Site Selection in Clinical Trials: Current Challenges and Future Opportunities

Site selection is a crucial step in clinical research as it affects the quality, efficiency, and cost of the clinical trial. However, many challenges exist in the current site selection process, such as low investigator participation, poor recruitment performance, and lack of data-driven decision making. This article aims to highlight some of the key factors that need to be considered when selecting sites, and to provide suggestions on how to improve the process and leverage the potential of artificial intelligence (AI) and machine learning (ML) in the future.

According to a recent WCG survey, only 28% of investigators participate in more than one clinical trial, and 40% of trials fail to meet their recruitment targets. Some of the reasons for these low numbers are the lack of adequate training, resources, and incentives for investigators, as well as the mismatch between the trial protocol and site characteristics. Therefore, it is important to evaluate a site's capabilities, experience, patient population, and infrastructure before selecting it for a trial. The decreasing number of investigators and increase in site burden, lead to the challenge of meeting recruitment targets and make site identification and selection an imperative part of clinical trial execution that should be continuously evaluated. It is essential to establish clear and transparent communication and collaboration between sponsors, sites, and patients at the start of the site identification/selection process and throughout the trial. This is to ensure that modifications, such as adding and/or removing sites or amending protocols, are included in all feedback loops.

Current Practises and Challenges in Site Selection

The traditional site selection process consists of two main stages: site identification and site feasibility. Site identification involves using various data sources, such as historical performance, claims data, regulatory compliance, and quality indicators, to generate a list of potential sites that match the study criteria. Despite the number of data sources available, a recent poll conducted by WCG revealed that more than half of sponsors are still making their site identification and selection decisions exclusively based on relationships and historical experiences, as opposed to data-based selection (see Figure 1). The second step in the site selection process is site feasibility, which involves collecting data from the sites themselves such as, patient population, demographics, referral sources, and facilities to assess their suitability and interest in participating in the trial. However, in the same poll conducted by WCG, most respondents believe that sponsors have little trust in the feasibility responses they receive from sites (see Figure 2). Sites agree that sponsors are not likely to believe their responses (see Figure 3), particularly surrounding recruitment numbers.

It is not a surprise that the data collected at the time of site identification and feasibility may not always align with reality. This is because this process is often fraught with challenges, such as:

- **Data Quality and Availability:** The data used for site identification may be outdated, incomplete, or inaccurate, leading to suboptimal site selection. Moreover, the data collected from the sites during feasibility may not reflect the actual enrollment potential or performance of the sites, as they may overestimate or underestimate their capabilities or interest. This can result in wasted resources, delays, and low retention rates.
- **Data Integration and Analysis:** The data used for site identification may come from different sources, such as internal databases, subscription services, vendors, or CROs, and may not be integrated or analysed in a consistent or comprehensive way. Moreover, the data collected from the sites during feasibility may not be weighted or prioritised according to the study objectives or recruitment strategies, leading to biased or inefficient site selection. This can result in missed opportunities, misalignment of expectations, and poor performance.
- **Data Utilisation and Feedback:** The data used for site identification and feasibility may not be utilised or communicated effectively throughout the site selection process, leading to missed opportunities or misaligned expectations. Moreover, the data collected from the sites during feasibility may not be updated or validated regularly, leading to inaccurate or outdated site selection. This can result in loss of trust, dissatisfaction, and attrition among the sites and sponsors.

To address these issues, some of the best practices and recommendations for improving the site selection process are:

- Use reliable and relevant data sources that are updated and verified regularly, and which cover a wide range of site characteristics and performance indicators.
- Use standardised and transparent criteria and methods for integrating and analysing the data, that align with the study objectives and recruitment strategies.
- Use effective and timely communication and feedback mechanisms that involve the sites and sponsors throughout the site selection process, and allow for adjustments and corrections based on feedback during the site identification process, and throughout trial execution to allow the necessary mitigation strategies to be implemented.

