A threat to life and livelihoods: examining the effects of the first wave of COVID-19 on health and wellbeing in Bengaluru and Patna slums

HARLAN DOWNS-TEPPER, ANIRUDH KRISHNA AND EMILY RAINS

ABSTRACT Taking advantage of our existing dataset of 6,721 slum households in two Indian cities, we undertook six rounds of follow-up phone interviews on the impact of COVID-19 between July and November 2020 with three key informants in each of 40 diverse slums. These cities showed contrasting health effects resulting from the first major wave of the COVID-19 pandemic – no deaths and nearly no illnesses were reported in Patna, while there was widespread low-intensity sickness and a cluster of deaths in Bengaluru. We found no clear pattern in the links between outbreaks and city or neighbourhood characteristics. Livelihood effects, however, were devastating across both cities. All but a few slum dwellers lost their jobs for several months and survived by cutting back on essentials, incurring loans, liquidating assets, and seeking help from neighbours. Government assistance, generous in the early part of the lockdown, dwindled rapidly. Many will likely become chronically poor.

KEYWORDS COVID-19 / India / informality / resilience / urban slums

I. INTRODUCTION

It seemed only natural when news of the COVID-19 pandemic broke to infer that slums[1] would require special protection. Slum residents face disproportionate risks and disease burdens due to built environment characteristics and inadequate access to crucial resources.[2] Slums are not only densely populated, but are also in many cases located in environmentally hazardous areas.[3] Moreover, slum dwellers face substantial challenges in accessing fundamental resources like clean water and sanitation and safe housing.[4] These conditions – inadequate service provision combined with crowding and environmental hazards – cumulatively increase health risks to slum residents from infectious diseases, injury, fire, weather-related issues and more,[5] making these high-risk areas in the eyes of public health officials.

During the first wave of the pandemic, beginning in March 2020, lockdowns were imposed in India with the intention of protecting these

Harlan Downs-Tepper is a PhD student at Duke University studying political economy and global development. Prior to beginning his doctoral studies, he worked with IDinsight on rigorous experiments to inform government and social sector clients in India and sub-Saharan Africa.

Address: Duke University, 201 Science Dr, Durham, NC 27708, USA; email: hwd3@duke.edu

Anirudh Krishna is a professor of Public Policy and Political Science at Duke University. His research investigates how poor communities and individuals in developing countries cope with the structural and personal constraints that result in poverty and powerlessness.

Email: ak30@duke.edu

Emily Rains is an assistant professor of Political Science at Louisiana State University. Her research examines the policy and political implications of urbanization in developing countries, primarily in India. She completed a dual PhD in Public Policy and Political Science at Duke University

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in 2021. Prior to beginning her doctoral studies, she worked at IDinsight, based in Bihar.

Email: erains@lsu.edu

and other fragile populations. Since the situation was so new and dire and the need for a public response so immediate, the health concern overrode everything else. The lockdowns lasted months, unanticipated, with important consequences for economic outcomes. Early studies predicted that profound economic stress would result from pandemic policies,[6] and the World Bank estimated that the pandemic had contributed to an increase in global extreme poverty for the first time in 20 years.[7]

Given that the pandemic entered countries via their cities, one might have expected deep health and economic effects in urban areas, particularly in cities' most vulnerable neighbourhoods. Indeed, a rapidly emerging body of literature argues that slum settlements are likely to experience large adverse effects, given that vulnerability to COVID-19 infection is directly related to various slum characteristics, including density, shared amenities, and crowding within homes.[8] Other emerging work emphasizes that COVID-19 poses specific health and economic challenges that expose existing slum vulnerabilities[9] or provides a roadmap for emergency assistance and long-term policy improvements in these spaces.[10]

Continuing in the same vein, this paper contributes to an identified gap in "city-to-city learning" in this literature by chronicling the direct and indirect impacts of COVID-19 in informal settlements in two cities during the first wave in 2020.[11] Given the continued burden of the pandemic since November 2020, this can in no way be considered more than a partial assessment of the impact in these cities. However, our fortuitous capacity to build on an earlier household dataset allowed for an informative comparison from this particular point in time.

Drawing on a sample of 40 neighbourhoods in Bengaluru and Patna, India, where we previously conducted representative household surveys, we conducted repeated phone interviews with 120 key informants between July and November 2020, collecting a record of near-real-time perceptions of the evolution of the virus and associated lockdowns in these slums. We combined these key informant reports with the extensive household survey data collected before the pandemic to trace the health and economic effects of the first wave across neighbourhoods with a wide range of baseline characteristics.

We found limited reports of hospitalizations and deaths during the first wave of the pandemic. Based on our data, the most severe health effects were concentrated in a few neighbourhoods in Bengaluru, while a larger share of Bengaluru slums described a lower level of less serious cases. In Patna slums, by contrast, deaths and illnesses attributed to the virus were almost non-existent in this period. We explored various hypotheses to explain these differences across cities, but were unable to establish patterns in the links between neighbourhood characteristics and health effects across the two cities.

Livelihood shocks, however, were deep and widespread in both cities, even during the first phase of the pandemic. Across neighbourhoods, slum residents coped by cutting back on food, liquidating assets, borrowing money and food, and – crucially – relying on their neighbours for support. However, neighbourhoods in Patna, which were already worse off prior to the pandemic, experienced particularly deep economic shocks, and were slower to recover than those in Bengaluru. Even before facing the second wave of the virus, people's coping capacities were seriously eroded – with increasing debts and assets liquidated – pushing many deeper into

1. The term "slum" usually has derogatory connotations and can suggest that a settlement needs replacement or can legitimate the eviction of its residents. However, it is a difficult term to avoid for at least three reasons. First, some networks of neighbourhood organizations choose to identify themselves with a positive use of the term, partly to neutralize these negative connotations; one of the most successful is the National Slum Dwellers Federation in India. Second, the only global estimates for housing deficiencies, collected by the United Nations, are for what they term "slums". And third, in some nations, there are advantages for residents of informal settlements if their settlement is recognized officially as a "slum"; indeed, the residents may lobby to get their settlement classified as a "notified slum". Where the term is used in this journal, it refers to settlements characterized by at least some of the following features: a lack of formal recognition on the part of local government of the settlement and its residents; the absence of secure tenure for residents; inadequacies in provision for infrastructure and services; overcrowded and substandard dwellings; and location on land less than suitable for occupation. For a discussion of more precise ways to classify the range of housing sub-markets through which those with limited incomes buy, rent or build accommodation, see *Environment and Urbanization* Vol 1, No 2 (1989), available at http://journals.sagepub.com/toc/eau/1/2.

2. Ezeh, A, O Oyebode, D Satterthwaite, Y-F Chen, R Ndugwa, J Sartori, B Mberu, G J Melendez-Torres, T Haregu, S I Watson, W Caiaffa, A Capon and R J Lilford (2017) "The history, geography, and

poverty. Helping slum residents cope more effectively with the later wave of the pandemic and any future crises requires, as Gupte and Mitlin[12] observe, attending to diverse social and institutional conditions that combine to make for a precarious existence.

