Italian Workers at Risk during the Covid-19 Epidemic

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Aim & Research Questions

- Analyzing the content of Italian occupations according to the degree of exposition to contagion risks during the COVID-19 epidemics

- Mapping professions and sectors of economic activity according to dimensions that expose workers to contagion risk

- Italy was the first Western country to adopt sectoral lockdown measures:

I.   Were sectors forced to close more exposed to risk of contagion?

II.   Did the sectoral lockdown target workers at high risk ?

Literature

- We build up on the literature that studies the labour market effects of technological change and classifies occupations according to their tasks (Autor et al., 2003; Firpo et al., 2011; Autor and Dorn, 2013)

- We contribute to a recent growing strand on literature on the characterization of economic activities along dimensions of risk and safety for workers during the recent epidemic

Literature

- Koren and Peto (2020), Leibovici et al. (2020) and Mongey et al. (2020) classify occupations according to the degree of required face-to-face interactions and physical proximity.

- Dingel and Neiman (2020) estimate how many jobs can be carried out from home in the US, based on O*Net.

- Boeri et al. (2020) classify jobs for the European labour markets using O*Net according to the extent to which they can be safely carried out under the epidemic, where safest jobs are considered those that can be carried out from home.

Data & Methodology

- The Italian Sample Survey on Professions (ICP) gives information on the content of all the 5-digit Italian professions

- ICP is the Italian equivalent of O*Net

- Job characteristics are specific of the Italian productive system, its labour market and institutions: no international crosswalk is needed

- We map professions and sectors according to 3 indexes:

    1.   Proximity: "During your work are physically close to other people?"

    2.   Disease exposure: "How often does your job expose you to diseases and infections?"

    3.   Possibility to work from remote (composite)

Data & Methodology

- Possibility to work from remote index is built on 7 dimensions:

i.   importance of performing general physical activities (reverse)

ii.   importance of working with computers

iii.   importance of maneuvering vehicles, mechanical vehicles or equipment (reverse);

iv.   requirement of face-to-face interactions (reverse)

v.   dealing with external customers or with the public (reverse)

vi.   physical proximity (reverse)

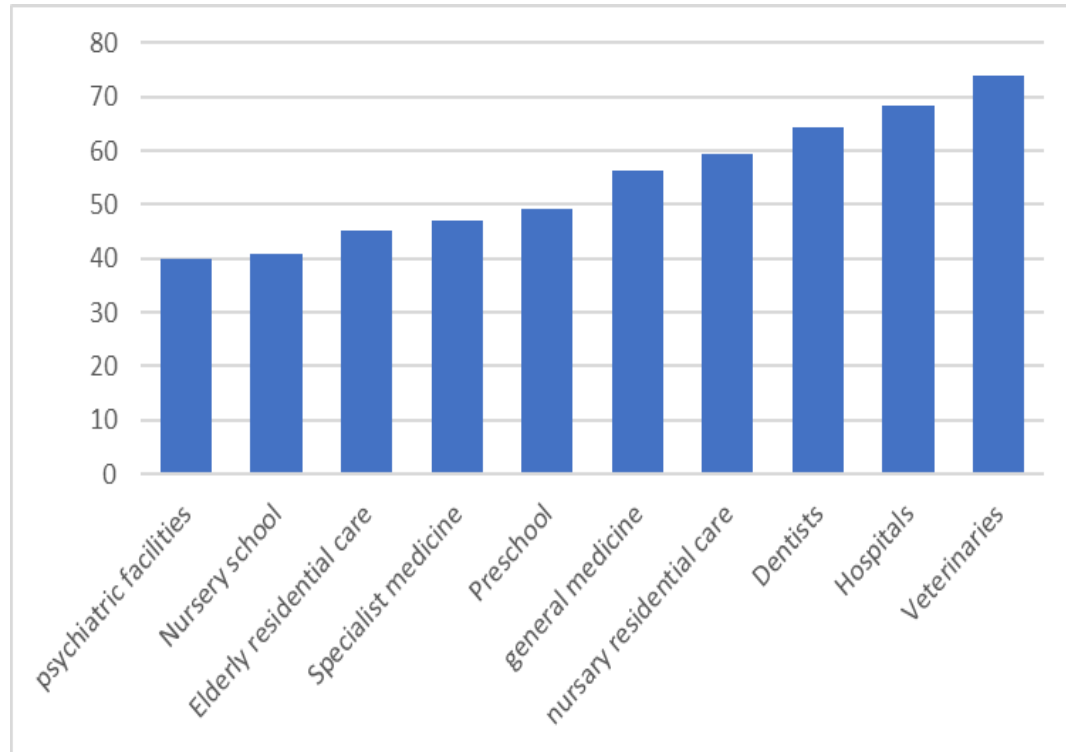vii.   time spent standing (reverse)

