

2021

The Impact of COVID-19 on Stock Returns of the Indian Healthcare and Pharmaceutical Sector

Shivam Mittal

Symbiosis Centre for Management & Human Resource Development, Symbiosis International, India

Dipasha Sharma

Symbiosis Centre for Management & Human Resource Development, Symbiosis International (Deemed University), Pune-411057, India, dipasha_sharma@scmhrd.edu

Follow this and additional works at: <https://ro.uow.edu.au/aabfj>

Copyright ©2021 Australasian Accounting Business and Finance Journal and Authors.

Recommended Citation

Mittal, Shivam and Sharma, Dipasha, The Impact of COVID-19 on Stock Returns of the Indian Healthcare and Pharmaceutical Sector, *Australasian Accounting, Business and Finance Journal*, 15(1), 2021, 5-21. doi:[10.14453/aabfj.v15i1.2](https://doi.org/10.14453/aabfj.v15i1.2)

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

The Impact of COVID-19 on Stock Returns of the Indian Healthcare and Pharmaceutical Sector

Abstract

Increasing COVID-19 cases has not only impacted health and day-to-day lives of people, but it has also had a material effect on India's economic growth. Stock returns of various sectors are evidence of a country's stagnated growth but the healthcare and pharmaceutical sector might be affected in a different manner. The purpose of this paper is to find out how has this pandemic has impacted the healthcare and pharma stocks. Daily closing prices of sector specific indexes for 233 days ranging from 15 May 2019 to 24 April 2020 have been taken to compare different sectors with our test sector, on the basis of different criteria. This study has applied the widely used event study methodology on our test sector; calculated abnormal returns, cumulative abnormal returns and also tested their significance. Event study approach suggests that there have been significant abnormal returns and cumulative abnormal returns in our test sector (healthcare and pharmaceutical sector) over the event window, though while comparing it with other sectors through another econometric model, the returns are not statistically significant and do not explicitly indicate the same.

Keywords

India, Healthcare and pharmaceutical sector, abnormal returns, COVID-19, stock performance



The Impact of COVID-19 on Stock Returns of the Indian Healthcare and Pharmaceutical Sector

Shivam Mittal¹ and Dipasha Sharma¹

Abstract

Increasing COVID-19 cases has not only impacted health and day-to-day lives of people, but it has also had a material effect on India's economic growth. Stock returns of various sectors are evidence of a country's stagnated growth but the healthcare and pharmaceutical sector might be affected in a different manner. The purpose of this paper is to find out how has this pandemic has impacted the healthcare and pharma stocks. Daily closing prices of sector specific indexes for 233 days ranging from 15 May 2019 to 24 April 2020 have been taken to compare different sectors with our test sector, on the basis of different criteria. This study has applied the widely used event study methodology on our test sector; calculated abnormal returns, cumulative abnormal returns and also tested their significance. Event study approach suggests that there have been significant abnormal returns and cumulative abnormal returns in our test sector (healthcare and pharmaceutical sector) over the event window, though while comparing it with other sectors through another econometric model, the returns are not statistically significant and do not explicitly indicate the same.

JEL classification: G01, G14

Keywords: India, Healthcare and pharmaceutical sector, abnormal returns, COVID-19, stock performance

¹ Symbiosis Centre for Management & Human Resource Development, Symbiosis International (Deemed University), Pune-411057, India. dipasha_sharma@scmhrd.edu

1. INTRODUCTION

1.1 Healthcare and Pharmaceutical Industries

The importance of the healthcare and pharmaceutical industry is increasing worldwide with an increase in life expectancy from 64.2 years in 1990 to 72.6 years in 2019 (United Nations, 2019). India is the third largest pharmaceutical industry in the world by volume (McKinsey & Co. Report, 2020) and it stands out as an attractive destination for establishing generic R&D centres and manufacturing units due to low operating cost and high-quality products across the value chain. India accounts for 20 per cent of global exports in generics by volume² making it the largest provider of generic medicines globally. India exports to more than 200 countries and it accounts for trade worth USD 19.14 billion in FY19 and is expected to reach USD 22 billion in FY20³. Healthcare has become India's major sector in terms of both revenue and employment. It is estimated to reach USD 372 billion by the end of FY22 with rising income, greater health awareness, increased prevalence of lifestyle diseases and improved access to insurance⁴. According to World Bank Economic Survey FY18, the government's expenditure on healthcare sector has risen to 1.4 per cent in FY18 from 1.2 per cent in FY14. The main aim of the government of India in investing and uplifting these sectors is to improve the quality of life of the citizens and prevent them from any future global pandemics. And in this twenty-first century, when people travel a lot either because of their work or for vacation, it takes a miniscule amount of time for disease to travel along to other parts of the world. The impact of infectious diseases is limited not only to humans but also to the economic and financial health of a country and an organisation (Mayer, 2000; Zhang et al., 2009).

1.2 SARS-CoV-2

1.2.1 Emergence of the Disease

In recent times, a new pandemic has arisen, named SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) or COVID-19, and its first case is reported to have originated in Wuhan, the capital city of Hubei province, China. According to the World Health Organization (WHO), the first confirmed case of COVID-19 was found on 8 December 2019. But according to Chinese government data (the *South China Morning Post*), the first confirmed case of suffering can be traced back to 17 November 2019. Similar kind of infectious diseases have swept the world in the past and it is happening again due to SARS-CoV-2. It has reached 213 countries and the confirmed cases have skyrocketed to more than 21 lakhs till date⁵ (WHO).

