Randomized Control Trial (RCT) versus Trials Involving the use of Real-World Evidence (RWE)

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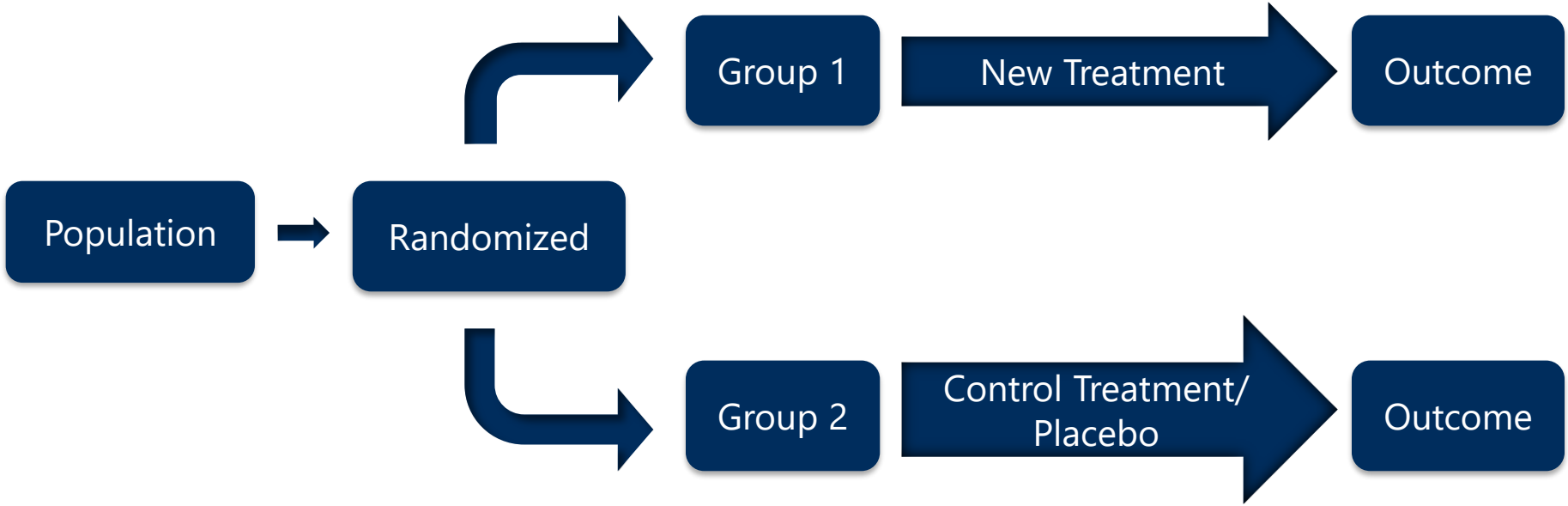
The difference is in the data.™

