that hospital's summary score is near a borderline. Any approach or methodology that is used to do ratings has to create cut points between each of the star categories and there will always be hospitals that are near those cut points or near those borders.

Because the hospital summary score is a relative score, a change of 0.02 may result in a different Overall Star Rating in one release, but not in a future reporting period. All of the scores are recalculated each reporting period based on the distribution of individual measure scores and the number of hospitals reporting each of these measures.

Question 7: **Do you see significant changes for hospitals with the changes from last report to the December report for a single hospital?**

We do not conduct any analyses for single hospitals, but slide 22 shows the overall national distribution of the Star Rating using the new methodology compared to the previous methodology. What we have tried to show is that, as a result of the multiple changes that were made in the methodology, there is a change in the overall distribution and so there are potentially many hospitals that change. Along with the methodology enhancements, the number and distribution of measures have also changed, which makes it difficult to see if an individual hospital's Star Rating has changed due to the enhancements or a combination of other factors.

Question 8: **Can you please share with us why there are more hospitals receiving Star Ratings this year than last? Is it simply the fact that more hospitals had enough measures in enough categories to qualify or is there something else going on?**

Compared to December of 2016, there are 63 more hospitals with a Star Rating. Fluctuations are expected with each Star Rating release and are likely driven by changes in whether or not a hospital meets various criteria for reporting of individual measures. None of the methodology enhancements change the reporting profiles of hospitals, so any differences seen between releases are likely not a result of methodological decisions but rather there are likely differences in public reporting overall.

Question 9: **How many hospitals were included in the final Star Rating scores?**

The total number of hospitals for the December 2017 release is 3692 hospitals. This information can be found on slide 24. Please note that this number is smaller than the total number of hospitals on *Hospital Compare*. This is due to several factors, including hospital pledging status, openings and closures, non-IPPS hospitals and hospitals not having enough data for the Star Rating.

Question 10: **How can hospitals validate their rating for accuracy?**

There are a variety of work products available outlining the Star Rating process, including Preview Reports and Hospital-Specific Reports, where hospitals can see their individual standardized scores as well as each of the intermediate or inter-steps and scores that exist between individual measures in the ultimate Star Rating. We also make available the Statistical Analysis Software (SAS) Package and the applicable data input file. This information is released along with the website display. The SAS Package and user guide are posted on the SAS Package page on *QualityNet*.

Question 11: **Are the measure groups reweighted and the new methodology for those groups that do not meet the minimum volume criteria to calculate a measure group score?**

The methodology for the reweighting of measure groups or the re-proportioning of weight was not changed for December 2017. For example, if a hospital only has five of the seven measure groups, then those five groups are re-proportioned to make up the entire 100 percent as it was done before. This is a topic that CMS sought public input on recently, and is a topic that will be discussed with the Technical Expert Panel (TEP) in the future.

Question 12: **With the existing methodology, approximately 50 percent of hospitals nationally received three stars and approximately two percent to three percent received one or five stars. Is this the same with this new methodology?**

Slide 22 describes the changes to the distribution between the old and enhanced methodologies. With the enhancements, about 32 percent of hospitals received three stars compared to 53 percent using the old methodology. There is also a higher proportion of hospitals that received one, two, four and five stars then previously.

Question 13: **Is this a yearly score? What month does this data incorporate?**

CMS intends to update the Star Ratings twice a year, generally in July and December. The applicable date ranges are available on the *Hospital Compare* website in the About the data section.

Question 14: **Currently on *Hospital Compare*, we can only view the Overall Star Rating. Are there any plans to publicly report the group scores and the overall summary score as well?**

CMS is currently looking at this topic. The group performance categories (better than, worse than, same as the national average) are available to the public on *Data.Medicare.gov*. Individual hospitals are also provided their group scores in the confidential Star Rating Hospital-Specific Reports.

