



Appendix F – Why $C = CASU$ Equation Does Not Work for Anchorage

Overview

To determine the amount of long-term nursing beds needed for the State of Alaska, an equation is provided to calculate this number. The equation is designed to incorporate available beds, utilization rates, and population trends. This appendix describes in details the error in using this equation when calculating the need for long-term care beds in Anchorage.

The $C = CASU$ equation referred to in this application is provided by the State of Alaska. This can be found on the State's website in the document "Alaska Certificate of Need Review Standards and Methodologies" in Section VI.

For all examples and graphs in this appendix, the data used is available upon request. Any errors in the calculations are due to rounding, and the exact numbers can be found in the spreadsheets that contain the data.

Definitions & Equations for the C = CASU equation

C (Caseload) = The average daily census of long-term nursing care patients five years from the project implementation date.

ADC (Average Daily Census) = Patient days per year / 365 days.

CASU (Composite Age Specific Use) = Defined as the cumulative average daily census of long-term nursing care patients for the age groups: 0-64 years, 65-74 years, 75-84 years, & 85 years and over, five years from implementation of the project.

UR = Utilization Rate for a given age group, which is the average nursing home bed use rate for the service area population for the preceding three years.

PP = Population Projection for a given age group, which is the projected population of that group for the fifth year from the project implementation date.

PBN = Projected nursing home bed need.

NHTO = Nursing home target occupancy, which is defined as 90%.

SAS (Service Area Share) = The proposed service area's share of the population to be served, as of the most recent geographic population estimates.

(Note: For this application, SAS is always equal to 1 since we plan to service the entire population of the service area.)

PBN_{SA} = Projected nursing home bed need taking into account the proposed service area's share of the population to be served.

CB = Current Beds in the proposed service area.

UBN = Unmet Bed Need.

$$\text{Utilization Rate (UR)} = \frac{\text{Bed Days}}{\text{Population}}$$

$$C = \text{CASU} = \frac{(UR * PP(0 - 64) + UR * PP(65 - 74) + UR * PP(75 - 84) + UR * PP(84 +))}{365 \text{ Days}}$$

$$PBN = \frac{C}{NHTO}$$

$$PBN_{SA} = PBN \times SAS$$

$$UBN = PBN - CB$$

(Note: Since SAS is always equal to 1 for this application, we will not use this equation in any examples and finish by calculating PBN for each.)

Explaining Why the $C = CASU$ Equation Does Not Work for Anchorage

There are three main reasons why the $C = CASU$ equation does not work for Anchorage. They are explained in the following text, equations, and graphs.

The first is that the equation does not include the fact that a large number of Alaskans throughout the state travel to Anchorage to receive health care. This makes it more sensible to view Alaska as a single health care community instead of smaller, separate ones. If the entire state was in need of a health care service, the logical place to put it would be Anchorage. In the example on the following page, the $C = CASU$ equation is run incorporating the entire state and the utilization data from 13 long-term care facilities (LTCF) in Alaska.

Example 1 – Beds needed in Alaska as a whole in 2030

Parameters

- Year Calculation Ran = 2020
- First Year of Service = 2025
- Five Years from Service Date = 2030
- CB = 752 Current Beds
- UR <65 = 0.078 Bed Days / Person
- PP <65 = 638,065 People in 2030
- UR 65-74 = 0.777 Bed Days / Person
- PP 65-74 = 74,660 People in 2030
- UR 75-84 = 2.454 Bed Days / Person
- PP 75-84 = 46,925 People in 2030
- UR 85+ = 7.488 Bed Days / Person
- PP 85+ = 12,117 People in 2030

Calculations

$$C = CASU = \frac{0.078 * 638,065 + 0.777 * 74,660 + 2.454 * 46,925 + 7.488 * 12,117}{365} = 860 \text{ Beds}$$

$$PBN = \frac{860}{0.90} = 955 \text{ Beds}$$

$$UBN = 955 - 752 = 203 \text{ Beds}$$

Evaluation

This shows that there will be a need for 203 beds in Alaska by the year 2030. This is nearly double the 106 beds that the equation tells us is needed for Anchorage alone.

