

Humana/Mays

2019 Healthcare Analytics Case Competition

Third Annual

Humana



TEXAS A&M UNIVERSITY
Mays Business School



Today's Agenda

- 01 | Introductions | Humana, Texas A&M
- 02 | Competition Overview | History, Eligibility, Timeline, Prizes
- 03 | Analytics Challenge | Introduction to the Case, Data Overview
- 04 | Additional Details | Judging Criteria, Final Submissions

Your Hosts



Texas A&M

Dr. Arvind Mahajan | Associate Dean for Graduate Programs



Humana

Genevy Dimitrion | VP Data Strategy & Governance



Clay Rhodes | Director, Opioid Task Force



Geoff Monsees | Director, Enterprise Data & Analytics

About Texas A&M

- Oldest public university in Texas
- Nearly 70K current students
- Over 450K alumni from the University
- \$10.8 Billion University Endowment
- \$1 Billion University Research Funding
- Created the 12th Man in Football in 1921
- Over 104K fans in Kyle Field, our Football Stadium
- **Mays' Vision & Mission:** Advance the world's prosperity by developing transformational leaders



TEXAS A&M UNIVERSITY

Mays Business School



About Humana

- **Founded in 1961** & Headquartered in Louisville, KY
- **Leading health care company** that offers a wide range of insurance products and health and wellness services
- **One of the nation's top providers of Medicare Advantage** benefits with over 30 years of experience and approximately 4.0 million members as of June 30, 2019
- **Approximately 16.6 million medical members** nationwide as of June 30, 2019

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 2-3 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
- Humana Employees are not eligible

Last Year:

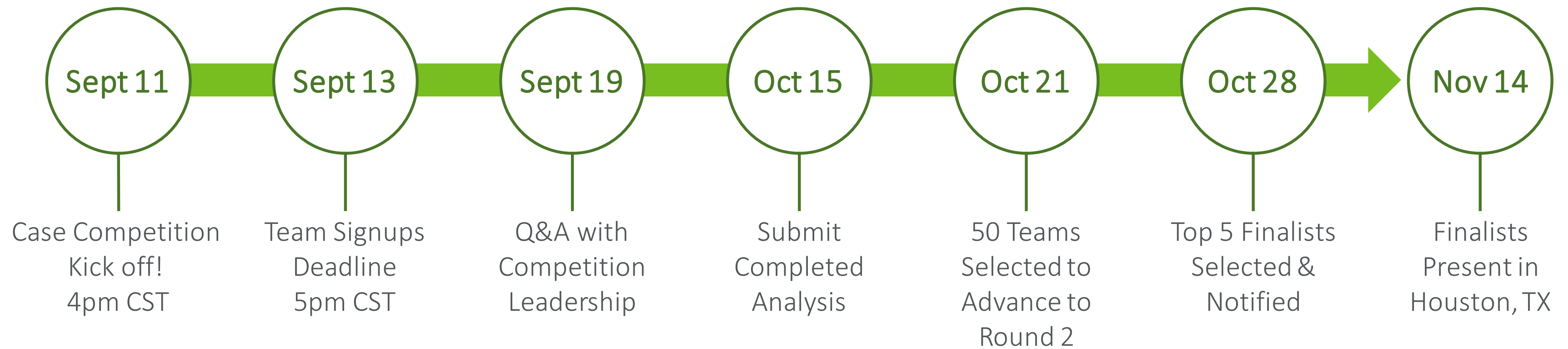
700+ Participants

246 Teams

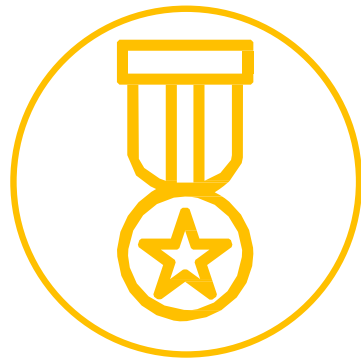
42 Universities

\$20K Top Prize

Competition Timeline



Competition Prizes



First Place
\$30,000



Second Place
\$15,000



Third Place
\$7,500

Humana



Getting Started

Register Your Team @ <https://www.humanatamuanalytics.com/register>

Information Needed:

