Methodology – Best Nursing Homes 2020

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1. Introduction

The Best Nursing Homes 2020 ranking lists the best nursing homes in terms of quality of care in 20 US-States. The states were selected based on population size.

a. Included states

The following states were included in the analysis:

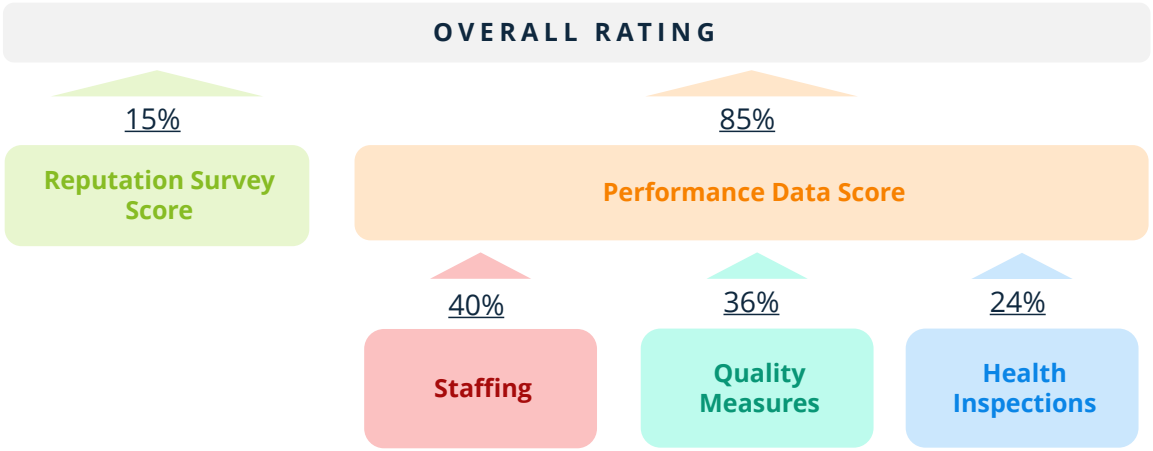
- Arizona
- California
- Florida
- Georgia
- Illinois
- Indiana
- Maryland
- Massachusetts
- Michigan
- Missouri
- New Jersey
- New York
- North Carolina
- Ohio
- Pennsylvania
- Tennessee
- Texas
- Virginia
- Washington
- Wisconsin

b. Scope

- Included are single branches of nursing homes (e. g. Okeechobee Health Care Facility), no nursing home groups or chains.
- A Nursing home had to have a capacity of at least 150 certified beds[1] to be considered.
- The amount of nursing homes awarded in each state varies by the number of nursing homes that achieved the threshold score. The state of New York had with 63 the most nursing homes awarded, while Missouri is represented with 10 nursing homes.
- Nursing homes, that are included in the Special Focus Facility (SFF) program, were not considered.

[1] 2070 nursing homes in the US according to the July 2019 Nursing Home Compare data files

2. Ranking Model



A score was calculated for every nursing home that was part of the analysis. The score is based on **two data sources**:

Reputation Survey: In cooperation with Newsweek, Statista invited about 46,000 medical experts (registered nurses, nursing home managers and administrators, licensed practical nurses / licensed vocational nurses, nursing assistants, therapists and physicians) to an online survey. Additionally, experts from all over the US could participate in the survey of the Best Nursing Homes by State on newsweek.com. It was mandatory to perform an email verification and self-recommendation was not possible (e.g. a recommendation of the nursing home someone worked for was not counted in the evaluation).

The distribution of participations was 42% managers/administrators, 31% registered nurses, 19% LPN, LVN and nursing assistants, 8% therapists and physicians)

Nursing Home performance based on CMS data in three domains: The U.S. Centers for Medicare & Medicaid Services (CMS) provides monthly updated performance data for each nursing home that participates in Medicare or Medicaid. The Nursing Home Compare website (medicare.gov/nursinghome-compare) administered by CMS assigns an overall ranking of one to five stars based on a nursing home's performance on three separate measures: health inspections, staffing, and quality measures. All three domains have their own star ratings from one to five stars. Better quality is indicated by more stars.

