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Behaviour on health issues amidst COVID-19 lockdown- a study from Kolkata and neighbouring areas

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Abstract

This paper examines the implications of the COVID-19 pandemic for health related issues. It outlines contemporary evidence of inequalities in pandemics through information collected through a survey taken up during last fortnight of May 2020 from 2088 households at Kolkata and its neighbouring districts of West Bengal, India. It then examines whether there exists any inequality resulted by the lock-down to prevent COVID-19 pandemic among these households which are of different socio-economic strata. It then explores the potential consequences if any, of the lockdown measures implemented abruptly in India as a response to the COVID-19 pandemic. The essay concludes by mentioning the marginal analysis with different R_0.

Keywords: India, Lockdown, Effect of Health, Marginal Analysis

1 | INTRODUCTION

One year ago, the 7.5 billion people on the Earth would not have predicted the enormous impact of COVID-19. According to the World Health Organization (WHO), the first identifiable case of COVID-19 was discovered in December 2019 in the Wuhan province of China, and the disease was declared a global emergency on January 30, 2020. However, many experts believe that the virus spread unnoticed throughout the region many months before that [1]. The single-stranded RNA virus spreads through aerosol droplets and can cause lethal respiratory complications. Preliminary studies by the CDC estimate that this novel strain of the Coronavirus has an infectivity, also known

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as R_0 (R-naught), of 2.5, meaning that one infected individual would, on average, spread the virus to 2.5 non-infected individuals [2]. In comparison, the common influenza virus has a R_0 of approximately 1 each year. With a vaccine started in only early in 2021 and there was actually no effective treatment to combat the virus, the world has endured the devastating effects of COVID-19.

In this paper, we will discuss the economic impact of COVID-19 on India on healthcare facilities, behaviour of a lower middleclass families in the backdrop of global scenario.

2 | BACKGROUND

One of the most notable global effects that was seen during the infancy of the pandemic was the disruption of the global supply chain. Covid-19 also impacted international affairs. COVID-19 originated in China, and China is responsible for 12.2% of the world's total exports; therefore, many countries immediately lost access to vital goods once the Chinese government implemented a mandatory quarantine. Many countries, especially poor countries, have heavily relied on China for many of their societal needs, and this dependence was exposed by COVID-19. Unfortunately, some of these lost vital goods included extremely important items to combat the virus, such as respirators, pharmaceutical medicines, and other various raw materials.

The World Bank projects that global growth is projected to shrink heavily with poorer countries feeling most of the impact, and the United Nations projects that it will cost the global economy around 2 trillion dollars this year.

Table below is a snapshot of latest IMF World Economic Outlook January 2021 which shows Annual Percent Change of Real Gross Domestic Product. The coronavirus crisis is creating serious consequences for economic activity worldwide. A large number of countries are currently confronted with a complex crisis, which includes a health shock, disruption of the domestic economy, a slump in foreign demand, capital flow reversals, and a collapse in commodity prices. According to the latest IMF World Economic Outlook, global output is estimated to have grown slightly in 2019, but is sharply declined in 2020, much worse than during the 2008–09 financial crisis. It is highly uncertain, but under the rather cautious assumption that the Covid-19 pandemic will die down gradually and containment measures can be gradually relaxed, the global economy is forecast to grow by 5.5% in 2021, when economic activity can be normalized with political support. Overall, a lack of preparedness was a major contributor to the struggles experienced by health care facilities in India. These deficiencies were exposed by COVID-19 and have prompted healthcare organizations around the world to invent new essential plans for pandemic preparedness. Social media has exacerbated the negative psychosocial impact of COVID-19. Rumours, propaganda, and increased false information on multiple social media platforms lead quickly to increased panic and anxiety.

3 | METHOD

The first case of COVID-19 in India was reported on January 30, 2020, in Trissur, Kerala. Originally, the country employed a strategy focused on containment of the virus, applying measures such as quarantine of individuals traveling from high transmission areas, isolation of infected individuals, contact tracing, and restricting the travel of people from areas where caseloads were high. As the number of cases increased, the contribution of sustained local transmission to the propagation of the virus became evident, and focus shifted to mitigation measures as a means of tackling the virus. Similar to the procedures implemented in China, India enforced bans on public gatherings, air travel both within the country and internationally, and the closure of public places. These restrictions put pressure on an economy that was already sluggish, and immediate negative impacts were seen in the agricultural, manufacturing and service sectors. Indian exports were hit significantly as the virus spread within the countries with which India conducts trade, and those countries halted manufacturing Furthermore, the pandemic and resultant lockdowns have taken a large negative economic impact on lower and lower

middle class families, in addition to psychological toll on many. As the pandemic rages on across the world, and some measure of lockdown persists in parts of the country, the ultimate impact of COVID-19 in India remains to be seen.

