**Supplement 1: Calculation of the Raw Satisfaction Rating (RSR)**

Beginning in April 2015, the Centers for Medicare and Medicaid Services (CMS) allowed the public to inspect the “star rating” of any hospital accepting patients with Medicare. A description of the star ratings system can be found at:

[http://www.hcahpsonline.org/Files/HCAHPS\_Stars\_Tech\_Notes\_9\_17\_14.pdf](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.hcahpsonline.org_Files_HCAHPS-5FStars-5FTech-5FNotes-5F9-5F17-5F14.pdf&d=AAMF3g&c=4sF48jRmVAe_CH-k9mXYXEGfSnM3bY53YSKuLUQRxhA&r=Q4SKLl06E_WXTFl8vq6eEFp0zvkag3ki8ODTJVO_XXQ&m=RoiDB2vo9dTiI92NdULYdq7STfe2C8sLnV4Vyk61-Ec&s=xbqP2rSL9cQWuN7A5FBvHMpu9ajxvXxSIQYn7TPoJK8&e=)

Star ratings are calculated from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. First, HCAHPS survey responses to individual questions are used to calculate a raw score. Second, CMS adjusts the raw scores for hospital clustering, patient mix index, improvement from previous scores, and method of survey in order to determine a star score. Given that our database came from one hospital, we were unable to account for these CMS adjustments. Instead, we calculated the raw score as CMS would have prior to making the inter-hospital adjustments. This allowed us to calculate our hospital’s raw satisfaction rating (RSR). The RSR was calculated in the following manner (just as CMS would do prior to adjustments) (Supplement Table 1).

 The star ratings are similar to the “top box” rating score used for value based purchasing (VBP), but with the following key differences.

1. Answers to questions 1-9, 11, 13-14, 16-17, 19-25 from HCAHPS are included for analysis.
2. For questions with multiple answers, the answers from surveys are weighted, rather than only counting the “top boxes” checked. Therefore, if a hospital receives an equal number of “always” responses and “never” responses, they would generate a lower score than a hospital with an equal number of “always” responses and “often” responses.
3. The averages from the 11 domains of questions (in this case there are 11 domains, not 8 as in the VBP top box calculations, because a different subset of questions from HCAHPS is used).”Cleanliness” and “quietness” are averaged together as are “overall rating” and “recommend the hospital”. That average score is then made into an integer through rounding up for each 0.5, to achieve an overall RSR.

Supplement Table 1: Calculation of Raw Satisfaction Rating

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| --- | --- | --- | --- |
| **DOMAIN** | **Questions on HCAHPS survey** | **Average score for this domain is calculated by:** | **Domain Score** |
| **Nursing Communication** | Q1,Q2,Q3 | [(#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333)]/3 | 0 – 100 |
| **Doctor Communication** | Q5,Q6,Q7 | [(#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333)]/3 | 0 – 100 |
| **Staff Responsiveness** | Q4,Q11 | [(#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333)]/2 | 0 – 100 |
| **Pain Management** | Q13,Q14 | [(#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333)]/2 | 0 – 100 |
| **Medicine Communication** | Q16,Q17 | [(#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333)]/2 | 0 – 100 |
| **Discharge Information** | Q19, Q20 | (#”yes”x100)/2 | 0, 50, 100 |
| **Care Transition** | Q23,Q24,Q25 | [(#”strongly agree”x100)+(#”agree”x66.666)+(#”disagree”x33.333)]/3 | 0 – 100 |
| **Cleanliness Rating** | Q8 | (#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333) | Averaged to give one score 0 – 100 |
| **Quietness Rating** | Q9 | (#”always”x100)+(#”usually”x66.666)+(#”sometimes”x33.333) |
| **Overall Hospital Rating** | Q21 | (Score of 1-10)x10 | Averaged to give one score 0 – 100 |
| **Likeliness to refer** | Q22 | (#”definitely yes”x100)+(#”probably yes”x66.666)+(#”probably no”x33.333) |
| **RSSR** |  | Sum of all 9 domain scores/900 | 0 – 1 |

 HCAHPS – **Hospital Consumer Assessment of Healthcare Providers and Systems** Q – question