Team YLM

Ziqi Xu, Kelsey Ren, Zheer Wang, Kavin Jindel

Outline

Introduction

Team YLM, participating in The Datathon 2024, comprises four members with distinct academic backgrounds. Ziqi Xu and Zheer Wang, studying Mathematics and Statistics, offer analytical prowess and data management skills. Kavin Jindel and Kelsey Ren, focused on Statistics and Computer Science, bring algorithmic thinking and software development expertise. This blend equips Team YLM to tackle the datathon's challenges, utilizing their combined knowledge to drive innovative solutions.

Problem Overview

OBJECTIVE:

Analyze IVR call data to improve resolution rate & customer satisfaction

FOCUS:

Uncover patterns between call attributes & reasons for calls not handled by IVR

GOALS:

Identify how attributes relate to call reasons & IVR resolution failures and propose solutions to increase IVR problem-solving capacity

Data Cleaning

- Converted key columns to integer type for uniform data handling

- Transformed 'resolved' column to binary format for clarity (1 for resolved, 0 for floor)

- Validated 'card_activation_status' with predefined acceptable values

- Handled missing values in 'card_activation_status' and 'account_status'

- Standardized 'account_status' with consolidated categories

- Examined enrollment status in e-billing across two different dates

- Unified multiple e-bill enrollment statuses into simpler categories

- Stripped unwanted characters from 'delinquency_history' and split it into current and past due components

- Identified and marked rows with inconsistent delinquency history as bad data

- Created a comparative delinquency status column to highlight changes over time

Analysis - Account Status

Proportion of Unsolved Calls by Account Status
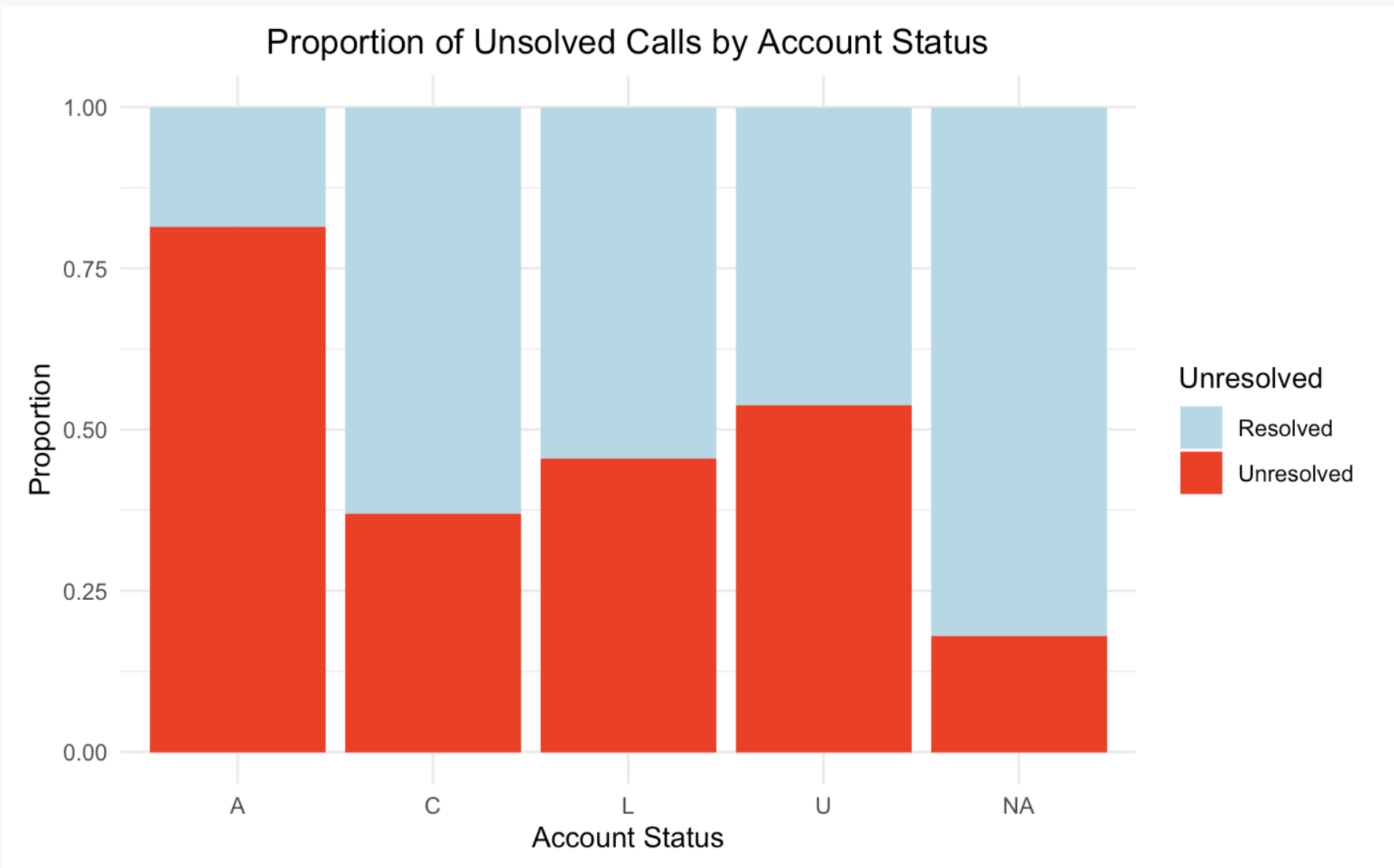
- A: Authorization prohibited