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

Deadline:

- September 13th, 5:00 CST

Issues with Registration? Send an email to humanacasecomp@tamu.edu

The Case

Using data to predict long-term opioid therapy post initial treatment



Case in Context | LTOT

Prevalence of Long-Term Opioid Therapy (LTOT)

Throughout the early 2000s, LTOT for non-cancer pain conditions (NCPC) increased considerably without a corresponding increase in incidence of NCPC

The Risks

Evidence suggests an elevated risk for overdose, abuse, misuse, and negative health outcomes related to increased dosing or longer duration therapy, including fractures, Myocardial Infarction, and sexual dysfunction

Humana's Goal

As a partner in health with a mission to help people achieve lifelong well-being, we are invested in improving the lives of the over 16 million members we serve

“

As many as **1 in 4** patients receiving long-term opioid therapy in a primary care setting will struggle with opioid disorder

”

Centers for Disease Control

Case Requirements | Key Components

Problem Statement

Using the provided data create a model to predict if members will continue opioid therapy six months after initial prescribing

Goal

To identify members at risk for continued long-term use of opioid therapies allowing for early intervention

Definitions

- 1. **Opioid Naïve** will be defined as not having an opioid ‘on hand’ in the preceding 90-day period, based on service date and pay day supply count
- 2. **Long Term Opioid Therapy** (LTOT) will be defined as continuous use of an opioid medication with 90% of days covered over a 6 month period

Challenging problem

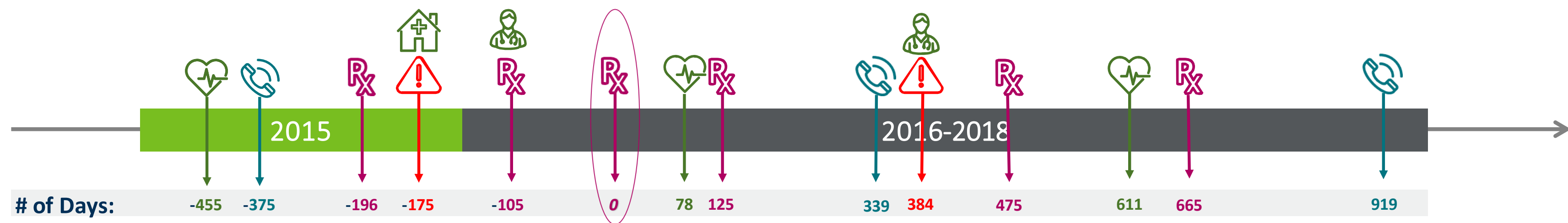
- 1. **Correctly identify & label events of interest** – initial opioid therapies for Opioid Naïve population and LTOT
- 2. **Feature Engineering** – Data are not analysis ready. Participants will have to clean and extract features based on longitudinal events
- 3. **Ability to Apply Model** – Round 1 judging will be solely based model performance demonstrated on holdout sample

Notes on Data

- 1. **Events of interest** don’t start until 2016
 - Every individual has at least 1 Opioid Naïve script
 - First Opioid Naïve = Day 0
- 2. **Includes 4 years of longitudinal data**
 - 2015 through 2018
- 3. **2015 data can be used** both for excluding events in early 2016, and for labeling claims history for making events

Case Data | Overview

- Data will provide a 4-year longitudinal view of events for a MAPD member
 - ✓ All members have continuous coverage during this 4 year time period
 - ✓ Each row of data will provide details corresponding to an event for the particular member.
- Each member will have at least one adjudicated pharmacy claim for an opioid naïve therapy (i.e. qualifying event)
 - ✓ The anchor date (i.e. day = 0) is based on the first opioid naïve claim - after January 2016 - for the member
 - ✓ Timing associated with all other events are relative to the anchor date