This article proceeds in six sections. In the next section, we briefly describe our methodology. In the third section, we review four key characteristics of slums that contribute to their vulnerability, which provide the backdrop against which the effects of the pandemic's first wave and the response can be better understood. Recognizing that phone interviews have several weaknesses, we cautiously present our conclusions on observed health and livelihood effects in Sections IV and V. Section VI concludes.

II. METHODOLOGY

We built on a body of prior research carried out by our team for over 10 years.[13] We drew on our previous survey data not only to select the settlements and key informants for this study, but we also merged these data with key informant reports to analyse relationships between neighbourhood characteristics and the reported effects of the virus.

We found when we commenced these investigations in 2010 that many slum settlements – particularly the most vulnerable – were omitted from official data sources.[14] To locate and study a representative sample of slums in each of three cities (Bengaluru, Jaipur and Patna), including those that were unlisted in official data sources, we built on an innovative approach that scholars have recently begun implementing: analysing satellite images to detect these settlements.[15] We iterated between manual analysis of publicly available Google Earth images and ground verifications to inductively develop a short list of criteria to identify and map a continuum of slums in each city, ranging from "blue-polygon" settlements composed of tented accommodation, to neighbourhoods of multi-storey concrete structures at the top end. Between 2015 and 2017, we gathered information on 4,566 households in 135 diverse slums of Bengaluru and 2,155 households in 43 diverse slums of Patna.[16] In each slum that we studied, we conducted focus group discussions on neighbourhood-level infrastructure and settlement histories. In addition – and most directly linked to the current inquiry – we interviewed key informants and local leaders and retained their mobile phone numbers. Building upon this baseline information, we conducted additional research during the first wave of the pandemic and the associated lockdown period.

Collecting information at different points during this pandemic period was fraught with difficulties. We certainly could not go into these slums ourselves, nor send anyone on our behalf. We could have tried to replicate household surveys by doing phone interviews with a representative sample of households, but we had substantial concerns about whose phone numbers would still be valid and whether response rates would be biased. Concluding that phone interviews with key informants was the *least-bad* way of getting reliable information under these difficult circumstances, we conducted several rounds of phone interviews with the key informants we had located earlier, taking care to speak independently with multiple informants within each locality.

sociology of slums and the health problems of people who live in slums", *The Lancet*, available at https://doi.org/10.1016/S0140-6736(16)31650-6; also Mitlin, D and D Satterthwaite (2013), *Urban Poverty in the Global South: Scale and Nature*, Routledge.

3. Gulyani, S and E M Bassett (2010), "The living conditions diamond: an analytical and theoretical framework for understanding slums", *Environment and Planning A* Vol 42, No 9, pages 2201–2219, available at https://doi.org/10.1068/a42520; also Khalifa, M A (2011), "Redefining slums in Egypt: unplanned versus unsafe areas", *Habitat International* Vol 35, No 1, pages 40–49, available at https://doi.org/10.1016/j.habitatint.2010.03.004.

4. Ezeh, A C, I Kodzi and J Emina (2010), "Reaching the urban poor with family planning services", *Studies in Family Planning* Vol 41, No 2, pages 109–116, available at https://doi.org/10.1111/j.1728-4465.2010.00231.x; also Matthews, Z, A Channon, S Neal, D Osrin, N Madise and W Stones (2010), "Examining the 'urban advantage' in maternal health care in developing countries", *PLoS Medicine* Vol 7, No 9, available at https://doi.org/10.1371/journal.pmed.1000327; and Osrin, D, S Das, U Bapat, G A Alcock, W Joshi and N S More (2011), "A rapid assessment scorecard to identify informal settlements at higher maternal and child health risk in Mumbai", *Journal of Urban Health* Vol 88, pages 919–932, available at https://doi.org/10.1007/s11524-011-9556-7.

5. See reference 2, Ezeh et al. (2017); also Corburn, J and L Riley (2016), *Slum Health: From the Cell to the Street*, University of California Press, Oakland.

6. See Kesar, S, R Abraham, R Lahoti, P Nath and A Basole (2020), *Pandemic, Informality, and Vulnerability: Impact of COVID-19 on Livelihoods in India*, Centre for Sustainable Employment Working Paper 2020-0; also Krishna, A (2020), "The poorest after the

pandemic," *Current History* Vol 119, No 820, pages 291–296.

7. World Bank (2020), "COVID-19 to add as many as 150 million extreme poor by 2021", 7 October, available at https://www.worldbank.org/en/news/press-release/2020/10/07/covid-19-to-add-as-many-as-150-million-extreme-poor-by-2021.

8. Mishra, S V, A Gayen and S M Haque (2020), "COVID-19 and urban vulnerability in India", *Habitat International* Vol 103; also Wilkinson, A (2020), "Local response in health emergencies: key considerations for addressing the COVID-19 pandemic in informal urban settlements", *Environment and Urbanization* Vol 32, No 2, pages 503–522, available at https://journals.sagepub.com/doi/full/10.1177/0956247820922843.

9. Lambert, H, J Gupte, H Fletcher, L Hammond, N Lowe, M Pelling, N Raina, T Shahid and K Shanks (2020), "COVID-19 as a global challenge: towards an inclusive and sustainable future", *The Lancet Planetary Health* Vol 4, No 8, pages E312–E14; also Parikh, P, L Diep, J Gupte and M Lakhanpaul (2020), "COVID-19 challenges and WASH in informal settlements: integrated action supported by the Sustainable Development Goals", *Cities* Vol 107.

10. Corburn, J, D Vlahov, B Mberu, L Riley, W T Caiaffa, S F Rashid, A Ko, S Patel, S Jukur, E Martínez-Herrera, S Jayasinghe, S Agarwal, B Nguendo-Yongsi, J Weru, S Ouma, K Edmundo, T Oni and H Ayad (2020), "Slum health: arresting COVID-19 and improving well-being in urban informal settlements", *Journal of Urban Health* Vol 97, No 3, pages 348–357.

11. We thank one of the anonymous reviewers for this language, which we paraphrased.

12. Gupte, J and D Mitlin (2020), "COVID-19: what is not being addressed", *Environment and Urbanization* Vol 33, No 1, pages 211–228, available at https://journals.sagepub.com/doi/10.1177/0956247820963961.

We selected a sample of 20 settlements each in both Patna and Bengaluru to represent the full range of slum living conditions. A small percentage of the sample that we had initially selected, less than 20 per cent, had to be replaced by other similar slums, because we were unable to reach the key respondents at these settlements at the telephone numbers they had given us some years earlier.

Table 1 lists features of the 40 selected slums. Though they vary in size from small (fewer than 300 households) to large (>1,000 households), all the settlements are compact and densely occupied. They lie at different distances to commercial centres, some in the very heart of these cities and others at the outskirts. The proportion of Scheduled Caste (or Dalits, sometimes formerly referred to as "untouchables") residents is high on average, exceeding 90 per cent in some settlements. In 10 per cent of the sample (four slums), residents are majority Muslim.