Statista modified the CMS approach by redistributing the assignment of the underlying measures to a 10-point score instead of 5 stars to allow for a finer evaluation of a nursing home performance. In addition, an awarded nursing home must have achieved a minimum of 5 out of a maximum of 10 points in all three measures, so that only nursing homes that show at least a satisfactory level of performance in all sub-areas are awarded. The overall score that determines the rank of each nursing home within a state is calculated by combining a reputation survey score (15%) and a performance data score (85%)[2].

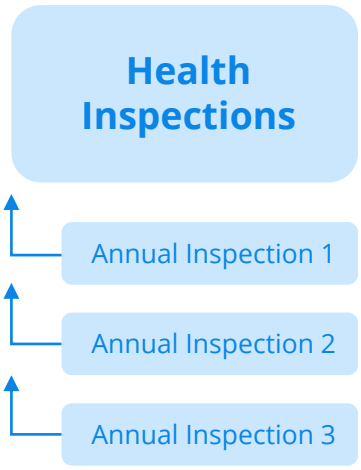
a. Calculation of Performance Data Score

Statista used CMS data that was published in July 2019 to determine the performance of nursing homes. This data is derived from three main sources: the Minimum Data Set (MDS), a standardized assessment tool that measures health status of nursing home residents, the Centers for Medicare & Medicaid Services' (CMS) health inspection database, and Medicare claims data, representing claims for various types of services that Medicare pays for including prescription drug purchases, inpatient and outpatient utilization, and more.

[2] The survey data in Arizona was not reliable and thus this data was not used. In Arizona, the rating is based on performance data only.

The ranking of nursing home domains by survey participants was used to determine the weights for creating the overall performance data score. The nurse staffing score is weighted more heavily with 40% than the quality of care score with 36% followed by 24% for the health inspection score.

i. Health Inspection Domain



Medicare and/or Medicaid certified nursing homes are inspected annually by states on behalf of CMS, with an inspection rarely happening longer than fifteen months apart. The unannounced inspections assess deficiencies in areas as resident rights, quality of life, medication management, skin care, resident assessment, nursing home administration, environment, and kitchen/food services.

The health inspection rating is based on the three most recent inspection surveys that are conducted by a team of healthcare professionals. More recent surveys are weighted more heavily than earlier surveys. The most recent survey is weighted with 1/2, the previous survey with a factor of 1/3 and the third survey with a factor of 1/6.

CMS assigns points to individual health deficiencies according to their extent and severity. Widespread deficiencies receive more points than isolated deficiencies and severe deficiencies receive more points than those which pose minimal harm for residents.[3]

As health inspections are based on federal regulations, the inspection process and outcome vary between states. The variations derive from many factors, which include but are not limited to differences in survey management, state licensing laws and policies in the state-administered Medicaid program. To address this, CMS health inspection ratings are based on the relative performance of a nursing home within a state.

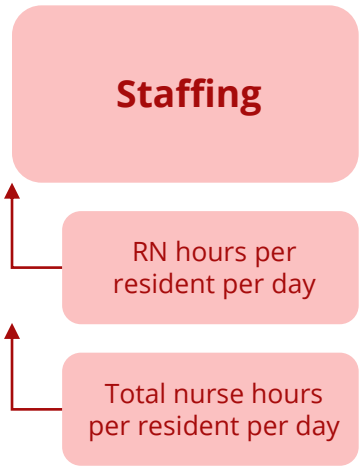
Statista and Newsweek follow this approach but base the rating on a finer evaluation of the health inspection point distribution in each state.

- The top 10 percent (with the lowest health inspection weighted scores) in each state receive a health inspection rating of ten points.
- The middle 70 percent of facilities receive a rating of two, three, four, five, six, seven, eight or nine points. The 70 percent is divided into eight sections, each representing 8.75% of the distribution, with the points awarded according to where they placed.
- The bottom 20 percent receive a one-point rating.

