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Possible effects of Coronavirus in the Colombian labour market*

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Abstract

The COVID-19 pandemic and its social distancing measures have brought unprecedented socio-economic challenges worldwide. One of the most urgent questions is how the labour force will be affected by the pandemic. The answer to this question will have considerable impact on the countries' productivity, poverty and unemployment rates, etc. Consequently, the measurement of jobs which can be performed without increasing the risk of contagion has become a priority. However, due to the lack of proper information, less advanced countries such as Colombia (where unemployment and informality rates are high - around 10.5% and 46.2%, respectively in 2019) face huge challenges in making such estimations. Thus, we contribute to the debate by adapting different international work-from-home and proximity measures and estimated the proportion of workers in the corresponding groups according to the context of a developing country such as Colombia. Our results suggest that a fifth of jobs in Colombia can potentially be done from home. While around 10% of Colombian workers have a high degree of physical interaction with other people.

Keywords: Coronavirus, Occupations, Demographics, Households

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1 Introduction

For a developing country with substantial levels of informality, how many jobs can be performed from home during the social distance measures? What are the works that will suffer in the phasing out of the confinement policies? What workers might face a more significant risk of unemployment? This short paper presents evidence built on the Colombian household survey GEIH 2016 - 2019 and on the occupational information from O*NET and STEP to answer such questions. This paper complements previous efforts that assess the impact of the virus and social lock-down in the Colombian labour market (Eslava and Isaacs, 2020; Jaramillo et al., 2020).

The first coronavirus case in Colombia was detected on March 6th, 2020. On March 20th, just after a couple of days form the first infection, the Colombian government declared quarantine as a social distance mechanism to prevent further spread of the virus. The economic impact of social distancing measures is not uniform across all economic activities and occupations (Del Rio-Chanona et al., 2020). This has been documented in the U.S. following two approaches. The first approach characterises the jobs that can be performed at home (teleworkable) (Dingel and Neiman, 2020). The second approach characterises jobs that are at higher risk of contagion because their task involves high proximity with others (Leibovici et al., 2020; Mongey and Weinberg, 2020).

Thus, this document, even if it contains essential and unknown information at the country and regional level, is original in the methodology used. It relies heavily on recent developments (Dingel and Neiman, 2020; Mongey and Weinberg, 2020; Saltiel, 2020). This paper fills a void for possible effects of COVID-19 at a disaggregated level, and present detailed information for a developing economy with significant levels of informality.

The paper also presents the characterisation of the most significant potential affected population. Moreover, this paper contributes to an ongoing debate on the use of O*NET data in developing countries (Lo Bello et al., 2019). Specifically, we have used the Occupational information network (O*NET) and the Skills Toward Employability and Productivity survey

(STEP) to adapt different international work-from-home and proximity measures according to the Colombian context. We find that the results from the O*NET and STEP lead to similar statistical estimates. This fact encourages the cautionary complimentary use of O*NET as secondary data for analysis in developing countries.

The document is divided into four parts. Section 2 presents the data used. Section 3 presents the analysis at the national level and to describe which household and worker characteristics are more likely associated with teleworking. In this section, we also evidence the different results obtained from O*NET and the from the STEP index constructed. Section 4 is devoted to analysing at the national level the effect of proximity and face-to-face interactions. Analysing the latter dimension is important because the affected occupations (and populations) might see a considerable change in demand, induced by changes in consumer behaviour to avoid contagion. Section 5 presents the conclusion and present some remarks relevant for public policy.

2 Data

Since 2006, the Colombian statistics office of Colombia (DANE) has conducted a monthly cross-sectional household survey (GEIH, by its initials in Spanish) to measure the characteristics of the Colombian workforce. The GEIH with a total sample size of approximately 23,000 households monthly is nationally representative and the main source for official labour market information in Colombia. In this survey, people are asked about their current level of education and occupation, among other characteristics. The main variables that we used in this analysis are reported in table A1.

However, one caveat of the GEIH is that the occupational classification used is the National Classification of Occupations 1970 (SOC 1970) at 2-digit level, a national occupation classification based on the qualification level and the sector[1]. As mentioned by Cárdenas (2020) the use of such outdated classification might affect any statistical analysis due to

[1]Sector is the closest translation for 'performance area'.

labour market changes. For instance, a set of occupations might have emerged during the last decades and the SOC 1970 might not have the proper categories to group these occupations.

One might try to use crosswalks and re-code the SOC-1970 to use a more up-to-date occupational classification such as the International Standard Classification of Occupations 2008 (ISCO-08) provided by the International Labour Organization (ILO). However, the use of crosswalks between SOC-1970 and ISCO-08 is limited. For instance, the SOC-1970 at 2-digit has the following occupational group: 'Building keeper, doorman, sacristan, cleaner, window cleaner, chimney sweep'(code 55). These group of occupations belong to different occupational groups in ISCO-08. For instance, a Building keeper in ISCO-08 is 'Security guards' (code 54 at 2-digit level), while a cleaner is coded as 'Domestic cleaners' (code 91). Consequently, any attempt to re-code SOC 1970 to ISCO-08 occupational groups might have considerable inaccuracies. These measurement errors are relatively relevant for the estimation of teleworkable or proximity occupations since one occupation in the same occupational group might require, for instance, high proximity with others while the opposite can be true for another occupation in the same occupational group at 2-digit level[2].

Thus, we used the raw text responses of the GEIH to reclassify the information to ISCO-08 and SOC-ONET at 4-digits and 6-digits level, respectively. To do so, we train a machine learning algorithm over 2.2 million of observations from a posted vacancy database, which has been pre-classified and validated (Cárdenas, 2020). This codification at 4-digit level is relevant because it allows us to merge with more precision different international classifications to the Colombian data.

In contrast, using the ISCO at 1, 2 or 3 digit level and international classifications (e.g. O*NET) might be considerably imprecise in categorising teleworkable or high proximity occupations. For instance, there is the following category group at 3-digit level ISCO 'client information workers' (code 422). This occupational category has these subgroups 'Telephone

[2]To the extent of our knowledge, there is not an official crosswalk between SOC 1970 and ISCO - 08 due to the difficulties in using crosswalks between this two classifications.

switchboard operators' (code 4222) and 'Hotel receptionists' (code 4224). The former group might tend to be a teleworkable occupation, while the second group not. Thus, any attempt to use the ISCO at 2 or 3-digit level might lead to incorrectly assign attributes to different worker groups.

