ITALIAN WORKERS EXPOSED TO RISK DURING THE COVID-19 EPIDEMIC AND THE LOCKDOWN

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Outline

• Introduction and aim of the paper
• Data
• Indexes of physical proximity and disease exposure
• The impact of lockdown in Italy
• Conclusions
Introduction

• The COVID-19 emergency in Italy, as well in many other countries is expanding

• Contagion speed and globalization (Zimmermann et al., 2020).

• Locking down several industrial sectors.

• However, some workers are more at risk than other because
  • they work in physical proximity to other people
  • they are exposed to diseases and infections,
  • or both.
The aim of the paper

• We analyse the content of Italian occupations operating in about 600 sectors during the COVID-19 epidemics.

1. We classify the occupations according to the worker’s
   a) Diseases exposure,
   b) Physical proximity
   c) Possibility to work from remote

and map them into sectoral indexes.

2. Expected employment impact of the recent sectoral lockdowns in Italy
   • March 11
   • March 25, 2020

with a particular focus on workers exposed to high risk of contagion.
“Contemporaneous” literature

• Koren and Peto (2020), Leibovici et al. (2020) and Mongey et al. (2020) : face-to-face interactions and physical proximity.

• Work from home:
  • Dingel and Neiman (2020) in the US, based on O*Net.
  • Boeri et al. (2020): European countries (including Italy) with O*NET
First paper that describes the characteristics of sectors relating them to the sectoral lockdowns.

It is done according to dimensions that expose workers to contagion risk, by considering different indexes together:
  - proximity,
  - disease exposure
  - the possibility to work from remote.

Main advantage: by using relative measures greater flexibility.

Most of the literature classifies jobs in absolute terms, we rank sectors

Threshold to choose based on evaluation of the contagion and risks.

Select which activities to re-open first and where to reinforce security measures.
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How to measure the job-related risk of exposure to COVID-19

• Italian Sample Survey on Professions (ICP) - 800 occupations - and we combine with the 2019 Italian labour force survey data (LFS).

• ICP last run in 2013 by INAPP of about 16,000 workers.

• The ICP directly asks workers to answer the questionnaire,

• Because policy makers have focused on sectors (rather than, for instance, occupations), we run the analysis at the 4-digit sectoral level.
ICP data (1)

• The survey is based on the US O*Net.

• The main advantage of the ICP data is twofold.

  1. It is granular in terms of occupations.

  2. Characteristics are specific of the Italian productive system.

• We avoid potential biases arising when information referring to the US are linked to labour market data referring to different economies such as the European ones.
• The ICP survey includes relevant questions in the current COVID-19 emergency.

• The survey directly asks about
  • **Physical proximity**: “During your work are physically close to other people?”
  • **Disease exposure**: “How often does your job expose you to diseases and infections?”. 
  • A score that goes from a 0 to 100 scale for each 5-digit occupation.
Questions on Working From Home attitude

- A composite index that proxies for the **WFH attitude**.
- The index is computed by taking the average of the **following seven questions**:
  
  i) importance of performing general physical activities (which enters with reversely);
  
  ii) importance of working with computers;
  
  iii) importance of maneuvering mechanical vehicles or equipment (reversely);
  
  iv) requirement of face-to-face interactions (reversely);
  
  v) dealing with external customers or with the public (reversely);
  
  vi) physical proximity (reversely);
  
  vii) time spent standing (reversely)

- Note that this index is similar to the **offshorability** by Autor and Dorn (2013), the **face-to-face** and **on-site job** indexes by Firpo et al. (2011).
Empoymtment in the top tercile

• In the spirit of Autor and Dorn’s routine employment share we calculate the percentage of sectoral employment in the top tercile
• For the physical proximity index, for instance, such percentage is calculated for each sector j as follows:

\[
% \text{Top Proximity}_j = 100 \times \left( \sum_k L_{kj} \times 1[\text{Proximity Index}_k > \text{Proximity Index}_j^{P66}] \right) \times L_j^{-1}
\]

• \(L_{kj}\) is the employment in occupation k in sector j
• \(1[\cdot]\) is the indicator function, which takes the value of one if the occupation’s physical proximity is above the 66th percentile of the employment-weighted index.
• The expected effect of lockdown in terms of employment most exposed to risk
• Introduction and aim of the paper
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• Indexes of physical proximity and disease exposure
• The impact of lockdown in Italy
• Conclusions
Correlation between exposure to infectious diseases and workers’ physical proximity: 4-digit

- Sectors that are most exposed to infections and diseases: workers in medical occupations and health services
- Physical proximity: education industry and retail trade activities.
- In the northeast quadrant sectors more at risk of contagion (both high physical proximity and exposition to diseases.)
The health industry records high values in both indexes.

