Costs and Affordability of COVID-19 Testing and Treatment in India

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Abstract

Background

The COVID-19 pandemic has triggered several underlying vulnerabilities with potentially far reaching consequences in low- and middle-income countries (LMICs) like India. Evidence of physical and socio-economic vulnerabilities caused by the pandemic are emerging rapidly, but one area that has received limited attention so far, is the financial vulnerability COVID-19 causes for households and the government. This paper aims to assess the financial burden imposed on governments and households and the ability of households to afford the required medical costs.

Methods and Findings

Using publicly available data, we computed per-episode mean costs for COVID-19 diagnosis and curative care by government and households. The curative costs included per-episode expenditure for (i) home isolation, (ii) hospital isolation and (i) ICU support. Expenditure was estimated based on mean costs derived from government capped package rates set for private facilities. Households' affordability was assessed by comparing costs per episode to the estimated household income. The number of days required to pay for the cost of testing and treatment served as a proxy for households' ability-to-pay. Work-days and wages/salaries for different types of workers were estimated based on Periodic Labor Force Surveys (PLFS, 2017-18) – a national level survey, with a sample size of 102,113 households and 433,339 persons, sampled through a stratified multi-stage random sampling approach.

The mean cost for COVID-19 testing was Rs. 2,229 per test (Min-Max: Rs. 2200 – 2500) in a private facility and free in public facilities. The average cost of home isolation was Rs. 829 (Min-Max: Rs. 164 – 2743), while a 10-day episode of hospital isolation in a private facility was Rs. 67,470 (Min-Max: Rs. 2700 – 12600), and admission to the intensive care unit (ICU) cost Rs. 128,110 (Min-Max: Rs. 82500 – 200,000). To afford hospital isolation, regular employees would need to spend the equivalent of 124 days of wages while self-employed and casual workers would spend 170 days, and 257 days respectively. For ICU hospitalization, casual workers, regular employees, and self-employed workers would require 481 days, 318 days and 232 days of work respectively. Thus, affordability of COVID-19 services is far worse among casual workers, wherein annual wage falls short of ICU hospitalization cost for 90% of workers and hospital isolation costs for 48% of workers. Among self-employed workers, the proportions whose annual wages could not afford ICU hospitalization and home isolation were 66% and 27% respectively. For regular employees, we found that for 51% and 15% of them, their annual salaries could not afford to pay for ICU admission or hospital isolation respectively.

Conclusions

Besides the financial burden associated with economic costs of COVID-19 lockdowns and other containment measures, the direct medical cost of seeking treatment by households is enormous and unsustainable. Our study has shown that households are subject to considerable financial burden rendering a sizeable segment unable to afford COVID-19 services. Future research must pay attention to measurements that can capture catastrophe and impoverishment inflicted by COVID-19 conditions. A deep dive to measure unaffordability must focus on what other basic needs are sacrificed while paying for COVID-19 conditions and treatments foregone.

Introduction

Since the outbreak of the COVID-19 pandemic, India has reported over 30 million total cases and about 281 deaths per million population, making it one of the most severely impacted countries in the world.^[i] The pandemic has resulted in both economic distress as well as loss of human lives. The lockdown mandates have cost millions of workers their jobs, along with large scale displacement and migration of laborers back to rural villages across the country. The International Monetary Fund (IMF) predicts that India's economy will contract by 11.2%, one of its worst performances in decades.^[ii] The pandemic has also disrupted health services resulting in lower immunization rates and decreased access to treatment of various diseases including tuberculosis, malaria, and several non-communicable diseases.^{[iii] [iv]}

In response, the government of India introduced policies to mitigate the economic and health impact of the pandemic.^{[v][vi]} To address COVID-19, the government set up a three-tiered COVID-19 healthcare delivery system that triages patients based on severity

of illness (See Box 1).^[vii] In response to the disproportionate effect of the lockdowns on private health facilities, the public healthcare system expanded both preventive and curative services for COVID-19. However, India’s public health system is plagued by several challenges ranging from workforce shortages, to poor infrastructure and quality of services.^[viii]^[ix] Moreover, the high reliance on the private sector for health care, coupled with the low levels of health insurance coverage put many households at great risk of financial hardships due to COVID-related treatment costs.^[x]

Box 1: India’s three-tiered health system response for COVID-19 treatment

India has developed a three-tiered structure for pandemic preparedness to quarantine, isolate, and treat COVID-19 cases, through dedicated COVID care centres, COVID health centres and COVID care hospitals in the public and private sector.^{vi} This three-tier strategy for managing COVID patients has been followed almost uniformly across the country.