Data & Methodology

- This information are matched to the 2019 Italian labour force survey data (LFS)

- We weigh each occupation-specific index by the employment share in each sector and we derive indexes of physical proximity, exposure to disease and infections and working remotely at the sectoral level
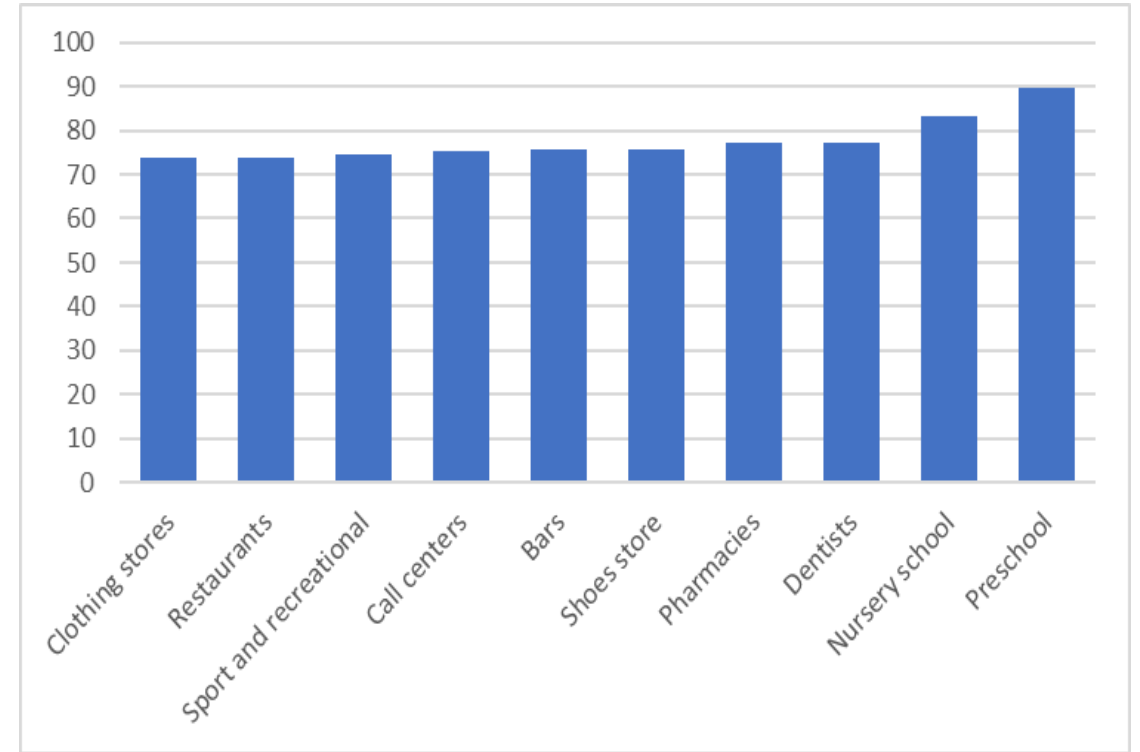
Data & Methodology

- We first correlate the sectoral lockdowns with the physical proximity and disease indexes in a simple OLS regression

- Then we run OLS regressions of the share of workers at high risk on the sectoral lockdown dummies

- Share of workers at high risk is the share of sectoral employment in the top tercile of the employment-weighted distribution of each index

