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The COVID-19 pandemic and the state in Bihar

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WIDER Working Paper 2022/51

The COVID-19 pandemic and the state in Bihar

Avinash Kumar¹ and Manish Kumar²

May 2022

Abstract: This paper presents a critical analysis of official data related to COVID-19 in Bihar state, India, which points to the manipulation of data for political ends. The ruling party's claim that the state managed the COVID pandemic brilliantly seems more politically motivated than scientific. We show that during both the first and the second waves of COVID-19 in Bihar, the state government failed to provide relief to its people and left many of them, particularly the poor, without food, health care, or transport for weeks and months while it successfully negotiated its own re-election.

Keywords: manipulation of data, COVID pandemic, Bihar, health, COVID-19

JEL classification: I18, H75

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1 Introduction

The Constitution of India lists ‘Public Health’ in the State list in the Seventh Schedule (Article 246) and empowers the states to make laws concerning it. The Epidemic Diseases Act, 1897, also empowers the state governments to take special measures and prescribe regulations as to dangerous epidemic diseases.¹ Most states in India invoked the Epidemic Diseases Act, 1897, after the outbreak of the COVID-19 pandemic in January 2020 in an attempt to contain and control it. The union government is not empowered to declare a national emergency for medical and pandemic reasons. However, on 25 March 2020, the union government imposed a 21-day national lockdown invoking the National Disaster Management Act, 2005.² The first case of COVID-19 was reported in Bihar on 22 March 2020, when a man tested positive after his death at the All India Institute of Medical Sciences (AIIMS) in the state capital, Patna (Kumar and Kumar 2020a). The state witnessed its first wave of cases between July and September 2020. Subsequently, not only was Bihar among the states with the lowest numbers of COVID cases, COVID deaths, and case fatality rates, according to official reports released in February 2021, but also it was applauded for its management of the health crisis by the union government in its Economic Survey 2020–21, in which Bihar is mentioned among the states that have ‘restricted the case spread the best’.³ Contrary to the official claims, however, experts raised doubts as to the state’s COVID-19 record. The second wave in the state during April–June 2021 was more devastating and it proved the critics right by exposing several of the official claims as fallacious.⁴

This paper argues that the official COVID figures of the state are only a fraction of the actual fatalities caused by the pandemic on account of two major developments: (a) judicial interventions made by the Patna High Court in April 2021, and (b) the release of the fourth National Seroprevalence Survey report, conducted by the Indian Council of Medical Research (ICMR), on 28 July 2021. In our attempt to find whether the state has been effective in responding to the pandemic, we decode the state–pandemic nexus. By enquiring what drives its decision-making process and asking why it acted or did not act in certain ways, we reveal a further erosion of the state government’s legitimacy (Kumar 2009, 2012) due to its ostensible incapacity. Our analysis also points towards an outright statistical manipulation (Aragão and Linsi 2020) whereby the state government presented COVID statistics that were politically ‘convenient’.

The paper has four broad sections following this introduction. Section 2 discusses the state’s health preparedness before the pandemic, underlining its vulnerable position. Section 3 sketches the COVID-19 situation through official statistics. In Section 4, we critically analyse the state’s commitment to fight COVID-19 and dissect the official claims. In Section 5, we analyse and discuss facts to substantiate our arguments. Key data sources include Health Statistics, Ministry of

¹ The powers of the union government under this Act are limited to taking ‘measures and prescrib[ing] regulations for the inspection of any ship or vessel leaving or arriving at any port in [the territories to which this Act extends] and for such detention thereof, or of any person intending to sail therein, or arriving thereby, as may be necessary’.

² <https://www.hindustantimes.com/india-news/covid-19-disaster-act-invoked-for-the-1st-time-in-india/story-EN3YGrEuxhnl6EzqrlreWm.html>

³ <https://www.indiabudget.gov.in/economicsurvey/doc/echapter.pdf>

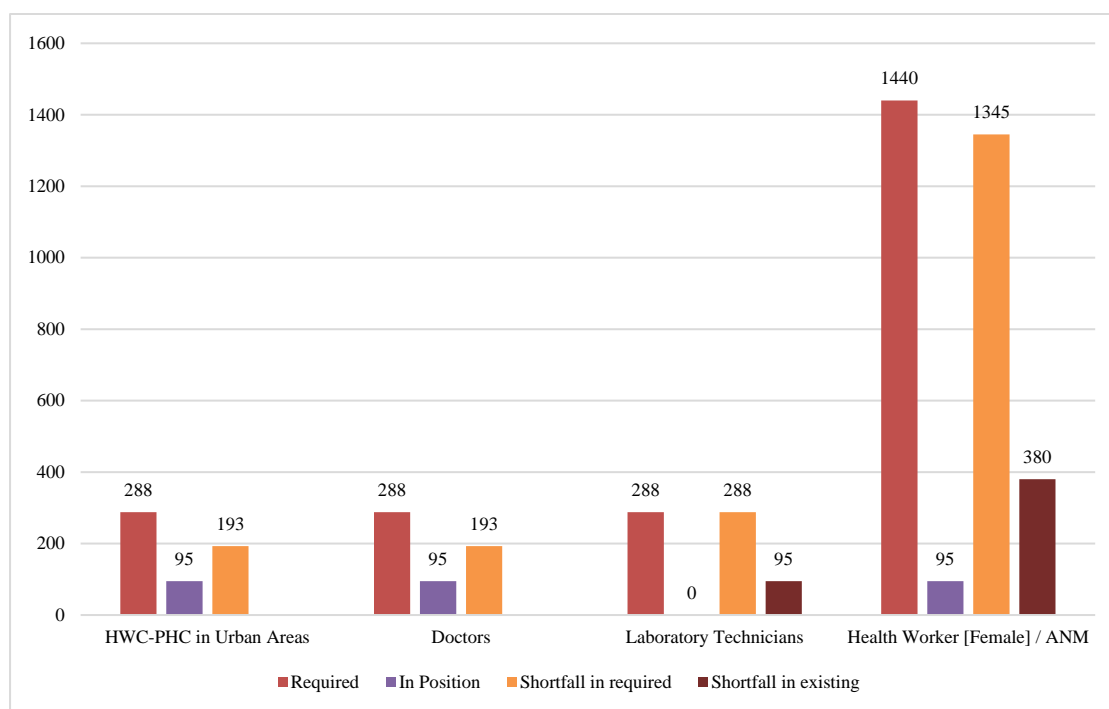
⁴ The official data released up to 31 August 2021, however, still show that the total number of COVID-19 cases in Bihar was only 2.1 per cent of the total COVID cases and the number of deaths was only 2.2 per cent of the total COVID-19 deaths in India. <https://www.mygov.in/corona-data/covid19-statewise-status>

Health and Family Welfare, Covid19India.org,⁵ ICMR, and Bihar’s Citizen Registration System (CRS). The paper ends with some concluding remarks.

2 Health preparedness pre-COVID

The prevailing condition of public health infrastructure in Bihar pre-COVID placed the population in a vulnerable position (Kumar and Kumar 2020a). With a population of more than 107 million and a per capita net state domestic product of INR46,664 (US\$616; RBI 2020), which is the lowest in India, the state faced serious problems on most of the indicators of the public health care system. While the WHO recommends 1,000 doctors per million people, Bihar had only 26 allopathic doctors per million people (at the all-India level this was 90).⁶ There were only 20 government hospitals per million people and only 278 beds per million people in Bihar as compared with 30 and 588, respectively, at the all-India level in 2019. In addition to these hospitals, the state had only 95 Primary Health Centres (PHCs) in urban areas, which was just one-third of its requirement.⁷ Each PHC must have at least one lab technician, but Bihar’s had none. The required number of health workers for each HWC-PHC is five, but the state had only one (a total of 95), which made the total deficit in the required health workers 1,345 (Figure 1). The situation in rural Bihar was even more critical.

Figure 1: Shortfall in required and existing health care infrastructure at urban PHCs in Bihar, 2019



Source: authors’ construction based on data from Government of India (2019).

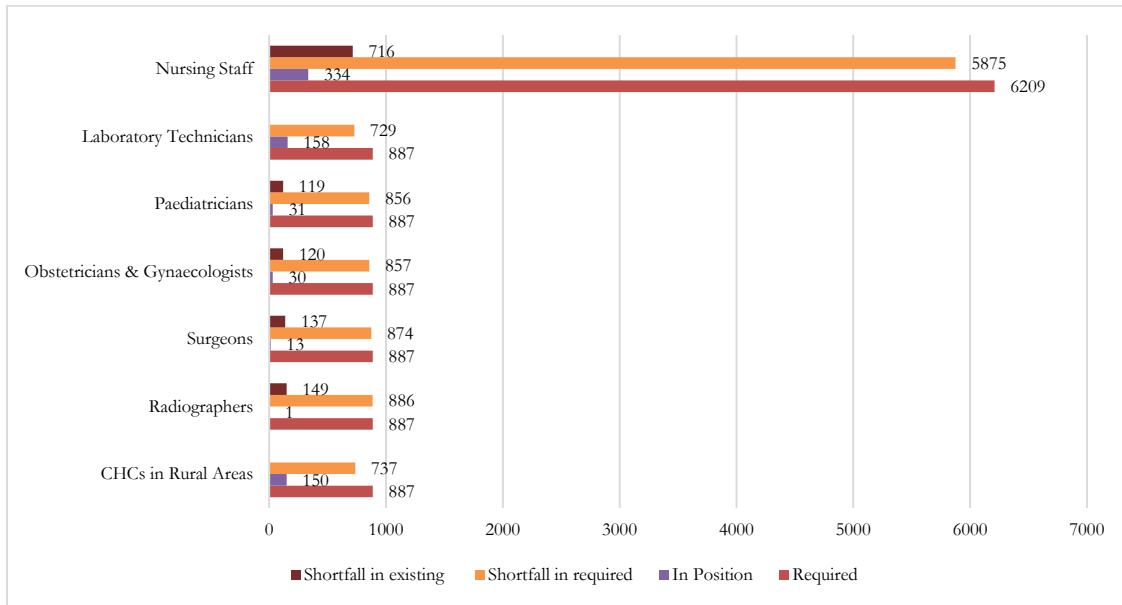
⁵ Covid19India.org is a website, active as of 31 October 2021, run by a group of volunteers who posted all the figures related to Covid-19 issued by all Indian states.

⁶ The official number of hospitals in Bihar is highly contested; for details see Kumar and Kumar (2020a).

⁷ To provide integrated curative and preventive healthcare to the rural population, India has developed a national norm for the establishment of Sub-Centres (for a population of 3,000 to around 30,000 at the village level), Primary Health Centres (for every c. 20,000–80,000 people), and Community Health Centres (for every c. 80,000+ people).

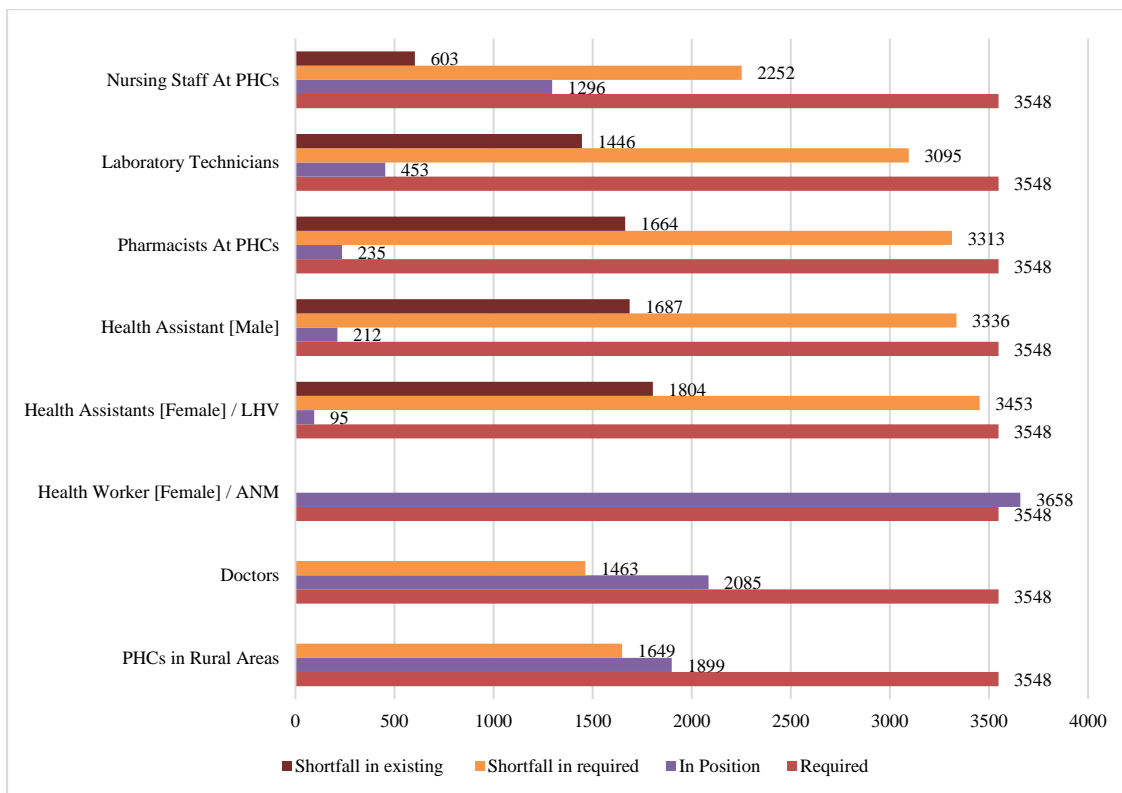
The shortfall of curative and preventive health care facilities (see Figures 2, 3, and 4) at the rural sites was the second largest amongst all Indian states, after Uttar Pradesh. Four specialists are required for each Community Health Centre (CHC), but Bihar had only 75 specialists in total, which is just 2 per cent of the required number.