Although the virus reached India later than in many other countries according to the statement made by the Ministry of Health and Family Welfare, the first case in India was reported on 30 January of a student studying in Wuhan, China, who was visiting Kerala. Whereas WHO declared COVID-19 as a global pandemic on 11 March, India reported its first fatality due to the virus on 12 March, in Karnataka⁶. Seeing the impact of the virus and increasing positive

² See Press release – Press Information Bureau, December 2018

³ See IBEF 2019 report on PHARMACEUTICALS (<https://www.ibef.org/download/Pharmaceuticals-October-2019.pdf>)

⁴ See IBEF 2020 report on Healthcare sector (<https://www.ibef.org/industry/healthcare-presentation>)

⁵ Data till 18th March 2020

⁶ Press release by Government of India on 12 March.

cases on a daily basis at a rapid pace, India was brought to the state of 21-day complete lockdown from 24 March,⁷ to prevent its citizens from the virus and curb the epidemic. Lockdown was implemented by constraining people to their houses under quarantine and shutting down all transport facilities, manufacturing of non-essential products, hospitality services, educational institutions and places of worship⁸. Lockdown was supposed to end on 15 April, but looking at the conditions of the country within the 21-day period, as confirmed cases and deaths were increasing, lockdown was extended for further 19 days till 3 May 2020⁹. According to the Indian Council of Medical Research report published on 17 April 2020, a total of 3,18,449 individuals had been tested for the virus and 14,098 been confirmed positive. The graph on the next page is updated for figures until 17 March end of the day, where total positive cases are implied on the secondary y-axis. According to the COV-IND-19 study group, a range of 4,836–28,925 confirmed cases by 15 April and 58,643–9,15,000 cases by 15 May are estimated¹⁰. India had already crossed the prediction on the lower end of the range but was less than half of the upper end on 15 April, which implies that India could have been worse off if preventive measures were not taken.

2.2 Impact of COVID-19 on Economy

With the whole economy having been shut down except the essential services, many sectors are bound to record low production volume and revenue for the final quarter of FY20 as well as for next year. Some industries that have an inhibit condition of mass gatherings will be worst hit, like entertainment, sports, aviation, transportation, restaurants and hospitality industry. For instance, the Chinese hotel market witnessed a 71 per cent year-over-year decline of occupancy on 23–26 January¹¹. All of this added up to a lower GDP growth for the country – we reported a six-year low growth rate of 4.7 per cent in the third quarter¹² of the current fiscal year. COVID-19 outbreak could cost the economy Rs. 6.3–7.2 lakh crore during the 21-day lockdown period¹³. The GDP growth may slow down to 4 per cent in the financial year ending on 31 March 2021¹⁴. The effect on India's trade could be around USD 348 million as a consequence of the virus outbreak (UNCTAD, 2020). For India, the overall export impact in the chemical sector is estimated to be the largest at USD 129 million, followed by textile and clothing at USD 64 million, automobile industry at USD 34 million and electricity at USD 12 million (UNCTAD 2020).

⁷ Ministry of Home Affairs (MHA order No. 40-3/2020-DM-I(A).

⁸ Annexure to MHA order No. 40-3/2020-DM-I(A).

⁹ MHA D.O. No. 4.-3/2020-DM-I(A).

¹⁰ <https://ihpi.umich.edu/news/bhramar-mukherjee-indias-coronavirus-cases-increase-national-government-relaxes-rules>

¹¹ <https://str.com/data-insights/news/press-releases>

¹² Press Release by NSO, MOSPI dated 28 Feb 2020.

¹³ Please see <https://www.nationalheraldindia.com/business/economic-cost-of-21-day-lockdown-is-rs-72-lakh-crore>

¹⁴ Please see https://www.business-standard.com/article/economy-policy/india-gdp-growth-slips-to-44-quarter-low-of-3-2-in-q4-11-yr-low-in-fy20-120052901552_1.html

