ACRO

RBQM Landscape Summary Report

June 2025

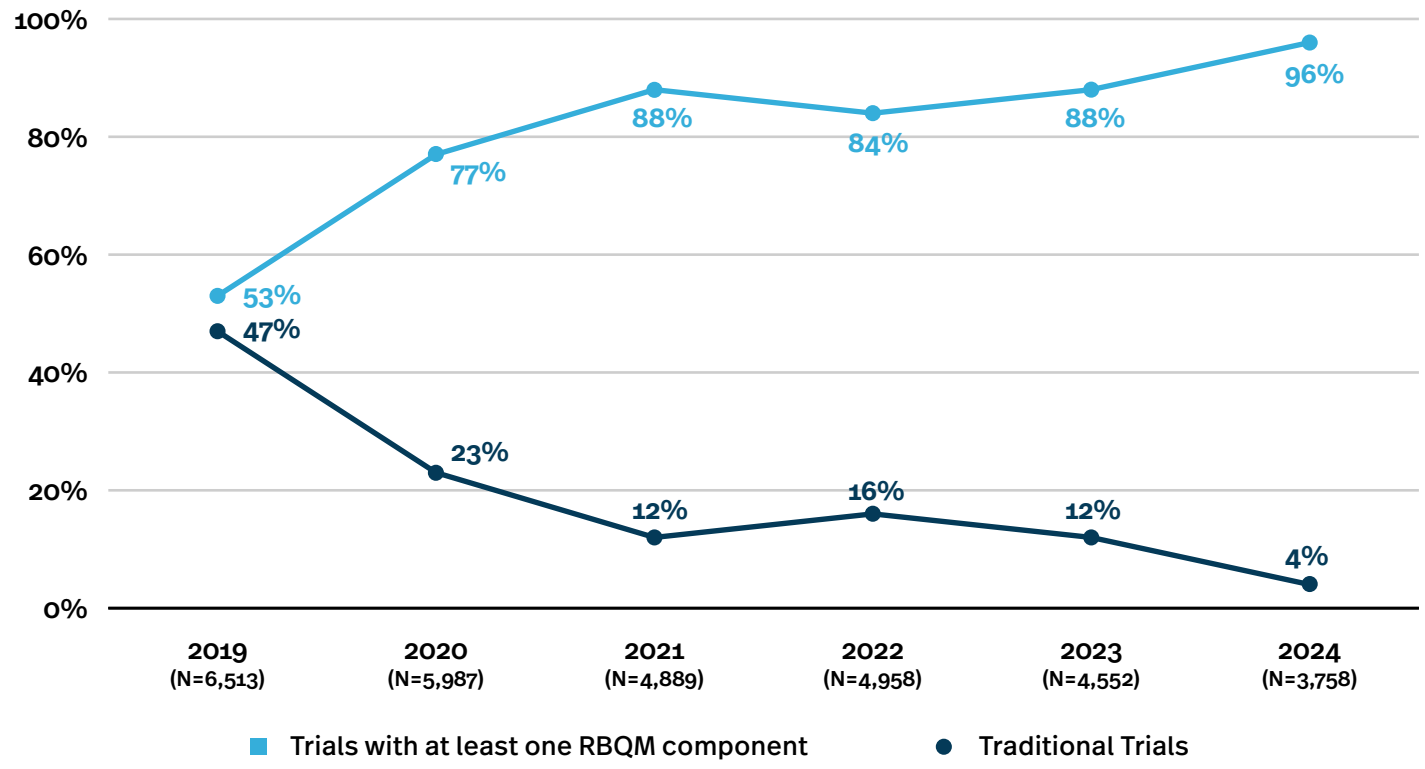
Overview of Trials in the Survey & Adoption Over Time:

In early 2025, ACRO conducted the sixth consecutive year of its annual landscape survey, and this report highlights key findings. The aim of the survey is to evaluate ACRO member companies' adoption of risk-based monitoring to better understand how the larger framework of risk-based quality management (RBQM) and risk-based monitoring (RBM) is being adopted across the clinical trial industry. Regulatory agencies such as the FDA and EMA have publicly stated that risk-based approaches are the most effective and efficient monitoring methods and have recommended that sponsors use an "end-to-end" risk-based approach in their study planning.