Figure 2: Shortfall in required and existing health care infrastructure at rural CHCs in Bihar, 2019



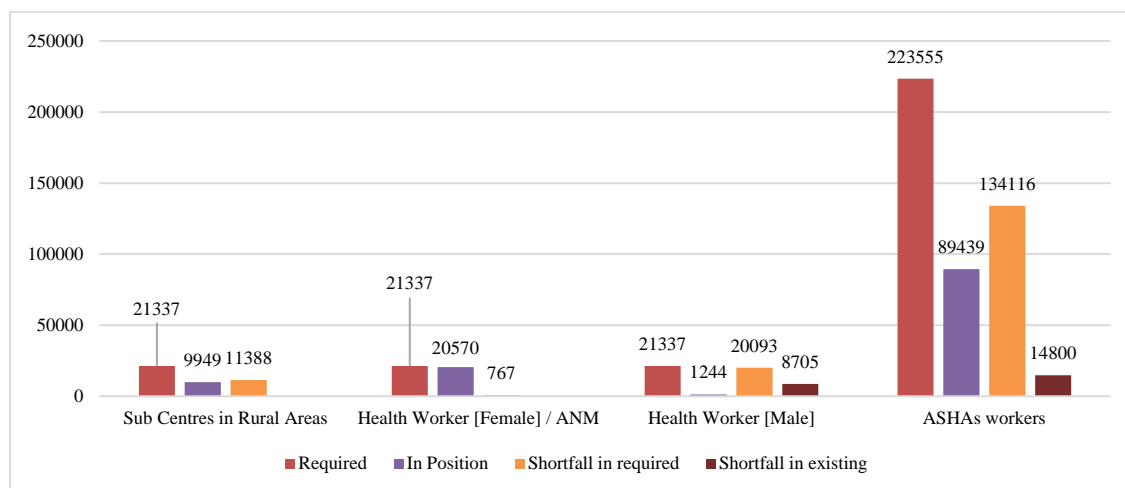
Source: authors' construction based on Government of India (2019).

Figure 3: Shortfall in required and existing health care infrastructure at rural PHCs in Bihar, 2019



Source: authors' construction based on Government of India (2019).

Figure 4: Shortfall in required and existing health care infrastructure at rural Sub-Centres in Bihar, 2019



Source: authors' construction based on Government of India (2019).

The question is whether poor health infrastructure alone can be used as a proxy to declare any state as a weak capacity state, particularly for dealing with a health crisis. Bihar's plight during colonial rule is well reflected in the Champaran Satyagraha uprising in 1917, which was sparked by 'social inequality, political discrimination and landlessness' (Rajshekhar 2021). But land reforms could hardly become a political agenda in a state made wretched by the feudal upper-caste militias in the first 40 years of rule dominated by the Indian National Congress. Although the change in the corridors of power with Janata Dal's Lalu Prasad Yadav as the Chief Minister (CM) of the state in 1990 symbolized the victory of the oppressed and the marginalized, it failed to bring in an age of fairness, prosperity, and rule of law (Kumar 2009, 2012). This era (1990–2005) was also marked by a significant cut in the union government's allocations for Bihar (Rajshekhar 2021). With the political change in 2005, when Nitish Kumar became the CM under the National Democratic Alliance (NDA) regime, it was expected that the government would invest in building state capacity. In the initial years, the administration remained much hyped for its growth miracle under Kumar's *sushasan*, but when viewed critically, the growth story looks pretty skewed and the performance of the state in some of the most important areas, such as education and health, has remained quite depressing.

Despite making 'growth in human development, through improvements in service delivery of health and education' an important agenda of *sushasan* (Gupta 2010: 4) and nearly a seven-fold increase in the state's total revenue collection between 2005/06 (INR178.37 billion) and 2016/17 (INR1,246.08 billion)—a large share of which was, however, due to an increased central allocation—average public expenditure on health since 2005 has remained at less than 4 per cent of total state expenditure. In 2018, the state government spent only INR77.94 billion on health, that is INR726 per person per year, the lowest per capita state health expenditure in the country (CBHI 2019). With no significant improvement in primary, secondary, or tertiary health care, the state reportedly failed to anticipate and contain epidemics year after year in the pre-COVID period.⁸ What people witnessed during the COVID-19 pandemic was thus the direct consequence of a constant dismantling of the public health system and an 'extraordinary neglect of people' (Rajshekhar 2021) under the current regime.

⁸ For details see Kumar and Kumar (2020a).

3 The COVID-19 pandemic in Bihar

Given the primary mode of infection by SARS-CoV-2, not all states in India were at the same risk of exposure to the infection at the beginning of the pandemic.⁹ While some states were at higher risk due to the aggravating factors due to structural characteristics of the state and its population, some had more protective characteristics (Cornia 2021). For example, the population in Bihar (as in several other northern states of the country) is substantially young (according to the 2011 Census, only 7 per cent of the population is over 60 years of age). Although there is a high level of outmigration from the state in search of employment and livelihood, it is mostly confined within the national boundaries (Kumar and Kumar 2020b). The incidence of international outmigration is low given that it has only 1.3 per cent share in the total returning migrants (Kumar 2018). Thus, even with the inadequate health preparedness for dealing with a global pandemic, as discussed in the section above, it had relatively more protective factors than some of the western and the southern regions of the country, which are connected globally. Similarly, in the absence of any variation in pharmaceutical interventions, such as vaccines and antiviral medication at the subnational level, it was essentially the effectiveness of non-pharmaceutical interventions (NPIs) (Haug et. al. 2020), implemented in response to the epidemic, that could help states delay and moderate the spread of the virus. However, the evidence suggests the non-preparedness of the state was not limited to the health infrastructure.

The state reported its first two cases in people with a history of foreign travel at AIIMS, Patna, on 22 March 2020 (one of whom died the same day). This was nearly 52 days after the first case in the country was reported, in Kerala, where the structural characteristics were much more aggravating.¹⁰ A third patient, who had recently returned from Scotland, tested positive on 23 March and was admitted to the Nalanda Medical College Hospital (NMCH), Patna. However, in contrast to the first detected case in Kerala, where the patient was immediately isolated to contain the spread of the disease, several resident doctors at NMCH came into contact with the COVID patient in Patna and were reported to have contracted the virus. Despite the notification of The Bihar Epidemic Diseases, Covid-19 Regulation 2020 on 17 March, which mandated home quarantine of 14 days, resident doctors at NMCH were forced to continue treating patients without being tested for days and weeks and were not allowed a home quarantine period (Ray 2020). The mismanagement of the state administration forced Bihar into the stage of local transmission at the very beginning of the pandemic. This was despite the fact that in one of his earliest announcements, on 16 March 2020, while speaking in the state assembly, the CM had appreciated the efforts of countries such as Taiwan, Thailand, and Bangkok, which had significantly checked the spread of COVID-19 by resorting to lockdown or social distancing measures,¹¹ and a week later, when the state reported its first death, announced a state-wide lockdown from 22 to 31 March.¹²

⁹ In the early days, transmission was primarily by touching of mucous membranes with hands soiled by exhaled respiratory fluids containing the virus or from touching inanimate surfaces contaminated with the virus.

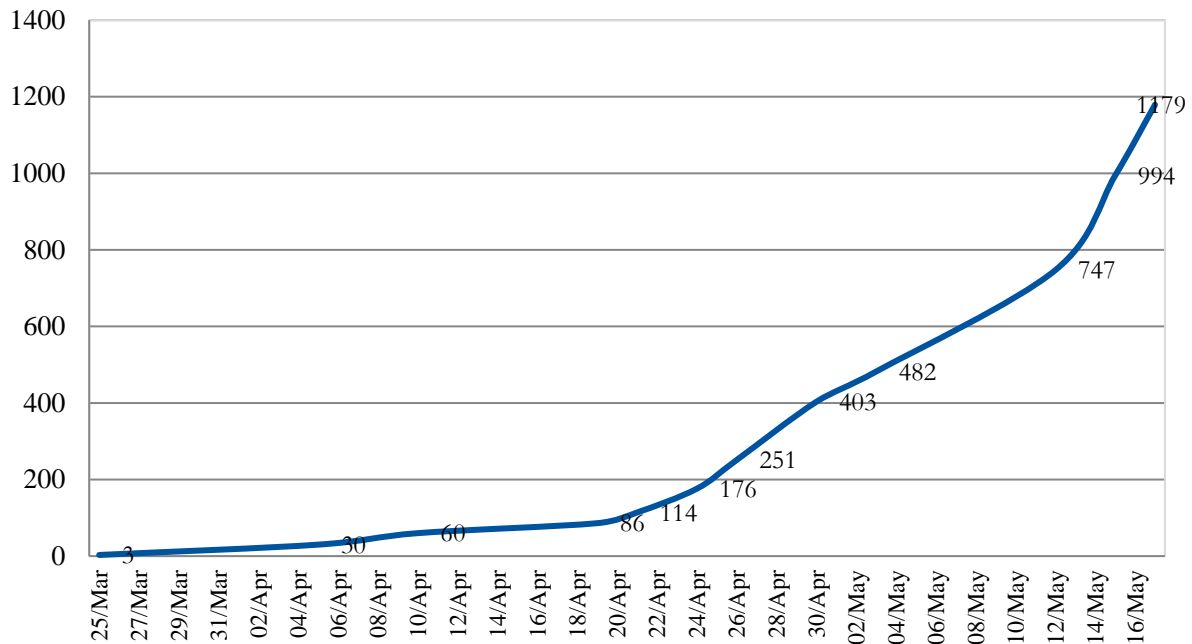
¹⁰ A 20-year-old female who had returned from Wuhan in China. She was immediately isolated and was discharged from hospital after testing negative on 20 February (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7530459/>). By 22 March, all states except Jharkhand, Sikkim, and seven north-eastern states had been hit by the virus.

¹¹ <https://www.hindustantimes.com/cities/bihar-to-offer-4-lakh-to-coronavirus-deceased-incur-treatment-expense/story-upu2oPbX4paUCsXGxC2EvM.html>

¹² Before that, the state government had issued orders for a partial lockdown between 13 and 18 March. [http://health.bih.nic.in/21-03-2020/221\(211\)_21.03.2020_memo_1.PDF](http://health.bih.nic.in/21-03-2020/221(211)_21.03.2020_memo_1.PDF)

This was followed, two days later, by a nationwide lockdown enforced by the union government between 25 March and 14 April, with some of the most stringent restrictions in the world (according to the Stringency Index developed by Blavatnik School of Government of Oxford University). This was initially extended to 3 May and subsequently to 17 May 2020, leaving no space for regional variations. During this period, the number of daily cases in Bihar remained consistently on an upward trend. Within 25 days, the number of confirmed cases reached 100 and in the next 25 days, by 15 May, it reached 1,000 (see Figure 5).

Figure 5: Confirmed COVID-19 cases in Bihar during national lockdowns, 2020



Source: authors' construction based on data from covid19india.org.

This eruption can be understood partly as a result of the state's unpreparedness for a national lockdown, which made millions of migrant workers within India jobless, income-less, and homeless and forced them to return to their home states, exposing them to the threat of infection as well as making them carriers (Kumar and Kumar 2020b), and partly of inapt medical governance, which was steered more by politics than by science.¹³ On the one hand, the Bihar government was the first in the country to announce that the treatment costs of COVID-19 patients would be covered by the state and the nearest dependant of a person dying from COVID-19 would get INR400,000 (US\$5,000); but on the other, the state government openly expressed its inability to bring back stranded workers, saying that it did not have enough resources to ferry them, and asked the union government to run special trains to bring them home.¹⁴ Later, on 4 May, when the union government announced a partial relief allowing workers to return to their home states, the number of migrants surged to over a million. But even after months had passed, migrant workers continued to be in distress. Not only did the travel registration process lack clarity, but those able to board trains allegedly went without food and water for days. Images of a toddler trying to wake up his dead mother and the death of a four-year-old at the Muzaffarpur railway

¹³ <https://www.nytimes.com/2021/09/14/world/asia/india-modi-science-icmr.html>

¹⁴ <https://www.financialexpress.com/india-news/not-enough-buses-why-bihar-wont-bring-back-its-stranded-migrants-despite-centre-easing-travel-restrictions/1944391/>

station in Bihar while his father went looking for milk were heart-breaking.¹⁵ The state failed to give dignity to the lives of its most vulnerable migrant citizens. Speaking to the authors, the District Magistrate of one of the districts in Bihar said:

During the initial few months, the district administration hardly got time to address the issues of the pandemic. We were totally occupied in addressing the panic and the crisis generated by the lockdown. Bihari migrant workers stuck in various parts of the country were making desperate calls asking for monetary and other help to come back home. We could only do little.¹⁶

The state initially mandated a 14-day quarantine in government facilities for all returning workers between 4 and 21 May, but tests were routinely carried out only for symptomatic workers. The remaining workers were tested randomly, with a heavier weight on pregnant women, children under 10, and those over 65 (Malani et al. 2020). Between 22 and 31 May, it restricted its institutional quarantine policy to workers returning from a few cities that were reporting higher rates of infection, with no change in its testing policy. This sudden shift in the institutional quarantine policy was unsubstantiated. Even the representativeness of Bihar's testing was unreliable because the state had different sampling weights for symptomatic persons, which did not take into account the number of returning migrants in each health and demographic group (Malani et al. 2020). There were reports that the quality of quarantine centres, where migrant workers after walking hundreds of miles to their homes were locked up, was pathetic.¹⁷ Many migrant workers fled from these centres due to non-availability of food and other basic facilities.¹⁸ On enforcing the national lockdown, too, reports of police brutality notwithstanding, Bihar failed miserably. Breaching activities in Bihar were the highest among all states, with a Lockdown Breaching Index (LBI) score of 75.28 in every lockdown phase between 24 March and 25 May 2020 (Puppala et al. 2021). The situation was compounded by the acute shortage of PPE, the most basic medical need for health workers across the state.¹⁹ Between 30 January and 17 May, the state had more than 100 days to ramp up its preparedness to fight the virus; but evidence suggests that no significant efforts were made to address the health crisis.

