Corruption in the Healthcare Sector in India during the COVID-19 Pandemic

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Abstract

This paper empirically estimates the monetary extent of corruption in India in the healthcare sector during the second wave of the coronavirus crisis while analysing the policies enforced to combat the virus. Combining micro-level, primary survey data with policies enacted by the Government of India, this paper compares the monetary burden of corruption borne by different income groups and reinforces the notion of COVID-19 being the great unequaliser and the regressivity of its burdens through the channel of corruption, fortified by the inability of the resource-constrained health care sector in India to withstand the surge in demand.

1. Introduction

The southern state of Kerala in India reported the first Coronavirus disease 2019 (COVID-19) case caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on the 30th of January, 2020 following which, it spread explosively throughout the nation with catastrophic health, social and economic repercussions. This was followed by a calamitous loss of life with the health systems unable to cope. Presently, India has the second-highest number of confirmed cases in the world and the third-highest number of reported COVID-19 deaths (Ritchie et al, 2022).

Based on the World Inequality Lab's Report (2022), India was named as one of the most unequal countries in the world, with the top 1 percent of the population worth one-fifth of the total national income in 2021, and the bottom holding merely 13 percent. COVID-19 increased inequality in most nations, affecting the vulnerable disproportionately due to differential access to healthcare for minorities and occupational restrictions for the low-income workers (Galasso, 2020; Alsan, Chandra & Simon, 2021). In the context of India however, corruption may have served as another channel in further increasing the prevalent disparity in society.

The World Bank defines corruption as "the abuse of public power for private benefit" (Huther & Shah, 2000). Other definitions of corruption include neglect of the public interest and misuse of the power gained from a public office for personal gains, however, they may be insufficient in understanding its extent in the context of the Indian health care system and the impact it has on the quality of life. Nevertheless, this paper does not aim to discuss the various definitions of corruption. There is voluminous literature on that subject[1] published by organisations such as Transparency International, the U4 Anti-Corruption Resource Centre and World Bank, all agreeing that while there may not be a singular

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[1] Although, in the survey designed for this study, if the selections made by respondents for a few multiple-choice questions regarding the access to treatments are inclusive of over-paying, bribery, black markets and utilisation of clout and connections, they are considered as indicative of corruption in the healthcare system.

universally accepted definition for corruption, they can vary notably to encompass broader points of issues in many contexts (Williams, 2021).

The implications of corruption necessitate its study, particularly in a situation such as the pandemic which was already rife with suffering for several individuals. A crisis accompanied with corruption however could "feed off each other, creating a vicious cycle of mismanagement and deeper crisis," therefore, undermining the state's capacity in formulating equitable policy responses during the pandemic. Countries performing poorly in keeping corruption in check were found to have violated human rights and democratic norms while managing COVID-19 (Vrushi & Kukutschka, 2021).

 Corruption has been known to cause leakages in the public sector, draining public resources, having detrimental consequences for economic growth and the quality of people's lives while undermining the state's ability to promote sustainable and inclusive growth. Not only does it reduce the public's trust in the state (Mauro, Medas, and Fournier, 2019), but also, "systemic corruption does moral harm." During the pandemic in India, bribes were demanded not just for procuring hospital beds but also for a decent burial or cremation. The pandemic accompanied with corruption disintegrated the concepts of a moral community where it was much easier for the rich to cope compared to the poor (Pellissery, Paul, Srivastava & Ranjan, 2021). For these reasons, it is imperative to determine the root causes of corruption and eradicate it.

Therefore, this research tests for an increase in the monetary extent of corruption in the second wave as compared to the first wave. To do this, first, this paper introduces the healthcare sector in India along with the disproportionate allocation of human and economic resources across rural and urban areas. This is followed by a discussion related to the overburdening of the healthcare sector during the pandemic, setting up the stage for corruption embedding itself at all levels in society. After describing the data and the methodology, the estimated results indicating the presence of significant corruption in the healthcare sector during the second wave are examined and factors that may have influenced corruption overall are discussed including policy efforts to minimise overcharging and catastrophic healthcare expenditure for the vulnerable. Lastly, it briefly scrutinizes over the possible implications of the prevalence of corruption and discusses suitable policy recommendations.

## 2. Healthcare in India

2.1. The History

Modern practices for healthcare evolved in the 1990s during the colonial period when it was built to serve the British officers in India. This ingrained a segmented structure in the healthcare sector within the country with the rich depending on the private sector and the poor resorting to the low-quality but mostly free services in the public sector funded by general taxation, facilitating the prevailing health inequality (Pellissery et al., 2021). After gaining independence in 1947, health expenditure in India for the first two decades primarily focused on disease control programs (Government of India, 1976) such that infrastructure and medical education suffered greatly, especially in rural areas.

In India, the private sector is the major player in healthcare services delivery and accounts for most of the healthcare expenditure. In rural areas, only 37 percent of people find healthcare facilities physically accessible. The public health care sector in India provides only 18 percent of outpatient care and 44 percent of inpatient care. On the other hand, the private sector employs 81 percent of the doctors, 29 percent of hospital beds and 58 percent of the hospitals, in the nation and takes liberty in charging exorbitant prices for its high-quality services because of lack in authoritative oversight. A meagre 28 percent of the population is served by 74 percent of the doctors who prefer to serve in metropolitan regions as there is a dearth of medical infrastructure in rural areas where resides around three fourths of the nation's population and constitutes 80 percent of all medical conditions in the country. Due to a lack of human resources, people in rural areas resort to dishonest or incompetent healthcare providers (Thayyil & Jeeja, 2013).

India has a multi-payer system that is supported by a combination of public and private health insurance funds. In 2018, The Government of India launched a publicly funded universal health insurance scheme called Ayushman Bharat which was designed to offer free medical care at both private and public healthcare institutions to the bottom 50 percent of the population working in the informal economy[2] (Zodpey & Farooqui, 2018). Additionally, The Employee's State Insurance Corporation's Social Insurance programme funds the healthcare expenditure of those employed in the organised sector with salaries up to ₹21,000 (€262.50) in both public and private hospitals (Employees' State Insurance Act, 1949). It was only in April 2020 though, that the Ministry of Health affairs gave a directive as part of Social Security in India that all employers are obligated to offer health insurance to their employees and dependents (Insurance Regulatory and Development Authority of India, 2020). However, a minimum of 75 percent of the individuals were found to have no insurance cover whatsoever (Singh, 2019).

Overall, Indian healthcare was burdened by the years of apathy that have been shown to it long before the pandemic caused havoc. The results of this research highlight the extent to which the pre-existing fractures in the Indian healthcare institutions widened, leading to devastating implications.

Daily New Confirmed Covid-19 Cases and Deaths per Million People in India
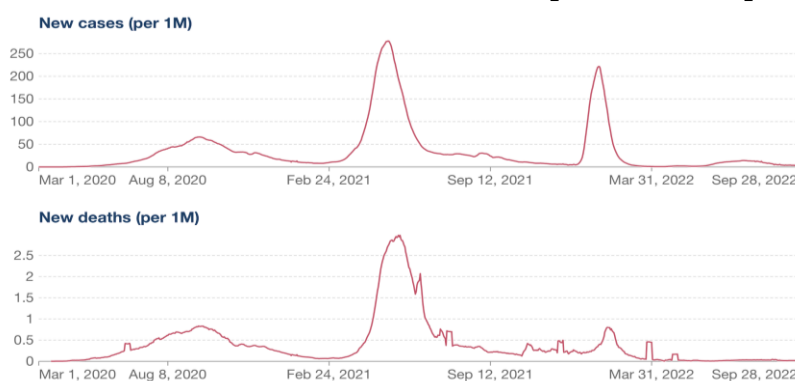
Source: Our World in Data (2022)
Figure 1

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[2] The informal economy in India is defined as consisting of "enterprises having less than 10 employees" while the organised sector in India is defined as consisting of "enterprises having more than 10 employees" (Employees' State Insurance Act, 1949).

2.2 Progression of the pandemic

India witnessed its first COVID death on the 13th of March, 2020 which was followed by a strict nationwide lockdown - aiming to interrupt the transmission chain (Sharma, 2020) - on the 24th of March, 2020. It was a highly stringent measure commended by the World Health Organization (2020) for its preventative nature and unprecedented scale of execution for 1.38 billion individuals; while also being criticised for being premature and poorly executed, spawning a livelihood crisis (Covid-19 lockdown estimated to cost India $4.5 billion a day, 2021). Consequently, the government was compelled to lift the lockdown and ease the travel restrictions within 52 days only for the first wave of the pandemic to peak on the 16th of September, 2020 with 93,617 daily reported cases.

After a strenuous battle against the disease, on the 28th of January, 2021, Prime Minister Narendra Modi publicised having "saved humanity from a big disaster" with the effective containment of the deadly virus. However, the proclamation was premature as the worst was yet to come. These announcements were accompanied by the resumption of festivities, extensive religious gatherings such as the Haridwar Kumbh Mela which was connected to at least 1,700 positive cases between April 10 and April 14th (Rocha, Pelayo & Rackimuthu, 2021), sports events that disregarded the warning signs of the upcoming crisis (Vasu, 2021) and overcrowded election rallies, allegedly serving as the prequel to the second wave caused by the more contagious and deadlier Delta variant (B.1.617).

As evident in figure 1 which tracks the progression of the pandemic in India by looking at the daily new confirmed cases and deaths, merely a few months after the end of the first wave, the cases rose sharply, peaking on the 6th of May, 2021 at 414,433 daily reported cases. The second wave in India accounted for one-third of the deaths worldwide during that period (Rampal, 2021). By July 2021, India's official reported death count was 4,00,000. However, according to the Centre for Global Development, the reality was "catastrophically worse" (Anand, Sandefur and Subramanian, 2021). According to the Consumer Pyramid Household Survey conducted by the Centre for Monitoring Indian Economy, which consisted of a longitudinal panel data of over 800,000 individuals across 232,000 households interviewed approximately 20 times since 2014, excess mortality exceeded by 4.7 million and 6.1 million during the two waves, respectively. Underreporting was embedded in the system as the Integrated Disease Surveillance Programme (IDPS) did not keep track of the fatalities occurring outside hospitals or COVID deaths in individuals who had not been tested (Bhatia & Alexander, 2020; Krishnan, 2021a).

Learning from the ensuing economic consequences of the first wave, in place of a nationwide lockdown, the regional governments were responsible for the duration and stringency of state lockdowns contingent on local conditions. By the 9th of May, 2021, most states had initiated lockdown procedures. While the series of lockdowns decelerated the progression of the disease spreading, the healthcare institutions were overwhelmed, particularly in the worst affected regions and constrained by the perpetual negligence shown to the public healthcare infrastructure in India (Bhaduri, 2020). In combination with the weak institutions surrounding the Indian healthcare sector, the surge in demand led to a series of corrupt practices being engaged within the healthcare institutions. The next section will discuss a few such instances of corruption and its implications, demonstrating the need for this research.

2.3 Corruption during COVID

According to a survey released in 2003 by Transparency International, India was ranked as one of the 30 most corrupt countries in the world, and healthcare was perceived to be the second most corrupt service in India where a quarter of the respondents engaged in bribery for the procurement of health care services. However, the impact of corruption was the largest in the healthcare sector and this was only made worse by the pandemic in 2020.

In an incidence of large-scale fraud, opportunists took advantage of the dire circumstances in the recently uncovered fraud by the pharmaceutical company Micro Labs which manufactures paracetamol tablets called Dolo-650. The company allegedly gave free Dolo-650s worth over ₹1,000 crores (€125 million) to doctors to have them prescribe the drug to COVID patients. The drug became the go-to therapy for treating mild symptoms (Thacker, 2022). In the data collected for this study, 52 percent of the individuals were prescribed this drug and received it at cost in a sector otherwise inflicted with corruption.

According to research published in the International Journal of Social Quality conducted by Pellissery, Paul, Srivastava & Ranjan (2021), the most devastating of these incidents took place when India's vaccination program commenced on the 16th of January, 2021, alongside which, to replenish the reserves, the government participated in vaccine diplomacy in an attempt to attract global capital despite the shamefully low vaccination rate within the country. Several politicians, particularly those from the ruling party, directly obtained medication and vaccinations. These politicians sat on the boards of directors of various private hospitals which displayed their images while advertising the vaccination drives. The healthcare industry, responsible for lives, became a political landscape and the entrusted leaders were on a mission to improve their public image while earning money from the exorbitant prices charged by these private hospitals for vaccinations. Despite media reporting medication and vaccination shortages everywhere else, both were available in select private hospitals which served as a ground for political campaigns. The private hospitals managed to get a hold of the vaccination despite the public sector being unable to do so effectively.