- C: Closed

- L: Lost

- U: Stolen

- NA: Normal

- When an account status is authorization prohibited, it has a higher percentage of unsolved calls (≈ 80%)
- Also, when an account status is stolen or lost, it has a high probability of unsolved calls (≈ 50%).
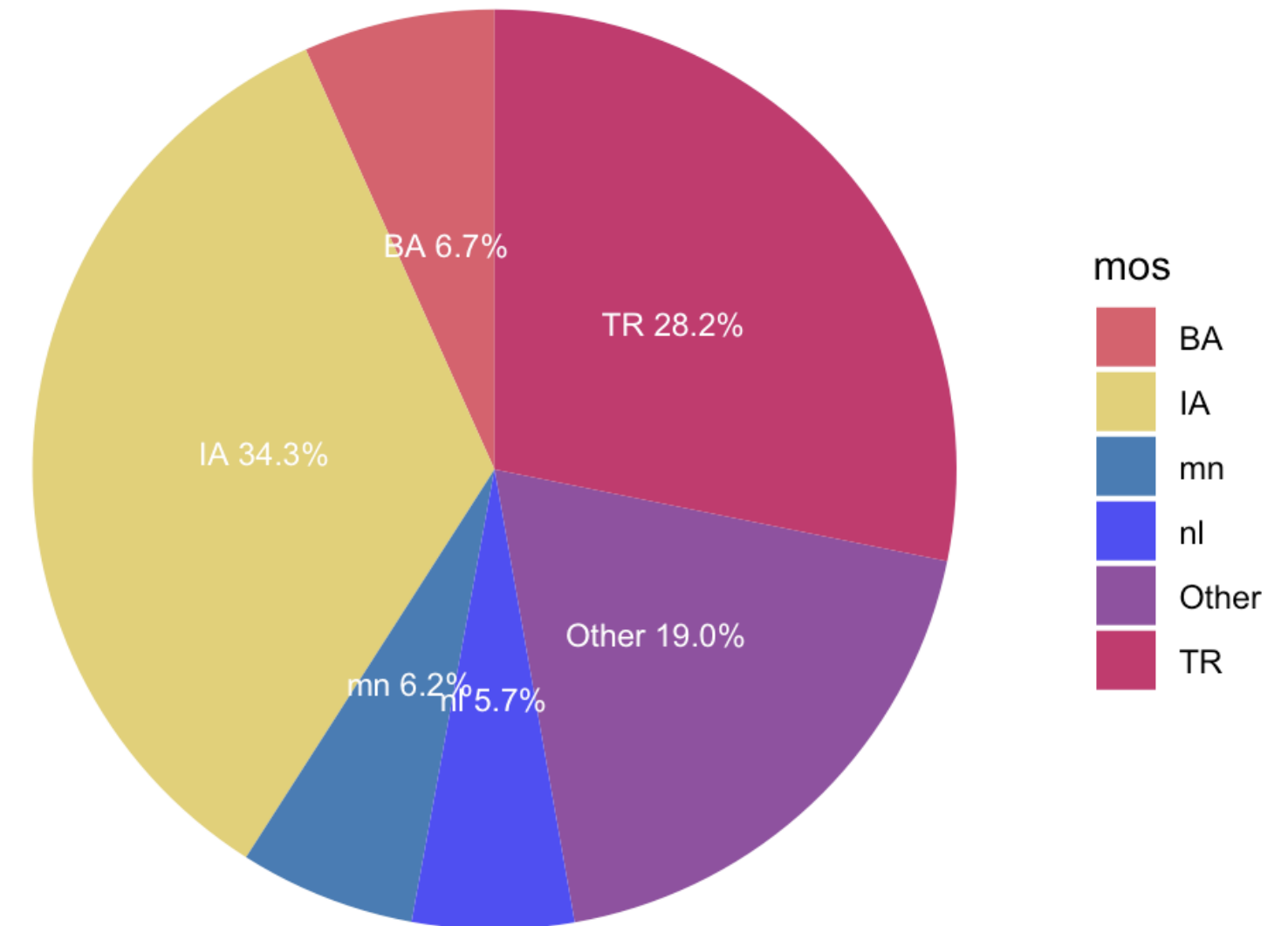
Analysis - Card Account Status "A":