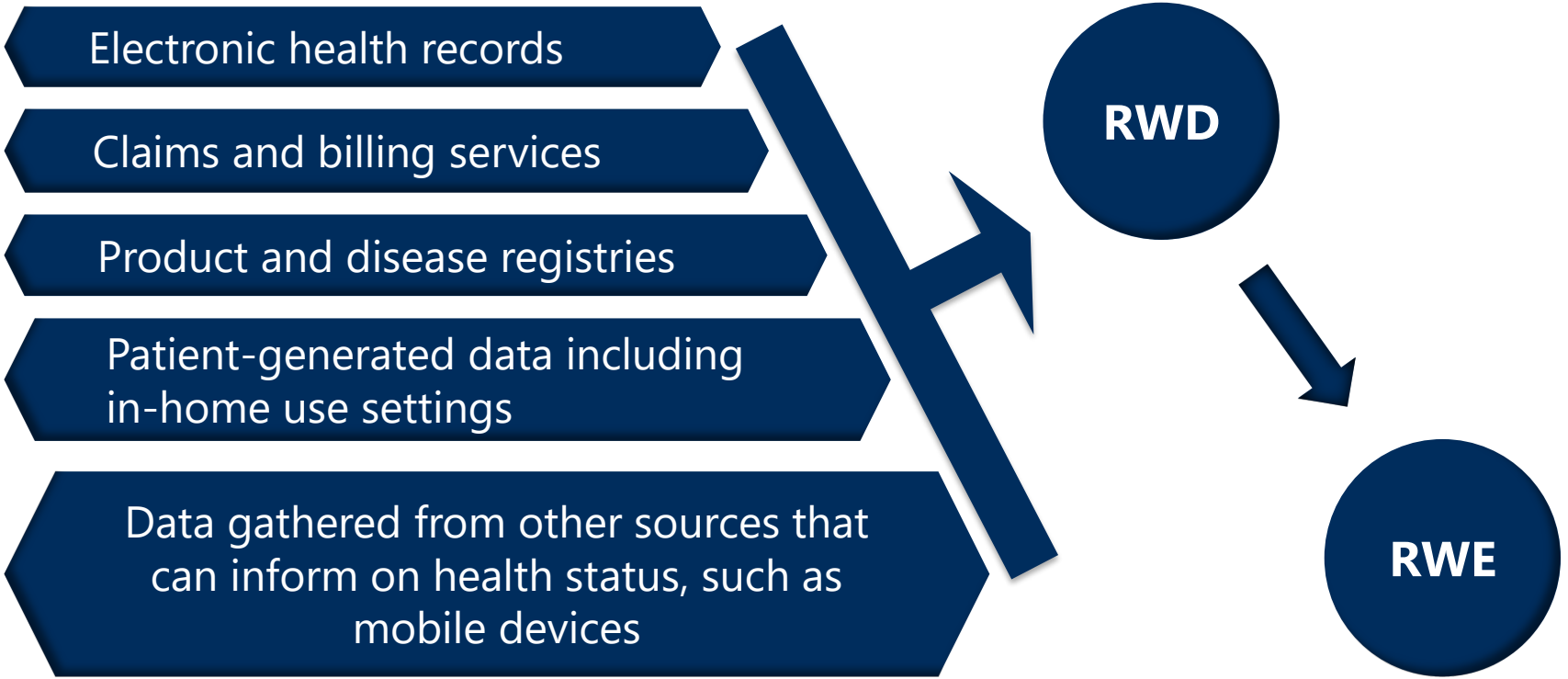
Overview

- What is a randomized control trial (RCT)
- What is Real-world evidence (RWE)
- Differences between RCT and RWE
- Communication from the FDA
- Real-world evidence (RWE) emerging use cases

Randomized control trial (RCT)



Real-world evidence (RWE)



Design

Item	RCT	RWE
Environment	Standardized environment of a clinical trial Artificial experimental treatment	Based on standard care
Population	Carefully selected population	Population based on medical practice
Conduct	Overseen by investigator	Many practitioners
Treatment Assignment	Prospective randomization	Retrospective characterization
Impact	Impacted by scientific thinking of the protocol author	Impacted by differing processes and documentation
Purpose	Assessment of safety and/or efficacy	Effectiveness

Data

Item	RCT	RWE
Data sources	Carefully designed database	Electronic health records (EHRs) Medical claims and/or billing data Product and/or disease registry data Patient-generated data including in home-use settings Data gathered from other sources that can inform on health status, such as data collected from mobile technologies, wearable's and other biosensors, social media and publicly posted data on the internet
Data structure	Structured	Structured or unstructured

