Poverty in India in the face of COVID-19: Diagnosis and prospects

Hai-Anh Dang

World Bank, Washington DC,

Peter Lanjouw

Corresponding author, Vrije Universiteit, Amsterdam

Elise Vrijburg

Vrije Universiteit, Amsterdam

About DEEP

Our mission is to build evidence, insights, and solutions that help end extreme poverty globally.

We aim to contribute to new global and national data and evidence that governments, decision makers, citizens and researchers can use to improve people's lives and support the world's poorest people in their efforts to escape extreme poverty.

We are a consortium of the Universities of Cornell, Copenhagen, and Southampton led by Oxford Policy Management, in partnership with the World Bank's Development Data Group and funded by the UK Foreign, Commonwealth & Development Office.

Corresponding author: Peter Lanjouw, Vrije Universiteit, Amsterdam. Email: p.f.lanjouw@vu.nl

Follow the programme here:

Preface

This paper is part of the Oxford Policy Management (OPM) Data and Evidence to End Extreme Poverty (DEEP) project, undertaken on behalf of the Foreign, Commonwealth and Development Office of the UK. We are grateful to Simon Hunt, Stevan Lee, Umar Salam and Lucy Scott of OPM for their guidance and advice. We are further grateful to Jehovannes Aikaeli, Ines Afonso Roque Ferreira, Gaurav Datt, Chris Elbers, David Garces-Urzainqui, Himanshu, John Hoddinott, Kenneth Mdadila, Tseday Mekasha, Gerton Rongen, Vincenzo Salvucci, and Finn Tarp for helpful discussions. All errors are our own.

Preface

Abstract

India has been hard-hit by the COVID-19 pandemic. The virus has exacted a heavy toll in terms of lives lost and deteriorating health outcomes. The economic consequences of the pandemic have been similarly grim. In this paper, we attempt an initial, interim assessment of the effect of the crisis on poverty in India. We review the growing literature that considers emerging poverty impacts, noting that there remain significant knowledge gaps due to limited evidence on current welfare outcomes. We analyse pre-COVID-19 survey data to examine the incidence of chronic poverty and downward mobility during a period of rapid economic growth and declining poverty. A profile of poverty during such a period offers a plausible, partial window on at-risk population groups. We suggest that notwithstanding the severe initial impacts of the COVID-19 crisis on poverty, there are grounds for expecting even more severe consequences going forward. As the virus spreads out of the relatively affluent cities, and as economic stagnation persists, rural areas, with historically higher rates of chronic poverty and vulnerability, may see particularly sharp increases in poverty. While recent vaccination developments offer some grounds for optimism, there remains an urgent need to identify, implement and amplify effective policy alleviation measures.

Keywords: Poverty; Vulnerability; Poverty Dynamics; Synthetic Panels; India; COVID-19.

JEL Classification Codes: I32, C53.

Table of contents

List of tables and figures

1 Introduction

The year 2020 marked a major break in the progress achieved throughout the world in reducing global poverty. Sustainable Development Goal (SDG) 1, announced by the international development community in 2015, had proclaimed the ambitious objective of ending extreme global poverty by 2030. Success in achieving the Millennium Development Goal of halving global poverty during the 1990−2015 period had undoubtedly emboldened the architects of the SDGs, who sought to pursue a poverty objective that, while clearly aspirational, did not appear to be entirely beyond reach. The onset of the COVID-19 pandemic in early 2020 has dampened these ambitions. Nowhere is this more evident than in India − a country where poverty reduction during the first decades of the 2000s had been remarkable, but where the impact of the COVID-19 pandemic has been staggering in terms of both public health and economic livelihoods.

Given that the COVID-19 pandemic remains in full swing it is impossible to arrive at a complete assessment of its full impact on poverty in India and how it may evolve going forward. The economic consequences of the crisis are still working their way through the Indian economy and policy measures aimed at addressing both the public health and economic fallout from the crisis continue to be formulated and rolled out. Empirical evidence on the actual impact of the crisis also remains highly fragmented and incomplete.

Yet, to preserve as much as possible of the progress that India has undeniably achieved in recent decades, policies must be introduced to mitigate the most severe consequences of the crisis. To this end, there is a need to anticipate the likely consequences of the crisis for poverty. Not only is it necessary to track how poverty is evolving in the face of the crisis, it is also important to identify and understand the circumstances of those who face a heightened risk of falling into poverty as the crisis continues to unfold.

In this study, we attempt to provide an assessment of how the fight to end extreme poverty in India has been disrupted by the arrival of the COVID-19 crisis. In particular, we aim to inform policymaking by providing insights into possible population groups that are likely to have been most seriously affected by the crisis, or that appear to be particularly exposed to its most pernicious consequences in the months and years to come.

We start in the next section with a brief review of progress in poverty reduction prior to the onset of the COVID-19 crisis. We are severely handicapped in this regard by the fact that nationally representative poverty data that underpin official estimates of poverty in India are not available beyond the year 2011/12, when the last publicly available National Sample Survey was published. Nonetheless, we document that, in the period between 2004/5 and 2011/2, poverty reduction in India had indeed been significant. It seems likely that a trajectory of declining poverty persisted until the COVID-19 crisis hit in 2020.

We then move to Section 3 to briefly describe the spread and dimensions of the COVID-19 crisis in India, and provide a timeline of the policy measures that were introduced in

response to the spread of the virus. Section 4 summarises findings from a desk review of reports on the poverty impacts of the crisis. Absent systematic and current statistical evidence, we rely on a variety of sources –and often anecdotal evidence – to arrive at an initial impression of the poverty consequences of the crisis and its economic manifestations.

We turn in Section 5 to a statistical analysis of household survey data from the first decade of the 2000s to investigate patterns of poverty dynamics that occurred during that time. We employ methods to construct synthetic panels from cross-sectional survey data to enquire into the characteristics of the chronically poor in India during this period of rapid economic growth and poverty reduction. It is likely that those who remained poor during that period are among those who are also at greatest risk of destitution during the sharp economic downturn ushered in by the COVID-19 crisis. We also scrutinise those who, during the period 2004/5–2011/12, faced a heightened risk of falling into poverty. It seems reasonable to suppose that those population groups that were most vulnerable during that period of rapid progress are again likely to count among the most vulnerable during the current period of tremendous economic stress. In Section 6 we offer some concluding remarks.

2   Pre-COVID-19 poverty trends

The evolution of poverty in India has long been the subject of close attention. In particular, with the introduction of economic reforms in the early 1990s there has been a strong interest to see how poverty outcomes have fared as economic growth accelerated (Datt and Ravallion, 2011; Ravallion, 2011). Figure 1 shows that poverty measured on the basis of India's national poverty line fell sharply during this period, falling from nearly 50% of the population in 1987/8 to just over 20% in 2011/12 (Dang and Lanjouw, 2019). Although growth started to pick up in the mid-1990s, the evidence suggests that poverty reduction only started to gather pace in the early 2000s, after the 2004/05 round of the National Sample Survey, and in particular between the 2009/10 and 2011/12 rounds.[1] Interestingly, the dramatic falls in poverty between 2009/10 and 2011/12 occurred when per capita growth rates were in fact lower than during the 2004/05−2009/10 interval (Figure 1).

Figure 1:   Trends in poverty and GDP per capita for India, 1987/88−2011/12
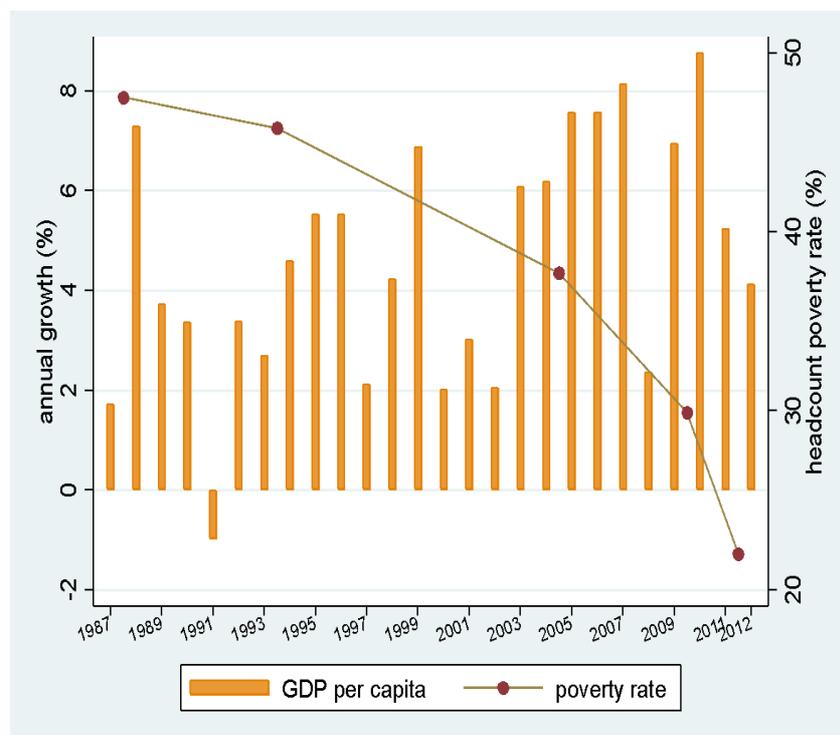
Source: Dang and Lanjouw (2018)

A question of considerable importance concerns how poverty evolved from 2011/12 up to the onset of the COVID-19 crisis. Unfortunately, the data needed to answer such questions are not available. The subsequent 'quinquennial' round of the National Sample Survey after 2011/12, fielded during the 2017/18 survey year, has not been released by the National

---

[1] Dang and Lanjouw (2018) explore the possibility that the marked acceleration in measured poverty decline between the last two survey years might have been driven by changes in survey methodology, but conclude that this is unlikely to have been the case.

Sample Survey Office (NSSO). There is considerable debate as to the likely evolution of poverty, with many commentators suggesting that the pace of poverty reduction slowed post-2011/12, alongside the lower per capita income growth rates for India as a whole. What seems unambiguous is that, with the onset of the COVID-19 crisis, poverty decline is likely to have halted altogether.

