How COVID-19 threatens biopharma – but could also drive change
The pandemic may cost biopharma more than $140b over the next four years but also provide an impetus for growth and innovation.
A decade ago, the biopharma industry was in crisis. It had been apparent for years that many of the best-selling drugs of all time were losing patent protection almost at the same time. In the course of several years, more than $100b in revenue was likely to disappear. And yet the so-called “patent cliff” is nearly forgotten today – because the industry replaced its lost income by refocusing strategies on rare diseases, resulting in the most productive period of innovation in the history of human medicine.

Today the industry is in crisis again – only this time, it is without the benefit of years to prepare. In a matter of weeks, the COVID-19 pandemic has suddenly disrupted the entire global economy. While biopharma is in the public eye – thanks to the global search for antivirals and vaccines – it also faces a unique set of threats. These threats have not been broadly recognized but are on the same order of magnitude as the patent cliff of the 2010s: our analyses suggest that nearly $140b of biopharma cumulative revenue is at risk of being lost through 2024 alone. This in addition to a new patent cliff, which separately threatens about $180b in revenue by 2023 but is not within the scope of this analysis. However, this downside scenario does not have to be inevitable.
The pandemic is directly impacting not only sales of existing drugs and therapies but also the development of new drugs for an as-yet-uncertain period of time, likely less than a year but potentially up to 18 months. The loss from marketed products is likely to be immediate and acute, particularly for products administered in clinical settings (e.g., infusions) as patients, especially those with a compromised health status, stay at home and forgo clinical treatments. Our estimates suggest that losses (among the top 20 pharma companies alone) through the end of 2024, of clinically administered products alone, could exceed $100b (Figure 1). Note, this estimate may also be conservative as it requires only a 30% drop in sales through April 2021, followed by a resumption of prior demand and restoration of the pre-COVID-19 growth trajectory.

While disruption to marketed products is significant, the risk to assets in development may be longer-lasting. In turn, this could lead not only to years of stunted growth for biopharma but also to significant delays in treatments reaching the market, resulting in years of needless morbidity and mortality. Already, industry sponsors have paused patient enrollment, reduced patient site visits and temporarily shut down entire trial sites to ensure the safety of patients. Contingency measures to manage data integrity and mitigate delays to Phase III trial readouts are obviously critical. However, capping the negative effects from COVID-19 and returning to standard operating procedure is likely to take until the end of 2020, even in an optimistic scenario. More likely scenarios that model repeated surges of COVID-19 could make a full recovery impossible until a vaccine is available, thereby extending disruption well into 2021.

Figure 1
Projected Rx revenues from drugs administered in clinical setting:
Pre-COVID-19 expectations vs. potential delay scenarios
Top 20 biopharma companies: global sales

![Projected Rx revenues from drugs administered in clinical setting](image)
Even with the arrival of a vaccine by mid-2021, the effects of COVID-19 on clinical trials today will be felt for many years, due to delays in new drug launches or expanded indications. To more deeply understand the potential effects the crisis could have on future drug development and revenue, we assessed the late-stage pipeline for a cohort of the industry’s largest sponsors. Looking exclusively at Phase III studies among the top 20 pharmaceutical and biopharmaceutical companies by revenue in 2019, and depending on duration of impact, COVID-19 endangers revenues from new molecular entities (NMEs) alone by up to $7b by 2022 and by $16b by 2023 (Figure 2). More than half of the Phase III pipeline for many sponsors consists of life cycle-management studies, implying that impact estimates from COVID-19 are highly conservative.

**Figure 2**

*Expected revenues: Pre-COVID-19 expectations vs. potential delay scenarios*

Phase III assets in the top 20 global biopharma companies
To quantify this effect for individual companies, we developed a model using five parameters that, according to a consensus of internal and external industry experts, likely contribute to a trial’s vulnerability to disruption by COVID-19 (Figure 3). Trial stage is the most critical parameter. Studies in the data-collection stage face significant issues in data integrity for sponsors, as these studies are more susceptible to missed patient dosing and do not have the ability to delay study starts or prevent overenrollment of patients. The therapeutic area is also highly weighted. Studies that target therapeutic areas with many treatment options are more likely to be disrupted; oncology trials, which are also the most numerous, are less at risk. (Leading sponsors have indicated that studies in oncology and other “grievous diseases” have faced relatively less disruption given the severity of these indications.) Each parameter was weighted to reflect its likely impact, then scaled to a three-point score reflecting degree of disruption. We then applied this scoring system to 621 Phase III studies (extension/long-term studies were excluded) that were in early setup, recruiting or data collection, with primary completion dates scheduled for April 2020 or after. Each sponsor’s Phase III trials were then aggregated into an EY-Parthenon COVID-19 disruption index.
Among the top 20 biopharma (Figure 4), the impact is variable and depends on asset mix in the pipeline, with some benefit from diversification. As the factors determining impact only partly overlap with the key determinant of effect on marketed products – i.e., whether or not the drug is administered in a clinical setting – a given company may be exposed to risks to current revenues, future revenues or both.