This reinforced health inequality in an already segmented system where the poor did not have access to such preventative vaccinations whereas the middle class accessed it by paying soaring prices at private hospitals. Throughout this time, the Union government did not act on trying to procure vaccines directly from the companies that were producing them. Instead, the regional governments were competing amongst themselves and in doing so, the prices went up. Only when the Supreme court intervened did the Union government announce a reversal of their vaccine policies and from 21st June, 2021, the central government started purchasing 75 percent of the vaccines from companies producing them within the country and supplying them to the state governments for free. Thereafter, the public had access to vaccinations for free in public hospitals (Pellissery et al 2021). However, by then an insurmountable number of lives were lost. By October 2021, one billion doses had been administered, 700 million of those were single doses and 300 million were double doses (Press Information Bureau, Government of India, 2021). According to research published in the Lancet Infectious Diseases Journal, based on excess mortality, immunisation against COVID reduced the death toll by over 4.2 million lives. However, more would have been possible had the Union Government policies been more proactive since the beginning

aiding in reaching the World Health Organization's target of fully vaccinating 40 percent of the individuals by the end of 2021 (Business Insider, 2022).

With the additional burden of COVID-19 on the healthcare sector, the inequality in access to healthcare in a democracy of equals became political and profit-seeking at the cost of individual lives. This research is motivated by the injustice that accompanied the pandemic. The inadequate infrastructure and regulatory capacity affected patient safety[3] during the pandemic (Narwal & Jain, 2021) taking away the basic human rights and integrity from the people, particularly the vulnerable in society.

3. Data and Description

Until recently, the micro-level aspects of corruption have been overlooked to a great extent in literature and drawing policy recommendations from solely macroeconomic studies have proved fruitless due to the inherent differences in the institutions and severity of corruption across countries (Herrera, Lijane & Rodriguez, 2007). Accordingly, this paper focuses on micro-economic empirical research based on primary data to better understand the heterogeneous mechanisms and distributional consequences of corruption to better inform policy decisions.

Corrupt behaviour being endogenous, illicit and secretive in nature, is difficult to study (Banerjee, Hanna & Mullainathan, 2012). Moreover, while earlier literature focusing on the micro-level aspects of corruption used subjective measures such as the perception of corruption, this paper aims to collect and report statistics from objective data. This is because, according to existing literature, surveys of perceived corruption are biased due to individual characteristics. Additionally, there may be systemic biases, particularly due to the fear and extensive media coverage of a widespread crisis such as the pandemic. It is therefore beneficial to look at micro-level objective evidence.

The most direct way of identifying corruption is through surveying bribe payers since the stigma associated with paying bribes is relatively little (Olken & Pande, 2012). So, to conduct this analysis I collected primary micro-level data using a survey which incorporates objective as well as subjective measures of corruption. The objective questions are inclusive of the various requirements for an individual who was treated for COVID-19 such as Isolation Bed or Intensive Care Unit Bed (ICU), oxygen cylinders and the standard drugs[4] recommended depending on the severity of the disease. The questions pertaining to such requirements discussed the means[5] by which an individual secured the required services and the amount of money (in Indian Rupee, ₹) they paid for the same. To avoid any reservations individuals may have had in answering questions regarding participation in corrupt practices, the respondents could choose the option, "prefer not to answer," however, as represented in the appendix

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[3] Patient safety is defined as "the prevention of adverse events associated with health care to achieve zero avoidable patient harm" (World Health Organisation, 2020).

[4] Although, the drugs primarily focused on in this study are: Tocilizumab, Remdesivir and Fabiflu as they remained prominent throughout the duration of the two waves.

[5] The means for securing healthcare services in the survey are listed as i) bribery, ii) connections, iii) black markets, iv) following up extensively, v) social media vi) procured without any difficulty vii) did not receive the service vi) prefer not to answer. These options are presented for each requirement respectively. The various means used in the survey are based on another short survey by Local Circles (2021) – a platform that escalates policy and government issues.

table A6,A7 and A8, very few individuals selected it, therefore eliminating several concerns about the willingness of respondents to disclose such information. Additionally, to avoid recall bias when answering questions relating to the expenditure incurred on treatments, market prices were stated for reference.

Furthermore, data on the price ceilings set by the governments of the 21 states in the dataset were collected for comparison with the expenditure incurred per day for occupying an Isolation or ICU Bed. The National Pharmaceutical Pricing Authority (NPPA) also announced price ceilings for experimental lifesaving drug - Remdesivir and oxygen cylinders (Ministry of Chemicals and Fertilizers, 2020; Ministry of Chemicals and Fertilizers, 2021). Additionally, data on the maximum retail prices (MRPs) for other drugs were collected - generic and branded. The collected data was meticulously cross referenced with the dataset to make valid comparisons.

Follow up questions covered the hospital sector (private or public sector) where the individual received treatment and the name of the hospital to manually cross reference the accreditation status of a hospital, allocated by the National Accreditation Board for Hospital and Healthcare Providers (NABH) as most individuals are unaware of the accreditation status of the hospitals where they received treatment. This was necessary as the NABH accredited hospitals were permitted to charge higher prices as compared to non-NABH hospitals[6]. Lastly, the survey asked a few subjective questions regarding the perception of corruption pre-pandemic, during the first wave and second wave of COVID-19 and a series of questions pertaining to individual characteristics, especially characteristics that may increase the probability of contracting COVID and the costs of any hospitalisations.

The survey could be filled digitally on a phone device or laptop. Although, considering the prevalent digital divide in India, in person and telephonic surveys were collected as well to accommodate the lower-income individuals. In total, the survey had a completion rate of 94.51 percent. To have a representative and credible dataset consisting of individuals from disparate backgrounds, a few organisations were approached to assist in the data collection process. These organisations included an NGO which operates in a tier 3 City - Saharanpur in Uttar Pradesh, a mid-sized manufacturing enterprise in Noida, a tier 2 city

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[6] The price ceilings for hospitalisation costs for COVID-19 were dependent on six factors. These factors included – (a) Whether an individual went to a private or public hospital – while public hospitals provided treatment for free more-or-less, private hospitals were allowed to charge to a certain degree. (b) The hospital accreditation status – an NABH accredited hospital was permitted to charge higher across all categories as compared to Non-NABH hospitals. (c) Price ceilings further varied based on the treatment requirements which were categorised as: i) Isolation Bed, ii) ICU bed without ventilator support and iii) ICU bed with ventilator support. The determined rates were inclusive of the charges for the COVID-19 test, personal protective equipment (PPE kits) and generic medication. Experimental drugs such as Remdesivir and Tocilizumab were not included in these costs. The rates set also include the costs of care for underlying co-morbid conditions such as hypertension, diabetes, cardio-vascular problems et cetera (Department of Health and Family Welfare, Government of Haryana, 2020). (d) Price ceilings differed by state and the state governments set them in accordance with their state requirements. (e) Some states went a step further and decided on differential price ceilings such that metropolitan areas had significantly higher price caps and underdeveloped regions had lower price caps. (f) Lastly, most states had a provision for individuals and families belonging to income groups below the poverty line. These families were to be provided COVID-19 treatment for free irrespective of the hospital sector they choose to get treated in.

in Uttar Pradesh; a university in Yamuna Nagar, a tier 3 city in Haryana, another university in Noida and one in Mumbai, a small clinic in Jharkhand and a few offices in Mumbai and Delhi. Also, auto-rickshaw drivers were randomly interviewed along with street vendors and housekeepers in Noida, Mumbai and Delhi.

The dataset obtained has 1,409 observations (801 individuals who filled in the survey for themselves and any immediate family members who lost their lives to COVID-19, providing data on 608 deceased individuals). Out of the 801 respondents, 248 suffered from COVID-19. The observations for those who had COVID-19 summed up to 1049 in total - 228 instances of COVID-19 from the first wave and 645 from the second wave. Out of these observations, 553 people needed various medications for their treatment- 453 of these observations are pertaining to a requirement for experimental drugs such Tocilizumab and Remdesivir. Additionally, 579 individuals required hospitalisation and 448 required oxygen cylinders.

As described in the appendix tables A1-A8, the data presents a rather representative sample. However, in instances where the sample is not representative of the population, appropriate controls have been incorporated in the methodology to avoid biased estimates. This holds true for indicators such as profession, income level, health insurance, state and city.

Anecdotal evidence from mass media coverages suggests widespread corruption in India during COVID-19 with respect to the solicitation of hospital beds, drugs and oxygen cylinders for treatment. However, anecdotal evidence is not sufficient. A glimpse of the extent of corruption before COVID-19, during the first wave and second wave in the form of employing bribery and connections to acquire services as per the perception of the people is given below in figure 2. These results are based on the data collected for this research and it asked the respondents, "Do you think bribery was common in the health care sector in India?" and "Do you think using clout and connections was common in the health care sector in India?" for all three time periods. Individuals could respond with any of the five options ranging from "Strongly agree" to "Strongly Disagree." Most people believed to some extent in the presence of corruption before COVID, however, the number of individuals who strongly agreed with the statements almost doubled in the case of bribery and approximately tripled in the case of connections by the second wave of COVID. Nevertheless, perceptions may be biased. This research aims to credibly estimate the extent of corruption in monetary terms and gain a comprehensive understanding of its impact.
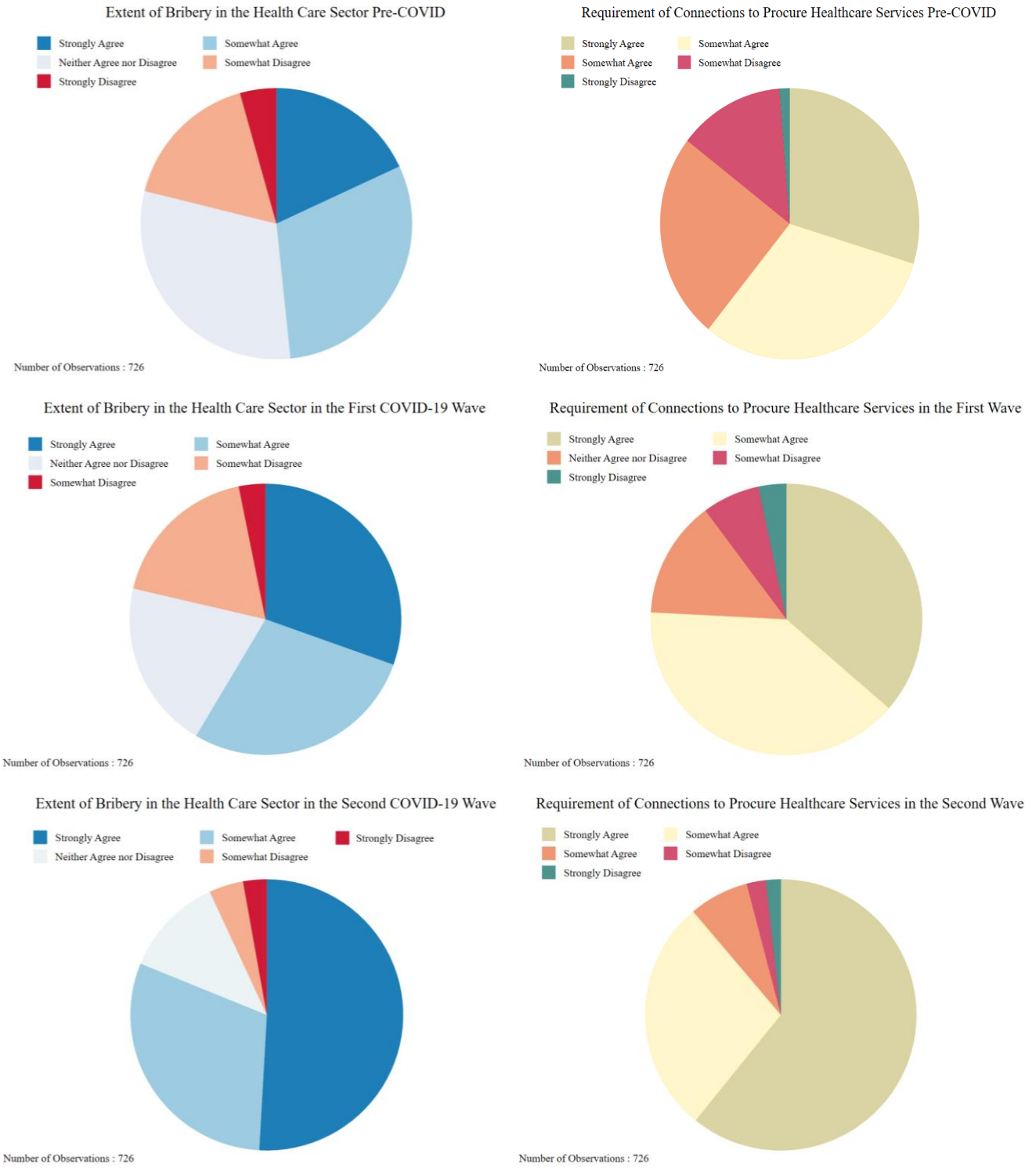
Figure 2

4. Monetary Extent of Corruption

This section compares the treatment costs during COVID-19 with the price ceilings set by the state and central governments and serves two purposes - firstly, it gives more clarity on the type of data collected and the indicators of corruption used in the analysis. Secondly, it displays the average minimum levels of corruption that we can say with certainty existed in the healthcare sector in India, hence building up to the methodology in section 5. Figures 3-8 display the scatter plots and fitted lines for the cost of treatment for COVID-19 for several requirements by each one's method of procurement. It is evident that there was a lot more corruption and overpricing during the second wave in the case of hospital beds and the drugs - Tocilizumab, Remdesivir and Fabiflu. This does not hold true for oxygen cylinders though.