Future Trends and Opportunities in Site Selection

As the complexity and competitiveness of clinical trials increase, there is a need for more innovative and adaptive approaches to site selection that can overcome the current challenges, and optimise the trial outcomes whilst continuing to use some of the tried and true qualitative and quantitative methods. Some of the emerging trends and opportunities in site selection are:

AI and ML: AI and ML can be used to enhance the data quality, integration, analysis, utilisation, and feedback in site selection, by applying advanced algorithms and models that can learn from the data

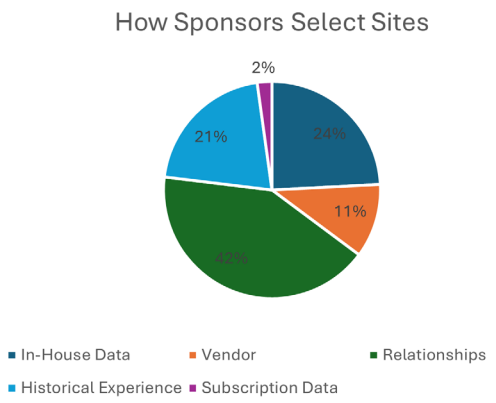

Figure 1

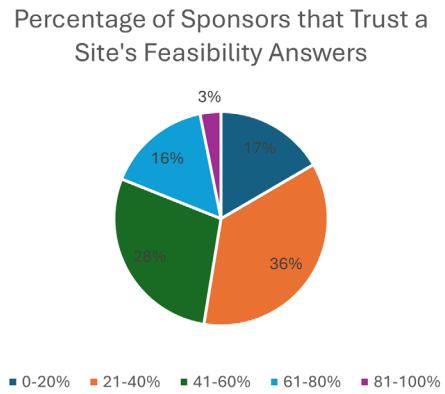

Figure 2

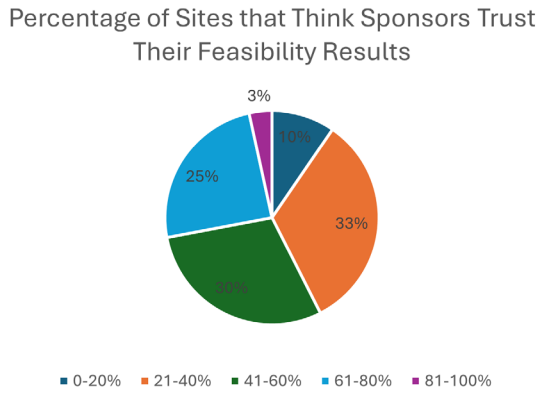

Figure 3

and provide insights and recommendations. For example, AI and ML can be used to:

- Predict the enrollment rate and performance of sites based on historical and real-time data, and adjust the site selection accordingly. This can help to optimise the site allocation, reduce the risk of under- or over-enrollment, and improve the trial efficiency and cost.
- Identify the best combination of site attributes and factors that align with the study objectives and recruitment strategies, and rank the sites accordingly. This can help to select the most suitable and interested sites, increase the site diversity and representation, and improve the trial quality and validity.
- Provide dynamic and interactive feedback to the sites and sponsors throughout the site selection process, and update the site selection based on the feedback. This can help to enhance site engagement and empowerment, foster a collaborative and respectful relationship, and improve site retention and satisfaction.

Site Engagement and Empowerment: Site engagement and empowerment can be used to enhance site participation, recruitment, and retention in clinical trials, by providing incentives, support, and recognition for the sites. For example, site engagement and empowerment can be used to:

- Offer financial support to the sites to support mutually beneficial initiatives to recruit patients to the trials, and align with their diversity, equity and inclusion goals, and health literacy activities. This can help to motivate sites, increase their loyalty and commitment, and reduce site turnover and dropout as these activities help support the sponsor, patient, and site relationship.
- Provide training, education, and resources to sites to help them improve their clinical research capabilities and competencies. This can help to increase the site's professionalism and quality, reduce its errors and deviations, and enhance its compliance and adherence.
- Listen to site feedback. Leverage qualitative and quantitative data to show their successes and shortcomings. It is worth having continuous feedback loops, like client satisfaction surveys, to obtain qualitative feedback from sites on what is working and what is not working so that you can have a real-time understanding of the current circumstances at the site in order to help provide mitigation support.
- Recognise and acknowledge sites for their achievements and challenges in clinical research and foster a collaborative and respectful relationship with them. This can help to increase site trust and confidence, reduce frustration and dissatisfaction, and improve communication and feedback.

Conclusion

Site selection is a critical component of clinical research, as it can determine the success or failure of the trial. However, the current site selection process is often inefficient, ineffective, and inconsistent, leading to poor site performance, recruitment, and retention. To address these issues, there is a need for more innovative and adaptive approaches to site selection that can leverage the power of AI and ML, and enhance site engagement and empowerment. By doing so, the site selection process can be improved and optimised, resulting in better trial quality, efficiency, and cost.

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