

Humana®



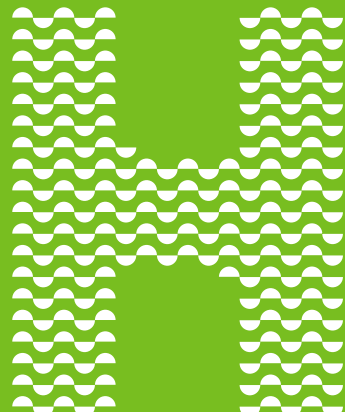
TEXAS A&M UNIVERSITY

Mays Business School

*Sixth Annual*

Humana/Mays

# 2022 Healthcare Analytics Case Competition





# Today's Agenda



01 | **Introductions** | Texas A&M, Humana

02 | **Competition Overview** | History, Eligibility, Timeline, Prizes

03 | **Analytics Challenge** | Introduction to the Case, Data Overview

04 | **Additional Details** | Judging



# Your Hosts



**Dr. Jerry Strawser**

Texas A&M – Mays School of Business

Associate Dean for Graduate Programs  
KPMG Chair and Professor of Accounting



**Geoff Monsees**

Humana

Director, Analytics & Insights  
Data Strategy & Governance



**Genevy Dimitrion**

Humana

Vice President  
Data Strategy & Governance



**Stephanie Franklin**

Humana

Director  
Population Health Strategy



**Gil Haugh**

Humana

Director, Data Science  
Clinical Strategies & Analytics





# About Texas A&M

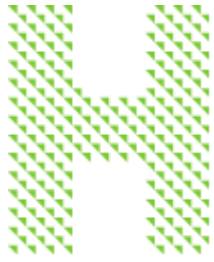
- Member of the highly prestigious **Association of American Universities** ( 1 of 63 universities in the United States)
- One of the few universities in the country designated a **land grant, sea grant, and space grant** university
- **Over 73k students** enrolled in 2022
- **Largest student body** in the Nation  
(2021 US News & World Report)
- **\$13.6 Billion** University Endowment
- **Over 525K alumni** who create a global Aggie network
- **Mays School of Business is nationally ranked** for the quality of its undergraduate programs, graduate programs and faculty scholarship



TEXAS A&M UNIVERSITY

Mays Business School





Members are at the heart of everything we do, and our employees are our strength. Here's a snapshot of our company.



**17.1 million**

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

- **5.1 million**  
Medicare Advantage members
- **3.6 million**  
Medicare prescription drug plan members
- **6.0 million**  
TRICARE members
- **5.2 million**  
Specialty benefits members



**30+**

years of Medicare experience



**65,000**

employee count  
(As of Aug. 18, 2022)



**No. 40**

on Fortune 500  
(As published May 2022)

**Humana**



# 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	2018	2019	2020	2021
 Topic	Readmission likelihood among diabetics	Acute Myocardial Infraction Likelihood	Long Term Opioid Therapy Likelihood	SDOH Identification of transportation challenged	Identification of COVID Vaccination Hesitancy
 Participants	350+	700+	1300+	900+	800+
 Teams	109	234	473	300	282
 Universities	19	48	81	78	76
 Prize \$	\$10.5K	\$35K	\$52.5K	\$70K	\$80K

# 2022 Highlights



Adoption of “Leaderboard” associated with Round 1 (Model Performance), which allows teams to see where they “stand” prior to final submissions