In the case of hospital beds and drugs, the prices charged during the second wave are discernibly above the price ceilings set by the state governments. Although some level of pre-existing corruption in the Indian healthcare sector is reflected in the first wave, the extent of corruption is significantly larger in the second wave, clearly indicating a drastic increase in corruption despite warnings by the state governments specifying, "non-implementation of these guidelines such as overcharging, etc. may invoke penalty under Section 118 of Indian Penal Code." (Government of Haryana, 2020). In the case of oxygen cylinders, however, there is significant corruption in the first wave as well and it declines towards the end of the first wave only to rise starkly in the second wave.

Nonetheless, the difference between the fitted line and the price ceiling in the graphs only represents a lower limit to corruption. The price ceilings considered at the State and City level are the maximum possible prices that may be charged for each sub-category. For instance, the price ceiling considered for ICU beds is the one for ICU beds with ventilator support. As not all patients admitted to ICUs required ventilator support, this result serves as a lower limit to the monetary extent of corruption.

While it may be argued that the increase in prices could be attributed to the increase in demand for healthcare services, particularly during the second wave which had 23.71 million confirmed cases as opposed to the first wave which had 10.78 million confirmed cases (Ritchie et al, 2022) and even though the results of this research imply that the inability of the healthcare sector to meet the increased requirements for services during the pandemic is one of the main causes for overcharging, nevertheless, any price charged over the price ceilings set can be legally defined as corruption. The increase in demand merely exposed the realities of a system that was already broken.

The next section discusses the methodology used in this research to estimate the monetary extent of corruption so that the root causes of corruption may be determined.
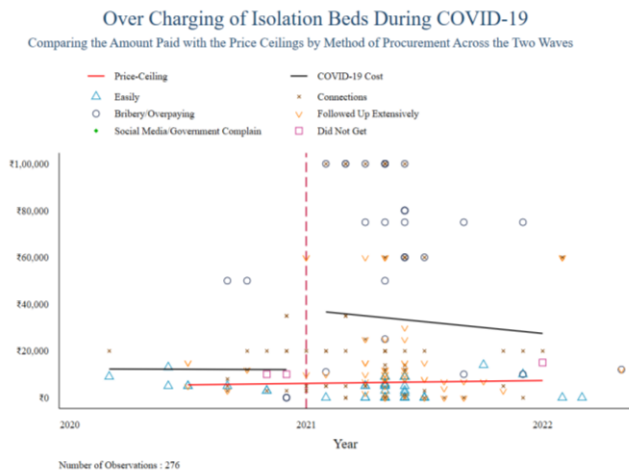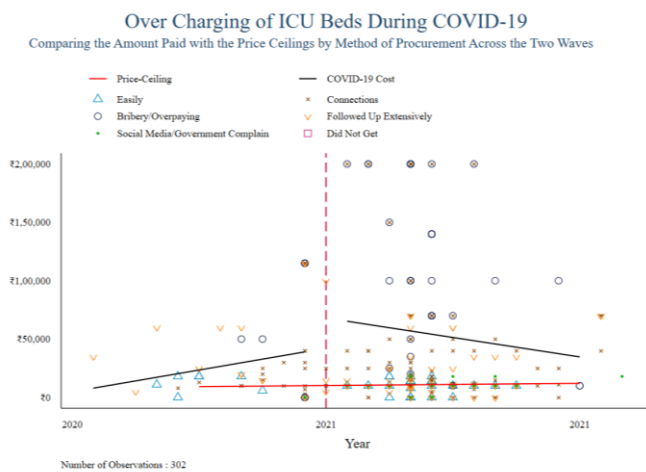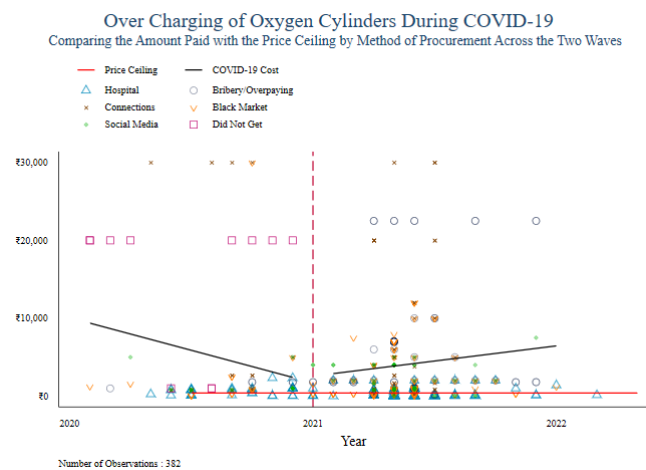
Figure 3

Figure 4
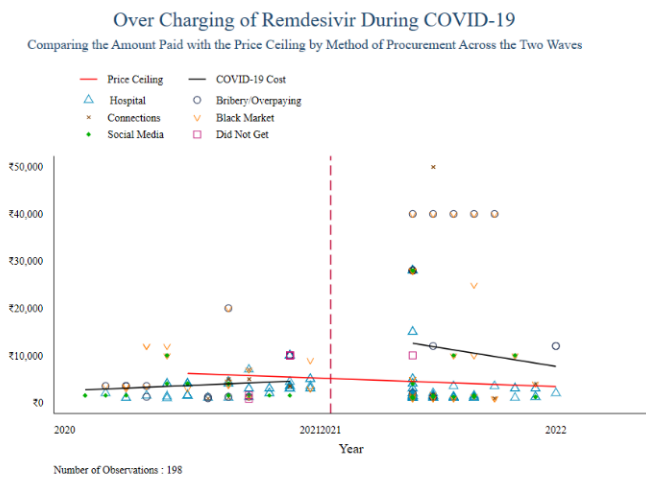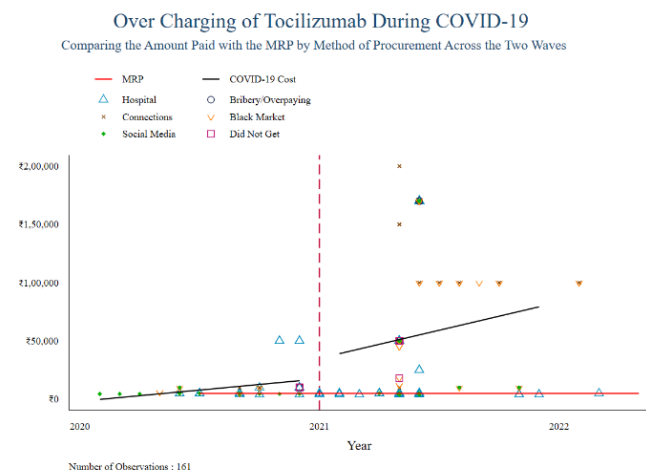

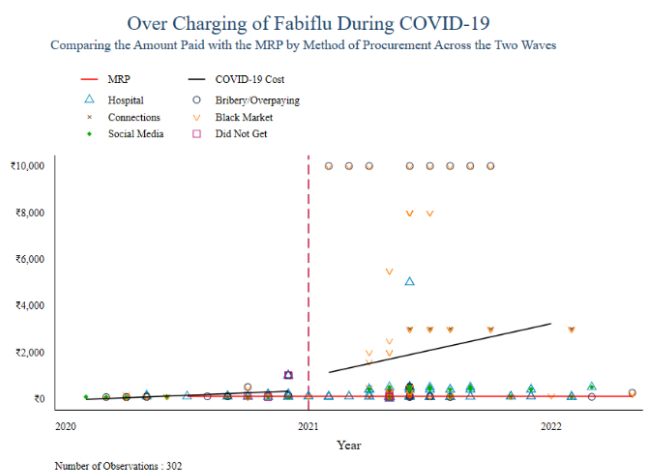
Figure 5

Figure 6

Figure 7

Figure 8

5. Methodology

As is discernible in figures 3-8, the costs of treatment for COVID-19 during the second wave were alarmingly higher based on the information provided by the survey respondents. To estimate the fraction of the treatment expenditure incurred per day by individuals attributed to corruption during the second wave of COVID-19, OLS regression models are used.

The reason for comparing the costs across the two waves to get a credible estimate for the monetary extent of corruption is three-fold. Firstly, the last three epidemics in India were over a decade ago - dengue in 2006, bird flu in 2008 and swine flu in 2009, the last two being variants of the influenza virus. However, none of them would have assisted in making valid comparisons with COVID as in the past ten years, the Indian healthcare system has evolved drastically. Moreover, precedents for treatment were already set in India for each of these three diseases from previous similar outbreaks and lastly because neither of them had spread with the virulence of COVID-19.

Secondly, comparisons between the hospitalisation costs for COVID-19 with the hospitalisation costs of other respiratory diseases in India are invalid as hospitalisation for other respiratory diseases cost much higher as compared to the cost of COVID-19 according to the data collected for this research. This may be because hospitalisation rates in India are among the lowest in the world as individuals only seek treatment for severe illnesses (Economic Survey 2021, Banerjee & Duflo, 2011). Because of this reason, the data is also limited and lastly, hospitalisation costs for respiratory may have been affected as well due to COVID-19 leading to biased estimates.

For these two reasons, comparing the costs of COVID-19 across the two waves would give us a more credible estimate. Thirdly, according to the Additional Chief Secretary to the Government of Haryana, Health Department (2020), "in all cases if the actual rates are lower than the proposed package rates … then the hospital shall charge the lower rates." In this research, the monetary cost for treatment during the first wave is used as a reasonable proxy for the "actual rates." Furthermore, by comparing the monetary costs across the two waves, any pre-existing levels of corruption in the healthcare sector may be eliminated, isolating the corruption specific to the second wave of COVID-19. Therefore, in the models below, we can credibly estimate the monetary extent of corruption across the two waves.

$$Y_i = \beta_0 + \beta_1 * X_i + \beta_2 * \gamma_{1i} + \beta_3 * \gamma_{2i} + \beta_4 * \gamma_{3i} + \beta_5 * \gamma_{4i} + \varepsilon \qquad (1)$$

In the model (1) above, Y_i is defined as the treatment cost per day paid by individual "i". X_i is the variable of interest which is 0 if the individual was hospitalised for COVID-19 during the first wave and 1 if the individual was hospitalised for COVID-19 during the second wave.

Additionally, this model contains four vectors - γ_{1i}, γ_{2i}, γ_{3i} and γ_{4i}. The first vector γ_{1i} represents the treatment requirements which varied drastically with each patient in terms of hospitalisation, oxygen requirements and medication. Second, γ_{2i} controls for hospital-level variables. The hospital-level controls include whether an individual received treatment in a private or public sector and the NABH accreditation status of the hospital they went to.

Next, γ_{3i} encompasses individual characteristics such as age group, household annual income level, health conditions such as a history of some respiratory disease, diabetes, cardiovascular disease and cancer; lifestyle habits such as - smoking and exercising, whether they have health insurance et cetera. Individual-level controls for pre-existing ailments can help minimise the variation in prices charged by hospitals for treatment. Fourth, γ_{4i} represents the geographic controls which, at the city level, classify them into tier-1, tier-2 and tier-3 cities, with tier-1 cities including metropolitan cities such as Delhi, Mumbai and Pune and tier-3 cities including rural areas. It also differentiates between various states[7] within the country.

Although, this may not provide a credible estimate of the monetary estimate of corruption as there is significant variation in prices depending on the type of corrupt practices indulged in. Individuals who used bribes to obtain a bed may have paid more as compared to those who utilised connections. Such differences may persist for procuring oxygen cylinders and drugs from black markets. This may bias the results. Therefore, an additional specification is used.

$$Y_i = \beta_0 + \beta_1 * X_i + \beta_2 * \gamma_{1i} + \beta_3 * \gamma_{2i} + \beta_4 * \gamma_{3i} + \beta_5 * \gamma_{4i} + \beta_6 * Z_i + \beta_7 * Z_i * X_i + \varepsilon \qquad (2)$$

The specification (2) follows from the model (1) above and includes variable Z_i which differentiates across the three common corrupt practices – namely, bribery, connections and black markets – used by an individual for attaining the required treatment. In this specification, the coefficient of interest becomes to β_7 which is the coefficient for the interaction effect between the corrupt practice and the second wave. By incorporating Z_i the model controls for the monetary impact of preexisting levels of corrupt practices and therefore, β_7 gives us the additional corruption in the second wave.

The methodology is used thrice, first to estimate the monetary cost of corruption with respect to hospital beds; second, with respect to oxygen cylinders and lastly, for drugs. The reason for separating the results is that while in the case of hospital beds, if an individual was not allocated a bed in any of the hospitals they approached, they resorted to quarantining at home, on the other hand, in the case of oxygen cylinders and drugs, if they were not available at hospitals, individuals procured them from black markets.

