PPD[®]

DECENTRALIZED CLINICAL TRIALS SURVEY REPORT

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1. Introduction

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This survey was conducted in 2020 among companies that outsource clinical research services or operations to contract research organizations (CROs). The objectives of the study were to gain current insights into the status of trends in the clinical trials market, including the threat to trials, patients and data presented by the global progression of the COVID-19 pandemic. The data also covers how existing trends are being accelerated by the need to sustain trials, and new strategies and regulatory measures that have been employed since news of the SARS-CoV-2 virus broke in early 2020.

Demographics

The research study was global in scope, with 60% of respondents working in North America, 30% in Europe and 10% in Asia-Pacific. It reflects a mix of large pharma/biopharma, mid-size pharma/biopharma, and small pharma/biopharma, with some weighting towards the large and small categories. Respondents mainly work in clinical operations or management, or clinical trials development, and over 90% of them are in C-suite or Director-level roles. The same high proportion have more than 10 years of experience – representing a respondent panel of high relevance and strong data integrity.

A large percentage of the full survey demographic represents a company that is active in outsourcing clinical research services or operations to CROs, and over three quarters of respondents are directly involved in decision-making relating to that process.

Therapeutic Areas Represented

1.	Oncology & Hematology	8.
2.	Rare Diseases	9.
3.	Immunology & Rheumatology	10.
4.	Neuroscience	11.
5.	Infectious Disease	12.
6.	Respiratory	13.
7.	Vaccines	14.

Cardiovascular Metabolic & Endocrine Gastroenterology Women's Health

- Critical Care
- Pediatrics Urology

Trends: COVID-19 Pandemic, Decentralized Clinical Trials and Digital Solutions

Questions in the study generated insights on the impact of the COVID-19 pandemic on clinical trials globally – namely concerns over delays, interruptions and continuity; patient enrollment / retention; site operations / capacity; supply chain interruptions; patient safety and access; and regulatory changes.

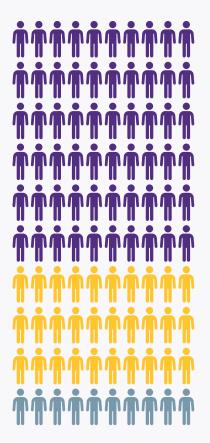
Mitigation strategies are also covered, as is data on the extent to which decentralized trials were already a growing trend in the clinical trials market, and how much the COVID-19 pandemic will alter or accelerate that trend. The depth of implementation of flexible protocols, direct-to-patient services, and digital solutions is also explored.

2. Demographics

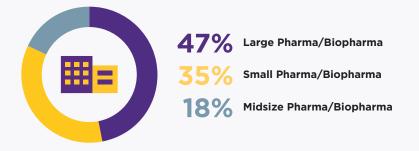
2. Demographics

2.1 Survey of Participant's Regional Location





2.2 Survey of Participant's Organization Type



2.3 Survey of Participant's Department



2.4 Survey of Participant's Job Title



2. Demographics

2.5 Survey of Participant's Industry Experience





2.6 Relationship with CRO

Survey Participant's Company's Relationship with Contract Research Organizations (CROs)

2.7 Influence with CRO

Survey Participant's Influence in the CRO **Selection Process**





My company currently outsources clinical research services or operations to contract research organizations (CROs).

4%

My company does not currently outsource clinical research services or operations, but is in the process of evaluating CROs - likely to need within the next 24 months.





78% I am part of the decision-making unit that selects the CROs.

I am part of a team that establishes 16% criteria / makes recommendations on the selection of CROs.

6% I supervise or coordinate with CROs.