After 17 May 2020, the union government shifted from a centralized decision on lockdowns to a more decentralized policy, thus making way for regional variations. Figure 6 presents the total number of COVID-19 cases and deaths in Bihar as per the official records. It is interesting to note that between April 2020 and June 2021, the state, as per its official record had only 2.4 per cent of the country's total COVID cases and COVID deaths (Figure 6). Bihar reached its first peak in August 2020 with 85,350 cases, and the second peak in May 2021 with 236,444 cases.

Given the poor health preparedness of the state discussed above, it was expected that Bihar would use its limited capacity for effective non-pharmaceutical interventions (such as increasing the laboratory and healthcare workforce, introducing testing and mask-wearing, offering financial support to hospitals, increasing patient capacity, increasing domestic production of PPE, along with cash assistance to the poor) to mitigate the spread of the disease. But evidence suggests that

¹⁵ <https://www.ndtv.com/india-news/coronavirus-a-baby-and-its-dead-mother-at-bihar-station-in-continuing-migrant-tragedy-2235852>

¹⁶ The Magistrate of a district in Bihar in a personal conversation with the authors.

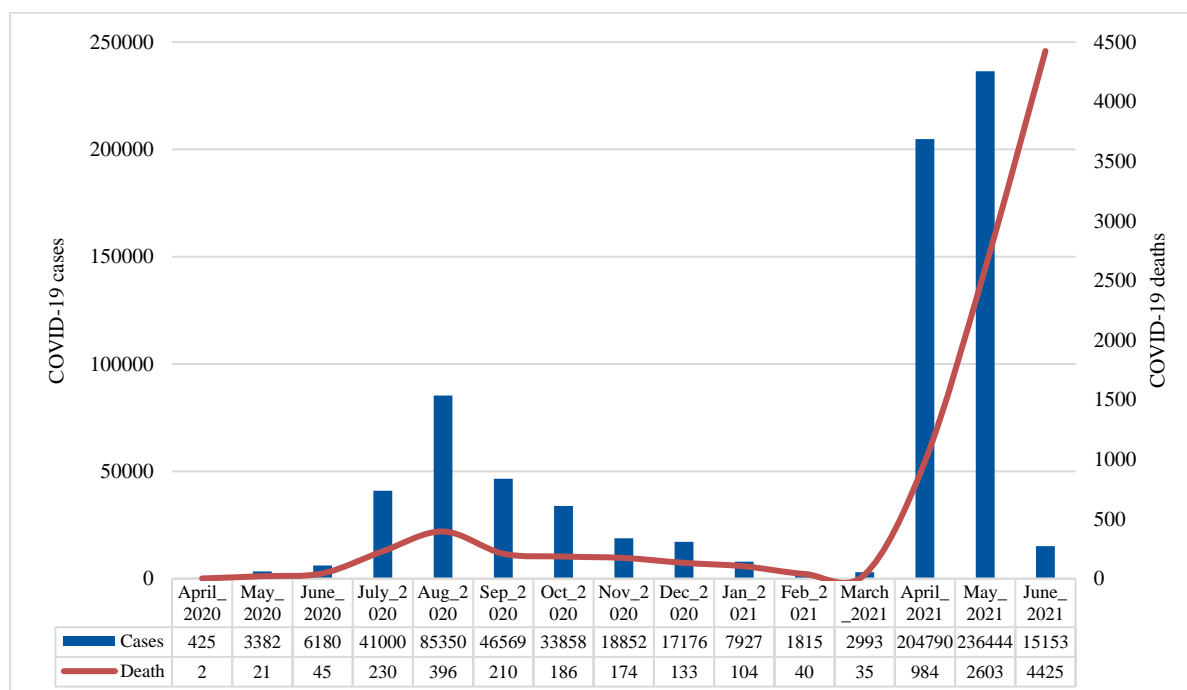
¹⁷ <http://www.uncat.org/banner/police-brutality-unwarranted-deaths-covid-19-lockdown/>

¹⁸ <https://www.thehindu.com/news/national/other-states/20-migrants-skip-quarantine-in-bihar-complaining-of-lack-of-amenities-and-food/article31507688.ece>

¹⁹ https://www.business-standard.com/article/news-ani/combatting-covid-19-production-procurement-of-ppe-kits-started-to-meet-demands-says-health-ministry-120040500925_1.html

the state performed very poorly on each of these fronts. In the next section, we examine the state's commitment to some of these.

Figure 6: Number of COVID-19 cases and deaths in Bihar, April 2020–June 2021



Source: authors' construction based on data from covid19india.org.

4 The state's commitment to fighting Covid-19

4.1 Enhancing testing capacity

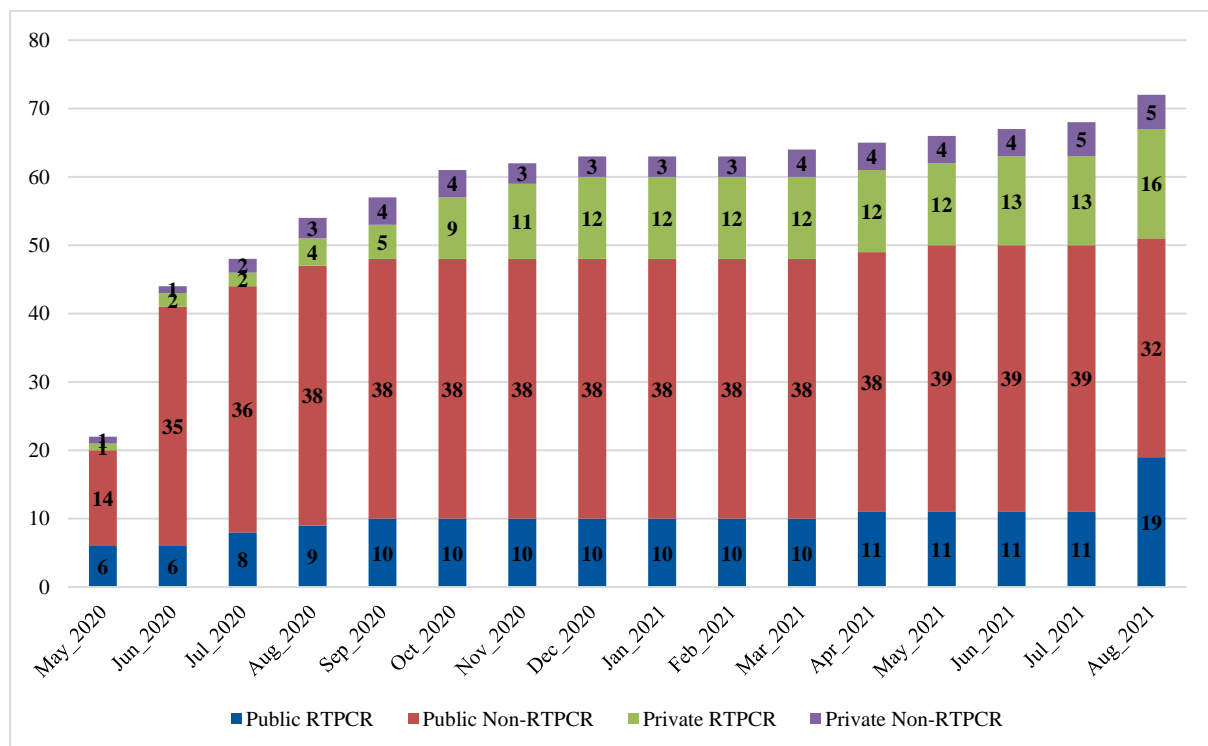
Given that the primary mitigation measure for rapid identification and isolation of infected individuals is testing (Du et al. 2021), one would assume that enhancing testing capacity would be one of the prime goals of any state. By the end of May 2020, when the number of cases in the state had reached over 3,600, the state had only 1 testing centre per 5 million population, primarily non-RT-PCR. Even during the peak of the first wave, i.e. in July/August 2020, the state had only 1 testing centre for roughly every 2 million people and the number of tests per million population (2,197) was lowest in the country.²⁰ The total number of testing labs in the state increased marginally from 48 in July 2020 to 61 in October 2020 and remained almost the same thereafter. During the second wave also, i.e. between April and June 2021, the state failed to improve its testing capacity. By August 2021, while the average number of testing laboratories per 10 million people in India was 23, the same for Bihar was just 3.

It is important to note that not all labs in Bihar, public as well as private, had the capacity to conduct RT-PCR tests, which has close to 100 per cent sensitivity and specificity in a laboratory setting. The state's reported RT-PCR daily testing capacity in August 2020 was of 10,700 swab samples through 10 public and private laboratories, but it could only reach 70 per cent of its

²⁰ <https://www.thehindu.com/news/national/other-states/covid-19-testing-lowest-in-bihar-among-19-states-says-niti-aayog-ceo/article32010642.ece>

capacity.²¹ The beginning of RT-PCR tests in private laboratories in Bihar in May 2020, as in other states, came at a high cost of INR4,500 (US\$60) per test, and therefore remained inaccessible for the majority of the poor.²² The state merely kept scaling up test counts via rapid antigen tests (RAT), which reached 90 per cent of all tests. The low detection of cases during the first wave of COVID-19 in Bihar was clearly reflective of the fact that the rapid antigen tests were missing infections as the RAT positivity in Bihar was less than 1 per cent, while the RT-PCR positivity was around 2.8 per cent (Cherian et al. 2021). But, despite such warnings, the state failed to increase the number of labs with RT-PCR capacity and even during the peak of the second wave (April 2021), it could only conduct 40,000 RT-PCR tests per day through 18 public and 5 private laboratories.²³

Figure 7: Number of COVID-19 test centres in Bihar, May 2020–August 2021



Source: authors' construction based on data from Indian Council of Medical Research Archives.

Furthermore, most of the COVID-19 testing centres were located in the state capital (Figure 8). The concentration of testing laboratories in the capital and surrounding districts (Patna division) clearly indicates an asymmetric distribution of resources and had adverse effects. According to the latest figures (August 2021), there were 15 testing centres per 10 million people in Patna division, whereas the average for the state was just 3 per 10 million people. This shows that even the most resource-rich division of Bihar was far behind the average number in India. It is also worth noting that all COVID-19 testing centres included in Figure 8 are located in urban areas. Hence, rural

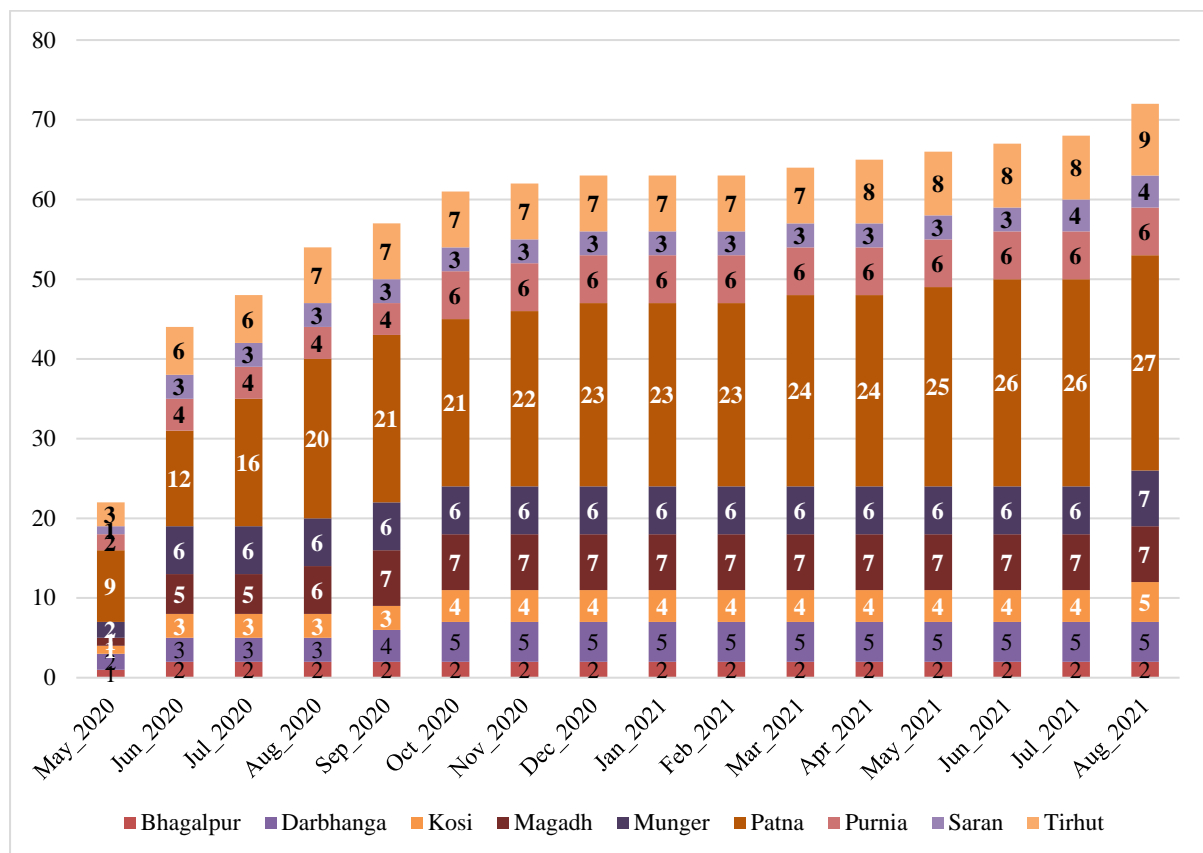
²¹ <https://www.hindustantimes.com/india-news/bihar-labs-underperform-in-rt-pcr-tests-centre-asks-state-to-increase-capacity/story-l2d0TynuPhpRFRwFluUCOJ.html>

²² This was gradually reduced to INR800 by December 2020. <https://www.hindustantimes.com/india-news/bihar-caps-cost-of-covid-rt-pcr-test-at-rs-800-down-from-rs-1-500/story-BHGJliy7sFn2v8YCUNITyI.html>

²³ <https://timesofindia.indiatimes.com/city/patna/increase-covid-beds-rt-pcr-tests-in-bihar-hc/articleshow/82121801.cms>

Bihar completely lacked even the most basic facilities to test and contain the spread of the virus. Slow laboratory turnaround times further impeded the use of testing to slow viral spread.

