

**COVID-19 Pandemic, Lockdown and the Indian Labour Market:
Evidence from PLFS 2017-18**

Vasavi Bhatt, Shweta Grover, Ajay Sharma



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[Email\(corresponding author\): vasavi@igidr.ac.in](mailto:vasavi@igidr.ac.in)

Abstract

Using the PLFS 2017-18, this study intends to analyse current labour market from the perspective of COVID-19 pandemic, subsequent lockdown and the expected slowdown in the Indian economy. We intend to explore the questions such as: a) What part of labour market would be largely unaffected from lockdown and expected slowdown? What type of occupations would be the most risky in the wake of social distancing norms? Which are the vulnerable groups of workers in the labour market, that are likely to be the most affected due to the lockdown and its aftermath

Keywords: COVID-19, lockdown, Indian labour market, work from home, decent work

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Evidence from PLFS 2017-18

Vasavi Bhatt, Shweta Grover and Ajay Sharma¹

¹ Vasavi Bhatt is Ph.D. Candidate with Indira Gandhi Institute of Development Research. E-mail: vasavi@igidr.ac.in
Shweta Grover has recently completed her Ph.D. from Indian Institute of Management Indore.
Ajay Sharma is faculty at Indian Institute of Management Indore. E-mail: ajays@iimdr.ac.in

1. Introduction

COVID-19 has overpowered the ability to earn a living for many people, rendering the world economy to a standstill, and bringing a myriad of social and economic changes. The situation in India is no different. With the number of COVID-19 cases increasing significantly, the Indian government announced a complete lockdown to practice social distancing like many other countries. During the lockdown, unemployment increased from 8 percent to 24.3 percent between March and May [CMIE]². According to the Ministry of Statistics and Programme Implementation (MOSPI), India's Industrial Production (IIP) fell by 16.7 percent year-on-year in March 2020³. It is the steepest decline since 1994. A plausible reason could be that the lockdown has closed many businesses either temporarily or permanently eventually exposing many workers to job loss. Against this background, this study intends to explore, how will the pandemic and slowdown affect the Indian labour market? Who will be the most and the least vulnerable workers in the current labour market if a long term shock or slowdown of systemic nature is observed?

On May 3, 2020 the government partially opened up the economic activities suggesting workers to continue working from home to ensure social distancing. This kind of work flexibility is not ubiquitous across all jobs and the plight of migrants is conspicuous through the media. Moreover, there is not much information about the extent and estimates of actual individuals being adversely affected by the lockdown⁴. Interestingly, the district level estimates of migrants

²<https://unemploymentinindia.cmie.com/> (Last accessed on May 30, 2020).

³<http://mospi.nic.in/iipdata> (Last accessed on May 30, 2020).

⁴<https://www.outlookindia.com/website/story/india-news-no-data-of-stranded-migrant-workers-labour-ministry-reveals-in-rti-query/352164> (last accessed on May 30, 2020)

from Census 2011 are not yet fully released⁵. Gita Gopinath, chief economist at the International Monetary Fund (IMF), in a blog⁶ (dated April 14, 2020) suggested that the coronavirus led slowdown across the world is likely to be bigger than financial crisis of 2007-08 and the great recession with more geographic outreach.

In light of the detrimental effects of COVID-19 on the global and national economy, this study explores three key aspects of the Indian labour market. First, we intend to understand what sort of occupations and workers will be able to cope with the aftermath of the lockdown and following slowdown. For this, we analyse the task content of the occupations to explore flexibility of jobs. Workers employed in occupations that enable spatial flexibility or working from home are likely to be the least affected and one of the first to adapt to the changing need of the time. Based on our estimates from Periodic Labour Force Survey (PLFS) 2017-18, approximately 17-19 percent of non-farm workers are engaged in work from home (WFH) occupations, with women and urban areas having larger share of these workers.

Second, given the nature of the pandemic, many of the occupations are categorized as risky due to high exposure to human interaction. We show that almost half of the workers are employed in high risk and medium risk occupations. Since social distancing is the key element of this pandemic, how will it affect certain set of industries based on their occupational composition, is also important to understand. For example, tertiary sector activities such as tourism, hospitality, repairs and related services are likely to get more affected than others.

Third, we identify the set of workers who are the most vulnerable in the current labour market. The vulnerability in the labour market is defined as per the definition of ILO (2009) based on the concept of social safety nets. We find that 15-17 percent of non-farm workers in rural and urban areas are vulnerable and face higher risk of job loss during a lockdown.

⁵<https://www.outlookindia.com/website/story/india-news-no-data-of-stranded-migrant-workers-labour-ministry-reveals-in-rti-query/352164>

⁶<https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/>

The rest of the paper is organized as follows. In the next section, we present the conceptual framework and related literature on labour markets and crisis. Section 3 discusses in detail the dataset and methodology used in the analysis. Section 4 provides the main findings about the various aspects of labour market i.e. workers in WFH jobs, high risk jobs and vulnerable workers. The last section concludes.

2. Conceptual framework and related literature

The effect of macroeconomic slowdown on labour market agents varies with labour market institutions prevalent in different countries. Developing countries, like India, house a large informal sector and informal workforce that coexists with limited social security and other safety nets. However, in developed countries labour market institutions and policies are well placed and the fiscal cover for citizens by the governments is bigger due to small size of their population and higher per capita tax collection. For example, the Danish government has assured that private sector workers who would lose their jobs due to coronavirus pandemic shall be paid 75 percent of their salaries⁷. Although the literature on the performance of labour market during the crisis/slowdown is largely confined to developed countries but it is still useful to outline a conceptual framework to understand various channels through which labour markets and especially workers are affected⁸.

The first channel is through direct job loss on account of reduced aggregate demand in the economy and reduction or closure of production activities. The economic downturn leads to longer durations of unemployment (Kroft et al., 2016). Falling revenues and rising costs of firms leads to job loss for workers (Fairlie, 2013; Von Wachter et al., 2009). Unlike regular times,

⁷ <https://www.brusselstimes.com/all-news/eu-affairs/100505/danish-government-will-pay-75-of-threatened-private-sector-salaries/> (Last accessed on May 30, 2020).

⁸The extensive literature talks about all the agents in the labour market, i.e. workers (including self-employed), firms, intermediaries as well as government agencies, but our focus in the study remains confined to workers. See Bewley (1999), Fabiani et al. (2015).

when a business fails during recession, many firms simultaneously lose demand, making it difficult for former employees to be rehired. Hoynes et al. (2012), show that in the US economy from 1979 to 2011, men, blacks, younger age cohort and workers with low education level suffer the most in terms of employment loss. They argue that manufacturing and construction sectors are more cyclical and most affected during the recession whereas services and government sector remain less exposed to cyclical fluctuations. Most of these studies are ex post facto analysis. In case of current situation, where slowdown is induced by a global pandemic and the response of the economies in terms of universal lockdown of countries and social distancing, the affected group of workers can be different than in the past.

