eClinical: How One Major BioPharma Company is Embracing the New World of Digital Clinical Research

The major objective of pharmaceutical research & development is to bring new health solutions to people who need them. Increasing research productivity and reducing protracted timelines when bringing a new molecule to market can help achieve this goal more rapidly. Sanofi, a leading biopharmaceutical company, has prioritised clinical study optimisation as an essential step in reducing drug development cycle time.

Specifically, the company has accelerated patient recruitment in clinical studies through the utilisation of digital technologies alongside site and patient facing innovations. These digital efforts, ongoing since 2015, have led to 1) protocol simplification, 2) development of relationships with key external healthcare professionals (HCPs) and 3) improved patient partnerships.

By developing a sustainable model using quantitative and qualitative solutions, Sanofi has demonstrated that the clinical trial process can be dramatically optimised. Establishing innovative platforms and working in partnership with investigator sites along with patient groups can bring the world of digital clinical research to life.

Bringing a new drug to market is increasingly challenging, particularly at the development stage with longer development times, challenges in achieving clinical trial enrolment, and an increasing number of highly-complex clinical trials. Optimising clinical trials presents an opportunity to realise a reversal in these trends.

Through the combined efforts of its research & development (R&D) teams, Sanofi has made progress each year in delivering increasingly accelerated drug development. The company's progress on this front is the result of improving its end-to-end clinical trial process by leveraging a combination of innovative approaches across internal and external solutions.

Critical opportunities were identified to reduce and reverse the industry trends at Sanofi:

- **Reduce protocol complexity:** Through establishing a clear line of sight between 'nice to have' data for collection and 'must have' data needed for endpoint evaluation, Sanofi has identified ways to eliminate unrelated procedures, thereby reducing the complexity and costs of each study. In parallel, it has increased the eligibility of target patient populations by eliminating unnecessary inclusion/exclusion criteria through the use of e-health records (e-HRs)[2], performing simulation modelling of patient prevalence and health characteristics. The use of e-HR has enhanced Sanofi's practice since 2012 of engaging clinical trial sites and patients across the whole development-stage portfolio, helping to understand operational and procedural challenges within proposed clinical trial designs. This evolving integrated approach has led to a reduction in protocol amendments by over 50% since beginning these efforts five years ago. As a result, Sanofi's amendment rates are now less than half of the industry average based on Tufts reported data[3].
- **Increase clinical trial enrolment:** The company initiated multi-channel digital solutions to increase trial awareness and accessibility by patients through social media platforms and other means. This effort also included leveraging clinical trial site and patient advocacy network relationships, and piloting 'distributed' (or decentralised) study approaches with the goal of bringing the clinical trial to the patient. Overall, these activities decreased the patient burden of enrolling in studies and led to improved enrolment rates.
- **Optimise the entire supply chain:** Sanofi has used software with predictive modelling combined with interactive response technology (IRT) parameters to identify different scenarios for production and distribution of intellectual property. This allows for early creation of a master plan to support clinical study execution, with the aim of minimising the quantity of drugs to be used.
- **Utilise direct to patient (DTP) model:** Sanofi is also one of the pioneers using the DTP model, which helps the company work directly with key patient groups. Overall, this approach has decreased patient burden, for example by enabling fewer visits to the hospital during trials.
- **Automate study documentation:** Important steps have also been made in the automation of some study documents, first focusing on narratives leveraging content re-use and then exploring a more end-to-end approach from protocol to clinical study reports associating both content re-use and artificial intelligence.

Embracing Digital Technology for Clinical Studies

Digital innovation is revolutionising clinical studies by extending the ability to interact remotely with physicians and patients. Advances in artificial intelligence (AI), machine learning, big data and analytics offer the promise of delivering medicines with greater speed and cost-efficiency to patients around the world through shortening the timeline of development and reducing uncertainty in the process.

Among the steps taken, Sanofi has integrated internal and external data sets used for modelling and simulation that include real-world e-HRs. Modelling and simulation are helping to run predictive analyses and risk identification. While improving the protocol design, the approach also helps to identify areas of the patient population that were unnecessarily restricted from clinical trials. Trial volunteers more accurately representing the patient population can be included while maintaining the integrity of clinical endpoints. This approach is now employed across the entire Sanofi development stage portfolio.