Figure 8: Testing centres in divisions of Bihar, May 2020–August 2021



Source: authors' construction based on data from Indian Council of Medical Research Archives.

4.2 Tracing and tracking

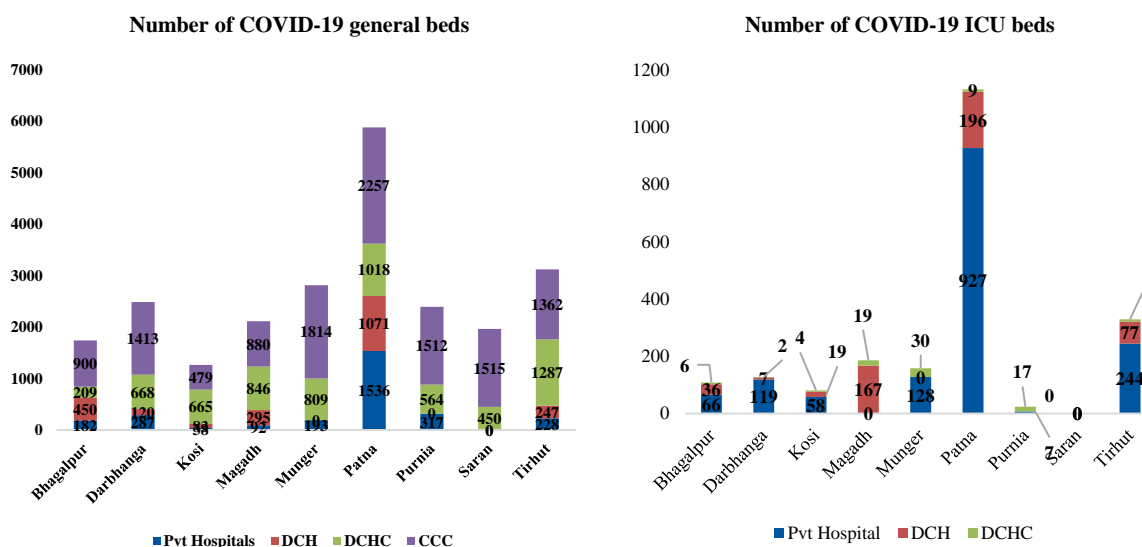
The next most important mitigation measure to break the chain of transmission is by tracing and isolating infected individuals and tracking all cases of suspected infections, particularly those that are asymptomatic. Contact tracing, particularly in reference to the returning migrants discussed above, was not properly planned in the early stages of the pandemic, and there is no evidence that it improved in the later stages; in fact, although it was a policy decision that all health care workers, police officers, shopkeepers, and sanitation workers would be tested for COVID, there is no evidence that this was actually done.²⁴ On 23 April 2020, health department officials reportedly claimed that the state's health care workers had visited 6.5 million houses and screened more than 36 million people in the state in order to trace asymptomatic cases. But reports suggest that these numbers are false and misleading as entire localities in many parts of the state were not screened, and in areas which were screened health workers did not document the travel history or symptoms of residents.²⁵

²⁴ <https://caravanmagazine.in/health/bihar-health-workers-say-the-state-did-little-to-prepare-for-the-covid19-pandemic>

²⁵ <https://caravanmagazine.in/health/bihar-health-workers-say-the-state-did-little-to-prepare-for-the-covid19-pandemic>

As regards the state’s capacity to isolate COVID-infected individuals with adequate care, the situation was so alarming that the Patna High Court in April 2021 had to take a *suomotu* action against the deficient COVID infrastructure.²⁶ The total number of Dedicated COVID Hospitals (DCHs)²⁷ in the state was only 12. According to the latest available data (Figure 9), the total number of general beds and ICU beds dedicated to COVID across the state has remained totally inadequate throughout the pandemic.

Figure 9: Number of COVID-19 general and ICU beds in Bihar, September 2021



Source: authors’ construction based on data from State Health Society, Department of Health, Govt of Bihar.

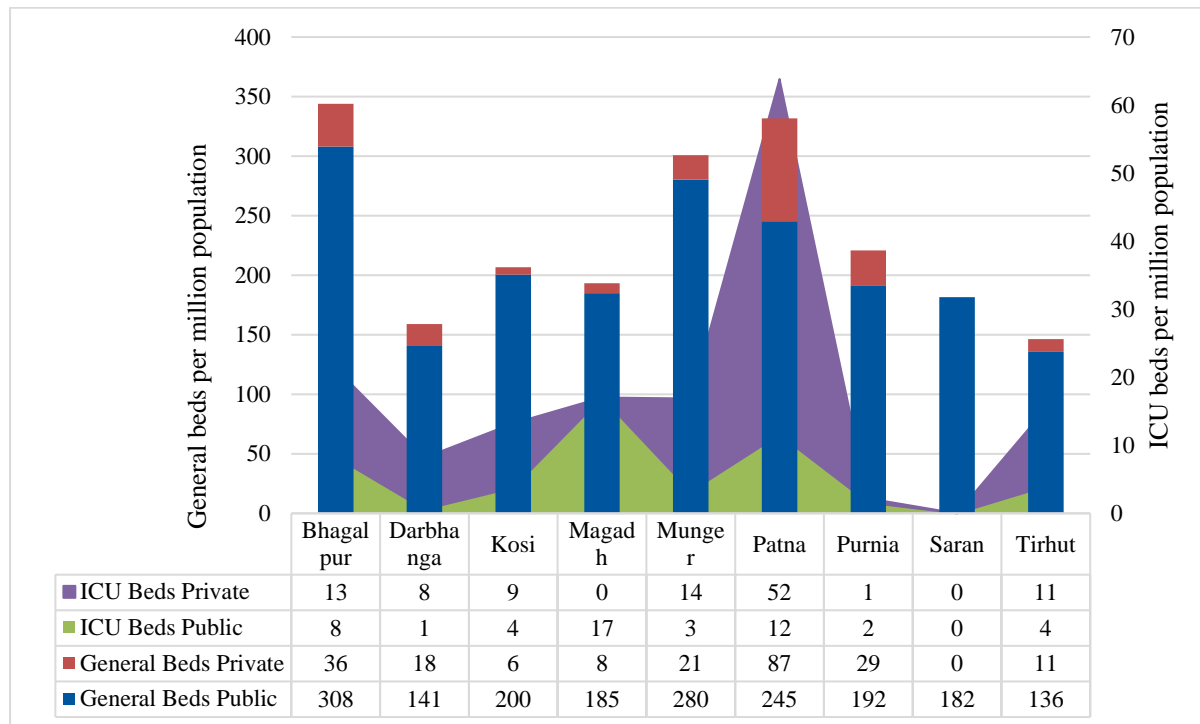
The state had only 20 ICU beds per million population, concentrated once again in Patna and in the private hospitals (14 out of 20). A large part of the state had either no ICU beds or a number that was wholly inadequate for the population during the entire period of the pandemic.²⁸ The average number of general beds in the state-run COVID facilities was 194 per million population (mostly concentrated in CCCs), while that in the private hospitals was only 27 per million population (Figure 10).

²⁶ https://www.livelaw.in/pdf_upload/patna-high-court-covid-management-392146.pdf

²⁷ The Government of India required all states to make a three-tier arrangement: Dedicated COVID Hospitals (DCHs), Dedicated COVID Health Centres (DCHCs), and COVID Care Centres (CCCs). DCHs are supposed to offer comprehensive care for patients who are clinically severe, i.e. either the entire hospital or a block in the hospital equipped with oxygen, ventilators, and ICU facilities. DCHCs offer care for patients who are clinically moderate with oxygen support and must be connected with a DCH. Private hospitals were allowed to be designated as DCHs and DCHCs. CCCs are for mild or suspected COVID-19 cases and are makeshift facilities connected with a DCHC and DCH. <https://www.mohfw.gov.in/pdf/FinalGuidanceonMangaementofCovidcasesversion2.pdf>.

²⁸ <https://www.forbes.com/sites/niallmccarthy/2020/03/12/the-countries-with-the-most-critical-care-beds-per-capita-infographic/?sh=462ecfc77f86>

Figure 10: Number of general/ICU beds per million population in Bihar, September 2021



Source: authors' construction based on data from State Health Society, Department of Health, Govt of Bihar.

This resulted in overwhelmed hospitals in Patna, which was the only place where critical patients from all parts of the state could be treated. Figure 11 shows that there is a positive correlation between ICU beds and reported COVID deaths. Patna, with the largest number of ICU beds, reported the largest number of official COVID deaths. Even after excluding Patna, an outlier, the correlation is very high ($r=+0.72$) indicating that areas with a higher number of COVID ICU beds had a higher number of COVID deaths, as patients from other parts of the states were also being admitted to these areas.

of profit-making opportunities and subjected patients to exorbitant charges.³⁰ The situation during the second wave became critical, with hospitals facing a severe shortage of oxygen as patients gasped for breath.³¹ Several patients were reported to have died waiting in ambulances at hospital premises due to non-availability of ICU or oxygen-supported beds.³²

The condition of frontline workers was equally deplorable. According to the Indian Medical Association, out of the 388 officially recorded COVID deaths in Bihar up to 7 August 2020, 18 were doctors. This meant that doctors accounted for nearly 4.3 per cent of the recorded deaths in the state, as against the national average of 0.5 per cent during the first wave. The state also recorded the highest number of fatalities among doctors (78 out of 269) in the country during the second COVID-19 wave. In total, 122 doctors have died of COVID-19 in Bihar since the outbreak of the pandemic.³³ During the peak of the first wave, doctors in several hospitals protested against the inadequate supply of PPE. In August 2020, around 20,000 paramedical employees under the National Health Mission (NHM) in the state went on strike with the support of junior doctors, including those at the AIIMS and state-run medical colleges, threatening to boycott work indefinitely from 27 August unless their demands were met. One of these was to have their life insured.³⁴ The High Court directed the state government to form a committee to look into the demands of the health workers but that committee never submitted a report. A year later, in May 2021, more than 27,000 contractual health employees again went on strike, blaming the state for overburdening them with work during the pandemic for meagre salaries.³⁵ All this indicates that the state ignored not just the common people but also its health care workers.

5 Discussion and analysis

A simple correlation exercise indicates that the number of COVID-19 positive cases is positively correlated with the number of operational test centres. This exercise in the situation in Bihar shows a similar outcome. Figure 12 shows that Patna division, which had the highest number of testing centres, also had the highest number of detected positive cases during the first and second waves of the pandemic. This clearly raises doubts over the reported number of COVID-positive cases in other parts of the state. Were these low numbers a real situation on the ground or were they only a consequence of the lower number of testing centres? Overall, do they indicate undercounting of cases in Bihar?

³⁰ <https://timesofindia.indiatimes.com/city/patna/govt-will-seal-private-hospitals-charging-patients-exorbitantly/articleshow/81956170.cms>

³¹ <https://www.thehindu.com/news/national/other-states/coronavirus-hospitals-forced-to-turn-away-patients-as-cases-rise-in-bihar/article34321603.ece>

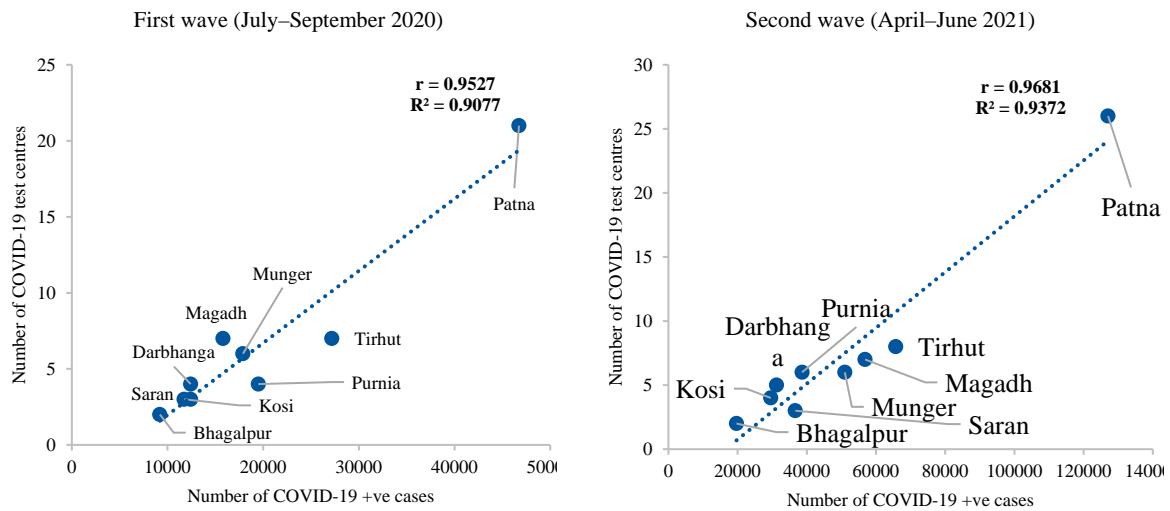
³² <https://www.hindustantimes.com/cities/patna-news/2nd-wave-patna-hospitals-face-shortage-of-beds-101618331381930.html>

³³ <https://www.news18.com/news/india/record-no-of-doctors-died-in-bihar-during-second-covid-19-wave-heres-what-is-plaguing-its-healthcare-3750245.html>

³⁴ In December 2017, 80,000 health workers including nursing staff, health managers, OT assistants, pharmacists, accountants, lab technicians, counsellors, and data operators, who were hired on contracts under the NHM, had gone on strike.