Account status is authorization prohibited

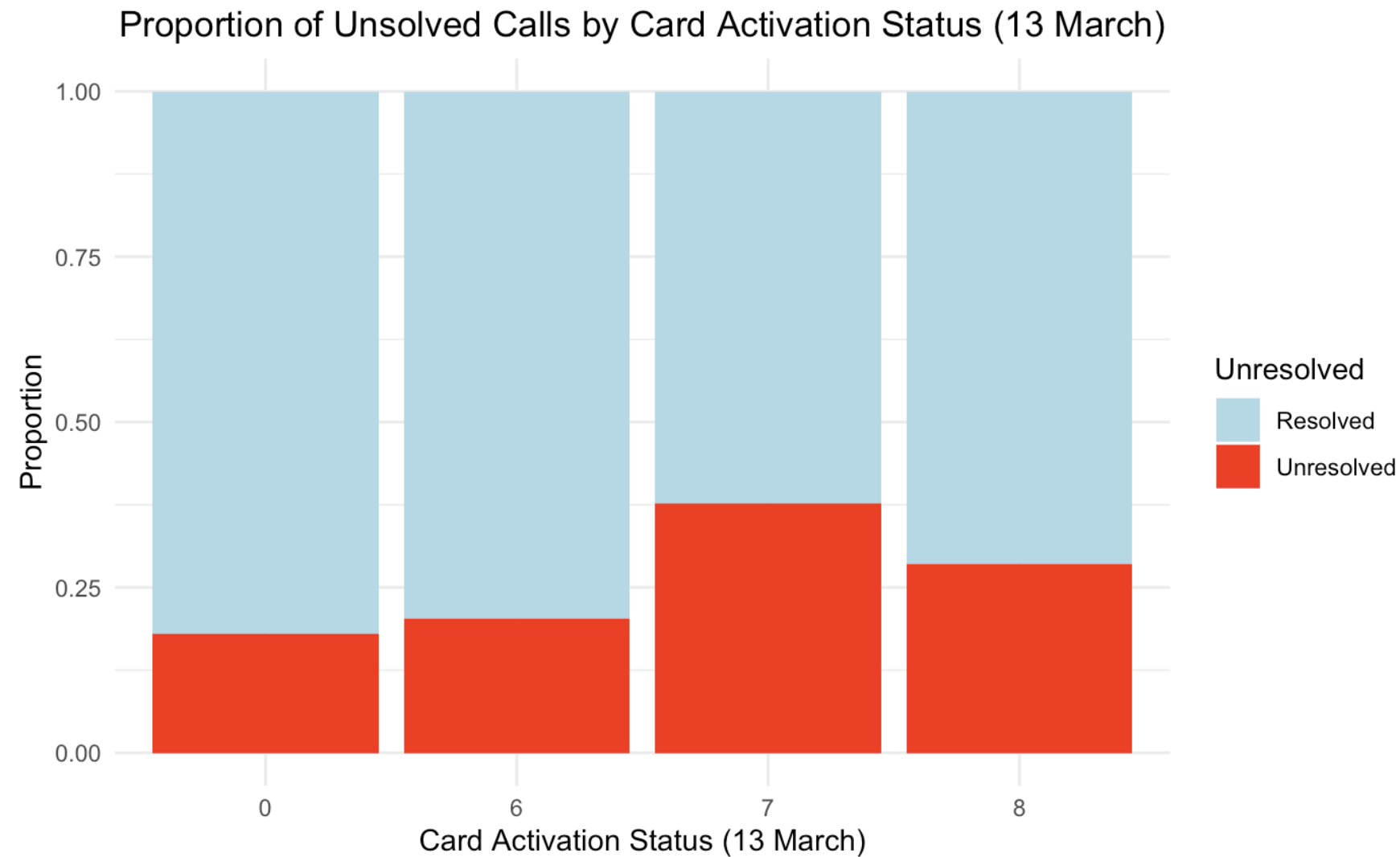Top 12 MOS Values for Account Status 'A' Sorted by Unresolved Percentage
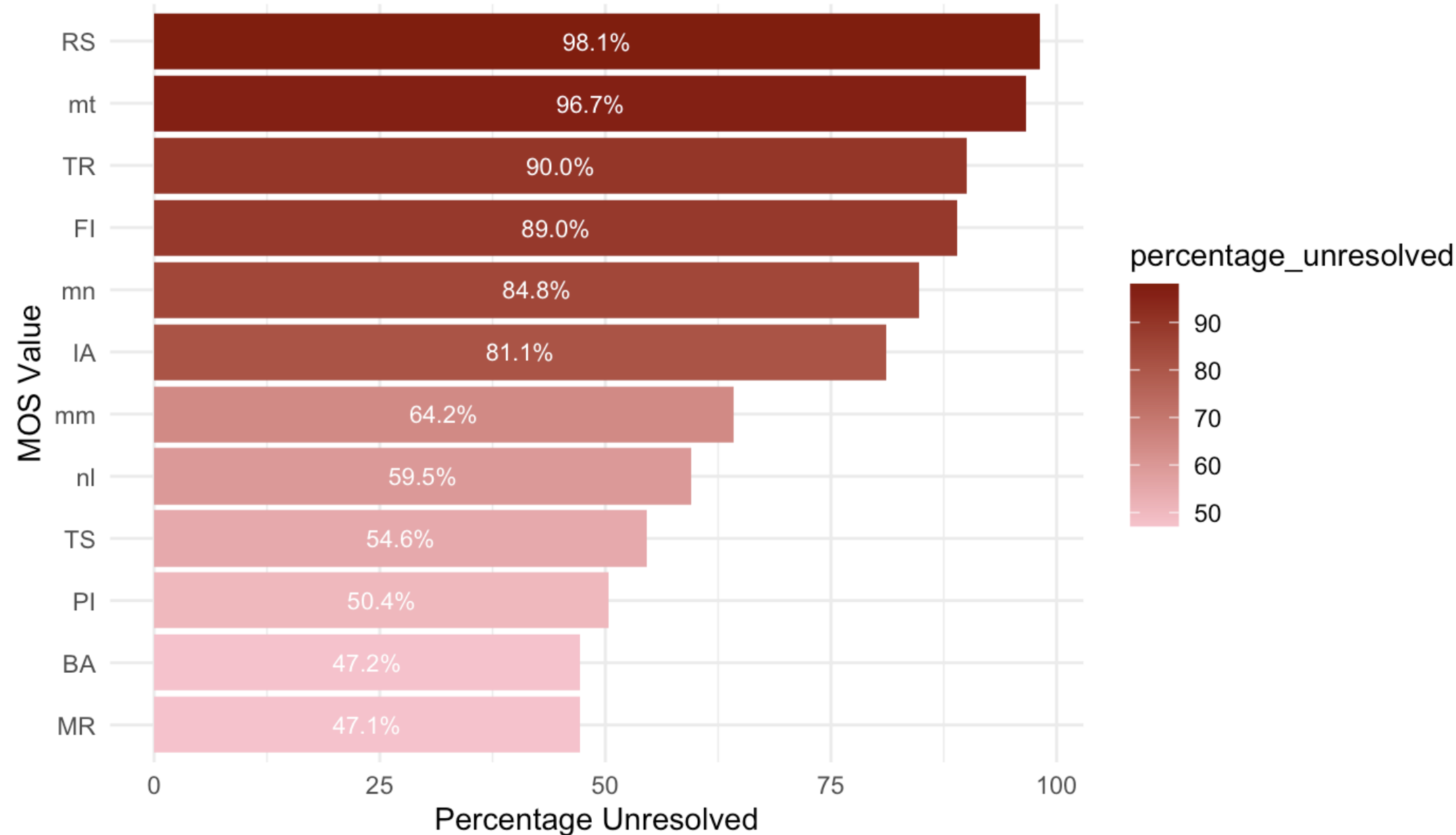
Top 5 Unresolved MOS Types for Account Status A

High portion & High unresolved percentage (> 50%): IA, TR, mt, mn

High portion & Medium unresolved percentage (< 50%): BA, AA

Analysis - Card Activation Status

Proportion of Unsolved Calls by Card Activation Status (13 March)

- 5: activated

- 6: blank implies card does not need to be activated

- 7: SYF sent customer a new plastic with a new account number and it has not been activated yet.

- 8: SYF sent customer a new plastic with the same account number as their old plastic and it has not been activated yet.