In each of the 40 slums, three key informants were selected, including at least one area leader and one female respondent, all of them well connected and broadly knowledgeable about neighbourhood occurrences. An initial phone call provided information about the study and screened interested respondents for their knowledge of the community. In a small number of cases – fewer than 6 per cent – respondents were replaced due to attrition between interview waves.

The 120 key respondents were 35 years old on average and ranged from 20 to 65. A little under two-thirds were men. Most respondents had spent their entire life in the same slum – even living in the same house. The average length of stay was 33 years in Patna and 26 years in Bengaluru. This is consistent with the fact that most slum households in these cities have lived there for multiple generations.[17] The selected key respondents were given telephone airtime worth INR 250 (US$ 3.50) for each completed interview, which lasted, on average, 30 minutes.

We started phone interviews in the last week of July 2020, three months into the pandemic, and conducted six waves of structured interviews, ending in the first half of November 2020. Two trained investigators in Bengaluru, and one in Patna, each of whom we had worked with previously, carried out these interviews in the local languages. Each interview round had a common core set of questions – concerned with health and livelihood impacts – and a rotating set specific to that round. The rotating topics in different rounds included education, local governance, gender and migration. Responses to closed-ended and short open-ended questions were recorded on tablets using SurveyCTO. We also followed up with detailed, open-ended interviews with 23 selected key respondents from a subset of 12 settlements.

A method that relies principally on key respondent phone interviews is heavily dependent upon secondary information. Aware of this shortcoming, we restricted our inquiries to readily observable and commonly experienced occurrences. For instance, we asked about deaths, hospitalizations, and the number of neighbours sick at home, but we did not ask about the incidence of infection, which we did not expect to be reliably observed. When asking about deaths in the past fortnight, we asked separately about total deaths, COVID-19 deaths, deaths due to other known causes, and deaths of no known cause. We consider the information about deaths to be reliable, since deaths are infrequent and widely talked about – and since COVID-19 deaths were certified and became grave and widely noted events. By independently asking the three

TABLE 1
Sample characteristics

Slum name	City	Size (no. of households)	Age (years)	% migrant	% Scheduled Caste	% Muslim	% employed formally	% with ration card	% with voter ID card	% with private toilet	Continuum quartile (1 is least well-off and 4 is most well-off)
Ambedkar Colony	Bengaluru	S	50	0%	63%	3%	10%	84%	100%	39%	2
Kasturamma Badwane	Bengaluru	S	50	5%	66%	3%	17%	82%	84%	100%	3
Muniyappa Cement Compound	Bengaluru	S	80	7%	97%	3%	0%	90%	100%	3%	1
Shiva Nagar Colony	Bengaluru	S	50	0%	94%	0%	10%	74%	100%	94%	3
Siddharth Nagar	Bengaluru	L	100	7%	63%	3%	10%	90%	90%	83%	4
Sindhi Colony	Bengaluru	S	60	3%	17%	77%	3%	100%	100%	13%	1
Yarab Nagar	Bengaluru	L	45	0%	20%	77%	10%	83%	100%	80%	4
Mominpura	Bengaluru	M	60	0%	0%	88%	0%	81%	94%	78%	2
Ashraya Nagar	Bengaluru	L	12	7%	30%	13%	10%	73%	93%	20%	1
Shivananada	Bengaluru	M	32	10%	7%	23%	47%	77%	93%	70%	2
Someshwarnagar	Bengaluru	M	40	7%	23%	3%	6%	67%	93%	83%	3
Gorguntepalya	Bengaluru	S	10	40%	87%	0%	10%	53%	80%	0%	1
Uttarahalli Lake	Bengaluru	S	8	40%	47%	0%	0%	7%	20%	0%	1
Dyanandan Sagar	Bengaluru	L	176	3%	27%	43%	10%	87%	97%	80%	3
Old Madiwala	Bengaluru	L	166	13%	20%	7%	10%	93%	97%	83%	4
Hombegowda Slum	Bengaluru	M	50	0%	57%	13%	9%	93%	100%	43%	2
K G Halli	Bengaluru	M	80	7%	47%	0%	24%	77%	100%	87%	2
Weavers Colony, Near Kolifarm Gate Bus Stop	Bengaluru	L	40	18%	25%	0%	8%	88%	93%	98%	4
M V Garden, The Millenia Bus Stop	Bengaluru	M	80	20%	40%	10%	20%	93%	98%	100%	4
Venugopal Nagar, Hulimavu, Near Hulimavu Lake	Bengaluru	M	28	23%	48%	3%	18%	85%	95%	98%	3

(continued)

TABLE 1 (Continued)

Slum name	City	Size (no. of households)	Age (years)	% migrant	% Scheduled Caste	% Muslim	% employed formally	% with ration card	% with voter ID card	% with private toilet	Continuum quartile (1 is least well-off and 4 is most well-off)
East Lohanipur	Patna	M	56	23%	92%	0%	9%	53%	90%	78%	3
Kamla Nehru Nagar	Patna	M	80	23%	43%	35%	0%	80%	93%	20%	1
Harijan Toli (Behind Alpana Cinema)	Patna	S	150	5%	92%	2%	7%	73%	97%	67%	2
Samanpura Mehandi Nagar	Patna	S	45	32%	2%	98%	0%	42%	97%	63%	2
Indrapuri (New Slum)	Patna	S	35	52%	55%	0%	0%	52%	80%	3%	1
Chitkohra Pul Ke Niche (Jagjiwan Nagar)	Patna	S	30	33%	47%	12%	0%	52%	65%	8%	1
Sachiwalya Gumti No.1, Yarpur Ambedkar Colony	Patna	M	50	30%	89%	4%	12%	20%	76%	14%	1
Nehru Nagar Mushar Toli	Patna	S	38	27%	68%	0%	2%	87%	98%	67%	2
Rajapur Dujra Pahelwan Ghat	Patna	S	200	13%	0%	42%	0%	70%	88%	60%	2
Bhupatipur	Patna	S	150	3%	60%	0%	2%	48%	80%	45%	1
Navaratan Pur Village	Patna	S	120	38%	12%	0%	4%	52%	87%	60%	2
Changarh Toli	Patna	S	100	22%	10%	2%	0%	62%	93%	68%	2
Shivaji Park Kankarbagh	Patna	S	30	33%	72%	0%	0%	62%	80%	2%	1
Mahmudi Chak	Patna	S	20	42%	60%	0%	4%	52%	82%	33%	1
Naya Gaon Bari Path	Patna	M	80	33%	35%	0%	0%	47%	88%	53%	2
New Sandalpur Ambedkar Colony	Patna	M	24	22%	68%	23%	5%	38%	93%	48%	1
Nalwan Toli	Patna	S	50	23%	35%	2%	7%	48%	90%	82%	3
Sandalpur (Abdul Bari Bhawan)	Patna	S	45	20%	60%	23%	8%	42%	90%	23%	1
Jaypur Dhanki	Patna	S	120	10%	13%	0%	2%	32%	93%	55%	1
Mangal Talab	Patna	S	DK	30%	88%	0%	30%	64%	85%	79%	3

separate respondents in each settlement, we were able to isolate unusual responses and follow up with additional investigations.[18]

We want to emphasize that these responses are more order-of-magnitude assessments than precise estimates. The greater precision that is allowed for by more extensive household surveys was unavoidably unobtainable. Lacking more precise means of information during the pandemic, these order-of-magnitude data nevertheless help reveal important aspects of lived experiences and coping strategies.

