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Real-World Data and Real-World Evidence

Supporting Clinical Decision Making

Real-world data (RWD) are the data relating to areas such as patient health status and/or the delivery of health care not collected in conventional randomized controlled trials (RCT), including sources such as electronic health records (EHRs), wearables, connected devices, medical claims data, and product, patient, and disease registries.

RCT REMAIN THE GOLD STANDARD IN ASSESSING A TREATMENT'S SAFETY AND EFFICACY

Real-world evidence (RWE) is the clinical evidence obtained from RWD, with regard to the use, potential benefits or potential risks associated with a medical product. It can be used to supplement RCT.

Trends, Applications and Challenges of Real-World Data and Real-World Evidence

Nearly **86%** **OF US OFFICE-BASED PHYSICIANS** rely on electronic health record systems (as of 2017).[1]

GROWTH IN DATA CAPTURE TOOLS

With the recent progress in technology and integrated medical records, along with the rise in remote monitoring, telehealth and wearables*, **RWD are being captured at an unprecedented volume.**[2]

ADDITIONAL INSIGHT INTO PATIENTS AND MEDICAL IMPACTS

Decentralized, pragmatic clinical trials (randomized trials including real-world elements closely resembling routine clinical practice), can generate RWE outside of controlled settings, potentially giving clinicians added information regarding medical impact.[3]

Between 2012 and 2019, the FDA has used RWE in **90+** **MEDICAL DEVICE REGULATORY DECISIONS.**[4]

INCREASED USE IN REGULATORY DECISIONS

The US Food and Drug Administration (FDA) has used RWE for medical devices and drug safety and has released a framework of its Real-World Evidence Program in 2018 to evaluate the **potential use of fit-for-purpose RWE to support certain changes to labeling for already approved drugs.****[4,5]

IMPROVED UNDERSTANDING OF PATIENT SUB-POPULATIONS

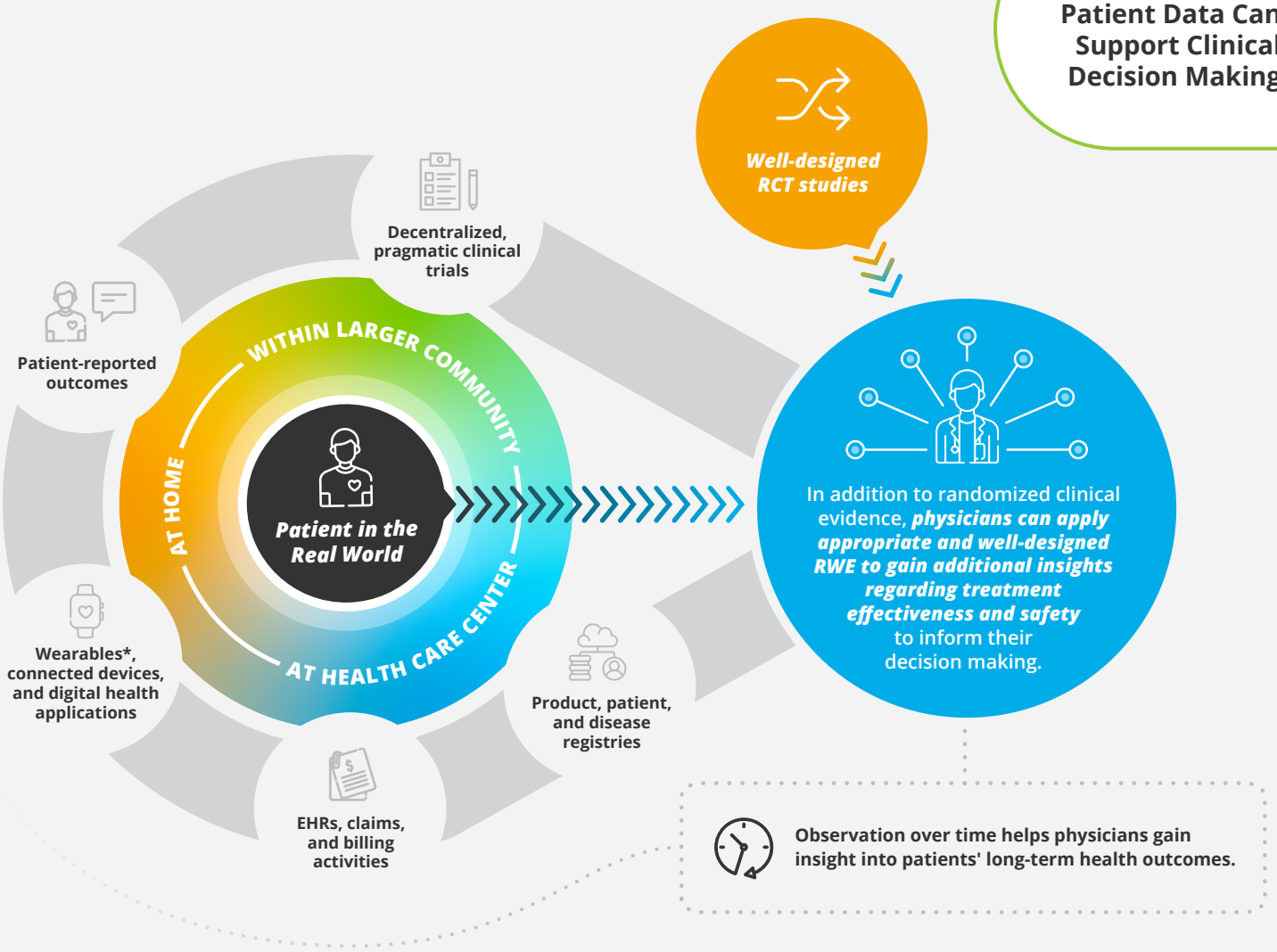
The RWE environment can allow for a **larger range of hypothesis generation and testing** across different patient populations and geographies.[6]