The second channel discusses the skills and jobs that would be affected by the slowdown and crisis. Recession or slowdown may lead to huge churning in the labour market in the favour of highly skilled workers and non-routine jobs (Hershbein & Kahn, 2018). Jaimovich and Siu (2020) show that most of the jobs lost during recession are in routine occupations and are never recovered.

The third channel explores the role of government interventions using various active and passive labour market policies targeting firms and workers. Recessions are believed to be the best time to introduce large scale labour market reforms. It becomes essential for countries to make comprehensive changes in their approach to tackle labour market woes, explained by Turrini et al. (2015) as the “back against the wall” hypothesis. Adascalitei and Morano (2015), provide a detailed account of labour reforms across countries after the 2008 crisis. Eichhorst et al. (2010) show how labour market institutions provide buffer to the labour market at the time of crisis (financial crisis 2008). In case of Germany, stringent employment protection laws limited the dismissals. At the same time, policies on work hour regulations allowed firms to adjust their costs and efficiently cope with the economic downturn. Taking lessons from this for India, smartly taken labour market reforms can provide some stability in its labour market.

Drawing motivation from these various strands of literature on economic slowdown and labour market outcomes, we discuss various groups of agents who are likely to be affected in the aftermath of economy wide lockdown and imminent slowdown of Indian economy.

3. Data and methodology

This study uses data from the PLFS conducted by National Sample Survey Office (NSSO) for the period July 2017 to June 2018. The PLFS data provides the socio-economic and demographic information for a sample of 102,113 households comprising 433,339 individuals in rural and urban areas across all Indian states. The primary focus of the survey is to provide information on the economic activity status of all household members including their occupation and industry of work. This dataset also enables us to look at the status of workers from multiple perspectives such as enterprise type, location of work and social security benefits. The occupation codes are available at 3-digit level based on National Classification of Occupations (NCO) - 2004 and the industry of work codes are available at 5-digit level based on National Industrial Classification (NIC) - 2008. The information on non-farm⁹ workers in the working age (15-59 years)¹⁰ is based on their usual principal and subsidiary status of work. Sample weights provided in the dataset are used to derive population estimates.

Identifying work from home (WFH) occupations

Given the nature of COVID-19 pandemic and its implications on nature of interaction among individuals, social distancing is indispensable. For many of the occupations, working in close proximity and face-to-face communication along with similar other aspects are key tasks to be

⁹Non-farm sector, in this study, excludes NIC 2008 division 01, “Crop and animal production, hunting and related service activities” but includes division 02, “Forestry and logging” and division 03 “Fishing and aquaculture”.

¹⁰The Annual Report PLFS 2017-18 (Government of India 2019) identifies 15-59 years as working age. We follow the same practice in this paper. Only 0.18 percent of workers in the sample are less than 15 years old and 7.36 percent are 60 years or older.

carried out on day to day basis. This leads to a natural question, what are the occupations that can be carried out from remote locations.

One can always conduct a survey of the workers and ask them direct questions whether their day to day activities require interacting face-to-face or require some complement technology which is difficult to access from remote location¹¹ (Nakrošienė et al., 2019). For example, a machine operator in a manufacturing plant would not be able to work from remote location due to machine being complement to his primary task requirement. On the other hand, a teacher would require just a communication device, a mobile phone or laptop with internet connection for him/herto conduct teaching sessions from remote location¹². One can also analyse the task content¹³ of various occupations, to classify them as being teleworkable or not. This is one of the traditional ways to analyse and categorize various occupations along different lines, such as for offshorable occupations (Goos et al., 2014), routine and non-routine tasks (Autor et al., 2003). The second approach allows using secondary sources of data unlike the first approach that requires primary data collection from workers. For our analysis, we use the second, task-based approach to identify WFH jobs and corresponding labourforce.

To this end, we use the classification proposed by Dingel and Neiman (2020, hereafter DN) and extended by Yasenov (2020). DN use the O-NET¹⁴ classification of occupations (an extensive job survey covering various aspects of jobs and workers suitable for them). It is a US based dataset. Since the relative position and essential characteristics of occupations are likely to be similar in any country, O-NET is one of the most standard and widely used datasets for countries other

¹¹For a detailed report on cross-country analysis of tele work and its relation to labour market using the direct surveys of workers, please refer to Eurofound (2017).

¹²Remember that not all type of teachers can conduct classes from remote location for example laboratory sessions.

¹³See Autor (2013) for a task based approach to analyse labour markets.

¹⁴For our analysis, we use the 23.1 version of O-NET database and the O-NET- Standard Classification of Occupations (SOC) by International Labour Organization (ILO) cross walk to match with the NCO classification.

than the US. We use it due to the absence of a dataset that quantifies attributes of occupations in India¹⁵.

DN identify seventeen attributes from O-NET covering multiple aspects of an occupation such as requirement of physical activity, working with machine and equipment, virtual or physical contact with other people and exposure to outdoor environment, infection or injury to decipher which occupations can be categorized as WFH. Yasenov (2020) add another eleven attributes to this list to make the criterion more stringent. Both these methods classify an occupation as WFH only if none of the requirements hold¹⁶.

We first identify the WFH occupations among the NCO 2004 4-digit occupations. If all the 4-digit occupations within a 3-digit occupation are classified as WFH, we classify the latter also as WFH¹⁷. To check the sensitivity of our estimates of WFH occupations and workers, we also follow the method by Yasenov (2020). Following DN (Yasenov) method 16 (12) 3-digit occupations out of 113 can be done from home in India. The WFH occupations employ 17 to 19 percent of working age non-farm workers in India but their distribution is rather skewed across major occupation groups. Skill intensive occupation groups have a higher share of workers who can WFH, explained in detail later in the paper.

Measuring riskiness of occupations

Given that the current crisis is also a health hazard and the virus spreads through human interaction, jobs that expose workers to infections or make social distancing impracticable are

¹⁵It has been used in recent studies in the context of India (Balasubramanian, 2016; Sarkar, 2019; Vashisht and Dubey, 2019)

¹⁶Refer to Appendix for detailed discussion on construction of WFH measure.

¹⁷We also tried a different approach to classify NCO 2004 3-digit occupations as WFH where we first matched the NCO 2004 3-digit codes with SOC 2010 6-digit codes and then followed the DN method. Based on this, NCO code 312 i.e. Computer Associate Professionals was assigned the not WFH category. On the other hand NCO code 332 i.e. Pre-Primary Education Teaching Associate Professionals and NCO code 611 i.e. Market Gardners Crop Growers were classified as WFH. Computer Associate Professionals seem to be a WFH occupation compared to the other two. Hence we follow the method described in the paper.

more risky than others. Thus, risk level of an occupation has bearing on the continuity of the worker's employment. For measurement of risk factor, we categorize occupations based on the following attributes from O-NET: "performing or working directly with public", "physical proximity" and "exposed to disease or infections"¹⁸ (Bhorat et al., 2020; Barbieri et al., 2020). The value for each attribute ranges from 1 to 5 and is rescaled on a scale of 0 to 100. The three attributes are added and further standardized on a 0 to 100 scale to calculate an integrated risk factor. Occupations are categorized as high, medium and low risk if their risk factor is greater than or equal to 70, less than 70 but greater than or equal to 50 and less than 50 respectively. Out of 108 3-digit occupations, 21 are high risk, 29 are medium risk and 58 are low risk occupations¹⁹.