3   The COVID-19 pandemic

The COVID-19 pandemic, to which India became exposed at the beginning of 2020, has not left the country unaffected. In absolute terms, the spread of the virus has been striking. With over 27.1 million reported cases (as at 26 May 2021), India lags behind only the United States in terms of the absolute number of COVID-19-infected persons (Johns Hopkins University Center for Systems Science and Engineering, 2021). Compared to its vast population, however, India's COVID-19 outbreak seems less catastrophic.[2] The country ranks 94th out of all 199 investigated countries on the number of cumulative confirmed COVID-19 cases per million people, thereby lagging three places behind the world average as at 25 May 2021 (Our World in Data, 2021a). However, the fast spread of COVID-19 in the past two months gives cause for serious concern (Figure 2). As at 24 May, India ranked first on the World Health Organization's (WHO's) worldwide list of newly reported COVID-19 cases in the last 24 hours, with an astounding 222,315 cases (WHO, 2021). Moreover, the chances are that these data are underestimated, as the most recent data from 25 May 2021 suggest that India performs 58th lowest in the world of all 127 investigated countries on the number of daily tests performed per 1,000 people (Our World in Data, 2021c).[3]

---

[2] We note, however, that official figures pertaining to the spread and severity of the COVID-19 outbreak are widely questioned in the popular press and are thought to be severely understated.

[3] It should be noted that, in contrast with other countries, the number of PCR tests in India could not be isolated from the total number of tests performed, indicating that the test rate could also be based on other, less reliable tests (Our World in Data, 2021c). According to the *Hindustan Times*, the more unreliable Rapid Antigen Tests (RAT) made up about 49% of the tests in November 2020 (Hindustan Times, 2020). Other news reports indicate that massive testing seems to be largely done in low-profile areas just to meet the high testing target (Menon, 2020; Express Web Desk, 2020).

Figure 2:   Time-map of daily confirmed COVID-19 cases in India as at 25 May 2021

Source: Our World in Data (2021b)

Beyond the health crisis, India has also faced severe socioeconomic challenges. As noted earlier, the Indian economy was already slowing down before the recent pandemic. The two nationwide lockdowns introduced shortly after the onset of the pandemic, and which have been rated as among the most stringent in the world,[4] dealt the Indian economy an additional blow. The first lockdown, which started on 25 March and lasted for 21 days, involved a total closure of almost any type of commercial entity (except for grocery outlets) (Ministry of Home Affairs, 2020a; Singh *et al*., 2020). The second one comprised an extension of the first lockdown – initially for two weeks until 3 May, followed by another two weeks, and finally extending until 31 May (Ministry of Home Affairs, 2020b; Ministry of Home Affairs, 2020c; Ministry of Home Affairs, 2020d). During the second lockdown, districts were divided into three possible zones – red, yellow and green – depending on the spread of COVID-19 in that area, which determined the severity of measures in those places (Ray and Subramanian, 2020, p. 3). Within the red zones, the most high-risk areas were furthermore classified as containment zones (Express News Service, 2020). Although states and union territories were responsible for demarcating containment zones, and for declaring appropriate measures, the measures were expected to involve at least a night curfew from 7 AM to 7 PM imposed by the national government (Home Secretary, 2020). Within the

---

[4] See also the Oxford COVID-19 Government Response Tracker (OxCGRT, n.d.), which includes an index for the stringency of the government response to COVID-19. India's government response received a score of 86.57 out of 100 'stringency points' the day the first lockdown was announced. In the following days this score rose quickly to 100 out of 100.

containment zones, the lockdown was further extended to 30 June, and finally to 31 July (Ministry of Home Affairs, 2020e).

While the lockdown was extended in the containment zones, the remainder of India re-opened slowly in different unlock phases (Gangwar and Ray, 2021, p. 435). More recently, many states reverted to lockdowns on their own as a response to the new COVID-19 surge in early 2021. A media report by the India.com News Desk shows that, as at 24 May 2021, 32 out of 36 states and union territories were in complete lockdown (India.com News Desk, 2021).

The disruption to economic activity in India throughout the lockdown period has been investigated by Beyer *et al*. (2021), who scrutinise daily electricity consumption and night-time light intensity for evidence of economic turmoil. These two indicators yield important insights into a wide range of economic activities, and data are available on short notice and in high resolution (Beyer *et al*., 2021, p. 4-5). Their model, which can explain 90% of the variance in electricity consumption and light intensity in normal times, reveals that on the day the first lockdown was imposed (23 March 2020), electricity levels were 21% lower than their predicted normal value. This deviation declined further to -30% up until the end of March. It was not until the end of June, after the lockdown measures had been lifted, that deviations from the predicted normal electricity levels were no longer statistically significant (Beyer *et al*., 2021, pp. 5–7). However, in an extended analysis for the *Economist*, Beyer and colleagues show that India's rapidly rising infections have reversed the economic recovery from June 2020 (Figure 3). Clearly, this second wave has placed the Indian economy under further strain.

Figure 3:   Deviations from predicted daily normal electricity consumption in India (%)

Source: *The Economist* (2021)

4 Poverty impacts: A desk review

The socioeconomic consequences of the COVID-19 crisis, and the measures taken to tackle it , are unlikely to be distributed uniformly among Indian citizens. It is thus useful to identify those population groups that are most exposed to the economic burden of the current crisis in India, and to elaborate on the specific vulnerabilities they face. We begin by assembling insights gleaned from a review of research and media reports that have emerged since the onset of the pandemic.

One of the most widely observed vulnerable groups in India is informal workers. According to India's National Commission for Enterprises in the Unorganised Sector (NCEUS) (NCEUS, 2009, p. 12), informal employment entails 'those working in the unorganised enterprises or households [referring to private enterprises owned by individuals or households with less than 10 total workers, operating on a proprietary or partnership basis] excluding regular workers with social security benefits, and the workers in the formal sector without any employment/social security benefits provided by the employers.' This segment of the labour force is vast. A report by NCEUS shows that, based on sectoral statistics from 2004 to 2005, the informal sector contributed up to 50% to India's national GDP (NCEUS, 2009, p. 23). Moreover, based on these data and different GDP growth scenarios, it is projected that the informal sector comprised at least 93% of the working population in 2016−2017 (NCEUS, 2009, p. 139).

What makes informal workers economically vulnerable is that they are excluded from social security benefits, thereby being left unprotected against sudden shocks like illness or death (Unni and Rani, 2003, p. 130). Moreover, informal employment often generates lower incomes than similar formal employment does (Al Dahdah *et al*., 2020). Based on data from India's national 2011−2012 Employment and Unemployment Survey studying over 450,000 individuals across India, Narayanan (2015) estimates the formal−informal wage gap at different quantiles of the wage distribution and finds that this gap is significant for both Indian males and females across each quantile. He furthermore finds that the contribution of human capital to this wage gap is significant for both sexes and all wage contributions. This suggests that informal workers are consistently punished for being informal workers, despite having similar characteristics and skills compared to their formal worker counterparts. Lastly, informal workers often possess individual characteristics that draw them to this type of work and that create other vulnerabilities simultaneously − such as being female or belonging to a lower caste (Unni and Rani, 2003). We touch further upon these cross-dimensional characteristics below.

The COVID-19 crisis has accentuated the vulnerability of informal workers in several ways. First and foremost, informal workers saw an immediate decline in their earnings as soon as the lockdown put their jobs on hold (Al Dahdah *et al*., 2020). Because of a lack of social security, they had no protection against such losses. Based on data from the 2017−2018

Periodic Labour Force Survey, Estupinan and Sharma (2020, pp. 14–17) estimate that 89.5% of those at risk of losing their job during the first national lockdown and 68% of those at risk during the second national lockdown were informally employed. Moreover, they estimate that the average wage loss for informal employees throughout the entire lockdown period in 2020 was 22.62%, compared to the relatively low number of 3.83% for formal employees.

Although informal employment could technically be more easily restored after a lockdown than formal employment, the actual numbers are disappointing in this regard. Using a combination of personal surveys, secondary reports from organisations engaged with informal employees and comprehensive on-the-ground work, a case study by Azim Premji University (2021a) conducted in Bangalore showed that only 6% of the interviewed informal employees had returned to their previous job with similar or higher wages, and 15% had not returned to any sort of work by December 2020. Finally, one could expect a sudden loss of income to have a bigger impact on informal than on formal employees, given their generally lower-income status (Centre for Monitoring Indian Economy, 2020). It is feared that the now rapidly rising infections and subsequent economic effects will, yet again, take their toll on this vulnerable group (Al Jazeera, 2021).

Beyond the loss of income, informal employees are vulnerable due to a lack of access to healthcare. With one of the largest private and unregulated healthcare insurance markets, only 37% of the Indian population had any form of health insurance in fiscal year 2017/18 (Chatterjee, 2016; Tikkanen *et al*., 2020). Although two-thirds of the insured rely on public health insurance, informal employees might be particularly likely to miss out on such schemes (Tikkanen *et al*., 2020). The largest existing health insurance schemes in place – the Employees' State Insurance Scheme (ESIS) and Central Government Health Scheme (CGHS) – rely on employment in the formal sector, and smaller initiatives meant to target informal employees have not yet taken off, due to their limited focus, which is restricted to surgical procedures and families that are below the poverty line (La Forgia and Nagpal, 2012). Informal employees thus risk facing high out-of-pocket payments when they fall ill with the coronavirus. Herein lies a serious threat: a study by Selvaraj *et al*. (2018, pp. 2–7) using nationally representative Consumer Expenditure Surveys from the NSSO shows that, in fiscal year 2011/12, out-of-pocket healthcare payments drove 4.48% of Indian households below the nationally defined poverty line.

Considering these economic vulnerabilities, one cannot discount the risk of hunger among households relying on informal employment. The current crisis has resulted in the disruption of food supplies and has led to price hikes. Such developments are particularly difficult to deal with for informal workers who are confronted with the loss of jobs and declining incomes (Al Dahdah *et al*., 2020). Drawing on high-frequency time series data on modal prices and consumer price indices spanning the 284 days from 1 November 2019 to 10 August, 2020, a study by Cariappa *et al*. (2020, p. 16) revealed that, after the introduction of the first lockdown, retail prices of essential goods, such as chickpeas, mung beans and

tomatoes, increased significantly, by 3.03%, 6.06% and 10.32%, respectively. An analysis by the Centre for Equity Studies (2020, p. 16), based on randomly selected responses drawn from 1,450 purposive telephone interviews with persons reaching out for food relief in eight different states from May to June 2020, reveals that casual labourers went hungry more often than the self-employed or those earning a monthly wage. Casual labourers also disproportionately comprised those who reported suffering from extreme hunger, defined as not having had a full meal for more than seven days (Centre for Equity Studies, 2020, pp. 32–35). With the new second wave of infections, media reports warn that vulnerable informal workers will be pushed further into poverty, and potentially hunger (Biswas, 2021; Wallen, 2021).