The data collected were subjected to three types of analysis. First, to describe trends over time, we averaged key informant estimates of the outcomes of interest for each neighbourhood and each time period.[19] Second, to examine correlations between those outcomes of interest and neighbourhood characteristics, we merged the baseline household survey data with the key informant data. We then regressed the pooled key informant observations (N=720) on average neighbourhood characteristics, clustering by neighbourhood, to check for associations between neighbourhood characteristics and the effects of the pandemic. We report p-values from these regressions to indicate whether there is suggestive evidence of correlations. However, given the approximate nature of the data, we do not present regression coefficients. Finally, to the extent that space permits, we draw on follow-up interviews to provide detailed illustrative vignettes.

Overall, the data expose evidence of widespread economic devastation that few slum residents managed to escape. Certain characteristics of slums contribute to reduced resilience; vulnerability and volatility tend to be considerable in the presence of such conditions.

III. OVERVIEW: KEY CHARACTERISTICS OF SLUMS

Although slums come in different shapes and sizes, we argue that four underlying characteristics, shared to varying extents, describe their common condition: *variety, informality, volatility and persistence*. This section outlines each characteristic in turn.

a. Variety

Far from being uniform, slums span a variety of living conditions. In terms of quality of housing stock, they constitute the lower end of the city spectrum. But the lower end is very diverse, comprising a continuum. Living conditions, access to legal documents, and policy needs vary based on a neighbourhood's position on this continuum.[20]

The bottom of the slum continuum is made up of the flimsiest settlements – "blue-polygon" slums, so termed because of how these homes, made of poles topped by blue tarps, show up on satellite photos.[21] In these settlements, incomes are low and inconsistent, there is no drainage or water supply, and children rarely go to school. At the other end of the continuum, however, residents *"live in sturdily constructed houses with piped water, metered electricity, closed drainage systems and private toilets"*.[22] Between the top and the bottom of the continuum is a variety of living conditions.

We computed a "slum score" adapted from the UN-Habitat definition of a slum.[23] To calculate this score, we ran a principal components

13. This work was initiated by Anirudh Krishna over a decade ago and has expanded over time.

14. Bhan, G and A Jana (2013), "Of slums or poverty: notes of caution from Census 2011", *Economic & Political Weekly* Vol 48, No 18, pages 13–16; also Krishna, A (2017), *The Broken Ladder: The Paradox and Potential of India's One Billion*, Cambridge University Press.

15. See Kuffer, M, K Pfeffer and R V Sliuzas (2016), "Slums from space: 15 years of slum mapping using remote sensing", *Remote Sensing* Vol 8, No 6, available at https://doi.org/10.3390/rs8060455 for review.

16. We also collected information on 2,718 households in 45 slums of Jaipur in 2016 but were unable to undertake further investigations in this particular city during the pandemic period. Furthermore, we conducted an additional 2,112 household surveys in 32 slums in 2010 and 2012, but we use the data beginning in 2015 as baseline data for this study.

17. Rains, E and A Krishna (2020), "Precarious gains: social mobility and volatility in urban slums", *World Development* Vol 132, available at https://doi.org/10.1016/j.worlddev.2020.105001.

18. We find no systematic bias in key informant responses by leader status or gender. To check for bias, we regressed the absolute value of the difference between the respondent's answer for a given question and the average response for that neighbourhood on respondent characteristics. We also regressed an indicator variable that equals 1 for the response that differs most from the average neighbourhood response and 0 otherwise on respondent characteristics. See Table S1 in the online supplement.

19. Key informant responses are highly correlated overall. We also checked the correlation between the average values and several alternative measures, which are all highly correlated. The

analysis on several indicators, including durability of housing, sufficiency of living space, access to safe water and sanitation, and economic resources (see Table S3 in the online supplement).[24] *"Households in slums with higher scores have sturdier roofs, better toilets, better water and drainage infrastructure, more spacious and taller homes, and they hold more assets on average."*[25] Based on these scores we placed each slum within a particular quartile of the slum continuum. Our sample represents the full variation across this continuum (Table 1). Recognizing diversity in conditions is important because the same shock can have different effects for people in different living conditions.

b. Informality

Perhaps the central defining feature of slums is the pervasive informality that people experience and its multiple forms. Many slum residents are "triply informal," with informal jobs, informal (i.e., untitled) properties, *and* informal (or no) identity papers.[26]

Informal jobs: The extensive household surveys we had undertaken earlier had shown how a great majority of employed slum residents work in the informal economy – that is, in occupations that fall outside of government regulation. Only 6 per cent reported that they were formally employed when surveyed in 2016. For those employed informally, wages are lower and more volatile than with formal employment; and jobs can be, and very often are, lost at a moment's notice, with no benefits and no compensation.[27] Female respondents worked as maids, cooks or shop assistants, and both men and women as construction labourers, street vendors, shop assistants, drivers, petty mechanics, or in similar jobs. As with living conditions, the extent of job informality spans the slum continuum. As shown in Table 1, the percentage of employed residents working formally (while a minority everywhere) varies substantially across neighbourhoods, from 0 per cent of respondents in 11 neighbourhoods to 47 per cent of respondents in one neighbourhood.

Informal homes: Similarly, the earlier surveys had revealed how for many slum households, the title to one's home, too, is informal in nature, i.e., it is not recognized in law. More than 70 per cent had homes without legal titles. Not only were they unable to mortgage their homes, but the fear of demolition was also ever-present.[28] People with informal homes, the majority of slum residents, have a limited capacity to withstand risk.

Informal ID papers: A third dimension of informality, experienced at the lower end of the slum continuum, is the absence of government-issued identity papers. (In the Indian context, this includes documents such as ration cards, *Aadhar* identity cards and voter ID cards.) Many slum residents have none of these papers; others may have one, two or all three, with the average number of papers being greater in slums further along the slum continuum.[29] The safety net that is available to those who have these papers and can thus lay claim to subsidized food rations and other government assistance is denied to people without papers. About half of our respondents did not have ration cards when surveyed in 2016, as Table 1 shows, with this share dipping to 7 per cent in one slum of Bengaluru. Notably, the share with ration cards was lower in Patna.

Nearly every slum resident experiences one or more of these three kinds of informality. Informality reduces slum residents' capacity to

correlation between the neighbourhood average and the most different response per neighbourhood is .8. See Table S2 in the online supplement.