- New plastic & New account number without activation: higher unresolved percentage

- New plastic & Same account number without activation: high unresolved percentage

Analysis - Card Activation Status 7:

SYF sent customer a new plastic with a new account number and it has not been activated yet

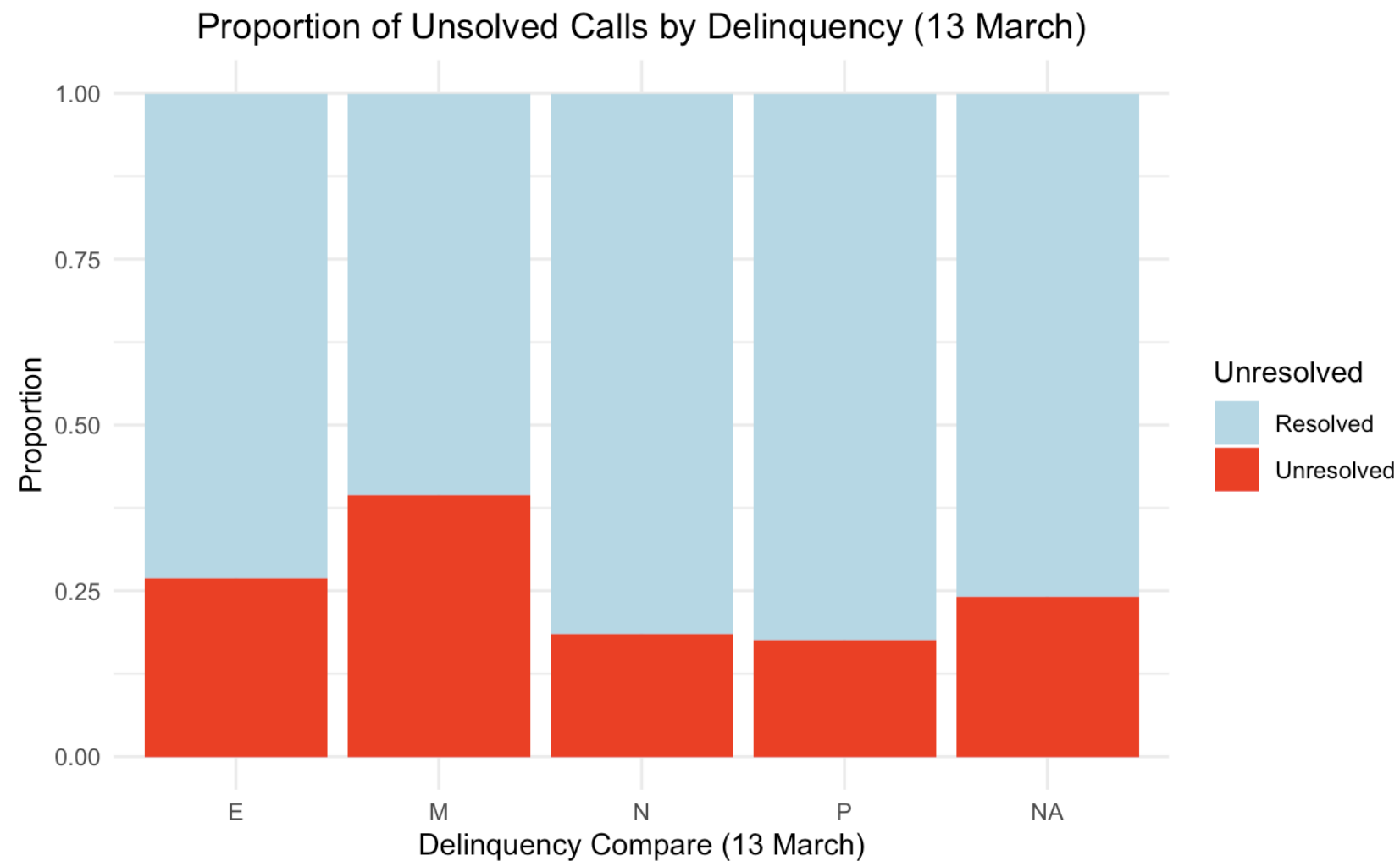Top 12 MOS Values for Card Activation Status 7 Sorted by Unresolved Percentage
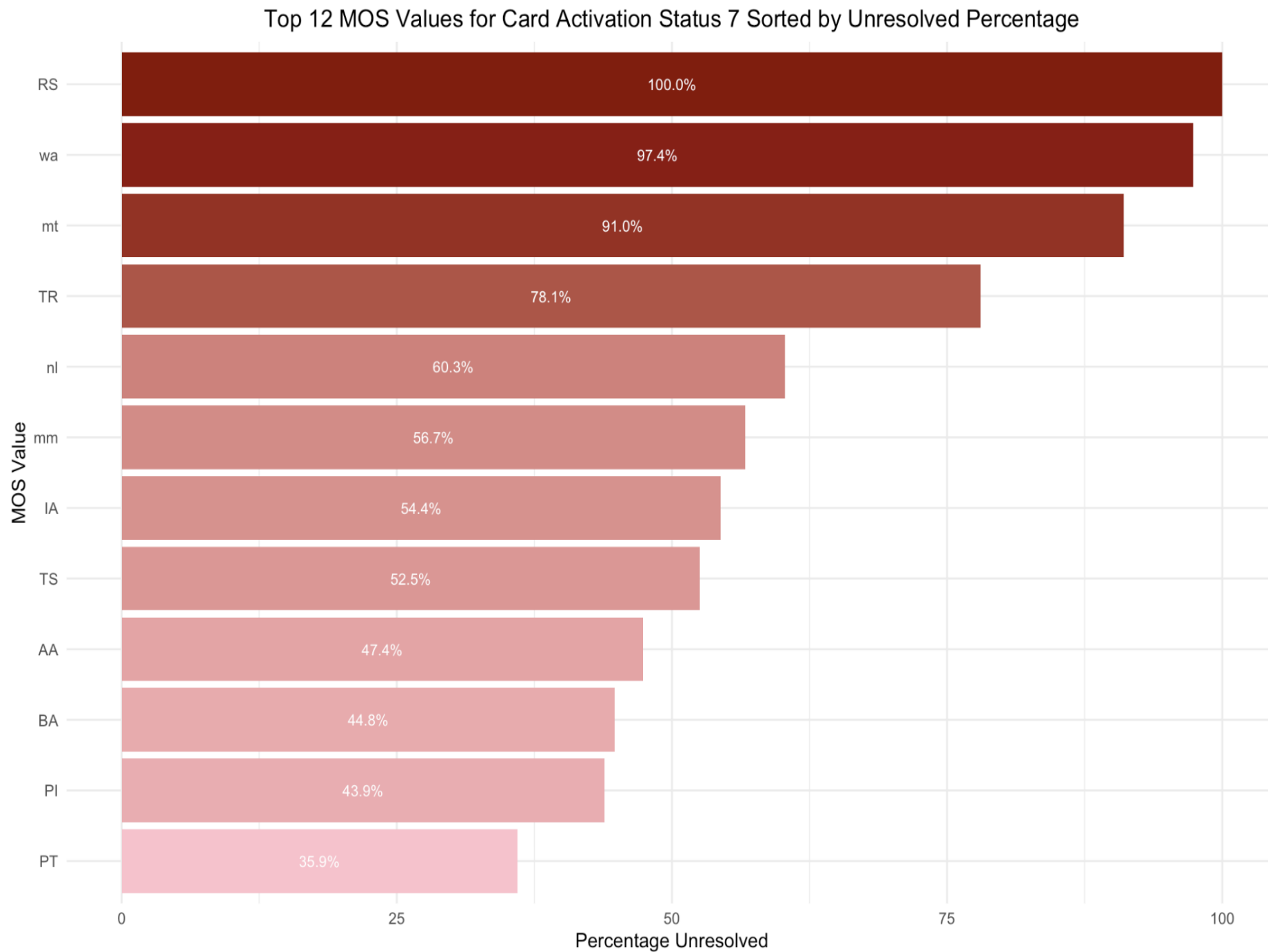
Top 5 Unresolved MOS Types for Card Activation Status 7
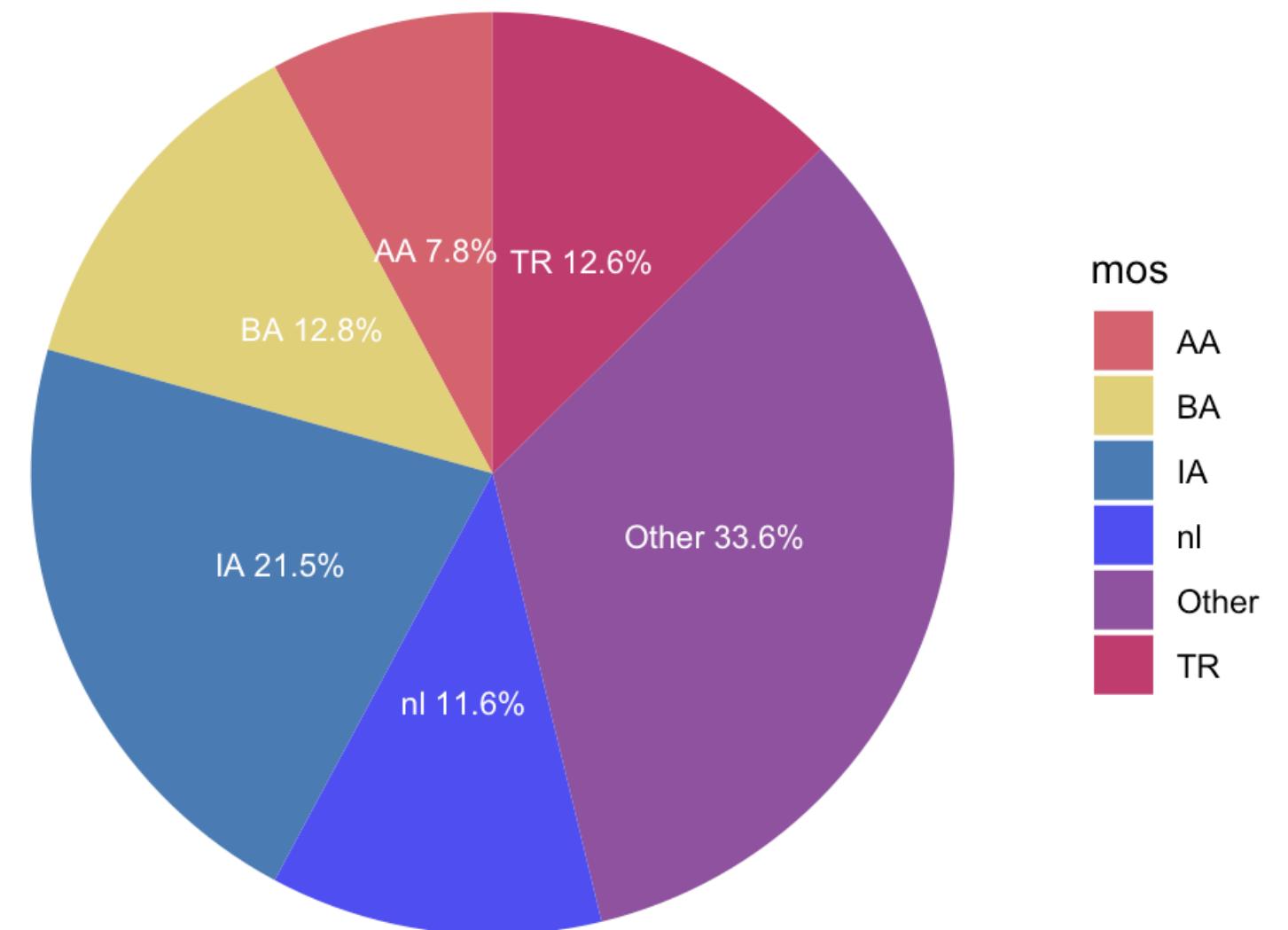
High portion & High unresolved percentage (> 50%): IA, nl, TR
High portion & Medium unresolved percentage (< 50%): BA, AA