A real time situation assessment of the students was attempted through a survey during this period of "Lock down", which is completely unprecedented. This "lockdown" was initially declared for seven (7) days from 25th March 2020, and then extended gradually by two months (each time by an addition of 15 days). Declaration of 'Pandemic' by World Health Organisation was made on 12th March 2020 and from second week of March 2020, the information of newer patients of positive corona virus (COVID 19) in India started pouring in. Although this "lockdown" was not very much sudden, but of course extraordinary to the normal citizens in all respect. Moreover, all educational institutes had suspended their classes even from an earlier date (from 16th March 2020) in West Bengal. Thus, all the students were interned in their homes from middle of March 2020. By middle of April 2020, information of closure of small business, shutting down of all kinds of daily earning, beginning of the 'long-march' by migrant workers in different parts of the land engulfed us with deep distress. In the educational front online classes were initiated by different institutes in this juncture, to compensate normal coursework to some extent.

In this turbulent socio-economic backdrop, the need for assessing the situation of households was felt tremendously but personalised survey was impossible at this moment and online option of survey was only left. The motivation of this Survey arises from the necessity of reviewing the measures of closures of all economic activity need for establishing of more effective policies that may mitigate the impact of a pandemic (COVID19) on health outcomes in India.

4. **Results**

i) **Details of the Survey**

Data were collected during the phase IV of "lockdown". The online survey was conducted among households with at least one current student of five colleges of Kolkata and its neighbourhood during 15th to 31st May 2020. Responses received from as many as 2088 students were processed and analysed at the All India Institute of Hygiene and Public Health, Kolkata. Being an online survey, only those with a fairly good internet connection could participate in it.

Students from North 24 Parganas, Kolkata, Howrah and Hooghly are well represented in the sample. Respondents from the other South Bengal districts are also found in good numbers, while a very small percentage of students from Districts of North Bengal and other states are also found in it.

As the selection of colleges was not random, no attempt is made to estimate population proportions from the sample. Instead, only the sample proportions are presented in the "Survey Findings" section. However, a good number of responses were received from students belonging to households of different social and economic backgrounds. Thus, the sample can be considered to be a fairly good mixture of households from diverse sections of the population of Kolkata and its surroundings. Nevertheless, one must bear in mind the following:

a) Data were collected with a moving reference period, varying in length. For a particular respondent the reference period is the whole lockdown period ending on the day of responding, (e.g. for the student who filled up the Google form on 20th May, the reference period was 22nd March to 19th May). Nevertheless, with 96% of the responses received within the first six days of the 16 days survey period: 15th to 31st May, the survey data, in effect, are taken to represent the state of affairs prevailing during the third week of May.

b) The survey results presented here are summarised based on the information "as reported by the respondent".

c) The survey suffered from 10% non-response on the whole. Most probably, the non-responding students did not have proper access to the Internet during the data collection period, only those with fairly well-functioning internet connection could participate in the survey.

d) The sample consists of mostly the middle middle-class and lower middle-class households. The most vulnerable group of households in India is generally too constrained monetarily to send their children to college for higher education.

i) **Health Profile of the households:**

a) **General profile of the surveyed sample**:

(i) Households of all the religio-social groups were found in the sample. There were 6% OBC, 16% SC and 1% ST students; 11% were Muslim and rest 66% belonged to the general category.

(ii) The prime earners of the households in the sample are predominantly from two occupational groups, viz. regular salaried worker (38%) and self-employed in trade (23%). These are followed by non-agricultural wage labourer, self-employed in manufacturing and self-employed in services, each with a share of about 10%. Some of the prime earners in the 'regular salaried' group is engaged in 'formal' sector enterprises, while the prime earners of the group. The 'others' include rentiers, pensioners or remittance receivers. The prime earners of the rest of the groups represent the 'informal economy', i.e. employees and self-employed workers of the informal sector enterprises and informal employees in the formal sector enterprises.