6. Results

6.1. Hospital Beds

Table 1 displays the regression results for hospitalisation costs per night. Column (1) contains the results of a preliminary analysis using the second wave as the only explanatory variable. The coefficient indicates that expenditure in the second wave was ₹10,008.21 (€125,10) more as compared to the expenditure in the first wave, significant at the 5 percent level. On having included illness specific controls, the estimate indicates that the monetary extent of corruption in the second wave is higher by ₹11,840.32 (€148.00) as compared to the first wave, significant at the 1 percent level.

The difference in the monetary extent of corruption across the two waves decreases and the significance diminishes in columns (3), (4) and (5) as additional control variables are added which can be expected as

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[7] The states and union territory focused on for this study are Maharashtra, Haryana, Uttar Pradesh and Delhi as the number of observations for each is over 200 as given in table 9.

a significant proportion of the variation is eliminated on including hospital level controls, individual characteristics and geographical controls.

The estimates for specification (2) are given in column (6). The estimates of interest here are the interaction effects between the second wave and bribery and connections respectively. According to column (6), the expenditure is lower in the second wave by ₹719.69 (€9.00), however, this result is not significant. Individuals who use bribery to have a hospital bed allocated to them pay ₹49,067.49 (€613.34) more as compared to individuals who use other methods of procurement and individuals who use bribery in the second wave pay ₹32,140.96 (€401.76) more in addition. The results are significant at the 5 percent level and 10 percent levels respectively. Individuals who use connections pay ₹3,553.82 (€44.42) more as compared to individuals using other methods of procurement and those using connections in the second wave in particular pay ₹420.21 (€5.25) more in addition. However, these results are not significant.

Therefore, in the case of hospital beds, the primary source of a monetary increase in corruption in the second wave was bribery.

Cost of Hospital Beds Per Day	(1)	(2)	(3)	(4)	(5)	(6)
Second Wave	10008.21**	11840.316***	6165.346	9296.42*	4116.091	-719.691
	(4038.93)	(3995.884)	(4344.31)	(5335.809)	(7010.913)	(10488)
Bribery						49067.487**
						(20249.717)
Bribery*Second Wave						32140.963*
						(18925.836)
Connections						3553.815
						(14343.65)
Connections*Second Wave						420.211
						(14107.784)
Constant	24257.732***	7586.576	24445.724***	5716.17	36739.048*	-79578.996***
	(3047.468)	(5631.397)	(6898.789)	(17867.667)	(22211.706)	(27987.282)
Observations	442	442	282	282	236	236
R-squared	.008	.091	.39	.533	.659	.73
Illness Controls	NO	YES	YES	YES	YES	YES
Hospital Controls	NO	NO	YES	YES	YES	YES
Individual Level	NO	NO	NO	YES	YES	YES
Geographical Controls	NO	NO	NO	NO	YES	YES
Procurement Method	NO	NO	NO	NO	NO	YES

Robust standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 1: Monetary Extent of Corruption in the Second Wave for Hospital Beds

6.2. Oxygen Cylinders

The estimates for the monetary extent of corruption in regards to oxygen cylinders are displayed in table 2. Column (1) does not include any control variables and according to this preliminary regression, the expenditure was slightly higher in the second wave as compared to the first wave by ₹1,317.22 (€16.47) and this estimate is significant at the 10 percent level. In subsequent columns (2), (3), (4) and (5), the differences in expenditure decrease across the two waves and are not significant anymore on the inclusion of illness specific controls, hospital level controls, individual characteristics and geographical controls.

The estimates corresponding to specification (2) are given in column (6) where the interaction effects between the procurement methods and the second wave are the main explanatory variables. The results indicate that the overall expenditure in the second wave was lesser by ₹1,443.44 (€18.04) as compared to the first wave. Individuals who used bribery and connections paid ₹2,053.27 (€25.67) and ₹1,554.04 (€19.43) more respectively as compared to individual using other forms of procurement for oxygen cylinders. In the second wave, individuals who used bribery paid ₹1,416.88 (€17.74) lesser and those who used connections paid ₹1.67 (€0.02) more as compared to the first wave. However, none of these results are statistically significant. Individuals who procured oxygen cylinders from black markets paid ₹3,260.87 (€40.76) lesser as compared to individuals using other methods of procurement. However, in the second wave, individuals procuring oxygen cylinders from black market paid ₹5,586.79 (€69.83) more as compared to the first wave. Both the results are significant at the 1 percent level.

Therefore, in the case of oxygen cylinders, the primary cause for the increase in the monetary extent of corruption in the second wave was individuals resorting to black markets.

Cost of Oxygen Cylinders per Litre	(1)	(2)	(3)	(4)	(5)	(6)
Second Wave	1317.217* (674.245)	1072.971 (840.334)	60.525 (832.553)	578.037 (911.252)	828.451 (1038.58)	-1443.436 (1036.404)
Bribery						2053.272 (1859.032)
Bribery*Second Wave						-1416.882 (1822.856)
Connections						1554.04 (1742.663)
Connections*Second Wave						1.669 (1831.037)
Black Markets						-3260.869** (1438.592)
Black Markets*Second Wave						5586.786*** (1494.25)
Constant	5494.573*** (1220.54)	5915.458*** (1363.44)	2768.197** (1265.833)	13586.63*** (2532.436)	18637.045*** (2608)	17073.945*** (2536.764)
Observations	377	360	360	359	323	323
R-squared	.023	.033	.095	.476	.614	.678
Illness Controls	NO	YES	YES	YES	YES	YES
Hospital Controls	NO	NO	YES	YES	YES	YES
Individual Level	NO	NO	NO	YES	YES	YES
Geographical Controls	NO	NO	NO	NO	YES	YES
Procurement Method	NO	NO	NO	NO	NO	YES

Robust standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 2: Monetary Extent of Corruption in the Second Wave for Oxygen Cylinders

6.3. Drugs

Finally, for drugs, the regression results for the monetary extent of corruption are displayed in table 3. In column 1, the monetary extent of corruption across the two waves is estimated to be ₹19,310.96 (€241.39) and this result is significant at the 1 percent level. The difference across the two waves persists even when various controls are added in subsequent columns (2), (3), (4) and (5). In column (2), (3) and (4) with illness specific, hospital level and individual level controls, the estimates for the monetary extent of corruption in the second wave as compared to the first wave increases to ₹27,073.97 (€338.42), ₹29,045.29 (€363.07) and ₹19,679.21 (€245.99) respectively, all three coefficients being significant at the 1 percent level. In column (5), on adding geographical controls, the coefficient for the second wave falls to ₹15,330.33 (€191.63), significant at the 1 percent level as well.

Lastly, the estimates for specification (2) are given in column (6) based on which, the amount overpaid on drugs in the second wave was lesser by ₹754.48 (€9.43), although this result is not significant. Individuals who used bribery to obtain the drugs overpaid by ₹22,107.43 (€276.34) in both waves, significant at the 5 percent level. In addition, individuals who used bribery in the second wave to procure the required drugs overpaid by ₹37,039.96 (€463.00), significant at the 1 percent level. Those who used connections to acquire drugs paid ₹48,871.36 (€619.89) more as compared to individuals using other means of procurement, significant at the 1 percent level. In addition, individuals who used connections in the second wave paid ₹17,118.98 (€213.99) more, although this result is not significant. Lastly, individuals procuring drugs from black markets paid ₹4,571.50 (€57.14) more as compared to individuals procuring the drugs through other means, however, this result is not significant. But individuals procuring drugs through black markets in the second wave paid ₹31,208.68 (€390.11) more significant at the 5 percent level.

Therefore, in the case of drugs, the variables that significantly contribute to the monetary extent of corruption were bribery, connections and black markets.

Cost of Drugs	(1)	(2)	(3)	(4)	(5)	(6)
Second Wave	19310.963***	27073.974***	29045.285***	19679.207***	15330.325***	-754.475
	(2956.242)	(3990.782)	(4384.041)	(4592.239)	(4663.203)	(3456.999)
Bribery						22107.427**
						(9811.671)
Bribery*Second Wave						37039.959***
						(11422.724)
Connections						48871.361***
						(9887.251)
Connections*Second Wave						17118.975
						(10592.581)
Black Market						4571.501
						(11231.859)
Black Market*Second Wave						31208.679**
						(14719.307)
Constant	7542.955***	27482.39***	56466.887***	20431.437	61778.636**	55997.452*
	(1030.401)	(6340.178)	(10119.73)	(25803.228)	(24182.15)	(32228.381)
Observations	442	335	335	334	304	304
R-squared	.035	.191	.231	.485	.597	.818
Illness Controls	NO	YES	YES	YES	YES	YES
Hospital Controls	NO	NO	YES	YES	YES	YES
Individual Level	NO	NO	NO	YES	YES	YES
Geographical Controls	NO	NO	NO	NO	YES	YES
Procurement Method	NO	NO	NO	NO	NO	YES

Robust standard errors are in parentheses
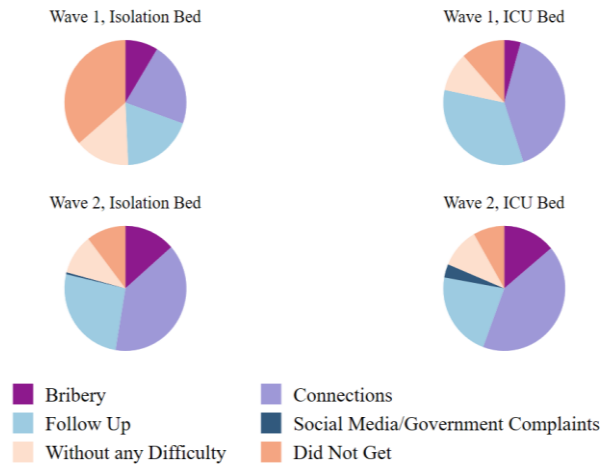*** $p<.01$, ** $p<.05$, * $p<.1$

Table 3: Monetary Extent of Corruption in the Second Wave for Drugs

7. Discussion

In the allocation of beds, the primary source of an increase in the monetary extent of corruption in the second wave is bribery. As illustrated in figure 9, the instances of bribery across the two waves increased in the case of hospital beds which is in line with the results. However, considering the utilization of connections, despite an increase in instances for it in the second wave, it is not translated to an increase in the monetary costs as the regression results for connections are not only statistically insignificant but also monetarily insignificant. Similarly, in regards to oxygen cylinders, even though black markets is the only variable that is statistically significant in causing an increase in the monetary extent of corruption in the second wave, according to figure 10, there was an increase in the instances of not only black marketing but also bribery and connections. Finally, looking at the means of acquiring drugs, as per figure 11, even though the rise in corrupt instances is not as large across the two waves, according to the regression results in table 3, using bribery and connections is statistically and monetarily significant in being responsible for higher expenditures in both the waves. In addition, in the second wave, bribery and black marketing are statistically and monetarily significant in their contribution to further higher expenditures. On the other hand, on a positive note, the proportion of individuals who did not manage to get the required treatment falls in the second wave as compared to the first for all three - beds, oxygen cylinders and drugs.

This section examines the factors that may have contributed to the monetary extent of corruption for beds, oxygen cylinders and drugs, and delves into the factors that may have affected the instances of corrupt practices, hence influencing future policies to combat it and its detrimental consequences.

Allocation of Beds by Method of Procurement

Wave 1, Isolation Bed

Wave 1, ICU Bed

Wave 2, Isolation Bed

Wave 2, ICU Bed

- Bribery
- Connections
- Follow Up
- Social Media/Government Complaints
- Without any Difficulty
- Did Not Get

Number of Observations : 643

Figure 9

Means for Procuring Oxygen Cylinders

Wave 1

Wave 2

- Bribery
- Connections
- Black Market
- Social Media
- Regular Sources
- Did Not Get
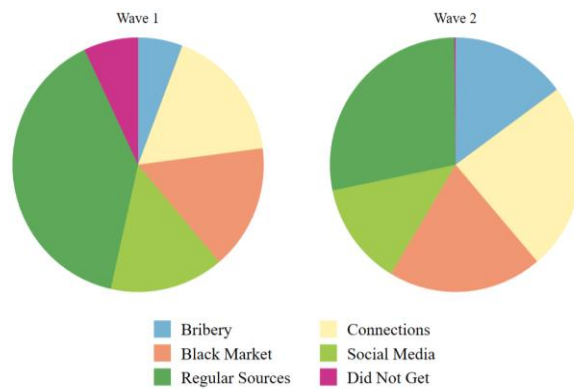
Number of Observations : 566

Figure 10

Means For Procuring Drugs

Wave 1, Fabiflu

Wave 1, Experimental Drugs

Wave 2, Fabiflu

Wave 2, Experimental Drugs

- Bribery
- Connections
- Black Market
- Social Media
- Regular Sources
- Did Not Get
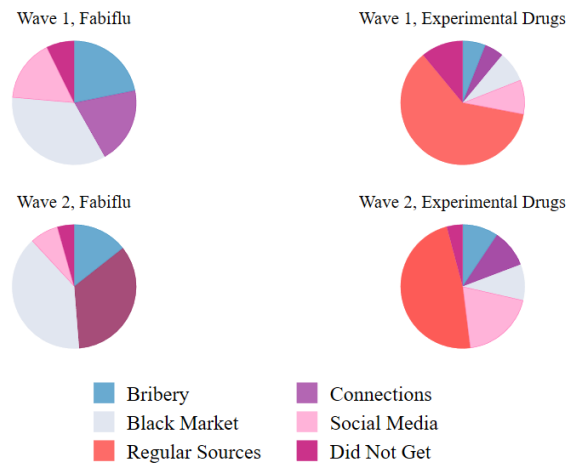
Number of Observations : 638

Figure 11

7.1. Lack of Infrastructure

In 2018-2019, the government health expenditure was 1.35 percent of the GDP as opposed to the recommended amount of 3 percent by the Economic Survey, Government of India, 2021 (Nagarajan, 2022). According to research conducted by the Economic Survey, (2021) low levels of prioritisation of healthcare in the central budgets is associated with higher out of pocket expenditure for citizens. Based on their estimates, an increase in public health expenditure may reduce out of pocket expenditure from 60 percent presently to approximately 30 percent.