Rx Claim - Paid

Days Since Qualifying Event: 0

Drug Class: Opioid Combination

Pharmacy: Humana Pharmacy, Inc

Brand Name: Endocet

Pays Days Supply: 60

Member Responsible Amount: \$0

Fully Paid Medical Claim

Days Since Qualifying Event: -455

Diagnosis: COPD

Place of Treatment: Hospital Outpatient

Net Paid Amount: \$0

Charge Amount: \$68

Member Responsible Amount: \$9.33

Inbound Call By Member

Days Since Qualifying Event: 339

Category: Refill Request

Reason: Refilled

Disposition: Closed

Location: SFDC

New Diagnosis

Days Since Qualifying Event: -175

Diagnosis: Mixed Hyperlipidemia

Place of Treatment: Office

Net Paid Amount: \$92.34

Charge Amount: \$145

Member Responsible Amount: \$15

Judging Criteria



Competition Judging | Three Rounds

Round 1: Model Accuracy

Open to all teams

- Ability to predict continued opioid therapy 6 months after initial prescription
- Observed ROC curve and AUC metric using a scored holdout data set

Round 2: Written Submission Evaluation

Top 50 teams from Round 1

- Multiple judges will review each submission creating a composite score based on the entirety of the solution: approach, analytics, insights, recommendations, and actionability.
 - ✓ 20% - Establishing key performance indicators aligned with business issue
 - ✓ 40% - Depth and description of analysis resulting in actionable business insights
 - ✓ 40% - Ability to provide meaningful implications and recommendations based on results/insights

Round 3: In-Person Presentation

Top 5 teams from Round 2

- Build on previous rounds by demonstrating the solution's ease of understanding, impact to the business, and viable with regards to implementation.
- Panel of Humana Executives and Texas A&M Professors will listen and evaluate final presentations
- Clarity of the solution, visualization, implications for the business, actionability, and professionalism are the key components the judges will be focused on

Round One | Model Accuracy

Participants to “score” model using secondary, holdout, data file

- Humana will provide a 2nd data set to be used in evaluation of model accuracy - Holdout Sample
- Teams will apply their model to the holdout sample 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 within holdout data set)
 - ✓ Predicted Value (Resulting score from modeling algorithm)
 - ✓ Individual Rank (Most likely individual based on predicted scored = 1, 2nd most likely individual = 2, etc...)

Humana will access model accuracy

- Humana will append LTOT ‘outcome’ to the scored file provided by each team
- ROC curves will be developed for each scored file
- Based on the ROC curve, AUC metric will be assigned to each team’s submission
- Top 50 teams will be identified and selected using AUC metric

Round Two | Written Submission Evaluation

Establish key performance indicators aligned to business issue | 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 | 40%

- Analytical approach conveys an appreciation of varying data types, variable relationships, and background research.
- Data have been cleaned, manipulated, and labeled appropriately ensure analyses are broadly applicable.
- Key drivers of outcomes are identified and explained
- Performance/evaluation of analytical approach are provided along with rationale for final selection.

Ability to provide implications and recommendations based on results/insights | 40%

- 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 results.
- Based on the recommendations, include the potential impact to the business.

Round Three | In-Person 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 due on Tuesday, October 15th at 11:59PM CT | Late submissions will not be accepted

Submit @ <https://www.humanatamuanalytics.com>

Scored File Format: *CSV* (Fields include: ID, Predicted Value, Individual Rank) | **Example:**

ID,Predicted_Value,Individual_Rank
1545,0.8954,1
32,0.8532,2
368,0.7976,3

Written Submission Format: *MS Word, PDF*

Presentation Format: *MS PowerPoint, PDF*

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

- CaseCompetition_*FirstName_LastName*.csv
- CaseCompetition_*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

Questions?

Website | www.HumanaTAMUAnalytics.com

Email | humanacasecomp@tamu.edu

Q&A call to be held on September 19th

All subsequent questions will be answered via email

- Questions will be compiled & answers provided on Tuesdays & Fridays starting 9/24
- All teams will receive the Q&A responses