20. Krishna, A, E Rains and E Wibbels (2020), "Negotiating informality – ambiguity, intermediation, and a patchwork of outcomes in slums of Bengaluru", *Journal of Development Studies* Vol 56, No 11, pages 1983–1999, available at https://doi.org/10.1080/00220388.2020.1725483; also Rains, E, A Krishna and E Wibbels (2018), *Urbanization and India's Slum Continuum: Evidence on the Range of Policy Needs and Scope of Mobility*, International Growth Centre Working Paper C-35309-INC-1.

21. Krishna, A, M S Sriram and P Prakash (2014), "Slum types and adaptation strategies: identifying policy-relevant differences in Bangalore", *Environment and Urbanization* Vol 26, No 2, pages 568–585, available at https://doi.org/10.1177/0956247814537958.

22. See reference 17, page 5; see also reference 21.

23. United Nations (2018), *World Urbanization Prospects: The 2018 Revision.*

24."Principal components analysis is frequently used to reduce multiple indicators to a single score, essentially weighting each indicator by how well that indicator explains differences across observations". See reference 20, Rains et al. (2018), page 31. See also James, G, D Witten, T Hastie and R Tibshirani (2013), *An Introduction to Statistical Learning with Applications in R*, Springer, New York.

25. Rains, E, A Krishna and E Wibbels (2019), "Combining satellite and survey data to study Indian slums: evidence on the range of conditions and implications for urban policy", *Environment and Urbanization* Vol 31, No 1, pages 267–292, page 276, available at https://doi.org/10.1177/0956247818798744.

26. Rains, E and A Krishna (2019), *Will Urbanization Raise Social Mobility in the South,*

withstand adverse shocks,[30] and the greater the degree of informality experienced, the greater, in general, is the vulnerability.

c. Volatility

In light of these vulnerabilities, slum dwellers' economic trajectories are highly volatile. One step forward is followed too often by two steps back. The combination of low and fluctuating average wages and highly uncertain situations makes it difficult to amass savings, reducing the capacity to weather shocks or make investments in human capital.[31] Many households live only one health shock away from chronic poverty.[32]

Rather than supporting an image of slums as conveyor belts to the urban middle class,[33] our earlier extensive studies in three Indian cities found limited evidence of sustained upward mobility across the slum continuum.[34] Slum settlements rarely develop into formal, non-slum areas. Moreover, while some households experience an increase in purchasing power over time, the vast majority remain poor. Any upward gains remain precarious, as residents experience high levels of risk that leave them vulnerable to downward mobility. Living conditions fluctuate, and many end up at the same level or even worse off than they were the decade before.

d. Persistence

Another misconception holds that slums are ephemeral and that, occupied primarily by migrant workers, they disperse or are upgraded when these workers become middle class. In fact, most slums, our earlier studies revealed, are established settlements, many of which have been around for multiple generations.

It is hard to date slums precisely as no official records are in existence for most of them. Oral histories abound, however, and the creation stories are sometimes backed by community-maintained records.[35] Table 1 provides the ages for these slums that we ascertained through oral history investigations. They vary in age from eight years to an estimated 200 years, with an average age of more than 40 years.

Residents of the 40 slums where we conducted follow-up phone interviews had lived in their current homes for over 20 years on average, according to the surveys we conducted prior to the pandemic. Most families (66 per cent) had lived in the same slum for multiple generations. First-generation migrants constitute a small percentage: on average, fewer than 20 per cent and not more than 52 per cent in any of these 40 slums.

Circular migrants, also large in numbers, are largely a different demographic group (though a small number of circular migrants reside in slums, almost entirely at the lower end of the continuum). The belief that slum residents could escape elsewhere, to some long-forgotten village homes perhaps, to escape the brunt of a pandemic afoot in the city, is misinformed.

Enhancing slum residents' resilience for dealing with ongoing crises, whether brought on by climate change or the continued depredations of this pandemic, will require heeding these four fundamental characteristics. We return to this point after presenting our findings.

Replicating the Economic History of the West?, WIDER Working Paper 102, United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki.

27. Breman, J (2013), *At Work in the Informal Economy of India: A Perspective from the Bottom up*, Oxford University Press, New Delhi; also ILO (2018), *Women and Men in the Informal Economy: A Statistical Picture*, 3rd edition, International Labour Organization, Geneva; and Mitra, A (2005), "Women in the urban informal sector: perpetuation of meagre earnings", *Development and Change* Vol 36, No 2, pages 291–316, available at https://doi.org/10.1111/j.0012-155X.2005.00412.x.

28. Besley, T and M Ghatak (2009), *The de Soto Effect*, STICERD - Economic Organisation and Public Policy Discussion Papers Series No 8; also de Soto, H (2000), *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*, Basic Books, New York; and Field, E (2007), "Entitled to work: urban property rights and labor supply in Peru", *The Quarterly Journal of Economics* Vol 122, No 4, pages 1561–1602, available at https://doi.org/10.1162/qjec.2007.122.4.1561.

29. See reference 25.

30. Harriss-White, B, W Olsen, P Vera-Sanso and V Suresh (2013), "Multiple shocks and slum household economies in South India", *Economy and Society* Vol 42, No 3, pages 398–429, available at https://doi.org/10.1080/03085147.2013.772760.

31. See reference 30.

32. See reference 14, Krishna (2017).

33. Frankenhoff, C A (1967), "Elements of an economic model for slums in a developing economy", *Economic Development and Cultural Change* Vol 16, No 1, pages 27–36; also Glaeser, E L (2011), *Triumph of the City: How Our Greatest Invention Makes*

IV. EXAMINING HEALTH EFFECTS

Scholars have estimated that about half of residents in some Mumbai and Bengaluru slums tested positive for COVID-19 antibodies by July 2020, yet deaths remained low.[36] We do not have antibody data for this study, but we draw on key informant reports of deaths, hospitalizations and symptomatic illnesses. Overall, our data from 40 slums depict widespread low-level COVID-19 incidence in Bengaluru slums during the first wave of the virus, with consistent and concentrated COVID-19 clusters in six larger-than-average slums. In Patna slums, by contrast, deaths and illnesses that can be attributed to the virus are almost non-existent.

In Patna, only one death was reported over any of the six rounds of interviews conducted between the end of July and mid-November. In Bengaluru, however, 40 per cent of neighbourhoods reported at least one death from COVID-19 during the interview period. Almost all of these deaths were clustered within six slums, where key informants reported that a total of 28 residents died from COVID-19 (ranging from 0.3 to 1.3 per cent of the settlement populations).

We observed similar patterns in reported rates of hospitalization and symptomatic illnesses (Table 2). There were almost no reported COVID-19 sicknesses in Patna at any given point during that period of time. Not a single respondent reported a household with members sick at home from COVID-19 in any week, and just a few reported cases of hospitalization – all within the same week. In Bengaluru, 70 per cent of neighbourhoods reported at least one hospitalized member, and 85 per cent reported at least one member sick at home with presumed COVID-19 over the six rounds of interviews. Most of the reported illnesses were again heavily clustered within the same six slums where we observed COVID-19 deaths.

