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What will virologists do after COVID?

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With China's reopening effectively marking the end of the COVID era, CIO are often asked what comes next for the field of virology. In this blog, we highlight several aspects of the infectious disease market from the perspective of an investor in biopharma companies.

Current market

Virology is part of the broader infectious disease category, which also includes bacterial and fungal infections. Pharma and biotech companies supply treatments and vaccines for a number of infectious diseases.

Prior to COVID, anti-infectives represented about 10% of the global pharma market. The category usually grows in the low single digits but has seen several periods of sharp growth in the past, driven either by disease outbreaks like COVID or by breakthrough innovations leading to a step-change in treatment. This happened in 2014–15, for example, with the introduction of new curative anti-viral therapies for hepatitis C (HCV).

We estimate the broader category of anti-infectives, of which antivirals are a part, grew at a low-single-digit rate from 2015–2020 (i.e., pre-COVID)—including the rapid rise and subsequent decline of new HCV drug sales. In 2021, anti-infectives were the fastest-growing category of drugs, but we expect sales of anti-COVID drugs to fall over the coming years, stabilizing well below the USD 28 billion of sales we estimate they generated in 2022. Excluding COVID treatments, the anti-infectives market is forecast to return to its historical low-single-digit trend over the next five years, based on current pipeline expectations.

New treatments still required

Many viral diseases remain significant challenges for society, especially in developing countries, and new treatments are still needed. Around 40 million people are living with HIV globally, and 1.5 million were newly infected in 2021, according

to UNAIDS. Where available, anti-retroviral drugs can control HIV viral loads, effectively turning HIV into a manageable chronic condition. But as the world learned in 2021, anti-virals and vaccines put pressure on viruses to evolve, so new treatments will always be needed.

Meanwhile, other diseases are becoming more prevalent. One example is the respiratory syncytial virus (RSV), infections of which have surged since the start of the pandemic, causing 177,000 hospitalizations and 14,000 deaths annually in the US alone, according to GSK. In addition, scientists have hypothesized that as global temperatures rise, the prevalence of insectborne diseases such as the zika virus and dengue fever will increase as warmer climates expand the habitable range of disease-carrying insects.

Antimicrobial resistance and the problem of misaligned incentives

The problem of mutations is not limited to viruses. In the broader infectious disease category, we see antimicrobial resistance (AMR) as a particular challenge not just for the healthcare industry but for society more broadly. The field of antibiotics has seen few major breakthroughs recently, with the last new class of antibiotics discovered in the late 1980s. Growing resistance to current antibiotics has led one influential report (Review on Antimicrobial Resistance, 2016) to estimate that if the issue of AMR is not addressed, it could lead to 10 million deaths annually by 2050.

But, development of new antibiotics has lagged other drug classes due to a lack of financial incentives: Any new, effective antibiotic would be held in reserve for later use, making it commercially unviable to develop new products. This misaligned incentive requires government action, in our view, in order to promote development of new antibiotics. Some countries, including the UK and Japan, have made progress with subscription-based compensation models for drug developers, but an attempt to promote a similar bill in the US has stalled. Growing awareness of the problem should eventually lead to action, we believe, but the timeline is unclear.

Future directions – gene therapy and new treatment modalities

It may come as a surprise that viruses can be helpful. But they are in fact at the heart of several new treatment modalities being developed for a range of diseases. Gene therapy, for example, uses an attenuated virus to deliver a corrective gene directly into the patient's cells, where it replaces a defective, disease-causing gene. Treatments based on viral gene therapies have been developed for rare inherited diseases, hematological cancers, and hemophilia, among other conditions. Related new modalities include cell therapy, where a similar process takes place outside the human body, gene editing, which uses so-called "molecular scissors" to make permanent changes to a patient's DNA, and RNA interference, which uses viral RNA to interfere with a disease-causing process. For more on these treatments and their applications, please see our report *Longer Term Investments: Genetic Therapies—update*, 3 March 2022.

Outlook

Overall, while the anti-infectives market grows relatively slowly, past experience with HCV shows that successful new treatments can still generate large returns for investors. There are still unmet needs in the form of currently untreated conditions, emerging diseases, and future mutations of existing pathogens.

COVID will likely not be the last pandemic. Solving the challenges of pandemic preparedness and AMR will require action beyond the scope of the pharma industry alone. But, given the long development timeline, further investment into early-stage drug discovery is required, and there is no time to waste.

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Original report - [What will virologists do after COVID?, 14 March 2023.](#)

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