The second reason is that the equation neglects the fact that the occupancy rates of the existing LTCFs are not reliant on how many people need the service, but more on the fact that on average, the facilities cannot be more than 90% full due to patient turnover.

Take for example, the two Providence long-term care facilities in Anchorage which are Providence Extended Care (EXT) and Providence Transitional Care (TRA). Their EXT facility sits at an average of 98.63% occupancy over the past 3 years. Their TRA facility sits at 84.66% occupancy. The reason for the difference in occupancy is not due to need, but to turnover times. Since their EXT facility has patients who stay for years at a time, there is very little turnover which allows them to keep their beds full most of the time. Their TRA facility is based more on the rehabilitation of patients, which means that those patients are in and out quicker and the turnover rate is much higher. When they constantly have to leave a room vacant for a couple days while waiting for the new patient to arrive, their bed days go down even though the room is technically occupied, which brings their occupancy rates down. Since 2005, the average occupancy of all the LTCFs in Anchorage have stayed between 89% and 91%. Even when there were 314 beds available before 2012, compared to the 248 that are available now, the average occupancy stayed around 90%.

The third reason is that the equation only takes into account population growth in the future and ignores the decline in utilization rates from the past. The purpose of the $C = CASU$ equation is to provide enough beds to keep the utilization rates constant while taking into account future population growth. It only works when the LTC beds supplied in an area are sufficient for the population, which has not been the case for Anchorage for at least the past 10 years. It also only takes into account the preceding three years of utilization rates and ignores all the pertinent data before that time. We can prove this by taking a look at Anchorage about 10 years ago.

In 2008, the Mary Conrad Center (now known as Prestige) was approved to add 6 SNF beds to their facility. Using the $C = CASU$ equation, they calculated that there would be a need for 359 SNF beds in 2015. At that time, Providence Extended Care had 224 SNF beds while Mary Conrad Center had 90, adding up to 314 total beds in Anchorage. The average occupancy rate of those 314 beds for the preceding three years was around 90%.

Between 2008 and 2013, Providence Extended Care Center and Providence Cottages (Providence) removed 78 SNF beds from the Anchorage area, lowering the total number of beds to 248 where it has been ever since. The average occupancy rate of those 248 beds from 2013 to 2019 has remained at around 90%.

In summary, Anchorage had a decrease of 78 beds available from 2008 to 2019 and the average occupancy rates of those facilities stayed consistent around 90%. Meanwhile, the 65+ population rose by 62% (21,139 to 34,162) and the average utilization rate decreased by 49% (3.211 to 1.637). This is displayed graphically in the following four figures.

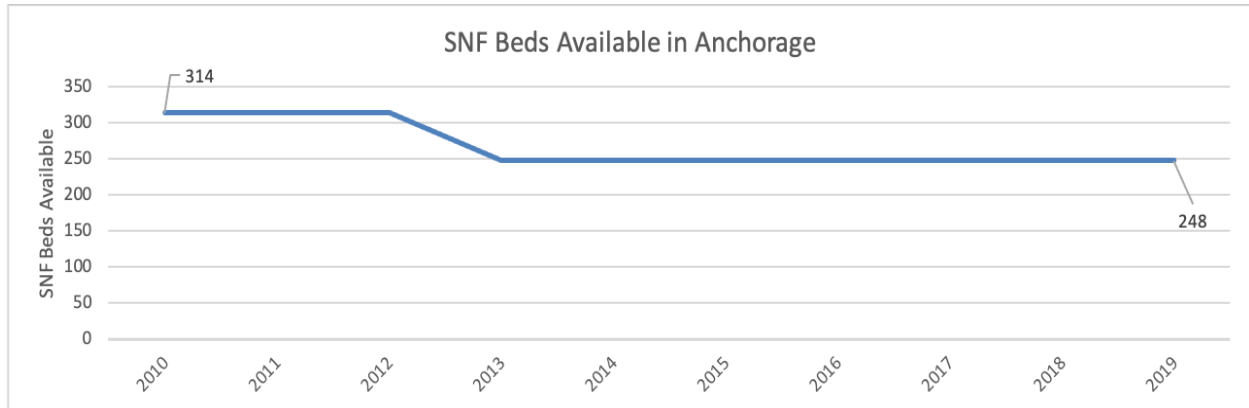


Figure App-F.1 – SNF Beds Available in Anchorage (2010-2019)