Table 1: Distribution of students' households by normal monthly income category

Income category (Rs.)	Number of households
Less than 7500	779 (37.3%)
7500 – 15000	630 (30.2%)
15000-25000	301 (15.4%)
25000-50000	217 (10.4%)
More than 50000	161 (7.7%)
All	2088 (100%)

Note: Figures in parentheses represent the percentage share of the income categories in the sample.

b) **Morbidity Incidence:** Table 2, however, depicts the picture of the morbidity status among respondents' households as well as number of persons for whom the status is reported upon. It is evident as well as alarming that more than 30% of the households have some or the other sign of chronic morbidity. Among 9876 persons (in 2088 households) 1011 suffered from at least one chronic disease, which means, one out of ten individuals is suffering.

It is depicted that around 29% households there is occurrence of higher morbidity in terms of more than chronic disease. In 22% households there are incidence of two chronic diseases and in rest 7% households there are incidence of more than two. It is however, reported by 121 households (among 188 households) that there are more than one member with one or more than one disease.

Table 2 : District wise distribution of households by chronic morbidity status with number of chronic disease

district	No Chronic Disease (CD)	At least one CD	With chronic disease		all
			1 CD	>1 CD	
24 PGS(N)	284	150 (35%)	93 (62%)	57 (38%)	434
24 PGS(S)	69	43(38%)	30(70%)	13(30%)	112
Hooghly	156	74(32%)	52(70%)	22(30%)	230
Howrah	654	280(30%)	213(76%)	67(24%)	934
Kolkata	185	58 (24%)	37(64%)	21(36%)	243
Other Dist.	90	33(27%)	25(76%)	8(24%)	123
Other State	10	2(17%)	2(100%)	0(0%)	12
all	1448	640 (31%)	452(71%)	188(29%)	2088

Note: Figures in parentheses represent the percentage share of the income categories in the sample

Type of disease: As the record is based on self-reporting mode, it is possible only to count the reported disease.

Table 3: Status of Morbidity by type of Disease

Type of Disease	households (hhd) with member(s) suffering from	% WRT hhd with morbidity (N_{CD}= 640)
Diabetes	235 (11%)	37
Hypertension	130(6%)	20
Heart related	79(4%)	12
Pain or ache	70(3%)	11
Lungs related	53(3%)	8
Thyroid	44(2%)	7
Gastric trouble	25(1%)	4
Kidney related	14(1%)	2
Others[1]	235(11%)	37

1. Rest of the ailments are consolidated in "other".

Table 3 is prepared on the basis of different types of chronic ailment derived from the report. Apart from the diseases stated in this list rest are included in 'others'. As a single type of disease, diabetes is found to be the major (11%) contributor of sufferings to the total surveyed households, followed by Hypertension (6%). Heart disease, chronic pain, disease of lungs and thyroid are the other alarming factors in a declining order.

C. Hospitalisation/ Doctor Consultation:

Table 4 depicts the aforesaid characteristics of households (in percentage distribution) for all districts

Table 4: Percentage of households according to morbidity status, and hospitalisation in different districts

Districts	% of households with			
	ailing person	doctor being consulted if ailing	requiring hospitalisation	problem faced for hosp.
Kolkata	12	79	2	67
24 PGS(N)	9	80	3	27
24 PGS(S)	16	83	2	50
Howrah	7	86	2	44
Hooghly	7	82	1	0
Other Districts	12	60	2	50
Other states	21	100	7	0
all	9	81	19	40

It is also important to portray more about health scenario including hospitalisation (other than chronic disease), whether doctor was consulted and if not what are the reasons behind. Hospitalisation, if any and problems related with hospitalisation was also studied. Table 4 clearly indicates about 10% households had at least one ailing person during this lockdown period. In different districts, this percentage varies from 7% to 16%. For about 80% of them, doctors were consulted. At the same time, among the ailing, as small as 2% needed hospitalisation. Hospitalisation was not easy for about 40% of the cases. For Kolkata, it records highest cases of challenging issues for hospitalisation. Though there was less representation from other districts, the proportion ailing who did not or could not consult doctor, is lowest among them. Unfortunately, Kolkata is in the top as a separate district in this regard.

D. Requirement/ Purchase of Medicine:

As it is already stated that during lockdown there was substantial problem faced by the households on procurement of medicine. In this section we would try to analyse the data whether the respondent's households have experienced some problem or not.