Analysis – Delinquency History

Proportion of Unsolved Calls by Delinquency (13 March)

- M: more delinquency in current than the past
- N: current = past = 0
- E: current = past, but with delinquency
- P: curret < past, paid delinquency currently
- NA: current - past > 1, bad data

The more delinquency in current than in the past (M), the higher proportion of the unresolved call will be (≈ 40%).

Analysis - Delinquency History: "M"

More delinquency in current than the past

Top 12 MOS Values for Delinquency Compare 'M' Sorted by Unresolved Percentage
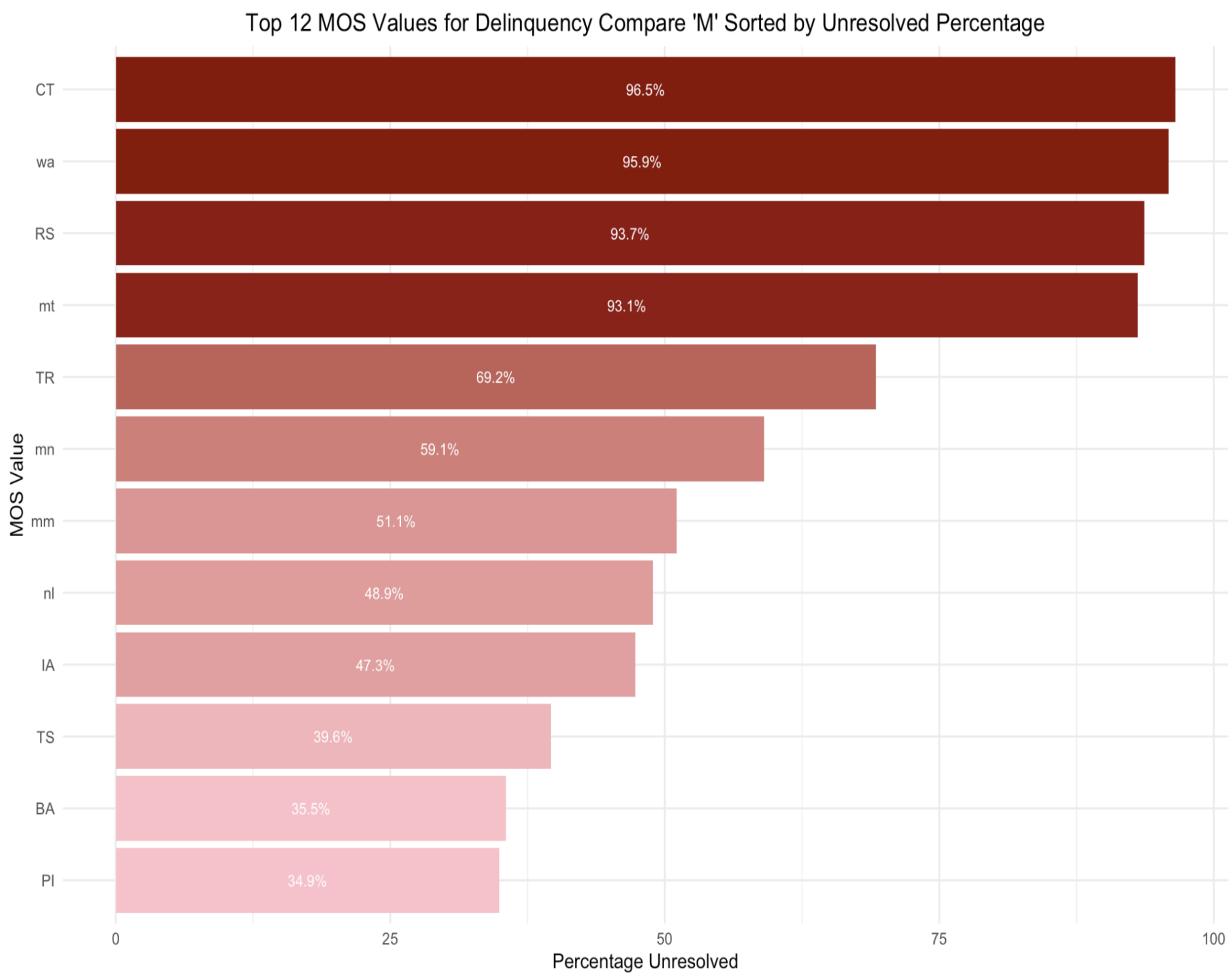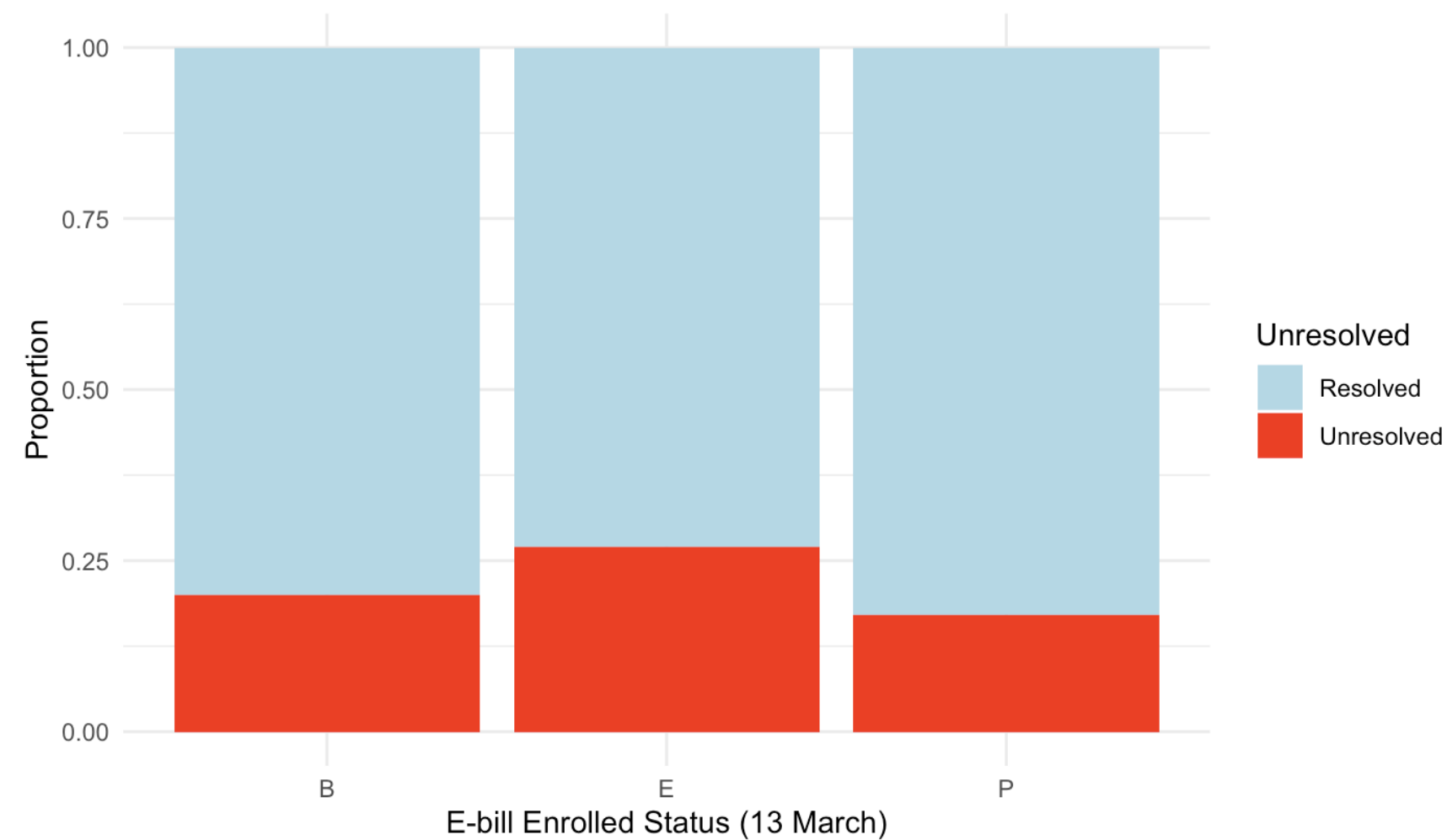