In March 2020, there were reportedly only 40,000 ventilators in India, of which 8,432 were employed by the public sector (Chandna, 2020). On the other hand, the lowest number of cases after the peak of the first wave were seen in January with a little lower than 15,000 cases per day (Safi, 2021). Clearly, the persistent underfunding of the Indian healthcare sector created a system that was ill-equipped to cope with the pandemic, hence paving the way for corruption.

Due to a shortage of life supporting beds at hospitals, individuals kept sick loved ones at home by obtaining medical essentials from the black market. Dealers started hoarding vital supplies such as drugs and oxygen cylinders creating an artificial supply shortage and selling them at exorbitant rates, profiting off the distressed patients and their families (Pellissery et al, 2021). Within the capital city of Delhi, between the 13th of April 2021 and 18th of May 2021, during the peak of the second wave, the Delhi Police arrested over 300 people for cases of hoarding and black-marketing of oxygen cylinders and COVID drugs. An amount of ₹1.30 crores (approximately 0.17 million dollars) was recovered from three bank accounts used by illegal groups for cheating people on the pretext of providing COVID related help (COVID-19 in Delhi: Over 600 cases filed, more than 300 arrested for pandemic-related crimes, say police, 2021).

Oxygen Cylinders are imperative in saving lives as supplemental oxygen support gives individuals more hours or even days for the drugs to work effectively by increasing lung capacity (Times of India, 2021). The absence of cryogenic tanks, logistical issues and scarcity of liquid medical-grade oxygen that was induced by the blatant apathy towards the cautionary notices of the parliamentary panel in February, 2021 assisted in the considerable burden on the healthcare institutions during both waves (Patel, 2021). Despite alerts of the upcoming second wave from the members of the National Task Force (NTF) for COVID-19, the NTF did not convene in the months of February and March, 2021 as confirmed by two if its members (Krishnan V., 2021). Only with the emergency aid provided by other nations- not just for oxygen cylinders but for drugs, vaccinations, and other medical supplies as well- and the key emergency measures designed by the government to divert oxygen produced for industrial purposes through temporary restrictions did India manage to survive a potential catastrophe (BBC News, 2021, Ratna, George, & Aliani, 2021).

Therefore, due to the consistent negligence shown to the healthcare sector in India, the sudden surge in demand in the second wave left hospitals overwhelmed - lacking both human and monetary resources - with corruption as one of the symptoms for the disease. Other symptoms included hospitals squirming on the quality of treatment provided, however, that is not the focus of this study. Nevertheless, it is important to recognise how the failures of the past may impact healthcare in the present.

7.2. Policy Measures Taken

Corruption especially thrives in environments of complex regulations, particularly if they are changing constantly and bureaucrats are given too much discretion (Herrera, Lijane & Rodriguez, 2007). This was precisely the situation during the pandemic as strict measures were put in place which were constantly changed or updated depending on the trajectory of the cases and developments in science, giving opportunists the chance to make private gains in troubled times and generating further allocative inefficiencies in society. The sense of urgency to respond to the pandemic coupled with the stringent measures strained the sector making it vulnerable to corruption (Kirya, Cuadrado & Hausenkamph, 2021). This section therefore examines the policy responses of the Indian government.

One of the major policies directly impacting the expenditure on COVID treatments was the setting of price ceilings. Price ceilings are widely used by policy makers to restrict monopoly pricing and protect the interests of the vulnerable low-income groups (Swamy, 1994). Nevertheless, there has been extensive debate on their efficacy and the consequent welfare loss for consumers and producers alike (Nicholson & Snyder, 2008). Several factors contribute to the effectiveness of price controls. In competitive industries, price ceilings that are arbitrarily[8] set "distort resources and lessen efficiency" (Sheahan, 1961). Furthermore, in the presence of weak institutions, with lower levels of transparency and accountability, price ceilings have been associated with rent extracting behavior and the formation of black markets (Shleifer & Vishy, 2002). Additionally, non-binding price controls may lead to collusion among producers at prices above the competitive market equilibrium (Haucap & Muller, 2012). On the contrary, according to Spray and Werker (2017) who studied the impact of price ceilings in Liberia – a country rife with poverty and weak institutions- the authors found that price controls did not serve as an instrument for corruption, rather, they suppressed monopoly pricing effectively. In the Indian context, both the positive and negative effects of price ceilings may have come into play.

The heterogeneous Indian healthcare sector ranges from big corporate hospitals and publicly funded medical research institutes, to small clinics and the extent of transparency differs substantially. NABH accredited hospitals and larger corporations are under greater scrutiny as compared to smaller hospitals and clinics with lower authoritative oversight. This may install varying degrees of compliance to the price ceilings set by the government.

On the 24th of March, 2020, Prime Minister Narendra Modi announced a $150 billion subsidy for the healthcare industry which was spent on setting up testing facilities, ICU beds, amplifying the production of PPE kits, ventilators and training the medical staff. The ventilator beds increased from 25,000 in the first wave to 50,000 in the second wave (Jain, Iyengar & Vaishya, 2021). Due to the shortage of hospital beds, many hotels were converted to provide treatment and provisional measures were taken to increase the capacity. An initiative called COVID War Rooms was started to aid people in finding hospital beds and was run by individuals who volunteered to provide assistance.

However, an analysis of the government data determined that ICU beds and ventilators saw a drastic fall between the peak of the first wave and the beginning of the second wave. This was because, after a drop

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[8] The information available on how the price-ceilings were calculated is limited however, therefore, no claims can be made in that regard.

in the number of daily cases, most provisional government facilities built to cope with the surge in capacity were disassembled (Rawat, 2021). Such temporary measures reduced transparency and accountability. Additionally, the COVID War Rooms initiative led to a large-scale fraud where beds were blocked under fake names and later allotted to the highest bidder (Hospital bed scam: Searches at Bengaluru corporation Covid War Rooms, 2021). This was done through collusion between doctors, diagnostic clinics and the volunteers who worked in the COVID War Rooms making it a hallmark of the corrupt healthcare system in India (Pellissery et al., 2021). Such provisional measures assisted corruption to seep in through the fractures in the Indian health care system despite the government's efforts leading to increased inequality in access to healthcare.

The varying degree of transparency and accountability across the healthcare sector may explain why the coefficients for the results of the second wave were negative implying a decrease in expenditure, whereas simultaneously, the coefficients for the corrupt methods of procurement were monetarily and statistically significant. The setting of price ceilings halfway through 2020 and the compliance with the price ceilings in areas with higher levels of transparency and accountability may have contributed to the fall in price across the two waves, however, in areas lacking transparency and accountability, there may have been a rise in corruption, with opportunists taking advantage of the dire circumstances surrounding the second wave.

Therefore, in a country like India with weak institutions and limited capacity for enforcing transparency and accountability, setting price controls may be a second-best policy (Spray & Wakker, 2017) having both positive effects in some areas and negative consequences in others.

7.3. The Healthcare Institutions

According to the 2003 Transparency Index survey, the doctors followed by the hospital staff are alleged to be the key actors leading to corruption (Kumar, 2003). Corrupt practices emerged because of the principal-agent relationship between doctors and their patients. Asymmetric information in healthcare is a leading cause for overtreatment of patients by physicians creating physician-induced demand (Ikegami, Onishi & Wakamori, 2021) making the sector vulnerable to corruption. With the inferior quality of public health care and the lack of transparency in the private sector, the healthcare sector in India overall is prey to corrupt practices (Kasthuri, 2018), which can only be exacerbated by the increase in demand for healthcare during COVID. This asymmetrical power dynamic, the fear surrounding the disease and the low information availability on standard practices for its treatment put the doctors and hospital staff in an advantageous position, making it possible for them to engage in rent seeking behaviour. Fraudulent billing, informal payments and theft, and diversion of medicines for private use are common corrupt practices engaged in by providers (Glynn, 2022).

During the initial few months of COVID-19, only public hospitals with supplementary funding from the government were equipped to treat those who tested positive for the disease (Sharma, 2020). Soon thereafter, the public sector found itself over-burdened and hospitals in the private sector were required to reserve at least 50 percent of the beds for the treatment of patients referred by the public health authorities (The Economic Times, 2021). This may have contributed to the fall in instances of individuals not being able to have a hospital bed allocated to them.

Due to individuals postponing elective surgeries, major corporations reported heavy losses in an industry which reported profits of 1,737 percent in 2018. Additionally, the price ceilings set by the government and the increase in expenditure on extra costs for sanitization and protective gear with regular tests and quarantine for the staff made the workforce limited according to an executive of a corporate hospital. Monetary bonuses had to be given out to provide an incentive to the staff to come in for work despite the risk to their lives and the lives of their loved ones. Several smaller hospitals expressed their fear of inevitably shutting down (Bhuyan, 2022a). This may have provided smaller clinics incentive to engage in corrupt practices to survive in an industry that was crippling and had already suffered heavy losses by the time the second wave began, despite overcharging being punishable by law.

During the second wave of the pandemic in India, the black market was thriving. In April, 2021, the Medical Education and Drugs Department directed that experimental drugs such as Remdesivir will only be available to hospitals. The drugs would be centrally distributed to the regional government, and then delivered to the hospitals. The only way to access them would be through hospitalisation. This change in policy in the second wave led to a supply chain disruption creating severe shortages in several areas (Barnagarwala, 2021). However, such drugs were prescribed even when they were not available in the hospitals (Pellissery et al.,2021). This implies a presence of black marketing which led to relatives trying to attain the drugs independently. However, the only way for Remdesivir to have entered the black market in the second wave was through the hospitals in the first place. Instead of the prescribed medicines being administered to the individual, occasionally, the hospital staff would push it into the black market to gain from the high demand for Remdesivir. The Central Drugs Standard Control Organisation warned that states had been reporting a shortage of Remdesivir that may lead to its hoarding and black marketing. However, no heed was paid to these warnings. Similarly, when the oxygen cylinders were not available, a patient's relatives were expected to procure them (Kaushik & Manral, 2021).

However, this paper does not aim to undermine the dedication of the medical staff. A total of 1,616 healthcare workers lost their lives to COVID by the 9th of February, 2022 (Economic Times, 2022). The heroism of the doctors, volunteers and other healthcare workers has been revered on the individual level. Nevertheless, at the institutional level, the failures led to pressing concerns.

8. Impact

Having determined the monetary extent of corruption coming from within the healthcare institutions, it is imperative to contemplate the impact of corruption. This research briefly examines the consequences of corruption, reiterating the importance of further research in the area. Figure 12 represents the individuals who are willing to pay the hefty costs of corruption by income group. According to the figure, the rich pay significantly more as compared to other income groups.

In the case of oxygen cylinders however, the lowest income groups pay the most and the expenditure for this income group remains surprisingly high for beds and drugs as well. The primary cause for these variations may be that in rural areas, 75 percent of the households earn less than ₹5,000 (€62.50) per month falling in the low-income category (Tewari, 2015). Approximately 70 percent of the Indian population resides in rural regions however it is served by only 26 percent of the doctors in the nation

(Thayyil and Jeeja, 2013). The Indian rural health care is a three-tier system, comprising Sub-Centres[9] (SCs), Primary Health Centres[10] (PHCs) and Community Health Centres (CHCs). Only the CHCs are staffed by specialists such as physicians and surgeons. According to research analysing the primary challenges for rural healthcare in India, a primary concern is the massive shortage of specialists working at the CHC level (Kumar, Nayar & Koya, 2020). As of 2020, the average number of villages covered by a CHC was 128 (Ministry of Health and Family Welfare, 2020) and the number of government hospital beds per 10,000 individuals in rural India was a meagre 3.2 (Mampatta, 2020).