Real-World Data and Real-World Evidence Limitations

RWD/RWE have limitations, such as: [5,2,7,3]

- RWD/RWE analyses can only evaluate association and not causation, therefore are **answering different questions than RCTs.**
- There have been concerns related to **biases due to lack of randomization and issues of quality in data collection**, which should be closely evaluated.
- The source and type of data used may **limit the generalizability** of the results and endpoints.
- There could be **missing or incorrectly coded data** from the source.

Real-World Patient Data Can Support Clinical Decision Making



Examples of Key Questions for Evaluating Real-World Evidence Studies[8,3]

What is the quality of the data source?

Data must be vetted by experts to ensure it is 'fit-for-purpose,' containing complete and accurate information on the appropriate population.

Were appropriate statistical methods applied?

Well-designed RWD studies use appropriate statistical methods to help adjust for potential biases and to test hypotheses with sufficient sample size.

Is the analytical research approach transparently communicated?

The research design should be communicated fully and prospectively, in part to ensure that there is no 'cherry-picking' to obtain favorable results.

Is the study replicable or reproducible?

Enough data curation and study design detail should be made available publicly to allow other researchers to duplicate the study with the same or similar data.

How Real-World Evidence May Be Able to Help Address Certain Health Inequities

"Despite efforts, challenges to participation in clinical trials remain, and certain groups continue to be underrepresented in many clinical trials."

- US FOOD AND DRUG ADMINISTRATION, NOVEMBER 2020[9]

While Latinx and African American people represent 30% of the US population, they only comprise 6% of all participants in federally funded clinical trials.[10]

Underrepresentation in clinical trials can leave clinicians without enough information to make treatment decisions for patients from underrepresented groups.

Appropriate and well-designed RWE has the potential to fill knowledge gaps by offering access to broader, more representative findings, which physicians can use to inform treatment decisions for their patients.[11]

UNDERREPRESENTED GROUPS INCLUDE: [12-14]

- Socioeconomically disadvantaged patients
- Racial and ethnic minorities
- The elderly

***Not all wearable device data are robust and accurate; there is an increased need for sound and reliable publications supporting wearables to collect RWD.**

**** Regarding drug submissions, the FDA has primarily used RWD in its evaluation of drug safety and only in limited circumstances to inform decisions regarding drug effectiveness. Per the 2018 FDA Framework for its Real-World Evidence Program, the program will "evaluate the potential use of RWE to support changes to labeling about drug product effectiveness, including adding or modifying an indication, such as a change in dose, dose regimen, or route of administration; adding a new population; or adding comparative effectiveness or safety information."**[5]

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