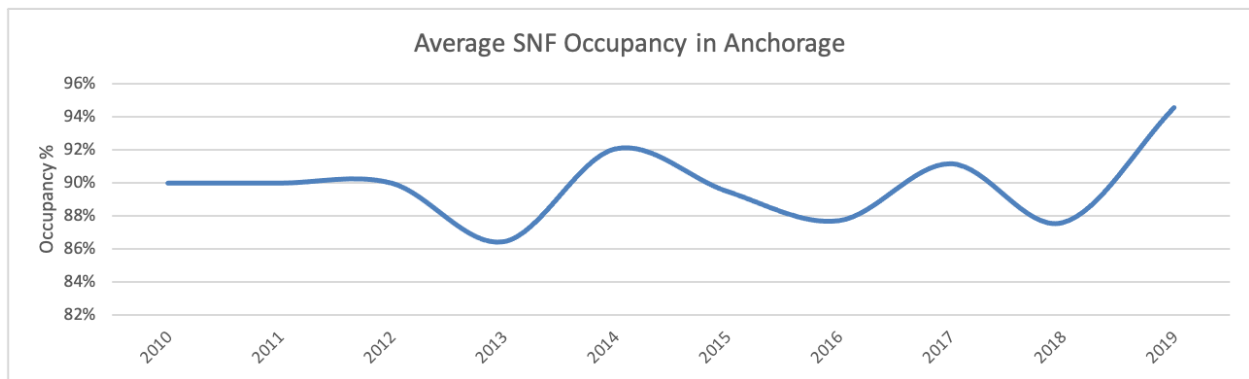


Figure App-F.2 – Average SNF Occupancy in Anchorage (2010-2019)