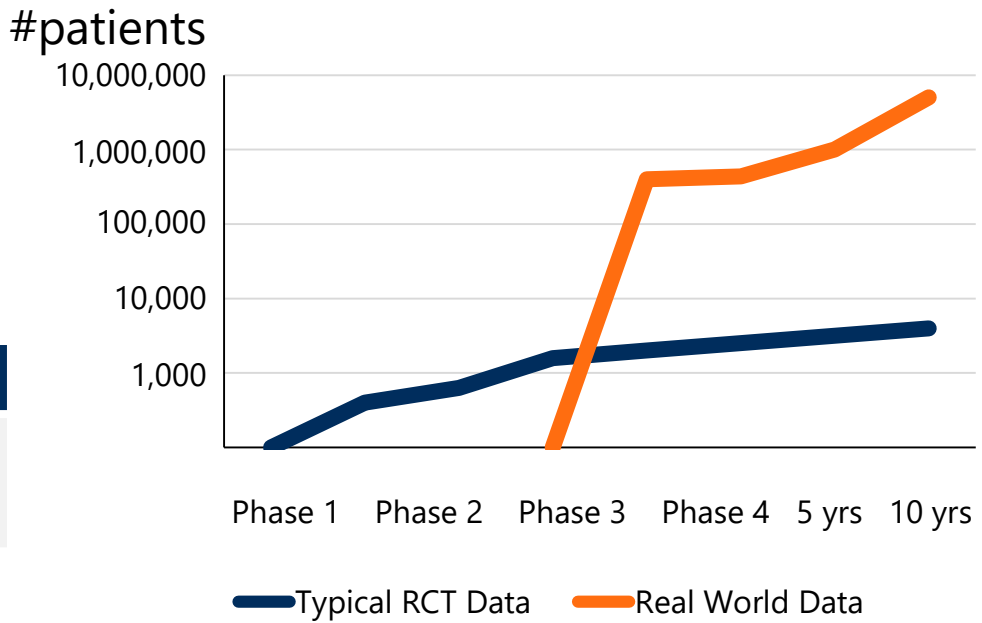
Data (Cont'd)

RCT

Average data points collected is approximately 400 000 to 1 000 000

RWE

Average number of facts in a cohort: 500 000 to 9 000 000



Reference: How Can Real-World Data Support Clinical Trials and Medical Research?

Reference: Using RWD to examine the patient journey

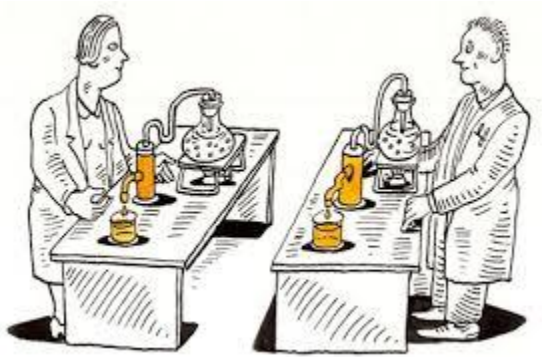
Analyses

RWD and RWE combination "fit for purpose."

Predefined Analysis Plan

Validation

RCT	RWE
Perfectly validated against the source	Uses data as is to reflect actual medical practice



Programming

Communication from FDA

- **Sentinel**
  - System containing data on more than 100 million individuals

- **FDA Framework**
  - Whether the RWD are fit for use
  - Whether the trial or study design provides adequate scientific evidence
  - Whether the study conduct meets FDA regulatory requirements

- **RCT Duplicate program**
  - Replicate the results of 30 completed RCTs
  - Predict the result of 7 additional ongoing RCTs

Real-world evidence (RWE) emerging use cases

- RWE used to establish historical controls
- Early approval then RWE post-market monitoring
- On-label RWE from another country submitted
- Medically accepted alternative-use RWE submitted for new indications
- Medically-accepted alternative-use RWE submitted for expanded populations

Conclusion

- Currently RWE cannot substitute RCT due to multiple factors
- RCT – Highest reliability
- RCT and RWE has a mutually supplementary relationship
- RWE – Can be much more cost-efficient in later phases compared to RCT
- Time in RCT versus RWE

References

- Real-world Evidence versus Randomized Controlled Trial: Clinical Research Based on Electronic Medical Records
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- How Can Real-World Data Support Clinical Trials and Medical Research?
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- Barriers and Disincentives to the Use of Real-World Evidence and Real-World Data
  https://www.ncbi.nlm.nih.gov/books/NBK540112/
- Using RWD to examine the patient journey
  https://www.slideshare.net/zhaohuicai/pathway-20-for-rwe-and-ma-2015-john-cai

Thank you!

Any questions?

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