While using WFH and risk level classifications, a few caveats are important to mention to understand the limitations of this approach. These measures are only indicative of the actual characteristic of the occupations as workers may actually not be able to work from home for multiple reasons. For example, teachers may not be able to practice it in the absence of electricity, proper internet and electronic equipment among many other things with them or the students. Similarly, if a firm stops running on site, then its share of WFH workers will also not have any work to do from home. The structure of the job and sector may modify to mitigate human interaction, for example by automation, which may lower risk factor of the occupation. Therefore, these measures at best give an upper bound of number of workers in occupations based on WFH and risk level classification.

¹⁸ Different other attributes from O-NET have been used to assess the contact intensity of occupations. We believe that the aforementioned attributes in the form of an index best capture the overall risk factor of an occupation. See, <https://bit.ly/36KFb3s>; and <https://bit.ly/2TRis00> (Last Accessed on May 30, 2020).

¹⁹ For five 3-digit occupations, we could not find values for the components of the risk factor in O-NET, and hence, they were dropped.

Vulnerability in labour market

ILO (2009) defines a worker to be vulnerable if a) the earnings from the employment is not able to lift the person and his/her household out of the poverty, b) the economic activities carried out by the workers is not able to provide them any social safety nets in terms of social security benefits, paid leaves, formal contracts and so on, and c) a combination of both (a) and (b) criteria. These workers are the most vulnerable to any shock in the labour market and ILO (2009) report argues that their employment cannot be counted as decent work (sustainable development goal8). Saunders (2003) adds one more criterion to identify vulnerable workers which is workers who though are eligible to receive social security benefits but are either unaware to avail such benefits or are not given such benefits (evaded by the firms). We can identify these groups from the PLFS survey dataset that collects information on nature of economic activity, social security benefits (based on questions asked to the survey respondents), employment contracts as well as the consumption expenditure of the corresponding household to ascertain the poverty status.

4. Main Results

We will first discuss the estimates and characteristics of the WFH workers followed by the distribution of workers in occupations of different risk levels. Lastly, we will address the vulnerable group of workers in the labour market.

Workers in work from home (WFH) occupations

As per the PLFS survey, the potential WFH workers constitute 19 percent of the workforce which is an increase from 16 percent in 2011-12 (Chatterjee et al., 2020). It is comparable to the

estimate of 13 percent workers for developing countries but is way less than USA (34 percent) and China (28 percent based on Yunnan Province estimates) (Saltiel, 2020).

In India, urban areas have higher share of WFH workers than the rural areas (see Table 1). This remains true for both male and female workers. A larger share (23percent) of female labour force is employed in WFH occupations than their male (18 percent) counterparts. Such pattern could be an outcome of gender roles assigned to occupations and more flexible occupations preferred by women. It has been observed that more women work in cognitive jobs while more men work in manual jobs (Acemoglu & Autor, 2011; Balasubramanian,2018). An age-cohort wise analysis highlights that individuals in older age cohort are more likely to be in WFH occupations than younger worker (see Appendix Table A1). Work experience and job hierarchy can be an explanation for this. Older workers may move towards jobs where nature of tasks changes in the direction of delegation and management requiring lesser day to day interaction with other workers on floor that can be performed remotely. There is mixed evidence in the literature about how the distribution of workers varies with age²⁰. While Mongey et al. (2020) do not find any difference between the age of workers who can and cannot work from home, Saltiel (2020) on the other hand finds that workers older than 40 years are more likely to not work from home.

[TABLE 1 HERE]

The 37.41 million workers (by DN approach) in India who can potentially work from home are concentrated in few major occupation groups. Based on one digit occupational classification, following DN approach, legislators, senior officials and managers (category 1), professionals (category 2), associate professionals (category 3) and clerks (category 4) have 87, 43, 49 and 57

²⁰ There is also evidence that workers in industries that face greatest economic risk due to pandemic and hence social distancing are younger workers. (<https://www.brookings.edu/research/who-are-the-workers-already-impacted-by-the-covid-19-recession/> - Last accessed on 30 May, 2020)

percent of WFH workers respectively²¹. Service-related occupations and other elementary occupations or those that require working on site or outdoors have negligible percent of workers who can work from home. Based on this, we can say that WFH occupations are generally associated with cognitive tasks, which is also corroborated by the fact that a larger share of workers (47 percent) in WFH jobs have above higher secondary level of education. The same holds for rural and urban workers where 39 percent and 53 percent of workers in WFH jobs belong to above higher secondary level of education respectively. On the other hand, only one fifth of the entire workforce falls in this category of education level, and the share is even lower for non WFH workers.

In an economy with around 70 percent of workers engaged in informal employment/sector, it is not surprising that a large share of workers engaged in self-employed activities are in WFH category (29 percent) as compared to wage and salaried employees (21 percent). This seems counterintuitive in comparison to the existing literature (Saltiel, 2020). But exploring further, a justification can be provided. First, the self-employment is not a homogenous category and includes own-account workers, employers and helpers. The incidence of WFH is lower among own account workers (28 percent) and helpers (23 percent) as compared to employers (54 percent). Employers largely perform delegating tasks which can be done from remote location while worker work from the site. Also own-account workers do not have to engage with other workers which may facilitate remote working. Looking at the occupational composition of the self-employed and wage and salaried further confirms this argument. The occupation “Directors and Chief Executives” which is a WFH occupation by DN and Yasenov approach constitutes 27 percent of total employment of self-employed (own account and employers) workers. In case of wage and salaried workers, two of the largest occupations employ only 15 percent of these workers and fall under non WFH category.

²¹ The corresponding numbers by Yasenov approach are 84, 34, 38 and 57 percent respectively.

Next, we come to the spatial distribution of workers in WFH jobs. We generate the district level share of workers who can work from home using PLFS data. In Figure 1, it seems clear that some states and regions have higher concentration of WFH workers. This includes states of Karnataka, Kerala, parts of Tamil Nadu, national capital region of Delhi and nearby districts, coastal Maharashtra (including Pune), Chandigarh and adjacent parts of Haryana, Punjab and Himachal Pradesh, substantial part of North eastern states, Kolkata and nearby districts. Further we also see a clear difference in the rural and urban areas with nature of concentration in rural areas is largely in the outskirts of major agglomerations (See Appendix Figure A1 and A2).

[FIGURE 1 HERE]

As share of WFH workers at the district level does not provide the magnitude of the WFH workers in different states. We provide the position of various states in terms of total workers share and their corresponding share of WFH workers in Figure2.