Table 5 Requirement of Medicine by the households during lock down

Districts	Requiring medicines
24 PGS(N)	352 (81%)
24 PGS(S)	92(82%)
Hooghly	197(86%)
Howrah	772(83%)
Kolkata	208(86%)
Other Dist.	88(73%)
Other State	12(86%)
all	1721(82%)

Table 5 shows that irrespective of presence of chronic disease patients or not, around 82% house-holds needed medicine amid lockdown; in different districts this percentage is quite similar (81 to 86 per cent). Medicine shops were mostly open as provider of emergency good, and scene of people queuing for maintaining socialdistancing to procure those was a common feature in front of every medicine shop. This was based on two questions, whether they need medicine in the reference period and status of availability, if required. Table 5 shows the number and percentages of households requiring medicines during lock down.

Here we have collected some information whether the households who are in need of medicine could procure it without much hassle or not. Table 6 shows the status of obtaining medicines.

Table 6: Status of obtaining medicines by households with or without chronic diseases (CD)

Status of household on obtaining medicines	Number and % of households	
	all HHDs	HHD with CD
available at home (previously stocked)	212 (12%)	62(10%)
could be purchased from medicine shop as and when required	1255(73%)	439(69%)
required ordering and made available within a week	138(8%)	74(12%)
ordered through online	43(3%)	13(2%)
faced tremendous problem	68(4%)	47(7%)
other	5(0%)	5(1%)
all	1721	640

While presenting, we have separated out the households with chronic diseases. In 10% (HHDs with CD) to 12% households intimated that they had some stock of medicines, which is quite usual for some HHDs with chronic diseases. Excluding those 10% households, around 70% could procure medicines from medicine shops, while rest confronted various types of problem, including deferred supply,

online ordering and even rushing to the vicinity of big hospitals to purchase required medicine. It is worth mentioning that the poorest group shows least percentage of procuring medicines online, whereas among the richest it is highest

In the healthcare system, given its limited resources, prioritises are given to COVID-19 cases. Living with a health condition that requires instant or regular medical care got neglected. It is reported that many have been struggling to get their schedule on the chemotherapy sessions, or dialysis, or even a diagnosis of a life-threatening ailment amid the nationwide lockdown. Many were not getting proper medical attention. Whether one is rich or poor seems to matter little in the face of the COVID-19 outbreak, as hospitals – both State-run and private – reel under staff crunch and lack capacity to tackle the contagion as well as other chronic and common ailments. Overall situation got worsen with the information of widespread infliction and sad demise of health workers in COVID-19. The patients, on the other hand, are grappling with an endless wait for medical intervention while living with the fear of contacting the virus during procedures at hospitals.

5. **Discussion**

(i) **Trade-off of Health care:**

It is thus can be derived that non-COVID-related care has been suspended to accommodate needs arising from the pandemic; initially for sound clinical reasons relating to do-no-harm. It could be argued that this has been one of the puzzling things of the coronavirus disease 2019 (COVID-19) pandemic, given that resource scarcity and trade-offs are the very lifeblood of economics. As Covid-19 gripped the nation with increasing number of patients amidst lockdown which was initiated on 25th March 2020 and then extended till 30th June has negatively impacted people's access to essential health care services, especially for the elderly and chronically ill populace. With chronic non-communicable diseases (NCDs) like cardiovascular ailments, cancer, diabetes, chronic respiratory ailments and other NCDs accounting for 63 per cent of the total deaths in India, the threat they pose to households and the healthcare system in non-pandemic times is outrageous. Our estimates from the most recent National Sample Survey (NSS) 75th round (2017-18) data show that around 8.6 per cent of the population are aged 60 years and above and approximately 3.7 per cent of the Indian population are chronically ill. With a scarcity of population-based data, one has to rely on sample surveys like NSS and National Family Health Survey (NFHS 4- 2015-16) to get estimated prevalence of chronic ailments in India. Our estimates on the incidence of selected chronic ailments from NFHS-4 data shows that 4 - 4.4 per cent of men and women aged below their mid-50s suffer from any three chronic diseases (viz. diabetes, heart disease, asthma). In a similar fashion, estimates from NSS 75th round data reveals that for people aged above 50, the rate is as high as 11.6 per cent for India with Kerala having the highest burden, followed by Andhra Pradesh, West Bengal, Punjab, Maharashtra, Gujarat and Tamil Nadu. Estimates from both the data sources further suggest that prevalence of cancer is not very low in India. States such as Tamil Nadu, Jharkhand and Madhya Pradesh dominates in prevalence rates of cancer for the men aged below mid-50s, while Bihar, Tamil Nadu and Karnataka have higher prevalence rates of cancer for women aged below 50s. For people aged 50 years and above, Kerala, West Bengal, Uttarakhand, Haryana, Punjab and Rajasthan exhibit cancer prevalence rate higher than the national average. These figures clearly portray the enormous section of Indian population in need of regular healthcare. Unprecedented lockdown and its eventual repetition to arrest the spread of Covid-19 have blatantly deprived this section from availing regular healthcare services such as chemotherapy, dialysis, blood transfusions or even life-saving drugs. The brunt is fuelled from multiple shortfalls in anticipation and planning.