Category I—dedicated COVID Hospital (DCH)	<ul style="list-style-type: none"> • Comprehensive care primarily for clinically severe cases • Fully equipped intensive care units (ICUs), ventilators, and beds with assured oxygen support • Separate areas for suspect and confirmed cases • Serve as referral centers for the dedicated COVID-19 health centers and the COVID-19 care centers
Category II—dedicated COVID Health Centre (DCHC)	<ul style="list-style-type: none"> • Care for clinically moderate cases • Hospital beds with assured oxygen support linked to one or more dedicated COVID-19 hospitals
Category III—COVID Care Center (CCC)	<ul style="list-style-type: none"> • Care only for clinically mild or very mild cases or COVID-19 suspect cases • Makeshift facilities can be set up in hostels, hotels, schools, stadiums, lodges, etc., both public and private • Separate areas for suspected and confirmed cases • Linked to one or more dedicated COVID-19 health centers and at least one dedicated COVID-19 hospital for referral purposes

As per the national survey of households on health in 2017-18, only 14% of the rural population and 19% of the urban population had any form of health insurance coverage.^{vi} The national survey also suggested that 58% of all hospitalization occurs in private facilities and the rest in government hospitals. For those with employer-based and government-sponsored health insurance coverage, measures have been adopted to cover and reimburse COVID-19 related healthcare expenses^[i]^[ii]. India’s insurance regulator also directed the private health insurance companies to provide coverage for COVID-19 related expenses.^[iii] Table 1 highlights the coverage for COVID-19 related treatment delivered under major schemes in India. Besides the health insurance schemes, all testing and treatment in government hospitals remains cashless and free. However, the cap placed on package rates by the government does not provide complete financial risk protection with several instances of private health facilities charging patients over and above the packages rates.^[iv] For uninsured patients accessing private hospital services, government-mandated price ceilings are applicable only to 60% of hospital bed capacity.^[v]

Table 1. Coverage for COVID-19 related treatment in India under various schemes

Scheme name	Coverage	Eligibility	Coverage limit	Out of pocket payment
Pradhan Mantri Jan Arogya Yojana (PMJAY) ^[vi]	Testing and treatment of COVID-19 free at all empanelled facilities and hospitals	PMJAY-eligible beneficiaries	INR 500,000 per family	Nil
Pradhan Mantri Garib Kalyan Yojana ^[vii]	Loss of life and accident death coverage for eligible health workers; treatment expenses not covered.	Public and private sector health workers, volunteers authorized by government officials involved in COVID-19 related responsibilities;	INR 5,000,000 per health worker	Nil
Employees' State Insurance Scheme (ESIS)	Testing and hospital treatment of individuals insured by the ESIS; reimbursement of purchase of medicines by beneficiaries from private chemists	Individuals and family members working in establishments with less than 20 employees and earning monthly wages of INR 21,000; eligible individuals and family members who lost employment due to COVID ^[viii]	No ceiling for insured and family members	Cashless facility available for treatment in empaneled hospitals; Premium and ESIS employee beneficiary contribution reduced from 1.5% to 1% of wages due to COVID
Central Government Health Scheme ^[ix]	Treatment and reimbursement of medical expenses related to COVID diagnosis	Central government employees, pensioners and eligible dependent family members	No ceiling for treatment at CGHS facilities and hospitals; coverage in private hospitals capped	Cashless facility available for treatment in empaneled hospitals and diagnostic centers; Premium and beneficiary contribution through salary deductions
Corona Kavach Policy ^{[x] [xi]}	The policy is offered by all eligible public and private health insurance providers in India for coverage of COVID-19 related treatment costs.	Individuals between 18 – 65 years of age without any kind of health protection	INR 500,000	One-time premium payment by households/ employers

Public health expenditures (PHE) in India are only 1.18% of gross domestic product (GDP)^[xii], far below the global average of 6% and the 2.5% recommended by the High-Level Expert Group for Universal Health Coverage in India.^[xiii] As per World Bank estimates, even without the COVID pandemic, 17% of the total population faced catastrophic health expenditures, spending more than 10% of their household income on health.^[xiv] The expanded coverage of COVID-19 treatment under government sponsored programs is bound to put further fiscal strain on central and state governments to maintain health services while ensuring adequate financial protection for the public. Given the severe impact of health care costs on households in India, which are further exacerbated by the COVID-19 pandemic, this paper investigates: (i) the COVID-19 related financial costs to government and households; and ii) the affordability of COVID-19 testing and treatment costs for households.