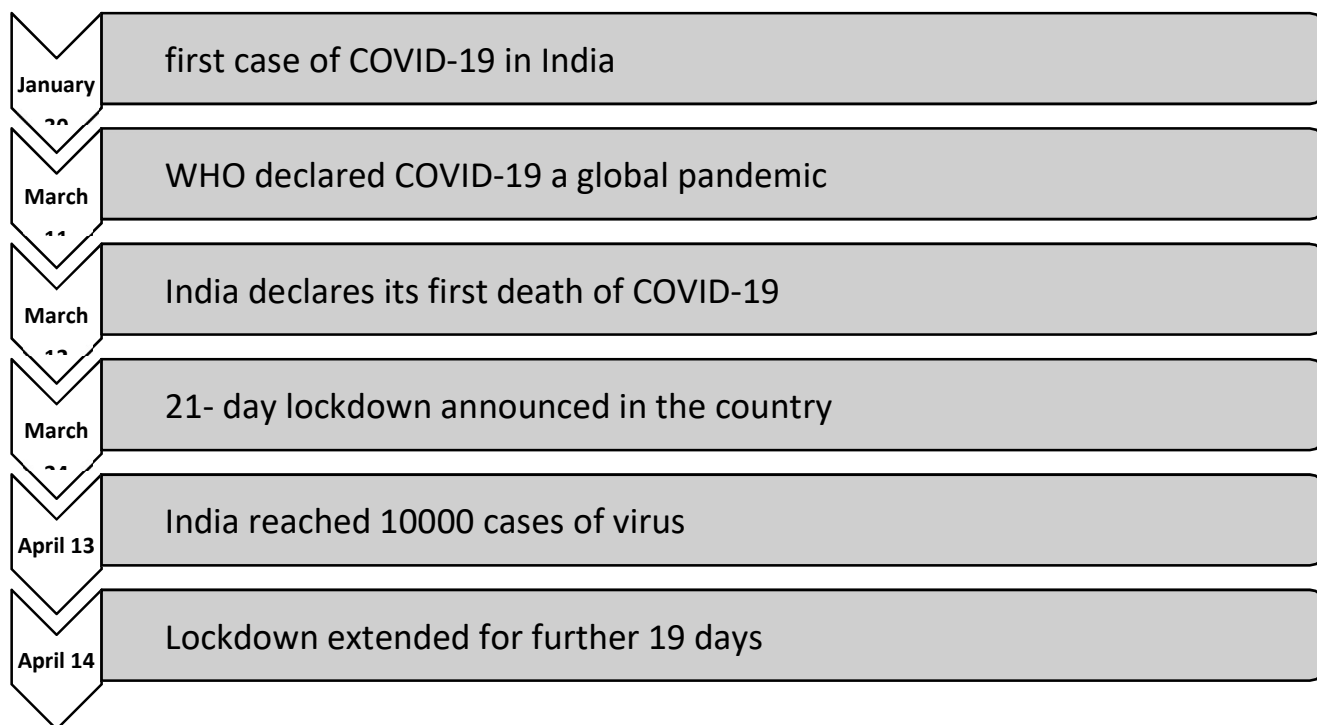
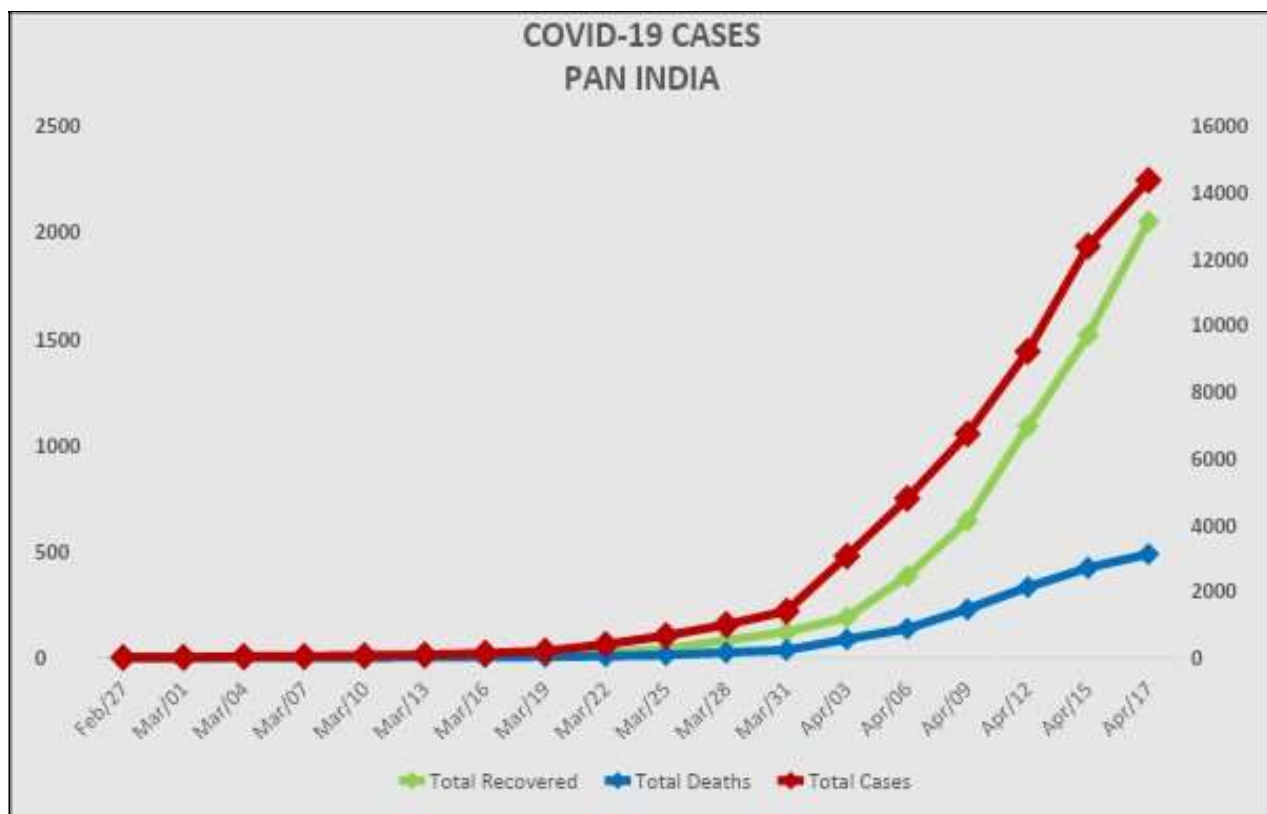


Figure 1: Timeline of COVID-19 effect in India



Data Source: Ministry of Health & Family Welfare; Indian Council of Medical Research

Note : Graph is compiled by author

Figure 2: Number of COVID-19 cases in India

Underestimating the results of companies due to reduced operation has led to uncertainty among investors about the future of companies, and has made the stock market volatile. Both BSE Sensex and NSE Nifty crashed by 23 per cent in the month of March. Sensex saw its biggest drop since 2001 when it fell 15 per cent. Nifty50's previous biggest drop was in March 1993 where it dropped by 19.6 per cent¹⁵. Although these are not the first instances of both indices falling more than 20 per cent in a month, it has happened twice before, in 1992 during the Harshad Mehta case and in 2008 during the financial crisis. Even though both of the indices have seen some upward movement in April 2020, the equity market still remains volatile due to the uncertainty in domestic and global markets.

The remainder of this paper has been organised as follows. Section 2 discusses literature review and Section 3 illustrates the data sources and methodology. Section 4 discusses the econometric framework and the last section concludes the paper.

2. LITERATURE REVIEW

The stock market reflects the current situation of the economy and it reacts to major events. Past literature has shown the same from time to time, for example, how news affects the stock market (Li, 2018) or how stock market responded to foot-and-mouth disease (FMD) outbreaks in Korea (Pendell D. et al., 2013). The Chinese stock market has shown significant negative returns related to the daily growth of both total confirmed cases and total cases of deaths caused by COVID-19 (Al Awadhi A. M. et al., 2020).

On similar lines as COVID-19, in 2003 SARS epidemic had spread throughout the world. SARS impacted the airline stock of Canada, China, Hong Kong, Singapore and Thailand. A study also found that airline stocks were more sensitive to news about SARS relative to the average non-aviation sector (Elaine Loh, 2006). The Ebola epidemic in Africa also led to disinvestment from equity mutual funds and the disinvestment increased with the coverage of media (Alfonso Del Giudice & Andrea Paltrinieri, 2017). SARS hit the tourism industry worst; it saw the highest stock decline within a month (approximately 29 per cent). This was supported by a study that showed that Taiwanese hotel stocks showed significant cumulative abnormal returns on and after the day of outbreak of the epidemic (Chen, Jang & Kim, 2007). The outbreak of SARS impacted the hotel stock returns in Taiwan, not only because of loss in revenue for the hotels but also due to higher discount rates offered by them (Chen, 2010). Apart from the tourism sector, investment, retail sales, restaurants, hotels and the air transport industry were among other sectors that were adversely impacted on a great scale (Keogh-Brown & Richard, 2008). Taiwanese biotechnology stocks showed significantly positive cumulative abnormal returns at the time of outbreak of enterovirus 71, dengue fever, SARS and H1N1 (Wang et al., 2013).