In the present survey data on incidence of ailment and reason if untreated was collected. Table 7 below shows distribution with respect to different income category, with the following typical problem faced for consulting doctor, where a clear picture of trade-off can be observed for the incidence of ailment and their treatment.

Table 7: Percentage of households according to morbidity status, and doctor consultation with problems encountered for that among income categories

Income Categories	% of households having								
	no ailing person	ailing person	requiring hospitalisation	doctor consulted if ailing		if no doctor was not consulted, the reasons			
				yes	no	R1	R2	R3	R4
Less than 7500	92	8	2	80	20	39	38	15	8
7500-15000	90	10	2	76	24	51	25	13	13
15000-25000	92	8	2	88	12	67	33	0	0
25000-50000	91	9	2	85	15	33	67	0	0
More than 50000	91	9	1	93	7	0	100	0	0
all	91	9	2	81	19	44	36	11	8

R1- Ailment not considered serious; R2- Doctor Clinics were closed nearby, moreover no vehicles was available to go beyond; R3: Financial constraint; and R4- Others

The Table above clearly states the fact that percentage of household who have consulted doctors (even telephonically), when someone is ailing, varies from 76% to 93%, the least belongs to lower economicechelon, whereas highest fits in to the richest among the respondent's households. Moreover, the reason R3 (Financial Constraint) is applicable to lower two economic groups only. Other than upper two eco-nomic categories, the most frequent reason for not consulting doctor was "not considering the ailment serious". However, the richer group was willing to consult a doctor but due to "Doctor Clinics were closed nearby, moreover no vehicles was available to go beyond", they could not get it done.

The secondary and tertiary hospitals primarily in charge of providing chronic healthcare services are now clogged with Covid-19 patients. Credible prints and online news portals reported night shelters near AIIMS swarmed with unattended cancer patients for days. The closure of all OPDs and speciality services in government hospitals from March 24 onwards has left them stranded without either treatment or food. According to a senior oncologist at Mumbai-based Tata Memorial Hospital, there has also been a sudden dip in inter-state inflow of patients. Although follow-ups are being done telephonically and via online, many people do not have the know-how or access to those means. The situation is equally grim for patients requiring dialysis as they are facing similar problems due to mobility restrictions and non-availability of public transport services. Missing regular doses would probably bring down their immunity and make them more susceptible to get co-morbidities like TB. Life-saving drugs and essential diagnostics are far-fetched as laboratories are also not operational in the lockdown. It is recognised that there is a level of pandemic where trade-offs do not matter, or, at least, are so obvious that little analysis is required. This is also because, beyond a particular level of R (the reproduction rate for the virus) and background prevalence and incidence, the economy and health considerations go hand-in-hand. It is understood, however, that this situation prevailed for all stratum of people-whether rich or poor.

4 | MARGINAL ANALYSIS

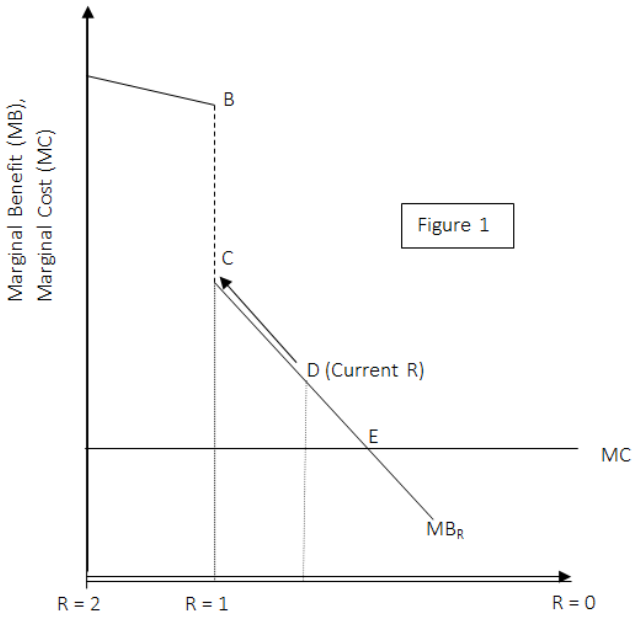
The thought process behind marginal analysis is better described via conceptual diagrams which we have drawn in the context of emerging from lockdown (see, Figure 1 and Figure 2). We know that R differs by time & place and also across subgroups, but obviously trade-offs with the economy can be still made. Moreover, this framework is proposed for use and adaption by government and other public agencies.