We combined the Colombian household survey with other sources at 4-digit level to determine the proportion of workers susceptible to distress due to the COVID-19 pandemic. We use different criteria: (i) the extend for which occupation is teleworkable or not, describes what share of the population could not be affected by social distance measures; (ii) a proximity index that describes how close a person must be to other individuals to perform his job, so the demand could drop because of the virus; (iii) a face-to-face indicator that shows if the occupation has frequent face-to-face interaction, and could be affected because of the spreading of the virus.

In particular, to measures to what extent an occupation is teleworkable, we use the construction by Dingel and Neiman (2020), which is constructed in selected dimensions of the work context and work activities from O*NET. Using O*NET in developing countries has been of concern in research given the differences in working realities in the developed and developing world, the differences in technology adoption, occupation licensing and legislation, the informal prevalence of work in developing countries among the many criticisms.

To address this issue, we followed (Saltiel, 2020). We construct a teleworkable indicator using the STEP survey[3], with all the countries pooled[4]. The STEP survey contains information on the skills and work activities in low and middle-skill countries. The final result is a teleworkable indicator at the 4-digit occupational level. We compare the obtained results in both indicators, and both agree in the classification for 84.3% of total workers in Colombia. We report in the next section the estimates for each of the teleworkable indicators. Con-

[3]The index is composed by the following dimensions: (i) Lifted Anything more than 50 Pounds; (ii) Time/contact involved with non-coworkers/customers; (iii) Repair electronic equipment (already generated); (iv) Operate/work with heavy machines (already generated); (v) Use a computer at work. The results are then aggregated to ISCO-08 3-digit level and merged with the Colombian household survey.

[4]We use all of the 16 countries, excluding China and Albania. We do not consider only the information on Colombia because the sample size is small (1930 observations).

sidering that technology penetration is lower in Colombia, the estimates are an upper limit (an optimistic scenario) for telework-compatible occupations. The number reported is also in line with the country level reported in Dingel and Neiman (2020).

To measure workers that are at higher risk of contagion because their tasks involve close proximity with others could be affected by the virus, we calculate a proximity index following Leibovici et al. (2020) and Mongey and Weinberg (2020). The proximity index indicates if an occupation to be performed needs to be at a proximity of 1.5 o less (less than an arm of distance). This information is contained in category 4.C.2.a.3 from O*NET (work context). We present the results form this index only since there is not a comparable measure in the STEP survey. Nevertheless, a similar disclaimer as above can be made, and we consider that the estimates are a lower bound due to cultural differences and institutional arrangements (occupational licensing and health and safety regulations). Identify the share of occupations that need proximity is important to determine potential changes in both demand and supply. In demand, since people will be reluctant to buy goods and services in which the personal proximity is large in order to avoid the contagion. The changes can also be induced by the supply of labour to those occupations since workers trying to avoid risk for them, and their families decide to avoid such employment relationships.

Finally, we also construct a face-to-face index following Avdiu and Nayyar (2020). This measure indicates if the person to perform the job need face-to-face contact. This information also comes from the O*NET taxonomy[5]. Taking as an input such index, we construct an indicator function, assigning the value of 1 if the value is over 75th percentile of the distribution of the index.

[5]The construction is based in the work context *4.C.1.a.2.l*, that relates to the frequency in which a person needs face to face discussion to perform its job. A higher value means that face to face interactions are more frequent.

3 Teleworking and employment type

3.1 National characterization

The effects of social distancing measures are not homogeneous across sectors and occupations. The incidence of computer use on work tasks and activities, the technological level of different sectors of the economy, and the modernization of sectors are factors that can increase or alleviate such effects. In this section, we describe results for those occupations that are compatible with teleworking.

When we take into consideration the results constructed using O*NET (Table 1), one-fifth of the jobs in Colombia can potentially be done from home. The situation nevertheless is not as good when considering the informal population, and just the 13% of the informal population can perform his job from home. These shares are below Dingel and Neiman (2020) estimates for the United States (37%). The reasons for the differences can be found in the different sector composition and the different occupational structure. The percentage, however, is in line with Latin American countries (Bolivia 15%, Chile 25%) and other developing economies.

When we take into consideration the results constructed from the STEP survey, the percentage of jobs that can be performed at home is similar to the O*NET based estimation: around 22% of works can be done from home. The behaviour of the informal share is also similar (10%), and is considerably below the formal share (48%)[6].

If the results are constructed using the O*NET or ISCO-08 classification, why they differ between countries? The answer is because the occupational composition in each sector is different in each country, and the share of each sector varies among regions. For example[7], regions that have a larger share of occupations in financial services have higher shares of teleworkable occupations (Antioquia, Cundinamarca and Valle), while the regions in which

[6]When we compare the two indexes, they coincide in the classification for 84.3% of the occupations. See table A2 in the appendix.

[7]The following results are based on the index construct using O*NET.

Table 1: Share of occupations compatibles with telework by population

	O*NET			STEP		
	National	Formal	Informal	National	Formal	Informal
Teleworkable **compatible** occupations	19.7%	35.4%	13.4%	22.7%	48.8%	10.3%
Not teleworkable occupations	80.3%	64.6%	86.6%	77.3%	51.2%	89.7%

Source: DANE-GEIH 2016 - 2019. Own calculations.