Inclusion of fairness and equity measurements into the judging criteria



Including business sponsor to final panel of judges



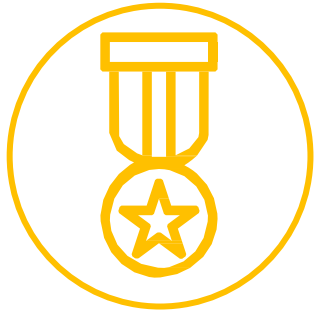
# Competition Timeline







# Competition Prizes



First Place

**\$50,000**



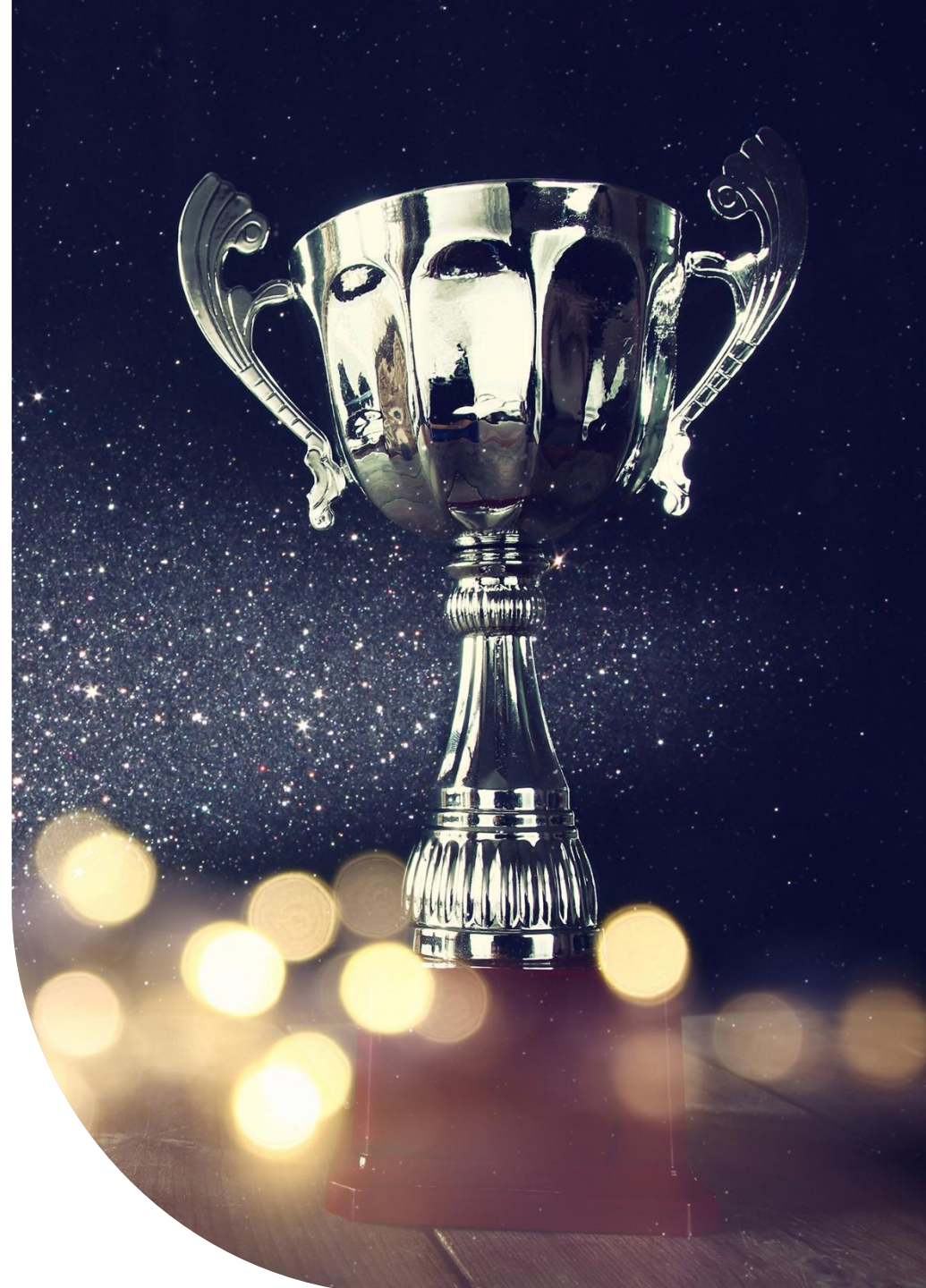
Second Place

**\$20,000**



Third Place

**\$10,000**





# Getting Started

## Register Your Team at:

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

## Information Needed:

- Team Name
- Team Member Names
- Designated Team Leader
- School Represented
- Signed NDA *for each team member*

## Team Registration:

- Early: September 14<sup>th</sup>
- Deadline: September 23<sup>rd</sup>, 5:00 PM CST

## Data Release:

- Starts September 15<sup>th</sup> (must have completed team registration & signed NDAs)

## Issues with Registration?

- Send an email to [humanacasecomp@tamu.edu](mailto:humanacasecomp@tamu.edu)



# 2022 Problem Statement

Humana believes in a whole person health model that supports physical, mental and social health, and, ultimately, helps people achieve their best health. And, we believe in a more equitable health system where social needs do not determine your health outcomes.

**Health-related social needs (HRSNs)** are the immediate health-harming conditions affecting a specific individual. These HRSNs are quite often a result of structural and/or social determinants of health that are in place. HRSN examples include: food insecurity, transportation barriers, loneliness, financial strain, and housing insecurity.

**Housing insecurity** is the focus of this year's case competition and is defined as the lack of access to quality and safe housing. It may include scenarios such as lack of affordability, unsafe/overcrowded conditions or frequent moves. 37.1 million American households are "housing cost-burdened," and 32.7% of older adult households have severe housing problems. Resulting health problems can range from allergies to neurological to heart damage.