Physical proximity risks are present in many large sectors of the Italian economy.

The question on how, whether and when allowing again such working activities is of outmost importance during the phase-out of the lockdown.
Occupational distribution in each percentile rank of the physical proximity index: 5 sectors

- High risk of proximity in the services sector (including healthcare), and in retail trade.
- Manufacturing between the 30th and the 60th percentile
- Agriculture: little to no physical proximity
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• The expected impact of lockdown in Italy
• Conclusions
## Lockdown in Italy: 2 decrees

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Sector employment</th>
<th>Workers affected</th>
<th>% workers affected</th>
<th>% affected among top 66th physical proximity</th>
<th>% affected among top 66th diseases exposure</th>
<th>% affected among &gt; 50-y.o. males</th>
<th>% affected among &gt; 50-y.o.</th>
<th>Workers affected among top 66th physical proximity</th>
<th>% affected among top 66th diseases exposure</th>
<th>% affected among &gt; 50-y.o. males</th>
<th>% affected among &gt; 50-y.o.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A. Lockdown implemented on March 11, 2020</strong></td>
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</tr>
<tr>
<td>G - Trade</td>
<td>3,283,268</td>
<td>904,423</td>
<td>27.5</td>
<td>36.4</td>
<td>10.6</td>
<td>25.0</td>
<td>21.1</td>
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<tr>
<td>I - Hotel, restaurants</td>
<td>1,510,284</td>
<td>1,089,357</td>
<td>72.1</td>
<td>78.6</td>
<td>68.2</td>
<td>63.1</td>
<td>71.3</td>
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</tr>
<tr>
<td>J - Information, communic.</td>
<td>619,220</td>
<td>4,769</td>
<td>0.8</td>
<td>4.0</td>
<td>2.8</td>
<td>0.3</td>
<td>0.4</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>P - Education</td>
<td>1,580,162</td>
<td>40,324</td>
<td>2.6</td>
<td>2.6</td>
<td>2.1</td>
<td>1.2</td>
<td>2.1</td>
<td></td>
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<tr>
<td>R - Sports, recreational</td>
<td>317,876</td>
<td>254,078</td>
<td>79.9</td>
<td>85.0</td>
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<td>78.6</td>
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<tr>
<td>S - Other services</td>
<td>709,981</td>
<td>392,794</td>
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<td>78.4</td>
<td>71.8</td>
<td>44.1</td>
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<tr>
<td><strong>Total economy</strong></td>
<td>2,685,743</td>
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<td>11.5</td>
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<td>13.0</td>
<td>7.9</td>
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<td><strong>Panel B. Additional lockdown implemented on March 25, 2020</strong></td>
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<tr>
<td>A - Agriculture</td>
<td>887,192</td>
<td>53,235</td>
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<td>41.1</td>
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<td>8.4</td>
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<tr>
<td>B - Mining and quarrying</td>
<td>24,965</td>
<td>15,317</td>
<td>61.4</td>
<td>30.1</td>
<td>63.3</td>
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<td>C - Manufacturing</td>
<td>4,318,814</td>
<td>2,862,660</td>
<td>66.3</td>
<td>53.8</td>
<td>38.1</td>
<td>66.1</td>
<td>66.8</td>
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<td>F - Construction</td>
<td>1,331,231</td>
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<td>78.7</td>
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<tr>
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<td>I - Hotel, restaurants</td>
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<td>1,171,420</td>
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<td>80.5</td>
<td>71.9</td>
<td>70.7</td>
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<td>0.3</td>
<td>0.4</td>
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<tr>
<td>L - Real estate</td>
<td>164,294</td>
<td>164,294</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
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<tr>
<td>M - Professional services</td>
<td>1,512,434</td>
<td>70,956</td>
<td>4.7</td>
<td>30.6</td>
<td>3.6</td>
<td>3.3</td>
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<tr>
<td>N - Other business services</td>
<td>1,034,091</td>
<td>387,860</td>
<td>37.5</td>
<td>42.0</td>
<td>22.5</td>
<td>36.0</td>
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<td>100.0</td>
<td>100.0</td>
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<td>100.0</td>
<td>100.0</td>
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</tr>
<tr>
<td>S - Other services</td>
<td>709,981</td>
<td>427,286</td>
<td>60.2</td>
<td>79.0</td>
<td>71.9</td>
<td>51.5</td>
<td>40.4</td>
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<tr>
<td>T - Household activities</td>
<td>747,521</td>
<td>5,695</td>
<td>0.8</td>
<td>0.9</td>
<td>0.9</td>
<td>0.7</td>
<td>2.0</td>
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</tr>
<tr>
<td>U - International organiz.</td>
<td>14,442</td>
<td>14,442</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
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</tr>
<tr>
<td><strong>Total economy</strong></td>
<td>7,916,447</td>
<td></td>
<td>33.9</td>
<td>34.6</td>
<td>18.5</td>
<td>28.6</td>
<td>34.2</td>
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</tbody>
</table>
### OLS regressions of physical proximity and disease indexes on the sectoral lockdown dummies with OLS