By August 2020, the number of cases in rural and semi-rural regions increased by 27 percent due to the migration of infected workers from urban regions to their native villages (Acharjee, 2020). The sudden surge in cases coupled with the lack of resources in rural and semi-rural areas led to a disheartening scenario. For individuals requiring hospitalisation and oxygen cylinders, the lack of infrastructure and human resources resulted in a massive influx of people in urban areas from surrounding small towns and villages to seek healthcare (Noronha, 2021). This could be one possible explanation as to why low-income individuals spent as much as middle and upper-middle income households on ICU beds and slightly more on average compared to low-middle income households on hospital beds.

Overall, the low-middle income households shared the lowest portion of the monetary cost of corruption whereas the rich shared the highest portion of the monetary cost of corruption followed by the upper-middle income households. However, these findings do not incorporate the resulting difficulty a low or low-middle income individual may face when trying to secure treatment, relative to those who have the social connections or wealth required to secure the treatment.

Additionally, the secondary impacts when some individuals are willing and able to pay bribes are not considered. If some individuals are more willing to engage in bribery and over-paying to secure treatments for their loved ones during a time of stress, desperation, and chaos, it may create a social norm such that bribery is expected by both parties and priority in access to treatments is given to individuals who can afford to engage in such illegal practices. According to an empirical study by Fisman and Miguel (2007), weak legal institutions may aid in creating cultural norms such that corruption becomes the acceptable practice in those areas. During COVID, this would leave the low-income and low-middle income households two options - either pay the higher costs of bribery in the private sector or have other patients prioritised and resort to the public sector. Even though the poor did not pay as much as the rich according to the previous bar chart, the impact of even paying slightly more to receive treatment may be catastrophic for the poor, even though the amount may be insignificant to the higher income groups due to the prevalent disparity in income.

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[9] SCs serve as the first point of contact between the community and focus on programs related to nutrition, child health and family welfare.
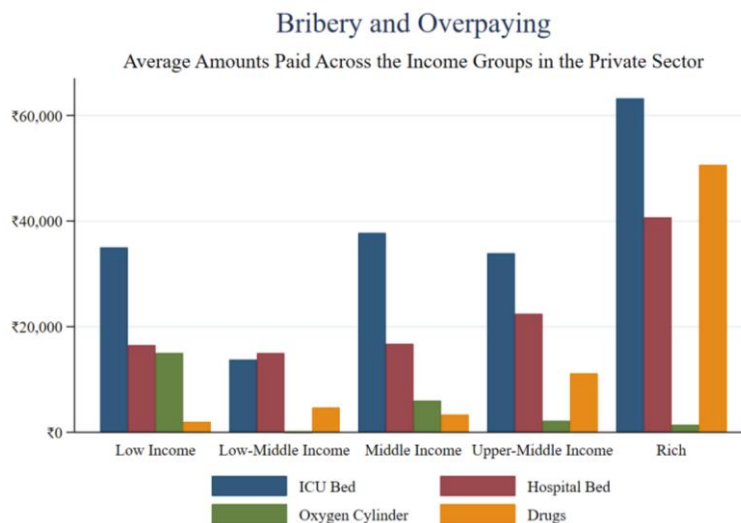[10] The PHCs focus primarily on preventative care.

Bribery and Overpaying
Average Amounts Paid Across the Income Groups in the Private Sector

Figure 12

Catastrophic Healthcare Expenditure
Treatment Expenditure as a percentage of the Annual Household Income
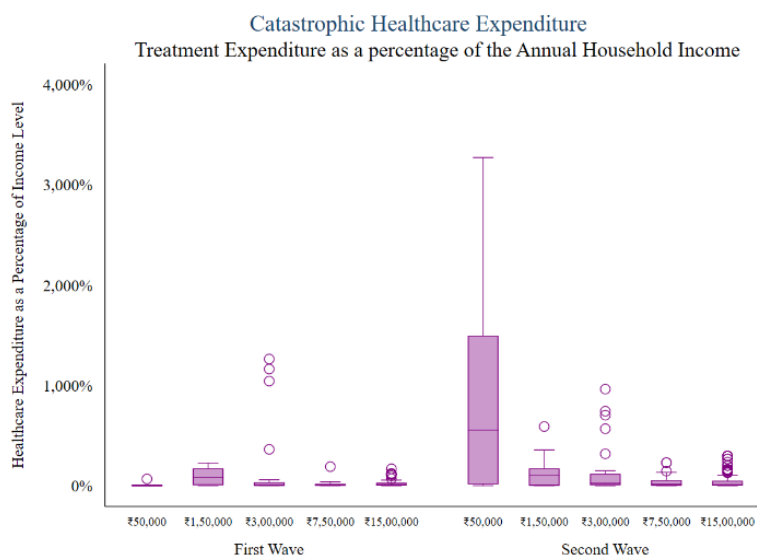
Figure 13

8.1. Regressive Burdens of Corruption during the Second Wave

The World Health Organization considers health expenditure to be catastrophic if it is 40 percent or more of the capacity to pay (Kawabata, Xu & Carrin, 2002). Other studies define it as medical expenditure exceeding 10 percent of the annual income in the Indian context (Devadasan, Criel, Damme, Ranson & Vann der Stuyft, 2007). This section, therefore, briefly discusses the impact that this monetary extent of corruption had on the weaker income groups.

Banerjee and Duflo (2012) found that the poor spend copious amounts of money on a single health related event. Based on their findings, poor families spend more than ₹5,000 (€62.50) which is ten times the average monthly budget per capita for the average family. The rich on the other hand spend as much as 26

times the average monthly budget per capita. According to their research, every third household they interviewed in Udaipur- a tier 3 city in the state of Rajasthan - was indebted for loans taken out to pay for healthcare. Most of these loans were from money lenders who charged approximately 3 percent per month (42 percent annually). This is the situation in most rural regions in India.

The boxplot in figure 13 graphs the estimated total medical expenditure[11] for the treatment of individuals suffering from COVID 19 across varied levels of severity of the disease as a percentage of the average annual household income of the five income brackets[12] in both waves. However, this is a conservative estimate[13] as it is based on the minimum recommended doses and requirements.

Nevertheless, the box plots depict that the median healthcare expenditure as a percentage of household annual income for an individual belonging to the low-income category was exceedingly high in the second wave. The burden of corruption in the form of bribery and overcharging is the largest for the lowest income households, despite the monetary cost mostly being borne by the rich. Moreover, the total expenditure estimated as a fraction of the annual household income is only estimated assuming one individual in the family gets infected with COVID. In reality, that was not the case. The cost of treatment for a poor or middle-class family was made even more unaffordable by the much more virulent second wave which infected entire families in a go unlike the first wave (Jharkhand: MLAs demand free Covid treatment for all, 2021).

The box plots indicate that corruption during COVID further added to the regressive burdens of the disease. While the data is limited to credibly estimate the impact of corruption on various income groups, nevertheless, it is necessary to conduct research in the area to prevent greater levels of inequality in a country already stricken with immense poverty and disparity among the various income groups.

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[11] Total Medical Expenditure = (Expenditure on hospitalization*Number of Days an individual had COVID-19 + Expenditure on Oxygen Cylinders*6 days + Expenditure on drugs*Recommended dosage)
This estimation includes each treatment only if the respondent revealed the requirement for it in the survey. The approximation assumes that a hospital bed was required throughout the duration an individual was infected by COVID-19 as the median number of days a hospital bed is required varies between 12 and 14 days (Daher et al., 2021; Rees et al., 2020), whereas, in the dataset, the median number of days was 11 - 13.5 days, hence, justifying its use. It is assumed that supplemental oxygen support was required for 6 days, one litre per day because, according to research, the average duration of supplemental oxygen required among patients was 6 days (Leulseged et al, 2021). The minimum requirement of oxygen was by those who merely needed a few puffs from a portable cylinder whenever they experienced shortness of breath, or the blood oxygen level fell slightly. In such a case, on average, a one litre portable cylinder lasted for a day or two. Lastly, the recommended dosage for Fabiflu was one tablet a day for 7 days after which the doctor would determine the next steps for the treatment, as per the specialists at hospitals in New Delhi (2021). The treatment for Remdesivir lasted five days and the minimum recommended dosage was: 200mg on the first day and 100mg for the next four consecutive days and for Tocilizumab it was 400ml every four weeks (Ministry of Health and Family Welfare, Government of India, 2022).
[12] The midpoints are used for each income level. For example, for low-income groups with earnings below ₹1,00,000 (€1,250), total treatment expenditure is estimated as a percentage of ₹50,000(€625) since the average annual wage of low-income households is ₹53,000 (€662.50) per year (Vyas, 2022b). For the rich, ₹15,00,000 (€18,750) is used as the midpoint between ₹10,00,000 (€12,500) and ₹20,00,000 (€25,000) where resides 5.4 percent of the Indian population over which lives the remaining 2.6 percent (Sidhartha, 2020).
[13] For severe cases of the virus, a heavier dose of the drugs was prescribed accompanied by other medication as well which have not been included in this estimation. A great portion of the underestimation may also come from the requirements of oxygen cylinders. For people with severe cases of COVID, oxygen was consumed at flow rates as high as 10 litres per minute. This approximation uses the lowest possible requirements.

8.2 Implications of this Catastrophic expenditure

Jeffery Sachs views corruption as a poverty trap with each causing the other leading to a vicious cycle. However, the presence of a poverty trap needs to be assessed on a case-by-case basis (Banerjee & Duflo, 2012). It has been revealed that in India, 24 percent of households spend as much or more than their subsistence spending capacity with 26 percent relying on informal loans and 8 percent selling their assets to pay for medical expenses. Additionally, 35 percent of the poor incur catastrophic health expenditures. Among uninsured households, the impoverishment effect of catastrophic health expenditure is 8 percent, pushing Indian households into poverty with rural households more likely to experience such catastrophic expenditures relative to urban households (Sekher, 2011). According to the National Sample Survey (2018), 86 percent of rural India and 81 percent of urban India did not have any health expenditure coverage, however, those who do are primarily covered by government insurance schemes. More than 80 percent of people pay for health expenditures out of their own pockets (Sharma, 2019). The situation was only worsened by the pandemic.

During COVID-19, households were pushed into a medical poverty trap[14]. It has been estimated that a minimum of 150 million children have plunged into multidimensional poverty with no or minimal access to education, health and even housing. (UNICEF, 2020). The World Bank (2020) estimates that approximately 88 million to 115 million people would have been pushed to extreme poverty which is defined as living on less than $1.90 a day.

To prevent catastrophic healthcare expenditure the Government of India launched a scheme- Pradhan Mantri Jan Arogya Yojana (AB_PMJAY) which identified 10.74 crore poor and vulnerable families that were entitled to ₹5,00,000 (€6,250) per family for secondary and tertiary care hospitalisations (Ministry of Health and Family Welfare, 2020). However, some state governments such as the Delhi government had not signed up for this scheme (Dutt, 2019). Even in the states that did sign up for it, during the second wave with cases having crossed 100,000 incidences daily in March, 2021, hospitals were overextended, and individuals who kept their sick loved ones at home, purchasing medical supplies from the black markets at exorbitant prices without being hospitalised were not covered by the AB_PMJAY. Due to the lack of infrastructure in rural and semi-rural areas, the situation was worse. Additionally, COVID infected entire families at once leaving several family members hospitalised at the same time. If the low-income individuals went to a private hospital - whether because they prefer it over the public sector or because the public hospitals were at full occupancy, ₹5,00,000 (€6,250) per family is not sufficient to cover the total hospitalisation costs of multiple family members at the exorbitant prices charged in the private sector.

With respect to private insurance, there were multiple cases of patients being denied their claims on baseless grounds such as: "the price charged by private hospitals, pre-existing ailments or the 'mildness' of their COVID." This resulted in a three-way conflict, with the Insurance Regulatory and Development Authority of India declaring that existing insurance policies must cover hospitalisation costs. On the other

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[14] A medical poverty trap is defined as an increase in out-of-pocket expenditure for accessing public and private health-care services eventually pushing families into poverty (Whitehead, Dahlgren & Evans, 2001).

hand, some state governments stated that the price ceilings do not apply to those who are insured making the hospitals charge exorbitant prices and insurance companies refusing to cover charges above the capped rates. The private hospitals made insured individuals pay the full cost. However, the insurance companies refused to cover costs above the price ceiling, especially since the increase in claims was severely hurting the insurance industry as well. The managing director from Star Health and Allied Insurance claimed that the hospitals tend to over-hospitalise patients and the insurance companies are forced to cover the hefty bills (Bhuyan, 2022b). In other cases, the private insurance companies delayed the settlement, leaving families in a financially critical situation for months (Hellowell, Myburgh, Sjoblom, Gurazada & Clarke, 2020). For these reasons, the entire healthcare industry failed the individuals causing devastating losses.