In times of crisis, medical and healthcare companies are in heavy demand for supplying the necessary medicines and equipment; not only that but they also have to spend on R&D to develop vaccines for the disease. Since the revenue margin of these companies will increase in the upcoming quarters, investors take note of this and their share price may increase due to bulk buying. But since Indian companies procure almost 70 per cent of the active pharmaceutical ingredients (APIs) for their medicines from China (Bloomberg), and as factories are closed in China due to the coronavirus outbreak, Indian pharma industry is already

¹⁵ Source: Bloomberg database

under pressure (Chatterjee P. 2020). Existing literature indicates that infectious diseases negatively affect the stock prices of several sectors, but the question is, do they also impact the stocks of healthcare and pharma sector negatively? According to the literature, there existed significant positive cumulative abnormal returns before the announcement date of virus and significantly negative cumulative abnormal returns after the announcement date (Yang, Wang & Chen, 2010).

The SARS crisis did bring negative impact on tourism, wholesale and retail, but the biotechnology sector saw positive shocks from the impact of the crisis (Yang & Chen, 2009). There exists hardly any literature which has taken Indian stocks into consideration for such major epidemics. The purpose of this paper is to investigate how the outbreak of SARS-CoV-2 affected stock performance within the healthcare and pharmaceutical industry in comparison to the expected return from them, and the overall stock market returns during the event period.

3. DATA AND METHODOLOGY

We have taken daily closing prices of stock indexes of different sectors and the Bombay Stock Exchange SENSEX (BSE SENSEX) obtained from E-Research and BSE website. BSE SENSEX is a combined weighted stock index of top 30 companies in India, distributed among various sectors. For each index we have used closing prices of 233 trading days, starting from 15 May 2019 till 24 April 2020.

To get a clear picture of how healthcare sector has performed, we have performed analysis on various levels. We started with the simplest form of analysis by using data of different sectors and narrowed it down further step by step into performance of healthcare and pharmaceutical sector.

We first calculated the return of different indexes for last month of our study time-period by using the closing prices of first day and last day of month ($IR = \text{Price}_{\text{April}} / \text{Price}_{\text{March}}$). Results from this give us a blurry picture of how different sectors have performed over the last month; remember that these returns are of a period after the announcement of pandemic.

To gain more clarity in the results, we compared mean returns among all sectors for two different time periods – pre-event mean return and post-event mean return. The pre-event mean return window is of 177 days, starting from 16 May 2019 till 31 January 2020, and post-event mean return window is of 55 days from 1 February 2020 to 24 April 2020. To test the significance of these returns we also applied t-test for two samples assuming unequal variances.

The last step while comparing different sectors with our test sector (that is, healthcare and pharmaceutical sector) was to plot a graph of daily abnormal returns of both sectors over our post-event window. This graphical representation would help us to see if there were abnormal returns in any other sector too apart from the test sector; and if not, it would strengthen the case for the test sector.

Event study is widely used in financial economics to determine whether there has been any effect of a particular event or information on the stock performance. To see the impact of coronavirus on India's healthcare and pharmaceutical industry, we will apply event study model here. The event day has been taken as the day on which India reported its first fatality due to the virus – 12 March 2019. The study period is of 233 days, which is divided into an estimated period of 178 trading days and event period of 55 trading days. BSE SENSEX index is taken as a benchmark index to calculate abnormal return of all sectors. The expected return (R_{it}) is derived using the market model and Ordinary Least Square (OLS), which is based on the following regression model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

R_{it} – Expected return of sector

R_{mt} – Market return return of sensex

β_i – unbiased beta coefficient

α_i – intercept

the abnormal return (AR) is calculated as –

$$AR_t = R_{kt} - R_{it}$$

R_{kt} – Normal or actual return

$$R_{kt}, R_{mt} = (Price_n / Price_{n-1}) * 100$$

$$t(AR_t) = \frac{AR_t}{\sqrt{Var(AR_{pre})}}$$

AR_{pre} – Abnormal return of pre-event period

4. EMPIRICAL RESULTS

By looking at the last 30 days trading return (one month includes only those days on which the market was open, from 9 March 2020 to 24 April 2020) of different indexes, only two sectors have provided positive returns. BSE FMCG index has increased by 2.91 per cent and the test sector (BSE Healthcare) has given a 14.19 per cent return, much higher than any other sector. All other sectors gave negative returns – for example, Consumer Discretionary lost almost 19 per cent in a month, Banks fell by 26 per cent and Realty sector lost a whopping 30.7 per cent in a month. These results give a slight indication that the test sector might have provided abnormal return in the post-event window.

Table I - One-month index return

Sector	1-Month % Return
BSE SENSEX	-12.09%
BSE HEALTHCARE	14.19%
BSE AUTO	-18.34%
BSE BASIC MATERIALS	-17.27%
BSE CONSUMER DISCRETIONARY	-18.09%
BSE REALTY	-30.68%
BSE IT	-10.97%
BSE BANKEX	-26.05%
BSE FMCG	2.91%
BSE TECK	-9.87%
BSE METAL	-20.12%
BSE OIL & GAS	-4.16%
BSE INDIA MANUFACTURING INDEX	-4.20%
BSE INDIA INFRASTRUCTURE INDEX	-13.74%

Note: Above table is based on author's analysis

The results obtained from testing the mean returns and its significance in the pre-event and post-event period are given in Table II. Figures under the pre-event mean column are the mean of daily returns generated over the period 16 May 2019 to 31 January 2019, while those under post-event relate to the period 1 February 2020 to 24 April 2020. T-statistic provides the test statistics of testing the mean differences with a two tailed test assuming unequal variances.

