



Leveraging decentralized clinical trial strategies to reduce health care disparities

Authors

Jennifer Urwongse, MBA, director, decentralized clinical trial strategy and innovation,
PPD clinical research business of Thermo Fisher Scientific

Despite an increasing understanding that therapeutics can, and commonly do, have different efficacy and safety profiles for patients of disparate backgrounds, minority populations remain significantly underrepresented in today’s clinical trials.

According to an estimate by the [National Institutes of Health \(NIH\)](#), 75% of clinical trial participants for novel drugs approved in 2020 were white. However, the [2020 census and subsequent projections](#) reveal that only 60% of the overall population is white, with the remaining 40% having heritage in whole or in part in something other than white-European.

These imbalances must be amended, and, fortunately, the U.S. Food and Drug Administration (FDA) has experience rectifying them. For example, the effort to reverse the long history of systemic underrepresentation of cisgender women in clinical research resulted in a [1993 reversal of previous guidance](#) that banned women of childbearing age from participating in early-phase research. Although it took 23 years, cisgender women represented a majority of the U.S. clinical trial patient population by 2016.

While considerable gender-based inclusion progress has been made, per Figure 1, patients of minority ethnic populations remain considerably underrepresented in today’s clinical research. Additionally, despite approximately 1.6 million Americans identifying as transgender or nonbinary, [less than 1%](#) of clinical trials in the United States include patients from these populations.

Figure 1: U.S. Minority Population vs. Minority Clinical Trial Population (2020)

U.S. Minority Population vs. Minority Clinical Trial Population (2020)			
Percent of Overall Population		Percent of Clinical Trial Population	
Black	14%	Black	8%
Asian	7%	Asian	6%
Hispanic	19%	Hispanic	11%

Source: [Contemporary Clinical Trials](#)

This lack of representative inclusion negatively impacts public health, as ethnic origin can profoundly influence the likely response to a given therapeutic. Polymorphisms, or gene structure differences, [may influence a drug’s action](#) by altering its pharmacokinetic properties like absorption, distribution, metabolism and excretion.

For instance, studies have demonstrated a range of responses to the blood pressure-lowering effects of β -blockers and ACE inhibitors. Evidence points to common genetic drug metabolism, drug target and disease pathway polymorphisms that impact conditions ranging from cancers and neurological and cardiovascular diseases to mood disorders.

To successfully treat and/or prevent disease states, clinical trial patient populations must accurately reflect the population inflicted with the condition. Ultimately, diversity in clinical trials is fundamental to reducing disparities and increasing access to effective health care.

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Root causes of underrepresentation in clinical research

While the causes of minority population underrepresentation in clinical trials are numerous and complex, there are identifiable themes, including;

- Mistrust in clinical studies or the medical system due to historical and modern mistreatment,
- Misunderstanding of the benefits of clinical trial participation,
- Cultural and/or language barriers,
- Lack of awareness of available trials, and
- Access challenges based on geography, socioeconomic status and required time commitments.

Population segments can also be omitted due to a trial’s inclusion and exclusion criteria. For example, patients with cognitive and physical disabilities, people living with HIV or hepatitis, or patients managing ranging comorbidities can be inadvertently excluded, resulting in the trial’s population not accurately reflecting the therapeutic’s ultimate target patient population.

New clinical trial diversity regulatory framework

In April 2022, the FDA issued a draft guidance to improve clinical trial enrollment of participants from underrepresented racial and ethnic populations. Commonly referred to as the Diversity Plan, this guidance is a framework for establishing clinical trial patient populations reflective of the therapeutic's target patient population.

The Diversity Plan prioritizes racial and ethnic diversity while promoting inclusion of other underrepresented relevant populations, including sex, gender identity, age, socioeconomic status, disability, pregnancy and lactation status, and comorbidities. Designing clinical trials within the Diversity Plan framework requires a thorough characterization of the epidemiology of the disease, including its prevalence among minority populations and subgroups, to proactively achieve representative inclusion.