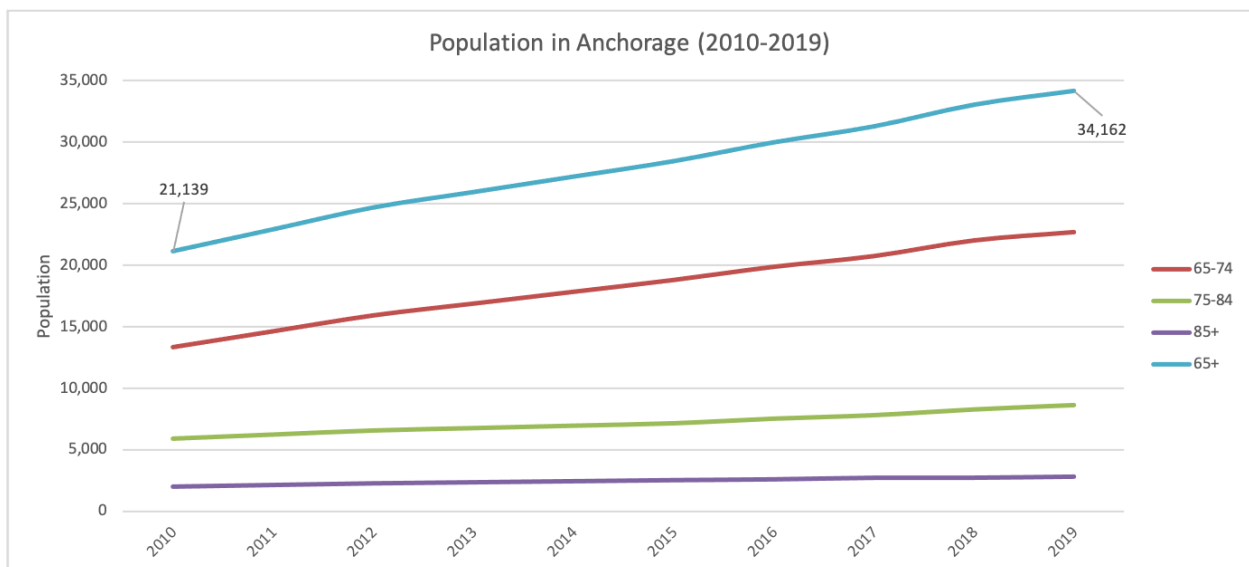


Figure App-F.3 – Population in Anchorage (2010-2019)

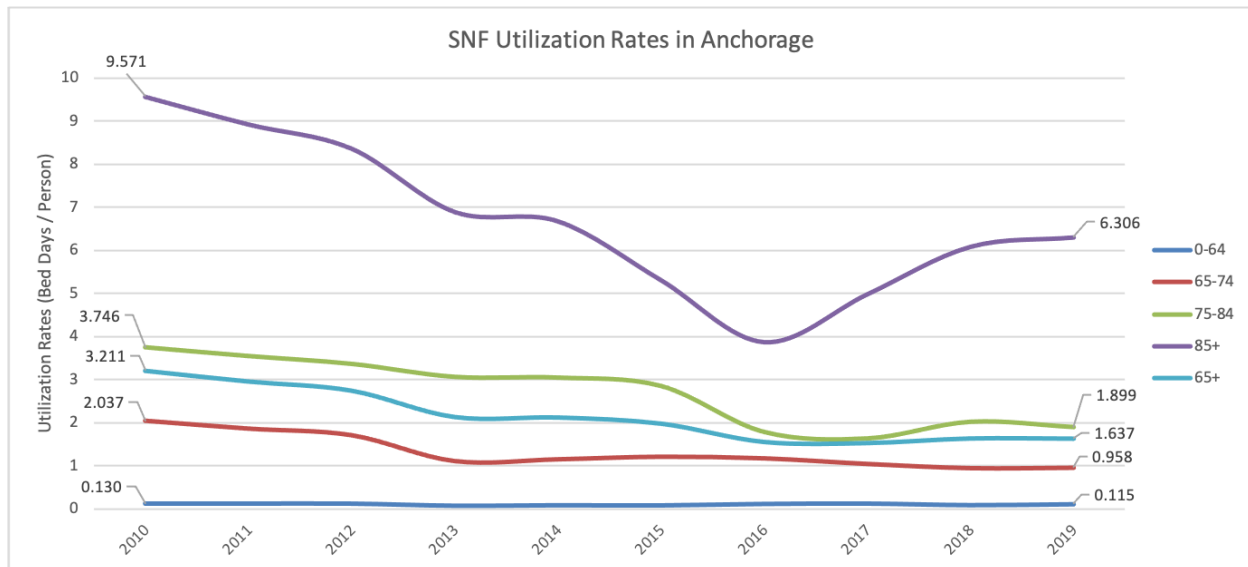


Figure App-F.4 – SNF Utilization Rates in Anchorage (2010-2019)

These graphs show that the $C = CASU$ equation is not achieving its purpose. If it were, the utilization rates would be constant over the years. The problem here is that new beds were needed back in 2010, but never added. This created a new norm for the equation and tricked it into thinking that since the utilization rates went down, that is where they should be. Instead of growing with the population, it has decreased with the utilization rates. This is illustrated in the next two examples.

