



Eighth Annual
Humana-Mays
2024 Healthcare Analytics Case Competition



TEXAS A&M UNIVERSITY

Mays Business School

Humana[®]

Agenda

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- 02 | **Competition Overview** | History, Eligibility, Timeline, Prizes
- 03 | **Analytics Challenge** | Introduction to the Case, Data Overview
- 04 | **Additional Details** | Judging



Your Hosts



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TEXAS A&M UNIVERSITY

Mays Business School

- Member of the highly prestigious **Association of American Universities** (1 of 69 universities in the United States)
- One of the few universities in the country designated a **land grant, sea grant, and space grant** university
- One of the largest universities in the country, with over 73,000 students enrolled in 2024
- **\$18 Billion** University System Endowment
- **Over 525,000 alumni** who create a global Aggie network
- **Mays Business School is nationally ranked** for the quality of its undergraduate programs, graduate programs, and faculty scholarship
- **mays.tamu.edu/humana-tamu-analytics**





Who we are

Humana Inc. is committed to putting health first—for our teammates, our customers, and our company. Through our Humana insurance services, and our CenterWell™ healthcare services, we make it easier for the millions of people we serve to achieve their best health, delivering the care and service they need, when they need it.

The result is better quality of life—not only for people with Medicare and Medicaid, but also for families, military service personnel, and communities at large. This is more than health insurance, and more than healthcare.

**It's human care: care that's
completely centered on people and
what they need to feel whole.**

Human care means we see past the medical condition to the person—the whole person—using technology, data analytics, and good old-fashioned listening to learn about them on a deeper level. Then, we take action, removing barriers to help members get the care they need.



Members are at the heart of everything we do, and our employees are our strength.

Here's a snapshot of our company



16.3 million medical members

across all 50 states, Washington, D.C.,
and Puerto Rico

6.2
million

Medicare
Advantage
members

2.3
million

Medicare
prescription
drug plan
members

6.0
million

TRICARE
members

4.6
million

Specialty
benefits
members
State-based
contracts and
other members

1.4
million



30+ years

of Medicare experience



67,600 employees

as of December 31, 2023



Competition Overview

The Challenge

This is an opportunity for students to showcase their analytics skills to solve real-world business problems using Humana's data

Eligibility Requirements

- Student must be enrolled part- or full-time in an accredited Master of Science, Master of Arts, Master of Information Systems, Master of Public Health, Master of Business Administration, or similar master's programs that educate in business, healthcare, or analytics located within the US
- One entry per team; teams must have 2-4 members from the same school
 - If a participant drops out of the competition, no substitution is permitted
 - If the team falls below the 2-person minimum due to a member leaving, the team is no longer eligible to compete
- Students may only participate on one team
- Students must be currently enrolled and must not have graduated from the qualifying program at the time of the final case competition presentations
- Humana Employees are not eligible

2017-2023



Topics:

- Readmission likelihood among diabetics
- Acute Myocardial Infraction Likelihood
- Long Term Opioid Therapy Likelihood
- SDOH Identification of transportation challenged
- Identification of COVID Vaccination Hesitancy
- Medication Adherence Likelihood



Over 5,000 Participants



1,519 Teams



85+ Universities



Prizes have increased from
10.5K to over 90k



Guidelines for Faculty, Staff, & Mentors

Examples of what faculty, staff, and mentors **can offer** students prior to and during the competition:

- ✓ Promote & encourage students to participate in the case competition.
- ✓ Remind participants to strictly adhere to the rules and deadlines,
- ✓ Provide motivation & words of encouragement to all participating student teams.
- ✓ Reiterate the importance of avoiding general, careless, mistakes (i.e., deadlines, not following submission requirements, spell check, etc.),
- ✓ Celebrate success when a team moves completes a milestone or moves to the next round,
- ✓ Encourage ALL team members to contribute to the work effort.

Examples of what faculty, staff, and mentors **SHOULD NOT DO** during the Humana-Mays Case Competition:

- ✗ Don't suggest resources, background material, or references.
- ✗ Don't ask specific questions about a team's submission.
- ✗ Don't provide any direction – written or verbal – on the work product of a participating team. This includes but is not limited to:
 - ✗ Tools, methodologies, or approaches related to solution development.
 - ✗ Recommendations surrounding data cleansing, feature creation, feature selection, or techniques to improve performance or accuracy.
 - ✗ Proofreading and/or editing submissions, reviewing models, anything directly related to work created for their submission for any round.
- ✗ Don't use this competition as an internal competition within a course.



