SAMPLE ANALYSIS
Quantitative Analysis of Game Balance

Guard Distribution & Sabotage Probability

In most playtests, we used 4 pools with 3 active Lifeguards. This creates a 25% probability (1 in 4) that a pool will go unguarded if guards are assigned randomly. Early playtests with equal pools and guards (3 pools & 3 guards) made sabotage almost impossible, favoring Lifeguards. Adding an extra pool (4 pools vs 3 guards) increased tension without making sabotage too frequent.

Sabotage Balance Adjustments

Sabotage success rates above 40% (e.g., with 5+ pools) led to Patron victories in over 80% of games, so we limited the pool count to keep sabotage success around 20-30% per round. The probability of sabotage triggers key gameplay events (like unlocking the Rescue Diver), so balancing odds was essential for exciting but fair pacing.

Play Duration Metrics

Average full-game length with 10-12 players was 50 minutes. Each round (Night + Results + Day) averaged 5 minutes, with Day Phases taking 3 minutes for quick discussions or up to 6 minutes for heated debates.

Role Impact Probabilities

Security's chance to investigate a Patron in the first 3 rounds averaged 20%, assuming random targeting. This preserves suspense while encouraging strategic guesses. Recruiter Patron's chance to convert the Sleeper Lifeguard before discovery was ~35% over an average 10-round game, making conversion possible but not dominant.

Defense vs. Elimination

When a player was voted for elimination during the Day Phase, they defended successfully about 45% of the time, indicating balanced opportunities for players to avoid elimination through social strategy.

Gameplay Outcome Distribution

Over 20 test sessions, Lifeguards won 11 games and Patrons won 9, demonstrating roughly even win rates with our finalized pool-guarding ratio and role adjustments. This near-even outcome suggests balanced gameplay across player strategies and random chance.

Intentional Balancing Adjustments

Early playtests showed games were too slow (Lifeguards overpowered) or too fast (Patrons dominant) when sabotage rates fell outside 20-30%. We adjusted pool numbers, limited Lifeguard protections (e.g., Bodyguard can't protect the same player two nights in a row), and tweaked voting rules to ensure neither team had overwhelming advantages.

Conclusion

These quantitative tests and adjustments ensured Guard Duty provides a tense, fair experience for both teams, with meaningful randomness and strategic depth. Probabilities were tuned so success depends on player skill and hidden information, maintaining replayability and balance.