One particularly vulnerable subgroup of informal workers comprises migrant workers, who often reside in rural areas but travel intra- or inter-state to urban areas for work (Rawal *et al*., 2020). In a paper by Srivastava (2020, p. 29-30), the total number of vulnerable migrant workers is estimated using data from the National Sample Survey, the National Statistical Office and the Census of India. Defining vulnerable migrant workers as those workers who either migrate for a short duration (i.e. seasonal migrants) or longer-term migrants from the bottom four lowest consumption quantiles and fifth lowest occupational categories,[5] the paper estimates that there are about 128 million such migrant workers in India (Srivastava, 2020, pp. 8–13).

It should be noted first that, even compared to other informal workers, migrant workers face a particularly high chance of losing employment. In the four-hours following the announcement of the first lockdown in March 2020, most of these migrant workers were suddenly left without a job (Sengupta and Jha, 2020, pp. 158–162). Systematic data on the effects of the two nationwide lockdowns on migrants and other vulnerable communities are scarce, but a purposive-sampling study from 5,000 telephone interviews conducted in 12 Indian states by Kesar *et al*. (2020) reveals that 86.6% of inter-state migrant workers lost employment due to these lockdowns in 2020. Regression analysis further shows that migrant workers were significantly more likely to be laid off than similar non-migrant workers – rural migrant workers were 73.9% more likely, and urban workers 50.7% more likely, to lose their job than their non-migrant counterparts (Kesar *et al*., 2020, pp. 19–22).[6]

---

[5] Srivastava employs the 2004 National Classification of Occupational categories, as defined by the National Career Service project, which is based on the level of skill and education necessary to perform the occupation. The lowest five out of nine categories are: 5. Service workers and shop and market sales workers; 6. Skilled agricultural and fishery workers; 7. Craft and related trades workers; 8. Plant and machinery operators and assemblers; and 9. Elementary occupations (Srivastava, 2020, p. 10; Ministry of Labour and Employment, pp. 4–14).

[6] While caution is required in inferring regarding the population as a whole, the sample is occupationally and geographically diverse and therefore likely to yield suggestive insights into the circumstances of vulnerable communities (Kesar *et al*., 2020, pp. 8–11).

It can be presumed that these job losses were only partially recovered during the unlock phase. A survey of 372 migrant workers in the auto, construction and garment sectors revealed that, in October 2020, 60% of the migrant workers were still fully out of work (Seth, 2020, p. 1). A survey conducted by Azim Premji University among 2,778 individuals across 13 states revealed that around 20% of the interviewed informal workers who lost their job during the first two nationwide lockdowns were still out of work in October and November (Azim Premji University, 2021b, p. 17; Azim Premji University, n.d.). It seems likely that the present second wave will cause further job losses among migrant workers.

Alongside a heightened risk of losing their job, migrant workers are especially vulnerable to getting infected with COVID-19. It is generally known that migrant workers' housing conditions in their area of employment are often rudimentary and cramped, making it difficult for them to self-isolate (Sengupta and Jha, 2020, pp. 158–62). A cross-sectional study by Babu et al. (2017, p. 336–38), using a sample of almost 50,000 internal migrant households from 13 different Indian cities, revealed that the majority of those (43.4%) lived in non-registered slums, followed by registered slums (32.7%) and dwellings at the work or construction site (11.7%). Furthermore, the majority of these workers (70.6%) resided in single-room shelters, and had no access to a private water tap (44.6%) or a private toilet (63.8%). Under such conditions, the chances of getting infected with COVID-19, paired with facing high out-of-pocket payments, are substantial.

Moreover, it might be more difficult for migrant workers to guard against hunger than for other informal employees. The Centre for Equity Studies report (2020, p. 34) shows that both inter-state and intra-state migrants were more often hungry during May and June 2020 than non-migrants, with the intra-state migrants being especially vulnerable to hunger (see Figure 4). This inequality could be explained by the fact that officials often fear migrant workers are illegal, and therefore deny them ration cards (Abbas, 2016, p. 159). The study by Babu et al. (2017, p. 345) revealed that, between 2011 and 2012, 76.8% of all migrant workers did not possess a ration card. Their consistent lack of access to food protection has been accentuated by the current crisis.

Figure 4: Hunger incidence across migration status (% as part of subsample)

Hunger and migrant status
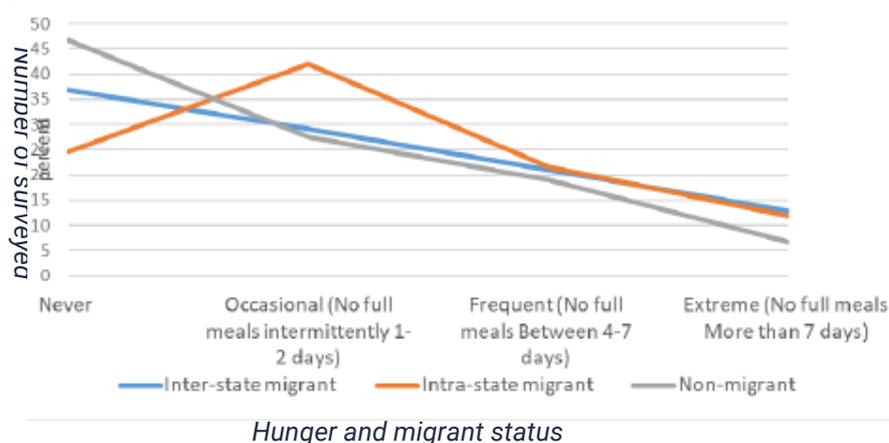
Source: Centre for Equity Studies (2021, p. 34)

Confronted with income shortfalls, the possibility of hunger and the risk of getting infected with the coronavirus, national and local lockdowns compel migrant workers to go back to their rural homes, sometimes under hazardous conditions (Sengupta and Jha, 2020, pp. 158–62). The first nationwide lockdowns (from 25 March to 31 May 2000) caused a flood of migrants who were attempting to return home. Estimates by the economist and demographer Amitabh Kundu and his colleagues put the number of internal migrants who returned home at around 12 million (Chishti, 2020). The issue was prominent enough for the national government to help individual states transport about 9.9 million migrants via designated buses and trains between May and June 2000 (Iyer, 2020). Unfortunately, the most vulnerable immigrant workers were, in particular, unable to access these transportation opportunities as they were stranded in peripheral locations and on worksites, leaving them no alternative but to walk home on foot (Srivastava, 2020, p. 18). A database of media-reported deaths in India until 3 July shows that, out of the 961 deaths that resulted from the lockdowns (deaths resulting from COVID-19 infection not included), 209 were caused by people walking long distances or during migration (Thejesh, 2020). Despite a large number of these migrants returning to their worksites in the unlock phase, news reports indicate a fear that the new wave of COVID-19, and subsequent local lockdowns, will cause another migrant push to rural India (Gulati *et al*., 2021, p. 24; Agarwal and Bellman, 2021; The Indian Express, 2021; Naik, 2021).

When they return home, migrants may find themselves in an even more vulnerable position, due to the absence of social protection measures and health facilities in rural areas. First of all, as media reports show, in rural areas there is often a lack of awareness of appropriate measures against COVID-19, or of what it means to quarantine. Furthermore, local efforts to inform rural residents about these matters are inadequate (Agrawal, 2020). Even when returning migrants and villagers are well-informed, the quarantine arrangements in rural areas frequently fall short – they either involve being placed in poorly equipped quarantine centres or going into self-quarantine, which many migrants lack the means to do (Sengputa and Jha, 2020).

Second, numbers show that rural areas suffer a severe lack of healthcare facilities compared to urban areas. Based on a nationwide survey conducted with 14,746 households from 12 different states, a report by the IMS Institute for Healthcare Informatics from 2013 revealed that inhabitants in rural areas all across India have to travel disproportionately longer to access a healthcare facility: 63% of the rural population has to travel over five kilometres to access a hospitalisation unit, compared to 26% of the urban population (IMS Institute for Healthcare Informatics, 2013, p. 17). Moreover, the number of hospital beds in rural areas is sometimes critically low. Using data from the Directorate General of State Health Services, a study by Ghosh and Dinda (2017, p. 110) reveals that the states whose rural areas have the lowest number of hospital beds per 100,000 inhabitants are Bihar, with 5.685 beds per 100,000 patients, followed by Chhattisgarh (7.762), Uttar Pradesh (9.947),

Haryana, (14.864), Madhya Pradesh (19.065) and Maharashtra (18.360).[7] Three out of these six states are among the top states in terms of being home to inter-state migrants – Professor Kundu from the Research and Information System has estimated that, based on the 2011 Census of India, Uttar Pradesh would rank first (accounting for 25% of inter-state migrants), Bihar second (accounting for 14%) and Madhya Pradesh fourth (accounting for 5%) in this regard (Singh and Magazine, 2020).

For rural areas, the threat from bad containment measures and inadequate healthcare provisions is severe. Data from the Backward Regions Grant Fund, dedicated to the development of backward (rural) districts, shows that of the 243 backward regions for which data were available,[8] their contribution to the number of infections has risen from 11.2% during the first COVID-19 wave to 16% during the new, second wave. Moreover, in absolute terms, the death toll in these regions has quadrupled compared to that of the first wave (Sinha, 2021; Ministry of Panchayati Raj, n.d.). Though the new wave has initially spread most rapidly in urban areas, the consequences of the second wave may be hardest felt in the less-equipped and more impoverished rural regions (Mehta and Jamkhandikar, 2021; Mitra, Talreja and Yeung, 2021).

Aside from serious health risks, another issue that awaits migrants when returning home is further income losses. In rural areas, poor households are typically unable to generate sufficient income from farming. Drawing on household-level data from a nationally representative NSSO survey among 51,770 farm households spread over 6,638 villages throughout the country, Birthal *et al*. (2014, pp. 38−41) find that especially poor households depend on a mixture of wage labour and agricultural income – for the households with the bottom 20% income, agriculture accounts for nearly 50% of their total income and wages and salaries account for 28.4%. With the nationwide lockdown falling exactly within the winter harvest season in 2020, rural families faced a shortage of labour and equipment, and saw their crops being left unsold (Maggo, 2020). Based on key informant interviews among 1,515 farmers in two contrasting Indian states (Haryana and Odisha), Ceballos *et al*. (2020, pp. 1−3) found that, in both states, the vast share (61% and 74%, respectively) could not sell their harvest immediately upon harvest. Thus, migrant workers and their rural-based families have experienced a double-dip in income, from both a lack of wages and salaries and a lack of produce sales.