³⁵ <https://www.newsclick.in/Bihar-After-Court-Order-Govt-Assurance-Thousands-Contractual-Health-Workers-Resume-WorkFrom>

Figure 12: Correlation between number of testing centres and number of COVID-19 cases

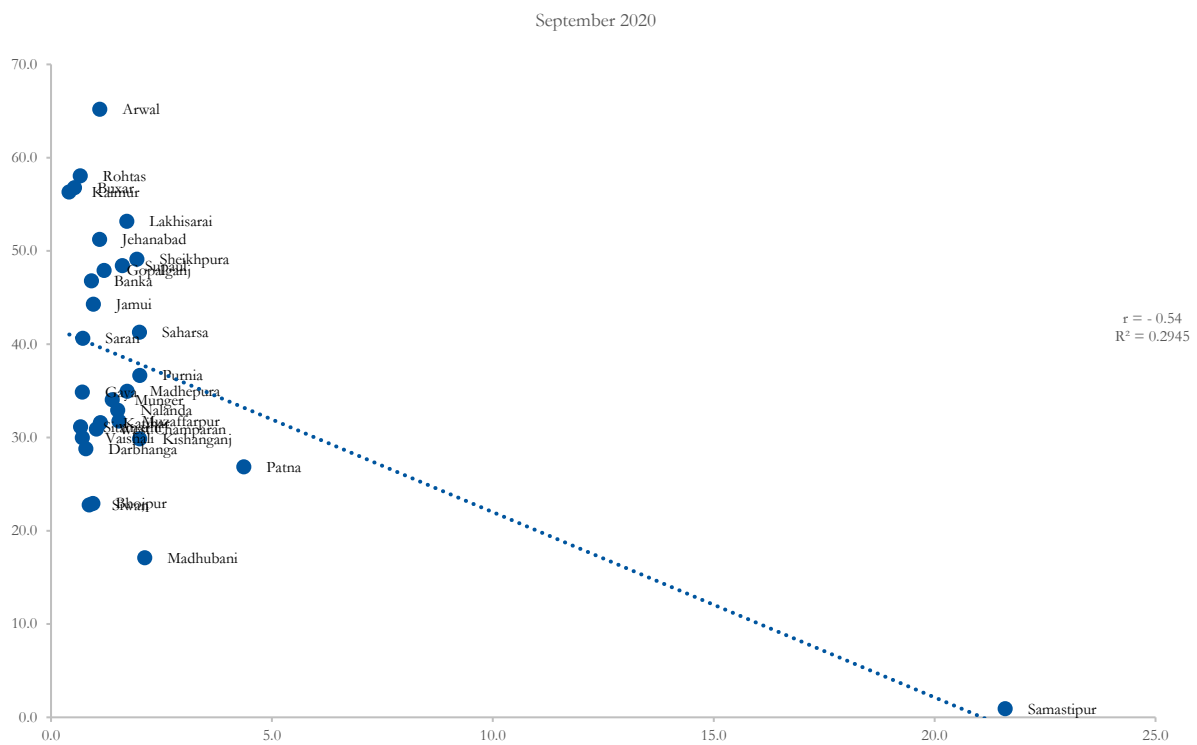
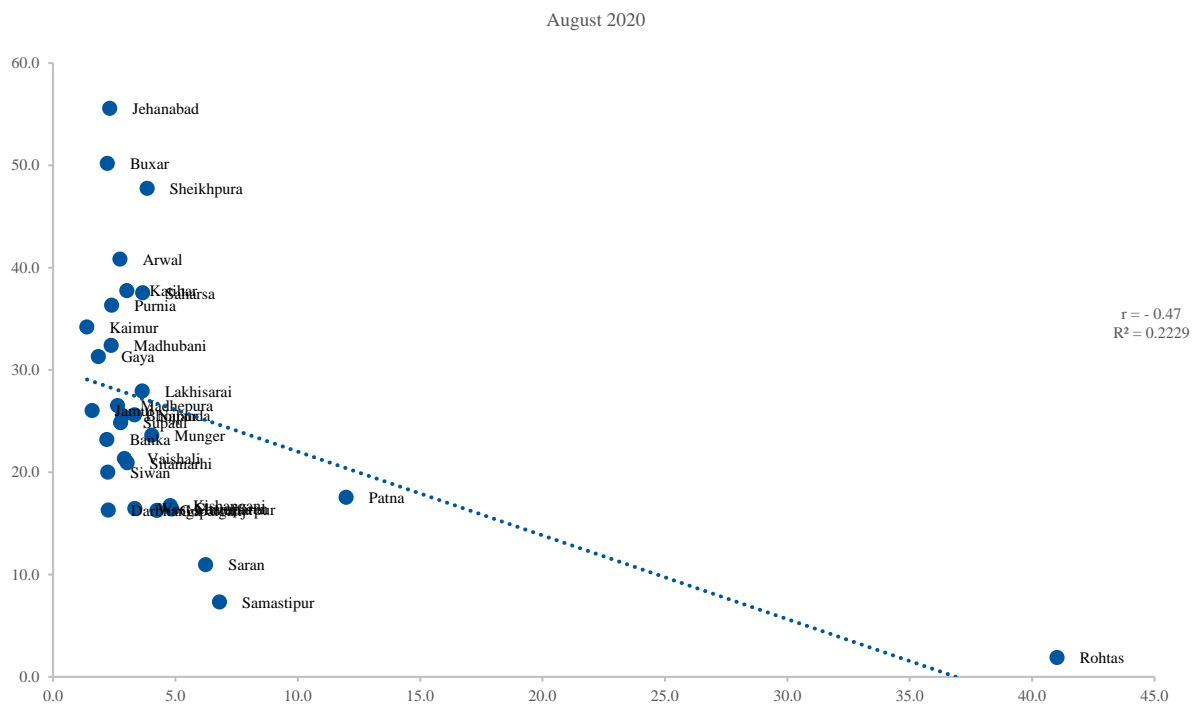


Source: authors' construction based on ICMR for COVID test centres and covid19india.org for number of COVID cases.

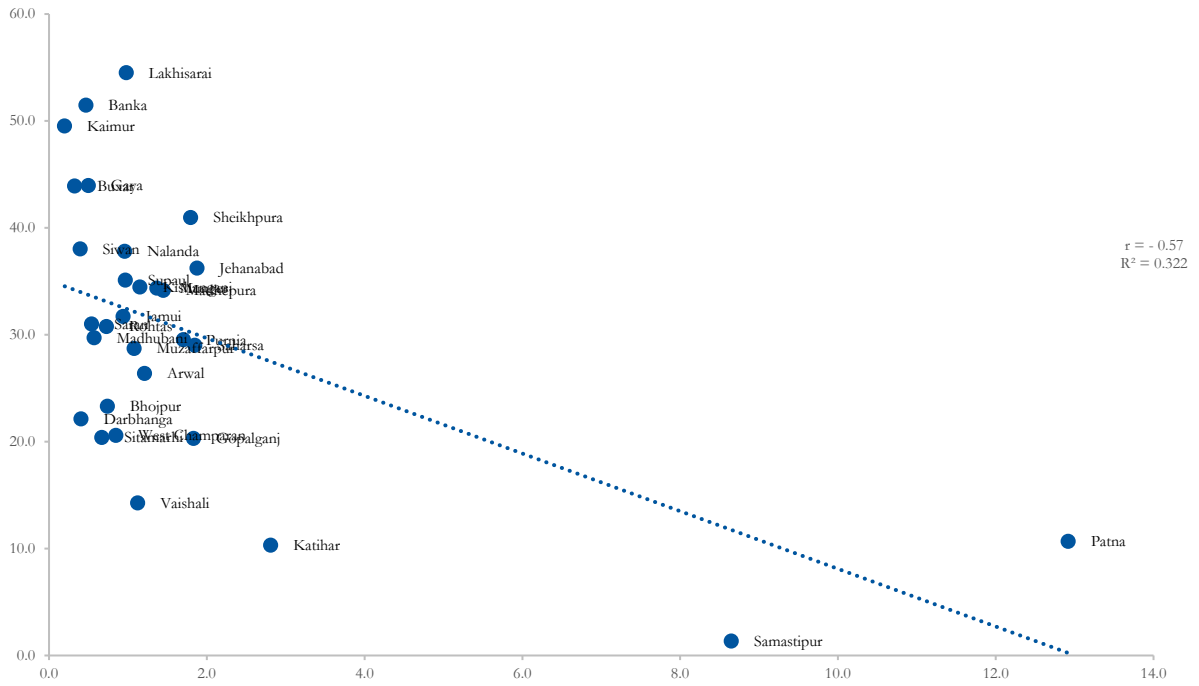
To estimate the undercounting, we examined the relationship between the Test Positivity Ratio (TPR) and the number of COVID-19 tests per thousand people (TTP) between April 2020 and January 2021.³⁶ As indicated in Figure 13, there is a negative correlation between the monthly TPR and TTP of all the above-mentioned months. This indicates that the number of tests (per thousand people) was kept lower in districts with a high positivity ratio and higher in districts with a low positivity ratio.

³⁶ It is to be noted that district-wise testing data are not available after January 2021, as the state government only provides the total number of tests conducted on a particular day at the state level.

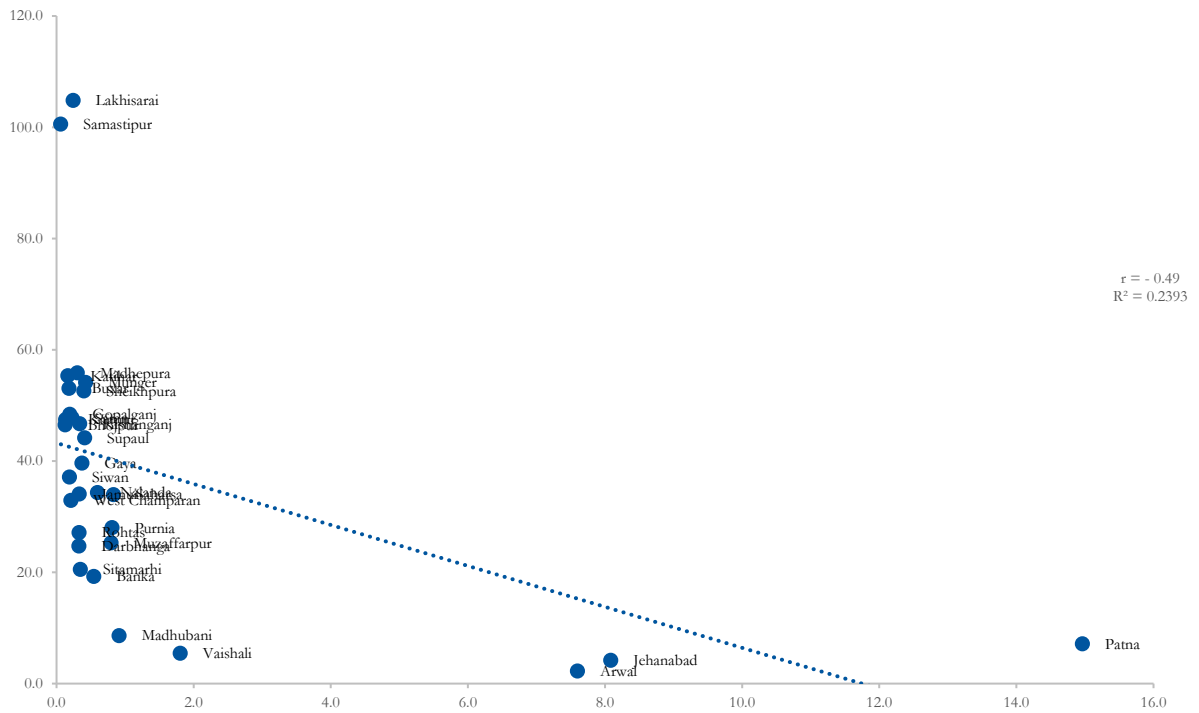
Figure 13: Correlation between TPR and TTP