These data sources admittedly miss those who were infected but asymptomatic and others who successfully hid their illnesses from their neighbours. However, it is worth noting that reports of death and illness in these slums point commonly to the same limited occurrence within the same small cluster of communities.[37]

The differences between the numbers of illnesses and deaths in Bengaluru and Patna are statistically significant at the 95 per cent

Us Richer, Smarter, Greener, Healthier, and Happier, Penguin Press, New York; Turner, J (1969), "Uncontrolled urban settlement: problems and policies", in G W Breese (editor), *The City in Newly Developing Countries: Readings on Urbanism and Urbanization*, Prentice Hall, Englewood Cliffs, pages 507–534; and World Bank (2009), *Reshaping Economic Geography: World Development Report*, Washington, DC.

34. See reference 17.

35. Auerbach, A (2018), "Informal archives: historical narratives and the preservation of paper in India's urban slums", *Studies in Comparative International Development* Vol 53, pages 343–364, available at https://doi.org/10.1007/s12116-018-9270-5

36. Chinnaswamy, S (2020), "SARS-CoV-2 infection in India bucks the trend: Trained innate immunity?", *American Journal of Human Biology*, available at https://onlinelibrary.wiley.com/doi/full/10.1002/ajhb.23504; also George, C E, L R Inbaraj, S Chandrasingh and L P de Witte (2021), "High seroprevalence of COVID-19 infection in a large slum in South India; What does it tell us about managing a pandemic and beyond?", *Epidemiology and Infection* Vol 149, available at https://www.cambridge.org/core/product/identifier/S0950268821000273/type/journal_article; and

TABLE 2
Key informant-reported sickness attributed to COVID-19

Sickness attributed to COVID-19 in Bengaluru (average % of households per slum)						
	31 Jul	17 Aug	31 Aug	13 Sept	13 Oct	31 Oct
Sick at home	3.2	1.3	2.7	2.6	7.2	3.4
Sick in hospital	2.4	2.3	2.2	1.8	4.6	0.3
Sickness attributed to COVID-19 in Patna (average % of households per slum)						
	31 Jul	17 Aug	31 Aug	13 Sept	13 Oct	31 Oct
Sick at home	0.0	0.0	0.0	0.0	0.0	0.0
Sick in hospital	0.0	0.1	0.0	0.0	0.0	0.0

confidence level. Importantly, though, we fail to satisfactorily explain the differences between these cities. For instance, it is contestable whether the better health outcomes in Patna slums occur because of, or in spite of, the longer lockdown period in Patna, nearly two months longer than the one in Bengaluru. However, it should be noted that when the lockdown was simultaneously in force in both cities, Bengaluru slums reported more deaths and illnesses than Patna slums.

Moreover, we found no significant association between these COVID-19 clusters and a range of predictors, whether the use of shared amenities like toilets or water pumps, the number of households in the slum, the proximity to Bengaluru's city centre or to each other, the share of Scheduled Caste or migrant households, or the type of employment.

Alternative hypotheses about disease spread also failed to explain inter- and intra-city differences. Early explanations, including climatic differences,[38] differences in demographic features,[39] or differences in regional connectivity,[40] either run contrary to observed differences between Patna and Bengaluru, or are incomplete. One study found that the countryside around Patna witnessed high incidences of COVID-19, reportedly spread by returning migrants.[41] And yet, our data suggest that Patna slums were less affected.

Variations in precautionary practices, like testing and masking, were also not associated with COVID-19 clusters. In our initial interview waves, we found high and comparable rates of masking in both cities, both of which gradually fell over time. In Patna, these precautions had nearly disappeared by the end of October 2020. We leave it to a later time and to other investigators to probe these differences and others that may have arisen during the more recent phase of the pandemic.

V. WIDESPREAD LIVELIHOOD LOSSES

While the health effects during the first wave were far from the worst-case scenario that some had feared, livelihood effects were deep and widespread. Slum residents in both cities faced serious economic hardship as a result of the first wave of the pandemic.

Slum residents' livelihoods depend on meagre resources. They make a living when richer people require their services. But when those richer residents reduce expenses or furlough their staff, which they did during the first wave of the pandemic, slum dwellers' incomes fall steeply. Every action a government takes to control the pandemic – lockdowns, curfews, restrictions on weddings and celebrations, bans on construction – tends to affect slum residents' livelihoods adversely.

In response, we found in both cities that slum residents spent down their savings, cut back on food, borrowed money and liquidated assets. As of April 2020, the first month after the lockdown began, roughly 50 per cent of household heads in Bengaluru and 82 per cent in Patna had lost their primary source of income. After the lockdowns ended, people faced widespread job losses and wage reductions. Those employed informally, the majority, suffered the most.

By mid-November 2020, our informants reported that one-quarter of pre-pandemic income in Bengaluru and one-third in Patna had still not been recovered. Figure 1 depicts the reported pattern of income recovery, with acute losses exhibited over an extended period, a recovery that

Malani, A, D Shah, G Kang, G N Lobo, J Shastri, R Jain, S Agrawal, S Juneja, S Imad and U Kolthur-Seetharam (2021), "Seroprevalence of SARS-CoV-2 in slums versus non-slums in Mumbai, India", *The Lancet Global Health* Vol 9, No 2, pages e110–e111.

37. Interestingly, these six slums are all larger in size than the average slum. Because they constitute a small sample, however, it seems risky to advance a hypothetical relation between slum size and health outcomes.

38. Mecenas, P, R T da R M Bastos, A C R Vallinoto and D Normando (2020), "Effects of temperature and humidity on the spread of COVID-19: a systematic review", *PloS One*, available at https://doi.org/10.1371/journal.pone.0238339.

39. Nordling, L (2020), "Africa's pandemic puzzle: Why so few cases and deaths?", *Science* Vol 369, No 6505, pages 756–757, available at https://www.science.org/lookup/doi/10.1126/science.369.6505.756.

40. Chinazzi, M, J T Davis, M Ajelli, C Gioannini, M Litvinova, S Merler, A Pastore y Piontti, K Mu, L Rossi, K Sun, C Viboud, X Xiong, H Yu, M E Halloran, I M Longini Jr and A Vespignani (2020), "The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak", *Science* Vol 368, No 6489, pages 395–400, available at https://doi.org/10.1126/science.aba9757.