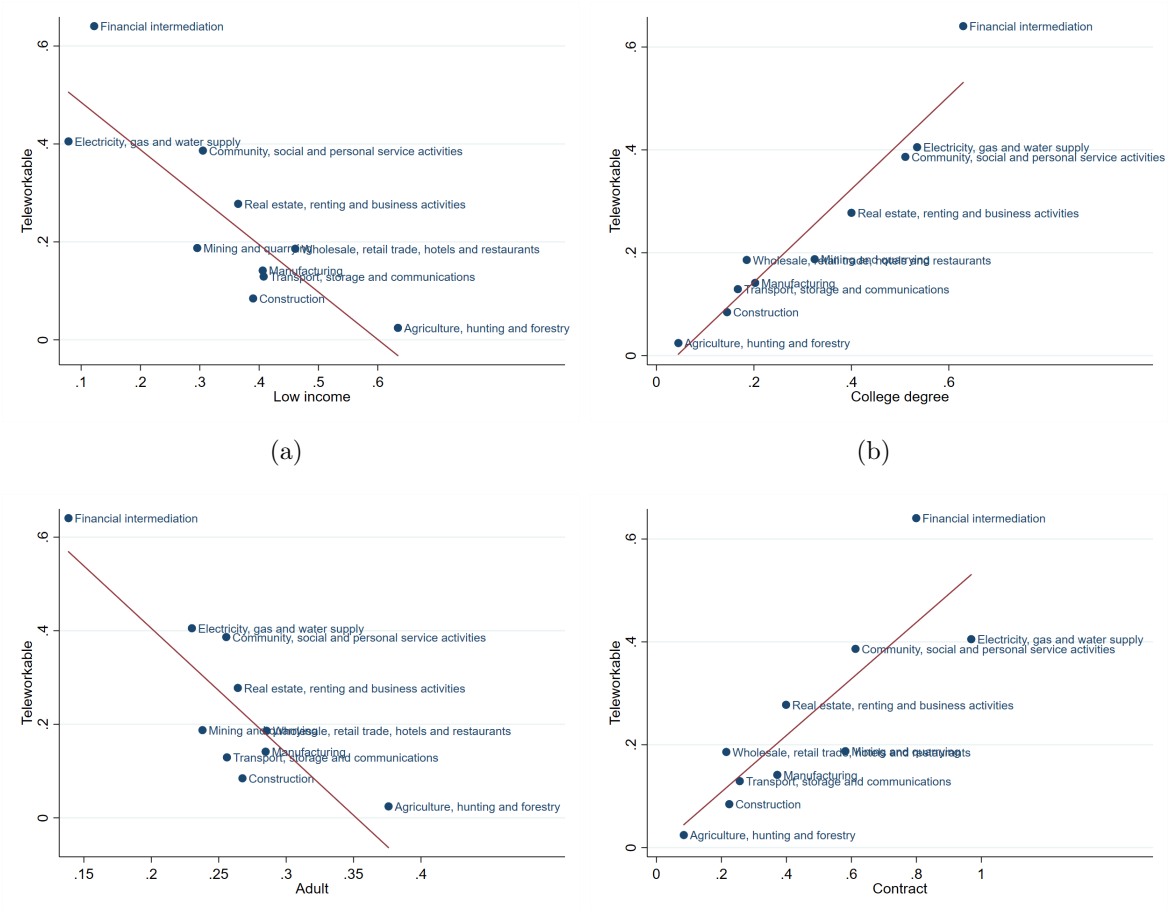
the agricultural sector prevalence the share is lower (see Figure A1). The sector composition also has different impacts on the informal population. According to Figure 1, the sectors in which the highest proportion of employment is concentrated in occupations that are not compatible with teleworking (agriculture, construction, manufacture). The opposite being also true, where the sectors more compatible with telework do not represent a large proportion of employment (financial services). This makes that the adverse effects of social distance measures affect in a different manner the population. The characteristics of the population in each of the sectors reflects this, since the average age, level of education, income and the firm's size changes within sectors.

Table 2: Share of workers in occupations compatible with telework by sector

Sector	Total nacional	Formal	Informal
Agriculture, hunting and forestry	2.1%	13.0%	1.3%
Mining and quarrying	16.7%	24.7%	5.4%
Manufacturing	15.4%	25.0%	6.4%
Electricity, gas and water supply	33.6%	35.0%	44.0%
Construction	8.1%	19.5%	2.8%
Wholesale, retail trade, hotels and restaurants	19.7%	24.0%	18.1%
Transport, storage and communications	13.7%	28.8%	8.0%
Financial intermediation	64.1%	62.3%	76.7%
Real estate, renting and business activities	27.7%	38.8%	11.9%
Community, social and personal service activities	37.1%	49.8%	17.9%

Source: DANE-GEIH 2016 - 2019. Own calculations.

Figure 1: Correlation between telework share and worker characteristics by industry



(a) Share of teleworkable occupations and share of workers with low income by sector. (b) Share of teleworkable occupations and share of workers with higher degree education. (c) Share of teleworkable occupations and share of workers older than 50 years old. (d) Share of teleworkable occupations and share of workers with full-time contracts.

Source: DANE-GEIH 2016 - 2019.

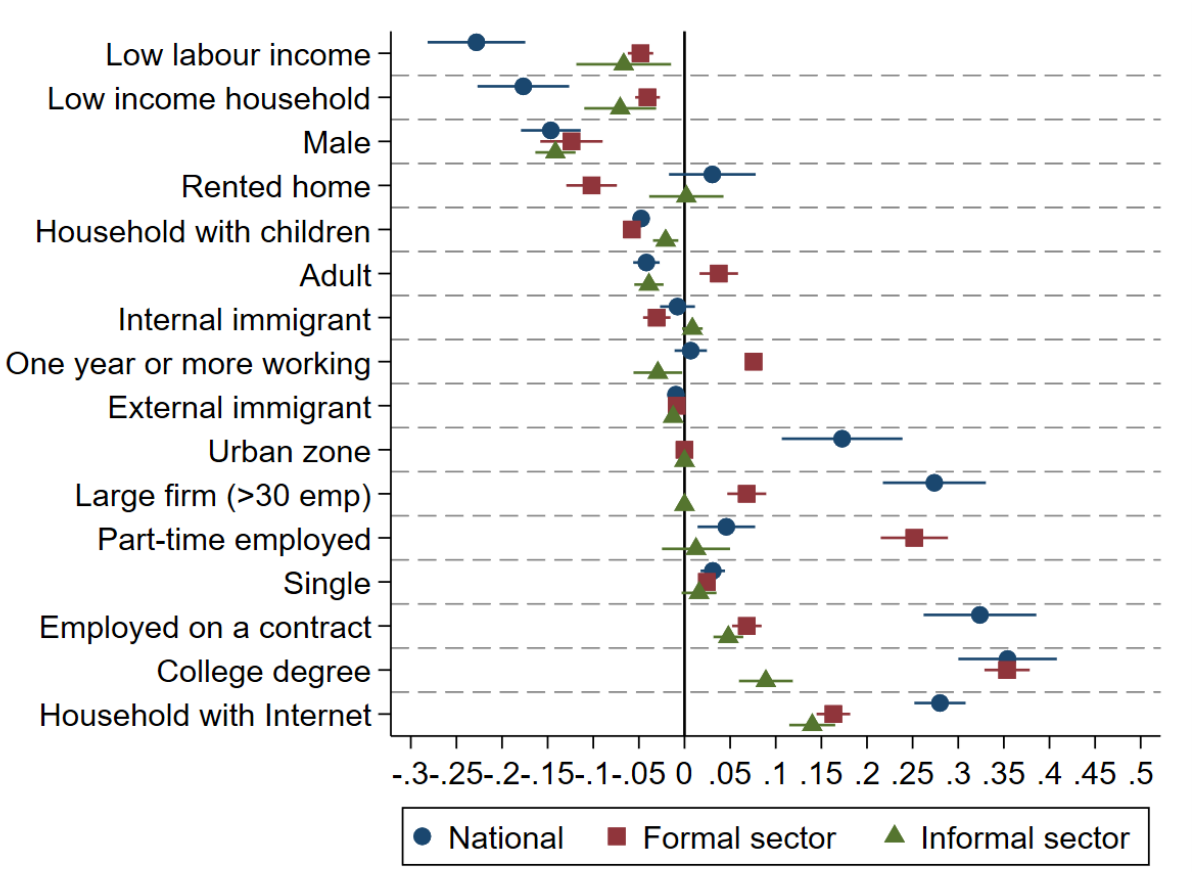
To provide a more detailed characterisation of the workers in work-from-home occupations, we followed Mongey and Weinberg (2020) who proposed the following approach:

$$y_{TW,i} = \beta X_i + \epsilon \tag{1}$$

Where $y_{TW,i}$ takes values of 1 if, for instance, the worker's income is below the national average (low labour market income) and zero otherwise; or it takes a value of 1 if the worker has a college degree and zero otherwise. X indicates if the person works in a work-from-home occupation ($X = 1$, and zero otherwise). ϵ is the sample mean. Consequently, β shows the fraction of workers who are in work-from-home occupation by different population groups.

Figure 2 plots the corresponding coefficients. For instance, at a national level, the fraction of people in work-from-home occupations with low labour income is 22.8 percentage points lower than the fraction of people in non-teleworkable occupations with a low labour income. This result suggests that the share of low labour income workers is relatively higher for non-teleworkable occupations. In contrast, the fraction of workers in work-from-home occupations with an internet connection at home is almost 30 percentage points higher than the fraction of people in non-teleworkable occupations with an internet connection at home. Overall, these results show that vulnerable workers (e.g. Low income, low educated workers, etc.) tend to have a lower share in work-from-home occupations.

Figure 2: Characteristics of workers in teleworkable occupations, by job type (formal/informal)



Source: DANE-GEIH 2016 - 2019. Own calculations.

3.2 Households and workers characteristics

To characterise the populations that are under more stress due to social distance measures is one of the main objectives of the present document. We contribute with evidence that helps as input to design policies to tackle the possible effects in such populations.

Large urban areas concentrate on the largest share of economic activity and employment in Colombia. In developing countries, agglomeration economies in urban areas are highly correlated with informal activities and jobs. One of the advantages of using the household survey is that we can distinguish the effect that the different dimensions have, and characterise the specific for the informal population. Informality is measured only at the urban level, so is not possible to assess if economic activities in rural areas are more or less associated to telework, but we can measure other characteristics for the informal population.

In order to calculate the likelihood to work in work from home occupations, we run the following regression:

$$\mathbf{1}_{TW,i} = \beta X_i + D_{R,i} + D_{S,i} + \epsilon \tag{2}$$

Where $\mathbf{1}_{TW,i}$ is the teleworkable indicator function, X is a set of covariates that characterise the worker and its household and D_k is a set of regional and sectorial dummies. In order to identify the effect in the informal population, we run the regression in three different subsets of the database: We run the first regression at the national. The second regression with the formal workers and the last containing the informal workers.

The econometric estimation follows Saltiel (2020), in order to compare his findings for a developing country, and our estimates from O*NET for Colombia. This choice is different from the model presented by Mongey and Weinberg (2020), in which the observables are in the left-hand side, and the work-from-home index is the covariate.

As in the aggregate level, the characteristics form the formal and informal population change are heterogeneous in the population. Even if in general the results are significative

there are no statistical differences between the formal and informal population, with a few exceptions. The most important is the considerable difference in the likelihood of having a work-from-home depending on the college degree. In the national sample, the likelihood to have a teleworkable job is around 20%. This value is in line with the findings of Saltiel (2020) in which the estimates for the college graduate are between 20% and 30%, and are less than the results for the U.S economy, by almost 10% (Dingel and Neiman, 2020). When we consider the informal population, the likelihood is still positive and significant but it is one quarter (6%) of the estimated value for the national level. Another variable for which the effect in the informal population differs is regarding part-time employment. While part-time employment for the formal has a large contribution to the likelihood of being employed (20%), for the informal population, it has no importance. Another interesting finding is that being older, if in the process of an informal job, lowers the likelihood of having a work from home job, while the opposite is valid for a formal worker.

From the worker characteristics analysed, being an external immigrant[8], having a low labour income (income below the minimum wage), being male decreases the chances of being in a teleworkable occupation. There is an associated penalty of being an immigrant at the national level, but for the informal market in the case of internal migrant, the difference disappears.