Such a double dip in income might lead to concerning levels of indebtedness. In a mixed-methods-based study, including both data from the Networks, Employment, Debt, Mobility and Skills in India Survey and individual in-depth surveys from 2016 to 2017 distributed

---

[7] Compare this to the numbers for these states' urban areas: Bihar with 53.597 beds, Chhattisgarh with 176.833 beds, Uttar Pradesh with 91.997 beds, Haryana with 58.923 beds, Madhya Pradesh with 81.163 beds and Maharashtra with 82.384 beds (Ghosh and Dinda, 2017, p. 110).

[8] A total of 272 backward districts are included in the Fund (Sinha, 2021).

among 2,692 individuals across 15 rural villages in Tamil Nadu, Guérin *et al.* (2020, p. 11) show that 99% of the households were indebted, with a median of four outstanding loans per family and an average value of Indian rupees (INR) 58,000 (almost US$ 800) per loan. Informal interviews from the same study revealed that, following the first-wave lockdown, families were pressured by lenders to pay back their outstanding debts and faced difficulties finding new sources of credit (Guérin *et al.*, 2020, pp. 17−20).

To summarise, vulnerability of Indian households during the COVID-19 crisis is rooted in the informality of the Indian labour market. Informal employees' exclusion from social security benefits causes an unstable income, which is not as easily restored to them during unlock phases as it is taken away from them during lockdown phases. Of these employees, migrant workers constitute a particularly vulnerable subgroup. Their lack of adequate self-quarantine capabilities, combined with a lack of access to food, exposes them to a higher incidence of illness and hunger. Often coming from poorer, rural districts with few healthcare facilities, they find themselves conflicted, between staying at their worksite or going back home. Special attention should be paid to those families that survive on a mixture of agricultural income and income from informal employment, as they are likely to see a double dip in their income and looming indebtedness.

4.1   Cross-cutting dimensions

Certain dimensions, such as gender, religious status and caste, disproportionately affect individuals' vulnerability in the current crisis. These cross-cutting dimensions often coexist with individuals' (informal) employment situation to create an even more vulnerable profile (Ray and Subramanian, 2020, pp. 46−47). In the paragraphs below, we will touch upon three of these dimensions: gender, religion and caste.

First, women are likely to carry a higher burden during the current crisis than men. Despite only 20% of all Indian women being employed, among those women that are employed, 90% are involved in informal employment − and thus face the associated vulnerabilities (World Economic Forum, 2020, p. 28; ILO, 2018, p. 88). The current crisis is likely to disproportionately affect women's employment status. Based on the Centre for Monitoring Indian Economy's Consumer Pyramids Household Survey, drawing on data from 174,405 households nationwide, Ashwini (2020, pp. 3−4) finds that pre-lockdown-employed women were approximately 20% less likely to be employed post-lockdown than pre-lockdown-employed men. Estimating the effect of being female in rural areas on the risk of employment loss, another study finds that being a rural-based female increases one's chance of losing employment during the lockdown period by 75.7% compared to being a rural-based male (Kesar *et al.*, 2020, p. 22).

Women's vulnerability extends beyond a disproportionate loss of income. The literature suggests that, due to their lower social status, women in India are likely to suffer disproportionately from food shortages and price hikes, thus having a higher chance than

men of going hungry (Asadullah and Raghunathan, 2020; Global Hunger Index, 2010, p. 14). Moreover, women often suffer from additional health risks (and accompanying high out-of-pocket payments). Research suggests that Indian households are more likely to prioritise, and devote more resources to, the healthcare needs of males compared to females (Oster, 2006; Barcellos *et al*., 2014). Female-headed households are also more likely to suffer economically from a health shock. A study by Dhanaraj (2014, p. 15), which employs a logit model on a panel dataset covering more than 3,000 households in the Indian state of Andhra Pradesh over 15 years, estimates that female-headed households faced an 80% higher risk of experiencing such a welfare loss relative to male-headed households.

Muslims form another vulnerable group. First, they are more likely to be employed in vulnerable segments of the informal sector than other religious groups. According to the 2014 Post Sachar Evaluation Committee (PSEC)[9] report, merely 23% of Muslim urban households earn their livelihoods through regular wage employment, compared to 42% of all urban households. Furthermore, their incidence of relying on non-agricultural self-employment is 25%, compared to 14% for Hindu households[10] (PSEC, 2014, p. 14). Moreover, Muslims often lack access to social resources that are available to other vulnerable communities, and suffer from a lower distribution of public welfare services and benefits, making it more difficult to cope with a loss of earnings (Pandya, 2010, p. 16; Pandya, 2010, p. 29).[11] This could explain why, according to the Dhanaraj study (2014, p. 15), Muslim households have an estimated 26.5% higher chance of welfare loss due to serious illness or death than other religious groups. They are also more likely to sell assets or lend money to cope with such a loss, which in the long run is believed to increase their economic vulnerability even further (Dhanaraj, 2014, p. 6; Dhanaraj, 2014, p. 17). Thus, the current COVID-19 crisis might deteriorate their already low economic status.

Third, scheduled castes (more commonly known as Dalits) comprise a particularly vulnerable constituency. Households belonging to this group are often reliant on low-paid informal jobs that require migrating or commuting to urban areas, thus exposing them to the vulnerabilities of informal employment (Ganguly, 2020). Estimates provided by the NSSO, based on surveys covering more than 2.5 million households in 2011/12, indicate that scheduled castes account for the bulk of households that are dependent on income from casual labour (Ministry of Statistics and Programme Implementation, 2015, pp. 21–25). In addition, scheduled caste members had limited access to public benefits even before the

---

[9] The PSEC is a committee set up by the Prime Minister's Office on Socioeconomic and Educational Status of the Muslim Community in India to evaluate the socioeconomic conditions of Muslim Indians (PSEC, 2014). The PSEC uses national datasets (such as from the NSSO) to infer their results.

[10] It is important to note that Hinduism is the dominant religion in India – according to 2011 Census Data, 79.80% of the total Indian population identifies themselves as a Hindu, compared to 14.23% identifying themselves as Muslim (Office of the Registrar General and Census Commissioner, India, n.d.).

[11] Data on such issues are unfortunately often incomplete or lacking – something which is also acknowledged by the PSEC (PSEC, 2014, p. 164).

crisis, and are likely to be in even more desperate need of them now (Ganguly, 2020). The study by Kesar *et al*. (2020, p. 34) revealed that 54% of all scheduled caste members in the sample did not receive any type of cash transfer during the first-wave nationwide lockdowns, which is considerably higher than the percentage for the other socially disadvantaged castes, namely scheduled tribes (46%) and other backward castes (44%). Unsurprisingly, then, scheduled caste members were more susceptible to going hungry than other groups. Using a telephone survey among 164 rural households across 13 states, Niyati and Vijayamba (2020) reveal that the proportion of households with less-than-usual food consumption in September 2020 was higher among scheduled caste members (56%) than among households belonging to other castes (42%).

5   Poverty impacts: insights from historical analysis of poverty dynamics

Documenting the poverty consequences of the COVID-19 crisis with formal statistical analysis is difficult due to the non-availability of the necessary household survey data. As noted above, some efforts have been made to produce interim results based on phone interviews, data on electricity consumption and via the recording of economic activity through night-lights data (Beyer *et al*., 2020, Kesar *et al*., 2020). However, insights are still very limited and piecemeal.

One additional potential direction is to analyse pre-COVID-19 data to identify population groups in India that face a heightened likelihood of being chronically poor (i.e. long-term poor) or that face a heightened risk of falling into poverty even if they are currently non-poor. The working hypothesis here is that vulnerability and chronic poverty observed during a period of rapidly rising living standards can possibly point to population groups that are deprived in a fundamental sense, and that are thus particularly likely to be hard-hit when general economic conditions deteriorate. Studying such poverty dynamics at the all-India level is difficult, however, as the data underpinning official poverty estimates in India come from cross-section rather than panel surveys. Dang and Lanjouw (2018) attempt to overcome this constraint by applying a 'synthetic panel' method to India's NSSO data, and study welfare dynamics based on estimates derived from this approach. We build on their analysis to assemble potential insights into the population groups that are particularly exposed to the impacts of the COVID-19 crisis.

5.1   Chronic poverty and vulnerability from pre-crisis data: methodology

As described in greater detail in the companion paper to this paper (Garcés-Urzainqui *et al*., 2021) a synthetic panel methodology was recently introduced in Dang *et al.* (2014) and Dang and Lanjouw (2013, 2021). This approach was also adopted for the study of poverty dynamics in India by Dang and Lanjouw (2018).

We outline the main idea of the synthetic panel method below, referring the reader to Garcés-Urzainqui *et al.*, 2021, for further discussion. Let x_{ij} be a vector of household characteristics observed in survey round *j* (j= 1 or 2) that are also observed in the other survey round for household i, i= 1,…, N. These household characteristics include variables that may be collected in only one survey round, but whose values can be inferred for the other round.

Let y_{ij} then represent household consumption or income in survey round j, j= 1 or 2. The linear projection of household consumption (or income) on household characteristics for each survey round is given by

$$y_{ij} = \beta_j' x_{ij} + \varepsilon_{ij} \qquad\qquad (1)$$

Let z_j be the poverty line in period j, j= 1 or 2. When analysing poverty dynamics the interest is in knowing such quantities as

$$P(y_{i1} < z_1 \ and \ y_{i2} > z_2) \qquad (2)$$

which represents the percentage of households that are poor in the first period but non-poor in the second period (considered together for two periods), or

$$P(y_{i2} > z_2 | y_{i1} < z_1) \qquad (3)$$

which represents the percentage of poor households in the first period that escape poverty in the second period. In other words, for the average household, quantity (2) provides the joint probabilities of household poverty status in both periods, and quantity (3) the conditional probabilities of household poverty status in the second period given their poverty status in the first period.