Question 15: **The "N" in old versus new is 3692. I thought it was stated that the final Star Ratings calculation will only include hospitals that will ultimately receive a Star Rating score, slide 21, so the movement of Step 5 had no impact.**

The 3692 number that you see is the final number of hospitals that are included in the Star Rating. There are approximately 4500 hospitals that may report at least one measure on *Hospital Compare*, but do not meet the thresholds for a Star Rating. As a result, 3692 hospitals were included in the clustering using the new methodology. In the previous approach, all 4500 hospitals would have been clustered, and then only 3600 would have had their score reported because clustering was done after the reporting threshold. By moving the reporting threshold step up, we only include the hospitals that meet the minimum thresholds in the clustering algorithm.

Question 16: **Does the five-star system relate to the Leapfrog report?**

The Leapfrog report is different than our five-star system. CMS posted frequently asked questions (FAQs) and other information posted earlier when we first rolled out with the Star Ratings that went over the differences between CMS ratings and the ratings used in other systems, such as Leapfrog and U.S. News.

Question 17: **Please review the use interpretation of slide 30.**

Slide 30 is meant to show how the different methodology results in a different distribution of Star Ratings. The rows here apply the previous methodology using December 2017 data. The columns represent methodology with the enhancements on the same December 2017 data. One way to interpret this would be, for example, in the case of three-star hospitals using the previous methodology on December 2017 data. You can see that at the end of row 3 there are 1959 hospitals that would have received three stars. Using the new methodology on the same December 2017 data, at the bottom of the column for three, you can see there are 1187 hospitals that receive three stars. Using the new methodology, 178 of the previously three-star facilities now receive two stars and 594 now receive four stars.

The same is true in the other cells and you can follow along in that way.

Question 18: **We have discovered several coding issues with our Preview Reports. Can we still write to CMS for clarification?**

CMS has determined that it is the providers' responsibility to verify the accuracy of their data prior to the submission deadline and that any changes after the submission date cannot be made. The intention of the preview period is for hospitals to review their data prior to being publicly reported on *Hospital Compare*. The preview period is not a review and corrections period where hospitals can send corrected data.

Question 19: **I am clear on my hospital Star Ratings that will now be published in December using the new methodology. Did we also receive the Star Rating using the previous methodology that would have been published in December 2017?**

Not with your current Hospital-Specific Report, no. We did not provide those.

Question 20: **Any additional thoughts on reweighting the domains?**

CMS solicited feedback about the measure group weighting during the recent public input period (August 29–September 27, 2017). This feedback is considered as part of the continuous measure reevaluation process, and we intend to address this recommendation with our TEP. CMS will announce any methodology updates before publicly reporting.

Question 21: **Are additional enhancements planned based on the feedback period ending in September 2017?**

CMS has determined that it is the providers' responsibility to verify the accuracy of their data prior to the submission deadline and that any changes after the submission date cannot be made. The intention of the preview period is for hospitals to review their data prior to being publicly reported on *Hospital Compare*. The preview period is not a review and corrections period where hospitals can send corrected data.

PART II: Questions and Responses Post-National Provider Call

Subject Matter Experts researched and answered the following questions after the live webinar.

Question 22: **Are there any plans to bring the dates of data reported to a more current reflection of hospitals, or a plan to disclaim the dates in a clearer way for the public? For example, mortality data is still very old and does not reflect improvements already in place.**

CMS uses the most up-to-date information available to us. The claims-based measures are calculated using the final paid claim, which minimizes significantly the chance a hospital will provide a revised claim, thereby changing the denominator. The process of care, healthcare-associated infections (HAI), and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) data are submitted by the hospital to the various data warehouses. Hospitals have 4.5 months for the Hospital IQR Program and four months for the Hospital Outpatient Quality Reporting (OQR) Program after the close of the quarter to submit their final, complete data file. The 4.5 months was agreed upon at the implementation of the Hospital IQR Program, and was

the timeframe requested by hospitals. After files are submitted, they are tested to ensure data accuracy, and measure calculation occurs. The final calculations are then placed in the *Hospital Compare* Preview Report providing hospitals with a 30-day preview period prior to display to the public.

Question 23: Are there 59 or 57 measures for the December release?

There are 57 measures used in the December 2017 Star Ratings calculations.

Question 24: Are the Star Rating reports released November 14, 2017, already using the new methodology?