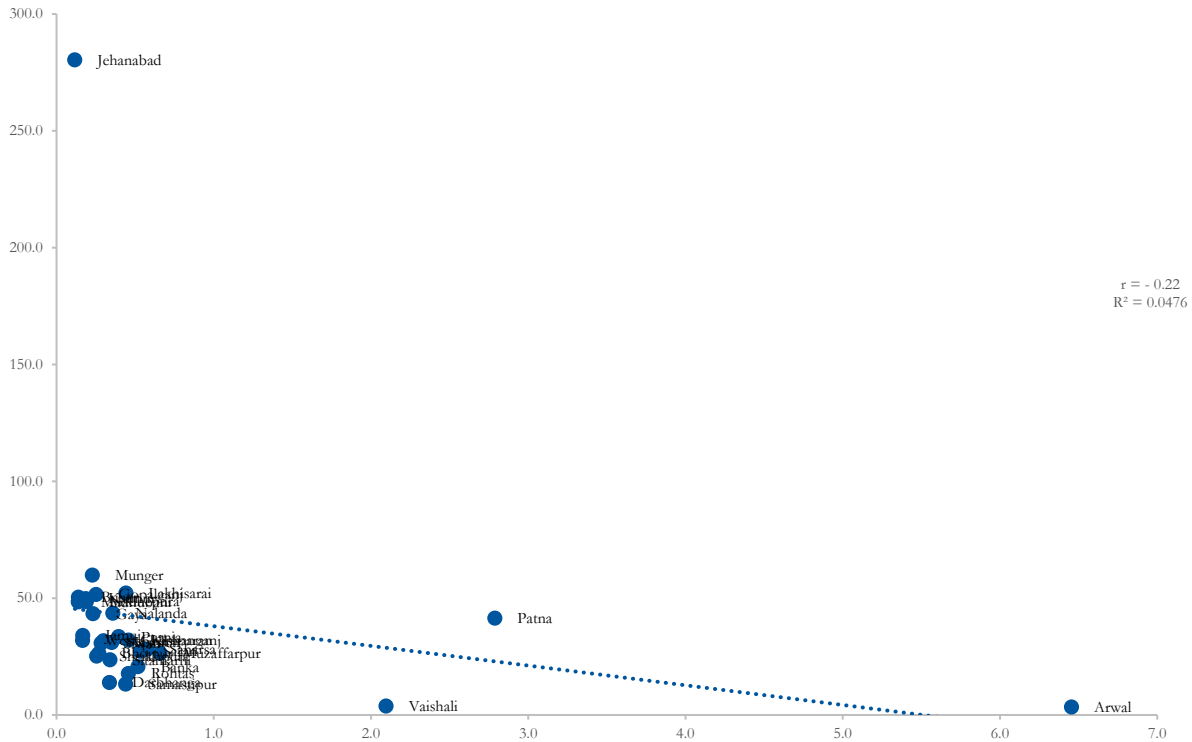
October 2020



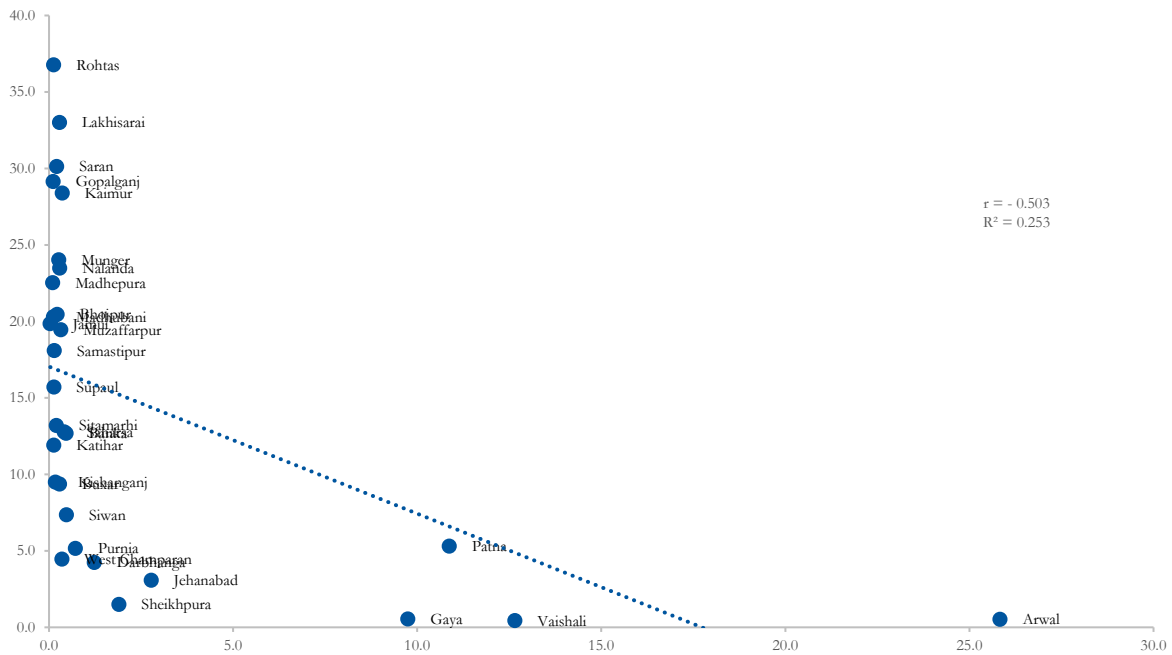
November 2020



December 2020



January 2021



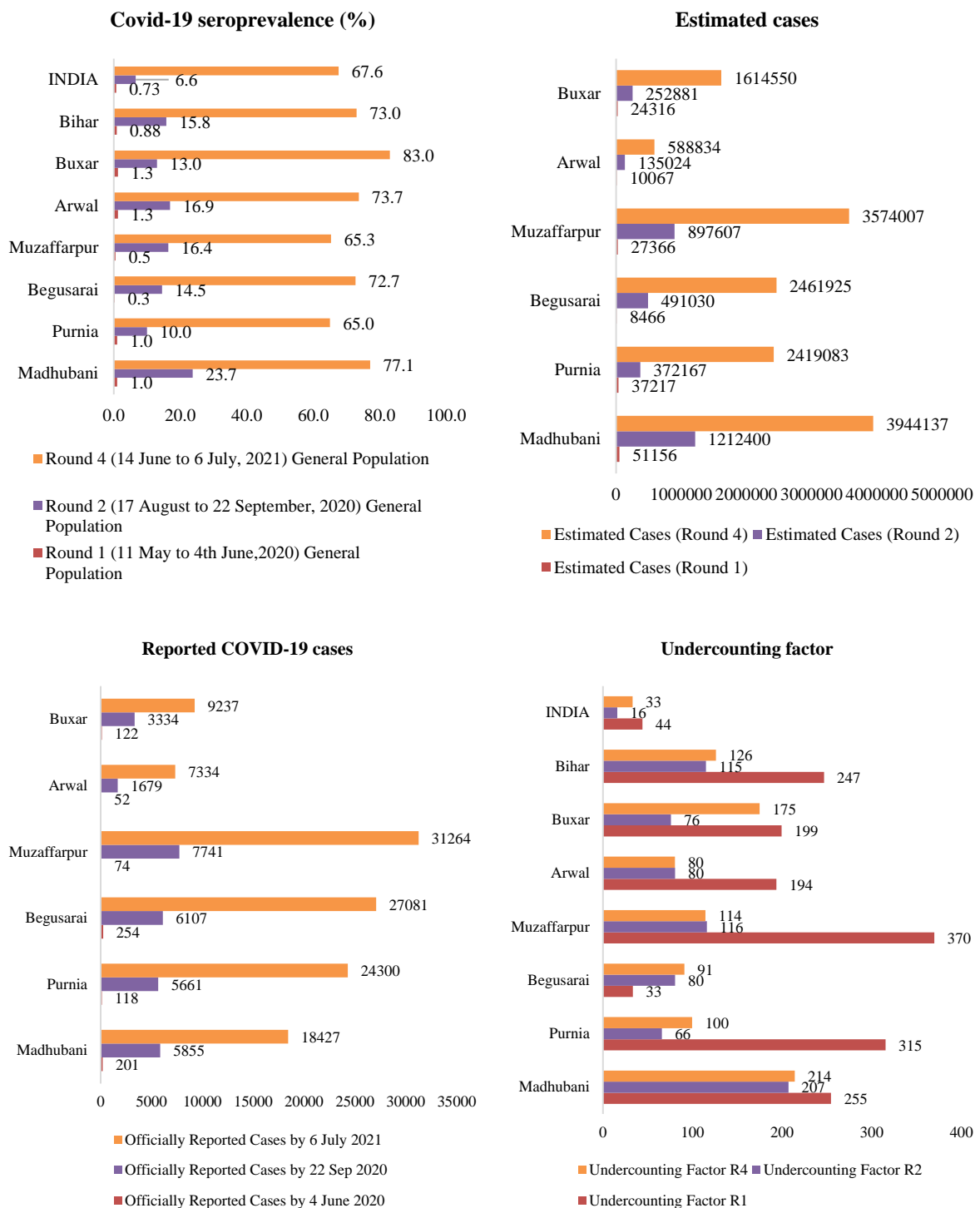
Source: authors' construction from covid19india.org data.

For instance, in August 2020, out of 100 people tested for COVID-19 in Rohtas district, 41 were found positive, but only 1.9 per thousand people were tested in the district. The number of tests in Rohtas slightly increased in the following months but the situation in other districts, including Samastipur, did not change. Samastipur registered a very high TPR for three consecutive months— 7 per cent in August, 22 per cent in September, and 9 per cent in October—but the number of tests declined from 7 per thousand people in August to only 1 per thousand in September and

October. A similar situation can be observed for Arwal and Vaishali districts between November 2020 and January 2021. The case of Patna, the region with the greatest capacity in the state, between October 2020 and January 2021 proves that this negative relationship is not driven by the fact that areas with greater capacity have a higher TTP and a lower TPR. TPR in Patna remained constantly high but the number of tests conducted per thousand people there was kept very low. The decision to carry out the tests in various districts was clearly manipulated, with the aim of keeping the average TPR of the state at a lower level in the clearing grounds for the State Assembly election due in October/November 2020.

The undercounting of COVID-19 cases in Bihar was further corroborated by the ‘undercounting factor’ explained above using the seroprevalence surveys conducted by the ICMR between July 2020 and June 2021. The undercounting factor is calculated as the ratio of estimated cases (on the basis of the seroprevalence surveys) to officially reported cases. As shown in Figure 14, the seroprevalence in Bihar during the first round was just 0.88 per cent. This meant that out of every 1,000 people in Bihar, fewer than 9 had COVID-19 antibodies (detected or undetected) between 14 June and 6 July 2020. During the second and the third rounds, the seroprevalence increased to 15.8 and 29.5 per cent, respectively, reaching at a whopping 73 per cent (i.e. 73 out of every 100) among the general population during the fourth round conducted between 14 June and 6 July 2021. The jump in seropositivity in all six districts of Bihar is higher than the country’s average, indicating that most of the cases in these districts were undetected due to the low number of tests and lack of testing centres. This is further corroborated by estimating the undercounting factors for each of these rounds for these six districts in Bihar. During the first round of the survey, the undercounting factor for India was 44, which means that for each detected case of COVID-19 there were 44 undetected cases. The average undercounting factor for Bihar during the first round was 247. This declined during the second round, indicating that the rate of detection of COVID-19 cases improved, but it went up once again during the third round. After the last concluded seroprevalence survey in June/July 2021, Bihar remained at the top of the chart with COVID cases undercounted by a factor of 126.

Figure 14: ratio of estimated cases to officially reported cases ('undercounting factor')



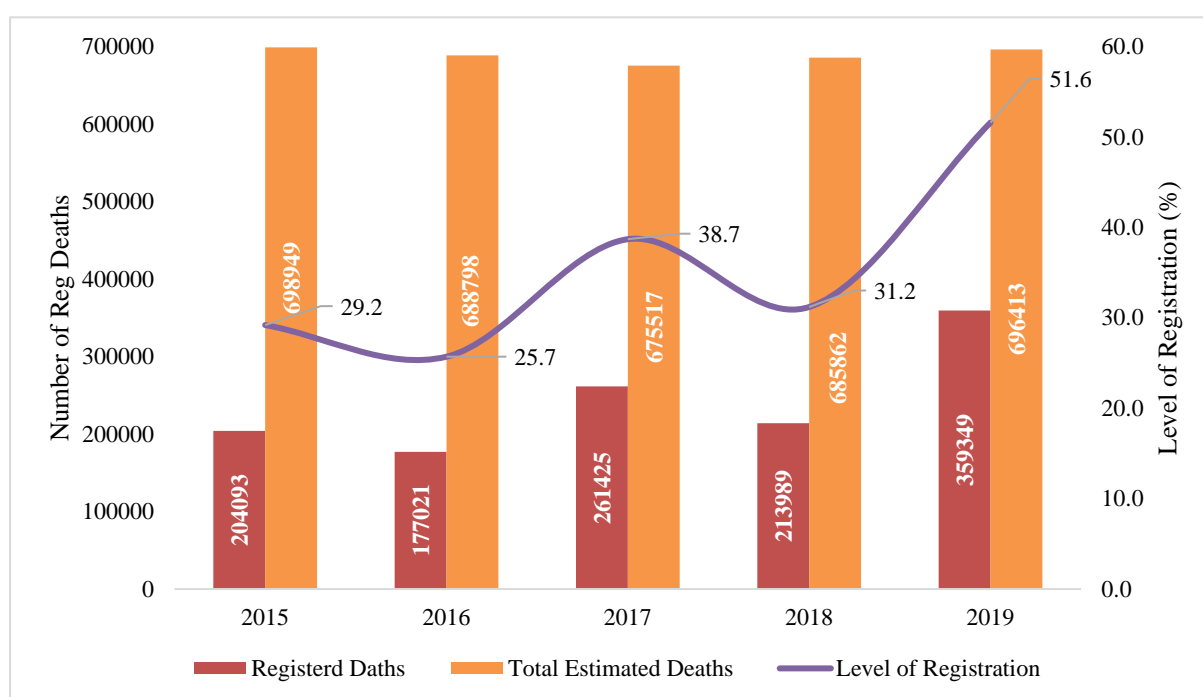
Note: undercounting factor = $\frac{Estimated\ cases}{Reported\ cases}$

Source: authors' construction based on ICMR for seroprevalence, covid19india.org for COVID cases; estimated cases and undercounting factors calculated by authors.