Example 2 – Beds needed in Anchorage in 2030, equation ran in 2013

Parameters

- Year Calculation Ran = 2013
- First Year of Service = 2025
- Five Years from Service Date = 2030
- CB = 248 Current Beds
- UR <65 = 0.129 Bed Days / Person
- PP <65 = 249,275 People in 2030
- UR 65-74 = 1.866 Bed Days / Person
- PP 65-74 = 28,189 People in 2030
- UR 75-84 = 3.551 Bed Days / Person
- PP 75-84 = 17,708 People in 2030
- UR 85+ = 8.956 Bed Days / Person
- PP 85+ = 4,711 People in 2030

Calculations

$$C = CASU = \frac{0.129 * 249,275 + 1.866 * 28,189 + 3.551 * 17,708 + 8.956 * 4,711}{365} = 520 \text{ Beds}$$

$$PBN = \frac{520}{0.90} = 578 \text{ Beds}$$

$$UBN = 578 - 248 = 330 \text{ Beds}$$

Evaluation

This shows that if you had run the C=CASU equation back in 2013, you would have calculated there to be a need for 330 beds in Anchorage in the year 2030.

Example 3 – Beds needed in Anchorage in 2030, equation ran in 2020

Parameters

- Year Calculation Ran = 2020
- First Year of Service = 2025
- Five Years from Service Date = 2030
- CB = 248 Current Beds
- UR <65 = 0.114 Bed Days / Person
- PP <65 = 249,275 People in 2030
- UR 65-74 = 0.984 Bed Days / Person
- PP 65-74 = 28,189 People in 2030
- UR 75-84 = 1.851 Bed Days / Person
- PP 75-84 = 17,708 People in 2030
- UR 85+ = 5.794 Bed Days / Person
- PP 85+ = 4,711 People in 2030

Calculations

$$C = CASU = \frac{0.114 * 249,275 + 0.984 * 28,189 + 1.851 * 17,708 + 5.794 * 4,711}{365} = 318 \text{ Beds}$$

$$PBN = \frac{318}{0.90} = 354 \text{ Beds}$$

$$UBN = 354 - 248 = 106 \text{ Beds}$$

Evaluation

This shows that currently, the C = CASU equation tells us there is a need for 106 beds in Anchorage in the year 2030.

Because the $C = \text{CASU}$ equation relies so heavily on the utilization rates, it has dropped the bed need by 224 in just 8 years while the population has grown tremendously. The existing long-term care facilities were full back then and still are now.

The same equation was run for each year from 2013 to 2020 using the preceding three years of utilization data for each. This chart is shown in the following figure. See how the $C = \text{CASU}$ equation has been calculating fewer and fewer beds needed over these years, even though the population has been growing.

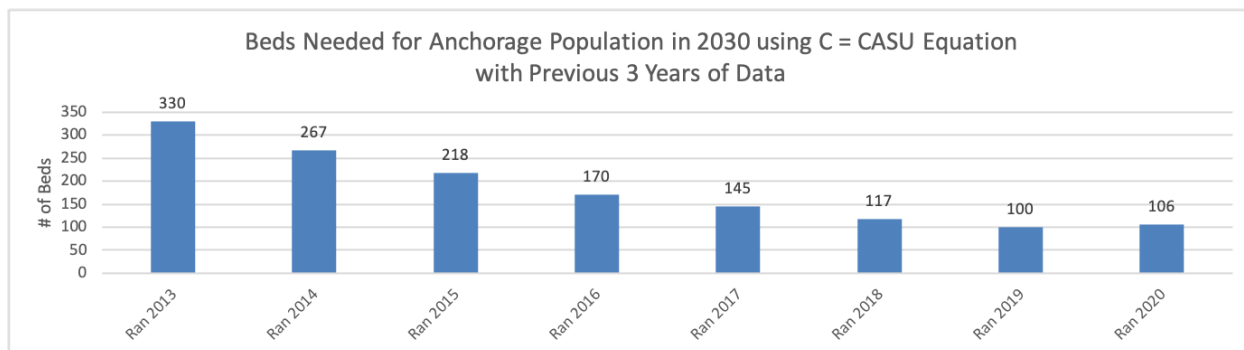


Figure App-F.5 – Beds Needed for Anchorage in 2030 using $C = \text{CASU}$ (2013-2020)

Looking into the future, common sense would conclude that the longer the State goes without adding beds, the more beds will need to be added. The $C = \text{CASU}$ equation illustrates the exact opposite. The next example shows the beds needed in Anchorage in 2030 if the equation was run that same year.