Nursing homes, that are included in the Special Focus Facility (SFF) program and nursing homes which have not been assigned a weighted score by CMS have not received a health inspection rating from Statista and Newsweek.

[3] Scores for different types of deficiencies can be looked up in the Technical User's Guide of the Nursing home compare website on https://www.medicare.gov/nursinghomecompare/Data/About.html#technicalDetails

ii. Staffing Domain



The Payroll-Based Journal (PBJ) system allows nursing homes to submit the number of hours facility staff is paid to work each day. The information collected is auditable to ensure accuracy and reflects average staffing over an entire quarter. Staffing data of directors of nursing homes, registered nurses (RNs), licensed practical nurses (LPNs), certified nurse assistants (CNAs), medication assistants, and nurse assistants in training is reported through this system.

The daily resident census is derived by CMS from MDS resident assessments.

CMS rates each nursing home based on two measures: **Registered nurse (RN) hours per resident per day** and **total staffing** (the sum of registered nurse, licensed practical nurses and nurse assistants) **hours per resident per day**.

Registered nurse hours per resident per day and total staffing hours per resident per day are calculated by using the sum of registered hours as a numerator and the residents census as the denominator of each nursing home.

$$\frac{\sum PBJhours}{\sum residentCensus} = Hours_{Reported}$$

These measures are adjusted for each facility to consider different levels of care needed for individual residents. CMS adjusts the reported staffing ratios for case-mix, using the Resource Utilization Group (RUG-IV) case-mix system.

$$(Hours_{Reported} \; / \; Hours_{Case-Mix}) * Hours_{Case_Mix\ National\ Average} = Hours_{Adjusted}$$

For both staffing measures, CMS assigns ratings of 1 to 5 stars based on rating cut points. Statista and Newsweek follow this approach but base the rating on a finer evaluation of the adjusted hours per resident day distribution of both staffing types.

Rating cut points[4] are set using a percentile-based method. Each point category from 1 to 10 represents 10 percent of the distribution.

Staff Type	10 points	9 points	8 points	7 points	6 points	5 points	4 points	3 points	2 points	1 point
Registered Nurse	≥ 1.197	≥ 0.950	≥ 0.800	≥ 0.688	≥ 0.599	≥ 0.518	≥ 0.444	≥ 0.370	≥ 0.277	< 0.277
Total	≥ 4.846	≥ 4.396	≥ 4.120	≥ 3.916	≥ 3.732	≥ 3.557	≥ 3.379	≥ 3.198	≥ 2.970	< 2.97

Note: Adjusted staffing values are rounded to three decimal places before the cut points are applied.

To achieve 10 points in both staffing measures a nursing home must have provided an adjusted average of at least 4.846 hours of total nursing staff per resident per day and at least 1.197 hours of registered nurse hours per resident per day.

An overall staffing rating is derived by calculating the arithmetic average of both staffing ratings. If the overall staffing is not a whole number, the average is "rounded towards" the registered nurse rating. E.g., if a nursing homes RN rating is 10 and total staff rating 7, the average is 8.5. This result is rounded to an overall staffing rating of 9. The table on the following page shows the rounding rules in detail.

[4] A rating cut point is the threshold where a rating switches from a rating of 10 to 9 for example.

RN rating and adjusted hours		Total nurse staffing rating and adjusted hours (RN, LPN and nurse aide)									
		10	9	8	7	6	5	4	3	2	1
		≥ 4.846	≥ 4.396	≥ 4.120	≥ 3.916	≥ 3.732	≥ 3.557	≥ 3.379	≥ 3.198	≥ 2.970	< 2.97
10	≥ 1.197	10	10	9	9	8	8	7	7	6	6
9	≥ 0.950	9	9	9	8	8	7	7	6	6	5
8	≥ 0.800	9	8	8	8	7	7	6	6	5	5
7	≥ 0.688	8	8	7	7	7	6	6	5	5	4
6	≥ 0.599	8	7	7	6	6	6	5	5	4	4
5	≥ 0.518	7	7	6	6	5	5	5	4	4	3
4	≥ 0.444	7	6	6	5	5	4	4	4	3	3
3	≥ 0.370	6	6	5	5	4	4	3	3	3	2
2	≥ 0.277	6	5	5	4	4	3	3	2	2	2
1	< 0.277	5	5	4	4	3	3	2	2	1	1

iii. Quality Measure Domain

Data for quality of resident care measures come from the Minimum Data Set (MDS) national database and Medicare claims data. MDS assessments are performed on all residents of Medicare- or Medicaid-certified nursing homes and address the resident's health, physical functioning, mental status, and general well-being.