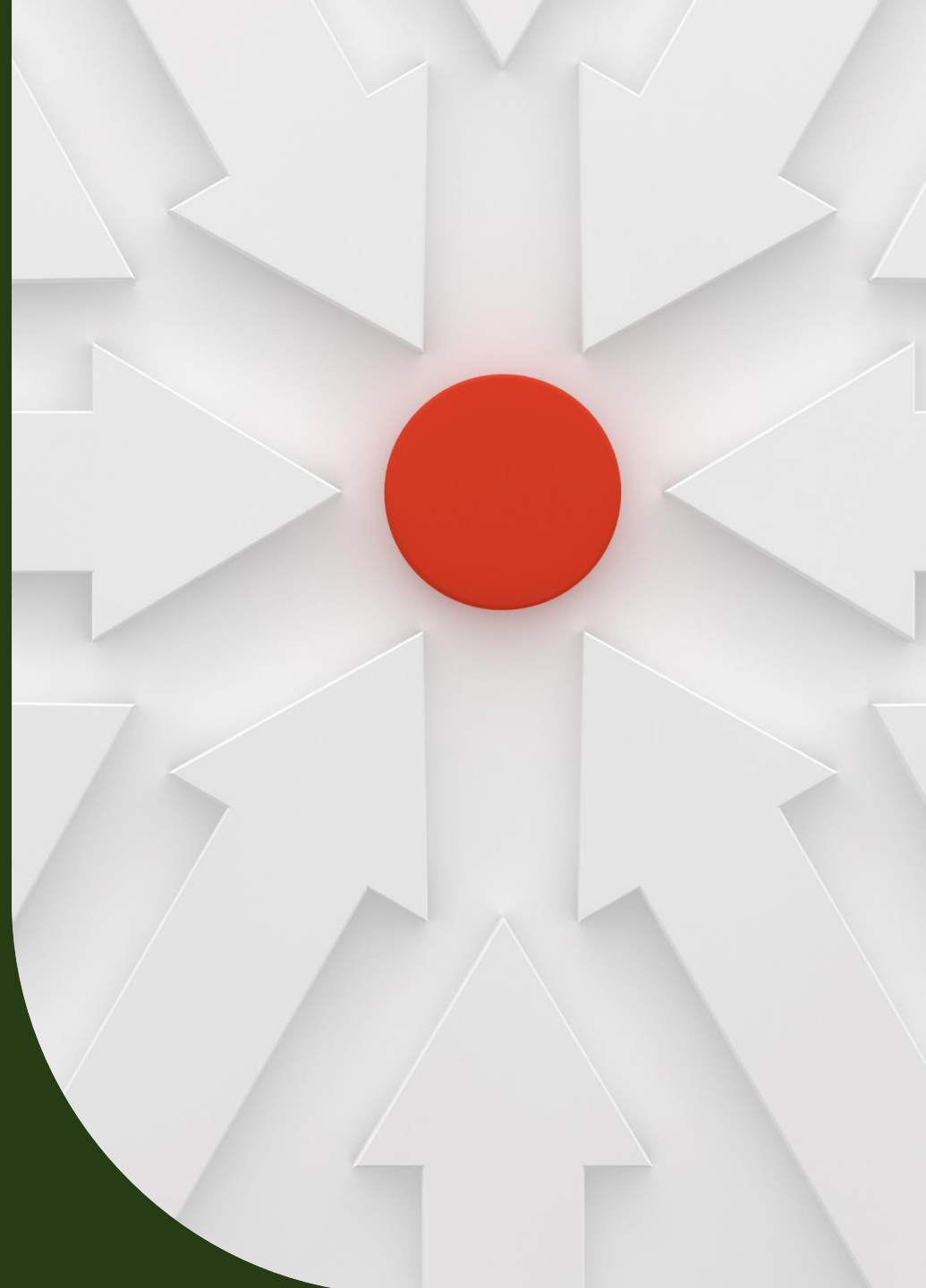
**Using the provided data and potentially supplementing it with public data, create a model to identify Medicare members most likely to be struggling with housing insecurity issues and propose solutions that help people achieving their best health.**





# Competition Objectives

- Identify members most likely to be experiencing Housing Insecurity issues
- Provide recommendations & potential solutions based on the insights derived from the data.
- Ensure analysis and recommendations demonstrate fairness and equity through mitigation of potential bias inherent in the data







# Case Requirements | Key Components

## Important Definitions

- ***Fairness in AI:*** Augmented Intelligence (AI) can help deliver easy and seamless experiences to members and improve their health outcomes. It can also reflect and magnify the history and values of a society, including biases. Intentional or not, without our intervention, decades of fighting for equality can be unwritten in a few lines of code.
- Humana is committed to developing and fostering more equitable and inclusive AI for protected classes: *race, sex, age, low-income status, and disability status*.

## Challenging Problem

- ***Predictive model*** – Definitively knowing a member's housing insecurity status is difficult without a broad screening, therefore, having an effective predictive model to accurately identify members most likely to be insecure is very important.
- ***Proposed solutions*** – It is likely that members experiencing housing insecurity are not homogeneous and may have different drivers for their insecurities. As such, there are perhaps different solutions for different segments of members.