41. See reference 36, Malani et al. (2021).

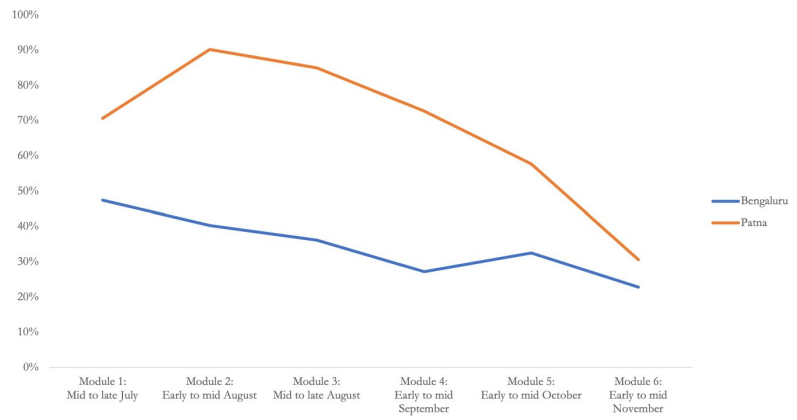

FIGURE 1
Per cent of pre-pandemic income still not recovered

remained incomplete at the time of writing in February 2021. The few key respondents we spoke with later, during and after the second wave of the pandemic, reported that the lockdowns were not as strictly enforced as in the first wave, probably resulting in fewer and lesser livelihood losses.

During the first wave, people in slums coped with the more substantial livelihood shocks in a variety of ways, with different degrees of desperation. Key informants from 60 per cent of these settlements during at least one interview round reported that their neighbours liquidated assets. In all but one neighbourhood, residents reported borrowing money during at least one interview round. Finally, substantial numbers from *every settlement* were reported as cutting back on food during at least two of our six interview rounds. Each of these methods of coping further limited a household's ability to cope with a future crisis, particularly one like the second wave that followed soon after.

The severity of the economic distress was greater in the slums of Patna. Not only was the lockdown longer in Patna than in Bengaluru – people began getting back to work by July 2020 in Bengaluru and September 2020 in Patna – but slum residents in Patna were also less likely to possess documents needed to access formal government assistance both before and during the pandemic. Paper informality was greater in Patna, restricting access to public assistance.

We look first at the situation in Bengaluru. Figure 2 illustrates changes over time in coping strategies and government assistance. Around half of Bengaluru neighbourhoods reported that at least 10 per cent of households began cutting back on food and increasing borrowing in the early stages of the lockdown. In about 10 per cent of neighbourhoods, residents liquidated assets such as jewelry in these initial months. As government assistance began to dwindle by the end of May, with slum residents still largely out of work, households began to borrow and cut back on food in larger numbers. After July, as residents were able to get back to work, the rates of borrowing began to decrease, and eventually, the number of those cutting back on food and liquidating assets began to decrease as well.

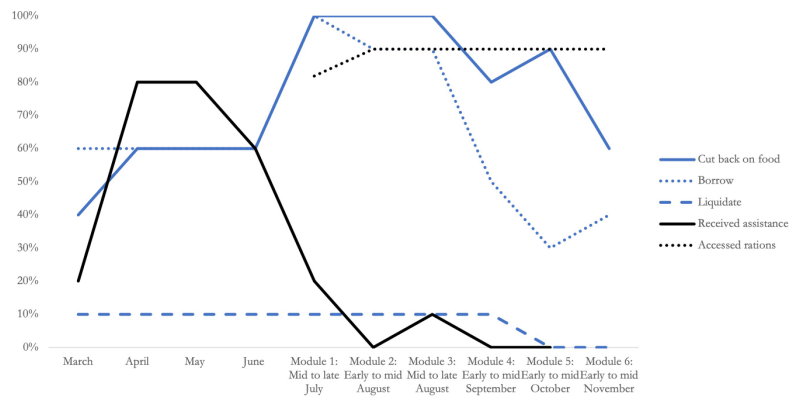

FIGURE 2
Per cent of Bengaluru neighborhoods reporting at least 10 per cent of residents relying on various coping strategies

We observed this temporal pattern not only from the repeated information in key informant modules but also from in-depth follow-up interviews with a subset of key informants, in which we inquired about both their own experiences and those of other families in the neighbourhood that fared particularly well or poorly during the pandemic.

For example, 38-year-old Ravi is a key informant living in Ashraya Nagar, Bengaluru. Before the pandemic, he earned around 15,000 rupees (~US$ 200) per month as a construction worker. He was unable to work during the lockdown (from the end of March through June) and said his family suffered during April and May because he had no savings going into this period. Government assistance helped substantially with food insecurity in his neighbourhood at the beginning of the lockdown. The local Member of the Legislative Assembly (MLA) distributed dry food rations at the end of March and in April 2020, and continued to distribute prepared meals until the end of June. The local municipal office provided free milk in April and May. By May, however, assistance from government sources had ended, and Ravi began liquidating assets to make ends meet. He sold his wife's gold jewelry.

In Patna's slums, initial earnings and savings were lower than was the case in Bengaluru, and coping patterns looked quite different (Figure 3). Slum neighbourhoods immediately responded to the lockdown by cutting back on food and rushing to liquidate assets. A few months into the lockdown, as assets declined, borrowing began to exceed liquidating. As in Bengaluru, key informants reported that government and NGO assistance had dwindled by June, leading to a sharp increase in the proportion of neighbourhoods with residents liquidating, borrowing, and cutting back on food. These coping strategies begin falling off around mid-August and early September, when the lockdown eased and people began returning to work. Access to food rations also began to increase sharply at this point. While access to food rations was relatively high and stable in Bengaluru (residents from 80 to 90 per cent of neighbourhoods reported they were

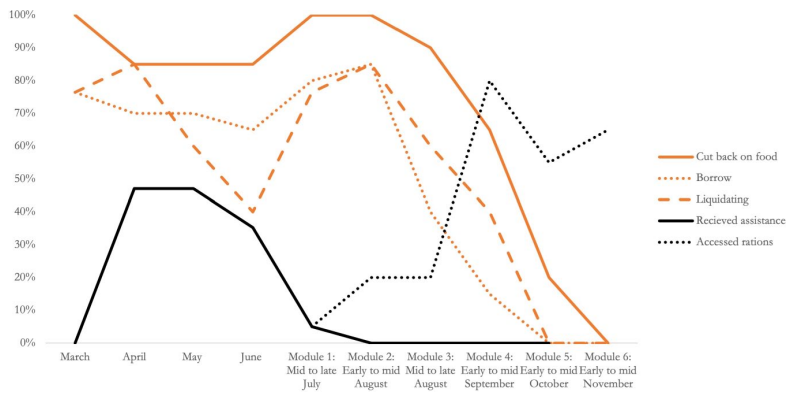

FIGURE 3
Per cent of Patna neighborhoods reporting at least 10 per cent of residents relying on various coping strategies

consistently able to access rations), this pattern appears quite different in Patna. In mid-July, residents from only 5 per cent of neighbourhoods were accessing food rations from the government, principally through MLAs, but access increased substantially in early September.