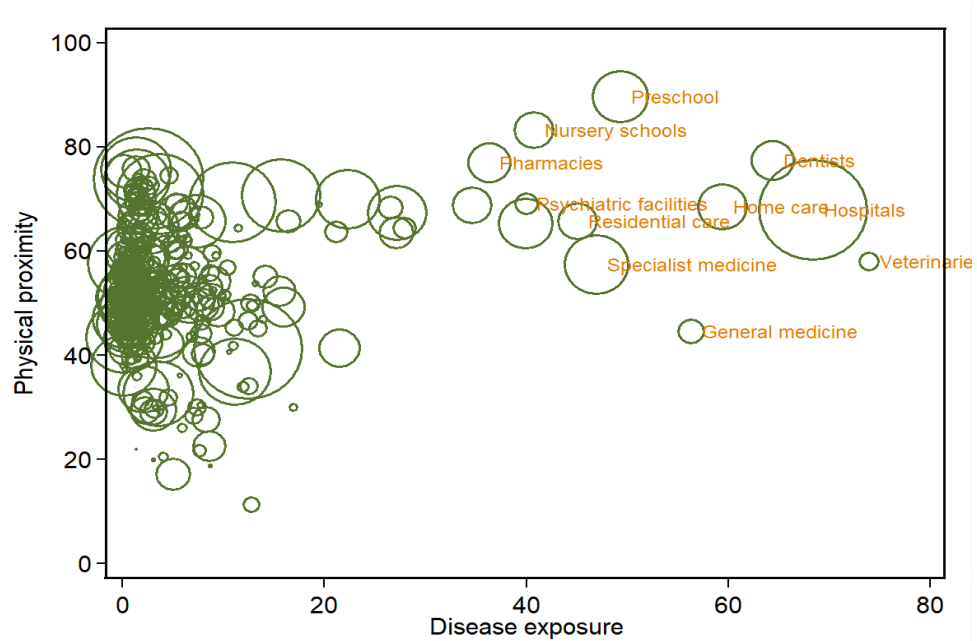# Top 10 sectors by diseases exposure and worker's physical proximity

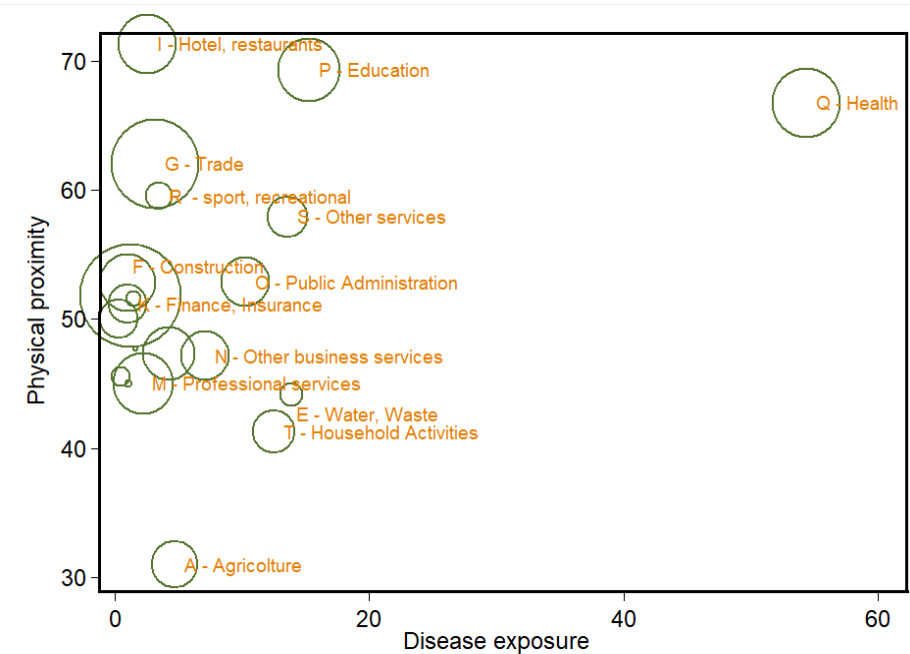Panel A. Top 10 sectors by disease exposure

Panel B. Top 10 sectors by physical proximity

Correlation between exposure to infectious diseases and workers' physical proximity

Panel A. 4-digit sectors

Panel B. 21 aggregate sectors

Sectoral distribution: workers' demographics composition, disease exposure and physical proximity (employment in thousands)