While the Diversity Plan guidance is expected to be finalized in 2024, the Consolidated Appropriations Act, a 2023 omnibus appropriations bill, included several provisions intended to promote diversity in clinical trial enrollment, encourage the growth of decentralized clinical trials (DCTs) and streamline clinical trials. Specifically, the act instructed the FDA to require diversity plans for all Phase III clinical trials conducted for drugs, biologics, devices and diagnostics that use the 510(k), premarket approval (PMA), *de novo*, and investigational device exemption (IDE) pathways.

While the legislation does include some exceptions, the mandate for clinical trial diversity is now a statutory requirement, and the industry is already leveraging the FDA's Diversity Plan as a compliance framework.

Decentralized solutions enable diversity

Because [seven of 10 potential patients](#) live more than two hours from clinical trial sites, conducting relevant studies requires new strategies and tactics to design clinical trials that include representative patient populations.

DCTs lift geographic barriers, allowing clinical research teams to expand their reach and engage diverse patient populations, many members of which could not practically participate in traditional, brick-and-mortar-only clinical trials.

In addition to geographic barriers, traditional clinical trial constructs lack flexibility around data collection options, further challenging the ability to assemble diverse patient populations. Conversely, DCTs are highly flexible and can include digital technology and decentralized services that reduce patient burden.

The COVID-19 pandemic dramatically accelerated the adoption of such constructs. During the pandemic, sponsors and investigators were forced to seek remote trial solutions to support patients while traditional sites were closed. Decentralized solutions proved to sponsors, investigators, regulatory authorities and patients that clinical trials could be designed to be much more flexible, resilient and patient-centric while still collecting high-quality data. Patients and health care professionals became much more comfortable using digital technologies such as televisit platforms, which facilitate flexibility while maintaining the patient/clinician relationship.

Near-patient solutions include options like home health care visits or leveraging community pharmacies for blood draws, medication administration and other study requirements. Virtual sites harness digital technology and home health care providers or other remote site solutions, with patient safety and oversight maintained by a virtual principal investigator (PI), allowing patients to participate in trials without ever visiting a brick-and-mortar site. Mobile sites might be effectively deployed if a target patient population is geographically concentrated but far from traditional clinical sites. For example, for a study exploring treatment for an occupation-related condition, a mobile site might be stationed in a large employer's parking lot, permitting clinical trial participants to schedule their site visits directly before or after work, during their lunch break, or at another convenient time.



Patient and site centricity — designing fit-for-purpose DCT strategies

A well-designed clinical trial keeps the patient's experience at the forefront. For DCT strategies to decrease patient burden and increase patient access and awareness from diverse communities, multiple factors must be considered, including;

- Therapeutic indication,
- Study visitation requirements,
- Patient population characteristics and their unique challenges,
- Patient (and caregiver) burden,
- Geographic constraints, and
- Regulatory considerations.

Offering patients flexible study participation options makes trials more attractive and minimizes the risk of patient dropout.

Clinical site personnel are also critical partners when designing, deploying and utilizing DCT solutions. The DCT landscape is multifaceted and continues to evolve rapidly. To successfully deploy a decentralized strategy, it is critical to ensure site personnel are thoroughly trained and supported. Therefore, digital and DCT services must be cohesively aligned with comprehensive and easy-to-follow documentation and processes to ensure quality of delivery, all without becoming a burden to the sites and their patients.

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Sites should provide feedback to help inform ongoing digital and DCT adoption, improvement and optimization efforts. Finally, regulatory requirements and operational norms in each market must be thoroughly considered and incorporated into trial designs.

Fortunately, DCT innovations offer ever-increasing possibilities, including patient and site-facing technology, wearables/sensors, eSource, predictive patient behavior and risk applications, medication adherence solutions and direct-to-patient solutions. Additionally, today's digital platforms commonly offer device flexibility, allowing patients to choose whether to use their own or a provisioned device.

A patient's comfort with digital technologies is another factor. However, well-designed application and device interfaces, comprehensive training and site-level assistance can ensure patients are comfortable and comply with study requirements.

Even screening for potential participants can often be done in manners that are convenient for patients and efficient and cost-effective for the trial's sponsor. For example, potential patients could be sent micro-sampling devices to collect blood samples at home and ship them back to the lab for testing as part of a clinical trial's eligibility screening process. In addition to offering convenience and cost savings, this decentralized approach reduces emissions generated by patients and clinicians traveling to and from sites within large screening studies.