[FIGURE 2 HERE]

One key takeaway from this distribution is that, we can make some calculated predictions that what are the regions who would be able to cope with the wrath of the lockdown and what are the regions that would be the most affected by the lockdown. Regions highlighted above given the flexibility of local labour market in terms of teleworkable workforce are less likely to see a large dip in economic activities as well as in dismissal and discontinuation of employment, compared to other regions. Before we move on, a few cautions are in place. First, in the PLFS data, we get the information about the geographical location of the residence of the worker and not the workplace. Therefore, one should understand that effect of commuting is not accounted for in

our calculations²². We can always argue that distance of commuting generally is not more than crossing a district/cluster region in India.

Workers in high, medium and low risk occupations

During the lockdown on account of COVID-19 pandemic, on the opposite spectrum of WFH workers are the individuals who are part of essential services and engaged in activities which can be classified risky, as the concept of social distancing does not apply to them. Though many of the essential services come under the high risk occupations, the reverse is not true. For example, a barber is a high risk occupation, as social distancing cannot be maintained and further physical proximity with the clients also leads to exposure, but it is not characterized as essential services.

Workers in high risk occupations are always going to be more exposed to infections by virtue of their jobs requiring them to deal with public, working in proximity with other workers or exposing them to disease or infections. Then there are workers whose jobs are low risk but face the risk of job loss because they cannot go out and work. But these workers will find it least difficult to go back to work. Hence, returning to work post lockdown depends on the risk factor associated with the job and it is likely to be slower for workers in high risk jobs. Therefore, industries that have a larger share of workers in low risk occupations may find it easy to reopen.

Using the aforementioned risk index, we find that almost half of the workforce is employed in medium or high risk jobs (see Table 2). The share of workers in these jobs is higher in rural areas than in urban areas. Similar pattern holds for men. However, almost 60percent of women are in these jobs. It can be noticed that women have a higher share of workers in WFH jobs and lower share in low risk jobs. Thus, a lockdown like situation may have a less intense impact on

²²Due to lack of geographical location of workplace, accounting for commuting remains a non-trivial albeit tedious exercise.

women as compared to men but bringing them back to work may be more difficult (Mongey et al., 2020).

[TABLE 2 HERE]

The ten most risky occupations employ 10.23 million workers comprising more than 5 percent of the non-farm workers (see Appendix Table A2) and none of these occupations fall in the WFH category of occupations. Health personnel and protective service workers which include police officers also belong to the essential services. Travel attendants and personal service workers such as barbers do not come under essential services and are also not able to perform their jobs at home. Hence, their services are suspended in view of social distancing making them vulnerable to a voluntary lockdown like situation.

Combining the WFH feasibility and the risk factor of the occupations at the sectoral level can provide more insight into which sectors are most exposed to risk and which sectors remain functional in a lockdown like situation so that informed policy decisions can be made (see Table 3).

[TABLE 3 HERE]

Three stark work environments emerge from Table 3. The first one is the safest work environment with a large share of workers employed in low risk and WFH jobs. The information and communication sector is one such sector where more than 60 percent workers can work from their homes and more than 70 percent of them also perform low risk activities. In the education sector, most of the workers perform medium risk jobs followed by low risk jobs and can work from home also. The requirement to make interaction and work with close proximity to students may increase the risk factor of jobs in this sector. However, with remote learning most of the workers in this sector can shift to low risk category. Another work environment consists of low risk jobs that cannot be performed remotely. The sectors that fall in this category

are manufacturing, water and sewerage and wholesale and retail. Only the essential services that fall under these sectors can function in a lockdown like situation since most of the workers in these sectors need to go on site to work. This makes these workers vulnerable not to health risk but to a voluntary lockdown. The third category of work environment consists of jobs that are at high risk and cannot be done from home. Such sectors are transport and storage, public administration and human health. These sectors are also essential to keep the society running in the situation of a lockdown.

[FIGURE 3 HERE]

In the current situation, one might be interested in understanding whether regions which are better off in terms of economic activity and per capita income are also center of high risk jobs or not? Especially when, in the current scenario the worst hit regions by coronavirus are the centers of economic activity. A larger share of workers in high risk jobs in these regions can make matters worse even when the lockdown is revoked. Using per capita state domestic product as a proxy for economic activity, Figure 3 suggests that the share of workers in high risk jobs in a state tends to bear a positive relation with its per capita net state domestic product. This figure shows the position of the states in terms of risks faced by them while opening up.

This sub-section provides the policymakers a tool to understand the risks faced by the workers and in turn by the economy during the lockdown as well as during the process of opening up of the economy.

Vulnerable workers in labour market

We use the indicators suggested by ILO (2009) to measure the vulnerable workers in the labour market. First set of workers are part of below poverty line households. In India, the recent poverty line estimates based on NSSO data for 2011-12 is provided by Rangarajan Committee Report (Government of India, 2014). They show that in 2011-12, poverty rate was 22 percent for

India. Since there are no official estimates of poverty after that, we use the bottom two deciles of households by their monthly per capita expenditure to identify below poverty line households²³. Based on this criterion, we find that 15 percent (15.2 million) of rural and 17 percent (15.9 million) of urban workers can be categorized as vulnerable and not part of decent employment.

Moreover, in order to practice social distancing, these workers are likely to be out of work (among these workers only 7 percent in rural and 13 percent in urban areas can work from home) with their household most affected. Their chances of getting employment will also be gloomy in the succeeding slowdown. A further look into the economic activities done by these vulnerable workers reflects that in rural areas, they largely work as casual workers (53 percent), followed by self-employed (27 percent) and lastly wage and salaried workers (20 percent). In the urban areas, the situation is slightly better with 38 percent self-employed, 34 percent wage and salaried and 28 percent casual workers. Also among the vulnerable workers engaged in wage and salaried activities, 91 percent of rural and 94 percent of urban earn below Rs. 15000 per month of salary, which is a threshold below which worker should be mandatorily eligible for social security benefits if the size of the firm in which they are employed is above 20 workers²⁴. Only 16 (19) percent of rural (urban) vulnerable wage and salaried workers, are part of enterprises above 20 workers. A cursory look highlights that majority of these vulnerable workers are engaged in economic activities outside the purview of social security benefits. Coming to whether they (wage and salaried vulnerable workers) actually receive any type of social security benefit (such as provident fund, pension, gratuity, maternity or health benefits) from their employer or not, we find that only 18 percent (0.53 million) in rural and 14 percent (0.77 million) in urban give the answer in affirmative. In addition, 16 percent (0.46 million) in

²³Estimates of poverty rate for 2011-12 using the Tendulkar methodology are 25.7 percent in rural areas and 13.7 percent in urban areas. On the other hand for the same period, Rangarajan committee estimates are 30.9 percent for rural and 26.4 percent for urban areas.