What is worse, according to a petition made to the Supreme Court of India, most individuals lost their only bread earners (Shah, 2021). Although all three states and one union territory that are the focus of this study had provisions for COVID victim's kin to apply for ex-gratia, the compensation was a measly ₹50,000 (€625) which would not have covered the expenditure incurred for COVID treatments. Moreover, the complicated paperwork and formalities involved in the disbursal of the compensation made it immensely difficult for a grief-stricken individual to gain the benefit of the ex-gratia (COVID-19 deaths: SC says deadline of 4 weeks for seeking ex gratia payment not sufficient, 2022; Aswani, 2021). Building on that, a sizable proportion of the claims were rejected based on technicalities such as - an individual's death occurring outside the hospital over thirty days after the diagnosis of COVID-19 (Saigal, 2022). Therefore, despite the policy measures put in place by the government, many individuals were unable to benefit from them. All of this made recovery to pre-covid standards of living extremely difficult for some families

According to a survey by the Centre for Monitoring Indian Economy, the recovery post-pandemic has been uneven. The Index of Consumer Sentiments (ICS) which serves as an indication for future developments of households' consumption and saving has recovered directly in proportion with the income bracket a household falls under with richer households reporting a higher growth in ICS and only households with an annual income above ₹2,00,000 (€2,500) per annum reporting an increase in ICS at all in May, 2022. This very unequal nature of recovery may be indicative of a poverty trap with the ICS of the poorest income households shrinking by 8.2 percent even in the month of May 2022 (Vyas, 2022a).

With 80 percent of medical conditions coming from rural India coupled with the low-quality health services in those areas, the health of individuals residing there has been persistently poor as compared to their urban counterparts. This was only made worse by the pandemic and the inability of the government to provide timely aid. Consequently, it led to catastrophic health expenditure pushing these families into extreme poverty and having consequences for their health in the future because of long COVID suggesting a medical poverty trap for these individuals.

Therefore, it is imperative that solutions for corruption are found and implemented to reduce the drastic inequalities from further growing in society.

9. Shortcomings of this Research

As discussed previously, some of the primary concerns are with respect to the data, its representativeness and any bias that may come along with it. As discussed in section 3, appropriate measures were taken to minimise these problems, however, there may still have been recall bias on the part of the survey respondents or a reluctance to report their corrupt behaviour leading to an underestimation. Moreover, the results may be underestimated as in the first wave, treatment was more experimental. However, by the second wave, a precedent was set for treatment, bringing the costs down. Additionally, individuals had started being vaccinated by then and many others may have developed some level of resistance due to the first wave, bringing the average cost down, due to a decrease in the severity rates. On the other hand, it is also possible that individuals who lost someone to COVID were negatively biased and misreported or exaggerated in the responses. There could also be a systemic negative bias as COVID proved to be a challenging time for most individuals and the events were extensively covered in the media for over two years which might cause people to be negatively biased.

This research primarily focuses on monetary implications of corruption during COVID-19 while briefly discussing the prevalence of the other forms of corruption. However, their impact is not covered to a huge extent. For instance, the data does not inform about the delay in access to healthcare caused by corrupt practices which leads to other wealthier or better-connected individuals getting priority in treatment and the subsequent consequences like the birth of social norms such that bribery is expected by all parties. This may have even had affected the probability of an individual not surviving a severe case of COVID in addition to contributing to catastrophic healthcare expenditure. Another concern skipped over in this study is the quality of treatment – a subjective measure which is hard to credibly estimate. The pandemic could have had detrimental repercussions on the quality of services provided in both the public and private sector. If hospitals were willing to engage in rent-seeking practices, it is possible that they were likely to skim on the quality as well, affecting the possibility of the patient's survival during the pandemic. There were several police reports regarding negligence by doctors with the worst being of cases where patients were raped preceding their death (Times of India, 2022; Hindustan Times, 2020).

Lastly, it only considers corruption with respect to drugs, hospital beds and oxygen cylinders. For the purpose of policy making and to eradicate corrupt practices, it is imperative to conduct researches which analyse the impacts of the various players in the health care industry and not only recognise their part in corruption but understand the motives or incentives to take part in such unethical practices. It is also important to recognise how wide spread the corruption was and its implications on the moral fabric of society. For instance, corruption did not even end with an individual's life. The most gruesome reports in the media came from the public crematoriums which were ill-equipped to cope with the pressure brought on by the pandemic. Family members were reported to have waited for hours or even days to give their family members a proper burial. Bribes were asked for even at public crematoriums. While there is no change in utility in the way the dead are disposed of, the lack of respect for the sentiments of the family members and the deceased individuals who were stripped of their right to a respectable funeral is disheartening (Pellissery, et al 2021).

10. Conclusion and Policy Recommendations

During the pandemic, through the conspiring of various parties within society, corruption became the standard, rendering citizens helpless. COVID-19 created a "paradoxical experience of a caring society and a cold state," (Pellissery et al., 2021) with exemplary displays of heroics and immorality.

Considering the size of the nation, its population, and the delicate socioeconomic makeup; accompanied by the inefficiencies of the healthcare system; and the virulence of COVID-19, the policies by the Government of India despite a few shortfalls, were a good response to the pandemic, however, they fell short on execution and coordination amongst the various players in the healthcare industry. In the first wave, the government took extremely stringent precautionary measures that helped contain the pandemic in a system which was not equipped to deal with a situation of this magnitude. The livelihood crisis that followed afterwards discouraged the government from taking such precautionary measures in the second wave. In fact, the government completely failed to anticipate the upcoming second wave and its severity, ignoring various claims from COVID committees beyond which they had no choice but to respond to the crisis unlike in the first wave where they prevented it. The core problem of responsive policies in India is the nation's lack of capacity to adequately respond leading to a host of problems including inducing corrupt practices, catastrophic health expenditure, widespread poverty, and unimaginable excess deaths. Even the most sincere, extensive, and comprehensive response policy measures would have had a limited impact in the given circumstances.

The consequences could have been less severe had the government taken preventative action during the second wave, recognising the upcoming wave in a timely fashion. A primary cause for this may be a persistent lack of both financial and human resources which led to not enough epidemiologists in prominent positions of COVID-19-related committees (Nandraj, Devadasan & Girish, 2020). Moreover, the Indian Council of Medical Research was further criticised for not updating the treatment protocol between the two waves of the pandemic. For example, despite WHO releasing a statement indicating that Remdesivir is ineffective in the treatment of COVID, no directives were given to modify the treatment protocol and Remdesivir continued to be sold at exorbitant prices (Krishnan, V., 2021). Overall, such instances led to corruption with regressive burdens.

The most critical solution for India as a nation would be to invest more in the healthcare sector to make up for all the years of underinvesting and take this as an opportunity to build a strong institution with supervisory agencies that monitor the presence of any illegal activities while aiming to reduce the information asymmetry in the sector. Furthermore, out of pocket expenditure is directly impacted by how highly the federal and state governments prioritise healthcare (World Health Organisation, 2010) and reduces sharply when public healthcare expenditure as a percentage of GDP is increased even infinitesimally (Economic Survey, 2021). Telemedicine and technological advancement came to India's aid during the pandemic in providing treatments in even the most remote locations (Pathak & Rai, 2021). Expanding the use of telemedicine can also help compensate for the lower quality provisions in rural areas to some extent.

Additionally, in times of crisis, the government may consider compensating the key players in the healthcare sector, especially in a crisis such as COVID where not only did the expenses increase for the

hospitals and the insurance firms but also there were additional restrictions placed on them by the government. In these circumstances, the incentives for engaging in corruption in a previously profitable health care sector to merely survive and not get crushed by the burden of the pandemic would be larger than the fear of engaging in fraudulent activities.

Furthermore, there were a lot of gaps in the policies which made corruption possible, to begin with. For instance, the government asked the hospitals to reserve a minimum of 50 percent of the beds for COVID patients, but they did not specify how much percentage of each type of bed should be reserved, leaving hospitals to reserve the most expensive beds to make up for the losses they had been incurring (Bhuyan, 2022a). In light of the losses and new regulations, hospitals marked up the prices through over charging in transportation costs and for PPE kits used making the price ceiling non-binding. Eventually, some governments put price ceilings on transportation costs as well and set limits for the maximum number of PPE kids that should be used per patient, per day, nevertheless, the lack of specific guidelines from the beginning aided in overcharging.

Nonetheless, additional research in this area is necessary to help design appropriate measures so that the nation may be better equipped to prevail in other crises and to ensure that the citizens receive the basic human right to good health and prevent degradation in the moral fabric of the society caused by corrupt practices in a sector as essential as healthcare. The impact of corruption on the level of trust in government systems could be extremely consequential for a developing nation such as India's prospects. Therefore, the pandemic can be seen as an opportunity to build a better system that caters to the needs of all individuals in a society irrespective of their affluence.

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A. **Appendix**

This appendix first describes the data using various statistics followed by which it showcases the regression results based on specification (2) in section 5 split by the hospital sector an individual approached to compare the monetary extent of corruption from the public and private healthcare sector and delve deeper into the root causes of corruption in the second wave.

A.1 Data and Description

Below, from table A1-A9, the data is further described while elaborating on the questions that were asked during the survey, emphasising on why they were incorporated as control variables in the analyses performed as based on extensive research before the survey was designed. The tables are segregated based on the classifications made in the methodology, for example: table A3 displays the hospital level controls in the sample while table A4 displays the individual level characteristics that may have impacted the cost of healthcare for an individual for the treatment of COVID-19.

Variable		Freq.	Percent
	Negative	360	25.55
COVID-19	Positive	1049	74.45
	Total	1409	100.00
	No	801	56.85
Deceased	Yes	608	43.15
	Total	1409	100.00
	First	228	26.12
Wave	Second	645	73.88
	Total	873	100.00
	Not Required	479	45.27
Hospital Bed	Isolation Bed	269	25.43
	ICU Bed	310	29.30
	Total	1049	100.00
	Not Required	448	44.62
Oxygen Cylinders	Required	556	55.38
	Total	1004	100.00
	Not Prescribed	837	79.79
Tocilizumab	Prescribed	212	20.21
	Total	1049	100.00
	Not Prescribed	602	57.39
Remdesivir	Prescribed	447	42.61
	Total	1049	100.00
	Not Prescribed	702	66.92
Fabiflu	Prescribed	347	33.08
	Total	1049	100.00

Table A1: Summary Statistics of Treatment Expenditures

Variable	Obs	Mean	Std. Dev.	Min	Max
Hospital Bed Cost Per Night	457	32986.324	45976.943	0	350000
Oxygen Cylinder Cost Per Litre	382	3344.297	6361.947	0	30000
Tocilizumab Cost Per 200mg vial	175	35371.429	55619.751	0	200000
Remdesivir Cost Per 100mg vial	363	12306.782	21852.458	0	155000
Fabiflu Cost Per Tablet	299	941.696	2285.98	0	10000

Table A2: Summary Statistics of Treatment Expenditures

Variable		Freq.	Percent
Hospital Sector	Neither	100	9.53
	Public	133	12.68
	Private	816	77.79
	Total	1049	100.00
NABH Accredited Hospitals	No	40	18.52
	Yes	176	81.48
	Total	1409	100.00

Table A3: Representation of Hospital-Level Variables

Variable		Freq.	Percent
Age Group	<= 25	203	20.04
	25-35	167	16.49
	35-45	167	16.49
	45-55	170	16.78
	55-65	135	13.33
	> 65	171	16.88
	Total	1013	100.00
Profession	Student	99	9.92
	Front-line Worker	32	3.21
	Blue-Collar Worker	90	9.02
	White-Collar Worker	544	54.51
	Unemployed	95	9.52
	Retired	138	13.83
	Total	998	100.00
Income Level[15]	Low	72	5.41
	Low-Middle	145	10.89
	Middle	166	12.47
	Upper-Middle	259	19.46
	Rich	689	51.77
	Total	1331	100.00
Smoke	Never	661	64.93
	Quit Smoking	91	8.94
	Occasionally	201	19.74
	Regularly	65	6.39
	Total	1018	100.00
Workout	Never	308	30.40
	Used to	148	19.25
	Occasionally	362	35.74
	Regularly	195	14.61
	Total	1013	100.00
Farming Community[16]	No	1112	83.55
	Yes	219	16.45
	Total	1331	100.00
Gender	Prefer Not to Say	39	3.91
	Female	413	41.38
	Male	538	53.91
	Non-binary/Third Gender	8	0.80
	Total	998	100.00

Table A4: Representation of Individual Characteristics

Variable		Freq.	Percent
Health Insurance	No	268	26.53
	Yes	742	73.47
	Total	1010	100.00
Diabetes	No	1250	44.62
	Yes	195	55.38
	Total	1004	100.00
Cardiovascular Disease	No	837	79.79
	Yes	212	20.21
	Total	1049	100.00
Respiratory Disease	No	602	57.39
	Yes	447	42.61
	Total	1049	100.00
Cancer[17]	No	702	66.92
	Yes	347	33.08
	Total	1049	100.00

Table A4: Representation of Individual Characteristics

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[15] The annual household income brackets in the survey are based on the classifications utilised by the Centre for Monitoring Indian economy. Based on the average annual household income level, the data is categorised into five income groups. Households with annual income lower than ₹1,00,000 (€1,250) are at the bottom of the income pyramid and constituted 9.8 percent of all households in 2019-2020. The next bracket has an annual income ranging from ₹1,00,000. (€1,250) to ₹2,00,000 (€2,500) and accounted for 45 percent of all households. The median household income was ₹1,70,500 in 2020, after having fallen from ₹1,87,410 (€2,342.63) in the year 2019. Consequently, the ₹1,00,000 (€1,250) to ₹2,00,000 (€2,500) brackets can be referred to as the lower middle class. The third category had annual household income spanning from ₹2,00,000 (€2,500) to ₹5,00,000 (€6,250), representing the middle class. The fourth is considered the middle class with household income between ₹5,00,000 (€6,250) and ₹10,00,000 (€12,500).