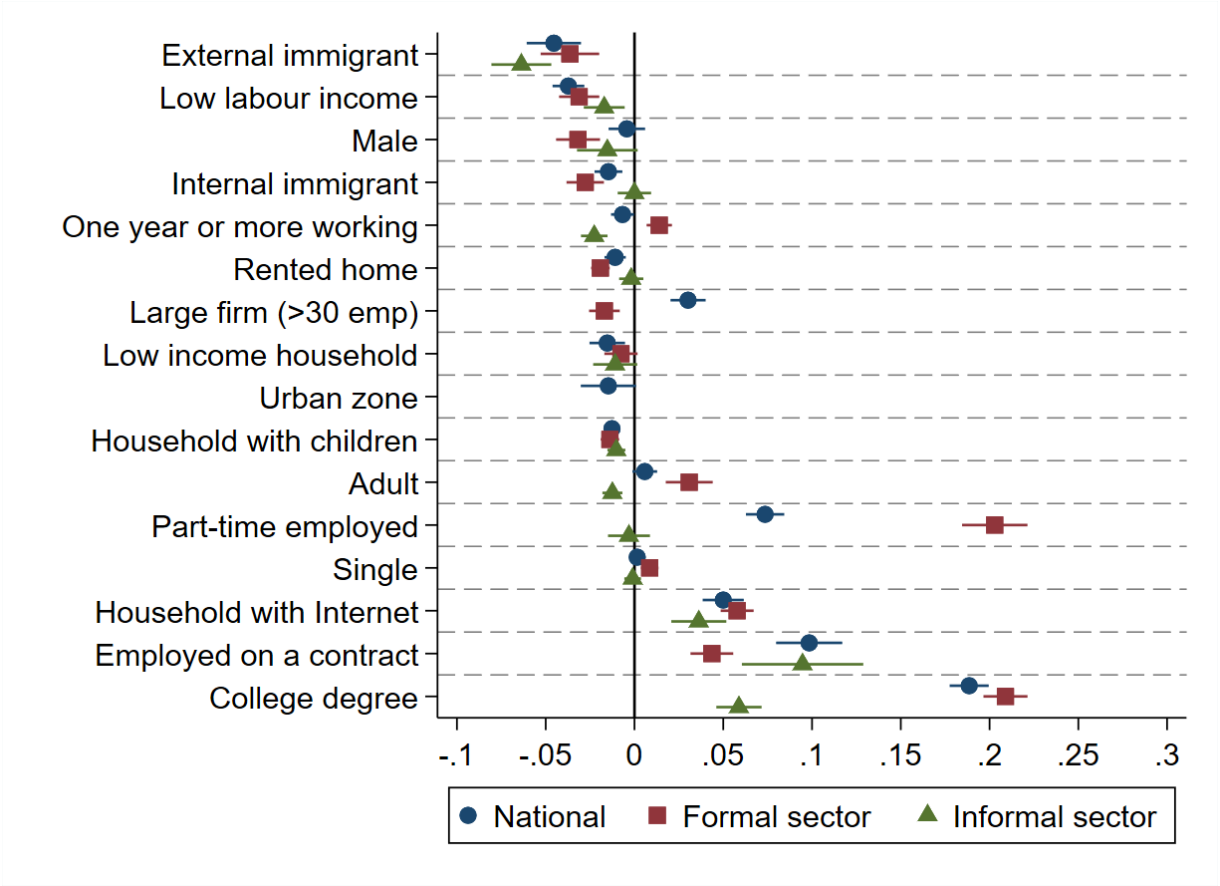
From the household characteristics, we observe that renting, living in a low-income household and having at least one children at home decrease the chances of having a teleworkable job. The effects are small but significant. A big increase is found in households that have internet access, for which the increase is around 10%[9].

Figure 3 reports the results of the estimation. The estimates identify the effects within region and sector. When introducing the occupation dummy, the effects disappears since the index is constructed at the occupational level.

[8]External immigrant refers to foreign people living in the country. In contrast, internal immigrant refers to Colombian people who have recently (between 5 years) move to live in another city within the country.

[9]In Colombia, only 42.9% of workers live in a house with an internet connection (see A1), and this feature is highly correlated with vulnerability in other economic aspects.

Figure 3: Likelihood of working in a teleworkable occupation, by job type (formal/informal)



Source: DANE-GEIH 2016 - 2019. Own calculations.

4 Proximity

With the ending of social distance measures, what will happen with people that need to be at proximity of others to do their job? The end of social distance measures alleviates the pressure for the occupations that can not work for home. Nevertheless, the return to work will put the pressure on other occupations that for their execution need proximity or face-to-face interaction. This section presents the characterisation of such populations and tries to reply, what are the occupations that might be affected due to the high contagion rate and the virus spread.

In order to identify the magnitude of such effects, we make use of two different indexes. Te first one is the proximity index Mongey and Weinberg (2020), that identify if a job to be performed need an arm or less of distance (1.5 meters or less). The second index is constructed following Avdiu and Nayyar (2020), which present the share of jobs that need face-to-face interaction to be performed.

Calculating the proximity index in the GEIH, we get that almost 10% of jobs are proximity occupations. The figure is slightly larger for formal workers.

Table 3: Share of workers in high personal-proximity occupations

	National	Formal	Informal
Low-proximity	89.4%	86.6%	89.2%
High-proximity	10.6%	13.4%	10.8%

Source: DANE-GEIH 2016 - 2019. Own calculations.

As in the work-from-home occupations the effect across sectors and regions (Fig. A2) is heterogeneous (Tab. 4). The regional disparities correlate to population density and regional sector composition. The most affected sectors are strategic sectors for employment in Colombia: construction, tourism and social and personal services are the sectors that strategically will be prioritized out of the quarantine. The risk of performing jobs in such sectors is not even, a fact that should be taken into consideration. Given that the market

is very tight due to the impact of the virus, the outside option for workers has decreased, pushing them to work, putting in risk their health and their family well-being. Due to the lack of job openings in these occupations, workers will continue to maintain their job and exposing themselves without any compensation for such behaviour, opening the opportunity for government intervention to compensate such failures.