2. Demographics

2.8 Therapeutic Focus of Drug Pipeline

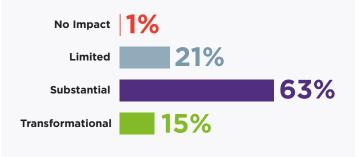
Survey Participant's Ongoing Clinical Trials' Therapeutic Focus

Oncology & Hematology		Rare Diseases	Immunology & Rheumatology
64%		45%	34%
Neuroscience	Infectious Disease	Respiratory	Vaccine Development
27%	24%	23%	23%
Cardiovascular	Metabolic & Endocrine	Gastroenterology	Ophthalmology
21%	15%	13%	13%
Women's Health	Critical Care	Pediatrics	Urology
13%	10%	8%	5%

3. COVID-19 Impact and Mitigation

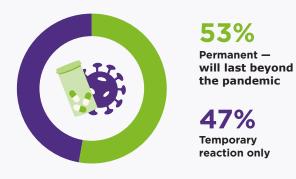
3.1 Covid-19 Impact on Ongoing Trials

How has the current COVID-19 crisis impacted your ongoing clinical trials?



3.2 Impact Timeline

Do you anticipate the COVID-19 impact your clinical trials to be permanent or temporary?



3.3 Covid-19 Impact on Ongoing Trials

What are the most impacted areas of clinical trial operations caused by COVID-19?

Patients' ability to visit investigator site(s)	Operating capacity at sites	On-site monitoring access	Recruitment and retention
57%	35%	32%	28%
Obtaining patient consent or reconsenting	Clinical supply chain interruptions	Data collection and quality	Regional regulatory hurdles
17%	16%	14%	6%

Percentages in the above chart represents the top 2 boxes of the impact scale

3.4 Most Concerning Aspect of COVID-19 Impact

Looking ahead, what are the most concerning aspects of the Covid-19 Impact?

- 1 Trial delays, interruptions and continuity
- **2** Patient enrollment and retention
- B Limited site operating capacity
- Patient safety and access
- **5** Clinical supply chain interruptions
- 6 Endpoint collection and data quality
- Obtaining patient consent
- 8 Regulatory changes

Ranked First

Mean Rank



Percentages in the above chart represents the top 2 boxes of the impact scale

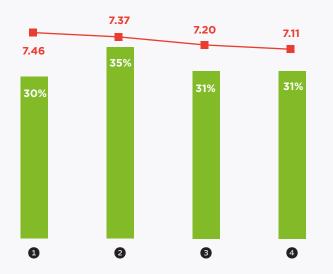
3.5 COVID-19 Regional Impact

How have your clinical operations been impacted by the pandemic across different regions?

- 1 Trials in North America
- 2 Trials in EMEA
- **3** Trials in Asia-Pacific
- **4** Trials in rest of world

T2B Most Impact

🗕 Mean



Percentages in the above chart represents the top 2 boxes of the impact scale

3.6 Therapeutic Areas Impacted — Ranked

Within your current pipeline, which therapeutic area(s) have been impacted the most?

Oncology & Hematology		Rare Diseases	Immunology & Rheumatology
Rank #1		#2	#3
Mean Rank: 2.1 (*n=64)		2.6 (*n=45)	2.7 (*n=34)
Vaccine Development	Respiratory	Ophthalmology	Neuroscience
#3	#4	#5	#6
2.7 (*n=23)	2.9 (*n=23)	3.0 (*n=13)	3.3 (*n=27)
Infectious Disease	Gastroenterology	Women's Health	Metabolic & Endocrine
#7	#8	#9	#9
3.5 (*n=24)	3.8 (*n=13)	4.2 (*n=13)	4.2 (*n=15)
Cardiovascular	Critical Care	Pediatrics	Urology
#9	#10	#11	#12
4.2 (*n=21)	4.5 (*n=10)	4.9 (*n=8)	5.8 (*n=5)

*n indicates the sample size

3.7 Mitigation Strategies Implemented

To mitigate the impact of the pandemic, what are some of the technologies or strategies being implemented or planned by your organization?

Remote site visits/ monitoring	Risk assessments and mitigation plans	Reduced site visits	Replacing paper with digital clinical outcome assessments
69%	66%	60%	54%
Virtual pre-site selection visit	Ensure remote eConsent is available	Amending existing SOPs and alliance agreements	Remote safety lab collections
51%	49%	47%	42%
Remote EMR Access	Deferring trials	Setting up home health care options for patients	Creating flexible protocols to incorporate decentralized/ hybrid trials
39%	35%	32%	32%
Avoiding immune- compromised regimens	Establishing direct-to- patient (DTP) options for patients	Shifting trials to other locations/ sites	Reduced number of sites
27%	26%	23%	23%

3.8 Mitigation Strategies Initiated Not Implemented

To mitigate the impact of the pandemic, what are some of the technologies or strategies being implemented or planned by your organization?