[16] According to research, several respiratory diseases such as asthma like syndromes, chronic bronchitis, organic dust toxic syndrome et cetera are associated with farmers and those living in and around agricultural areas (Nordgren & Bailey, 2019, Romberger & Poole, 2014).

[17] According to the Centre of Disease Control and Prevention (2020), individuals with any of the following comorbidities – Diabetes, Cardiovascular Disease, Respiratory Disease and Cancer - are more at risk as COVID-19 progress rapidly and becomes more severe often leading to death amongst these individuals.

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Variable		Freq.	Percent
State	Assam	4	0.30
	Bihar	10	0.75
	Chhattisgarh	1	0.08
	Delhi	285	21.41
	Gujarat	18	1.23
	Haryana	194	14.70
	Himachal Pradesh	4	0.30
	Jharkhand	42	3.15
	Karnataka	6	0.45
	Kerala	6	0.45
	Ladakh	1	0.08
	Madhya Pradesh	6	0.45
	Maharashtra	277	20.80
	Odisha	20	1.50
	Punjab	20	1.50
	Rajasthan	46	3.46
	Tamil Nadu	9	0.68
	Telangana	6	0.45
	Uttar Pradesh	355	26.65
	Uttarakhand	10	0.75
	West Bengal	12	0.90
	Total	1332	100.00
City[18]	Tier – 1	556	41.74
	Tier – 2	526	39.49
	Tier - 3	250	18.77
	Total	1332	100.00
Highway	No	658	49.47
	Yes	672	50.53
	Total	1330	100.00
Park	No	278	20.89
	Yes	1053	79.11
	Total	1331	100.00

Table A5: Representation of Geographical Characteristics

[18] The Government of India uses a ranking system for purposes such as allocating house rent allowance and the provision of income tax exemptions (Ministry of Finance, Government of India, 2015). Tier-1 cities are considered metropolitan in nature, classified based on population density, level of development and salary whereas Tier 3 cities include underdeveloped cities. All cities filled in by the respondents were allocated to one of the three categories.

Variable		Freq.	Percent
Bribery/ Overpaying	No	502	86.70
	Yes	77	13.30
	Total	579	100.00
Connections	No	332	57.34
	Yes	247	42.66
	Total	579	100.00
Follow Up Extensively	No	415	71.68
	Yes	164	28.32
	Total	579	100.00
Social Media or Government Appeals	No	563	97.24
	Yes	16	2.76
	Total	579	100.00
Routine Processes	No	491	84.80
	Yes	88	15.20
	Total	579	100.00
Did Not Get a Bed	No	515	88.95
	Yes	64	11.05
	Total	579	100.00
Prefer Not to Answer	No	561	96.89
	Yes	18	3.11
	Total	579	100.00

Table A6: Representation of Means of Procurement for Hospital Beds

Variable		Freq.	Percent
Bribery	No	360	25.55
	Yes	1049	74.45
	Total	556	100.00
Connections	No	393	70.68
	Yes	163	29.32
	Total	556	100.00
Black Market	No	409	73.56
	Yes	147	26.44
	Total	556	100.00
Social Media or Government Appeals	No	452	81.29
	Yes	104	18.71
	Total	556	100.00
Routine Processes	No	337	60.61
	Yes	219	39.39
	Total	556	100.00
Did Not Get a Bed	No	544	97.84
	Yes	12	2.16
	Total	556	100.00
Prefer Not to Answer	No	548	98.56
	Yes	8	1.44
	Total	556	100.00

Table A7: Representation of Means of Procurement for Oxygen Cylinders

Variable		Freq.	Percent
Bribery	No	458	82.82
	Yes	95	17.18
	Total	553	100.00
Connections	No	431	77.94
	Yes	122	22.06
	Total	553	100.00
Black Market	No	392	70.89
	Yes	161	29.11
	Total	553	100.00
Social Media or Government Appeals	No	439	79.39
	Yes	114	20.61
	Total	553	100.00
Routine Processes	No	264	47.74
	Yes	289	52.26
	Total	553	100.00
Did Not Get a Bed	No	511	92.41
	Yes	42	7.59
	Total	553	100.00
Prefer Not to Answer	No	935	98.52
	Yes	14	1.48
	Total	553	100.00

Table A8: Representation of Means of Procurement for Drugs

A.2 Monetary Extent of Corruption in regards to the Hospital Sector

As discussed previously, the healthcare sector in India is heterogeneous and the there is a stark polarity between public and private healthcare providers in terms of availability of both human and monetary resources, quality of services provided and the sections of society each one caters to. This section therefore further analyses the impact of corruption in each sector. Specification (2) from section 5 is used[19] to repeat the regression analysis for hospital beds, oxygen cylinders and drugs to determine the monetary extent of corruption in each.

According to the results in table A9 column (1), in regards to hospital beds in the public sector, most results are neither statistically nor monetarily significant, and in several cases indicate a fall in costs. Individuals using connections however, as compared to other means of procurement, in the second wave pay ₹11,487.78 (€143.60) lesser, significant at the 5 percent level. Contrarily, considering the cost of hospital beds in the private sector in column (2), individuals who use bribery in the second wave pay ₹50,162.71 (€627.03) more, significant at the 1 percent level. Individuals using connections as opposed to other means of procurement pay ₹14,966.44 (€187.08) more and using connections in the second wave costs an additional ₹16,915.77 (€211.45), both results being significant at the 10 percent level.

Regarding oxygen cylinders in public hospitals as displayed in column (3), individuals using bribery pay ₹4,947.94 (€61.85) more compared to other means of procurement, significant at the 1 percent level. None of the individuals claimed to use bribes to procure an oxygen cylinder in the second wave however. Individuals using connections pay ₹3,881.67 (€48.52) more in the public sector for the procurement of oxygen cylinders, significant at the 1 percent level. Using connections in the second wave though costs ₹1,952.50 (€24.41) lesser, significant at the 5 percent level. On the other hand, in the private sector, the procurement of oxygen cylinders as displayed in column (4) costs ₹3,626.75 (€45.33) more when individuals use bribery in the second wave, significant at the 1 percent level.

Lastly, the results for the monetary extent of corruption with respect to the acquiring of drugs in the public sector is displayed in column (5). According to the results, the acquiring of drugs in the second wave costs ₹8,987.23 (€112.34) lesser as compared to the first wave, significant at the 5 percent level. There were no observations for utilising bribery or connections in both waves in the public sector for drugs. Conversely, the procurement of drugs from the private sector as given in column (6) costs ₹7,780.82 (€97.26) more for individuals using bribery as opposed to other means of procurement, significant at the 10 percent level. Using bribery in the second wave costs ₹30,187.83 (€377.35) more in addition, significant at the 1 percent level. Using connections costs ₹9,421.88 (€177.77) more for individuals, whereas, using connections in the second wave additionally costs ₹41,956.96 (€524.46), both results being significant at the 1 percent level.

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[19] However, not all variables used previously are incorporated here due to the lesser number of observations available in the case of the public sector and to prevent more observations from dropping out because of randomly missing data for some variables. The data is mostly missing for the accreditation sector of the hospital as not all individuals disclosed the name of the hospital they went to, therefore, making it hard to discern whether or not the hospital was accredited. Furthermore, for oxygen cylinders and drugs, black markets are also excluded from the analysis as the aim is to investigate corruption across the public and private sectors.

Therefore, for hospital beds, oxygen cylinders and drugs, the primary source of corruption, particularly in the second wave was the private sector.

Cost	(1) Hospital beds	(2) Hospital beds	(3) Oxygen Cylinders	(4) Oxygen Cylinders	(5) Drugs	(6) Drugs
	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector
Second Wave	-1083.081	-3409.879	171.266	-629.262	-8987.225**	3782.176
	(2993.166)	(6137.394)	(301.466)	(1390.482)	(3414.386)	(3334.019)
Bribery	-6227.319	-2332.176	4947.935***	-1555.194		7780.82*
	(4738.43)	(10717.746)	(64.49)	(1186.531)		(4419.219)
Bribery*Second Wave	7145.602	50162.714***		3626.747***		30187.825***
	(5113.655)	(13171.572)		(1274.078)		(7721.272)
Connections	4340.745	14966.44*	3881.672***	382.32		9421.881***
	(4519.824)	(8750.864)	(137.353)	(2565.48)		(3294.409)
Connections*Second Wave	-11487.748**	16915.767*	-1952.502**	2.373		41956.964***
	(4883.699)	(9341.933)	(952.572)	(2684.367)		(6626.264)
Constant	8508.525**	13065.504	-3489.09***	21967.255***	4149.516	-6182.468
	(3365.396)	(11597.525)	(635.496)	(2687.778)	(4534.727)	(7424.007)
Observations	112	323	85	292	68	374
R-squared	.579	.446	.824	.369	.649	.566
Illness Controls	YES	YES	YES	YES	YES	YES
Hospital Controls	NO	NO	NO	NO	NO	NO
Individual Level	YES	YES	YES	YES	YES	YES
Geographical Controls	YES	YES	YES	YES	YES	YES
Procurement Method	YES	YES	YES	YES	YES	YES

Robust standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

Table A9: Monetary Extent of Corruption with respect to Hospital Sector

Based on the results, the public sector was relatively more cost-effective, efficient and uncorrupt in providing services for COVID-19. On the other hand, the private sector engaged in profiteering behaviour throughout the duration if the pandemic. As mentioned previously, initially, only the public sector provided treatment for COVID-19, however, on being overwhelmed by the rise in cases, the private sector was asked to reserve beds as well to treat COVID patients. This could be a possible explanation as to why the monetary cost of using connections fell in the public sector by the second wave for beds and oxygen cylinders. On the other hand, the private sector incurred heavy losses with the onset of the pandemic as opposed to the government funded public sector and hence, their incentive to engage in corrupt practices may have been higher. Considering the numerous instances of corrupt practices, it is baffling that individuals would continue to visit the private sector.

Figure A1 compares the percentage of individuals that received treatment in each sector across five income groups. The preference for the private sector over the underfunded public sector seems relatively constant across all income groups. This may be influenced by past experiences with the public sector. As discussed in section 2.1, the public sector was underfunded, and the services provided were of inferior quality. Therefore, despite the increase in the budget allocated to health services in 2021, and the hefty investments and policies made by the government to help the public sector cope and provide good quality treatment for COVID-19, due to a lack of faith in the quality of services provided by the public sector, even the vulnerable preferred the more expensive treatments inspite of the profiteering behaviour of the private sector.
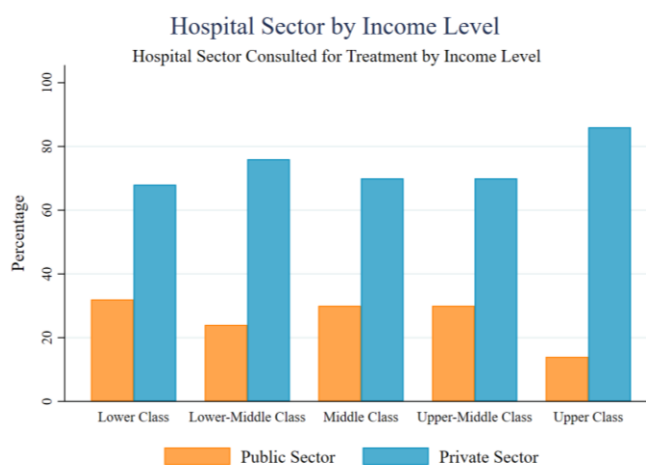

Figure A1

With immense support from the government, the public sector showed promise by diligently providing mostly free services barring certain minimal expenses and with minimal corruption. Yet, evidently, it took a back seat to the private sector in the provision of healthcare because of the inconsistent perception regarding the quality of services provided by public hospitals. This led to individuals frequenting the private sector in desperation and further encouraging its corrupt practices which was fueled by the burden on the hospital staff and the losses incurred by the time the second wave began.

Considering the circumstances, it would have been wise of the government to compensate the private sector for the losses it was incurring to minimize the incentives for corrupt practices which were ultimately born by the individuals suffering from COVID and their families. In addition, improving the image of the public sector while further investing in it to prevent such situations to arise in the future is imperative in reducing the extent of catastrophic healthcare expenditure that was borne by the low income groups.