Sectors	Workers	Physical proximity index	% workers > 66th pct	Disease exposure index	% workers > 66th pct	Working from remote index	% workers > 66th pct	% male >50 y.o.	%female >50 y.o.	% male <50 y.o.	%female <50 y.o.
A-Agricolture	908.8	31.0	*4.8*	4.7	*48.2*	46.1	*8.3*	29.4	10.7	44.7	15.2
B -Extraction	24.7	45.0	*3.9*	1.1	*27.4*	54.4	*38.8*	33.7	3.5	54.6	8.2
C-Manufacturing	4,321.0	51.8	*11.4*	1.2	*7.6*	51.9	*32.5*	22.4	7.2	51.5	18.9
D-Energy, Gas	114.1	51.6	*12.9*	1.5	*13.7*	58.8	*66.8*	32.2	6.8	41.8	19.2
E-Water, Waste	242.8	44.1	*3.2*	13.8	*63.8*	52.3	*29.2*	35.8	5.6	48.3	10.3
F-Construction	1,339.4	52.8	*8.5*	1.0	*8.2*	42.1	*13.4*	30.4	1.9	63.0	4.8
G-Trade	3,286.5	62.0	56.8	3.1	*13.5*	40.0	*13.6*	18.8	10.9	39.7	30.6
H-Transportation	1,142.7	47.3	*18.2*	4.2	*40.0*	50.1	*28.7*	28.3	6.9	51.1	13.7
I-Hotel, restaurants	1,480.2	71.3	85.8	2.6	*31.5*	34.5	*7.5*	11.1	11.7	38.4	38.8
J-Information, comm	618.1	50.0	*7.4*	0.3	*3.7*	67.3	*91.4*	19.5	7.8	50.9	21.8
K-Finance, Insurance	635.6	51.2	*13.3*	1.0	*13.2*	61.2	*71.8*	22.7	12.9	32.2	32.1

Sectoral distribution: workers' demographics composition, disease exposure and physical proximity (employment in thousands)

Sectors	Workers	Physical proximity index	% workers > 66th pct	Disease exposure index	% workers > 66th pct	Working from remote index	% workers > 66th pct	% male >50 y.o.	%female >50 y.o.	% male <50 y.o.	%female <50 y.o.
L-Real estate	164.0	45.5	1.3	0.5	2.3	60.7	48.6	23.3	14.6	30.3	31.9
M-Professional services	1,516.4	45.0	1.7	2.2	8.2	65.8	90.7	19.6	11.0	33.5	35.9
N-Other business serv.	1,027.9	47.1	15.7	7.1	55.6	53.7	31.0	15.5	16.1	32.5	35.9
O-Public Administr.	1,008.3	52.9	21.1	10.2	35.5	56.7	64.6	32.9	26.3	24.9	16.0
P-Education	1,589.5	69.3	69.5	15.2	77.7	48.5	22.4	12.1	36.7	12.5	38.7
Q-Health	1,922.2	66.8	64.2	54.4	85.4	43.0	24.9	14.7	25.1	15.5	44.7
R-sport, recreational	318.2	59.5	42.6	3.5	34.1	48.1	35.5	16.0	10.4	41.8	31.8
S-Other services	711.6	58.0	44.1	13.6	70.2	43.4	26.0	13.8	18.7	24.3	43.2
T-Household Activities	738.9	41.3	40.3	12.5	96.4	53.6	54.6	4.1	38.6	7.8	49.5
U-International org.	13.6	47.7	5.1	1.6	13.8	60.8	73.1	13.9	13.2	38.2	34.7
Total economy	23,124.7 [a]	55.1	33.1	8.8	33.6	49.0	33.3	20.0	14.4	37.3	28.2

Sectoral lockdowns and workers affected

Sectors	Sector employment	Workers affected	% workers affected	% affected among top 66th physical proximity	% affected among top 66th diseases exposure	% affected among > 50-y.o.	% affected among males > 50-y.o.
Panel A. Lockdown implemented on March 11, 2020							
G - Trade	3286.5	907.6	27.6	35.2	11.0	25.2	21.1
I - Hotel, restaurants	1480.2	1073.3	72.5	79.1	63.8	62.7	71.2
J - Information, comm	618.1	4.8	0.8	4.4	10.8	0.4	0.6
P - Education	1589.5	41.7	2.6	2.9	1.8	1.3	2.0
R - sport, recreational	318.2	256.1	80.5	88.6	85.2	79.6	76.0
S - Other services	711.6	401.0	56.3	78.9	75.4	45.7	29.5
		2684.4	11.6	27.0	10.8	8.0	6.9