## Data Included:

### ***Target:***

Housing Insecurity Indicator

### ***Features:***

- Medical claims features
- Pharmacy claims features
- Demographic/Consumer data
- Credit features
- Clinical condition features
- CMS features
- County level SDOH features
- Revenue features
- Outreach point features





# Case Data | Overview

**Target population:** Humana MAPD members

**Event:** Each member will have a binary flag to indicate Housing Insecurity

**Lookback:** 1 year look back prior to the date that member responded the screening

**Data warehouse:** 800+ features

## Medical Claims and Condition Features

- *Claim count and cost by place of treatment (Inpatient, Outpatient, ER, etc.)*
- *Claim count by CMS diagnosis code categories*
- *Claim count by behavioral health conditions*
- *Charlson Comorbidity Index and utilization*

## Pharmacy Claims Features

- *Claim count and cost:*
  - *Brand/generic*
  - *Mailed/non-mailed*
  - *Maintenance/non-maintenance*
  - *BH/non-BH*
  - *OTC/non-OTC*
  - *Humana prescription categories*

## Demographics/CMS/Consumer Features

- *Age*
- *Gender*
- *Race*
- *Disability*
- *Dual eligible*
- *Low income subsidy*
- *Rural category*
- *CMS risk score and payment amount*

## Other Features

- *Rural Atlas SDOH features*
- *Robert Wood Johnson Foundation SDOH features*
- *Outreach point features*
- *Revenue code related utilization features*
- *Credit data features*

# Judging Criteria





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 | Three Rounds

<b>Round 1: Model Accuracy &amp; Fairness</b> <i>Open to all teams</i>	<ul style="list-style-type: none"><li>○ Ability to predict members most likely to be experiencing housing insecurity<ul style="list-style-type: none"><li>✓ Observed ROC curve and AUC metric</li></ul></li><li>○ Ability to ensure fairness in the modeling solution<ul style="list-style-type: none"><li>✓ Observed Disparity Score</li></ul></li></ul>
<b>Round 2: Written Submission Evaluation</b> <i>Top 50 teams from Round 1</i>	<ul style="list-style-type: none"><li>○ 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"><li>✓ 20% - Establishing key questions &amp; performance indicators aligned with business issue</li><li>✓ 30% - Depth and description of analysis resulting in actionable business insights</li><li>✓ 50% - Ability to provide meaningful implications and recommendations based on results/insights</li></ul></li></ul>
<b>Round 3: Presentation</b> <i>Top 5 teams from Round 2</i>	<ul style="list-style-type: none"><li>○ Build on previous rounds by demonstrating the solution's ease of understanding, impact to the business, and viability with regards to implementation.</li><li>○ Panel of Humana Executives and Texas A&amp;M Professors will listen to and evaluate final presentations</li><li>○ Clarity of the solution, visualization, implications for the business, actionability, and professionalism are the key components the judges will be focused on</li></ul>



# Round One | Model Accuracy

## Participants to “score” model using secondary data file

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

## Humana will access model accuracy & 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

\*Additional details related to the Disparity Score be found on the competition website in a document titled: “*Fairness in AI Guide*”





# Round One | Leaderboard

## Mid-Cycle Leaderboard

- Provide teams an ability to see where their model ranks – in terms of performance – compared to other participants
- Leaderboard results will be posted daily on the competition website
- Mid-cycle Leaderboard will be available from October 3<sup>rd</sup> – October 14<sup>th</sup>
- Teams may submit once per day to the mid-cycle Leaderboard
  - Highest performance score for each team will be recorded and used in Leaderboard rankings
- Teams are not required to participate in the mid-cycle evaluation, however, must submit a scored validation file and Round 2 written submission prior to the deadline of October 16<sup>th</sup> 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 19th

- All teams who submit a scored validation file will see their final metrics & 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

## 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 & results***
- Based on the recommendations, including the potential impact on the business



## Round Three | Presentation

The final round is the culmination of the challenge where everything gets pulled together and presented 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





# Final Submissions

Submissions are due on **Sunday, October 16<sup>th</sup> at 11:59 PM CST**

Late submissions will not be accepted

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

\*Scored File Format: CSV (Fields include: ID, SCORE, RANK) | Example: *ID,SCORE,RANK*  
*1545,0.8954,1*  
\*Written Submission Format: *MS Word, PDF*  
*32,0.8532,2*  
*368,0.7976,3*

\*Final submission file names should be in the following format, using the first and last names of your team captain

- 2022CaseCompetition\_*FirstName\_LastName\_2022mmdd*.csv
- 2022CaseCompetition\_*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](mailto:humanacasecomp@tamu.edu)



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

Email: [humanacasecomp@tamu.edu](mailto:humanacasecomp@tamu.edu)

Facebook: <https://www.facebook.com/humanacasecomp>

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