In 2024, 96% of clinical trials had at least one RBM or RBQM component included, a massive improvement from 2019, when this figure was only 53%.

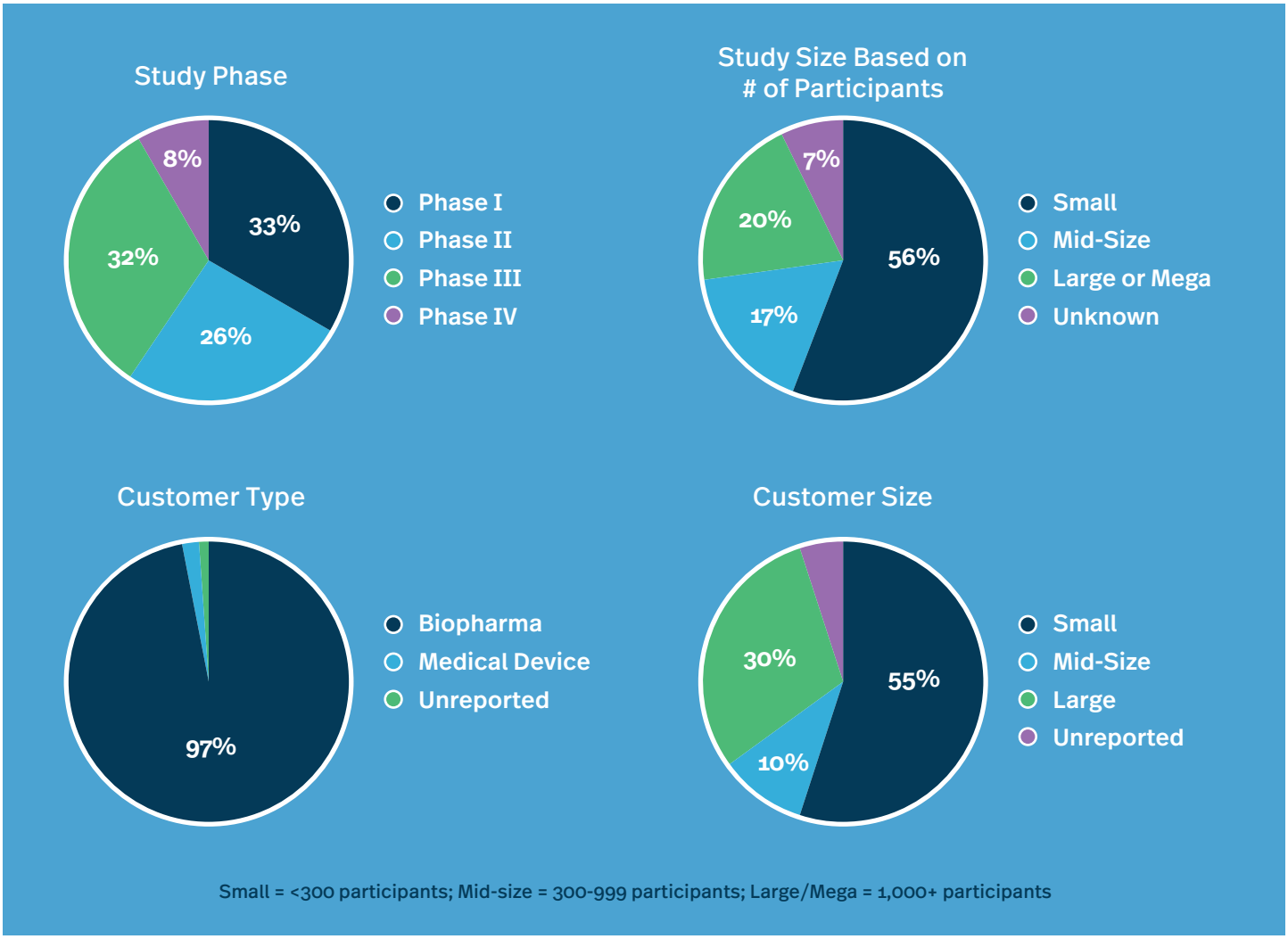
Over the past six years, as clinical trials running in more traditional operating models are reaching their planned completion, the percentage of new trials adopting more efficient risk-based monitoring operating models is steadily increasing.