Methods

Our analysis focused on four COVID-19 service packages including: (i) COVID-19 testing, (ii) Home isolation for COVID-19, (iii) Hospital isolation for COVID-19, and (iv) Intensive Care Unit (ICU) hospitalization for COVID-19, with and without ventilator. These

services are performed in India in accordance with the national pandemic preparedness plan to quarantine, isolate, and treat COVID-19 cases, through dedicated COVID-19 care centers, COVID-19 health centers, and COVID-19 care hospitals in the public and private sector^[i]. Table 1 and S1 Appendix section A1 describes details of the protocols, and levels of care. For each service package, we estimated the unit cost of providing the service, the affordability for Indian households by socioeconomic groups, and the total cost to the government of India of providing the service given the burden of COVID-19 cases. Our analysis included only financial costs, not economic or opportunity costs as the former is a better representation of the per-episode financial burden in the short-run.^[ii] We obtained data for this analysis from publicly accessible sources, therefore, this study qualified as non-human subjects research and did not require ethics approval.

Estimating unit costs of COVID-19 intervention packages

We conducted a top-down cost estimation using publicly available data from national- and state-level sources including, the government-insurance package rates, the government capped package rates for private facilities, and the National Sample Survey (NSS) data. ^[iii]^[iv]^[v] The mean costs of providing each COVID-19 intervention outlined above was estimated in 2020 Indian Rupees (INR) and US Dollars. Unit cost for COVID-19 testing was obtained from average cost of testing as mandated by state governments (see methods section in S1 Appendix Section A2). For symptomatic patients requiring home isolation for COVID-19, we used the cost of home-treatment for fever and the common-cold as proxies. Unit-level per episode average expenditures were derived from NSS data that capture mean spending per person for common cold and fever – code '04' for fever and code '36' for respiratory conditions. Since NSS was conducted in 2018, the estimated cost was then adjusted for inflation to report expenditure in 2020 equivalents (See S1 Appendix section A2 for details). To estimate unit costs for hospital-based services, we analyzed the government-insurance package rates and the government-capped package rates from eighteen major states. These approved package rates represent how much the government-sponsored health insurance will reimburse health facilities for providing COVID-19 care while government-capped rates reflect financial burden on households. The rates vary by state so we used the average cost estimate. Further details of unit cost estimation are highlighted in S1 Appendix Section A2.

Assessing financial burden of COVID-19 intervention packages

We measured financial burden by estimating affordability of treatment and testing for households by comparing unit costs with the equivalent of individual daily wages, thus the cost of using each service was transformed to the equivalent of number of days needed to work in order to afford the service. Separate estimates were derived for each of the three occupational classifications defined by the Government of India, namely: casual worker, regular employees and self-employed.^[vi] We used proxy measures for affordability by calculating the number of days required to pay for the cost of testing and treatment. Work-days and wages/salaries for three types of workers were measured based on Periodic Labor Force Surveys (PLFS, 2017-18). PLFS is a national level survey, with a sample size of 102,113 households and 433,339 persons. The PLFS utilized a stratified multi-stage random sampling method. Details of our estimation methods are described in S1 Appendix Section A3.

Estimating total cost of COVID-19 services borne by households and the Government

The financial resources required to meet the cost of providing testing and treatment was estimated by multiplying the total number of COVID-19 cases by the average cost of the COVID-19 packages. We estimated total costs per annum as well as one quarter total costs – first wave (April 2020 to March 2021) and (April 2021 to June 2021). Total number of COVID-19 cases and tests administered for the period under consideration were obtained from official estimates^[vii]. Using data from the US Centers for Disease Control and Prevention, we assumed that 14% of COVID-19 cases will require hospitalization for severe disease conditions while 2% will require ICU hospitalization (with or without mechanical ventilation) for very severe disease.^[viii] We further assumed that pre-COVID patterns of using public vs. private health facilities did not change and will therefore mirror service-use patterns as in the latest national health survey (NSSO) 2017-18. By contrast, the number of cases tested in public and private facilities depends on the distribution of testing facilities.