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
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</thead>
<tbody>
<tr>
<td><strong>Panel A: Physical proximity index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lockdown 11/3</td>
<td>13.120**</td>
<td>13.454**</td>
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<tr>
<td></td>
<td>(1.250)</td>
<td>(1.247)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lockdown 25/3</td>
<td></td>
<td></td>
<td>1.921*</td>
<td>2.536**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.754)</td>
<td>(0.744)</td>
</tr>
<tr>
<td>Observations</td>
<td>605</td>
<td>593</td>
<td>605</td>
<td>593</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.132</td>
<td>0.149</td>
<td>0.010</td>
<td>0.019</td>
</tr>
<tr>
<td>Health sector</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Panel B: Disease exposure index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lockdown 11/3</td>
<td>0.159</td>
<td>1.086</td>
<td>-3.700**</td>
<td>-2.065**</td>
</tr>
<tr>
<td></td>
<td>(0.798)</td>
<td>(0.749)</td>
<td>(0.635)</td>
<td>(0.422)</td>
</tr>
<tr>
<td>Lockdown 25/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>605</td>
<td>593</td>
<td>605</td>
<td>593</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.000</td>
<td>0.003</td>
<td>0.051</td>
<td>0.039</td>
</tr>
<tr>
<td>Health sector</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

- The first lockdown targeted sectors where workers' **physical proximity** was particularly high.
- In terms of **exposure to diseases** no significant effect.
- This is partly expected because the health industry has never been included.
OLS regressions of the share of workers at high risk on the sectoral lockdown dummies

The first decree involved workers at high proximity risk
- The first decree did not keep home people at high risk of diseases,
- The sectors under lockdown had a lower share of workers with a high possibility to work from remote:
  - Rob check: 25%, 50%
Percentage of male workers above the age of 50 and sectoral lockdown

<table>
<thead>
<tr>
<th>% Males above 50 years of age</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lockdown 11/3</td>
<td>-5.857*</td>
<td>-6.099*</td>
<td>-9.572**</td>
<td>(2.420)</td>
<td>(2.421)</td>
<td>(1.564)</td>
</tr>
<tr>
<td>Lockdown 25/3</td>
<td></td>
<td></td>
<td></td>
<td>1.226</td>
<td>0.822</td>
<td>-0.571</td>
</tr>
</tbody>
</table>
                                                                 (1.120) | (1.125) | (2.034) |
| Observations                | 605  | 593  | 593  | 605  | 593  | 593  |
| $R^2$                       | 0.012 | 0.014 | 0.102 | 0.002 | 0.001 | 0.001 |
| Health sector               | No   | No   | No   | No   | No   | No   |
| Empl-we'd                   | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |

- The sectors that stayed open had a higher share of workers who were male above the age of 50 (but many of them are WFH). The second lockdown: no significant effect.
- Very asymmetric effect in terms of age: optimal targeted lockdowns (Acemoglu et al. 2020).
- Optimal policies should take the age dimension (Favero et al., 2020).
  - In Italy and other European countries age-based measures will not be implemented.
Outline

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- The impact of lockdown in Italy
- Conclusions
Conclusions

• Sectors and workers most exposed to risks during recent COVID-19 outbreak.

• Synthetic indexes:
  • physical proximity in the workplace,
  • exposure to diseases and infections,
  • the possibility to working from home

• The sectoral lockdowns in Italy targeted sectors
  • Higher share of workers in physical proximity,
  • But not sectors with a higher exposure to infections, even excluding the health and the education industries.
  • Lower share of workers who can work from home.

• Help policymakers select which activities to reopen first and where to reinforce security measures
References

- Barbieri, T., Basso, G. and Scicchitano, S. (2020b), COVID-19 epidemic: Italian workers exposed to risk and the lockdown, CEPR Vox.eu
Thank you!!!

Paper


Me

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https://sergioscicchitano.wordpress.com/
Top 10 sectors by disease exposure
Top 10 sectors by physical proximity
Proximity by NUTS-3
Disease by NUTS-3
Working from home by NUTS-3