Phasing Out Traditional Clinical Trials



A Closer Look at the Studies in ACRO's Dataset

With data provided from seven CROs, the 2024 survey included 3,758 outsourced studies. While most of the studies included in the survey are small (defined as <300 participants), the organizations represented span across small to large biopharmaceutical companies. The information provided is representative of activities across the industry and is reflective of industry sponsors' overall adoption of RBQM.



Ongoing Trials

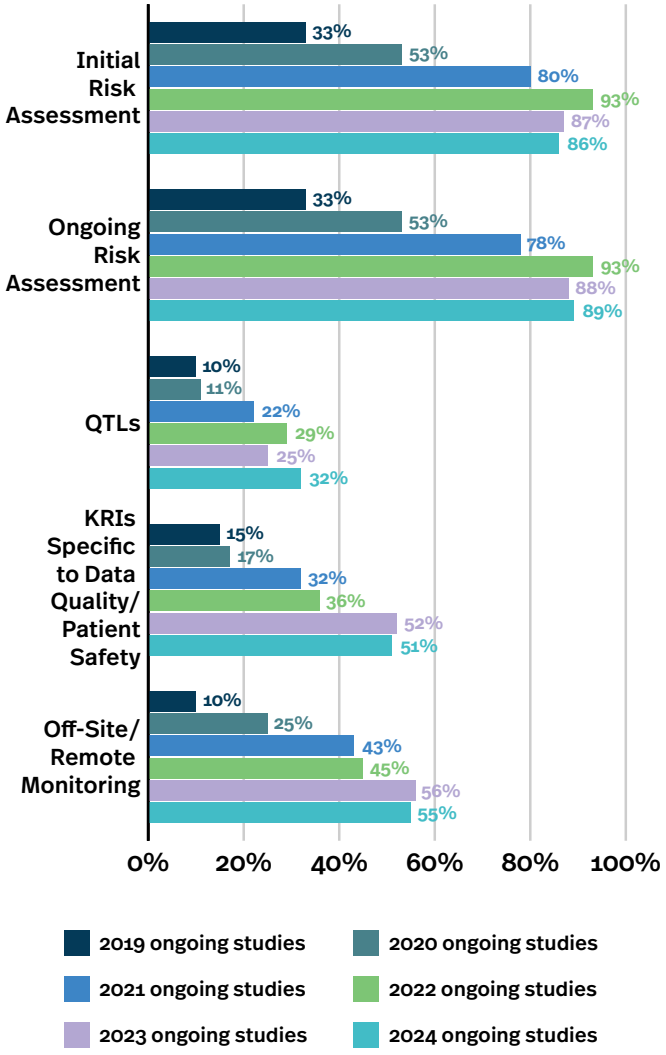
Adoption of components in ongoing trials:

The following graph shows how each RBM or RBQM component was adopted in ongoing clinical trials in each year 2019-2024:

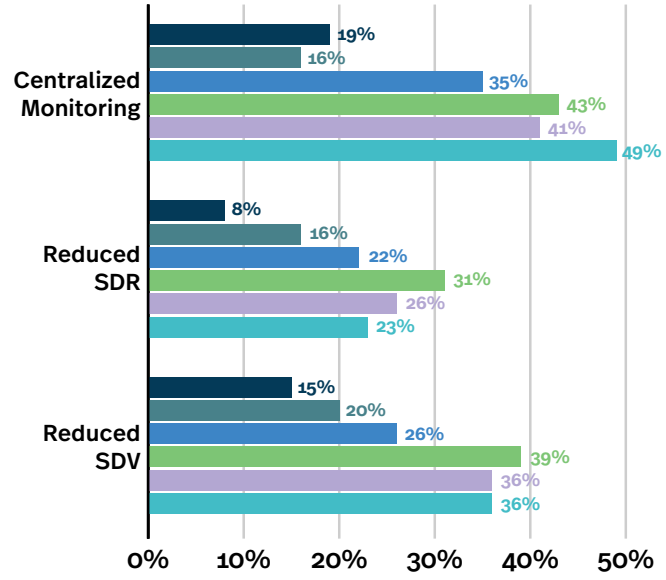
Highlights of Ongoing Studies:

- ACRO believes that initial and ongoing risk assessments are happening in every study. Survey data shows 89-93% of studies utilized risk assessments in recent years, but we believe that many sponsors are bringing risk assessments in-house. This survey is designed to assess only services provided by CROs, which explains the deficit.
- After the COVID-19 global pandemic, we saw huge jumps in centralized monitoring and off-site or remote monitoring. Though there was a slight dip in 2024, adoption of these components far exceeds pre-pandemic figures.
- The data shows that sponsors are more likely to reduce source data verification (SDV) than they are to reduce source data review (SDR). It appears that SDR is a comfort factor for studies that are implementing centralized monitoring. Most ongoing clinical trials incorporate risk assessments, with nearly half also implementing key risk indicators (KRIs), central monitoring, and off-site or remote monitoring. Despite these advancements, an unexpected number of trials still rely on 100% SDR and SDV. This highlights a significant opportunity for improvement and a need to rethink traditional approaches across all trial phases and therapeutic areas, especially as increasing study complexity calls for broader adoption of centralized monitoring strategies.
  - ACRO members believe that as centralized monitoring becomes more generally accepted as 'standard practice,' comparable reductions in SDR and SDV will occur in parallel.

Prevalence of RBM & RBQM Components in Ongoing Studies



Prevalence of Centralized Monitoring, Reduced SDR, and Reduced SDV in Ongoing Studies



New Study Starts

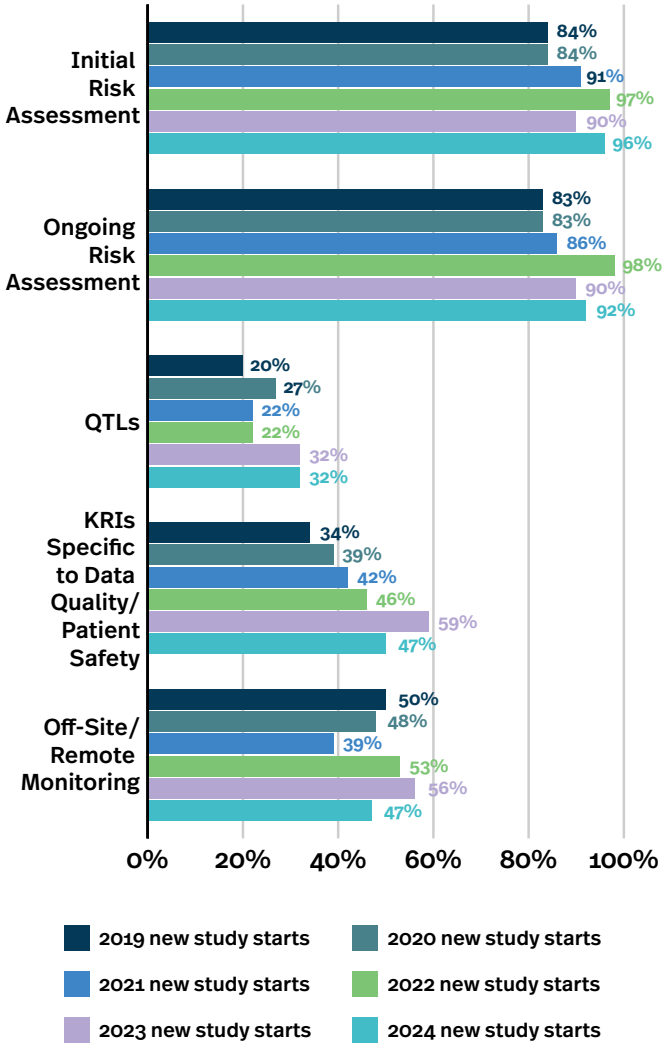
Adoption of Components in New Study Starts:

The same analysis was run based on new study starts each year. Looking at newly started studies gives us an idea of what next year's survey results will look like.