Results

Unit costs of COVID-19 services

Table 2 summarizes the unit costs estimates for each COVID-19 package analyzed. COVID-19 tests are provided for free in government facilities while in private facilities, individuals pay on an average Rs. 2,229 per test (Range = Rs. 2,200 to Rs. 2,500). Home isolation on average costs Rs. 892 per person per episode (Range = Rs. 164 to Rs. 2,743) with non-severe disease conditions. This includes costs of medical consultation and medicines for treating fever, cold and cough. For hospital isolation (with or without ICU-care), the government has a policy to provide services for free in government facilities. Treatment costs in private hospital for isolation in a general ward was capped by different states at the mean rate of Rs. 67,470 per episode (Range = Rs. 27,000 to Rs. 126,000). For treatment of patients in a private ICU facility, the government-capped package rates were on average Rs. 128,110 per episode (Range Rs. 82,500 to Rs. 200,000).

Table 2. Unit cost estimates and affordability of COVID-19 services

Tests and Treatment (Testing and treatment cost per episode)	Unit cost estimates (in Rupees)			Affordability (In number of work days required to pay for average cost)		
	Mean	Min.	Max.	Casual workers	Regular employees	Self-employed
Testing	2,229	2,200	2,500	8.2	4.0	5.4
Home Isolation	829	164	2,743	3.1	1.5	2.0
Hospital Isolation	67,470	27,000	126,000	249.2	120.1	164.5
ICU Hospitalization	128,110	82,500	200,000	471.0	228.0	312.0

Affordability and financial burden of households for COVID-19 services

Figure 1 highlights affordability measured by number of work days required to pay for COVID-19 care. COVID-19 testing cost would require 4 days, 5.4 days, and 8.2 days equivalent of wages for regular employees, self-employed, and casual workers respectively while home isolation would require 1.5 days, 2.0 days and 3.1 days equivalent of wages respectively. For hospital isolation, workers would need to spend an equivalent of 120 days, 164 days and 249 days of wages, while ICU hospitalization would require 228 days, 312 days and 471 days of wages respectively to pay for treatment. Figure 2 shows the proportion of employees whose annual salary/wage is lower than the cost of seeking each COVID-19 service. Among regular salaried employees, about 50% have annual incomes that are less than the per episode cost for ICU hospitalization for COVID-19 and while 14% have annual incomes less than per episode cost for hospital isolation. As far as self-employed workers are concerned, the respective proportions that have incomes lower than cost of ICU hospitalization and hospital isolation are 66% and 27% respectively, and for casual workers, the proportions were larger at 86% and 43%.

Total costs borne by households and the Government for COVID-19 testing and treatment

Table 3 summarizes the burden of COVID-19 cases, and total financial costs of the services used for prevention and treatment of the virus in India. Our estimates show that 14.1 million cases of COVID-19 occur in India between April 2020 and March 2021, with 11.9 million requiring home isolation and 2.2 million needing hospitalization, including ICU support. The overall annual costs to be incurred by the government and households are projected to be Rs. 323,477 million (US\$ 4,408 million) and Rs. 324,143 million (US\$ 4,417 million) respectively. COVID-19 testing accounts for 96% of the total followed by home isolation over one percent of total. Hospitalizations and ICU support (with and without ventilator use) account for approximately 3%.

