1 Problem Statement

Overall project goal: Develop an analytics solution that can help Pfizer improve on-time closure of investigations.

What is an investigation?
Occasionally, something unexpected happens at the site: say a roof leak, or foreign material in the product—and investigators have to determine what went wrong and isolate the root cause. These investigations are supposed to take 30 days but investigators often have trouble meeting this deadline.

A big part of our project was finding an impactful area of focus. Can you think of any other hypotheses to explore?

2 Exploratory Data Analysis

Our area of focus: After extensive exploratory data analysis and conversations with multiple sites, we settled on load balancing as the biggest opportunity.

Key motivating findings: With each new overlapping investigation an investigator has, their likelihood of on-time closure decreases by ~3%. However, not everyone gets overloaded at the same time, so there is opportunity to load balance.

3 Methodology

Simulation: We simulated many different assignment strategies to understand the expected impact of our proposed logic. Our simulation has over 25 parameters and can be run for any site or subset of investigators.

Optimization: We formulated the assignment process as a linear optimization problem to understand how far our online assignment process is from the globally optimal solution.

4 Results and Discussion

Online assignment process closes >50% of gap to offline optimal solution. This is a strong result, as real-time logic can never match a solution that has oracle knowledge of future investigations.

On-time closure uplift is strongest with broader resource pooling and more complex assignment logic, with up to 13% uplift projected across focus business unit.

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I wish I had this all along. I’m happy to go along with your recommendations.
- Investigator on the pilot team
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+13%

+6%

Step 3: Resources are fully pooled within each business unit

Step 4: Investigators assigned across business unit based on likelihood on closing investigation on time

Step 1: Resources are pooled within each area

+4%

+3% on-time closure