If true panel data are available, one can straightforwardly estimate the quantities in (2) and (3); but in the absence of such data, synthetic panels can be used to study mobility. To operationalise the framework two assumptions are made. First, it is assumed that the underlying population being sampled in survey rounds 1 and 2 are identical such that their time-invariant characteristics remain the same over time. This implies that the conditional distribution of expenditure in a given period is identical regardless of whether it is conditional on the given household characteristics in period 1 or period 2 (i.e., $x_{i1} = x_{i2}$ implies $y_{i1}|x_{i1}$ and $y_{i1}|x_{i2}$ have identical distributions). Second, ε_{i1} and ε_{i2} are assumed to have a bivariate normal distribution with correlation coefficient ρ and standard deviations σ_{ϵ_1} and σ_{ϵ_2}, respectively. Quantity (2) can be estimated by

$$P(y_{i1} < z_1 \ and \ y_{i2} > z_2) = \Phi_2 \left(\frac{z_1 - \beta_1'x_{i2}}{\sigma_{\varepsilon_1}}, -\frac{z_2 - \beta_2'x_{i2}}{\sigma_{\varepsilon_2}}, -\rho \right) \qquad (4)$$

where $\Phi_2(.)$ represents the bivariate normal cumulative distribution function (cdf) and $\phi_2(.)$ stands for the bivariate normal probability density function (pdf). In equality (4), the parameters β_j and $\sigma_{\varepsilon j}$ are obtained from equation (1). It is possible to estimate ρ via the following formula

$$\rho = \frac{\rho_{y_1 y_2} \sqrt{(y_1)(y_2)} - \beta_1'(x)\beta_2}{\sigma_{\varepsilon_1} \sigma_{\varepsilon_2}} \qquad (5)$$

Dang and Lanjouw (2013, 2021) suggest that the simple correlation coefficient ρ_{y1y2} can be approximated from the birth cohort-aggregated household consumption between the two surveys. As noted in Garcés-Urzainqui *et al*. (2021) this procedure for estimating ρ_{y1y2} is not uncontroversial, with some observers casting doubt on the stability and reliability of the estimate that results from it (Elbers, 2021; Herault and Jenkins, 2020). Fortunately, Dang and Lanjouw (2018) were able to validate poverty dynamic estimates in the present case based

on this approach with the India Human Development Survey, a panel dataset also covering the 2004/5–2011/12 period.[12]

Using the given poverty lines z_j, quantities (2) and (3) classify the population into two groups: one poor and the other non-poor. But the analysis can be enriched by further disaggregating the non-poor group into two groups: the 'vulnerable' (those that are non-poor but still face a significant risk of falling into poverty) and the 'secure' (or 'middle class'). These two groups can be distinguished on the basis of a vulnerability line that lies above the poverty line and that separates the two groups from one another. A common, but rather *ad hoc*, approach is to arbitrarily scale up the poverty line by a certain factor to obtain such a vulnerability line. For example, in India, in the past vulnerability was proposed to occur within a fixed income range between 1.25 times and twice the national poverty line in India (NCEUS, 2007). This approach has the advantage of being simple and easily communicated, but it appears to be based on no underlying rationale. A recent approach proposed in Dang and Lanjouw (2017) instead derives the vulnerability line from a specified vulnerability index that reflects the likelihood of the non-poor falling back into poverty. This approach estimates a vulnerability line that lies above the poverty line and below which the non-poor population faces an average risk of falling back into poverty equal to the pre-specified vulnerability index. The vulnerability index itself has to be specified up front and can be based on various criteria, including budgetary planning, social welfare objectives, or relative concepts of well-being. In contrast to Pritchett *et al*. (2000) and Chaudhuri (2003), this approach to estimating vulnerability considers as 'vulnerable' a segment of the population that is currently non-poor, treating this population segment as distinct from the currently poor (even though the poor are certainly also likely to be vulnerable in a deeper sense).

Dang and Lanjouw (2018) analyse the dynamics of poverty and vulnerability in India based on the synthetic panels' procedure outlined above. Their analysis covers the period between 1987 and 2012. We report here their findings for the period 2004/5–2011/2 (Table 1). Dang and Lanjouw (2018) estimate a vulnerability line that is based on a vulnerability index of 20%. In other words, they derive a vulnerability line such that the risk, on average, of those who are located between the poverty and the vulnerability line is 20%. This analysis yields a vulnerability line based on the 2004/5–2011/12 synthetic panel interval equal to INR 770 in 2004/5 prices, which can be compared to the rural India poverty line in 2004/5 of INR 447 per person per month.

Table 1 points to a fair amount of consumption mobility between 2004/5 and 2011/12. However, transitioning out of poverty and directly into the 'secure' category is a very rare occurrence – most 'escapes' from poverty landed the poor in the category of vulnerable. Between 2004/5 and 2011/12, just under 18% of the population was estimated to be

---

[12] Garcés-Urzainqui *et al*. (2021) provide further details.

chronically poor (in the sense of being poor in both periods). Of the 37% of the population estimated to be poor in 2004/5, therefore, roughly half (48.8%) were unable to escape from poverty. At the same time, while just over 40% of the population could be considered vulnerable in 2004/5, an estimated 6.4% had dropped back into poverty by 2011/2 and another 19.4% continued to face a heightened risk of falling back into poverty. Given that the economy of India was growing particularly strongly during this period, and that overall poverty fell markedly (from an estimated 37% to 25% for this subset of the population – comprising households with household heads aged between 25 and 55), it seems reasonable to suppose that the chronically poor and vulnerable possess characteristics and attributes that would make them particularly likely to experience reversals during a period of generalised contraction. It is also plausible that many of these characteristics and attributes would persist over time. If so, acquiring a better sense of the characteristics of the chronically poor and the vulnerable between 2004/5 and 2011/2 might point to the population groups that are also most at risk during the current COVID-19-related economic downturn. Under that hypothesis we undertake such a profiling exercise below.

Table 1: **Welfare transition dynamics based on synthetic panel data, India 2004/05−2011/12 (percentages)**

Vulnerability line corresponding to V-index of 0.2		2011			
		Poor	Vulnerable	Secure	Total
2004	**Poor**	17.8	15.1	3.6	36.5
		(0.0)	(0.0)	(0.0)	(0.1)
	Vulnerable	6.4	19.4	14.6	40.4
		(0.0)	(0.0)	(0.0)	(0.0)
	Secure	0.6	5.6	17.0	23.1
		(0.0)	(0.0)	(0.1)	(0.1)
	Total	24.8	40.1	35.1	100
		(0.0)	(0.0)	(0.1)	

Note: The vulnerability line is that which corresponds to a vulnerability index of 0.2 in 2004/05− 2011/12 (i.e. INR 770). All numbers are in 2004 prices for all of rural India. The rural India poverty line for 2004/05 is INR 446.68. All numbers are estimated with synthetic panel data and weighted with population weights, where the first survey round in each period is used as the base year. Bootstrap standard errors in parentheses are estimated with 1,000 bootstraps adjusting for the complex survey design. Household head's age range is restricted to between 25 and 55 for the first survey and adjusted accordingly for the second survey in each period. Estimation sample sizes are 91,751 and 75,159 for the first and second periods, respectively.

Source: Dang and Lanjouw (2018)

5.2   Who are the chronically poor and the downwardly mobile?

Our interest here is in studying chronic poverty and vulnerability during a time of rapid economic growth and deriving from that exercise some insights into how the current COVID-19 pandemic might expose particular population groups to a heightened risk of poverty. In order to base our estimates on the actual experience of households during the 2004/5−

2011/12 period, we present our findings in terms of the odds of belonging to the chronically poor and the odds of actually being downwardly mobile between 2004/5 and 2011/12.[13] In doing the latter we depart slightly from our concept of vulnerability, in that we look at the characteristics of those households who actually dropped into the status of poor in 2011/12 from the status of vulnerable or secure in 2004/5, combined with those households who fell into the status of vulnerable in 2011/12 from the status of secure in 2004/5. From Table 1 we can see that the average odds of downward mobility were thus 19.8% (12.6/63.5 = 0.198), while the average odds of chronic poverty were 48.8% (17.8/36.5 = 0.488).

We consider first, in Table 2, the association between education and the odds of belonging to the category of either the chronically poor or the downwardly mobile. Table 2 indicates that the education level of the household head is closely associated with both chronic poverty and downward mobility. Households in which the household head is uneducated, or has less than primary school completion, are more likely than average to comprise the chronically poor or to be downwardly mobile. Chronic poverty becomes less likely once the household head has primary schooling or higher. And as education levels rise, the likelihood of chronic poverty diminishes further. The odds of downward mobility, on the other hand, only diminish appreciably (by falling below 1) once the household head has completed secondary schooling or higher. Even a little education thus seems to help protect against chronic poverty, but more than a minimum is needed to guard against a heightened risk of downward mobility. From this one might infer that protection measures during the COVID-19 crisis should not fail to target those with moderate education levels. This is especially so since it is likely that overall education levels are likely to have increased since 2011/2.

Table 2:   Profile of the chronically poor or downwardly mobile 2004/5−2011/12: Education

Characteristics	Chronically poor	Downwardly mobile
Educational levels (odds)		
Less than primary education	1.064	1.139
Primary education	0.973	1.066
Middle school	0.903	1.009
Secondary education	0.757	0.857
College	0.762	0.542
Average odds	**1.000**	**1.000**

Note: Estimates show the difference between the probability of falling into each category relative to the mean chronic poverty and vulnerability rates of 48.8% and 19.8%, respectively.

Table 3 examines patterns of employment of heads of households and the odds of being chronically poor or downwardly mobile. Considering first the chronically poor, we see that on the whole rural workers have higher-than-average odds of belonging to the chronically poor,

---

[13] The data that support the findings of this study are available from the corresponding author upon reasonable request.

while urban workers are less exposed. Among rural workers, only those employed in the 'others' (non-labour) category have lower than average odds of being chronically poor. Agricultural labourers in rural areas are particularly strongly linked to chronic poverty, while urban wage workers are least exposed. As noted above, the COVID-19-induced economic crisis was particularly strongly felt, at least initially, by informal sector workers in urban areas. To the extent that the patterns prevailing in 2004/5−2011/12 continued to hold, it would appear that the immediate impact of the crisis was not on the poorest of the poor at the all-India level.

Looking at patterns of downward mobility in Table 3, we see that households headed by agricultural labourers were also particularly likely to experience downward mobility between 2004/5 and 2011/12 − a time when rural incomes and employment were rising sharply. It is difficult to imagine that this vulnerability of agricultural labourers would not persist when the Indian economy experienced a sharp reversal as a result of COVID-19. In urban areas, it is urban wage workers who have the lowest odds of downward mobility, which is consistent with the booming, urban-led growth trajectory underway in India between 2004/5 and 2011/12.

Of course, as noted in Section 4 above, a group that was particularly hard-hit by the economic lockdown that followed the COVID-19 outbreak in India was migrant workers. These urban-based informal workers abruptly lost their jobs and suddenly found themselves without a source of livelihood in the town and cities where they resided. Poverty among this population group cannot but have risen sharply. Massive flows of such workers back to their rural homes ensued. It is clear that the patterns of rural versus urban poverty among informal workers described in Table 3 − pertaining to the 2004/5−2011/12 period − are not capturing the particularly vulnerable situation of these migrant workers. The assessment that urban informal workers were relatively protected during the COVID-19-induced crisis must thus be substantially nuanced in light of this observation. Unfortunately, National Sample Survey data are unable to shed light on the share of total informal urban workers who were migrants, and on what percentage of such workers were so hard-hit by the COVID-19 crisis that they chose to return to their rural villages. Further investigation and analysis of this question is urgently needed.