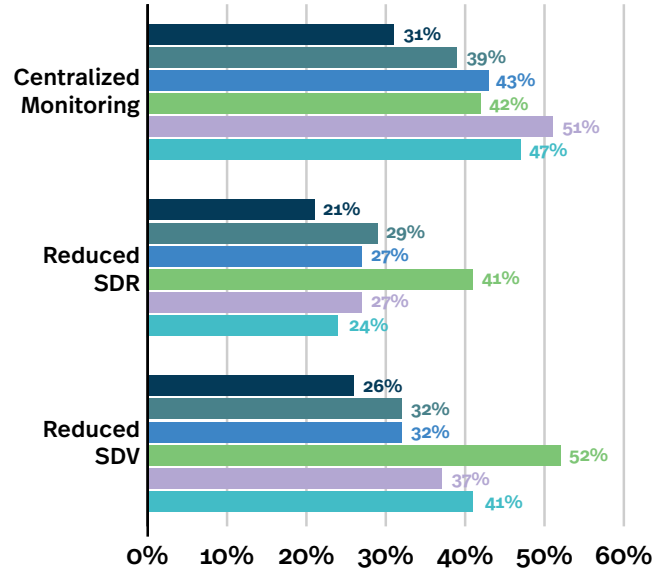
Highlights for New Study Starts:

- Roughly half of new studies outsourced to CROs utilize risk assessments, KRIs, centralized monitoring, and remote monitoring.
- There was a small decrease in the use of KRIs and remote monitoring. Refinement of centralized monitoring strategies including study specific analyses and more efficient recognition of problems might explain this decrease.
- ACRO's dataset shows that industry adoption of RBM and RBQM components has steadily grown from 2019 to 2024. However, we are seeing a decline in the adoption of certain components, namely reduced SDR. We're still seeing 100% SDR/SDV on most studies.* In large/mega-sized studies (defined as > 1,000 participants) started in 2024, 100% SDR is being used 82% of the time and 100% SDV is being used 30% of the time. This is costing the industry a lot of time, capital, and human resources for little return.

Prevalence of RBM & RBQM Components in New Study Starts



Prevalence of Centralized Monitoring, Reduced SDR, and Reduced SDV in New Study Starts



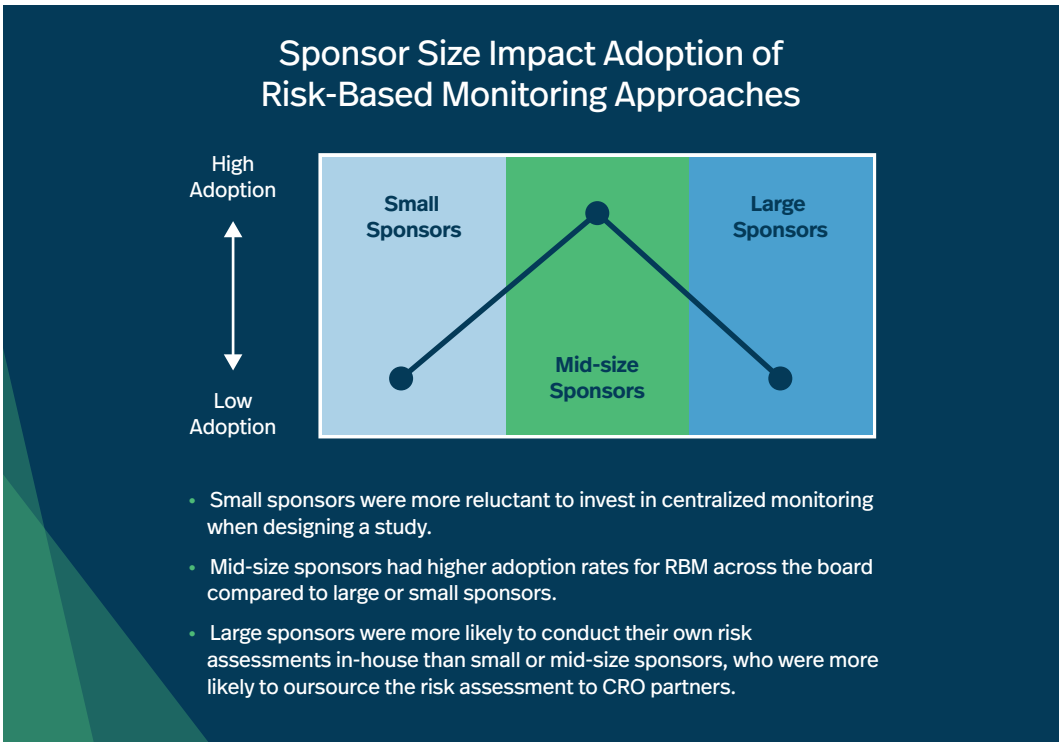
* **Note:** Differing functional service provider (FSP) models are commonly used by sponsors, and this may be contributing to the high levels of 100% SDR/SDV that we are seeing in our dataset. If a sponsor deploys a FSP strategy and contracts with multiple vendors or CROs on a given study, this may introduce an additional level of risk due to the need for the different vendors to closely coordinate their activities in deployment of a successful RBQM strategy. To mitigate this risk, sponsors may be more inclined to include 100% SDR/SDV as a back-up when outsourcing in this model. ACRO believes that RBQM should be implemented in a holistic end-to-end manner in all outsourcing models, improving monitoring of a trial and data quality.