Setting up home health care options for patients	Establishing direct- to-patient (DTP) options for patients	Creating flexible protocols to incorporate decentralized/hybrid trials	Remote safety lab collections
27%	27%	26%	25%
Shifting trials to other locations/ sites	Remote EMR Access	Amending existing SOPs and alliance agreements	Virtual pre-site selection visit
24%	24%	24%	23%
Replacing paper with digital clinical outcome assessments	Risk assessments and mitigation plans	Reduced number of sites	Deferring trials
23%	22%	19%	18%
Ensure remote eConsent is available	Remote site visits/ monitoring	Reduced site visits	Avoiding immune- compromised regimens
16%	16%	15%	12%

3.9 Mitigation Strategies Planned But Not Initiated

To mitigate the impact of the pandemic, what are some of the technologies or strategies being implemented or planned by your organization?

Creating flexible protocols to incorporate decentralized/hybrid trials	Establishing direct- to-patient (DTP) options for patients	Setting up home health care options for patients	Reduced number of sites
28%	24%	23%	21%
Shifting trials to other locations/ sites	Virtual pre-site selection visit	Avoiding immune- compromised regimens	Remote EMR Access
21%	21%	20%	20%
Ensure remote eConsent is available	Reduced site visits	Remote safety lab collections	Replacing paper with digital clinical outcome assessments
20%	20%	3%	13%
Amending existing SOPs and alliance agreements	Risk assessments and mitigation plans	Deferring trials	Remote site visits/ monitoring
12%	12%	10%	10%

3.10 Mitigation Strategies Not Planned

To mitigate the impact of the pandemic, what are some of the technologies or strategies being implemented or planned by your organization?

Avoiding immune- compromised regimens	Reduced number of sites	Deferring trials	Shifting trials to other locations/sites
41%	37%	37%	32%
Establishing direct- to-patient (DTP) options for patients	Remote safety lab collections	Setting up home health care options for patients	Remote EMR Access
24%	20%	18%	17%
Amending existing SOPs and alliance agreements	Ensure remote eConsent is available	Creating flexible protocols to incorporate decentralized/ hybrid trials	Replacing paper with digital clinical outcome assessments
17%	15%	14%	10%
Virtual pre-site selection visit	Reduced site visits	Remote site visits/ monitoring	Risk assessments and mitigation plans
5%	5%	5%	0%

3.11 Importance of Mitigation Strategies

Importance of your clinical trials pandemic mitigation strategies.

Remote site visits/ monitoring	Risk assessments and mitigation plans	Creating flexible protocols to incorporate decentralized/hybrid trials	Reduced site visits
Rank #1	#2	#3	#4
Mean Rank: 5.28 (*n=95)	5.31 (*n=100)	6.24 (*n=86)	6.64 (*n=95)
Setting up home health options for patients	Ensure remote eConsent is available	Establishing direct- to-patient (DTP) options for patients	Virtual pre-site selection visit
#5	#6	#7	#8
7.09 (*n=82)	7.16 (*n=85)	7.17 (*n=76)	7.26 (*n=95)
Replacing paper clinical outcome assessments with digital ones	Amending existing SOPs and alliance agreements	Remote EMR Access	Remote safety lab collections
#9	#10	#11	#12
7.56 (*n=90)	7.95 (*n=83)	8.00 (*n=83)	8.31 (*n=80)
Shifting trials to other locations/ sites	Avoiding immune- compromised regimens	Reduced number of sites	Deferring trials
#13	#14	#15	#16
8.45 (*n=68)	8.66 (*n=59)	9.01 (*n=63)	9.73 (*n=63)

*n indicates the sample size

4. Decentralized Trials Implementation

4.1 Average Implementation Time

On average, how long has it taken for your organization to implement a hybrid or decentralized trial (i.e., from protocol redesign to first patient TeleVisit)?