Table 3: Annual COVID-19 Cost Estimates for Government and Households

Number of COVID-19 Cases (In Millions)					
Time-Period	Testing	Home Isolation	Hospitalization	ICU Hospitalization	COVID-19 cases
Wave 1 (April 2020 to March 2021)	245.91	10.31	1.47	0.24	12.22
Wave 2 (April 2021 to June 2021)	151.92	15.36	2.14	0.36	17.86
Total	397.83	25.87	3.61	0.60	30.08
Government Expenditure					
	Testing	Home Isolation	Hospital Isolation	ICU Hospitalization	Grand Total
Mean Cost (Rs.) (per episode/per day)	2,229	NA	1,800	5,839	NA
Wave 1 cases (April 2020 to March 2021) (No. Millions)	130	NA	0.62	0.10	NA
Wave 1 Annual Expenditure (Millions Rupees)	290,314	NA	11,087	5994	307,594
Wave 1 Annual Expenditure (Million US\$)	3918	NA	149.54	80.85	4,148
Wave 2 Cases (April 2021 to June 2021) (No. Millions)	81	NA	1.14	0.19	NA
Wave 2 Expenditure (April 2021 to June 2021) (Million Rupees)	179,474	NA	20,448	11,055	210,977
Wave 2 Expenditure (Million US\$)	2,421	NA	276	149	2,845
Household Expenditure					
	Testing	Home Isolation	Hospital Isolation	ICU Hospitalization	Grand Total
Mean Cost (Rs.) (per episode/per day)	2,229	796	7,400	14,000	NA
Wave 1 Cases ² (Millions)	115.58	11	0.85	0.14	NA
Wave 1 Annual Expenditure (Millions Rs.)	257,625	8,365.78	62,941	19,846	348,779
Wave 1 Annual Expenditure (Million US\$)	3475	112.84	849	268	4,704
Wave 2 Cases (April 2021 to June 2021) (No. Millions)	71.40	15	1.24	0.21	NA
Wave 2 Expenditure (April 2021 to June 2021) (Million Rupees)	159,156	12,227	91,994	29,007	292,385
Wave 2 Expenditure (Million US\$)	2,147	164.92	1,241	391	3,943.68

Notes:

1. Denotes annual number of cases treated with government funds.
2. Indicates annual number of cases treated with household funds.
3. The annual number of COVID-19 cases tested is based on share of private and public laboratories, which are currently 53% and 47% respectively, with households and government bearing costs.

4. Disaggregation in respect to government and households' treatment for hospitalization is based on NSS distribution of inpatient in the proportion of 42% and 58% respectively.

5. NA – Not applicable

Discussion

We estimated the unit costs incurred for COVID-19 testing and treatment interventions, the affordability and financial burden to households, and the total costs borne by governments and households. Our findings showed that on average the unit cost of COVID-19 interventions ranged from a low of Rs. 2,229 (US\$ 30) for testing to a high of Rs. 140,000 (US\$ 1,907) per episode for ICU admission. While COVID-19 testing combined with home isolation were relatively more affordable (five days, seven days, and 11 days of work needed by regular employees, self-employed and casual workers respectively), hospital isolation and ICU admission were not affordable (232 days, 318 days, and 481 days respectively for regular employees, self-employed and casual workers). Casual workers therefore are the most impacted implying that their annual wage fell short of per episode cost for 90% of workers when seeking treatment for ICU hospitalization and 48% of workers while receiving treatment for hospital isolation. However, since fewer people require ICU hospitalization or hospital isolation, the financial impact is concentrated in the households affected and not generalized to the entire population. By contrast, a significant portion of the population are required to home isolate whenever there is suspicion of an infection and this creates a problem for casual workers in particular, some of which earn annual incomes that fall below the cost of home isolation.

The estimated total costs to households (i.e., out-of-pocket payments) for COVID-19 testing and treatment over the period April 2020 to March 2021 was Rs. 340,413 million (US\$ 4,639 million) while total costs to the government over the same period was Rs. 307,594 million (US\$ 4,191 million) respectively. The second wave caused by mutation of original variant, the Delta variant, was far more transmissible and deadly. Therefore, the number of cases in just one quarter of 2021 (April to June, 2021) was estimated to be 17.86 million cases against 12.22 million during the entire financial year April 2020 to March, 2021. Consequently, the associated total costs to households was far higher at Rs. 292,385 million (US\$ 3,943 million) in one quarter of April to June, 2021 as against Rs. 348,779 (US\$ 4,704 million) during the financial year (April 2020 to March, 2021). For the government alone in the second wave involving only three months (April to June, 2021), the estimated cost works out to about 12% of annual budget of states and central government put together.

To our knowledge, this is the first estimation of unit-costs, affordability, and total costs of COVID-19 testing and treatment in India. Therefore, our findings make valuable contributions to the discussion of COVID-19 financing in India and around the world. Our findings confirm concerns of a significant financial burden placed by COVID-19 on poor and middle income households in India.^[i] A disproportionately lower spending on health budget reported in middle income economies (less than US\$ 10 per capita) as COVID-19 response is also confirmed by this analysis^[ii].