The FDA has reiterated the concept of risk proportionality, which focuses resources on high-risk areas while avoiding unnecessary efforts in low-risk areas. Centralized monitoring does just that: Enables early detection of issues, improves data quality, increases patient safety, and reduces expending unnecessary resources. Despite this, there is an apparent hesitancy, stemming from risk aversion, lack of trust, and fear of missing adverse events, to move away from traditional trial elements like SDR and SDV. The stakes are high in a clinical trial, and companies want to ensure they are not missing anything. However, experience suggests 100% SDR/SDV leaves more room for errors and opportunities for mistakes. It can also create logistical challenges for CROs and sponsors that cost valuable time and money.

Adoption

Does Adoption Differ by Sponsor Size?

When looking at new study starts, mid-size sponsors had higher adoption rates across the board compared to large or small sponsors. ACRO's data shows that large sponsors were more likely to conduct their own risk assessments in-house than small or mid-size sponsors, who were more likely to outsource risk assessments to CRO partners. Mid-size sponsors were more likely to reduce SDR as compared to small and large sponsors. Mid-size and large sponsors were more likely to reduce SDV as compared to small sponsors. In our experience, smaller sponsors are generally more reluctant to invest in centralized monitoring when designing a study, but we believe by doing so, the cost of monitoring could drastically be reduced through reductions in SDR/SDV and on-site monitoring.



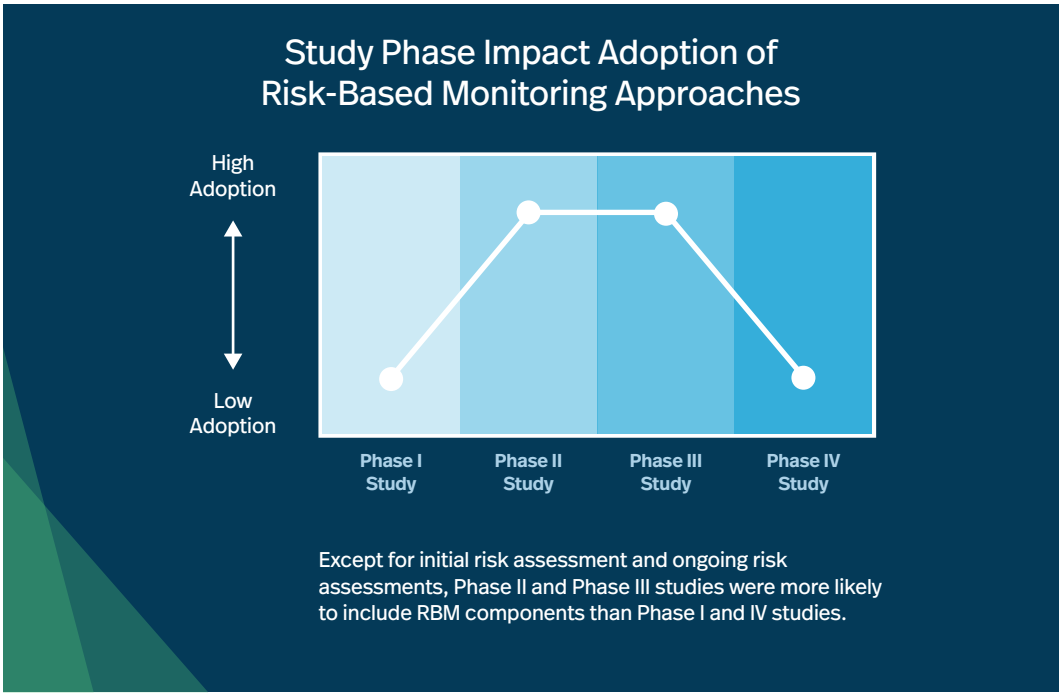
Does Adoption Differ by Study Size?