Example 4 – Beds needed in Anchorage in 2030, equation ran in 2030

Parameters

- Year Calculation Ran = 2030
- First Year of Service = 2025
- Five Years from Service Date = 2030
- CB = 248 Current Beds
- UR <65 = 0.119 Bed Days / Person
- PP <65 = 249,275 People in 2030
- UR 65-74 = 0.774 Bed Days / Person
- PP 65-74 = 28,189 People in 2030
- UR 75-84 = 1.037 Bed Days / Person
- PP 75-84 = 17,708 People in 2030
- UR 85+ = 4.201 Bed Days / Person
- PP 85+ = 4,711 People in 2030

Calculations

$$C = CASU = \frac{0.119 * 249,275 + 0.774 * 28,189 + 1.037 * 17,708 + 4.201 * 4,711}{365} = 246 \text{ Beds}$$

$$PBN = \frac{246}{0.90} = 273 \text{ Beds}$$

$$UBN = 273 - 248 = 25 \text{ Beds}$$

Evaluation

In 2030, the C = CASU equation will assert that there is a need for 25 beds in Anchorage that same year.

We have done this same calculation for every year from 2013 to 2030 using the preceding three years of utilization rates for each. To predict the future utilization rates used in these equations, the average case load were used from the LTCFs in Anchorage from 2010 to 2019. This is shown graphically in the following two figures.

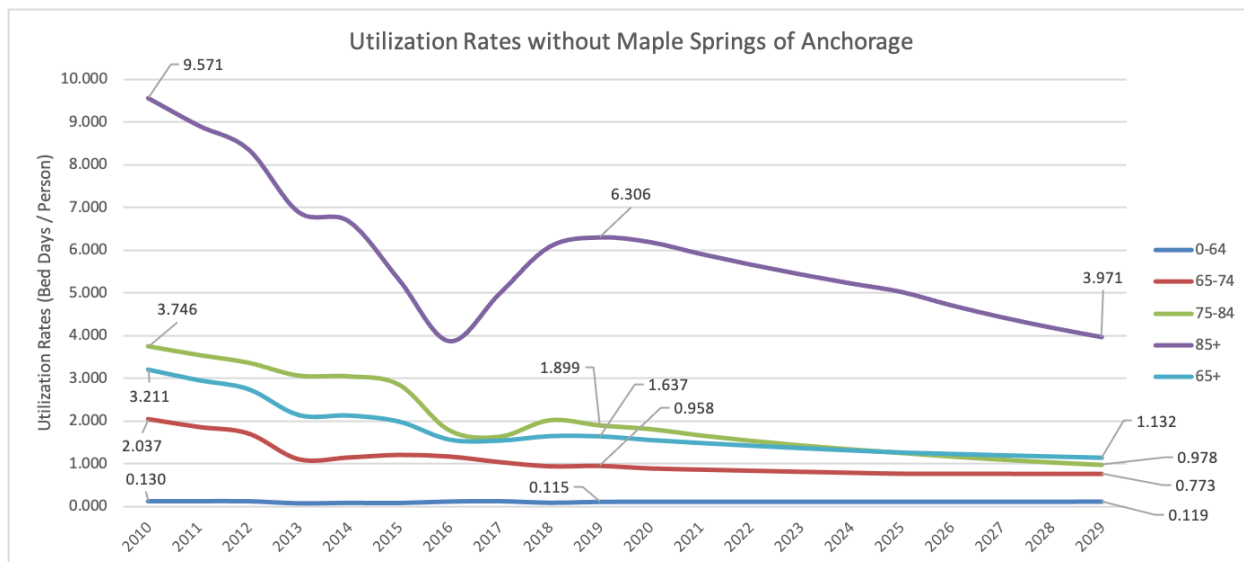


Figure App-F.4 – SNF Utilization Rates in Anchorage (2010-2029)