**Figure 4**

EY-Parthenon COVID-19 disruption index: impact on sponsors

*Pipeline product scores are indexed across five parameters discussed in more detail below. Marketed products are indexed across two parameters (route of administration and therapeutic area), and weighted by revenue. Both indexes are weighted from EYP primary research. Index is agnostic of clinical setting (i.e. hospital vs. clinic), and thus may overestimate for some products administered in ambulatory clinics less affected by COVID-19.*

Source: EY-Parthenon interviews and analysis, EvaluatePharma, Clinicaltrials.gov
Potential solutions

In sum, clinical trials are facing significant and varied disruptions. However, just as early estimates of COVID-19’s death toll assumed no changes to our modus vivendi— and have been somewhat lessened by behavioral modification—this sobering outlook for biopharma can be turned around, at least for assets in clinical development. The drive to continue clinical development and mitigate a punishing economic impact could, and should, accelerate the adoption of new technologies that largely already exist. The most potentially impactful of these solutions focus on trial virtualization.

Virtualization can apply to most stages of the clinical Trial life cycle (Figure 5). During clinical trial setup and initiation, sponsors can partner with virtual solutions vendors for protocol design and review, site/investigator selection and study startup, patient recruitment, and electronic informed consent (eConsent). For example, vendors that leverage patient and clinician input, real-world patient data and industry benchmarking to ensure a well-designed trial protocol can help sponsors run more effective virtual trials with fewer protocol deviations. Other virtual solutions in the trial setup and initiation phase include those that automate the investigator identification and selection process, efficiently recruit patients using electronic medical data and/or social media, and execute the remote consent process necessary for new patients to enroll in hybrid or virtual trials.

Figure 5
Sponsor perspective: virtualization of clinical trials

Upon further validation in the future, employment of synthetic control arms may take place in parallel to studies or post-initial approval for product life cycle management.
In addition, numerous vendors offer virtualization solutions within the clinical trial administration phase, which includes trial operational management, direct-to-patient drug and supply logistics, patient treatment management, digital biomarker collection, patient and outcome data management, and real-world evidence-based synthetic control arms. To conduct a virtual or hybrid trial within the COVID-19 pandemic and beyond, sponsors must leverage an integrated set of virtualization solutions that allow for remote patient-investigator interactions, monitoring of patient safety and outcomes, and seamless management of all trial data without loss of data integrity. Notable solutions that can help sponsors achieve this level of virtualization include remote monitoring solutions, telemedicine platforms, in-home treatment and/or testing, eSource integration of all trial data and remote data capture solutions (e.g., direct data capture, eCOA, ePRO and digital biomarker collection).

None of these options would be feasible without regulatory support. Fortunately, the FDA has acted quickly to issue guidance for how COVID-19 will affect clinical trials and has noted increased flexibility around several factors, including protocol design and review, eConsent, trial operational management, direct-to-patient drug and supply logistics, and patient treatment management. Specifically, the FDA has outlined that it will now:

- Allow consolidation of protocol modifications into one protocol amendment
- Encourage sponsors to use novel mechanisms to gather consent (including via eConsent)
- Promote remote monitoring and delivery of trial drugs directly to patients’ homes
- Allow immediate implementation of protocol changes that incorporate telephone and/or virtual visits for safety monitoring

As the FDA recognizes elements of virtual clinical trial development and administration, sponsors can confidently harness virtualization solutions for current and future trials, lessening the impact of COVID-19 and making trials more efficient and patient-centric moving forward.

These changes offer potentially meaningful and material benefits for both sponsors and patients beyond the context of COVID-19. Virtual visits reduce patient travel, saving significant time for the ~70% of trial participants that live at least two hours away from trial sites. Furthermore, patient drop-out rates decrease in virtual trial settings. Beyond patient retention, remote patient monitoring not only increases patient safety by allowing investigators to immediately and quickly identify safety concerns and modify trials but also provides the opportunity to diversify trial populations. Finally, hybrid or virtual trials can decrease trial expenses by diminishing costs associated with sites and site monitors and by converting in-person visits to virtual visits.
Conclusion

The biopharma industry can turn the COVID-19 experience into an opportunity for innovation and growth through trial virtualization. Evaluating possible virtual solutions that are already available, along with relevant vendors, can lead to increased efficiency, cost reductions, improved data harmonization and new discoveries. If drug developers act with creativity, determination and vision, they can do far more than survive this current crisis with their businesses intact. Instead, they can use the pandemic to improve leading biopharma practices in pursuit of a healthier world.

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