When looking at new study starts, ACRO's data shows that small and mid-size studies (defined as 300-999 participants) were less likely to outsource risk assessments. Mid-size and large/mega studies were more likely to implement KRIs, centralized monitoring and reduction of SDV as compared to small studies. Mid-size studies were more likely to utilize QTLS, off-site or remote monitoring, and reduction of SDR as compared to small and large/mega studies.

Does Adoption Differ by Phase?

For new study starts, ACRO's data shows that except for initial and ongoing risk assessments, Phase II and Phase III studies were more likely to include RBM components as compared to Phase I and IV studies. Phase II studies were more likely to incorporate off-site monitoring. Phase III studies were more likely to utilize QTLs, KRIs, centralized monitoring, and reduced SDR/SDV.

Given the wide variation in adoption across study size and phase, it is worth considering that certain RBM components are applied on a fit-for-purpose basis. This would account for the variation we see.



What's Next for Risk-Based Quality Management?

The number of data sources[1] in clinical studies is ever expanding due to increased utilization of electronic patient-reported outcomes (ePRO), electronic clinical outcome assessments, (eCOA), wearable devices, etc. According to a 2022 study led by Tufts CSDD in collaboration with a working group of pharmaceutical companies and CROs, there were more than 3.5 million data points in Phase III protocols alone.[2] The onsite, manual monitoring methods associated with traditional monitoring are limited in scope and will not be able to keep pace with data volume and complexity, necessitating increased adoption of RBQM. 100% SDR/SDV is no longer feasible with the volume of data in a modern trial.

An analysis done by the Society for Clinical Data Management indicates that upwards of 70% of data volume[3] is **not** coming from EDC, but rather from other sources (e.g., lab data). As a result of more direct participant or clinician data sources as well as technological enhancements to connect eSource and electronic Health Records directly to EDC less transcription activity is required by sites. As the industry moves away from systems in which data is manually transcribed, and moves towards direct data sources, the need for SDV will be significantly reduced if not eliminated entirely.

Advancements in artificial intelligence (AI) are opening new opportunities to maximize accuracy and efficiency in clinical data review. In the future, AI will be increasingly employed in RBQM to improve the efficiency and accuracy of data collection and monitoring, especially data volume and complexity intensifies. As organizations continue to implement and expand their RBQM approaches, they should take into consideration how AI and Machine Learning (ML) can be leveraged. The FDA is leading the way by fully embracing AI, and the industry should follow suit.

1 Society for Clinical Data Management, 2019, The Evolution of Clinical Data Management into Clinical Data Science: A Reflection Paper on the Impact of the Clinical Research Industry Trends on Clinical Data Management , https://scdm.org/wp-content/uploads/2024/03/2019_Evolution-of-CDM-to-CDS-Part-1-Drivers.pdf. Accessed 12 June 2025.

2 Getz, K., Smith, Z. & Kravet, M. Protocol Design and Performance Benchmarks by Phase and by Oncology and Rare Disease Subgroups. Ther Innov Regul Sci 57, 49–56 (2023). https://doi.org/10.1007/s43441-022-00438-5

3 Society for Clinical Data Management, 2019, The Evolution of Clinical Data Management into Clinical Data Science: A Reflection Paper on the Impact of the Clinical Research Industry Trends on Clinical Data Management, https://scdm.org/wp-content/uploads/2024/03/2019_Evolution-of-CDM-to-CDS-Part-1-Drivers.pdf. Accessed 12 June 2025.