Yes. The updated Star Rating Methodology was used to calculate the December 2017 data with results found in the HSRs that were distributed.

Question 25: Are the previous ratings of the hospitals going to be updated to reflect the new methodology?

No. The enhanced methodology was implemented for December 2017 and moving forward for future releases. It will not be applied retrospectively.

Question 26: Are there plans to publish the comments received during the comment period regarding the methodology changes?

Yes. The Public Comment Summary Report will be posted on *CMS.gov* in the next few weeks.

Question 27: Did the same number of hospitals get a star score under the old methodology for December 2017 and under the new methodology for December 2017?

Please refer to slide 28 that shows the Overall Star Rating Distribution difference between the previous methodology and the enhanced methodology.

Question 28: Can you show us a change (in percent) of patients with the Star Ratings? Based on the new methodology, is it appropriate for leaders to compare prior report results to this report?

See slide 22 for differences between December 2016 and December 2017.

Hospital leaders could still be able to compare their December 2016 and December 2017 Star Ratings; however, note that, in December 2016, the old methodology was used for calculation and, for 2017, the enhanced methodology was used. Please note that Star Ratings are not intended to guide specific hospital quality improvement efforts, but rather to make summary information available to the public.

Question 29: Can the latent variables used for each group be shared with the hospitals?

There is not a list of latent variables. Latent Variable Modeling (LVM) is used to estimate a group score for the dimension of quality represented by the measures in each group. LVM is a statistical modeling approach that has been used to summarize information in a variety of settings ranging from education to healthcare. For the Star Rating, LVM assumes each measure reflects information about an underlying, unobserved dimension of quality. A separate LVM is constructed for each group so that a total of seven LVMs are used to calculate the Star Rating. The LVM accounts for the relationship, or correlation, between measures for a single hospital. Measures that are more consistent with each other, as well as measures with larger denominators, have a greater influence on the derived latent variable. Each model estimates, for each hospital, the value of a single latent variable representing the underlying, unobserved dimension of quality; this estimate is the hospital's group score. For a detained description of the LVM, please see pages 13–16 of Comprehensive Methodology Report on *QualityNet*.

Question 30: Does CMS plan to use more recent Patient Safety Indicator (PSI) data (post September 2015) in the next version of the Five-Star report?

The applicable date ranges are available on the *Hospital Compare* website in the About the data section when the release is updated.

The data collection periods for December 2017 measures can also be found in the Overall Hospital Rating December HSR User Guide received with your HSR and found on the *QualityNet* Overall Hospital Rating webpage.

Question 31: **Do measures with larger loading coefficients provide more weight in the measure group score? For example, in the Safety of Care group, the PSI 90 coefficient is 0.94, while the coefficients for the infection (HAI) and complication measures range from 0.001 to 0.07. Does this mean the PSI 90 score will be the primary factor in this group?**

Yes. Measures with larger loading coefficients will have a greater influence on the hospital's group score. In your example, the PSI 90 measure would have a greater influence on the Safety of Care group score than the complication measure.

For more information on the latent variable model used to calculate the Star Ratings, please see pages 14–15 of the Comprehensive Methodology Report when available on the *QualityNet* website.

Question 32: **Have you seen any correlation between bed size of hospital and Star Rating?**

Analysis of correlation between bed size of hospitals and their Star Ratings by CMS is not available at this time.

Question 33: **Has there been, or will there be, additional analyses of Star Ratings distribution by category of hospitals (e.g., teaching hospitals, safety net hospitals)?**

Currently, distributions by hospital categories are not publicly available. Based on stakeholder recommendations, CMS is looking into how to make this data available in the future.

Question 34: **Glad to hear that we may get the Methodology and Specifications Report this week or next. Would it be possible in the future to release this**

document along with the Preview Reports or during the preview reporting period?

It is CMS intention to post supporting documents on *QualityNet* Overall Hospital Rating webpage as each document is finalized. In the future, it is our intention to release these documents along with the Preview Reports.