Medicare claims data, which is created when nursing homes and hospitals submit bills to Medicare for payment purposes, is used to calculate emergency department visits, hospitalizations, re-hospitalizations and community discharges. This includes data on long-stay residents as well as people in nursing homes for a short period of rehabilitation or nursing care. In total, the CMS quality measure ratings are based on the performance of 12 MDS-based quality measures and five measures that are derived from Medicare claims data.

The quality measure domain consists of three ratings. An overall QM rating, a long-stay QM rating and a short-stay QM rating. Short-stay resident quality measures show the average quality of resident care in a nursing home for those who stayed in a nursing home for 100 days or less. Long-stay resident quality measures show the average quality of care for certain care areas in a nursing home for those who stayed in a nursing home for 101 days or more. Some nursing homes only have long-stay or only short-stay QM ratings. In this case, the overall QM rating is equal to the long-stay or the short-stay QM rating.

Measures to determine the long-stay rating are

- Number of hospitalizations per 1000 long-stay resident days
- Number of outpatient emergency department visits per 1000 long-stay resident days
- Percentage of long-stay residents whose need for help with daily activities has increased
- Percentage of long-stay residents who received an antipsychotic medication
- Percentage of long-stay residents whose ability to move independently worsened
- Percentage of long-stay residents who self-report moderate to severe pain
- Percentage of long-stay residents with a catheter inserted and left in their bladder
- Percentage of long-stay residents with a urinary tract infection
- Percentage of long-stay residents experiencing one or more falls with major injury
- Percentage of high risk long-stay residents with pressure ulcers

Measures to determine the short-stay rating are

- Percentage of short-stay residents who were rehospitalized after a nursing home admission
- Percentage of short-stay residents who had an outpatient emergency department visit
- Risk-Standardized discharge to Community Rate
- Percentage of short-stay residents who made improvements in function
- SNF residents with pressure ulcers that are new or worsened
- Percentage of short-stay residents who self-report moderate to severe pain
- Percentage of short-stay residents who newly received an antipsychotic medication

CMS used imputation for nursing homes with missing data that do not reach the minimum of 20 MDS assessments or 20 nursing home stays in terms of missing claims data. All available assessments (or stays) are used by CMS and are supplemented by state average values to reach the minimum number. Data for quality measures that use imputed data are not reported on the Nursing Home Compare web-site and are also not included in the downloadable datasets at data.medicare.gov.

The four most recent quarters for which data is available are used to determine the ratings. In the case of claims-based measures and the short-stay pressure ulcer measure a full year of data is used without being broken out by quarter.

Different weights are used to assign QM points to individual quality measures. Some measures have a maximum of 150 points whereas others have a maximum of 100 points. In case of a maximum of 150 points Nursing homes are grouped into deciles based on the national distribution of the individual QMs. The lowest performing decile receives 15 points, increased incrementally each decile by 15 to a maximum of 150 points for the best performing decile.

Nursing homes are grouped into quantiles where the maximum of QMs is 100 points. Nursing homes in the lowest performing quantile receive 20 points. Points are increased in 20-point steps for each quantile to a maximum of 100 points.

All long-stay QM points and all short-stay QM points are then summed for each nursing home. The difference in weightings and number of measures results in a maximum of 1250 points for the long-stay QM score and a maximum of 900 for the unadjusted short-stay QM score. A factor of 1250/950 is applied to the unadjusted short-stay QM score, so that both QM sub-scores count equally in the overall QM score.