7.5 Months

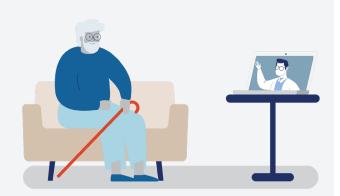


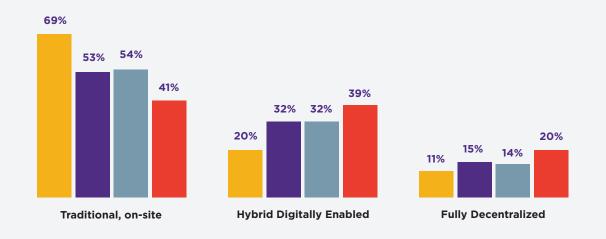
The average number from 100 respondents

4.2 Type of Trials 2019-2021

Of the clinical trials sponsored by your company from 2019-2021, please indicate the breakdown of trials (in percentages) - onsite, decentralized, or hybrid?

2019	Pandemic ends in Q4 2020
2020 H1	Pandemic continues in Q1 2021

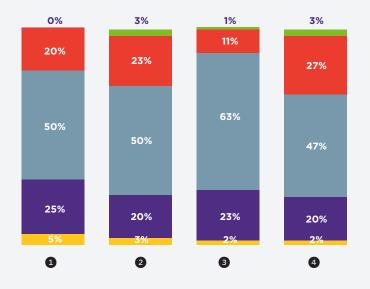




4.3 Expectations with Decentralized Trials

Rate how decentralized trials and tools have helped meet expectations for your organization?

- 1 Increase patient access and diversity
- 2 Reduce study footprint (less sites & countries)
- 8 Reduce burden for patient participation
- Accelerate timelines
- Greatly Exceed
- Exceed
- Matched
- Less than
- Much Less than



4.4 Decentralized Trials Benefits

What would you consider to be the primary benefit your organization has seen from its decentralized trials?

Limited trial interruption with decentralized design	Added convenience and comfort for patients	Reduced operational cost of conducting clinical trials	Faster recruitment and enrollment
19%	18%	16%	11%
Increased access for patients	Real-time data and monitoring	Stronger patient retention	Increased patient diversity
11%	10%	7%	7%

4.5 Data Quality & Quantity: DCT VS Traditional

Do you think decentralized trials can have at least the same [or higher] level of data quality and quantity when compared to traditional trials?





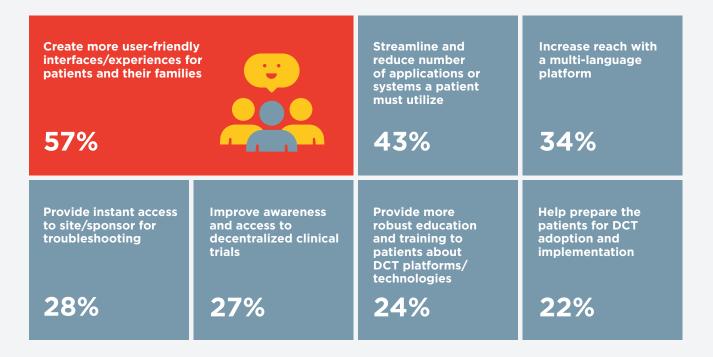
4.6 Research Improvements for DCTs

What would you improve or change about decentralized trial solutions to make them more effective for each of the categories below?

Create more user- friendly interfaces/ experiences for investigator sites	Provide more robust education and training to the clinicians about DCT platforms/ technologies	Reduce the cost of conducting clinical trials	Improve quality of study data
44%	32%	31%	28%
Provide better regulatory support	Help prepare the sites for DCT adoption and implementation	Increase reach with a multi-language platform	Provide the entire spectrum of digital services
26%	25%	24%	23%

4.7 Patient Experience Improvements for DCTs

What would you improve or change about decentralized trial solutions to improve patient experience?