While some may celebrate the higher seroprevalence in the state as an indicator of herd immunity,³⁷ it must be noted that it has come at the cost of many lives—lives which probably are not even part of the counted COVID-19 deaths. In the following paragraphs we make an attempt at an estimation of total and excess mortality due to COVID-19 in Bihar.

The state governments in India register the number of deaths as per the mandate of the Registration of Births and Deaths Act, 1969. The number of reported deaths is dependent upon the level of registration, which is the ratio of total registered deaths to total estimated deaths for a particular year in different states.³⁸ The state-wise annual estimation of deaths is done using a Sample Registration System. Figure 15 shows the level of registration in Bihar during the pre-COVID period (2015–19). It can be seen that the decline in the level of registrations in 2016 and 2018 reflects the decline in the total number of registered deaths in the state. However, the number of estimated deaths remains constant and is close to 700,000 for all these years.

Figure 15: Number of registered and estimated deaths and level of registration, Bihar, 2015–19



Source: authors' construction based on data from Civil Registration System, Bihar.

Since, the level of registrations for 2020 and 2021 is not available, we may not be able to make any conclusive statement, but a simple comparison of the total number of registered deaths in 2019 and 2020 (Figure 16) shows that there is a jump of 15 per cent from 359,349 in 2019 to 414,216 in 2020. A further comparison of registered deaths between January–May 2020 (129,815) and January–May 2021 (223,715) shows that there was a jump of 93,900 registered deaths in Bihar.

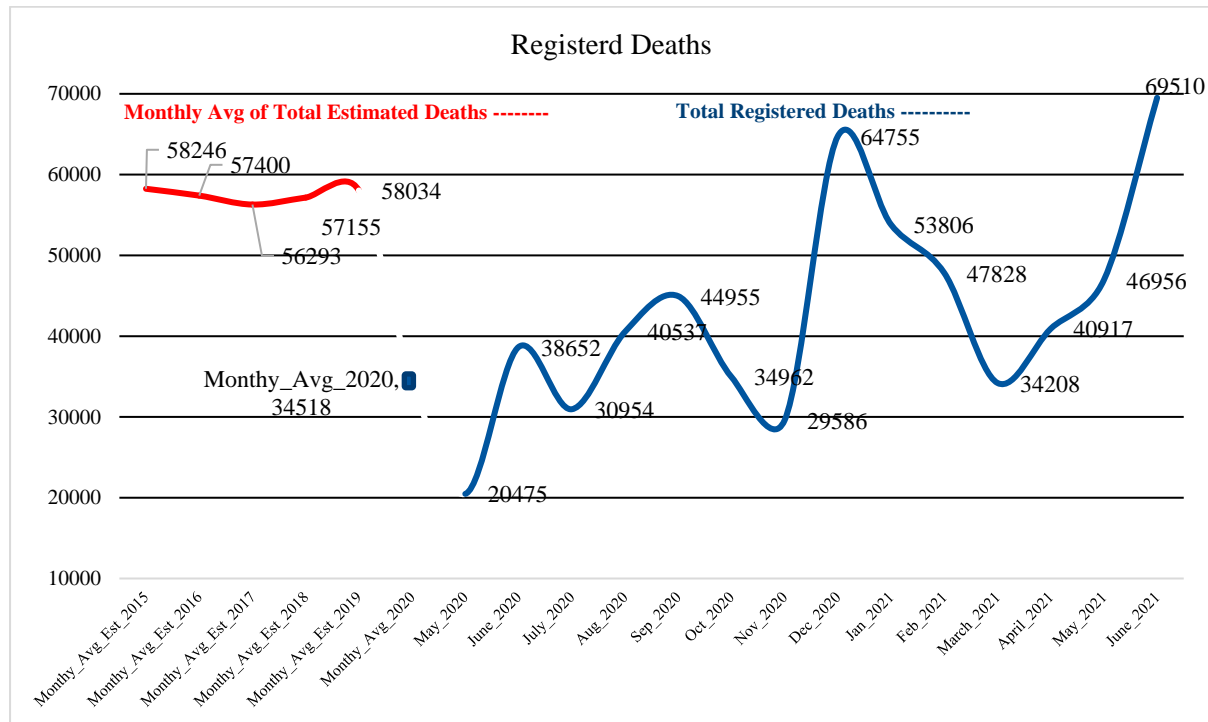
A comparison of the monthly trends of registered deaths (since estimation is not possible in the absence of level of registration) during the COVID-19 outbreak of June 2020–June 2021 with average monthly estimated deaths during a similar pre-COVID period (May 2019–May 2020) shows that the number of registered deaths during the COVID-19 outbreak is at times even higher

³⁷ <https://www.hindustantimes.com/cities/patna-news/73-develop-antibodies-against-covid-19-bihar-inches-closer-to-herd-immunity-101627143977697.html>

³⁸ https://censusindia.gov.in/2011-Common/CRS_2019/CRS2019_report.pdf

than the number of estimated deaths of the previous years (Figure 16). Undoubtedly, for a state like Bihar, where the level of registration is one of the lowest in India, the actual deaths would be much higher than the registered number during the COVID period as well.

Figure 16: Estimated and registered deaths, Bihar, 2015–21



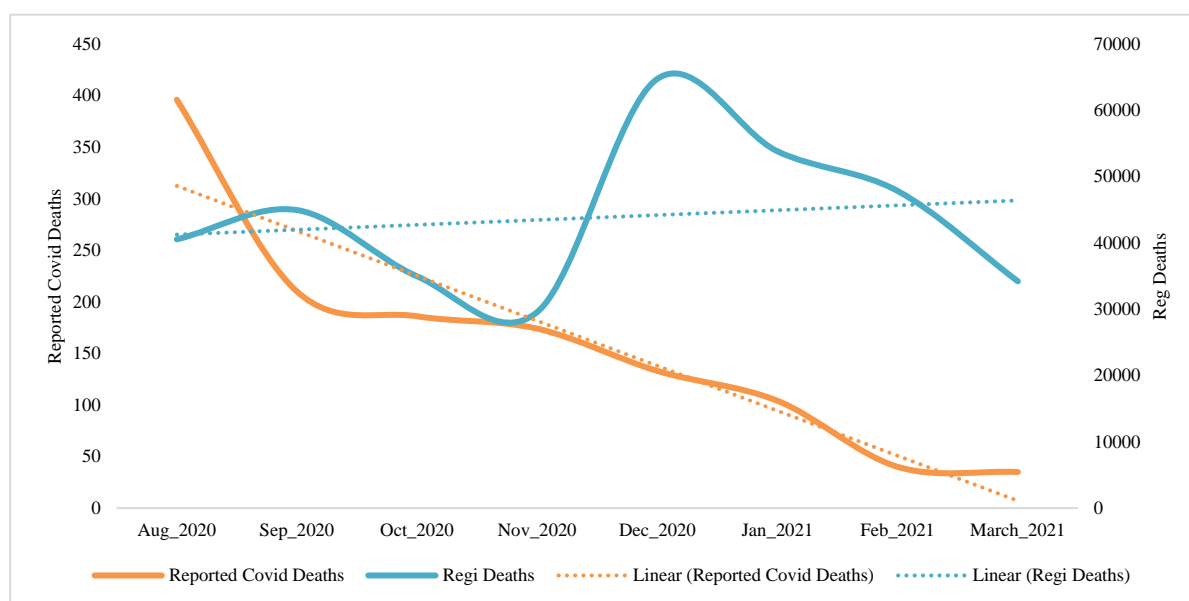
Note: between 2015 and 2019 total estimated death = $\frac{\text{Registered deaths} \times 100}{\text{Level of Registration (\%)}}$; for 2020 the value is the monthly average of the total registered deaths; values between May 2020 and June 2021 are monthly registered deaths.

Source: authors' construction based on data from Civil Registration System, Bihar. For 2020 the value is the monthly average of the total registered deaths; values between May 2020 and June 2021 are monthly registered deaths.

At three points between May 2020 and June 2021, the number of registered deaths showed a steep rise: after July 2020, which is consistent with the rising trend of COVID-19 reported cases and deaths during the first wave; after November 2020, which is consistent with the trend of high case fatality ratio (CFR) between November 2020 and March 2021 (Figure 17), although it seems to be a mystery that, at a time when the state witnessed a rise in the number of registered deaths (August 2020–March 2021), the number of reported COVID-19 deaths declined (Figure 17)³⁹; and again after March 2021, which is consistent with the rise of reported COVID-19 deaths in Bihar during the second wave.

³⁹ From an interaction with the Magistrate of one of the districts in Bihar, we conclude that COVID deaths in Bihar were being recorded from five sources—home isolation records, CCCs, DCHCs, DCHs, and patients on their way to a facility.

Figure 17: Reported COVID-19 deaths and registered deaths, Bihar, August 2020–March 2021



Source: authors' construction based on data from Civil Registration System, Bihar, for registered deaths and covid19india.org for reported deaths.

That the official COVID deaths were grossly under-reported became common knowledge during the second wave of the pandemic, when horrific images of people gasping for oxygen and dead bodies floating in the Ganges appeared in the national and international media. Soon thereafter, a Public Interest Litigation filed in the Patna High Court (PHC) by Shivani Kaushik, a student of law, snowballed into a major exposé of the failure of the state government on many fronts. Kaushik initially went to the Court on account of the failure of the state government to dispose of medical waste and the threat this posed to poor children, whom she saw foraging through medical waste to recover used masks and gloves.⁴⁰ But soon she linked it with several other irregularities and during the hearings of the case in May–June 2021 the PHC directed the state to provide data and details and to redress grievances of the people. The Court also rebuked the Bihar government for under-reporting the number of COVID deaths in the state.⁴¹ Responding to the queries of the Court on the number of deaths in Buxar district, where 71 dead bodies were found floating in the Ganges,⁴² the state government filed two separate affidavits of deaths (one reporting six deaths since 1 March 2021 and the other reporting 789 cremations at just one cremation ground between 5 and 14 May). On 12 May, the division bench, comprising Chief Justice Sanjay Karol and Justice S. Kumar, responded:

We're aghast at the way in which the two separate affidavits with two different figures of deaths in Buxar district are being filed before the court. The court deserves the correct and verified figures from the government [...] All facts first

⁴⁰ <https://www.nationalheraldindia.com/india/why-bihar-is-thanking-a-law-student-and-the-high-court>

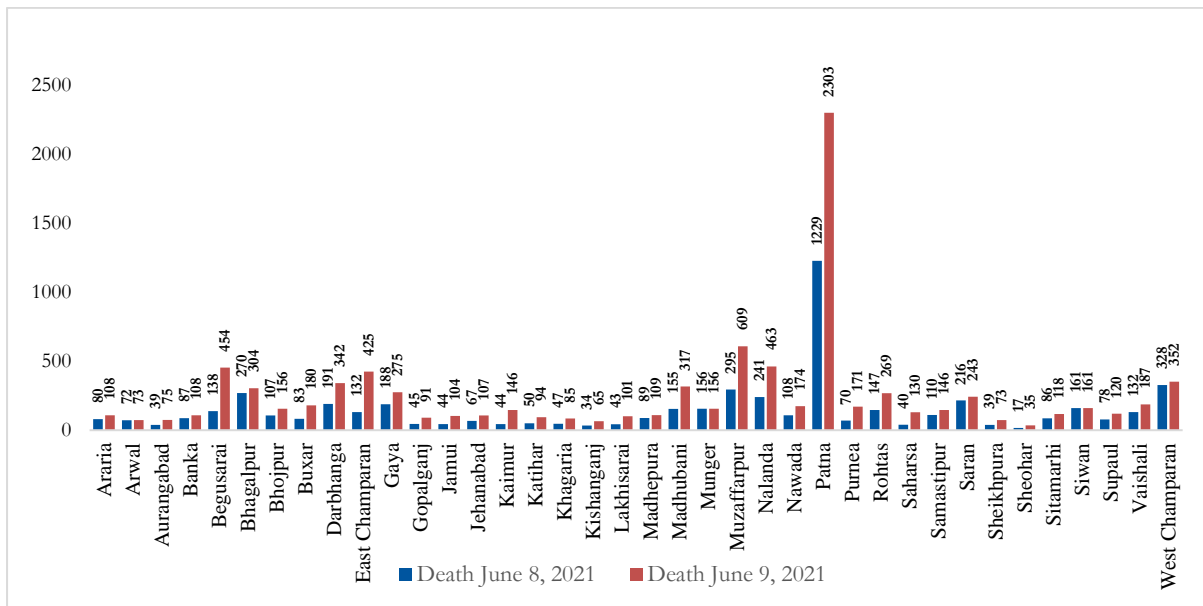
⁴¹ <https://www.indiatoday.in/coronavirus-outbreak/story/patna-hc-asks-bihar-govt-for-sources-it-relied-upon-to-revise-covid19-death-toll-1814220-2021-06-13>

⁴² <https://www.thehindu.com/news/national/other-states/patna-high-court-raps-bihar-government-over-widely-differing-covid-toll/article34582750.ece>

must be verified from all sources before being placed to the court; else it will amount to filing of false or incomplete affidavit [sic].⁴³

The hearings in the Patna High Court led to some improvements in the data. The state government reportedly conducted a 21-day audit of all deaths in every district and made a dramatic revision in the COVID death count—a whopping 72 per cent rise from 5,458 cumulative deaths on 8 June to 9,429 deaths on 9 June (Figure 18). Since the audit report is not in the public domain, we do not know how the revised figure was arrived at. However, the sharp increase in the numbers shows that the number of deaths announced earlier was grossly under-reported. In 4 of the 38 districts in the state, the audit resulted in more than a 200 per cent rise in COVID deaths, in 8 districts the increase was more than 100 per cent, and in 12 other districts the rise was more than 50 per cent.