Statista and Newsweek modify this approach by not interpolating missing data from MDS assessments or nursing home stays with the state average. Instead, only the available QMs of the respective nursing home are used. The achievable maximum score of the long-stay and short-stay measures are calculated individually for each nursing home. In order to calculate a maximum score, a minimum of 4 out of 7 QMs for the short-stay score and a minimum of 6 out of 10 QMs for the long-stay score are set. The individual short-stay and long-stay score is then adjusted with a factor of 1250 divided by the individual maximum score.

For example, if data for 5 long-stay measures is reported that each have a maximum score of 150 the individual maximum score for the respective nursing home is 750. If the summed score of these 5 measures is 580 the adjusted long-stay score is determined by multiplying the value with an adjustment factor of 1250/750. This is done so that both QM sub scores count equally in the overall score. Both scores and the combined overall QM score of these two are then assigned a rating by using the thresholds in the table below. Statista and Newsweek follow the CMS approach but base the rating assignment on a finer evaluation of the score distributions.

QM Rating	Long-Stay QM Rating Treshold	Short-Stay QM Rating Treshold	Overall QM Rating Treshold
1 Point	175 – 525	167 – 541	342 – 1066
2 Points	525 – 561	542 – 581	1067 – 1141
3 Points	565 – 604	582 – 621	1142 – 1216
4 Points	605 – 644	622 – 661	1217 – 1291
5 Points	645 – 684	662 – 701	1292 – 1366
6 Points	685 – 724	702 – 741	1367 – 1441
7 Points	725 – 764	742 – 781	1442 – 1516
8 Points	765 – 804	782 – 821	1517 – 1591
9 Points	805 – 844	822 – 861	1592 – 1666
10 Points	845 – 1250	862 – 1250	1667 – 2500

b. Reputation Survey

In cooperation with Newsweek, Statista invited about 46,000 medical experts (registered nurses, nursing home managers and administrators, licensed practical nurse / licensed vocational nurse, nursing assistants, therapists and physicians) to an online peer-to-peer survey. Additionally, experts from all over the US could participate in the survey of the Best Nursing Homes by State on newsweek.com.

Participants were asked to name up to five of the best nursing homes in the US and up to five of the best nursing homes in their respective home state. They were asked to recommend nursing homes by considering the quality of care offered, staff training level and the number of on-duty personnel.

Entry of recommendations was aided by an autocomplete function, which showed nursing homes based on the letters that have already been entered. It was also possible to recommend any nursing home that was not proposed by the autocomplete list. The autocomplete list included all 2070 nursing homes that have 150 or more certified beds according to the July 2019 Nursing Home Compare data files. For the participation in the survey on newsweek.com it was mandatory to perform an email verification. Recommendations for nursing homes that a participant works for were excluded from the analysis.

Recommendations have received different weights depending on the position in which they were mentioned. For example, recommendations of nursing homes that were stated as the best nursing home in a state received a higher weight than those recommendations that were stated as the fifth best nursing home.

The number of state and national recommendations were summed equally with their respective position rank weight. A score was assigned to each nursing home based on the number of weighted recommendations.

Additionally, participants were asked to rank quality of care measures, health inspections and nurse staffing according to their influence on the quality of nursing homes.

c. Overall Rating and State Rank

The overall rating is the weighted average of the overall performance score and the reputation survey score. CMS based overall performance data is weighted with 85% and the reputation score with 15%.[5]

All nursing homes that received a score of 5 or more in each performance data domain were ranked in their respective state. In total, 406 nursing homes in the 20 selected states met all criteria.

[5] The survey data in Arizona was not reliable and thus this data was not used in the analysis. The rating in Arizona is based on performance data only.

3. Disclaimer

The ranking is comprised exclusively of nursing homes that are eligible regarding the above-mentioned scope and those facilities that received a score of 5 or more in each performance data domain; a mention is therefore a positive recognition and is an indication of quality. The ranking was created through an elaborate process. The information provided in this ranking should be considered together with other information about nursing homes or, if possible, accompanied by a visit to a facility. The quality of nursing homes that are not included in the list is not disputed.