Competition Timeline





Competition Prizes



First Place

\$50,000



Second Place

\$20,000



Third Place

\$10,000



Top 5 Finisher

\$5,000





Getting Started

Register Your Team at:

<https://mays.tamu.edu/humana-tamu-analytics>

Information Needed:

- Team Name
- Team Member Names and Emails
- Designated Team Captain
- School Represented Name
- Signed NDA *for each team member (will be sent to each team member's email)*

Team Registration:

- Deadline: September 27th, 11:59 PM CST

Data Release:

- Starts September 18th (must have completed team registration & signed/verified NDAs)

Issues with Registration?

- Send an email to humanacasecomp@tamu.edu

Business Background





Background Information

Medicare Advantage (MA)

- Offers an all-in-one alternative to Original Medicare
- Private insurance companies offer Medicare Advantage plans approved by Medicare
- Coverage bundles Medicare Part A (Hospital coverage), Part B (Doctor and outpatient services), and Part D (Prescription drug coverage) and often includes additional benefits above and beyond what is offered through Original Medicare
- Most Medicare Advantage plans have provider networks. Health Maintenance Organizations (HMOs) require a primary care doctor referral for specialists, while Preferred Provider Organizations (PPOs) allow direct access to specialists but may have higher costs for out-of-network care

Stars

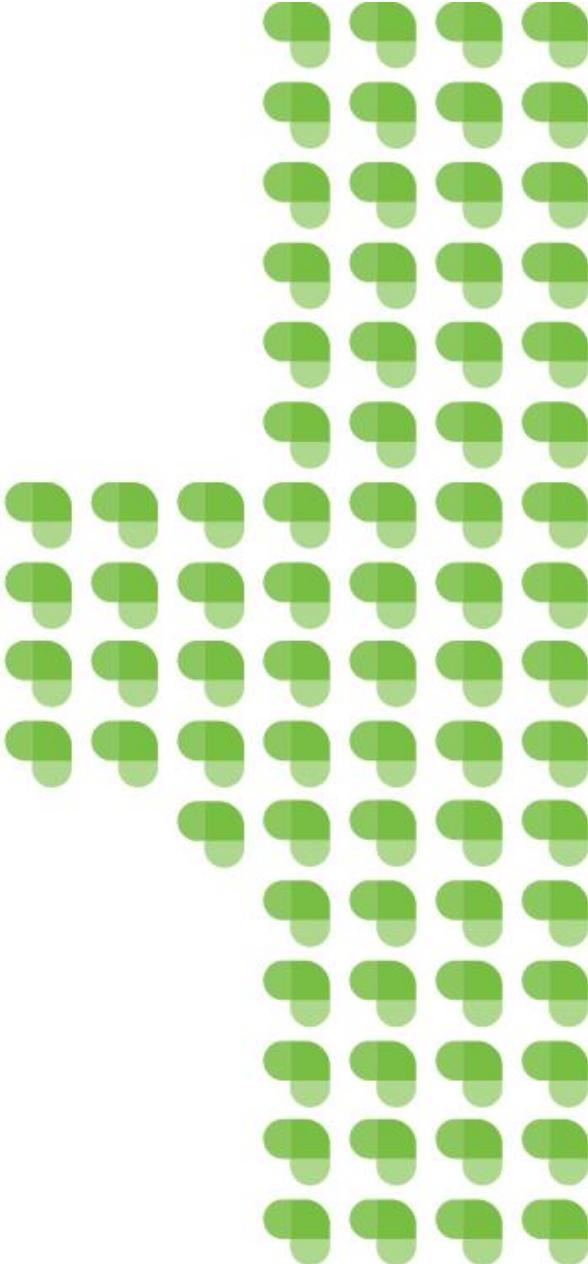
- CMS program designed to improve quality of care for MA members
- Data is collected for measures to quantify the number of eligible members that have closed targeted opportunities
- Certain measures/operational categories have a greater impact on the calculation
- Stars ratings can help members with selecting high-quality plans
- This data is used to calculate a plan's Star score; higher scores equal higher bonuses for qualified ratings
- Star bonuses are reinvested into member health plans and additional benefits