²⁴For some of the regulations, the eligibility is 10 workers or above. For a detailed discussion on worker's welfare and social security benefits (especially provident fund) refer to Naraparaju and Sharma (2017).

rural and 13 percent (0.70 million) in urban areas are not aware whether they receive or are eligible for such benefits.

Interestingly, out of the 15.2 (15.9) million vulnerable workers in rural (urban) areas, only 0.55 (0.77) million receive any type of social security benefit i.e. only 4-5 percent of these workers. Rest 95 percent of vulnerable workers do not have any cover for them during the situations like lockdown or slowdown and recession. Their households are most vulnerable to the shocks in the labour market. In the current scenario, some of the direct policy intervention such as reduction in the deductions for Employee Provident Fund (EPF) for employees and employers from 12 percent to 10 percent would only benefit to a miniscule of these vulnerable workers (4-5 percent). On the other hand, increase in the allocation of Mahatma Gandhi National Rural Employment Scheme (MGNREGS) would surely benefit the casual workers and part of other workers who would be forced to work as casual labour in the rural areas. For urban vulnerable workers, no such direct schemes are announced which has been one of the triggers for worker's mobility from urban to rural areas²⁵.

Another important safety net, which can reduce the impact of a voluntary lockdown for wage and salaried workers can be availability of paid leaves. In PLFS survey, we do not have information on how many paid leaves a worker can take but we can identify whether or not worker is at least eligible for such leaves. As compared to overall incidence of paid leave eligibility of 44 (47) percent in rural (urban) areas, among the vulnerable wage and salaried workers, it is just 26(19) percent. Further, only 13 (11) percent of vulnerable wage and salaried workers in rural (urban) areas have any type of written contract with their employers.

After closely observing the characteristics of the vulnerable group of workers, we can say that majority of them do not even qualify for any type of social security net, but even those who

²⁵We do not intend to say that this is a primary trigger for such mobility but contributes to a long list of woes faced by vulnerable group of workers, especially in urban areas.

qualify for such benefits do not have it, either due to informal nature of employment, avoidance or evasion by the employers or in some case even the workers do not want to be part of the formal contracts in order to take higher earnings in current period at home.

5. Conclusion

This study attempts to provide a timely analysis of labour market with a focus on identifying the effect of COVID-19 pandemic induced lockdown and the subsequent slowdown. Using PLFS survey 2017-18, we identify various groups of workers in the labour market who would be largely unaffected, exposed to higher risk (especially in the wake of social distancing) and would be the most vulnerable set of workers in the current scenario. The key takeaways are as follows.

First, in the aftermath of the lockdown and with social distancing being the norm, the possibility of working from home or remote locations will be one of the most desired traits of the workers. We identify the WFH occupations and find that they employ less than 20% of workers. Women have higher share than men in such occupations and they are largely concentrated in urban areas. We also find that some occupations are more risky than others in terms of exposure to human interaction. Almost half of the labour force is employed in high risk and medium risk occupations. Depending on the composition of workers by the risk level of their jobs, certain industries are more affected than others. Lastly, we identify the vulnerable group of workers as per the definition of ILO (2009) for Indian labour market. Using the bottom two deciles as proxy for poor households, we find that 15 percent of rural and 17 percent of urban non-farm workers can be categorized as vulnerable, with no decent work. Most of them are either self-employed or casual workers and largely without any social protection.

It is pertinent to gauge the magnitude of workforce and the occupational structure of an industry by the feasibility of the jobs to be done at home, the associated risk level and

vulnerability. This will enable to make informed policy decisions that can facilitate workers to go back to work in a safe environment. This study intends to provide inputs for the Indian policy makers and academics, who are working for the benefits of various agents in the labour market. It attempts to start a dialogue and discussion to design and implement labour market policies which utilize the strengths of the current labour market as well as is aware of the Achilles' heel in the current scenario.

