Using machine learning to identify the key drivers of MSSP results: Performance year 2022 update

Milliman

Appendix: Total Savings Percentage Top 20 ACO Characteristics

RANK	ACO CHARACTERISTIC	VALUES ASSOCIATED WITH HIGHER TOTAL SAVINGS	FEATURE IMPORTANCE
1	Regional Efficiency Factor BY3	Lower ACO Expenditures Relative to Risk-Adjusted Regional Expenditures	0.1818
2	Percent Change in Inpatient Admits BY3 to PY	Decreases in Inpatient Admits	0.1323
3	Percentage of Participating Providers Classified as a Primary Care Physician	More PCPs as a Percentage of Participating Providers	0.0977
4	Percent Change in Skilled Nursing Facility Admits BY3 to PY	Decreases in Skilled Nursing Facility Admits	0.0967
5	Percentage of Participating Providers Classified as a Specialist	Fewer Specialists as a Percentage of Participating Providers	0.0965
6	Positive Regional Adjustment	Higher Positive Regional Adjustment	0.0950
7	Risk Score Trend BY1 to BY3	Higher Risk Score Trend	0.0880
8	Positive Regional Adjustment Percentage	Higher Positive Regional Adjustment Percentage	0.0727
9	Risk Score Trend BY3 to PY	Higher Risk Score Trend	0.0684
10	Regional Efficiency Trend BY1 to BY3	Lower Regional Efficiency Trend	0.0643
11	Risk Score Improvement BY1 to BY3	Higher Risk Score Trend Relative to Regional Risk Score Trend	0.0611
12	Average Regional Efficiency BY1 through BY3	Lower Average Regional Efficiency	0.0566
13	Percentage of Beneficiaries Assigned in Outpatient Setting BY3	Lower Percentage of Beneficiaries Assigned in Outpatient Setting	0.0564
14	Number of Participating Providers Classified as a Specialist	Fewer Participating Specialists	0.0481
15	Percentage of Beneficiaries Assigned in an Outpatient Setting PY	Lower Percentage of Beneficiaries Assigned in Outpatient Setting	0.0434
16	Percent Change in Outpatient Visits BY3 to PY	Decreases in Outpatient Visits	0.0428
17	Risk Score Improvement BY3 to PY	Higher Risk Score Trend Relative to Regional Risk Score Trend	0.0414
18	Annual Wellness Visits PY	More Annual Wellness Visits	0.0360
19	Annual Wellness Visits BY3	More Annual Wellness Visits	0.0348
20	Outpatient Expenditures	Lower Average Outpatient Expenditures Per Beneficiary Person Years	0.0316

Note: The relative importance roughly measures how much each ACO characteristic contributed to the predictive accuracy.
The number represents the increase in error if the ACO characteristic was randomized (therefore, rendering it useless).
The relative magnitude of each number is more important than the actual number itself.

Appendix: Relative Improvement Top 20 ACO Characteristics

RANK	ACO CHARACTERISTIC	VALUES ASSOCIATED WITH HIGHER RELATIVE IMPROVEMENT	FEATURE IMPORTANCE
1	Percent Change in Inpatient Admits BY3 to PY	Decreases in Inpatient Admits	0.7051
2	Percent Change in Skilled Nursing Facility Admits BY3 to PY	Decreases in Skilled Nursing Facility Admits	0.2543
3	Risk Score Trend BY3 to PY	Higher Risk Score Trend	0.0971
4	Share of Beneficiaries with COVID-19 Episode	Lower Percentage of Beneficiaries with a COVID-19 Episode	0.0819
5	Regional Efficiency Trend BY2 to BY3	Higher Regional Efficiency Trend	0.0683
6	Percentage of Beneficiaries Assigned in an Assisted Living Facility BY3	Higher Percentage of Beneficiaries Assigned in Assisted Living Facilities	0.0655
7	Risk Score Improvement BY3 to PY	Higher Risk Score Trend Relative to Regional Risk Score Trend	0.0655
8	Composite Risk Score BY1	Lower Composite Risk Score	0.0607
9	Home Health Expenditures Per Capita PY	Higher Home Health Expenditures	0.0590
10	Percentage of Beneficiaries Assigned in an Assisted Living Facility PY	Lower Percentage of Beneficiaries Assigned in Assisted Living Facilities	0.0584
11	Composite Risk Adjusted Expenditures BY2	Lower Composite Risk Adjusted Expenditures	0.0578
12	Home Health Percent of Total Cost of Care	Higher Home Health Percentage of Total Cost of Care	0.0576
13	Hospice Expenditures Per Capita PY	Higher Hospice Expenditures	0.0552
14	Composite Risk Score BY2	Higher Composite Risk Score	0.0552
15	Composite Risk Score BY3	Higher Composite Risk Score	0.0539
16	Computed Tomography (CT) Events Per 1,000	Fewer Computed Tomography (CT) Events	0.0523
17	Home Health Per 1,000 Visits PY	More Home Health Visits	0.0497
18	Hospice Percent of Total Cost of Care	Higher Hospice Percentage of Total Cost of Care	0.0484
19	Outpatient ED Visits Per 1,000	More Outpatient ED Visits	0.0480
20	Outpatient Percent of Total Cost of Care	Lower Outpatient Percentage of Total Cost of Care	0.0478

Note: The relative importance roughly measures how much each ACO characteristic contributed to the predictive accuracy.
The number represents the increase in error if the ACO characteristic was randomized (therefore, rendering it useless).
The relative magnitude of each number is more important than the actual number itself.

This Appendix document accompanies the article found at the following link, published April 2024:

https://www.milliman.com/en/insight/using-machine-learning-key-mssp-results-performance-year-2022

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