Question 35: **Example: Hospital A - 1 Star. Hospital B - 2 Stars. However, Hospital B showed worse performance on some of the measures than hospital A, with all other scores being close to equal. Why would Hospital B score more stars than Hospital A. Category weighting did not appear to be the factor.**

There are a couple of reasons why Hospital B may have a higher Star Rating than Hospital A. The Star Rating methodology is complex: The measures used to calculate a Star Rating are in groups that have different weights, and the measures themselves have different loadings within the group.

The measure groups that contribute to the Star Rating have different weights: Mortality, Safety of Care, Readmission, and Patient Experience are weighed at 22 percent each, while Effectiveness of Care, Timeliness of Care, and Efficient Use of Medical Imaging are weighed at 4 percent each. If a hospital does not report measures for a given group, their weight allocations will be redistributed to account for that missing group.

In addition, if each hospital has a different set of measures contributing to its Star Rating, this could potentially lead to hospitals with similar scores receiving different stars. This is because the measures have different loading coefficients. The loading coefficient determine the influence that a particular measure will have on the group score.

For more information on group weights used to calculate the Star Ratings, please see pages 17–20 of the Comprehensive Methodology Report available on *QualityNet.*

Question 36: **How do we get our patient-level data?**

The claims-based measures HSRs were available during the July 2017 preview period. These reports contain patient-level details. If you need to request a copy of your HSR(s), please submit a request to the *QualityNet* Help Desk at qnetsupport@hcqis.org. The process of care, HAI, and HCAHPS data are submitted by the hospital to the various data warehouses. The Hospital IQR and Hospital OQR Programs give hospitals 4.5 months after the close of the quarter to submit their final, complete data. This data can be accessed through feedback reports available in the *QualityNet Secure Portal*.

Question 37: How did the new methodology impact individual scores (e.g., patient experience)?

The enhancement methodology does not impact the individual measure scores within the Overall Star Ratings. These individual measure scores remain unchanged, although they are used in the Overall Star Ratings calculation. Instead, the enhancement methodology impacts the Overall Star Ratings calculation steps.

Question 38: How can hospitals monitor their data concurrently, so we know where we are before the data is published? We do not seem to be tracking the same calculations?

Hospitals can review their detailed HSR to identify measures and measure groups for improvement. Hospitals can improve their Star Rating results by improving on individual measure performance as well as higher weighted measure groups, such as outcome measure groups of Mortality, Readmission, and Safety of Care or Patient Experience.

Question 39: How are the acute myocardial infarction (AMI), heart failure (HF), and other Excess Days in Acute Care (EDAC)-30 scores calculated (for our hospital's measure result on *Hospital Compare*)?

CMS calculates your EDAC measure scores as the difference ("excess") between your hospital's predicted days and expected days per 100 discharges. "Predicted days" is the average number of days your hospital's patients spent in

acute care after adjusting for the risk factors. “Expected days” is the average number of risk-adjusted days in acute care your hospital’s patients would be expected to spend if discharged from an average performing hospital with the same case mix.

To be consistent with the reporting of the CMS 30-day readmission measures, CMS multiplies the measure result by 100, such that the final EDAC results represent EDAC per 100 discharges.

For details on the statistical approach and the two-part logit/Poisson model used in the EDAC measures, please see appendix A of the 2017 Condition-Specific EDAC Measures Updates and Specifications Report on *QualityNet*.

Question 40: **How do we get the information updated on *Hospital Compare*? It currently indicates that our hospital doesn't have emergency department (ED) services. This is NOT correct information.**

For information on how to change your hospitals characteristics, please see the Updating your information on *Hospital Compare* page.

Question 41: **I am questioning this process. I do not see the purpose of this. It seems like you took a bell curve and flattened the bell, pushing hospitals into a lower or higher category. I do not agree with this, as well as you did not send the supporting material for us to even evaluate our scores properly.**

The enhancements for December 2017 are based on stakeholders’ feedback from the technical expert panel and the public input period, and go beyond a flattening of the curve. These enhancements include utilizing adaptive quadrature to calculate measure group scores, applying the reporting thresholds prior to k-means clustering, using complete convergence for k-means clustering, and removing hospital summary score Winsorization. Overall these methodological enhancements increase reliability, improve the stability of hospital estimates, and yield more useful results for consumers.