Medicare Risk Adjustment (MRA)

- CMS reimbursement methodology to fund care for MA members
- Healthcare providers must accurately document a patient's conditions in the medical record and on the claim to capture the true health status of the patient.
- Submission of diagnosis codes to CMS along with demographic information are used to calculate the member's risk score
- Risk scores determine payments to MAO to fund healthcare for MA members consistent with the member's health status

Engagement with Primary Care

- ✓ To most effectively manage their health and any chronic conditions they might have, MA members should see their Primary Care Physician (PCP) every year for a preventive visit.
- ✓ For this work, we are considering members to be “unengaged” if they have not had a preventive visit with their PCP in the calendar year. By this definition, members may be considered unengaged even if they are seeing a specialist, their PCP for acute (sick) or condition management visits, or have had visits to the emergency department. New members are assumed unengaged until their first preventive PCP visit.
- ✓ Preventive primary care visits are key to Humana’s success in the CMS Stars and Risk Adjustment programs, which allows Humana to offer additional benefits to help our members achieve their best health.



Our primary objective is to gain a greater understanding of behaviors and underlying barriers among **members in LPPO* plans who are not engaging in preventive care with a PCP.**

From these insights, we would like to build a model to predict which members are not likely to complete a preventive PCP visit in the current calendar year. The insights will help us understand how best to influence members and/or providers through outreach, process improvements, and other initiatives to increase engagement.

We would also like to have an understanding on to what extent this is a problem for our competitors and how they are addressing it.

Lastly, we are interested in greater insight on how primary care physicians and specialists address low patient engagement in preventive care.

Problem Statement





Problem Statement



There are several different types of Medicare Advantage plan options. Humana's market share of LPPO plans is growing. Many members choose LPPO plans because it gives them greater freedom in choosing their care. However, LPPO plans have significantly more unengaged members compared to HMOs.



The higher percentage of unengaged members leads to reduced provider touchpoints with members. These touchpoints are important for conducting preventive health screenings, monitoring medications, discussing health risks for aging members, and managing chronic conditions.



The reduction in provider touchpoints puts us at risk for lower Stars performance and incomplete risk documentation for our LPPO members. The decrease in performance and bonus premium to invest back into plan benefits then has negative member-level implications.



Competition Objectives

- Proactively and accurately identify members most likely to be unengaged in the calendar year
- Provide insights on key characteristics, activities, or events that increase a member's likelihood to engage
- Based on your findings, provide actionable recommendations and strategies to increase engagement
- Considerations:
 - Some members may have a PCP on file with us and some may not
 - Consider member wellness visit behavior patterns, such as seasonality and timing of their visits
 - Claims history is limited for new members, but new members are a strategic focus for us
 - Are there actions we could take to *reduce time* to first visit?





Case Data | Overview



Population of Interest:

Unengaged LPPO membership

Data has 1.9M members
with ~300 features



Behavior of Interest (i.e. Target):

Understand characteristics of why members **do not** visit a PCP for a preventive visit in a calendar year



Robust View of the Member & their Activity:

Demographics, claims, plan details, tenure, sales detail, medical/pharmacy claims, call center interactions, web activity, etc.



Individual Lookback:

1-3 years of previous behavior

Judging Criteria

Humana





SIMPLY STATED: We are looking for a solution that...

- Demonstrates an understanding of the underlying business issue
- Is grounded in the data that has been provided
- Is a combination of technical accuracy and practical application
- Provides a clear & articulate path forward