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Figures

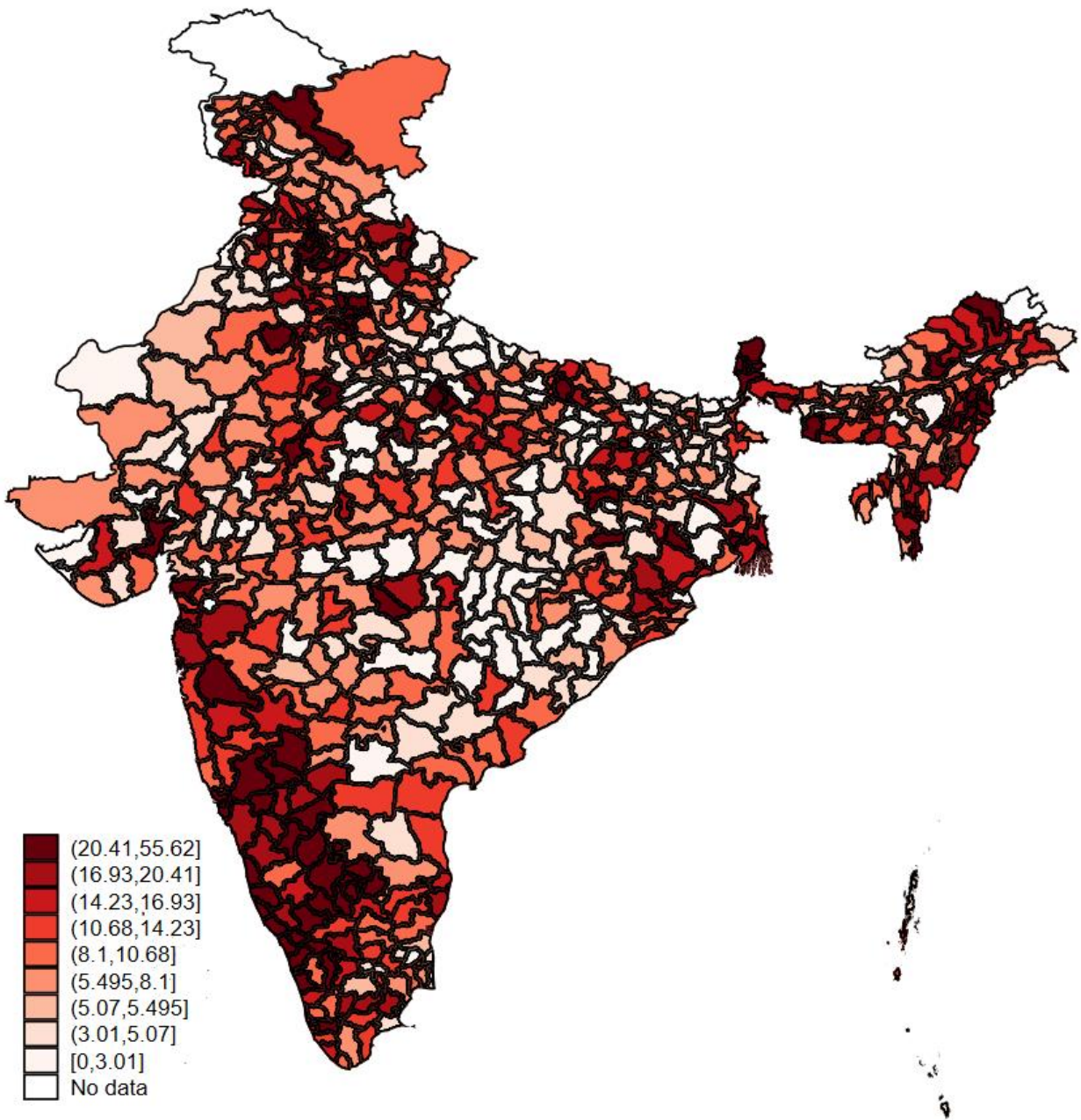


Figure 1: District wise share of WFH workers using DN approach

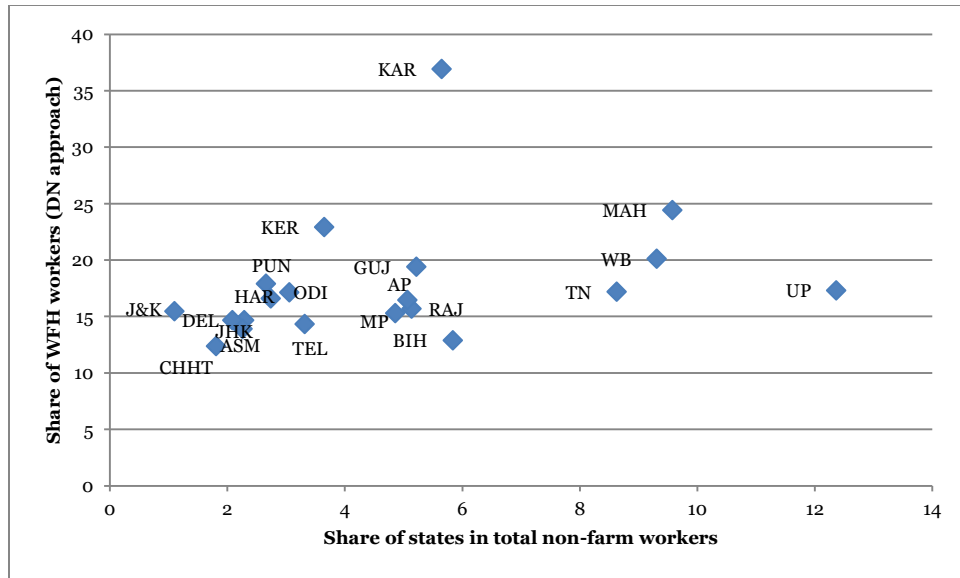


Figure 2: Top 20 states based on share of total workers and share of WFH workers

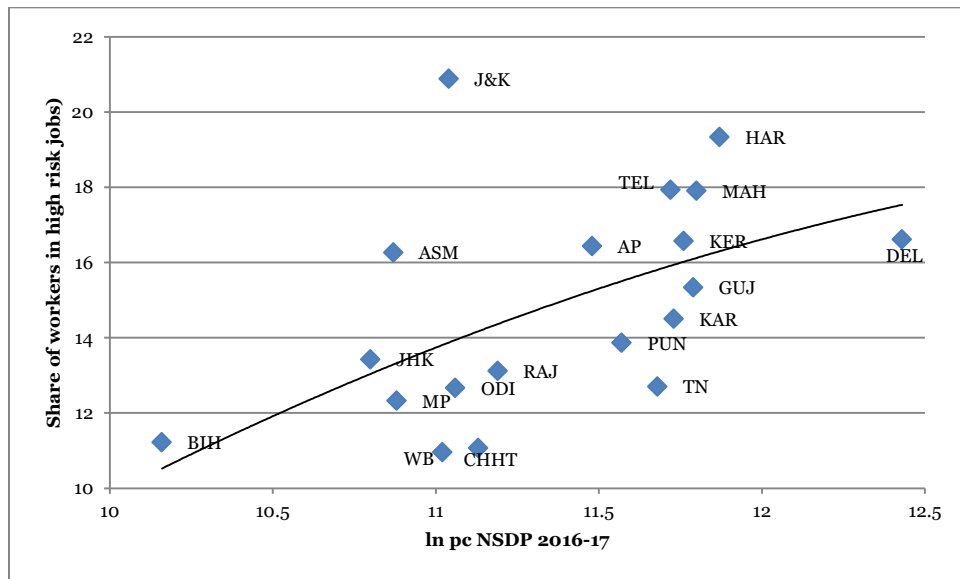


Figure 3: Correlation between per capita NSDP 2016-17 and share of workers in high risk jobs for top 20 states by number of workers

Tables

Table 1: Share of Workers in the Working Age Group (15-59 Years) in WFH Occupations, 2017-18

	Total			Male			Female		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
WFH (in percent) DN approach	15.68	22.34	18.87	15.01	21.32	17.95	19.21	26.45	23.08
WFH (in percent) Yasenov approach	15.03	19.31	17.08	14.32	18.14	16.10	18.76	24.01	21.57
Total workers (millions)	103.43	94.86	198.29	86.90	75.90	162.80	16.53	18.96	35.49

Source: Authors' estimates based on micro data from PLFS 2017-18.

Table 2: Share of Workers in the Working Age Group (15-59 Years) in Occupations by Risk Level, 2017-18

	Total			Male			Female		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
High Risk (in percent)	13.50	14.61	14.03	14.51	15.13	14.80	8.18	12.54	10.51
Medium Risk (in percent)	40.81	29.28	35.29	38.61	26.62	33.02	52.40	39.90	45.71
Low Risk (in percent)	45.69	56.11	50.68	46.88	58.25	52.18	39.43	47.56	43.78
Total workers (millions)	103.22	94.72	197.94	86.75	75.78	162.53	16.47	18.94	35.41

Source: Authors' estimates based on micro data from PLFS 2017-18.