Table 4: Share of workers in high personal-proximity occupations by sectors

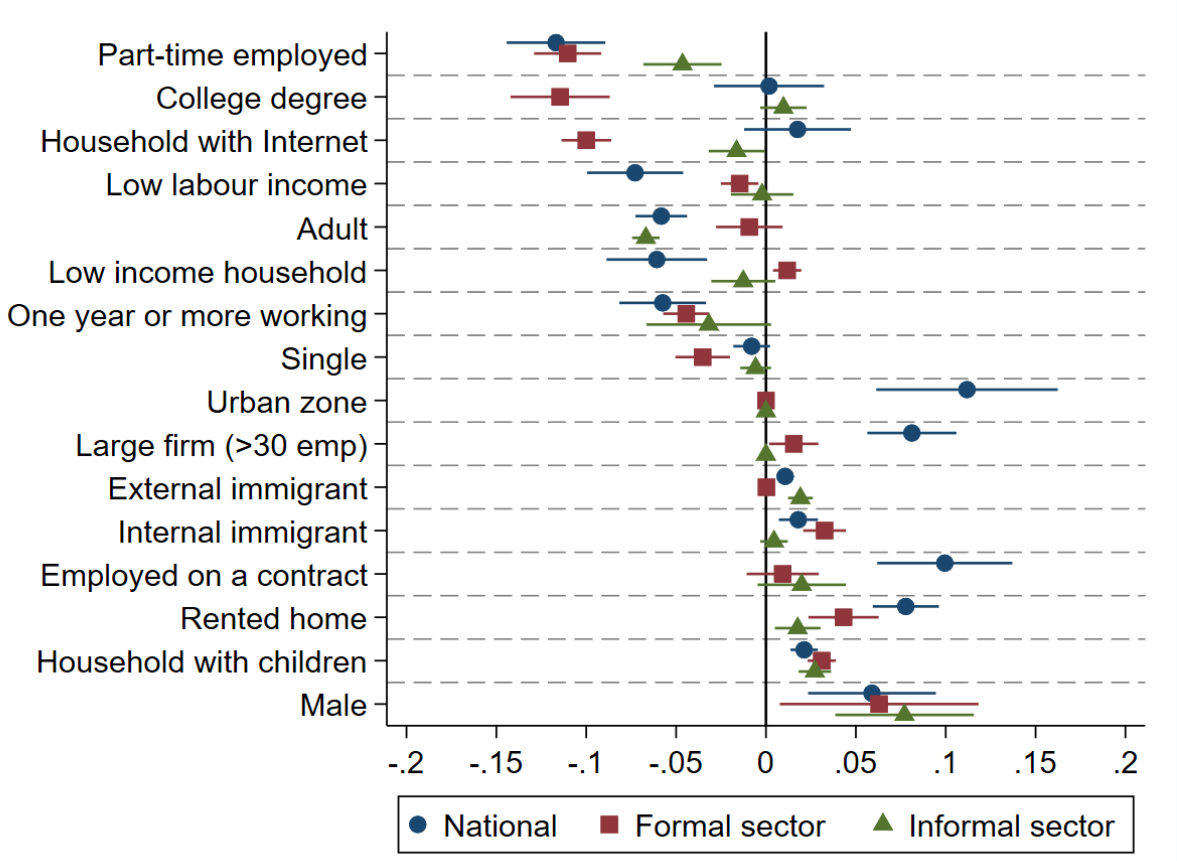
Sector	Total nacional	Formal	Informal
Agriculture, hunting and forestry	2.5%	6.9%	2.3%
Mining and quarrying	7.9%	8.7%	2.5%
Manufacturing	6.9%	5.4%	9.0%
Electricity, gas and water supply	11.4%	10.6%	6.9%
Construction	40.4%	28.9%	44.7%
Wholesale, retail trade, hotels and restaurants	3.5%	5.4%	2.9%
Transport, storage and communications	3.1%	6.2%	1.9%
Financial intermediation	8.6%	9.6%	1.2%
Real estate, renting and business activities	14.9%	18.1%	10.0%
Community, social and personal service activities	20.1%	22.4%	26.2%

Source: DANE-GEIH 2016 - 2019. Own calculations.

Following equation 1, we estimated the fraction of workers in high proximity occupations by different population groups. Figure 4, plots the corresponding coefficients. For instance, at a national level, the fraction of people in high proximity occupations with a low labour income is 7 percentage points lower than the fraction of people in non-high proximity occupations with low labour income. This result suggests that the share of low labour income workers is relatively lower in high proximity occupations. In contrast, the fraction of male workers in high proximity occupations is almost 6 percentage points higher than the fraction of male workers in high proximity occupations. Overall, these result show that vulnerable workers (e.g. Low income, low educated workers, etc.) tend to have a lower share in high proximity occupations.

Following equation 2, we estimate the likelihood of working in a high personal-proximity occupation. We observe that the individual and household characteristics effects are smaller

Figure 4: Characteristics of workers in high proximity occupations, by job type (formal/informal)

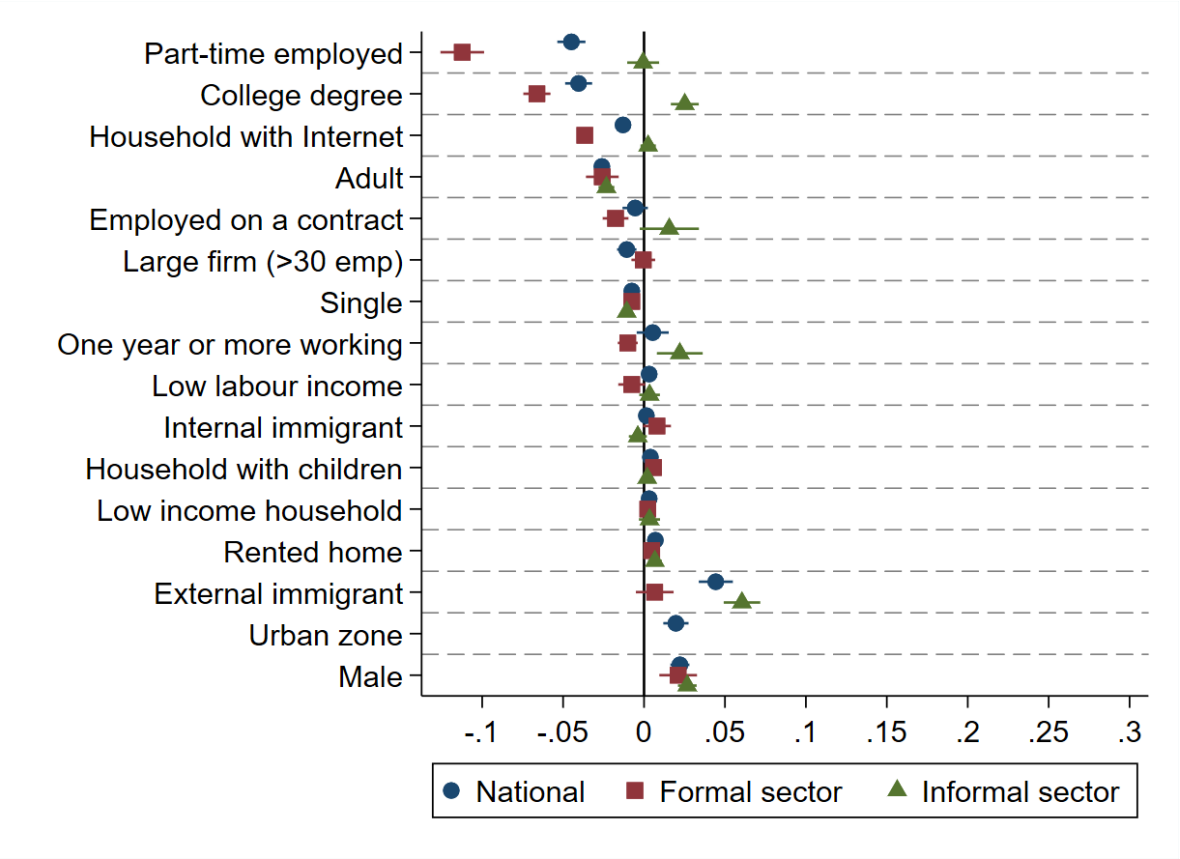


Source: DANE-GEIH 2016 - 2019. Own calculations.