By utilising e-HRs, distributed trials across an administrative framework, multi-channel recruitment and eLabels, Sanofi is leveraging the power and efficiency of digital technology to create a more practical experience for patients seeking to participate in clinical trials.

Some may believe that digital technology could be disruptive to the important relationship between patients and their treating

physicians. In our view, however, when used wisely, consciously and deliberately, digital technology can instead make it possible for healthcare professionals to better accommodate the needs of the individual patient, and in the case of clinical trials, increase patient recruitment rates.

Sanofi has a strategic partnership with Science37 to further develop the distributed study approach to address the major barriers to trial participation, including lack of knowledge about clinical trial opportunities and geographical challenges. The "direct-to-consumer clinical trial model" as Noah Craft, cofounder and CEO of Science37 calls it, creates a clinical trial environment centred on the patient, eliminating the need to travel to a distant trial site. In this model, the study comes to participants, speeding the pace of recruitment and improving patient satisfaction while also reducing drug development timelines.

Sanofi has also established strategic partnerships with key investigator sites and is expanding partnerships with patient advocacy groups across R&D. Looking at clinical trials from the patient's point of view has led to positive transformation. These investigator and patient networks were designed with real-world input from trial sites and patient advocates to ensure that mutually beneficial partnerships would result in higher recruitment rates per site through designing studies that were logistically possible and medically meaningful.

Sanofi believes that changing the environment, leveraging digital and new technologies, and building a more integrated clinical development approach around patients requires joint efforts, shared expertise and resources. Under the visionary leadership of Dr Elias Zerhouni, President, Global R&D at Sanofi, the company was one of the original TransCelerate member companies. In addition to TransCelerate BioPharma Inc, Sanofi is an active and leading contributor among selected projects from Europe's Innovative Medicines Initiative (IMI). These consortia offer a unique forum for pre-competitive and collaborative work to form the new clinical development landscape, and maintain good levels of interactions with regulators.

A common protocol template is one innovation that came about as a result of Sanofi's participation in TransCelerate. The common protocol template initiative has created a common structure and language for clinical trial protocols. This template helps streamline protocol development time and regulatory review, as well as improving end-to-end data flow. Using one common protocol template contributes to making protocols more user-friendly for investigators and patients. The complexity of regulatory reviews is being reduced while increasing the ease of data interpretation. Study sponsors now have the opportunity to implement therapeutic area standards and increase operational efficiencies.

One of Sanofi's current collaborations with IMI is focused on developing a decentralised approach to clinical trials that would require joint efforts from all stakeholders in clinical research. IMI seeks to establish centres of excellence with gold standard practices focused on linking patients, academia, small and medium-sized enterprises (SMEs), and members of the pharmaceutical industry. It aims to do so while ensuring a fully transparent process for adoption by regulatory agencies. This project, combined with an additional project to use wearable technology to optimise data collection and study performance, are meant to be game-changers not only in the clinical development field but also accelerating the definition and adoption in Europe of best practices for telemedicine.

In conclusion, by employing the still-evolving eClinical model, Sanofi continues to expedite both patient enrolment in clinical trials and the execution of these studies to support the development of new treatments. From a patient and HCP standpoint, this means earlier innovative health solutions. These changes demand a new level of expertise to design, conduct and report clinical studies in the digital age. They also impose dramatic changes in the IT landscape for R&D with the need for higher integration. Only early implementation of integrated eSolutions allows a sponsor to adequately leverage them. However, it is clear that digital technology is opening the door to delivering trials with improved patient access and clinical site performance.

REFERENCE

1. Tufts CSDD 3- CenterWatch Monthly, Aug 2017
2. The EHR4CR project (2011-2016) with a budget of +16 million Euros, has involved 35 academic and private partners (10 pharmaceutical companies) and is one of the largest of the IMI PPPs in this area. The consortium also included 11 hospital sites in France, Germany, Poland, Switzerland and the United Kingdom. It was part-sponsored by the European Commission through the Innovative Medicines Initiative (IMI). TriNetX is a network comprised of healthcare organisations representing over 84 million patients globally, biopharmaceutical companies, and contract research organisations (CROs).
3. Source: Tufts CSDD, 2015

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