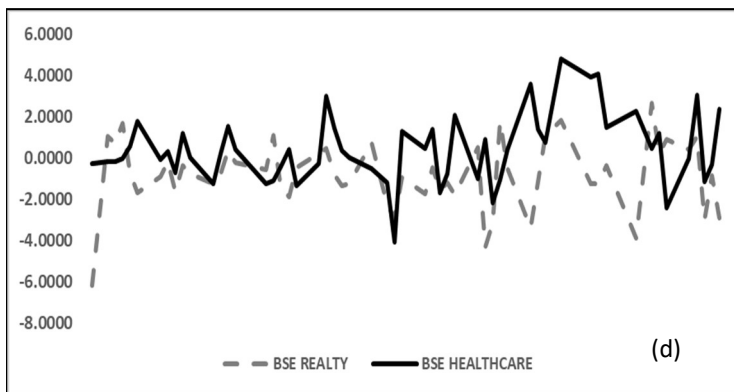
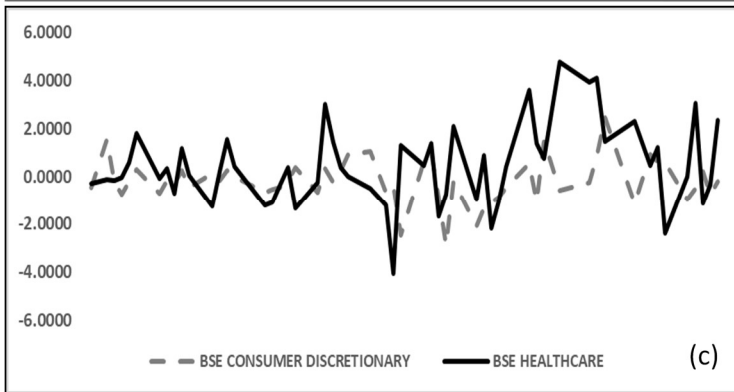
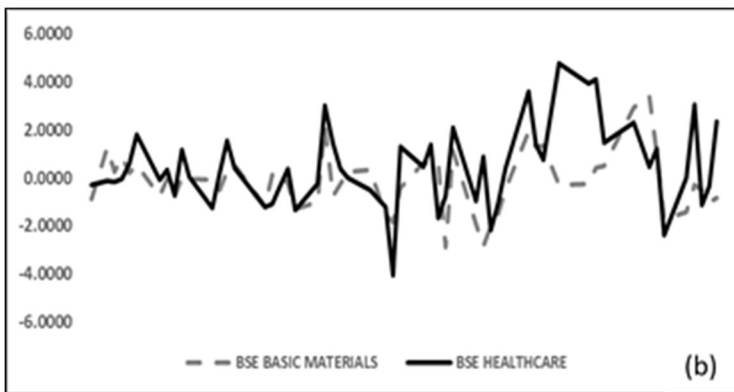
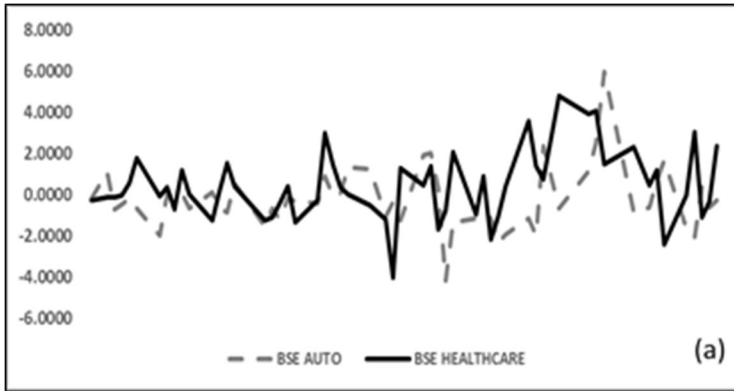
Benchmark index SENSEX fell down by a staggering 47.69 per cent in the post-event period, similarly other sectoral indices also felt the brunt of the pandemic. A few sectors that were impacted the most were realty, banks and financial institutions and metal, whereas the test sector BSE Healthcare gave positive returns of 18 per cent in the post-event period. Though only BSE Realty index has given significantly different results at 0.05 level and that too negative returns, positive return of test sector is an indication that they can be a safe bet for investors who want to go long on them.

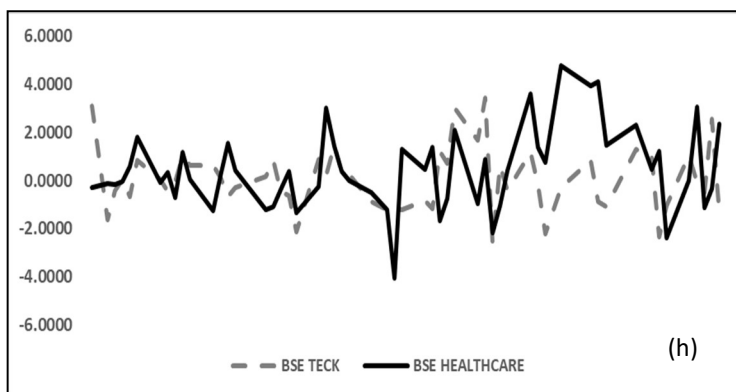
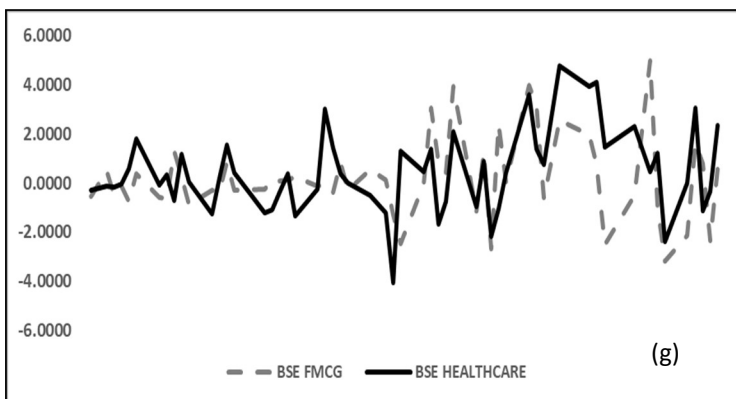
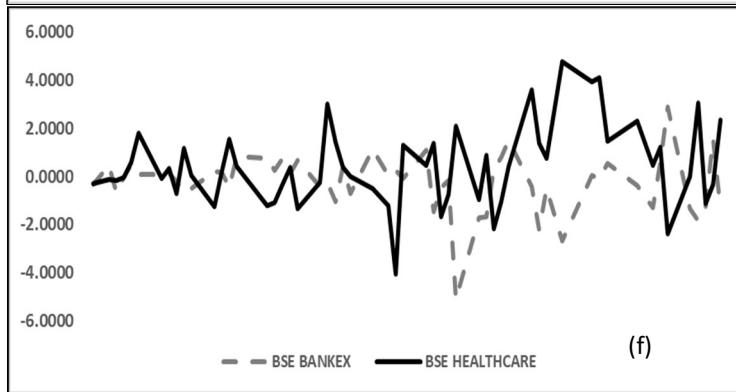
Since post-mean returns are not significantly different from pre-mean returns for the test sector, we need to test further using another method. One such method that is used here is of abnormal returns during the post-event period (from 1 February 2020 to 24 April 2020), by plotting daily abnormal returns of healthcare index with every other sectoral index on a graph and comparing them. Post-event period can be divided into two parts; one from 1 February 2020 to 11 March 2020, a day before the event date and other part from 13 March 2020 to 24 April 2020, a day after the event day. All the sectoral indices including Healthcare index fell steeply on the event day 12 March; post that period the test sector has outperformed the other sector on most days as can be seen in Fig. 3 (c), (d), (f).