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Question 42: **How was the decision made to utilize the excess days measures for AMI and HF in lieu of the readmission rates for those cohorts? Are there any plans to add the episodic payment measures or Medicare Spending Per Beneficiary measure?**

CMS vetted measure selection criteria with stakeholders through the original TEP and public input periods to ensure that the Star Rating captured the diverse aspects of quality represented by the measures on *Hospital Compare*. All measures for acute care hospitals reported on *Hospital Compare*, as determined using the data reported in the CMS *Hospital Compare* downloadable data file, were included in the Star Rating.

Because the Star Rating is intended for acute care hospitals, CMS first omitted all measures on *Hospital Compare* that were specific to specialty hospitals (such as a cancer hospital or inpatient psychiatric facility) or ambulatory surgical centers prior to applying any measure selection criteria. With these measures omitted, the total number of measures eligible for inclusion in the Star Rating for December 2017 was 124 measures.

CMS used the following criteria to exclude measures from the Star Rating calculation:

- Measures suspended, retired, or delayed from public reporting on *Hospital Compare*
- Measures with no more than 100 hospitals reporting performance publicly
- Structural measures
- Measures for which it is unclear whether a higher or lower score is better (non-directional)
- Measures not required for the Hospital IQR Program or Hospital OQR Program
- Overlapping measures (for example, measures that are identical to another measure, or measures with substantial overlap in cohort and/or outcome)

Question 43: **In the HSR Preview Report, the Overall Hospital Rating score in table 1 provides the hospital score and an upper/lower confidence interval. How does this score distribution match against Star Rating groupings? In other CMS programs, if the entire score distribution is above the national mean score, they are better than the nation, but there are only three groupings (better than, no different than, or worse than). I am unclear on how the score distribution works with the five grouping categories. Thank you for your clarification.**

The approach used to assign a Star Rating to a hospital differs from the approach used to assign a performance category to a measure group. Specifically, the Star Ratings methodology assigns performance categories at the measure group level only. (Please see table 2 of your HSR for your hospital's measure group performance categories.) To assign a performance category to a measure group, CMS compares a hospital's 95 percent confidence interval for a group score to the national average score for that group. CMS defines the group performance categories as follows:

- "Above the national average," defined as a group score with a confidence interval that fell entirely above the national average
- "Same as the national average," defined as a group score with a confidence interval that included the national average
- "Below the national average," defined as a group score with a confidence interval that fell entirely below the national average

This approach is similar to the approach you have described in your question. In contrast, a hospital's Star Rating is assigned based on k-means clustering. The k-means clustering analysis is a standard method for creating categories (or clusters) so that the observations (or scores) in each category are closer to their category mean than to any other category mean. The number of categories is pre-specified; CMS specified five categories, so that the k-means clustering analysis generates five categories based on hospital summary scores in a way that minimizes the squared distance between summary scores and their

assigned category mean. Stated in another way, hospitals were organized into one of five categories such that a hospital's summary score is "more like" that of the other hospitals in the same category and "less like" the summary scores of hospitals in the other categories. The methodology runs clustering until complete convergence, in which the procedure iteratively examines solutions until it can find no better solution. The final Star Rating categories were structured such that the lowest group is one star and the highest group is five stars. Calculations are based on the original methodology described in the "Overall Hospital Quality Star Ratings on *Hospital Compare* Methodology Report." However, enhancements have been made to the methodology for December 2017, as described in the "Star Methodology Enhancement for December 2017 Public Release" document. Both of these resources are available on *QualityNet*, under **Hospitals – Inpatient** > **Overall Hospital Ratings** > **Methodology**. Additional details will be made available in upcoming methodology, FAQ, and other documents.

Lastly, note that additional information is available in the HSR User Guide that accompanied your Overall Hospital Rating HSR.

Question 44: Does CMS release the measures that will be included in the Star Rating ahead of time? If so, where?

Overall Hospital Star Rating uses the measures that are reported on *Hospital Compare*. The list of included and excluded measures are available on the Preview Report Resources page of the *Quality Net* website.