Sectoral lockdowns and workers affected

Sectors	Sector employment	Workers affected	% workers affected	% affected among top 66th physical proximity	% affected among top 66th diseases exposure	% affected among > 50-y.o.	% affected among males > 50-y.o.
Panel B. Additional lockdown implemented on March 25, 2020							
A - Agricolture	908.8	54.7	6.0	46.4	2.1	8.5	10.6
B - Extraction	24.7	15.0	60.7	40.6	76.8	65.6	69.7
C - Manufacturing	4,321.4	2,863.6	66.3	57.5	44.2	66.8	67.4
F - Construction	1,339.4	812.1	60.6	77.4	52.9	63.7	64.6
G - Trade	3,286.5	1,571.5	47.8	47.3	23.4	48.3	49.6
I - Hotel, restaurants	1,480.2	1,152.2	77.8	80.8	69.3	70.7	77.5
J - Information, comm	618.1	4.8	0.8	4.4	10.8	0.4	0.6
L - Real estate	164.0	164.0	100	100	100	100	100
M - Professional services	1,516.5	78.1	5.2	28.7	4.1	3.6	2.6
N - Other business services	1,027.9	381.4	37.1	41.8	23.0	34.3	43.2
P - Education	1,589.5	41.7	2.6	2.9	1.8	1.3	2.0
R - sport, recreational	318.2	318.2	100	100	100	100	100
S - Other services	711.6	433.5	60.9	81.5	75.6	52.5	42.0
T - Household Activities	738.9	5.6	0.8	0.8	0.7	0.6	1.6
U - International org.	14.1	14.1	100.0	100.0	100.0	100.0	100.0
		7,910.4	33.9	36.75	16.74	28.75	34.55

Average difference in terms of risk exposition indexes between operative and sectors under lockdown

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

Percentage of workers in the top tercile of risk indexes and sectoral lockdown

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: % Employment in top tercile of the proximity index distribution						
Lockdown 11/3	43.955**	44.916**	53.596**			
	(4.405)	(4.398)	(6.333)			
Lockdown 25/3				2.187	3.872[+]	9.501
				(2.054)	(2.016)	(7.725)
Observations	605	593	593	605	593	593
R^2	0.205	0.229	0.320	0.002	0.006	0.020
Health sector		No	No		No	No
Empl-we'd			Yes			Yes

Panel B: % Employment in top tercile of the disease exposure index distribution						
Lockdown 11/3	4.664	6.085	1.264			
	(4.209)	(4.194)	(9.110)			
Lockdown 25/3				-12.896**	-10.546**	-20.555**
				(1.975)	(1.905)	(6.483)
Observations	605	593	593	605	593	593
R^2	0.002	0.004	0.000	0.065	0.049	0.095
Health sector		No	No		No	No
Empl-we'd			Yes			Yes

Percentage of workers in the top tercile of possibility to work from home index and sectoral lockdown

	(1)	(2)	(3)	(4)	(5)	(6)
Panel C: % Employment in top tercile of the working remotely index distribution						
Lockdown 11/3	-22.222**	-22.492**	-28.720**			
	(3.416)	(3.422)	(3.815)			
Lockdown 25/3				-9.688**	-10.310**	-18.070**
				(2.334)	(2.369)	(5.022)
Observations	605	593	593	605	593	593
R^2	0.039	0.040	0.098	0.027	0.031	0.079
Health sector		No	No		No	No
Empl-we'd			Yes			Yes

Percentage of male workers above the age of 50 and sectoral lockdown

	(1)	(2)	(3)	(4)	(5)	(6)
% Males above 50 years of age						
Lockdown 11/3	-5.857*	-6.099*	-9.572**			
	(2.420)	(2.421)	(1.564)			
Lockdown 25/3				1.226	0.822	-0.571
				(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
Empl-we'd			Yes			Yes

Conclusions

- Several activities, mainly in trade, personal services and leisure sectors need physical proximity to operate

- The number of workers employed in Italy whose physical proximity index is above the national average, excluding healthcare and necessary goods, is above 6.5 million.

- Groups at risk of contagion and complications from COVID-19 (mainly male above the age of 50) work in sectors that are little exposed to physical proximity, currently under lockdown or can work remotely.

- The lockdowns targeted sectors that, on average, had a relatively higher share of workers who operate in physical proximity, but not sectors with a higher exposure to infections, even excluding the health and the education industries

- Our results also show that the sectors whose activities have not been suspended involve a larger share of workers who can work from home