Comprehensive Analysis of Patient Disenrollment

# 1. Dataset Overview

**Objective:** To understand the factors influencing patient disenrollment and identify common characteristics among those who have left.

**Active/Inactive Distribution:** 70.6% of members are still active (activeFlag = 1), and 29.4% have disenrolled (activeFlag = 0).

**Demographics:**

• **Age:** Members range from 21 to 108 years, with a mean age of approximately 74.

• **Membership Duration:** Membership periods range from 3 to 70 months, with a median around 51 months.

# 2. Variable Analysis and Insights

## 2.1 Age and Membership Duration

**Findings:** Age alone does not significantly impact disenrollment (p > 0.05). The correlation between age and activeFlag is low, suggesting age does not directly influence the likelihood of disenrollment.

**Membership Duration:** There is a significant positive correlation (R = 0.376, p < 0.001) between memberMonthsCount and active status, indicating that longer-tenured members are less likely to leave.

**Insight:** Newer members are more likely to disenroll, which might be due to initial dissatisfaction or unmet expectations.

**Recommendation:** Implement targeted retention efforts for newer members, especially during the first three years, to increase long-term loyalty.

## 2.2 Health Plan Type

**Findings:** Health plan type has a statistically significant association with disenrollment (Chi-square p < 0.001). Plans like 'Humana' show higher rates of disenrollment, which may be due to plan-specific issues.

**Insight:** The variance in disenrollment across health plans suggests that certain plans may have features or coverage issues leading to member dissatisfaction.

**Recommendation:** Conduct detailed feedback surveys for high-disenrollment plans to identify potential pain points and make targeted improvements.

## 2.3 PCP (Primary Care Provider) Changes

**Findings:** Frequent PCP changes are correlated with higher disenrollment (negative correlation for noPcpChange with R = -0.182, p < 0.001).

**Insight:** Members with consistent PCPs are more likely to stay, suggesting that stability in care can lead to better retention.

**Recommendation:** Minimize unnecessary PCP changes to maintain continuity in patient care, potentially improving satisfaction and reducing disenrollment rates.

## 2.4 Prior Authorization Denials

**Findings:** A significant relationship exists between prior authorization denials and disenrollment (R = 0.052, p < 0.001 for onePriorAuthDenial), suggesting that members facing service access barriers are more likely to leave.

**Insight:** Members experiencing even a single denial may feel dissatisfied with coverage, prompting them to disenroll.

**Recommendation:** Streamline the prior authorization process and educate members on available resources to help navigate the system, reducing frustration and enhancing retention.

## 2.5 Demographic and Eligibility Variables

**Partial and Full Dual Eligibility:** Minimal impact on disenrollment, with weak correlations and no statistical significance.

**Age Group Indicators:** Some age groups (e.g., age65\_69, age70\_74) show slight correlations with active status, but these are not strong predictors independently.

**Insight:** Demographic eligibility factors alone are not strong drivers of disenrollment.

**Recommendation:** Although not impactful individually, these variables could be integrated into a predictive model as part of a broader analysis.

# 3. Statistical Analysis Summary

Correlation with Active Status (activeFlag):

• **Strong Correlation:** Membership duration (positive).

**• Moderate Correlation:** PCP changes (negative).

• **Weak Correlation:** Prior authorization denials.

**Chi-Square Tests:**

• Significant Variables: Health plan type (p < 0.001), with differences observed in disenrollment across specific plans.

# 4. Key Insights and Recommendations

**Primary Drivers of Disenrollment:**

**1. Health Plan Type:** High disenrollment rates in certain plans (e.g., 'Humana') suggest plan-specific issues that may be resolved through member feedback and adjustments.

**2. PCP Stability:** Members with stable PCPs are more likely to stay, indicating that provider consistency improves retention.

**3. Authorization Barriers:** Members experiencing prior authorization denials are more likely to leave, indicating that access issues reduce satisfaction.

**Recommendations:**

1. Implement targeted interventions for high-disenrollment plans.

2. Stabilize PCP assignments for members.

3. Address authorization denial issues through streamlined processes and member education.

# 5. Next Steps for Model Building

**Predictive Modeling:** The next phase involves developing a predictive model using logistic regression or a classification tree to estimate disenrollment likelihood.

**Model Validation:** Use cross-validation and assess R-squared values to evaluate the model’s performance.