Clinical Development Benchmarking Case Study: Analysis of Superior Development Strategies by Top Pharma

I. Client's Objective

- A leading pharmaceutical company sought to benchmark its clinical development strategies against top competing pharma companies to determine best practices in developing NMEs/NBEs in a cost-effective and timely manner

II. Lumleian's Perspective

- Benchmarking clinical development requires reliable and comprehensive data; Lumleian's proprietary data mining analytics platform uses all publicly available clinical development data from historic and current pipeline assets and provides a broad and accurate data set from which to draw conclusions

III. Client Result

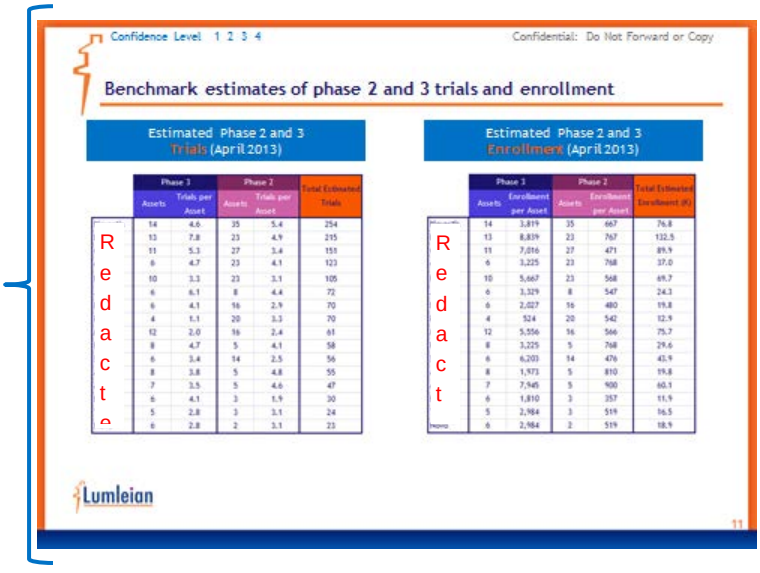
- Innovative data analysis: Client obtained answers to key questions, including:
  - —What is the average length of time for clinical development of approved drugs in the US over the past five years?
  - —Which companies progress assets through clinical trials to approval the fastest?
  - —What are the key drivers of top performers (i.e. portfolio, planning, execution)?

- Actionable deliverable: Client gained insight into how it compared to peers in clinical development, which is becoming increasingly costly and difficult to implement strategies to improve the cycle time, spend, and probability of success

IV. Engagement Summary

Evaluate Current and Historic Pipelines

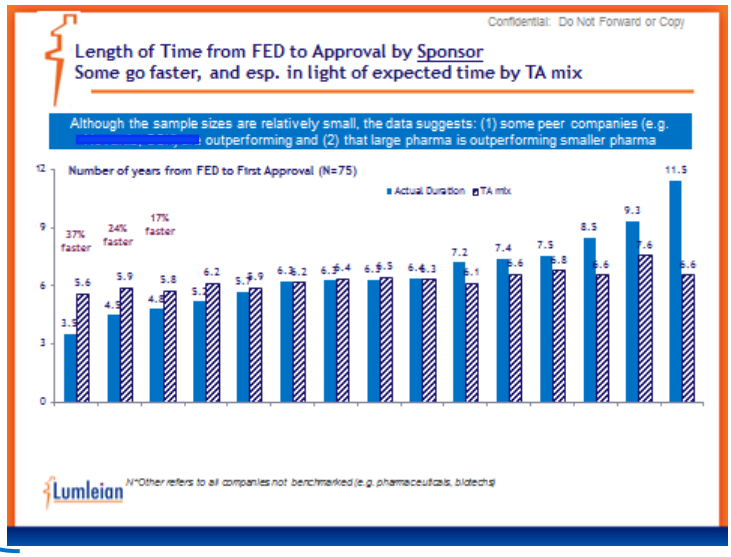
- Data mining techniques coupled with manual validation produces complete profiles of 17 top pharma pipelines and approvals:
  - — Overall pipeline strategy; e.g. therapeutic area focus, asset number, and phase distribution
  - — Clinical trial characteristics; e.g. enrollment, methodology, and duration
  - — Time to approval (cycle time) for each asset



IV. Engagement Summary

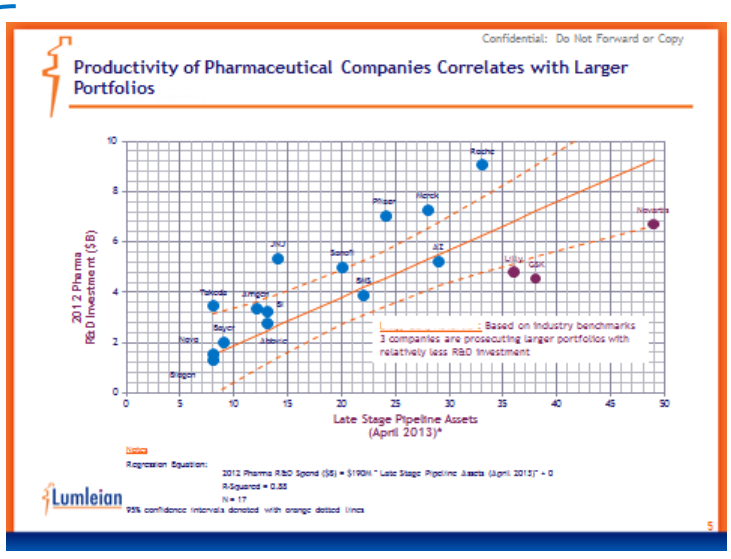
Calculate Industry Development Times

- Using data from all drug approvals since 2007, Lumleian calculated average clinical development time for the assets from each company
- Our team probed factors affecting cycle time for deeper analysis, including:
  - Therapeutic area mix
  - "White space" between trials and phases



Quantify Productivity as Correlated with Clinical Development Plans

- Productivity was calculated as the company's R&D spend per asset; additional segmentation included late stage trial and enrollment costs
- Companies were ranked according to productivity and results evaluated against corresponding development strategies



Characterize Elements of Portfolios Driving Variations in Development

- Lumleian scrutinized the current and historical clinical development strategies for each company's assets to determine factors driving efficiency and success, including:
  - Portfolio diversity
  - Targeted therapies
  - Focused "shots on goal"
  - Nontraditional trial designs