Build Data-driven R&D and Evolve our Data Science talents

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Key Messages - Deloitte Center for Health Solutions

“The reign of data is beginning, where rapid data-driven insights and automating manual processes becomes essential”
- Deloitte 2018

“Data conveners, science and insights engines, and data and platform infrastructure builders will drive the future of health for biopharma”
- Deloitte 2019

“A diverse and digitally literate workforce will be critical for the future. Data science talent will be crucial to combine and analyse data from disparate sources to accelerate drug discovery, increase trial efficiency, and support new approval pathways”
- Deloitte 2021

“Data science” History

- <1900 – Statistics
- 1960s Data Mining = bad activity, data “dredging”
- 1990 – “data mining” is good, surges in ~1996
- 2003 – “data mining” peaks (invasion of privacy?), slowly declines but still popular
- 2012 – Big Data
- 2014 – Data Science
- 2016 – Machine learning, deep learning

Data Science: Past, Present and Future by Gregory Piatetsky-Shapiro
Data Science
Contributions to Biotech-Pharma


Confirmatory Clinical Trials (CTs)
Manufacturing
Clinical Pharmacology
Data Science
Contributions to Biotech-Pharma


Confirmatory Clinical Trials (CTs)
Manufacturing Clinical Pharmacology

Discovery Research
Exploratory CTs
Clinical Practice–Relevant Data
Health Economics
Portfolio
Data Science
Contributions to Biotech-Pharma

- Confirmatory Clinical Trials (CTs)
- Clinical Pharmacology
- Manufacturing
- Discovery Research
- Exploratory CTs
- Health Economics
- Clinical Practice-Relevant Data
- Portfolio
- Post-marketing Safety
- Patient-Reported Outcomes
- Molecular (genomic, Genetic)
- Biomarkers
- Globalization
- Health Technology Assessments

Enablers for building data-driven R&D

- Build efficient clinical data pipeline (collection, transmission, curation)
- Better compliance with data and analysis standards
- Fit for purpose data visualization and review tools
- Analysis and reporting automation

- Digital platforms and access to RWD through partnerships
- Machine learning and other AI technologies to multiple data modalities to improve drug discovery
- Innovative approaches to drug development (master protocols, use RWE for regulatory decision) to cut development timeline
- Data science techniques to help design patient-centric trials
- Virtual and decentralized trials
• Build predictive/machine learning model is a key part, but only a small portion of the effort spent.

• Majority of time was actually spent on data integration and data engineering!

• “Data powers great AI” – fireside chat with Andrew Ng

https://www.youtube.com/watch?v=nIIPMmZaK-s

Critical for organization to think about Data Excellence strategy
The methodology research for using RWD/EHR continues to evolve...

https://flatiron.com/publications/
How to evolve data science talents?

- Hiring, upskilling, elevating current talents
- Strengthen the connection with the business
- Provide a framework for innovation within the organization
- Create an environment for data scientists to learn and share
How to be successful as a data scientist?

**What is Success?**

- Maximize the value/impact you can have on the company, for patients
- Increase the diversity of experiences you can choose in career

**Key Factors**

- Curiosity
- Personal motivation
- Capability to influence
The future of R&D will be data-driven.

It requires new technology, advanced analytics skills, and transformative drug development approaches.

Opportunity: In the digital era, Data Science is essential, which provides many opportunities for data scientists.

Exciting space for us to contribute and collaborate.