Figure 18: Number of reported COVID-19 deaths on 8 and 9 June 2021



Source: authors' construction based on data from Ministry of health, Govt of Bihar.

On 18 June 2021, the Patna High Court stated that

the Government, be it for whatever reason, is most reluctant to put in the public domain the number of deaths which occurred in Bihar during the last one year, i.e. during the time of Pandemic Covid-19. In our considered view, the resistance is uncalled for, for such action is neither protected by any law nor in consonance with good governance's settled principles. The Government, while correcting its myopic approach, only needs a reminder that 'To cover with veil of secrecy, the common routine business, is not in the interest of the public. Such secrecy can seldom be legitimately desired.' is what Honourable the Supreme Court had said in *State of U.P. v. Raj Narain*, (1975) 4 SCC 428. [sic]⁴⁴

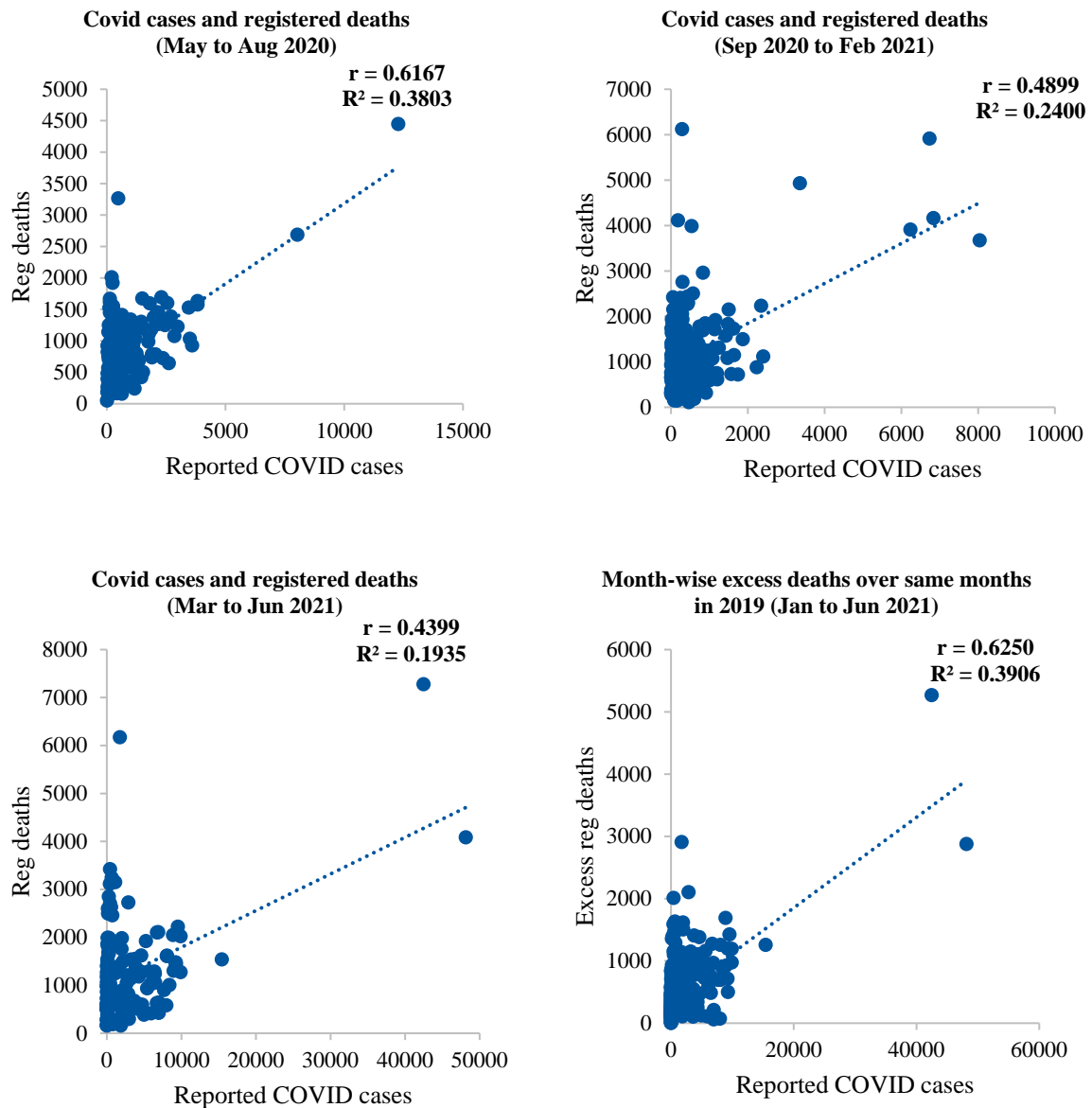
In this paper we also examine the under-reporting of deaths by looking at the relationship between district-wise COVID cases and registered deaths for three different periods: May to August 2020, September 2020 to February 2021, and March to June 2021. This division into three periods is

⁴³ <https://www.thehindu.com/news/national/other-states/patna-high-court-raps-bihar-government-over-widely-differing-covid-toll/article34582750.ece>

⁴⁴ <https://indiankanoon.org/doc/32098747/>

based on the trends of COVID-19 cases in Bihar, as shown in Figure 19, where each dot indicates a correlation between the numbers of registered deaths and of COVID cases in a month in a particular district. We find a positive correlation between COVID-19 cases and registered deaths for all three periods.

Figure 19: COVID cases and registered deaths in Bihar.



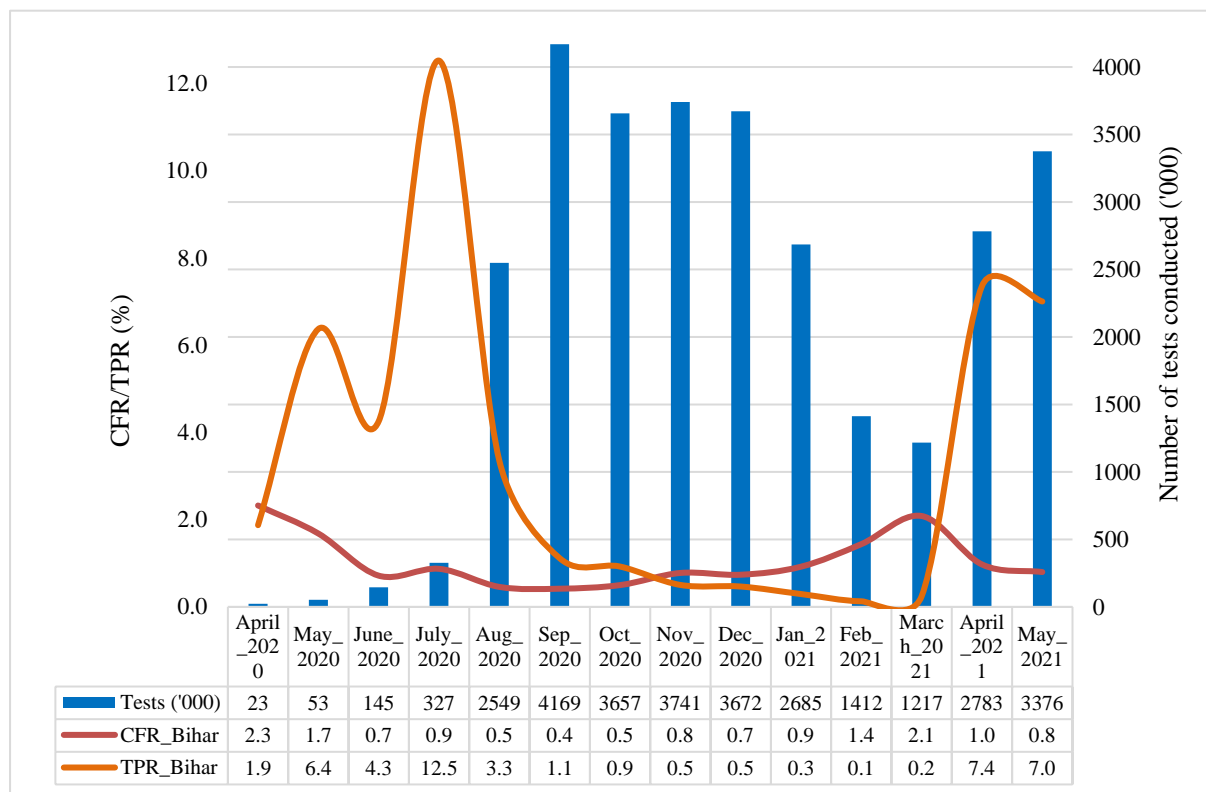
Source: authors' construction base on data from Civil Registration System for registered deaths and covid19india.org for COVID cases.

In the first period, when COVID-19 cases in Bihar were rising, the correlation coefficient was 0.62. In the second and third periods, the correlation weakened but remained positive. In the second period, the undercounting factor increased, which means that the growth rate of registered COVID cases was slower than the actual growth rate of virus spread. We also measured the excess registered deaths in Bihar from January to June 2021 over the same months in 2019. The correlation between excess deaths and reported COVID cases for the period January to June 2021

is 0.63, which indicates that the number of extra registered deaths during the first six months of 2021 is consistent with the trend of COVID cases, particularly during the second wave.

The claims of under-reporting of COVID cases and deaths are further strengthened by examining the relationship between the Case Fatality Ratio (CFR) and Test Positivity Ratio (TPR) in the state. Bihar witnessed a sharp increase in TPR between April and July 2020, from 2 per cent to 12.5 per cent. This can largely be accounted for by the inadequate number of tests conducted, which was just 0.5 per cent of the total population of the state. With the increase in the number of COVID tests from August 2020, the TPR declined to 3.3 per cent and subsequently to 1.1 per cent and 0.9 per cent in September and October, respectively. During the period between August and October 2020, the CFR remained almost constant, close to 0.5 per cent. However, October 2020 saw the start of a contradictory trend, in which the CFR rose significantly while the TPR kept declining till March 2021 (Figure 20).

Figure 20: Number of tests, CFR and TPR in Bihar, April 2020 to May 2021



Note: $CFR = \frac{\text{Deaths}}{\text{Deaths} + \text{Recovery}} \times 100$, $TPR = \frac{\text{Positive cases}}{\text{Total Tests Conducted}} \times 100$.

Source: authors' construction based on data from covid19india.org.

It is to be expected that states with better COVID-19 testing rates, health expenditure, and health care capacity will perform better with regard to COVID-19 fatality rates. There are four possible relationships between CFR and TPR (Monteiro and Kembhavi 2021).⁴⁵ A high TPR and a high CFR indicates that the spread of infection and its fatality are very serious. A high TPR and a low CFR could indicate either that the infected population is high but the health care system's performance is remarkable in keeping deaths low or that there is under-reporting of COVID deaths, which might need to be investigated. The third relationship of low TPR and low CFR can mean either that the epidemic is under control or that there is an under-reporting of both cases

⁴⁵ <https://indianexpress.com/article/explained/covid-data-coronavirus-cases-global-health-crisis-7337262/>

and deaths. The fourth possibility, of a low TPR and a high CFR, in contrast, points toward attempts to manipulate the test positivity rate by keeping it artificially low. The situation in Bihar between October 2020 and March 2021 is consistent with both the third and the fourth possibilities. If the official data of TPR and CFR are assumed to be correct, this means that COVID-19 became more deadly but less contagious during this period, which is a contradictory conclusion, especially when infection spread was far from over. Furthermore, this contradictory trend of increasing CFR and decreasing TPR was not witnessed at national level during the entire period of the pandemic. Hence, the contradictory trends indicate manipulation of data to keep the TPR artificially low.

Moreover, in the same period, the high fatality of COVID-19 coincided with a fall in the total number of tests conducted; in fact, the total number of tests recorded a decline of 67 per cent between October 2020 and March 2021. Afterwards, there was a rise in the number of tests and TPR: the total number of tests increased 2.8 times between March and May 2021. However, during the same period, the total number of reported COVID-positive cases and COVID-19 deaths increased 79 and 74 times, respectively. This is further indication of the under-reporting/manipulation of the vital statistics of the COVID-19 pandemic to suit political interests in Bihar.

6 Conclusion

The arguments made in this paper indicate the under-reporting/manipulation of the vital statistics of the COVID-19 pandemic to suit political interests in Bihar. The claim made by the media that the state ‘miraculously managed to keep COVID cases under control’ during elections on the basis of officially published figures lacks any scientific underpinning.⁴⁶ The official trend of TPR and CFR in Bihar clearly shows that the figures were manipulated to keep the TPR artificially low. The state’s decision to conduct an election in the midst of the pandemic, despite repeated attempts by the opposition parties to postpone it, shows its unwillingness to prioritize the people’s interest over that of those in power. The closely contested election held between 28 October and 7 November was won by the incumbent National Democratic Alliance (NDA) with a simple majority of 125 seats (out of 243). The main opposition party, Rashtriya Janata Dal, remained as the single largest party with 75 seats. The state not only failed to show any courage in providing relief to its people during the pandemic, but also left many of them, particularly the poor, without food, health care, or transportation for weeks and months. That the judiciary had to intervene to direct the executive to acknowledge the devastation caused by the pandemic suggests that the state has witnessed a further erosion of its legitimacy, due not just to its incapacity but also to its misuse of state authority for overtly political ends.

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⁴⁶ <https://www.indiatoday.in/india/story/bihar-covid19-coronavirus-cases-under-controll-assembly-election-poll-1740778-2020-11-13>

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