Table II - Impact of COVID-19 on stock returns

Sector	Pre-Event Mean	Post-Event Mean	T-Statistic
BSE SENSEX	0.0524	-0.4769	1.0435
BSE HEALTHCARE	0.0251	0.1814	-0.4020
BSE AUTO	0.0141	-0.7207	1.4021
BSE BASIC MATERIALS	0.0133	-0.5994	1.2333
BSE CONSUMER DISCRETIONARY	0.0577	-0.5756	1.4475
BSE REALTY	0.1522	-1.1157	2.5784
BSE IT	0.0190	-0.3689	0.8175
BSE BANKEX	0.0561	-0.8208	1.4057
BSE FMCG	0.0147	-0.1412	0.3715
BSE TECK	0.0287	-0.3441	0.8084
BSE METAL	-0.0483	-0.8571	1.3991
BSE OIL & GAS	-0.0174	-0.4087	0.7749
BSE INDIA MANUFACTURING INDEX	0.0267	-0.3099	0.7144
BSE INDIA INFRASTRUCTURE INDEX	-0.0476	-0.6836	1.4480

Note: * Significant level 0.1; ** Significant level 0.05; ***Significant level 0.01 Note: Above table is based on author's analysis





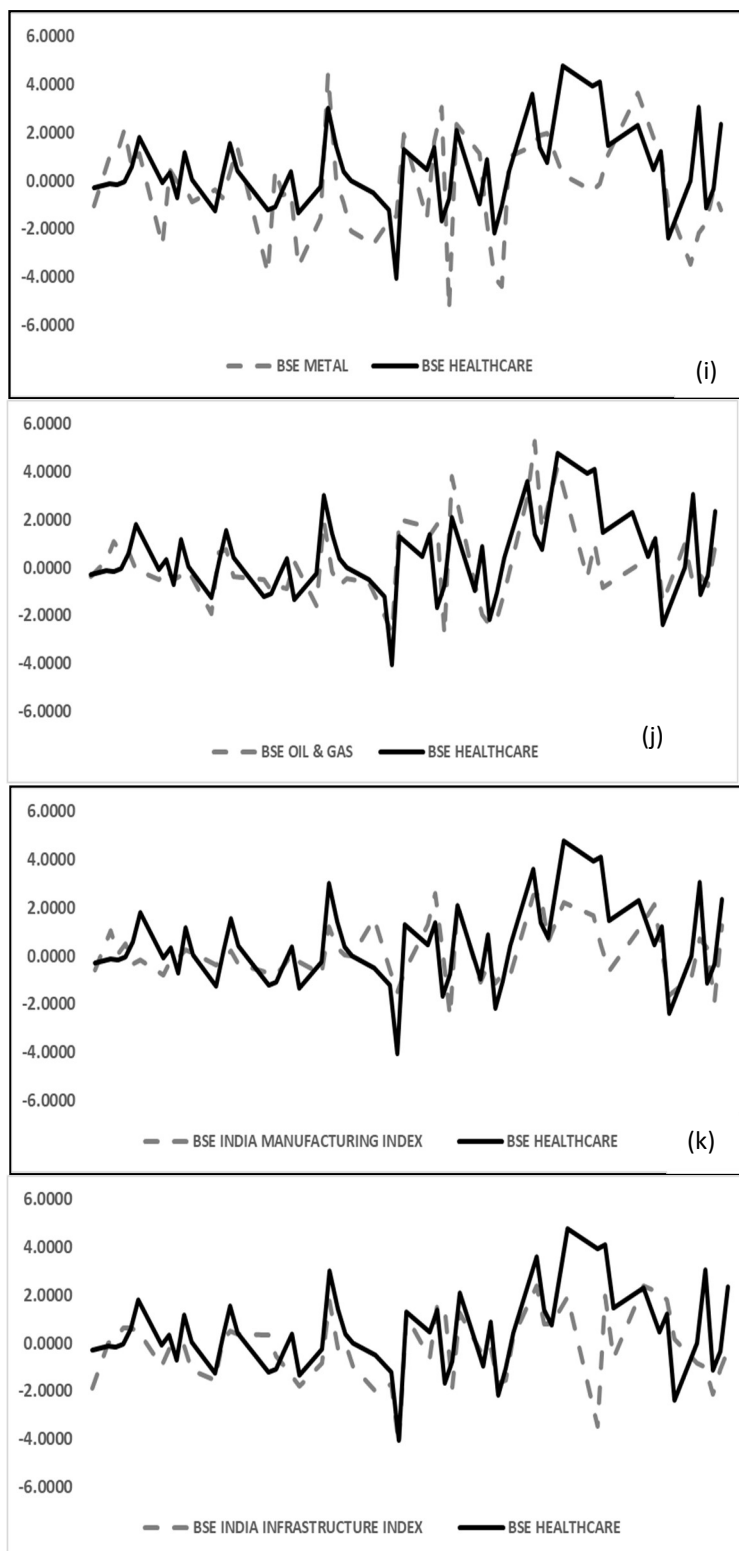


Figure 3: Comparison of daily abnormal returns of BSE Healthcare sector with different sectors

