



The novel coronavirus (COVID-19) continues to spread at an alarming rate with over 73,000 reported cases and roughly 1,900 reported fatalities to date¹. Although the virus has been primarily contained to mainland China, a total of 27 countries have reported confirmed cases². In this investment note, Steven Slaughter, lead portfolio manager of the Global Healthcare strategy, discusses the makeup of the virus as well as his view regarding the implications of the outbreak. Steven has over 30 years of healthcare experience, including corporate industry experience and extensive buy-side investment experience, which helps to inform him and his team on both the broader healthcare landscape as well as the important investment considerations therein.

Coronavirus outbreak and its implications from global healthcare team

Coronavirus: What is it?

Coronaviruses (CoV) are a family of viruses that cause illnesses ranging from the common cold to more severe diseases, such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Certain coronaviruses appear to be zoonotic, meaning they are transmitted between animals and humans. Common symptoms of coronavirus illnesses can include fever and respiratory issues, while more severe cases may result in pneumonia, kidney failure or even death³.

The novel coronavirus (COVID-19) is a new strain of coronavirus that had not been previously identified in humans. The first human infections were reported in December 2019 in Wuhan, China, and are believed to be as a result of human contact with a live animal market. Symptoms for COVID-19 are similar to those of the flu or a common cold (fever, cough, sneezing, and aches), which makes

its identification based on symptoms alone difficult. Accordingly, a recently developed Polymerase Chain Reaction (PCR) Assay has been released for laboratory testing and confirmation³.

COVID-19: Key Scientific Data Points

The novel coronavirus's incubation period (the time period from infection to the onset of symptoms) is quite variable, ranging from 3 to 14 days with a median of around 6 days. It also appears that the virus may be asymptotically transmitted, meaning that infected patients who are not exhibiting symptoms can still infect others. COVID-19's variable incubation period coupled with its potential for asymptomatic transmission, make it challenging to effectively screen for the infection and ultimately contain it.

As experts seek to contain this outbreak, a key metric that we and others will track is the basic reproduction number (R_0), which is a measurement of the transmission potential of the infection. R_0 is defined as the average number of secondary infections produced by a typical case of the infection. Current estimations of the R_0 for COVID-19 vary from 2.2 to 2.7 (in comparison, the SARS virus was 2.5, and the Spanish Flu was 1.8). In our view, a reduction in the growth of the number of new cases and an R_0 below 1.0 would allow for the containment of this virus in those regions experiencing outbreaks.

¹ Johns Hopkins CSSE, as of 18 February 2020.

² www.pharmaceutical-technology.com.

³ World Health Organization.

Clinicians' opinions regarding our ability to contain this virus vary meaningfully. Epidemiologists are projecting anywhere from a 10% to a 90% probability of the Wuhan outbreak being successfully contained within China. Outside of China, containing this virus and limiting outbreaks in other areas of the world appears highly contingent on the health standards of various countries exposed and their relative abilities to limit human-to-human contact.

Individual patient outcomes may also vary widely. Early reports suggest that most of afflicted patients can and do recover from the infection. Patient subsets disproportionately affected by this infection appear to be older patients as well as patients with pre-existing pulmonary disorders (i.e., smokers).

Potential Treatment Options

There are currently no approved treatment options for COVID-19. Vaccine and therapeutic manufacturers are working diligently, however, to explore various options for the treatment and containment of the virus. Certain commercially available HIV Protease inhibitors are currently being distributed for the potential treatment of the virus. In addition, Gilead's Remdesivir, an experimental antiretroviral, is also being tested. Pre-clinical investigational programmes targeting COVID-19 are also in the early stages of implementation, but the current focus is on established treatment candidates that could reach the market in short order⁴.

According to a draft report from 29 January, the World Health Organization's (WHO) R&D Blueprint Clinical Trials expert group plans to initiate a trial testing multiple investigational therapies. The report states that Gilead's Remdesivir "was considered the most promising candidate based on the broad antiviral spectrum, the in vitro and in vivo data available for coronaviruses and the extensive clinical safety database (in particular coming from the Ebola virus disease clinical trial and MEURI in eastern Congo)." The WHO also believes that HIV

protease inhibitors lopinavir/ritonavir from AbbVie Inc., either alone or in combination with IFN β 1b, is a "suitable second option for rapid implementation in clinical trials"⁴.

Gilead Sciences has started enrolling patients in two Chinese trials evaluating Remdesivir for treatment of COVID-19. Patients are expected to receive 10 days of IV Remdesivir and the primary endpoint of both studies will be clinical improvement at 28 days. These initial data are expected to read out in the April timeframe.

Investment Implications

As a reminder, the investment team focuses on fundamental research and intrinsic valuation to drive our investment process from idea generation through to portfolio construction. Further, we underscore our fundamental research with a keen understanding of corresponding scientific research and medical advances to aid our investment decision-making. Based on market conditions, we seek to build a diversified portfolio of healthcare companies while ensuring active positions are aligned with strength of conviction, intrinsic valuation, and appropriate risk parameters.

We continue to monitor the COVID-19 outbreak in China closely and are positioning the portfolio according to our findings. We have moved to position the portfolio more defensively based on the current state of the outbreak, adding to high-quality, attractively valued healthcare companies that we believe will hold up well through the period leading up to containment and post-containment. Additionally, we are increasing our exposure to select names within biopharma that we believe have the appropriate assets (vaccines, therapeutics, and diagnostics) that may demonstrate utility in the identification, treatment, and containment of the outbreak.

Notwithstanding the impact of the COVID-19 outbreak, we believe that the defensive characteristics of the healthcare sector, coupled with strong organic growth in selected companies, should provide continued outperformance over a full market cycle.

⁴ www.biocentury.com

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