Top 5 Unresolved MOS Types for Current Increased Delinquency
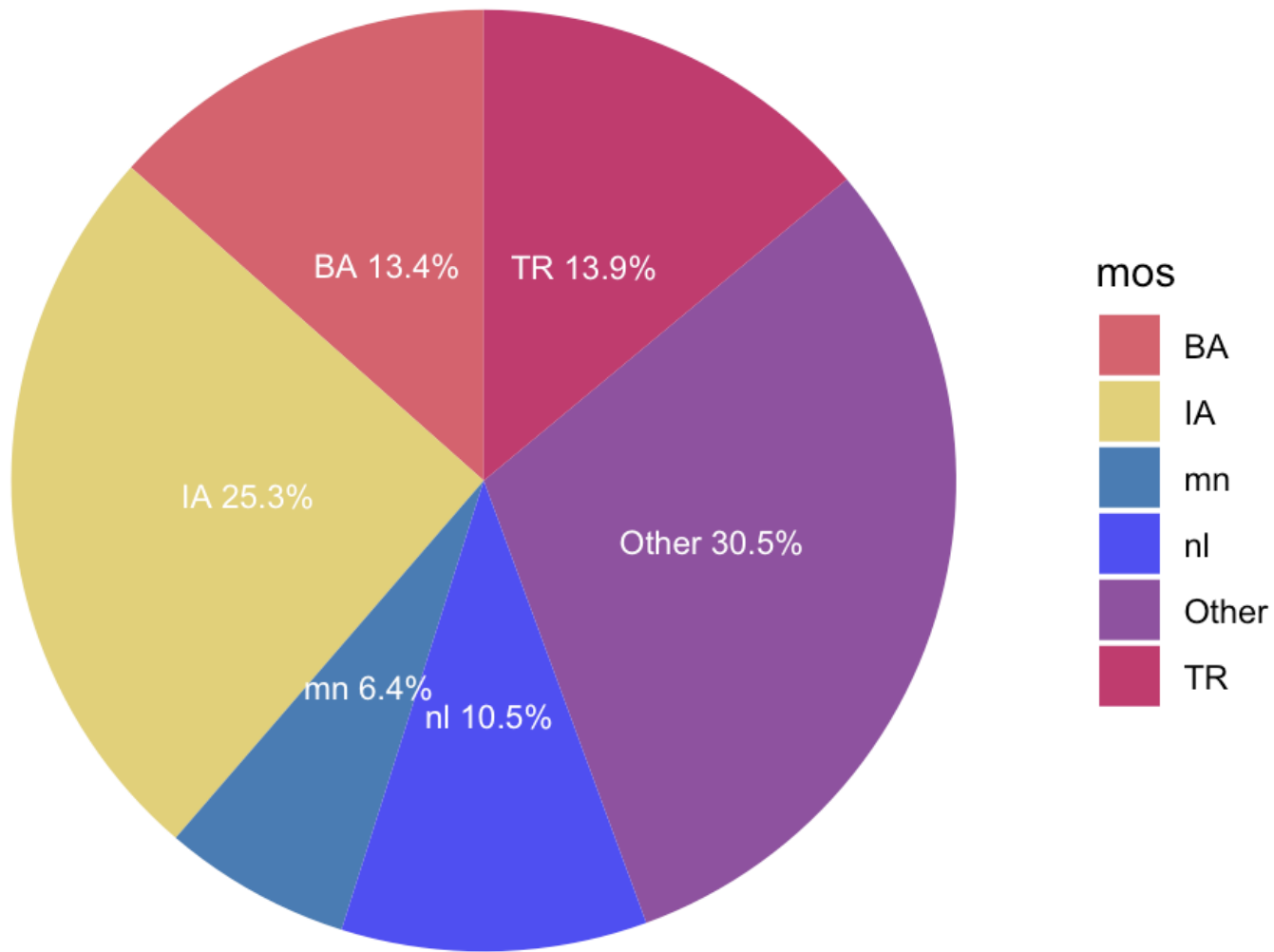
High portion & High unresolved percentage (> 50%): TR, mn