Table 3:   Profile of the chronically poor or downwardly mobile, 2004/05−2011/12: employment

Characteristics	Chronically poor	Downwardly mobile
Employment sector of household head (odds)		
Rural self-employed in non-agriculture	1.030	1.128
Rural agriculture labour	1.095	1.205
Rural other labour	1.076	1.172
Rural self-employed in agriculture	1.026	1.128
Rural others	0.961	1.022
Urban self-employed	0.701	0.689

Characteristics	Chronically poor	Downwardly mobile
Urban wage work	0.680	0.645
Urban others	0.745	0.752
Average odds	**1.000**	**1.000**

Note: Estimates show the difference between the probability of falling into each category relative to the mean chronic poverty and vulnerability rates of 48.8% and 19.8%, respectively.

Table 4 considers the likelihood of chronic poverty and downward mobility among different social groups between 2004/5 and 2011/12. Given that the Indian economy was growing strongly during this period, it is not surprising that scheduled tribes – the social group least likely to be full participants in the modernising Indian economy – experienced the highest odds of chronic poverty. Relative to the average, the odds of chronic poverty were more than 25% higher for this group. Compared to the scheduled tribes, scheduled castes face lower odds of chronic poverty, but are still significantly more likely than average to experience such poverty. This ranking of deprivation between scheduled tribes and scheduled castes carries over also to downward mobility. Scheduled tribes were particularly likely to experience downward mobility between 2004/5 and 2011/12, followed by the scheduled castes. The other caste groups in the Indian population (backward castes and others) faced lower than average odds of chronic poverty and downward mobility.

Table 4:   Profile of the chronically poor or downwardly mobile, India 2004/05−2011/12

Characteristics	Chronically poor	Downwardly mobile
Caste (odds)		
Scheduled tribe	1.262	1.427
Scheduled caste	1.071	1.125
Other backward castes	0.903	0.977
Other castes	0.899	0.877
Average odds	1.000	1.000

Note: Estimates show the difference between the probability of falling into each category relative to the mean chronic poverty and vulnerability rates of 48.8% and 19.8%, respectively.

Table 5 indicates that Muslim households were only slightly more highly represented than Hindu households among the chronically poor during the 2004/5−2011/12 period. However, the likelihood of downward mobility among Muslim households was considerably higher than among Hindu households. This finding resonates with the earlier discussion of the vulnerable position of Muslims in India during the COVID-19 pandemic.

Table 5:   Profile of the chronically poor or downwardly mobile 2004/5−2011/12: religion

Characteristics	Chronically poor	Downwardly mobile
Religion (odds)		
Hindu	1.004	1.000
Muslim	1.016	1.080
Other	0.832	0.776

Characteristics	Chronically poor	Downwardly mobile
Average odds	1.000	1.000

Note: Estimates show the difference between the probability of falling into each category relative to the mean chronic poverty and vulnerability rates of 48.8% and 19.8%, respectively.

Table 6 examines the odds of chronic poverty and downward mobility by population groups defined in terms of dependency ratio. Households with a dependency ratio above 50% are both slightly more likely than average to be chronically poor and rather more likely than average to experience downward mobility.

Table 6:   Profile of the chronically poor or downwardly mobile 2004/5-2011/12: dependency ratio

Characteristics	Chronically poor	Downwardly mobile
Dependents as % of household members (odds)		
0−25%	0.963	0.946
25−50%	0.999	0.997
50% or higher	1.028	1.054
Average odds	**1.000**	**1.000**

Note: Estimates show the difference between the probability of falling into each category relative to the mean chronic poverty and vulnerability rates of 48.8% and 19.8%, respectively.

We turn, finally, to the spatial distribution of chronic poverty and downward mobility across Indian states between 2004/5 and 2011/12. Table 7 indicates that of the major states, chronic poverty was relatively pronounced in Rajasthan, West Bengal, Jharkhand, Orissa, Chhattisgarh and Madhya Pradesh, and to a lesser extent Bihar. These are not the states where COVID-19 outbreaks were initially recorded. Indeed, the states of Maharashtra and Delhi are often described as having been confronted early on by the COVID-19 crisis, but with respective odds of chronic poverty between 2004/5 and 2011/12 of 0.932 and 0.715, would appear to have been relatively well protected in this regard. This lends some further support to the contention that the crisis affected a relatively better-protected segment of the population – at least initially – than might have been feared. Again, however, this observation needs to be tempered by the fact that the large-scale migration back to rural areas following the lockdowns originated largely from such cities as Delhi and Mumbai, and would thus drive rising poverty rates in rural areas of such poor sending-states as Bihar, Jharkand and Orissa.

When we examine the odds of downward mobility and consider those states with particularly large rural populations – regions within which there are fears that the COVID-19 virus has more recently been spreading – these are also the states with the highest chronic poverty rates during prosperous times: Rajasthan, West Bengal, Jharkhand, Orissa, Chhattisgarh and Madhya Pradesh, joined now also by Bihar, Uttar Pradesh and Himachal Pradesh. In these states, the odds of downward mobility were all greater than average during the 2004/5−2011/12 interval. To the extent that our conjecture is correct – that scrutinising poverty dynamics during good times offers a perspective on looming trouble-spots and particularly vulnerable groups during an economic downturn – we may take from

this that poverty impacts in India will become more pronounced as COVID-19 spreads away from its initial points of entry into regions and among population groups that appeared initially to have been spared.

Table 7:   Profile of the chronically poor or downwardly mobile, India 2004/05- 2011/12

Characteristics	Chronically poor	Downwardly mobile
India's major states (odds)		
Jammu and Kashmir	1.011	1.054
Himachel Pradesh	0.989	1.058
Punjab	0.841	0.816
Chandigarh	0.744	0.633
Uttaranchal	0.968	0.984
Haryana	0.946	0.953
Delhi	0.715	0.659
Rajasthan	1.030	1.038
Uttar Pradesh	0.987	1.022
Bihar	1.005	1.068
West Bengal	1.047	1.050
Jharkhand	1.066	1.098
Orissa	1.083	1.096
Chhattisgarh	1.100	1.112
Madhya Pradesh	1.071	1.054
Gujarat	0.993	0.961
Maharashtra	0.932	0.903
Andhra Pradesh	0.986	0.993
Karnataka	0.974	0.962
Kerala	0.919	0.942
Tamil Nadu	0.917	0.913
Average odds	**1.000**	**1.000**

Note: Estimates show the difference between the probability of falling into each category relative to the mean chronic poverty and vulnerability rates of 48.8% and 19.8%.

6   Concluding remarks

India is suffering deeply from the COVID-19 pandemic. Although the country had achieved major successes in its efforts to reduce poverty in the decades up to 2020, there are grounds for suspecting that the combined health and economic consequences of the spread of the coronavirus have brought that progress to a halt. It is reasonable to fear that progress in fighting poverty may have been significantly reversed.

Our ability to assess the full impact of the crisis on poverty is hampered by the lack of solid evidence on poverty in the period immediately preceding the onslaught of the COVID-19 crisis. Systematic statistical evidence on the evolution of poverty in the face of the crisis is also still pending. However, this paper shows that the rapidly growing literature documenting the spread of the virus, the corresponding impact on health outcomes, and the economic repercussions of the lockdown measures aimed at slowing the spread all provide ample grounds for suspecting a significant impact on poverty. This literature also documents population characteristics and identifies population subgroups that are facing sharply falling living standards.

The numerous studies assembled and reviewed in this paper point to the particular vulnerability of informal sector wage workers in urban areas. The studies document the phenomenon of mass migration by laid off temporary workers in urban centres – where the spread of the virus was first documented – back to their villages in rural areas. The literature further indicates that among those who have suffered a loss of employment and falling earnings, women, scheduled castes (Dalits) and religious minorities (notably Muslims) are disproportionately represented.

Because the greatest number of COVID-19 cases have been documented in large urban centres such as Delhi and Mumbai, and because the phenomenon of mass migration has generally been of laid-off urban workers, one may be inclined to view the poverty impact of the COVID-19 crisis as largely confined to urban areas. However, there are grounds for caution in drawing such a conclusion. First of all, the second COVID-19 wave has spread far more rapidly and widely into rural regions than was initially experienced in the spring of 2020. Further, it is widely acknowledged that documentation of the spread of the virus is less comprehensive in rural areas than in urban centres, due to fewer resources, lower capacity and a greater unwillingness of the rural population to submit to testing and the possibility of quarantine. As a result, the current incidence of COVID-19 infections is likely to be both surging, and undercounted, in rural areas. Furthermore, the consequences of a rise in infections may be more difficult to bear for these areas due to their underdeveloped healthcare infrastructure.

Our analysis of poverty dynamics in India – based on the pre-COVID-19 experience during an episode of rapid economic growth and poverty decline – indicates, moreover, that the risk of chronic (long-term) poverty and the likelihood of falling into poverty is particularly high in

rural areas, and in those states to which a majority of COVID-19-driven migrants are moving. Our analysis is premised on the notion that poverty persistence and downward mobility during periods of generalised prosperity can help point to likely 'hotspots' and population groups that are particularly at risk when economic downturns occur. We suggest, thus, that while the initial impact of the COVID-19 pandemic was on sectors and population groups that were relatively less poor, as the crisis spreads and the economic consequences of the crisis continue to reverberate, it is likely that the poverty impacts will become increasingly acute. Absent comprehensive and effective policy interventions to combat these poverty impacts, we suggest that they will be increasingly visible in rural areas.

The world, and India, remain in the midst of an unprecedentedly severe health and economic crisis. Recent progress in the development and application of a vaccine against COVID-19 provide grounds for some optimism but is unlikely to dramatically alter circumstances on the ground for some time to come. The final consequences of the crisis for poverty are still unclear. There is a pressing need to continue to assemble and analyse emerging evidence to document the scale of the challenge and to identify those who are in greatest need of assistance. Policies must learn from emerging lessons and adapt in response to the evolving picture on the ground. Successful experience must be digested and documented, as it is not unlikely that new pandemics, calling for renewed intervention, will emerge in the future.

References

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Abbas, R. (2016) 'Internal migration and citizenship in India', *Ethnic and Migration Studies* 42(1), pp. 150–168.