4.1 Event Study

The last step in the analysis is to apply event study methodology to examine the relationship between this pandemic and performance of Indian healthcare and pharmaceutical stocks. Table III presents abnormal returns (AR) for the post-event window from day -27 to day 27 (i.e., from 1 February 2020 to 24 April 2020) for the test sector. The results of the t-test imply that there

are significantly abnormal returns on 26 days, out of which it has given negative returns on only 7 days. Returns are statistically significant and negative at 90 per cent confidence interval (C.I.) on day -12, -8, -1 and positive at same C.I. on day -22, -18, 1, 21. They are statistically significant at 95 per cent C.I.; and negative returns on day 4, and positive returns on day -14, -5, 3, 13, 18. Abnormal returns are negative and statistically significant at 99 per cent C.I. on day 0, 9, 22; and positive at 99 per cent C.I. on day -22, -6, 6, 12, 15, 16, 17, 19, 24, 27. On event day 12 March (day 0), abnormal return is negative and significantly high even on 99.9 per cent C.I. Post-event day returns are positive and significant on most of the days, implying an upside in healthcare and pharmaceutical stocks.

Table III – AR of Healthcare Index during post-event period

Day	AR	t-test		Day	AR	t-test	
-27	-0.2835	-0.4057		1	1.2837	1.8374	*
-26	-0.1441	-0.2062		2	0.4678	0.6696	
-25	-0.1451	-0.2077		3	1.3838	1.9808	**
-24	-0.0414	-0.0592		4	-1.6675	-2.3869	**
-23	0.5820	0.8331		5	-0.7374	-1.0555	
-22	1.8078	2.5877	***	6	2.0789	2.9757	***
-21	-0.0758	-0.1084		7	-0.9745	-1.3949	
-20	0.3436	0.4919		8	0.8936	1.2790	
-19	-0.7192	-1.0294		9	-2.1673	-3.1022	***
-18	1.1910	1.7048	*	10	-1.0548	-1.5099	
-17	0.0460	0.0658		11	0.4235	0.6062	
-16	-1.2439	-1.7805	*	12	3.6106	5.1682	***
-15	0.2268	0.3246		13	1.3987	2.0021	**
-14	1.5412	2.2060	**	14	0.7615	1.0900	
-13	0.4325	0.6191		15	4.7962	6.8651	***
-12	-1.2236	-1.7514	*	16	3.9466	5.6490	***
-11	-1.0755	-1.5394		17	4.0913	5.8562	***
-10	-0.3956	-0.5662		18	1.4774	2.1148	**
-9	0.3995	0.5719		19	2.3003	3.2926	***
-8	-1.3311	-1.9053	*	20	0.4644	0.6647	
-7	-0.2495	-0.3571		21	1.1969	1.7132	*
-6	3.0305	4.3377	***	22	-2.3956	-3.4290	***
-5	1.4285	2.0447	**	23	-0.0127	-0.0182	
-4	0.3760	0.5383		24	3.0748	4.4011	***
-3	0.0081	0.0115		25	-1.1214	-1.6051	
-2	-0.5119	-0.7327		26	-0.3240	-0.4637	
-1	-1.1971	-1.7135	*	27	2.3525	3.3673	***
0	-4.0533	-5.8018	***				

Note: * Significant level 0.1; ** Significant level 0.05; ***Significant level 0.01 Note: Above table is based on author's analysis

Table IV – CAR during post-event period

Day	CAR	t-test		Day	CAR	t-test	
0	-4.0533	-5.7689	***	14	1.6474	0.6054	
1	-2.7696	-2.7873	***	15	6.4436	2.2927	**
2	-2.3018	-1.8914	*	16	10.3902	3.5866	***
3	-0.9179	-0.6532		17	14.4815	4.8581	***
4	-2.5854	-1.6456	*	18	15.9589	5.2109	***
5	-3.3229	-1.9307	*	19	18.2593	5.8110	***
6	-1.2439	-0.6692		20	18.7237	5.8152	***
7	-2.2184	-1.1163		21	19.9205	6.0447	***
8	-1.3249	-0.6285		22	17.5249	5.2009	***
9	-3.4921	-1.5717		23	17.5122	5.0877	***
10	-4.5470	-1.9512	*	24	20.5870	5.8601	***
11	-4.1234	-1.6942	*	25	19.4656	5.4333	***
12	-0.5128	-0.2024		26	19.1416	5.2430	***
13	0.8859	0.3370		27	21.4941	5.7813	***

*Note: * Significant level 0.1; ** Significant level 0.05; ***Significant level 0.01 Note: Above table is based on author's analysis*

Table IV represents cumulative abnormal returns (CAR) for the period after event day. Returns are statistically significant and negative at 90 per cent C.I on day 2, 4, 5, 10, 11; 99 per cent C.I on day 0 and 1. CAR is statistically significant and positive at 95 per cent C.I on day 15 and 99 per cent C.I on day 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27. CAR becoming positive from negative over a period of time and increasing gradually implies that the test sector has outperformed the market and provided significantly different results from the market.

4.2 Discussion

The results arrived at in the above section have been obtained after performing multilevel analysis using different tools. This section details what the results imply.

Beginning from the first level of analysis, the BSE Healthcare sector has given 14 per cent return in the last one month whereas the benchmark index SENSEX reduced by 12 per cent during the same period. This implies that the demand for the sector specific stocks during the pandemic period and the test sector has performed accordingly. Similar results are obtained while analysing the impact of COVID-19 on stock return, distributed into two periods. Here also BSE Healthcare index has provided positive returns unlike any other sectoral index, all of which gave negative returns during post-event period. Both AR and CAR results imply that BSE Healthcare index has given positive returns and returns are statistically significant during the post-event period.