4.8 Alternate Options Considered Prior to DCT

Before opting for a decentralized trial, what other options did you consider to mitigate challenges stemming from the pandemic?



4.9 Clinical Trial Type for Therapeutic Area

Rank of type of Clinical Trial Design for Therapeutic Areas

- Traditional Hybrid DCT Full DCT

Ophthalmology	(n=13)*	72%			14%	14%
Gastroenterology	(n=13)*	67%			20%	13%
Pediatrics	(n=8)	67%			19%	14%
Neuroscience	(n=27)*	63%		24	4%	13%
Rare Diseases	(n=45)*	62%		23	%	15%
Oncology & Hematology	(n=64)*	61%		25%	%	14%
Metabolic & Endocrine	(n=15)*	60%		29%		11%
Infectious Disease	(n=24)*	60%		25%		15%
Immunology & Rheumatology	(n=34)*	59%		28%		13%
Vaccine Development	(n=23)*	59%		24%		17%
Respiratory	(n=23)*	58%		23%		19%
Cardiovascular	(n=21)*	57%		27%		16%
Critical Care	(n=10)*	52%	31%	31%		17%
Women's Health	(n=13)*	48%	34%	34%		18%
Urology	(n=5)*	43%	37%			20%

*n indicates the sample size

4.10 CRO DCT Evaluation Factors

Importance of the following attributes when evaluating the hybrid or decentralized solutions offered by CROs.

Delivery Timelines	9	Quality Compliance		
70%		70%		
Experience (operational, methodological, therapeutic)		Responsiveness & support	Regulatory intelligence	
67%		64%	48%	
Cost	Global reach	Advanced or state-of-the-art DCT options	One stop shop — provides complete spectrum of services	
44%	34%	31%	31%	
Cultural fit with the CRO	Key partnerships I can leverage	CRO's industry reputation	Size and structure of CRO	
28%	28%	26%	14%	

5. Technologies in Clinical Trials

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5.1 Technologies, Tools and Platforms for Trials

Percentage of respondents rated the following strategies, tools, and platforms as having the most positive impact on trial performance.

Remote monitoring		Electronic clinical outcome assessments (eCOA)		
48%		45%		
Remote eConsent	Televisits	Home health care nurses and aid	Direct-to-patient (DTP) and direct- from-patient Services (DFP)	
42%	41%	37%	35%	
Communication gateways	eSource solutions	Decentralized trial platforms	Devices/Wearables	
35%	34%	34%	31%	

Percentages in the above chart represents the top 2 boxes of the impact scale

5. Technologies in Clinical Trials

5.2 Work with Tech Solution Providers

Do you work directly with tech, software or clinical trial platform companies to improve or digitize aspects of your clinical trials operations?





5.3 Try New Solution Platform with Trial

If you were given access to try a new feature, product or platform with your trial, would you be willing to test it?





6. Feedback on Decentralized Trials

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6.1 The top 10 most common responses regarding Decentralized Trials: Clinicians

- 1 Education and training are essential especially for older patients
- 2 Efficiency improvement, less time consuming
- 3 Excitement about advanced technology
- 4 Convenience for mitigate pandemic situation
- 5 Regulatory support need data and information privacy control
- 6 Compliance involvement
- 7 Cost concerning household and recruitment
- 8 Complexities, prefer face to face-to-face traditional sites
- 9 Time to get used to new processes
- 10 Others include regulators like FDA's approval on digital trials, quality concerns, etc.



6.2 The top 10 most common responses regarding Decentralized Trials: Patients

- 1 Patients' big willingness of adoption and excitement about new experiences
- 2 Efficiency improvement, less time consuming
- 3 Education and training are essential for older adults
- 4 Easy to access, more directly in the process
- 5 Take time to get used to the new process
- 6 Regulatory support need data and information privacy control
- 7 Time to get used to new processes
- 8 Requirement on patient-friendly interface
- 9 Complicated and challenging to participate
- 10 Others include cost saving, traditional site preference, etc.