than in work from home occupations (see Figure 5). Moreover, the likelihood of being in a proximity occupation is determined largely by the same set of variables as in the teleworkable occupations. Age, education, a part-time job and internet access diminish the likelihood of working in a high proximity occupation. Being an external migrant and male increases the likelihood of working in a proximity occupation. The likelihood tend to be lower for formal work which implies a heterogeneous effect and a larger effect on formal jobs. This fact raises the attention and need to be an issue treated in public policy analysis since these occupations will face a change in demand that will pressure the employment due to contagion prevention. There need to be created measures to protect those employment relations, and this can be done by imposing health and occupational regulations that give back confidence to the customers, or by compensating directly the risk taken in working in such jobs[10].

[10]Table A3 presents the occupations with higher proximity and a larger share of employment.

Figure 5: Likelihood of working in a high personal-proximity occupation, by job type (formal/informal)



Source: DANE-GEIH 2016 - 2019. Own calculations.

When we take into consideration the face-to-face occupations, we find that 1 in 20 occupations is face to face at the national level. The largest share, as in the proximity occupations, are disproportionately concentrated in the formal employment, where it affects almost 10% of employment (see Table 5).

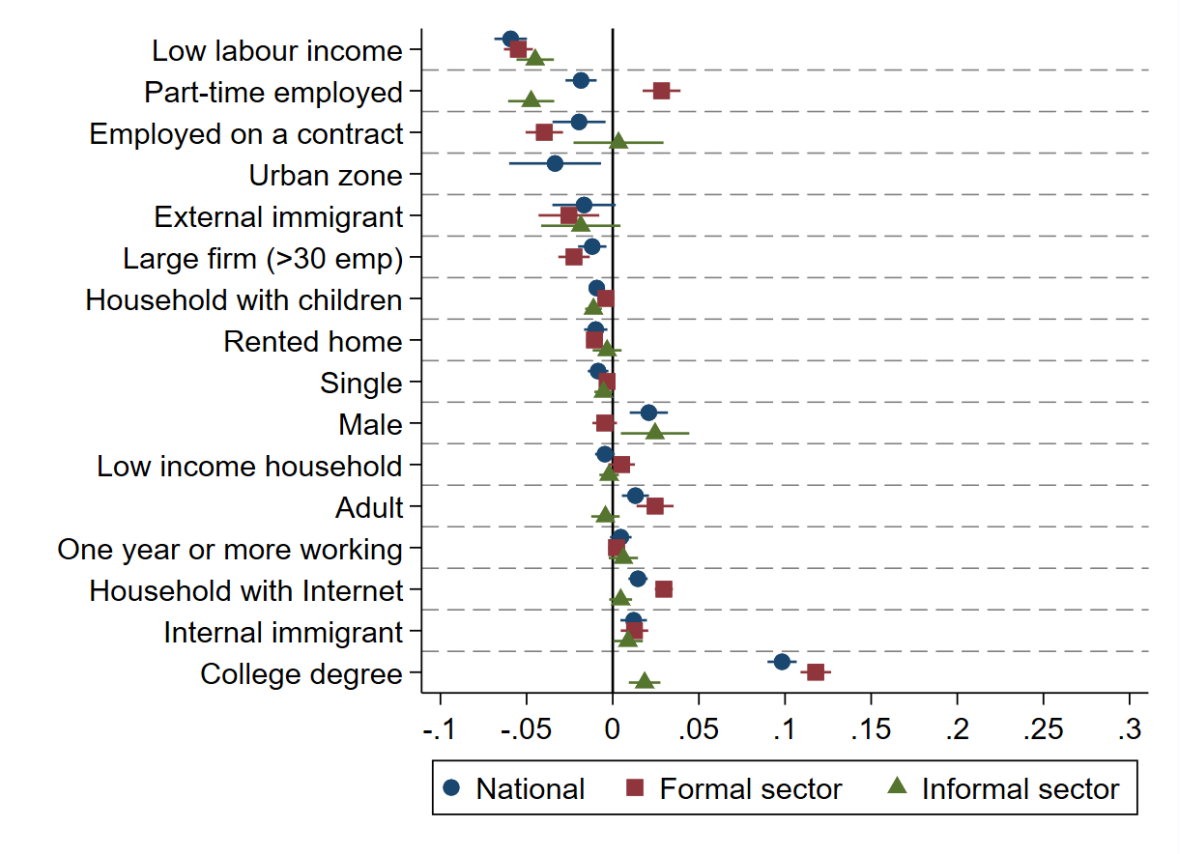
Table 5: Share of workers in occupations intensive in face-to-face interactions

	National	Formal	Informal
Non-face-to-face occupations	94.4%	90.3%	96.9%
Face-to-face occupations	5.6%	9.7%	3.1%

Source: DANE-GEIH 2016 - 2019. Own calculations.

Moreover, the main characteristic that affects the likelihood of working in face-to-face occupation is the educational attainment, for which the effect of the formal is the largest. Having low labour income, being partly employed have decreases the most the likelihood of being employed in a face-to-face occupation. As in the proximity occupations, the effects are larger for the formal population, remarking the fact that this type of employment might be the most affected after the social distancing measures end.

Figure 6: Likelihood of working in occupations intensive in face-to-face interactions, by job type (formal/informal)



Source: DANE-GEIH 2016 - 2019. Own calculations.

5 Conclusion

The effects of social distance seemed to be heterogeneous across regions and sectors. The occupational analysis gives more granular insights on how the effects are also different across different occupations. We take into consideration the individual and household characteristics and show evidence for which characteristics associates with more vulnerable characteristics are most likely to be affected by the social distance measures. Especially, the effects are stronger for workers of the informal sector.

When considering the effects after the social distance measures are taken off, the effect on the formal employment might be higher. The individual and household characteristics are also important but have the lowest explanatory power for proximity and face-to-face index. Schemes to compensate for the risk of working in occupations that face more risk are suggested in the presence of market failures.

The information presented aims to provide information for the construction of public policy programs, that arrives at the identified population.