Auguring poorly for future earning ability as well, we found that education was severely disrupted in both cities, with greater disruptions for children in Patna. Formal education experienced a near-total shutdown here: while 89 key informants had one or more children attending school before the lockdown (nearly 200 children total across all respondents), just two had children at school during the lockdown. In Bengaluru, many students were able to keep up with their studies through some alternative means, typically through self-study, through their mobile phones, and, to a lesser degree, computer access. Respondents in slums higher on the continuum were somewhat more likely to indicate that students kept up with their studies. In Patna, students across the continuum failed to keep up with their studies. The few who did keep up in Patna relied on their parents' help, or, less often, on paid-for coaching sessions or lessons provided over a mobile phone.

Consistent with the different livelihood and education effects, we find that expectations about the future varied substantially between the two cities. Seventy-seven per cent of key informants in Patna expected that economic conditions would continue to worsen three months after initially being interviewed, compared to what they were before the pandemic, but only 18 per cent in Bengaluru reported the same. Fifty per cent of key informants in Patna expected that conditions would be worse six months after being interviewed than they were prior to the pandemic; the comparable figure was 3 per cent in Bengaluru. The earlier revocation of the lockdown in Bengaluru, together with the faster revival of jobs, had a great deal to do with the more optimistic expectations there.

In addition to observing differences across cities, we found variation in economic impacts across neighbourhoods within cities. In Patna, residents of slums across the continuum were likely to cut back on food

during the early period of the pandemic, but in Bengaluru, the estimated proportion cutting back on food was weakly associated with being lower on the slum continuum (p-value = 0.085) and with having fewer savings before the pandemic (p-value = 0.001). While three-quarters of settlements in both cities reported having received assistance, such as food or cash, from government and non-government agencies during the early months of the pandemic, this assistance had dwindled almost entirely by June 2020.

We found that, holding estimated income losses constant, areas with stronger leadership were more likely to receive cash assistance in Patna (p-value = 0.020) and other assistance, such as food rations, in Bengaluru (p-value = 0.066).[42] These findings are consistent with another study from two other Indian cities that found that slum leaders actively sought neighbourhood assistance during the lockdown, but varied substantially in their levels of efficacy.[43] Our evidence suggests that government assistance in this early period helped residents delay borrowing in Patna and liquidating assets in Bengaluru. Receiving assistance in one month is associated with higher levels of borrowing in the next month in Patna. The same is true for liquidating in Bengaluru.

To extend our analysis to the medium term, we examined the relationship between neighbourhood characteristics and financial distress between mid-July and mid-November, after government assistance dwindled and residents began to return to work. We found that during this period in Bengaluru, there was no longer a relationship between the estimated proportion of residents cutting back on food and the position on the slum continuum or the baseline savings levels. However, we found that reported borrowing continued to be higher in neighbourhoods with fewer formally employed workers (p-value = 0.024). Moreover, in neighbourhoods with more renters (relative to homeowners), we found that residents continued to liquidate assets at higher rates (p-value = 0.002).

In Patna, where the lockdown lasted longer, we found that where residents had lower pre-pandemic savings, key informants reported that residents continued to cut back on food more over this period (p-value = 0.083). Labour formality also appeared to have an effect. Fewer residents had to cut back on food in neighbourhoods where more people were formally employed (p-value = 0.065), as could be expected.

Within neighbourhoods, households that had been most severely affected tended to share a common set of characteristics. We asked the key informants to identify and describe the experiences of the households that they believed had been most severely impacted by the first wave of the pandemic. In all but three of these interviews, the household heads described were widowed, elderly or experiencing ongoing health challenges. Notably, our interviews also revealed that neighbours – more than the government or NGOs – provided crucial support to these most vulnerable residents. Local community members not only offered loans and food to the most severely impacted households, but also lobbied on their behalf for permission from landlords to forestall rent payments and negotiated with the government and NGOs to provide additional assistance to those households.

For example, Nita is a 38-year-old widow who lives with her two children in Patna's East Lohanipur settlement. Prior to the pandemic, she earned a total of 7,000 rupees (approx. US$ 96) per month working as a

42. We constructed a variable for strength of informal leadership by considering three questions in our household surveys, each of which looked at a different aspect of informal leadership; however, these responses were closely correlated.

43. Auerbach, A and T Thachil (2020), "How does COVID-19 affect urban slums? Evidence from settlement leaders in India", *World Development* Vol 140.

maid across four houses. Early in the pandemic, three of her four clients dismissed her, and it became challenging to pay her rent of 2,500 rupees (approx. US$ 34) per month. Nita did not have a ration card and she received no support from political parties, government departments or NGOs during the lockdown. Instead, her neighbours provided support. They negotiated rent deferral with her landlord and gave her some food rations and low-cost loans. The local shopkeeper provided food as well. After the lockdown ended, Nita began working in a second home and was earning around 4,000 rupees (approx. US$ 55) per month by September.

This was a common pattern in the two cities: the neediest were cared for by the local community. This pattern is consistent with our survey findings prior to the pandemic. In our earlier household surveys, we had found that fewer than 4 per cent of respondents borrowed primarily from banks. Instead, they were more likely to rely on one another, and their friends and neighbours were their principal sources of support and assistance. The majority of households (69 per cent) also reported that their neighbours occasionally or regularly helped each other to cope with problems, such as caring for sick family members or lending money. In four Patna settlements that spanned a range of conditions, where we conducted additional social network surveys in 2016, 95 per cent of residents said they could turn to a neighbour for help in the event of a household health emergency. Similarly, 92 per cent of residents said they could turn to a neighbour if they suddenly needed to borrow 1,000 rupees for a day.

Community support is a crucial resource for slum residents, who are relatively disconnected from formal institutions.[44] The most helpless in slums were kept afloat during the pandemic by the generosity of their neighbours.

44. See reference 17.

VI. BUILDING BACK BETTER

Knowledge about slums has increased in recent years, but still across the global South there is, as Mitlin and Satterthwaite note, an *"astonishing lack of data about informal settlements"*.[45]

45. See reference 2, Mitlin and Satterthwaite (2013), page 279.

The emergent research has made it clear, however, that slum residents have fragile livelihoods, because the underlying conditions of slum existence make lives precarious. Upward mobility is a slow-moving train while downward mobility is a daily reality. Any sudden and extended crisis spells disaster in situations where people live without safety nets at the margins of society.

Our findings suggest that in coping with the situations faced during the first phase of the pandemic, slum residents may have spent down their small savings, liquidated their meagre assets, and used up much of their debt-taking capacity, making it exceedingly difficult to deal with the next crisis. Importantly, their neighbours, upon whom they relied heavily for weathering shocks, were similarly afflicted. With debts coming due in the months ahead, households were most likely pushed further into poverty.

In their current situations, many slum households teeter on the edge of poverty. The worst effects of the pandemic are yet to be revealed, after a reckoning is made with the effects of later waves of the pandemic. It will be a long time before these households are able to recover their former

economic standing. Repeated downturns before recovery has been fully achieved could pitch many slum households into chronic poverty.

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ORCID iD

Emily Rains https://orcid.org/0000-0001-6053-8425

SUPPLEMENTARY MATERIAL

Supplemental material for this article is available online.

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