DCTs' contribution to cost and quality management

As it became clear that the FDA and the U.S. Congress would require diversity mandates, the industry began expressing concerns about increasing the already staggering costs of clinical trial execution. Fortunately, DCT solutions help sponsors comply with the new regulations and meaningfully contribute to controlling three huge cost centers—patient recruitment, screening and retention, and quality management.

Remote clinical trial participation options greatly reduce the patient burden, making it easier for individuals with demanding schedules and responsibilities to participate in the entire trial. Specifically, DCT solutions can achieve a [30–50% reduction in recruitment timelines](#) and up to [90% patient retention rates, according to Deloitte](#).

Providing a more concrete picture of the return on DCT investment, a recently released [Tufts University](#) study identified a 400% return on investment (ROI) for Phase II and a 1,200% ROI for Phase III trials. In line with Deloitte's findings, the cost savings come primarily from reduced timelines, improved patient screening and enrollment, improved patient retention and fewer protocol amendments over a trial's life.

Finally, DCT solutions contribute extensively to clinical studies' high data quality standards. Wearable technologies, for instance, collect direct data streams passively and are not susceptible to input errors. Electronic questionnaires are programmed with skip logic and data checks, avoiding the risk of missing, inconsistent or abnormal values. Electronic data collection also minimizes site burden and eliminates the risk of manual transcription error, as completed electronic questionnaires can be automatically connected and uploaded to clinical trial data management systems.

Achieving patient diversity objectives with DCT solutions

The PPD™ clinical research business of Thermo Fisher Scientific is at the forefront of modernizing research by applying decentralized innovation to achieve trial diversity, data quality, timeline and budget objectives. Exploring the roles of decentralized solutions in the overall study is critical at the start of the protocol and study design planning process to align trial and patient diversity goals.

Figure 2: Our decentralized ecosystem



Our DCT ecosystem is a comprehensive collection of technology, people, partnerships, services and resources that support the modernization of clinical trials and their execution. The DCT ecosystem provides unique, solution-agnostic innovation centered around four core objectives:

1. Increasing patient diversity
2. Reducing patient burden
3. Improving patient access
4. Advancing clinical trial sustainability

To achieve these objectives, we make ongoing investments in developing internal operational capabilities, integrating external businesses focused on patients and sites and investing in innovative DCT trial platforms and service providers, all in manners that directly align with global regulatory guidance. The DCT ecosystem is dynamic as the business continually

assesses the DCT landscape for new technologies and innovations to offer. All DCT partners in the ecosystem have been pre-validated, saving sponsors time and resources.

Developing effective DCT strategies starts with DCT consultants, subject matter experts who apply the best fit-for-purpose decentralized solutions individually tailored for each trial. Sponsors can rely on our DCT expertise across our prolific and dynamic vendor-agnostic technology and service partner portfolio to ensure the right solution is delivered at the right time based on the trial's needs and diversity goals.

DCT operational oversight is the final critical piece of the ecosystem. Depending on the DCT strategy employed, we provide digital and decentralized subject matter experts who help guide and oversee the DCT implementation and operationalization, ensuring the overall success and alignment of the DCT services with the study team. Additionally, in collaboration with the Society for Clinical Research Sites, we developed our DCT network, an online DCT certification training program to ensure investigators and sites are properly trained on DCT operational execution.

The future is diverse

The pharmaceutical industry and regulators are working together to address the problem of underrepresentation in clinical trials because, with adequately diverse clinical study populations, sponsors have a better understanding of the safety and efficacy of the drugs they are developing across different population subgroups.

As a leading DCT pioneer and innovator, we are dedicated to leveraging our DCT expertise to modernize clinical trials, including utilizing our extensive decentralized clinical expertise to support the assembly of representative clinical trial patient populations, enhancing equality in the health care system and helping sponsors comply with evolving regulatory diversity requirements.

To further explore opportunities for sponsors to harness DCT strategies to overcome barriers to clinical trial participation and create more inclusive clinical trials, please see the on-demand webinar, ["Clinical Trial Diversity: Harnessing the Power of Technology for More Inclusive Studies."](#)