Agarwal, V. and Bellman, E. (2021) 'India's Migrants Flee to Their Villages as COVID-19 Prompts New Lockdown', *Wall Street Journal*, https://www.wsj.com/articles/indias-migrants-flee-to-their-villages-as-covid-19-prompts-new-lockdown-11618392602

Agrawal, P. (2020)' Bihar's Migrants Return To Face Stigma, Under-Prepared Medical Facilities', *India Spend*, https://www.indiaspend.com/bihars-migrants-return-to-face-stigma-under-prepared-medical-facilities/

Al Dahdah, M., Ferry, M., Guérin, I. and Venkatasubramanian, G. (2020) 'The COVID-19 Crisis in India: A Nascent Humanitarian Tragedy', *Books and Ideas.net*, https://booksandideas.net/The-COVID-19-Crisis-in-India.html

Al Jazeera (2021) 'As COVID cases surge in India, what next for the economy?', *Al Jazeera*, 20 April 2021, https://www.aljazeera.com/economy/2021/4/20/as-covid-cases-surge-in-india-what-next-for-the-economy

Asadullah, M.N. and Raghunathan, K. (2020) 'Fighting Gender Inequality in India During the COVID-19 Pandemic', *The Diplomat*, https://thediplomat.com/2020/06/fighting-gender-inequality-in-india-during-the-covid-19-pandemic/

Ashwini, D. (2020) 'The COVID-19 Pandemic and Lockdown: First Order Effects on Gender Gaps in Employment and Domestic Time Use in India', *GLO Discussion Paper no. 607*, Global Labor Organization, Essen, https://www.econstor.eu/handle/10419/222416

Azim Premji University (2021a) 'Impact of COVID-19 on livelihoods of informal sector workers and vulnerable groups in Bengaluru: A view from the ground', https://azimpremjiuniversity.edu.in/SitePages/pdf/COVID19-Impact-on-Informal-Sector-Bengaluru.pdf

Azim Premji University (2021b) 'Reviving Employment and Livelihoods in India: COVID-19 and After', http://publications.azimpremjifoundation.org/2531/1/CII%20Report%20-%20Employment%20%20Livelihoods.pdf

Azim Premji University (n.d.) 'COVID19: Analysis of Impact and Relief Measures', https://cse.azimpremjiuniversity.edu.in/covid19-analysis-of-impact-and-relief-measures/#clips

Babu, B., Kusuma, Y.S., Sivakami, M., Kumar Lal, D., Marimuth, P., Babu Geddam, J., Khanna, A. *et al*. (2017) 'Living conditions of internal labour migrants: a nationwide study in 13 Indian cities', *International Journal of Migration and Border Studies* 3(4), pp. 328–351.

Barcellos, S.H., Leandro, S.C. and Lleras-Muney, A. (2014) 'Child Gender and Parental Investments in India: Are Boys and Girls Treated Differently?' *American Economic Journal: Applied Economics* 6(1), pp. 157–189.

Beyer, R.C.M., Franco-Bedoya, S. and Galdo, V. (2021) 'Examining the Economic Impact of COVID-19 in India through Daily Electricity Consumption and Nighttime Light Intensity', *World Development* 140, pp. 1–13.

Birthal, P.S., Negi, D.S, Jha, A.K. and Singh, D. (2014) 'Income Sources of Farm Households in India: Determinants, Distributional Consequences and Policy Implications', *Agricultural Economics Research Review* 27(1), pp. 37–48.

Biswas, S. (2021) 'India COVID-19 migrants: "Lockdown will make us beg for food again"', *BBC*, https://www.bbc.com/news/world-asia-india-56711150

Cariappa, A.G.A., Acharya, K.K., Chaitanya, A.A., Sendhil, R. and Ramasundaram, P. (2020) 'Pandemic led food price anomalies and supply chain disruption: Evidence from COVID-19 incidence in India', https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3680634

Ceballos, F., Kannan, S. and Kramer, B. (2020) 'Impact of a national lockdown on smallholder farmers' income and food security: Empirical evidence from two states in India', *World Development* 136, pp. 1–5.

Centre for Equity Studies (2020) 'Labouring Lives: Hunger, Precarity and Despair amid Lockdown', http://centreforequitystudies.org/wp-content/uploads/2020/06/Labouring-Lives-_Final-Report.pdf

Centre for Monitoring Indian Economy (2020) 'An unhealthy recovery', https://www.cmie.com/kommon/bin/sr.php?kall=warticle&dt=2020-08-18%2011:02:19&msec=596

Chatterjee, M. (2016) 'Universal Health Coverage and Occupational Health and Safety for Informal Workers: A View from India', in R.M. Taylor (Rapporteur), *Forum on Public-Private Partnerships for Global Health and Safety*, forum conducted at the meeting of the Board on Global Health; Institute of Medicine; National Academies of Sciences, Engineering, and Medicine. Washington DC, the United States: The National Academies Press. pp. 30–39.

Chaudhuri, S. (2003) 'Assessing Vulnerability to Poverty: Concepts, Empirical Methods and Illustrative Examples', mimeo, Department of Economics, Columbia University, https://www.researchgate.net/profile/Detlef_Brem/post/What_is_the_relationship_between_vulnerability_and_poverty_as_well_as_gender_and_poverty/attachment/59d6310fc49f478072ea0cff/AS:273621778403334@1442247923533/download/Assessing+Vulnerability+to+Poverty+theory+2003.pdf

Chishti, S. (2020) 'Explained: How many migrant workers displaced? A range of estimates', *Indian Express*, https://indianexpress.com/article/explained/coronavirus-how-many-migrant-workers-displaced-a-range-of-estimates-6447840/

Dang, H. and Lanjouw, P. (2013) 'Measuring Poverty Dynamics with Synthetic Panels Based on Cross Sections', *Policy Research Working Paper No. 6504*, World Bank, Washington DC.

Dang, H. and Lanjouw, P. (2017) 'Welfare Dynamics Measurement: Two Definitions of a Vulnerability

Line and the Empirical Application', *Review of Income and Wealth* 63(4), pp. 633–660.

Dang, H.-A.H. and Lanjouw, P. (2018) 'Welfare dynamics in India over a quarter-century: Poverty, vulnerability, and mobility, 1987–2012', *WIDER Working Paper* 2018/175, UNU-WIDER, Helsinki.

Dang, H. and Lanjouw (2021) 'Measuring Poverty Dynamics with Synthetic Panels Based on Cross Sections', mimeo, update of Dang and Lanjouw (2013), Vrije Universiteit Amsterdam.

Dang, H., Lanjouw, P., Luoto, J. and McKenzie, D (2014) 'Using Repeated Cross Sections to Explore Movements In and Out of Poverty', *Journal of Development Economics* 107, pp. 112–128.

Datt, G. and Ravallion, M. (2011) 'Has India's Economic Growth Become More Pro-Poor in the Wake of Economic Reforms?' *World Bank Economic Review* 25(2), pp. 157–189.

Dhanaraj, S. (2014) 'Health shocks and coping strategies: State health insurance scheme of Andhra Pradesh, India', *WIDER Working Paper 2014/003*, https://www.wider.unu.edu/publication/health-shocks-and-coping-strategies

Elbers, C. (2021) 'A Note on Synthetic Panels in Poverty Mapping', mimeo, School of Business and Economics, Vrije Universiteit, Amsterdam.

Estupinan, X. and Sharma, M. (2020) 'Job and Wage Losses in Informal Sector due to the COVID-19 Lockdown Measures in India', https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3680379

Express News Service (2020) 'Explained: What are containment zones, how are they demarcated?', *Indian Express*, https://indianexpress.com/article/explained/coronavirus-cases-india-containment-zones-6487494/

Express Web Desk (2020) 'Coronavirus May 19 Highlights: Record 1,08,233 samples tested in a day, says Health Ministry', *Indian Express*, https://indianexpress.com/article/india/coronavirus-in-india-news-live-updates-covid-19-state-wise-cases-tracker-latest-news-lockdown-4-guidelines-6416396/

Ganguly, S. (2020) 'India's coronavirus pandemic shines a light on the curse of caste', *The Conversation*, https://theconversation.com/indias-coronavirus-pandemic-shines-a-light-on-the-curse-of-caste-139550

Gangwar, H.S. and Ray, P.K.C. (2021) 'Geographic information system-based analysis of COVID-19 cases in India during pre-lockdown, lockdown, and unlock phases', *International Journal of Infectious Diseases*. 105, pp. 424–435.

Garcés-Urzainqui, D., Lanjouw, P., and Rongen, G. (2021) 'Constructing Synthetic Panels for the Purpose of Studying Poverty Dynamics: A Primer', mimeo, Vrije Universiteit Amsterdam.

Ghosh, D. and Dinda, S. (2017) 'Chapter 6: Health Infrastructure and Economic Development in India', in R.C Das (ed.) *Social, Health, and Environmental Infrastructure for Economic Growth*, IGI Global, Hershey (PA), USA. pp. 99–119.

Global Hunger Index (2010) 'The Challenge of Hunger: Focus on the Crisis of Child Undernutrition', https://www.ifpri.org/publication/2010-global-hunger-index-challenge-hunger

Guérin, I., Michiels, S., Natal, A., Nordman, C.J. and Venkatasubramanian, G. (2020) 'Surviving debt, survival debt in times of lockdown', *CEB Working Paper no. 20-009*, https://ideas.repec.org/p/sol/wpaper/2013-309493.html

Gulati, A., Jose, S. and Singh, B.B. (2021) 'COVID-19: Emergence, spread and its impact on the India economy and migrant workers', *ZEF Working Paper 207*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3834328

Herault, N. and Jenkins, S. (2019) 'How Valid are Synthetic Panel Estimates of Poverty Dynamics?' *Journal of Economic Inequality* 17, pp. 51–76.

Hindustan Times (2020) 'Rapid antigen tests account for close to 50% of COVID-19 tests in India: Govt data', https://www.hindustantimes.com/health/rapid-antigen-tests-account-for-close-to-50-of-covid-19-tests-in-india-govt-data/story-WLh6mbgmXsZ92EBAA3zzBM.html

Home Secretary (2020) D.O. No. 40-10/2020-DM-1(A). Retrieved from: https://prsindia.org/files/covid19/notifications/5976.IND_Implementation_of_Lockdown_May_21.pdf

ILO (2018) *Women and Men in the Informal Economy: A Statistical Picture* (third edition), ILO, Geneva, Switzerland:

IMS Institute for Healthcare Informatics (2013) 'Understanding Healthcare Access in India: What is the current state?', https://docshare04.docshare.tips/files/25555/255552955.pdf

India.com News Desk (2021) 'Full List of States and Lockdowns in India', *India.com*, https://www.india.com/news/india/delhi-lockdown-haryana-rajasthan-curfew-extended-full-list-of-states-and-lockdowns-in-india-4686324/

Iyer, M. (2020) 'Migration in India and the impact of the lockdown on migrants', *PRS India*, https://www.prsindia.org/theprsblog/migration-india-and-impact-lockdown-migrants

Johns Hopkins University Center for Systems, Science and Engineering (2021) 'COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University', https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6

Kesar, S., Abraham, R., Lahoti, R., Nath, P. and Basole, A. (2020) 'Pandemic, informality, and vulnerability: Impact of COVID-19 on livelihoods in India', *CSE Working Paper 2020-01*, Centre for Sustainable Employment, https://www.research-collection.ethz.ch/handle/20.500.11850/428008

La Forgia, G. and Nagpal, S. (2012) 'Government-Sponsored Health Insurance in India: Are You Covered?' International Bank for Reconstruction and Development/World Bank, Washington DC.