Table 3: Distribution of Workers in the Working Age Group (15-59 Years) by Feasibility to Work from Home and Risk Level of Their Occupation Across Sectors, 2017-18

NIC 2008 Sections	Share of workers (in percent)	Workers in Non WFH Jobs (in percent) (DN Approach)	Workers in WFH Jobs (in percent) (DN Approach)	Total (in percent)	Workers in High risk Jobs (in percent)	Workers in Medium risk Jobs (in percent)	Workers in Low risk Jobs (in percent)	Total (in percent)
Agriculture	0.74	94.54	5.46	100	2.24	61.36	36.40	100
Mining	0.74	93.49	6.51	100	8.76	48.38	42.86	100
Manufacturing	21.53	86.95	13.05	100	2.21	19.24	78.56	100
Electricity	0.63	86.44	13.56	100	15.61	40.59	43.80	100
Water & Sewerage	0.44	81.09	18.91	100	8.21	16.04	75.75	100
Construction	20.92	97.44	2.56	100	0.56	78.98	20.46	100
Wholesale & Retail	17.43	76.61	23.39	100	1.39	7.71	90.91	100
Transportation & Storage	9.01	89.56	10.44	100	70.21	5.03	24.76	100
Accommodation & Food	3.26	79.15	20.85	100	2.87	50.66	46.47	100
Information & Communication	1.86	37.87	62.13	100	7.66	19.46	72.88	100
Finance & Insurance	1.92	70.93	29.07	100	8.37	49.52	42.11	100
Real Estate	0.38	52.27	47.73	100	5.57	55.08	39.35	100
Professional, Scientific & Technical	1.49	72.50	27.50	100	17.88	44.40	37.72	100
Administrative & Support	2.10	67.07	32.93	100	36.02	20.45	43.52	100
Public Administration	2.93	70.08	29.92	100	43.79	14.92	41.29	100
Education	7.00	32.09	67.91	100	12.72	58.76	28.51	100
Human Health	2.17	91.69	8.31	100	69.89	17.29	12.81	100
Arts & Entertainment	0.46	83.92	16.08	100	15.03	63.10	21.87	100
Other Service	3.18	78.09	21.91	100	31.51	30.18	38.31	100
Household Activities	1.82	98.43	1.57	100	25.18	68.87	5.95	100
Total (millions)	197.94	160.52	37.41	197.94	27.77	69.86	100.31	197.94

Source: Authors' estimates based on micro data from PLFS 2017-18.

Appendix

WFH Measure

Following are the attributes used by Dingel and Neiman (2020) from O-NET to create the WFH measure:

I. Generalized Work Activities

These attributes are defined on an importance scale defined between 1 to 5 and a level scale defined between 0 to 7. Keeping in line with the literature and for the sake of consistency with other attributes that are also defined on a 1 to 5 range, only importance scale is used here. The attributes are as follows:

- i. Performing General Physical Activities
- ii. Handling and Moving Objects
- iii. Controlling Machines and Processes
- iv. Operating Vehicles, Mechanized Devices, or Equipment
- v. Performing for or Working Directly with the Public
- vi. Repairing and Maintaining Mechanical Equipment
- vii. Repairing and Maintaining Electronic Equipment
- viii. Inspecting Equipment, Structures, or Material

II. Work Context

The attributes under work context are provided as weighted average of the context category (1 – 5) and its corresponding percentage of respondents. The final number varies between 1 and 5.

- i. Electronic Mail
- ii. Deal with Physically Aggressive People
- iii. Outdoors, Exposed to Weather
- iv. Outdoors, Under Cover
- v. Wear Common Protective or Safety Equipment such as Safety Shoes, Glasses, Gloves, Hearing Protection, Hard Hats, or Life Jackets
- vi. Wear Specialized Protective or Safety Equipment such as Breathing Apparatus, Safety Harness, Full Protection Suits, or Radiation Protection
- vii. Exposed to Disease or Infections
- viii. Exposed to Minor Burns, Cuts, Bites, or Stings
- ix. Spend Time Walking and Running

The additional attributes added by Yasenov (2020) are as follows:

- x. Very Hot or Cold Temperatures
- xi. Exposed to Contaminants
- xii. Cramped work spaces
- xiii. Exposed to Radiation
- xiv. Exposed to High Places
- xv. Exposed to Hazardous Conditions
- xvi. Exposed to Hazardous Equipment

- xvii. Spend Time Climbing Ladders, Scaffolds, or Poles
- xviii. Spend Time Kneeling, Crouching, Stooping, or Crawling
- xix. Spend Time Using Your Hands to Handle, Control, or Feel Objects, Tools, or Controls
- xx. Responsible for Others' Health and Safety

Occupations are identified based on whether they have a high requirement of these attributes for which the threshold is mostly 4 and above. For all of them, a higher value indicates less potential for the work to be done at home except for Electronic Mail which represents the frequency of using electronic mail. Therefore for this reverse value is used i.e. the threshold is 2 and less. The possibility of working from home is ruled out for an occupation if any of the aforementioned is true.