5. CONCLUSION

Healthcare sector promises to grow at a rapid pace in the near future due to development in lifestyle of people and life expectancy. India is a premier destination to lead the way to become the frontrunner in pharmaceutical industry from its current position of third. This paper studied how the outbreak of COVID-19 impacted the stock returns of healthcare sector. BSE Healthcare index represents the healthcare and pharmaceutical sector as a whole, and their closing prices have been taken as the benchmark for further analysis. The results show that COVID-19 outbreak significantly affects the stock performance of the sector. There was significantly positive CAR continuously from day 16 to day 27. There was significantly negative AR on event day, day 0. The result of this paper is consistent with the result of Wang et al. (2013) after day 15, but before day 12 stock returns indicate significantly negative cumulative abnormal returns.

Investors believe that the healthcare and pharmaceutical companies will be the beneficiaries of this pandemic as they would invest in research and development to prepare for the current pandemic and any such unfortunate events in the future. Positive abnormal returns (though not all of them are significant) even after 2 weeks of event day (day 0) imply that investors are in the sector for a long haul and are continuously pouring money in the healthcare and pharmaceutical stocks. This study would be useful for private equity firms and venture capitalists who want to invest in uncertain times, where many sectors would underperform due to low demand and further growth. Healthcare and pharmaceutical companies would be operating in an effective manner to fulfil the demand for their products and services, which would in turn increase their operating ability and turnover, making them the most lucrative option for investors.

This type of study considering the Indian stock market is one of a few, but the study is limited to companies included in the BSE Healthcare index and does not include any company in the same sector outside the index. Also, since there are no separate sectoral indices for healthcare and pharmaceutical companies, this study has taken BSE Healthcare index to represent both the sectors.

REFERENCES

- Al-Awadhi, A. M., Al-Saifi, K., Al-Awadhi, A. & Alhamadi, S., 2020. Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance*. doi: <https://doi.org/10.1016/j.jbef.2020.100326>.
- Chen, M. H., 2010. The response of hotel performance to international tourism development and crisis events. *International Journal of Hospitality Management*, 30(1):, 200–212. <https://doi.org/10.1016/j.ijhm.2010.06.005>.
- Chatterjee, P. (2020). Indian pharma threatened by COVID-19 shutdowns in China. *The Lancet*, 395(10225), 675.
- Chen, M. H.; Jang, S. C.; & Kim, W. G., 2007. The impact of the SARS outbreak on Taiwanese hotel stock performance: An event-study approach, *Hospitality Management* 26(1): 200–212. <http://dx.doi.org/10.1016/j.ijhm.2005.11.004>.
- Giudice, Del Alfonso; & Paltrinieri, Andrea, 2017. The impact of the Arab Spring and the Ebola outbreak on African equity mutual fund investor decisions, *Research in International Business and Finance* 41 (2017): 600– 612. <https://doi.org/10.1016/j.ribaf.2017.05.004>.
- Keogh-Brown, M. R.; & Richard, D. S., 2008. The economic impact of SARS: How does the reality match the predictions?, *Health Policy* 88(1): 110–120. <http://dx.doi.org/10.1016/j.healthpol.2008.03.003>.
- Li, K., 2018. Reaction to news in the Chinese stock market: A study on Xiong'an New Area Strategy. *Journal of Behavioral and Experimental Finance*, 19:, 36–38. <https://doi.org/10.1016/j.jbef.2018.03.004>.
- Loh, Elaine,. 2006. The Impact of SARS on the performance and risk profile of airline stocks, *International Journal of Transport Economics*, Vol. 33(, No. 3), (October 2006:), pp. 401–422.
- Mayer, J. D., 2000. Geography, ecology and emerging infectious diseases, *Social Science & Medicine* 50(7): 937–952. [http://dx.doi.org/10.1016/S0277-9536\(99\)00346-9](http://dx.doi.org/10.1016/S0277-9536(99)00346-9).
- Mckinsey&Company (2020). India Pharma 2020 Propelling access and acceptance, realising true potential. (Available at : https://www.mckinsey.com/~media/mckinsey/dotcom/client_service/Pharma%20and%20Medical%20Products/PMP%20NEW/PDFs/778886_India_Pharma_2020_Propelling_Access_and_Acceptance_Realising_True_Potential.ashx).
- Pendell, L. Dustin; & Cho, Chulgu,. (2013) Stock market reactions to contagious animal disease outbreaks: An event study in Korean foot-and-mouth disease outbreaks, *Agribusiness*, Vol. 29 (4): 455–468. <https://doi.org/10.1002/agr.21346>.
- UNCTAD, 2020. Global trade impact of the Coronavirus (COVID-19) Epidemic (UNCTAD/DITC/INF/2020/1), – 4th March, 2020.
- United Nations, 2019, Department of Economic and Social Affairs, Population Division, World Population Prospects.
- Wang, Y. H., Yang, F. J., & Chen, L. J. (2013). An investor's perspective on infectious diseases and their influence on market behavior. *Journal of Business Economics and Management*, 14(sup1), S112-S127.
- Yang, F. J.; Wang, Y. H.; & Chen, L. J., 2010. The information value of the infectious diseases outbreak on biotechnology, *Journal of Medicinal Plants Research* 4: 2103–2107.
- Yang, H. Y., & Chen, K. H. (2009). A general equilibrium analysis of the economic impact of a tourism crisis: A case study of the SARS epidemic in Taiwan. *Journal of Policy Research in Tourism, Leisure and Events*, 1(1), 37-60.

- Yi-Hsien Wang, Fu-Ju Yang & Li-Je Chen, 2013. An investor's perspective on infectious diseases and their influence on market behavior, *Journal of Business Economics and Management*, 14: sup1, S112–S127. <https://doi.org/10.3846/16111699.2012.711360>
- Zhang, Y.,; Dang, Y.,; Chen, H.,; Thurmond, M.; & Larson, C., 2009. Automatic online news monitoring and classification for syndromic surveillance, *Decision Support Systems* 47(4): 508–517. <http://dx.doi.org/10.1016/j.dss.2009.04.016>.