SARS-CoV-2 (aka COVID-19) FAQs

Is NicHealth invested in any companies working on a COVID-19 vaccine?

- We are certainly seeing a lot of activity in the vaccine development segment these last several months. However, we are not inclined to invest in any of these vaccine developers since we prefer to invest in companies that have demonstrated compelling proof-of-concept data in humans. In our view, few if any of the developers have reached this threshold, though their stock valuations suggest otherwise. Additionally, even the successful developers will likely face a different business model due to the urgent public health need. For example, Gilead is donating the first 1.5M doses of its anti-viral drug, Remdesivir. Going forward, the company will need to balance access with the costs of development. We are sticking to our investment mandate as long-term investors on long-duration assets that are changing the standard of care.

How do you see the vaccine landscape evolving over time? Are there companies that are better positioned to win the vaccine race?

- While there is certainly an urgency to bring a vaccine to market, we view this as more of an iterative process rather than a winner-take-all race. Safety and effectiveness must take priority over speed.
- Our expectation is that, in time, there will be multiple approved vaccines and anti-viral therapies used in conjunction with one another. We think it is still too early to definitively say how many and which vaccine developers will ultimately secure approval. Even though the FDA has been very flexible in working with some of these companies. The current timelines for SARs-CoV-2 vaccine development is moving exceptionally fast by normal standards. We are hopeful there will be an approved vaccine by 1Q21.
- Ramping to capacity will take time, so we believe it could be 1-2 years before there is widespread access across the population. Currently, Moderna appears to be furthest along with considerable support from the US government. Given the size of the company and lack of manufacturing and distribution resources, they will likely require additional funding and collaborations with large pharma to bring the vaccine to market.

What is your view of this corner of the market in terms of investment profitability and general outlook? Is it more profitable to invest in a firm developing COVID-19 treatments and prevention instead?

- The fact is, vaccine development is a challenging business. The bar for approval/safety is typically very high, global distribution is a major consideration, and profitability is always a question given the pressure to keep pricing affordable.
- While pharmacoeconomic studies (i.e. the value of a drug relative to the cost of treating a patient in a hospital using the current standard of care) could support a high price tag for a novel vaccine, it would be difficult given the government's involvement, their financial backing of current vaccines (and anti-virals) under development, as well as the sheer number of people that would need to be treated. Our current expectation is these therapies will be priced on a cost-plus basis, which caps profitability. Cost-plus pricing is more typical of a government defense contract. As such, it is not clear to us that vaccine development is ideally suited for small, single-product companies. Rather, it is our sense that vaccines are more in the

realm of large BioPharma. GlaxoSmithKline and Sanofi have dominant positions and they both do reasonably well. There are relatively few large vaccine manufacturers in the world (GSK, MRK, PFE, SNY), but they all have SARs-CoV-2 initiatives. Furthermore, we do not anticipate they will engage in any meaningful M&A on this front.

Many of these vaccine developers are seeing significant price appreciation. Do you think these valuations are warranted?

- In this environment, "COVID-19" has become somewhat of the new Bitcoin in our view. It seems many companies are throwing their hat in the ring and in the hopes that a press release announcing their involvement will prompt immediate stock appreciation. To some degree this has been the case. However, we think many of these opportunists will start to see a sharp contraction in their stock prices as the rigor of real drug development progresses.
- It is difficult to short these stocks because retail investors and generalist have really taken the reins. Given their small capitalization and limited liquidity, it does not take a lot of buy volume to drive these stocks higher. It may be counterintuitive. In addition, when companies become completely dislocated from fundamentals, it actually makes them more challenging to short. As Keynes said in the 1930s: *"Markets can stay irrational longer than you can stay solvent."* We have experienced periods like this before and we are convinced that the valuations of these speculative companies will revert. Regardless, our focus remains on our own investment mandate.

Beyond vaccines, are there other segments of the healthcare ecosystem that are a part of the COVID-19 solution?

- Much media attention is on the therapeutic agents (vaccines and anti-virals), however, other segments within the life science ecosystem have seen their adoption curve moved forward in the current environment. As highlighted in our recent PM Outlook letter, digital health/virtual services are a big beneficiary. In our view, the acceleration in remote healthcare will be lasting. Similarly, there are a few companies that are providing some of the back-end tools such as bioprocessing and bioengineering. With less exposure to media hype and the "hope" trade, we find their valuations more compelling and less prone to being bid up by generalists trying to chase the COVID-19 play.

Parting Thoughts:

- All told, we are glad to see the Life Sciences industry has really stepped up to the challenge. This has fostered a strong public/private partnership that we have not seen for a long time. This is an important dynamic, particularly during an election season.
- However, we are concerned that the Life Science industry could potentially be swept up in the anti-globalization/"Buy America" rhetoric. Lawmakers are increasingly calling on drug makers to exclusively manufacture medicines in (and presumably for) the United States. We believe this is extremely counter-productive. From a capital allocation perspective, the sheer expense of replicating existing supply chains is tremendously inefficient. It is noteworthy that unlike Charmin toilet paper or hand sanitizer, there have not been significant disruptions in the sourcing of Active Pharmaceutical Ingredients (APIs), which precluded Americans from getting the drugs they need. This obviates the need to onshore manufacturing.
- More specifically, there are major considerations on how this would play out on the human capital front. Having run M&A at a large life science tools company, I have seen first-hand the importance of leveraging

a global talent pool. There are many brilliant people out there and they are not all necessarily in the US. It is important to remember that the sector draws its strength from every corner of the world. Many of biotech's leading founders were immigrants themselves. If we wall ourselves in, we will all be worse off. We sincerely hope alternative proposals, based on inclusion and global collaboration, are found.

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