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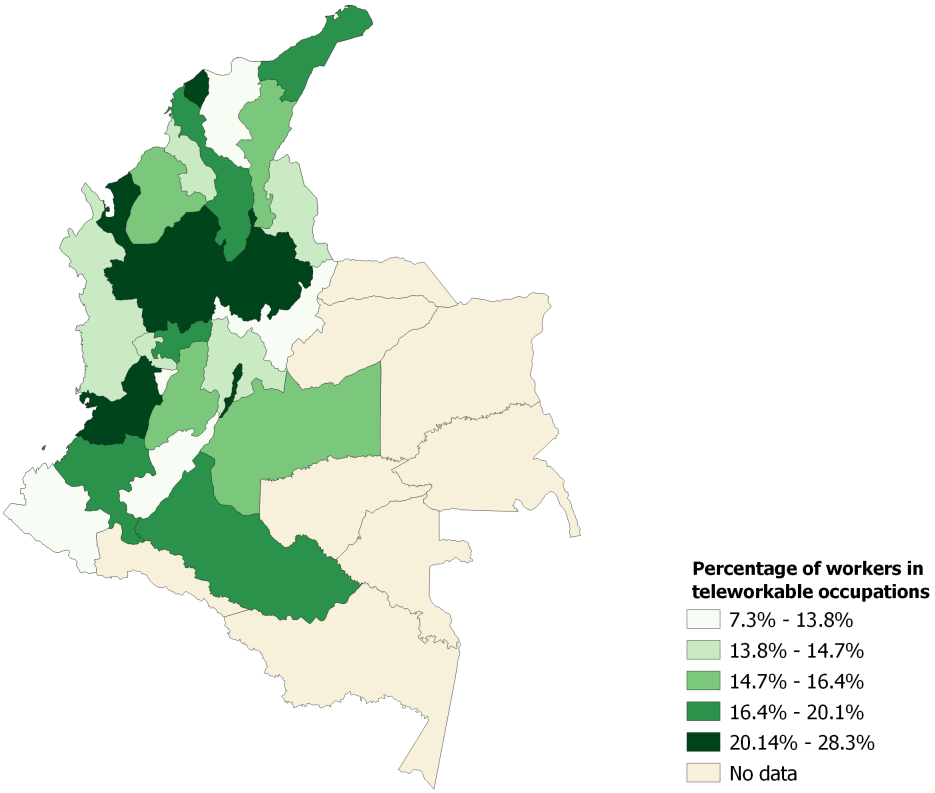
A Figures and Tables

Figure A1: Share of workers in teleworkable occupations by region



Source: DANE-GEIH 2016 - 2019.

Table A1: Descriptive statistics

Variable	Percentage
Workers characteristics	
Adult (> 50 years)	25.7 %
Male	58.3 %
Single	42.0 %
External immigrant	1.7 %
Internal immigrant	11.6 %
College degree	22.6 %
Urban zone	78.3 %
Job's characteristics	
Low labour income	42.1%
Large firm (>30 emp)	26.5%
Part-time employed	43.3%
One year or more working	71.3%
Contract	33.9%
Agriculture, hunting and forestry	16.4%
Mining and quarrying	0.9%
Manufacturing	11.8%
Electricity, gas and water supply	0.5%
Construction	6.4%
Wholesale, retail trade, hotels and restaurants	27.3%
Transport, storage and communications	8.0%
Financial intermediation	1.4%
Real estate, renting and business activities	7.8%
Community, social and personal service activities	19.6%
Household's characteristics	
Rents home	38.0%
Low household income	35.2%
Household with children	30.2%
Household with Internet	42.9%

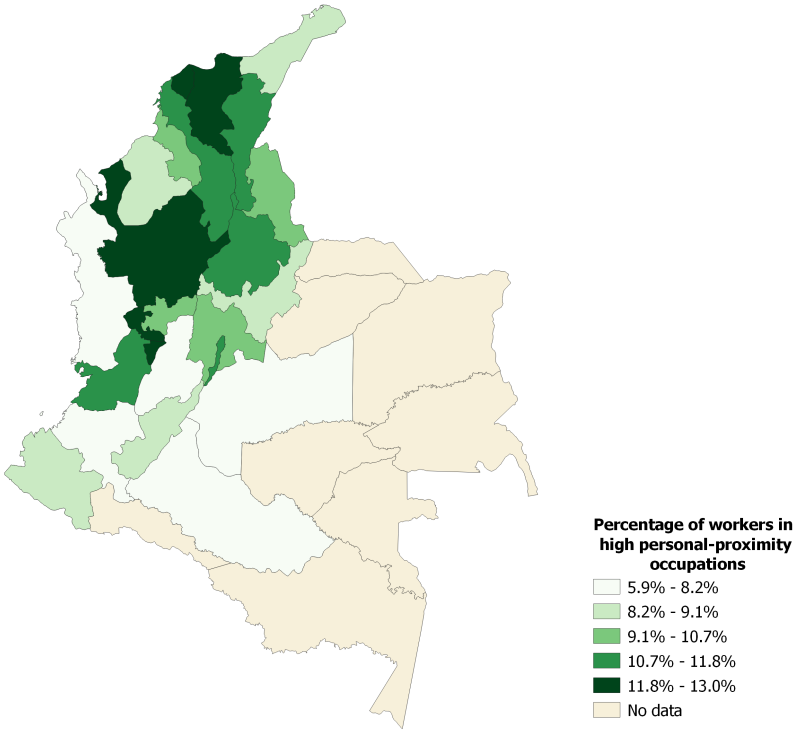
Source: DANE-GEIH 2016 - 2019. Own calculations.

Table A2: Teleworkable index comparison

		Saltiel (2020)	
		Non-teleworkable	Teleworkable
Dingel and Neiman (2020)	Non-teleworkable	70.9%	9.3%
	Teleworkable	6.2%	13.4%

Source: DANE-GEIH 2016 - 2019. Own calculations.

Figure A2: Share of workers in high personal-proximity occupations by region



Source: DANE-GEIH 2016 - 2019. Own calculations.

Table A3: Occupations that are performed with proximity and with a higher number of workers

Occupations	Percentage
Bricklayers and related workers	2.91%
Security guards	2.05%
Beauticians and related workers	1.25%
Personal care workers in health services and related workers	0.66%
Nursing professionals	0.59%
Health care assistants	0.50%
Hairdressers	0.37%
Home-based personal care workers	0.24%
Dentists	0.22%
Food service counter attendants	0.14%

Source: DANE-GEIH 2016 - 2019. Own calculations.

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