Maggo, D. (2020) 'Impact of COVID-19 on smallholder farmers – insights from India', World Business Council of Sustainable Development, https://www.wbcsd.org/Overview/News-Insights/WBCSD-insights/Impact-of-COVID-19-on-smallholder-farmers-in-India

Mehta, T. and Jamkhandikar, S, (2021) 'COVID-19 spreads to rural India, villages ill-equipped to fight it', *Reuters*, 6 May 2021, https://www.reuters.com/world/india/india-sees-record-daily-rises-covid-19-infections-deaths-2021-05-06/

Menon, S. (2020) 'Coronavirus: Is India's test and tracing strategy working?', *BBC*, https://www.bbc.com/news/world-asia-india-55083825

Ministry of Home Affairs (2020a) Order. No. 40-3/2020-DM-I(A). Retrieved from: https://prsindia.org/files/covid19/notifications/144.IND_Citizens_Guidelines_Lockdown_Mar_24.pdf

Ministry of Home Affairs (2020b), Order. No. 40-3/2020-DM-I(A). Retrieved from: https://prsindia.org/files/covid19/notifications/2737.IND_Extension_Lockdown_Order_April_14.pdf

Ministry of Home Affairs (2020c), Order. No. 40-3/2020-DM-I(A). Retrieved from: https://prsindia.org/files/covid19/notifications/IND_Extension_Lockdown_May_1.pdf

Ministry of Home Affairs (2020d), Order. No. 40-3/2020-DM-I(A). Retrieved from: https://prsindia.org/files/covid19/notifications/IND_MHA_Lockdown_Extension_upto_May31_17052020.pdf

Ministry of Home Affairs (2020e), Order. No. 40-3/2020-DM-I(A). Retrieved from:
https://prsindia.org/files/covid19/notifications/MHAOrder_29062020.pdf

Ministry of Labour and Employment (2015) *National Classification of Occupations – 2015 (Code Structure): Vol-I*,
https://www.ncs.gov.in/Documents/National%20Classification%20of%20Occupations%20_Vol%20I-%202015.pdf

Ministry of Panchayati Raj (n.d.) *Backward Regions Grant Fund: Programme Guidelines*,
https://mizorural.nic.in/file/BRGF/BRGF_GUIDELINES.pdf

Ministry of Statistics and Programme Implementation (2015) 'Employment and Unemployment Situation Among Social Groups in India', *NSS Report No. 563(68/10/4*,
http://mospi.nic.in/sites/default/files/publication_reports/nss_rep_563_13mar15.pdf

Mitra, E., Talreja, S. and Yeung, J. (2021) 'India's second wave is ravaging villages without hospitals or even doctors to fight it', *CNN*, 11 May 2021,
https://edition.cnn.com/2021/05/11/india/india-covid-gujarat-village-intl-hnk/index.html

Naik, M. (2021) 'As the pandemic's second wave rages, migrants trudge home again', *Indian Express*, https://indianexpress.com/article/opinion/columns/as-the-pandemics-second-wave-rages-migrants-trudge-home-again-7297303/

Narayanan, A. (2015) 'Informal employment in India: Voluntary choice or a result of labor market segmentation?', *Indian Journal of Labour Economics* 2015(58), pp. 119–167.

National Commission for Enterprises in the Unorganised Sector (2009) 'The Challenge of Employment in India: An Informal Economy Perspective' (Volume 1 – Main Report),
http://dcmsme.gov.in/The_Challenge_of_Employment_in_India.pdf

Niyati, S. and Vijayamba, R. (2020) 'Impact of the COVID-19 Pandemic on Food Security and Indebtedness in Rural India', https://www.researchgate.net/profile/Niyati-Singaraju/publication/351082698_Impact_of_the_COVID-19_Pandemic_on_Food_Security_and_Indebtedness_in_Rural_India/links/6083fce9907dcf667bbdff6c/Impact-of-the-COVID-19-Pandemic-on-Food-Security-and-Indebtedness-in-Rural-India.pdf

Office of the Registrar General and Census Commissioner, India (n.d.) *Data on Religion: Religion PCA*, https://censusindia.gov.in/2011census/Religion_PCA.html

Oster, E. (2006) 'Does Increased Access Increase Equality? Gender and Child Health Investments in India', *NBER Working Paper No. 12743*, NBER,
http://www.nber.org/papers/w12743

Our World in Data (2021a) 'Cumulative confirmed COVID-19 cases per million people', 25 May 2021, https://ourworldindata.org/coronavirus-data-explorer?tab=map&zoomToSelection=true&country=GBR~USA~ESP~ITA~BRA~IND~KO

R&region=World&casesMetric=true&interval=total&hideControls=true&perCapita=true&smoothing=0&pickerMetric=location&pickerSort=asc

Our World in Data (2021b) 'Daily New Confirmed COVID-19 Cases', https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&hideControls=true&Metric=Confirmed+cases&Interval=New+per+day&Relative+to+Population=false&Align+outbreaks=false&country=~IND

Our World in Data (2021c) 'Daily tests per thousand people (7-day smoothed)', https://ourworldindata.org/coronavirus-testing

OxCGRT (n.d.) 'Relationship between number of COVID-19 cases and government response', https://covidtracker.bsg.ox.ac.uk/stringency-scatter

Pandya, A.A. (2010) 'Muslim Indians: Struggle for Inclusion', Stimson, https://www.stimson.org/wp-content/files/file-attachments/Muslim_Indians-Complete_1.pdf

Post Sachar Evaluation Committee (2014) 'Post Sachar Evaluation Committee Report', https://www.sabrangindia.in/sites/default/files/audio_listing_images/kundu_commission_report_0.pdf?698

Pritchett, L., Suryahadi, A., and Sumarto, S (2000) 'Quantifying Vulnerability to Poverty: A Proposed Measure, Applied to Indonesia', *World Bank Policy Research Working Paper No. 2437*, World Bank, Washington DC.

Ravallion, M. (2011) 'A Comparative Perspective on Poverty Reduction in Brazil, China and India', *World Bank Research Observer* 26(1), pp. 71–104.

Rawal, V., Kumar, M., Verma, A. and Pais, J. (2020) 'COVID-19 Lockdown: Impact on Agriculture and Rural Economy', *SSER Monograph 20/3*, http://archive.indianstatistics.org/sserwp/sserwp2003.pdf

Ray, D. and Subramanian, S. (2020) 'India's Lockdown: An Interim Report', https://debrajray.com/wp-content/uploads/2020/05/RaySubramanian.pdf

Selvaraj, S., Farooqui, H.H., Karan, A. (2018) 'Quantifying the Financial Burden of Households' Out of Pocket Payments on Medicines in India: A Repeated Cross-Sectional Analysis of National Sample Survey Data, 1994-2014', *Boston Medical Journal Open*. doi: :10.1136/bmjopen-2017-018020.

Sengupta, S. and Jha, M.K. (2020) 'Social Policy, COVID-19 and Impoverished Migrants: Challenges and Prospects in Locked Down India', *The International Journal of Community and Social Development* 2(2), pp. 152–172. doi: 10.1177/2516602620933715.

Seth, A. (2020) 'The post-Lockdown State of Labour: Heading Towards an Institutionalization of Exploitation and Inequality', https://drive.google.com/file/d/1baXB35TNNlp-ap6fMZtg4elFg4Yxe8Mk/view

Singh, K.D., Goel, V., Kumar, H. and Gettleman, J. (2020) 'India, Day 1: World's Largest Coronavirus Lockdown Begins', *New York Times*, 25 March 2020, https://www.nytimes.com/2020/03/25/world/asia/india-lockdown-coronavirus.html

Singh, S. and Magazine, A. (2020) 'Explained: Indian migrants, across India', *Indian Express*, https://indianexpress.com/article/explained/coronavirus-india-lockdown-migran-workers-mass-exodus-6348834/

Sinha, A. (2021) 'In second wave, COVID hits rural India: cases and deaths quadruple', *Indian Express*, https://indianexpress.com/article/india/covid-second-wave-rural-india-coronavirus-cases-7306422/

Srivastava, R. (2020) 'Understanding Circular Migration in India: Its Nature and dimensions, the Crisis under Lockdown and the Response of the State', *Centre for Employment Studies WP 04/2020*, http://www.ihdindia.org/working-papers/2020/IHD-CES_WP_04_2020.pdf

The Economist (2021) 'Tracking the economic impact of India's second covid wave', *The Economist*, 1 May 2021, https://www.economist.com/finance-and-economics/2021/05/01/tracking-the-economic-impact-of-indias-second-covid-wave

Thejesh, G.N. (2020) 'Non Virus Deaths', https://thejeshgn.com/projects/covid19-india/non-virus-deaths/

The Indian Express (2021) 'Daily Briefing: Massive spread of COVID-10 in rural India; nearly 100 bodies found floating in Ganga; and more', *Indian Express*, https://indianexpress.com/article/india/daily-briefing-covid-19-vaccination-drive-second-wave-may-12-7311703/

Tikkanen, R., Osborn, R., Mossialos, E., Djordjevic, A. and Wharton, G.A. (2020) 'International Health Care System Profiles: India', the Commonwealth Fund, https://www.commonwealthfund.org/international-health-policy-center/countries/india

Unni, J. and Rani, U. (2003) 'Social Protection for Informal Workers in India: Insecurities, Instruments and Institutional Mechanisms', *Development and Change* 34(1), pp. 127–161.

Wallen, J. (2021) 'India's COVID crisis deepens as citizens starve and mass cremations burn the dead', *Daily Telegraph* (UK), https://www.telegraph.co.uk/global-health/science-and-disease/indians-starve-as-covid-crisis-deepens/

World Economic Forum (2020) 'Global Gender Gap Report 2020, https://www.weforum.org/reports/gender-gap-2020-report-100-years-pay-equality

World Health Organization (2021) *WHO Coronavirus (COVID-19) Dashboard: Situation by Region, Country, Territory & Area*, https://covid19.who.int/table