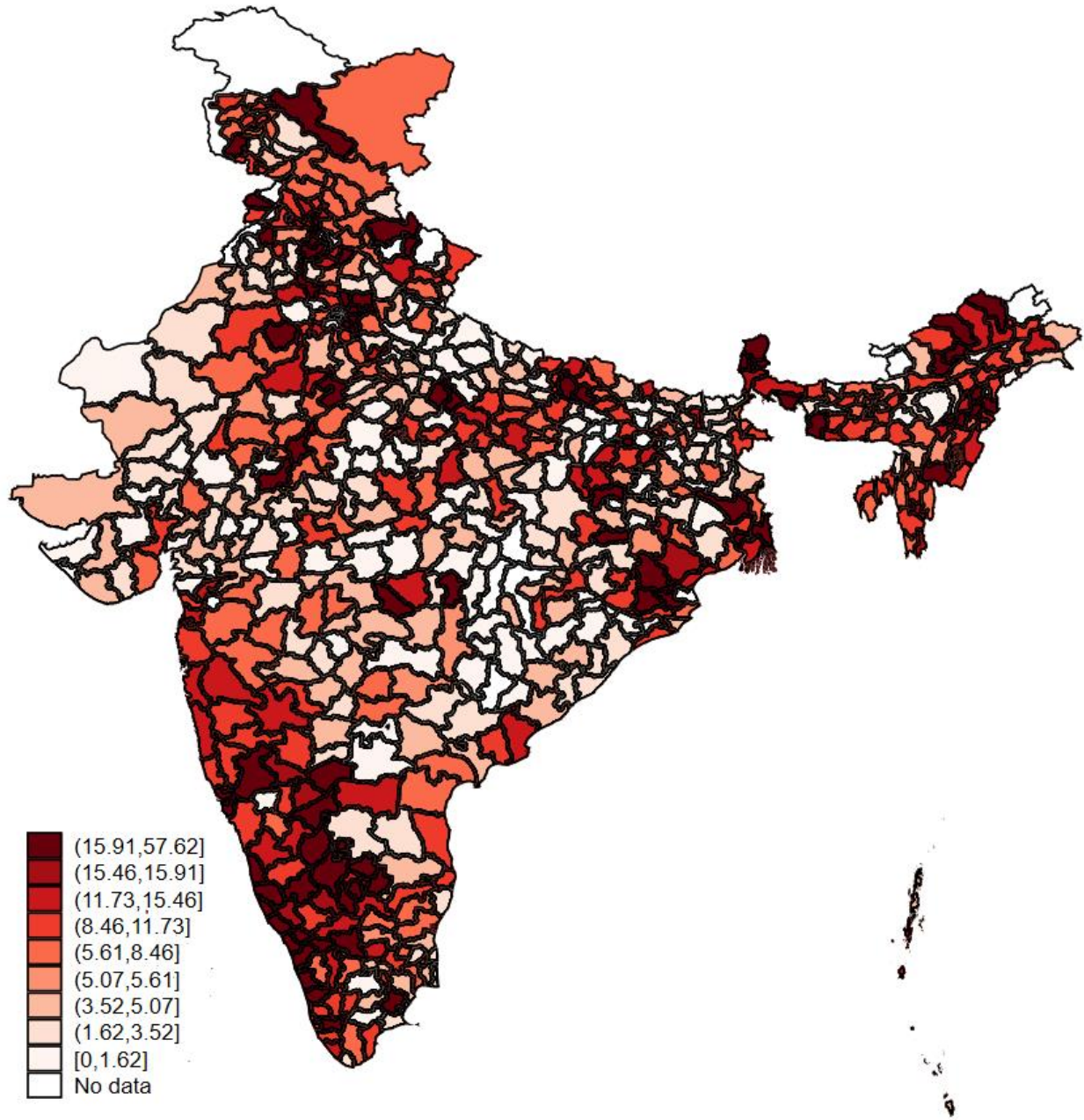


Figure A1: District wise share of WFH workers using DN approach in rural areas

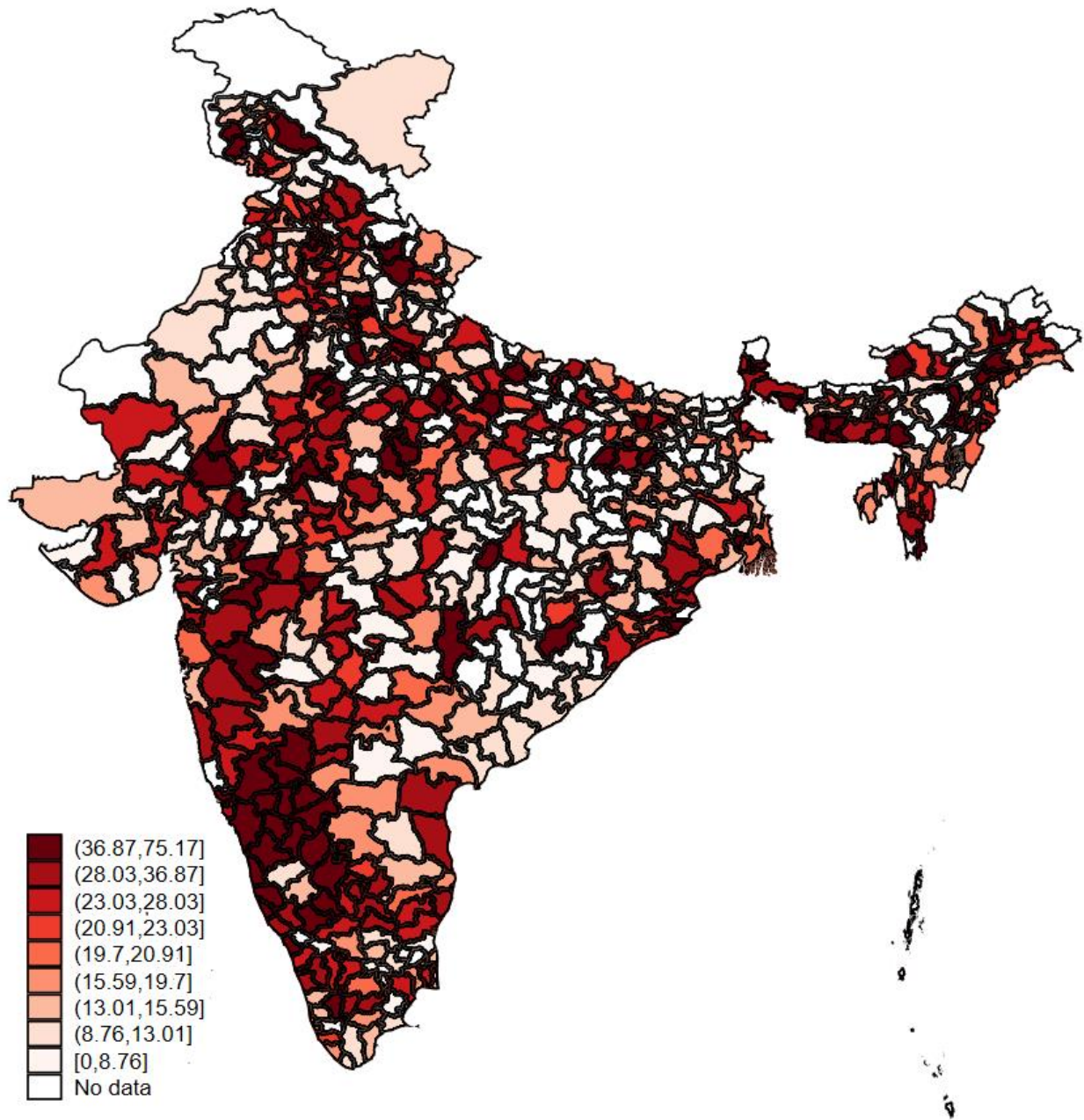


Figure A2: District wise share of WFH workers using DN approach in urban are

Table A1: Distribution of Workers in WFH Occupations by Age Group, 2017-18

Age	DN Approach			Yasenov approach		
	Non WFH(in percent)	WFH(in percent)	Total(in percent)	Non WFH(in percent)	WFH(in percent)	Total(in percent)
15-17	95.45	4.55	100	95.68	4.32	100
18-24	88.38	11.62	100	89.70	10.30	100
25-29	82.20	17.80	100	84.63	15.37	100
30-34	80.03	19.97	100	82.60	17.40	100
35-39	81.60	18.40	100	83.31	16.69	100
40-44	79.64	20.36	100	80.94	19.06	100
45-49	78.36	21.64	100	79.52	20.48	100
50-54	76.36	23.64	100	78.10	21.90	100
55-59	76.30	23.70	100	78.19	21.81	100
Total	81.13	18.87	198.29 million	82.92	17.08	198.29 million

Source: Authors' estimates based on micro data from PLFS 2017-18.

Table A2: Share of Workers in the Working Age Group (15-59 Years) in the Top Ten Occupations by Risk Factor, 2017-18

NCO 3 - digit	Description	Number of workers (millions)	Share of workers in total(in percent)
222	Health Professionals (except nursing)	0.98	0.50
322	Modern Health Associate Professionals (Except Nursing)	0.54	0.27
313	Optical and Electronic Equipment Operators	0.60	0.30
223	Nursing Professionals	0.50	0.25
323	Nursing and Midwifery Associate Professionals	0.57	0.29
514	Other Personal Services Workers	2.32	1.17
511	Travel Attendants, Guides and Related Workers	0.63	0.32
513	Personal Care Workers	1.74	0.88
516	Protective Services Workers	1.95	0.98
347	Artistic, Entertainment and Sports Associate Professionals	0.40	0.20
	Total	10.23	5.17

Source: Authors' estimates based on micro data from PLFS 2017-18.