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TWC Analysis Exercise - Vocational Rehabilitation (VR) Program

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1) What can be said about the typical total case cost and case length for successful case closures compared to unsuccessful case closures?

While performing my analysis, I found that successful closure cases had a lower average case length of 20.32 months compared to unsuccessful closure cases whose average length was 37.07 months. When we looked at the average case cost, successful cases cost almost \$3,000 more than unsuccessful cases. It was interesting to see the difference in cost when successful closures average 17 months less than unsuccessful closures. I believe that looking at the data by region, ethnicity, and disability will provide more insights to this.

2) How does VR program performance (in terms of successful case closure rate), case length, and total case cost vary by region?

Analyzing VR's program performance by region gave more insights to their performance, case length, and total case cost. I found that region 4 (East Texas) has the highest average case payment and the second highest average case length, however, it has the lowest successful closure case rate. I found that the average case length ranged between 19 months to 23 months, region 1 (Panhandle/West Texas) having the lowest average case length and region 3 (Central Texas) having the highest case length. The average cost ranged between \$5,268 to \$7,657, region 5 having the lowest average cost.

3) How does VR program performance (in terms of successful case closure rate), case length, and total case cost vary by ethnicity?

When looking at VR's successful case closure performance by ethnicity, the analysis showed that 40.5% of the total cases involved individuals who identified as caucasian. These cases on average have the lowest case length of 19.57 months between 1-7 months less than their counterparts. The lowest number of cases involves individuals who identified as Native American, representing 0.8% of the cases. These cases the success closure rate was 32.97% the lowest closure rate from this demographic. Even though individuals who identified as Native American only represented 0.8% of cases they had the third highest average case payment of \$6,989 and the highest case length of 34.02 months. The lowest average cost of \$4,915 being cases for individuals who identified as other and the highest average cost of \$8,853 for individuals who identified as Asiatic or Pacific.

4) How does VR program performance (in terms of successful case closure rate), case length, and total case cost vary by disability?

From my analysis I learned individuals that receive auditory/ communicative disability services have the highest success closure rate of 76.87%. This is the highest successful closure rate we have seen in our data. It is also on average the lowest case length, 13 months, taking almost 7 months less than other demographics. Additionally, the analysis revealed that individuals that receive visual disability services have the second highest success closure rate and on average spend the least amount of on their successful cases. It was interesting to see that on average spend \$1,000 more on the unsuccessful cases than they do on the successful ones.

5a) What relationships (if any) appear to exist between total case cost, case length, and VR program performance (in terms of successful case closure rate)?

My analysis revealed a low degree of correlation between total case cost and case length. For successful cases I got a correlation of 0.39 and for unsuccessful cases I got a correlation of 0.35. However, when I looked at the data based on region, ethnicity, and disability, I found a moderate degree of correlation between case cost and case length for employees with a visual disability (0.62) and cases in region 1 - Panhandle/West Texas (0.52) in successful closure cases. The strongest degree of correlation between case cost and case length I found was for those who did not indicate a disability with a -0.71 correlation. Although this is considered a strong correlation, there were only 3 cases in this demographic and the central limit theorem states that we need at least a sample size of 30 before making assumptions about the data. Overall, there seems to be an inverse relationship between the success rate and the average case payment. For example, region 5 had the most successful case rate out of all the regions but spent on average less money than four other regions. Another time we see this is for individuals who receive auditory/ communicative services. These individuals have the highest percentage success rate, however, on average their spending is \$3,500 less than individuals who receive physical disability services.

5b) What other factors may contribute to or mitigate VR program performance?

Some factors that may contribute to VR program performance is having trained and qualified VR case workers. About 50% of successful and unsuccessful cases took between 40 - 141 months. Turnover of staff could contribute to the time it takes to close a case.

6a) What is the quality of the dataset relative to the task?

The quality of the dataset was good. There were no missing values or inconsistencies. There were a few outliers but there was nothing that made the data hard to analyze.

6b) What additional information or fields would give you more insight?

Beyond ethnicity, I think it would be helpful to know a couple more client demographics like economic status/household income or the type of job field they are entering. I think it would also be interesting to have access to the reasons for unsuccessful closures. Analyzing the reasons for unsuccessful closures could provide more insight and help reduce the percentage of unsuccessful closures.

6c) Did you need to manipulate or change the dataset to complete this task?

I did some data cleaning. I used SQL (Google Big Query) to create a new table that added a column that listed the closure type as numerical data (successful =1 and unsuccessful =0).

7) What additional questions/answers would you have or provide the requestor after analyzing the data?

What are VR's program goals? Are there specific regions that VR would like to focus on and would like a more in depth analysis of the region by gender, ethnicity, and disability?