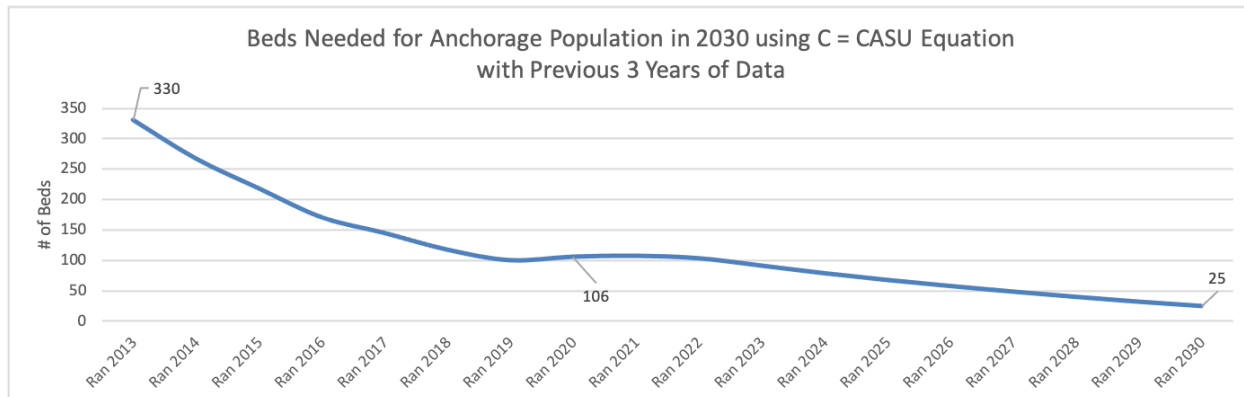


Figure App-F.7 – Beds Needed for Anchorage in 2030 using C = CASU (2013-2030)

If no beds are added to Anchorage in the next 10 years, the utilization rates for the 65+ population are going to go down by another 31% (1.637 to 1.132) and the C = CASU equation is going to tell us that only 25 beds are needed. In the Review Standards it states, “A new freestanding long-term nursing facility will not be approved unless the applicant has demonstrated a need for a minimum of 40 beds.” No beds will ever be able to be added again if the C = CASU equation is used to determine the need.

Solution

One possible solution we have thought of to compensate for the faults in the $C = CASU$ equation is to use 10 years of utilization data instead of just three, which more accurately captures how the beds have been used in the past. This will not get the number of beds to where they need to be, but it will start the curve in the right direction. The following example shows the bed need if the $C = CASU$ equation took into account the preceding 10 years of data instead of only three.

Example 5 – Beds needed in Anchorage in 2030 using Utilization Data from 2010-2019, equation ran in 2020

Parameters

- Year Calculation Ran = 2020
- First Year of Service = 2025
- Five Years from Service Date = 2030
- CB = 248 Current Beds
- UR <65 = 0.112 Bed Days / Person
- PP <65 = 249,275 People in 2030
- UR 65-74 = 1.320 Bed Days / Person
- PP 65-74 = 28,189 People in 2030
- UR 75-84 = 2.695 Bed Days / Person
- PP 75-84 = 17,708 People in 2030
- UR 85+ = 6.702 Bed Days / Person
- PP 85+ = 4,711 People in 2030

Calculations

$$C = CASU = \frac{0.112 * 249,275 + 1.320 * 28,189 + 2.695 * 17,708 + 6.702 * 4,711}{365} = 396 \text{ Beds}$$

$$PBN = \frac{396}{0.90} = 440 \text{ Beds}$$

$$UBN = 440 - 248 = 192 \text{ Beds}$$

Evaluation

If we use 10 years of utilization data instead of 3, we find that there will be a need for 192 beds in 2030 using the C = CASU equation.

Conclusion

Through these examples, we have shown how the $C = CASU$ equation does not work for Anchorage. It is not logical that just 10 years ago, the equation showed there was a need for 330 beds while today it says there is only a need for 106 beds. It makes even less sense that in 10 more years, it will tell us that there is a need for only 25 beds.

In this application, we are applying for a certificate to build 120 beds. We believe the actual need to be much higher than this and we believe that our facility will be up to 90% capacity soon after opening.