Findings from this study have important policy implications for financing of COVID-19 care and treatment in India. Our study reveals the aggregate financial burden that COVID-19 places on Indian households and the government are significant and closely aligned to current COVID-19 concentration in Indian states.^[iii] ^[iv] However, since COVID-19 also creates economic pressures on government and private spending, policy makers are faced with increasing demands for emergency healthcare funding and simultaneous reduced availability of funds. ^[v] A sharp rise in joblessness and wage loss induced by lockdown and the epidemic has put strain on household's ability to pay for health care. This is more so for casual workers whose wage remains seasonal and relatively lower than other worker households. Even for self-employed and regular employees, their relative annual salary falls far short of episodic cost of treatment for COVID-19. In planning for COVID-19 funding, special care must therefore be taken to protect existing funds for other routine health services so that COVID-19 wins do not automatically translate to losses for other sectors. Each service had different capped rates between public vs. private facilities and restrictions by way of package rates on the total amount billable for private facilities remain. To resolve this, governments should revise the reimbursement policies to fully cover costs of treatment and thus reduce out-of-pocket payments especially for those who access private facilities. Despite its best intentions, the COVID-19 coverage by PMJAY remains extremely low at 1.77 million tests and 0.60 million hospitalization, accounting for 0.49% and 14.25% respectively of the total tests and hospitalization during the period from April, 2020 to June, 2021.

Our study has some limitations. Since the estimates focused on direct financial costs of COVID-19 care, the larger costs to individuals and the health care system were not considered. Even other additional direct costs such as transport cost, payment made to funeral

expenses, etc. are unaccounted for. Further, during the second wave of the infections, shortages in oxygen supplies, medicines, hospital beds and funeral space led to high level of black-marketing and rent-seeking slamming deep holes on patients' pockets. For instance, Remdesivir, an anti-viral drug, was sold in the range of Rs. 4,000 – Rs. 40,000 for a 100 mg vial of injection, which otherwise would have costed barely Rs. 899 per vial in the market[vi]. Moreover, we did not estimate economic and opportunity costs such as costs of missed treatments or forgone prevention. These costs are likely to be considerable because of the effect of COVID-19 policy responses on service interruptions. However, since these costs do not require immediate mobilization of financial resources to meet emergent needs, they would have little impact on cash-flow and felt financial-burden. Nevertheless, our estimates should be considered the low-end of the full costs of COVID-19 interventions. Households are increasingly bearing the brunt of continuous investment in PPEs, personal hygiene, masks, procuring oxygen concentrators, medical equipments (pulse oximeter, spirometers) and quarantine measures, while governments are tasked with the implementation of public hygiene measures, additional monitoring and surveillance, and hospital infection control measures.

This study was devoted to measuring medical costs of testing and treatment. We did not seek to generate comprehensive economic costs of the pandemic, lockdowns, productivity loss and wage loss associated with the disease conditions. Future research must address and demonstrate comprehensive economic costs of the pandemic and the imperative for pandemic preparedness besides the need to prevent lockdowns and other stringent economic measures that can cripple vulnerable households. In the absence of a national household survey, future research must look for measurements around catastrophe and impoverishment that can help to further quantify the financial vulnerabilities on households. Quantifying foregone resource allocation for other basic needs within a household must also be assessed in order to understand the extent of financial vulnerabilities.

Conclusion

Use of COVID-19 prevention and treatment services is exerting enormous financial burdens on household and governments in India. In addition to dealing with job losses, household members have to spend a high number of daily wages equivalents in order to afford testing, home isolation, hospital isolation and ICU care. To mitigate this effect, it is imperative that the historically low budget allocation and utilization of funds in India receives urgent attention. The pandemic driven contraction and the projected decline in economic growth is likely to put enormous strain on exchequer. Therefore, the need to accelerate public spending by both central and state governments assumes importance due to financial vulnerabilities sustained by households. Job and wage loss suffered during the pandemic by households implies declining household income resulting in poor financial risk protection, worsening health status, and exacerbating health inequities. The government of India at all levels should improve the effectiveness of public spending by removing bottlenecks that prevent access to and utilization of health interventions.

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Figures

Figure 1

Number of work-days needed to pay for testing and treatment for COVID-19, disaggregated by occupational group

Figure 2

Proportion of workers whose per episode cost for hospital isolation and ICU hospitalization exceeds annual income/wage, disaggregated by occupational group

Supplementary Files

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