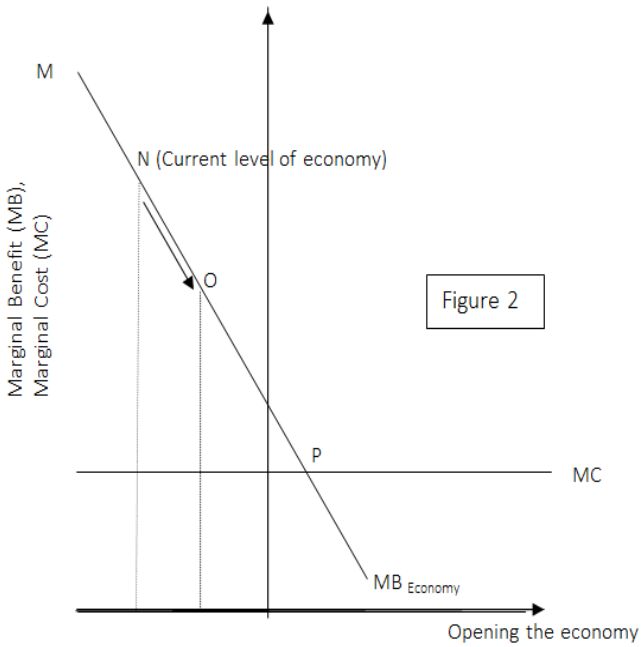
To illustrate, we assume that we are now in a zone where the background level of infection is still significant but in which R is less than 2. For the purposes of illustration, we further assume that community benefit can be monetised and so presented on the same scale (or axis) as costs (Figure 1 and Figure 2). Figure 1 illustrates Marginal Costs (MCs) and Marginal Benefits (MBs) of reducing R from 2 to 0, whilst Figure 2 illustrates the same for opening the economy. First, we invoke the above-mentioned notion of diminishing MB, whereby the MBs of reducing the R-value from 2 is positive but gradually reduces.

Let us say that in the range of R = 1.0 - 2.0, MB reduces only very gradually, after which, due to it being less critical, a sudden drop off in MB occurs before it continues on a more-regular downward slope. As we reduce R, the total benefits are greater and greater, but the increases, in terms of the marginal

social value of the corresponding health gains, are lesser and lesser.

Hence, the downward sloping MB line for R (Figure 1) and, correspondingly, for 'Opening the economy' (Figure 2). In the latter case, people may debate which sectors, or even which parts of sectors, are more or less valuable, even at the margin. However, even within sectors, we assume that the most-needed parts will be opened first, or, of course, never close. For the simplicity of our analysis, we assume that the MC of reducing R or economic expansions is constant and equal. Then, the question is where we go from here on any particular day, for a particular starting point for each of R and the economy. Two conflicting interests are active here. What should we do? It can be seen that the gap between MB and MC (or the MB/MC ratio) at our chosen starting point for the economy is greater than at the starting point for R. Opening of the economy can continue until the MB/MC ratios are equalised. For the range AB in figure 1, it can clearly be seen that additional benefits (MB) of reducing R, are high whilst R itself is high (say, 1.0 – 2.0). After threshold of R = 1.0, MBs of downward pressure on R persist but decline quite rapidly (CDE, in figure 1). Figure 2 shows that benefits of opening the economy also diminish, but at a different rate (MNOP, in figure 2).





Now, with equal MCs and with existing (current) levels of both R (Figure 1) and economy (Figure 2), it is found that when a consequence of any economic expansion is for R to fall back into 1.0 - 2.0 range, the marginal gains from any such expansion will be too small to justify going past a certain point, beyond which the gains from focussing on R far outweigh those of the economy.

5 | CONCLUSION

It is seen historically that any epidemic are experienced unequally with higher rates of infection and mortality among the most disadvantaged strata. India also is no exception. COVID-19 has worsen existing social inequalities in chronic disease and the social determinants of health. It is vital that this time, the right public policy responses are undertaken so that the COVID-19 pandemic does not increase health inequalities for future generations. We must continue to build upon the lessons learned so far from the management of COVID-19 and adjust our approaches to this pandemic, and to other future health and environmental crises, accordingly.

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