Competition Judging

Round 1: Model Accuracy & Fairness <i>Open to all teams</i>	<ul style="list-style-type: none">Ability to predict members most likely to be unengaged and not visit a PCP<ul style="list-style-type: none">✓ Observed ROC curve and AUC MetricAbility to ensure fairness in the modeling solution<ul style="list-style-type: none">✓ Observed Disparity Score
Round 2: Written Submission Evaluation <i>Top 50 teams from Round 1</i>	<ul style="list-style-type: none">Multiple judges will review each submission creating a composite score based on the entirety of the solution: approach, analytics, insights, recommendations, and actionability.<ul style="list-style-type: none">20% - Establishing key questions & performance indicators aligned with business issue<ul style="list-style-type: none">Complete external scan of what competitors are doing to address this underlying challenge and summarize key findings30% - Depth and description of analysis resulting in actionable business insights<ul style="list-style-type: none">A consideration of any ethical, legal, or privacy concerns related to the proposed solution, and recommendations to address concerns50% - Ability to provide meaningful implications and recommendations based on results/insights<ul style="list-style-type: none">Define key considerations for test and learn study design parameters and key considerations to support scalability
Round 3: Final Presentation <i>Top 5 teams from Round 2</i>	<ul style="list-style-type: none">Build on previous rounds by demonstrating the solution's ease of understanding, impact to the business, and viability with regards to implementation.Panel of Humana Executives and Texas A&M Professors will listen to and evaluate final presentationsClarity of the solution, visualization, implications for the business, actionability, and professionalism are the key components the judges will be focused on



Round One | Model Prediction Accuracy

Participants to “score” model using secondary data file:

- Humana will provide secondary data to be used in the evaluation of model accuracy and fairness
- Teams will apply their model to the secondary data and produce a resultant score (i.e. predictive value)
- Teams will return, as their Round 1 submission, a scored file in CSV format that includes the following fields:
 - ID (Unique identifier provided with secondary data)
 - SCORE (Resulting score from modeling algorithm)
 - RANK (Most likely individual based on predicted score = 1, 2nd most likely individual = 2, etc ...)

Humana will access model accuracy and fairness

- Humana will append ‘outcome’ to the scored file provided by each team
- Judging metrics will be established based on each team’s scored file
 - ROC curves generated & AUC metric will be calculated
 - Disparity Score and corresponding weighting will be calculated utilizing RACE & SEX
- Based on the 2 metrics, a final combined metric will be assigned to each team’s submission
 - Combined Metric = AUC * Disparity Score Weight
- Top 50 teams will be identified and selected using a combined metric



Round One | Leaderboard

Mid-Cycle Leaderboard

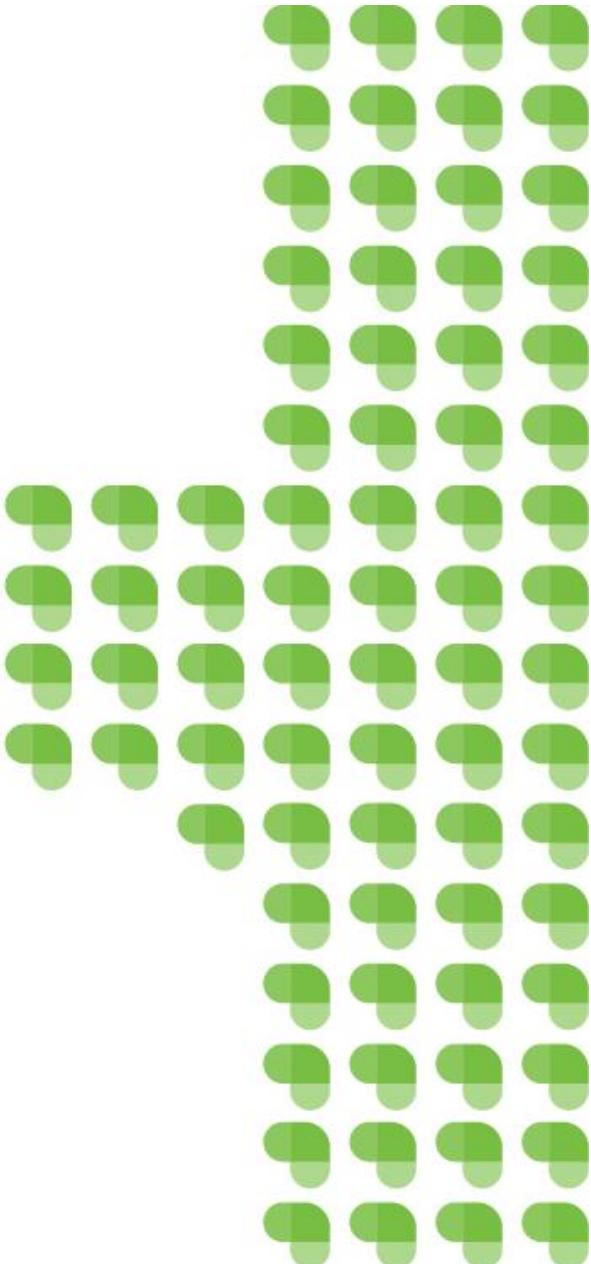
- Provide teams an ability to see where their performance model ranks compared to other participants
- Leaderboard results will be posted daily on the competition website
- Mid-cycle Leaderboard will be available from September 30th – October 10th
- Teams may submit once per day to the mid-cycle Leaderboard
 - The highest performance score for each team will be recorded and used in the Leaderboard rankings
- Teams are not required to participate in the mid-cycle evaluation, however, must submit a scored holdout file by 5:00 pm CT on October 11th to be considered for Round 2.
 - Mid-cycle Leaderboard provides relative guidance only...it is not a guarantee of final placement