High portion & Medium unresolved percentage (< 50%): BA, IA, nl
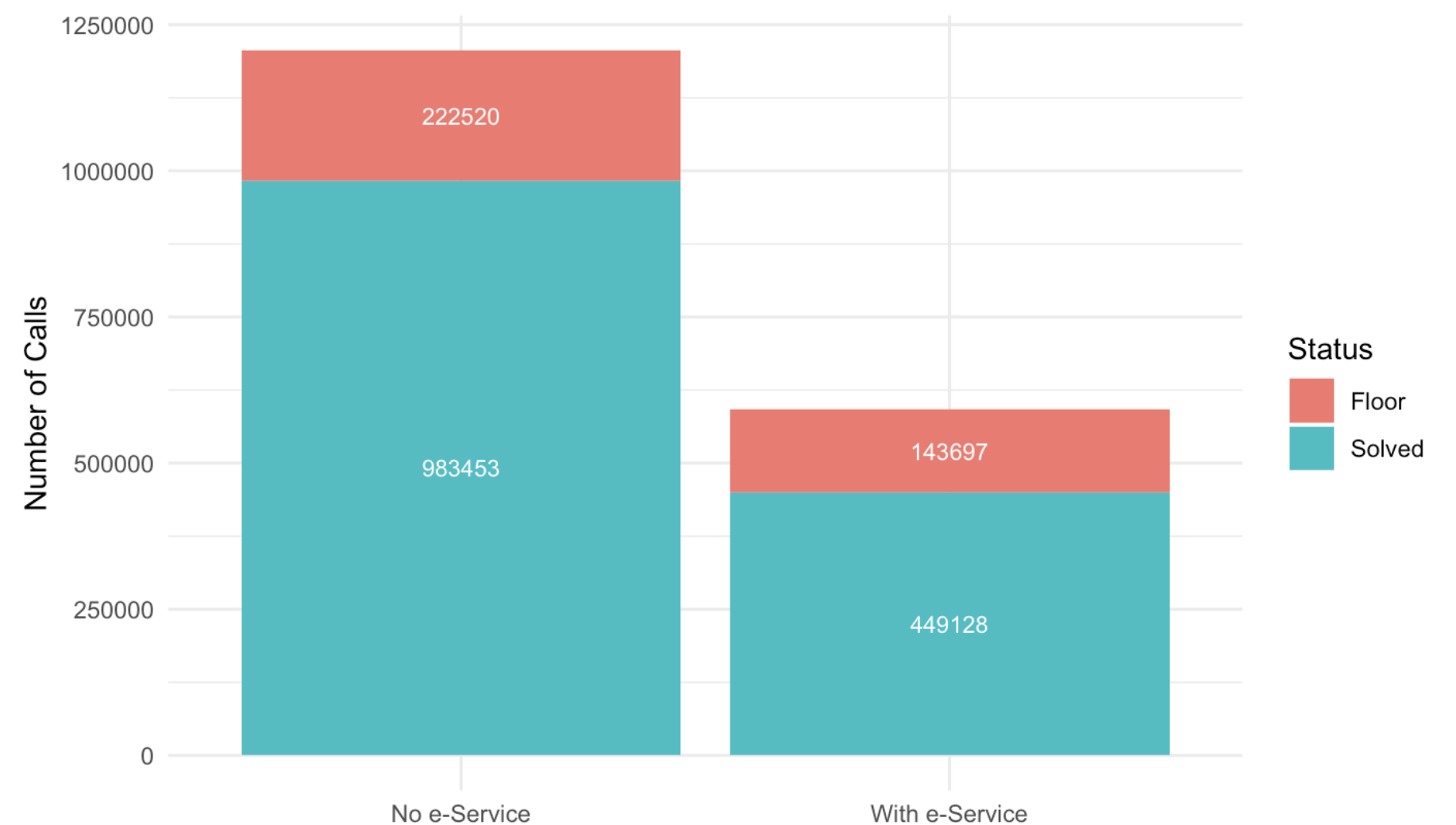
Analysis – E-bill Enrolled Status

Proportion of Unsolved Calls by E-bill Enrolled Status (13 March)

- replace blank to be P (paper)
- replace B, D, L to be B (both paper and electronic)
- keep E (electronic)

E-bill Enrolled Status does not influence the unresolved rate a lot.

Solved and floor ratio with and without e-service

E-service call ≈ ½ # No E-service call

Clients with e-Service have a higher unresolved rate
- E-service unresolved rate: 24.24%
- No E-service unresolved rate: 18.45%

CONCLUSION

- *Account Status*: When an account status is **authorization prohibited, stolen or lost**, it has a high percentage of unsolved calls.
- *Card Activation Status*: When clients have a new plastic with **a new or same account number** and it has not been activated yet, it has a high percentage of unresolved call.
- *Delinquency History*: The **more delinquency in current than in the past,** the higher proportion of the unresolved call will be.
- *E-bill Enrolled Status*: Clients with e-Service have a higher unresolved call percentage, but the percentages of B, E, and P don't have a large difference. We can conclude that E-bill Enrolled Status doesn't influence the unresolved rate a lot.
- *Top Unsolved Rall reason*: IA, BA, TR, nl, mn, AA

- IA: Identification and authentication
- BA: Account Summary
- TR: Transfer
- nl: NLU menu How may I help you
- mn: menu upfront
- AA: Activation

Solution

Account Status Issues (Authorization Prohibited, Stolen or Lost)
- Enhance Security Measures: Implement more sophisticated authentication and security questions specifically designed for these sensitive cases.

Card Activation Status
- Simplified Activation Process: Introduce a more streamlined, guided process for card activation within the IVR, including clear, concise instructions.

Delinquency History
- Personalized Payment Plans: For callers with a history of delinquency, offer personalized payment plan options or direct them to financial counseling services within the IVR.
- Proactive Notifications: Use predictive and proactive IVR features to remind customers of upcoming payments before delinquency occurs.

E-bill Enrolled Status
- Enhance Digital Support: For clients using e-services, improve digital support options and guide them towards resolving their issues through digital channels where possible.
- Clarify E-bill Benefits: In the IVR, briefly highlight the benefits and simplicity of e-bill management to encourage usage and reduce call volume.

Improve System

Simplify Process

Feedback Loop

Unresolved Call Reasons
- IA (Identification and Authentication): Streamline the authentication process by implementing voice biometrics or multi-factor authentication to reduce friction.
- BA (Account Summary): Use predictive IVR features to provide account summaries immediately after authentication, addressing common inquiries upfront.
- TR (Transfer): Offer clearer options for transferring funds within the IVR, including voice-guided assistance.
- nl (NLU Menu) and mn (Menu Upfront): Improve natural language understanding (NLU) capabilities to better recognize and route calls based on customer intent expressed in their own words.
- AA (Activation): Simplify the activation process and ensure customers can easily activate their cards through the IVR.

THANK YOU!