The final Leaderboard will be posted on October 11th no later than 11:59pm CT

- All teams who submit a valid scored holdout file will see their final metrics and rankings
- Top 50 teams will be confirmed via email

Additional details related to the Leaderboard can be found on the competition website in a document titled:
"Humana Mays Case Competition –Round 1 Leaderboard Guide"





Round Two | Written Submission Evaluation

Establish key performance indicators aligned to business issues | 20%

- Explicit statement of the business issue and a translation into a data problem
- Statement and definition of the metrics that will be used to evaluate the abovementioned business problem

Depth and description of analysis resulting in actionable business insights | 30%

- Analytical approach conveys an appreciation of varying data types, variable relationships, and background research
- Data have been cleaned, manipulated, and labeled appropriately to ensure analyses are broadly applicable
- Key drivers of outcomes are identified and explained
- Performance/evaluation of the analytical approach is provided along with rationale for final selection
 - *What makes your approach unique or best suited for this problem/data?*

Ability to provide implications and recommendations based on results/insights | 50%

- Tell the story of why your results matter and how they should be actioned...’So What?’
- Include a clear statement of recommendations – *based on your findings and results*
 - *Is there anything you would differently if you had more time and/or data?*
- Based on the recommendations, include the potential impact on the business

Additional details related to the Leaderboard can be found on the competition website in a document titled:
“Humana Mays Case Competition –Round 1 Leaderboard Guide”



Round Three | Presentation

The final round is the culmination of the challenge where everything gets pulled together and presented virtually to a team of executives.

Professionalism and Communication

- Presentation is visually engaging and professionally delivered
- Business problem, analytical approach, and results are well-connected and clearly articulated
- Recommendations and Implications to Humana are well-defined and appropriate to the payer context
- Presenters are well-prepared and able to address questions in a clear and concise manner





Key Submission Dates

<https://mays.tamu.edu/humana-tamu-analytics>

Late submissions will not be accepted*

Round 1 Submission: Due on Friday, October 11th@ 5:00 PM CT

Round 2 Submission: Due Sunday, October 20th@ 11:59 PM CT Only Top 50 from Round 1 need to submit for Round 2

Must follow prescribed file formats to be accepted*

Round 1 Holdout File Format: CSV(Fields include: ID, SCORE, RANK) | Example:

Round 2 Written Submission Format: MS Word, PDF

Must follow the following naming conventions* (using the first and last names of your team captain)

Leaderboard/Round 1: 2024CaseCompetition_FirstName_LastName_2024mmdd.csv

Round 2: 2024CaseCompetition_FirstName_LastName.doc

Judging is Blinded | Do not include names or school in content of submission

If you have any issues with your submission, please email: humanacasecomp@tamu.edu

ID,SCORE,RANK

1545,0.8954,1

32,0.8532,2

368,0.7976,3

*Failure to comply with submission requirements may result in disqualification



Website: [*https://mays.tamu.edu/humana-tamu-analytics*](https://mays.tamu.edu/humana-tamu-analytics)

Email: *humanacasecomp@tamu.edu*