

# Determinants of COVID-19 Infection Among Employees of an Italian Financial Institution

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## SUPPLEMENTARY MATERIAL

**Supplementary Table 1.** Sociodemographic characteristic of the population for each statuses considered, at August 31, 2021.

Variable and category	Status	8/31/21	Variable and category	Status	8/31/21
Female	Close Contact	6,590	45-49	Possible-probable contact	684
Female	Concluded	10,262	50-54	Close Contact	2,941
Female	Confirmed	2,573	50-54	Concluded	4,460
Female	Negative	38	50-54	Confirmed	1,120
Female	Possible Contact	711	50-54	Negative	17
Female	Possible-probable contact	2,216	50-54	Possible Contact	308
Male	Close Contact	5,047	50-54	Possible-probable contact	896
Male	Concluded	8,042	55+	Close Contact	3,478
Male	Confirmed	2,191	55+	Concluded	5,390
Male	Negative	22	55+	Confirmed	1,471
Male	Possible Contact	499	55+	Negative	17
Male	Possible-probable contact	1,593	55+	Possible Contact	381
<45	Close Contact	3,241	55+	Possible-probable contact	966
<46	Concluded	5,320	Bank	Close Contact	1,767
<47	Confirmed	1,368	Central Site		
<48	Negative	16	Bank	Concluded	3,651
<49	Possible Contact	330	Central Site		
<50	Possible-probable contact	1,263	Bank	Confirmed	1,358
45-49	Close Contact	1,977	Central Site		
45-49	Concluded	3,134	Bank	Negative	5
45-49	Confirmed	805	Central Site		
45-49	Negative	10	Bank	Possible Contact	95
45-49	Possible Contact	191	Central Site		

(continues)

**Supplementary Table 1.** Sociodemographic characteristic of the population for each statuses considered, at August 31, 2021. *(continued)*

<b>Variable and category</b>	<b>Status</b>	<b>8/31/21</b>	<b>Variable and category</b>	<b>Status</b>	<b>8/31/21</b>
Bank Central Site	Possible-probable contact	866	Emilia-Romagna	Possible-probable contact	247
Bank Branch	Close Contact	9,870	Friuli Venezia Giulia	Close Contact	365
Bank Branch	Concluded	14,653	Friuli Venezia Giulia	Concluded	567
Bank Branch	Confirmed	3,406	Friuli Venezia Giulia	Confirmed	151
Bank Branch	Negative	55	Friuli Venezia Giulia	Negative	64
Bank Branch	Possible Contact	1,115	Friuli Venezia Giulia	Possible Contact	115
Bank Branch	Possible-probable contact	2,943	Lazio	Close Contact	649
Abruzzo	Close Contact	132	Lazio	Concluded	1,057
Abruzzo	Concluded	202	Lazio	Confirmed	291
Abruzzo	Confirmed	48	Lazio	Negative	1
Abruzzo	Negative	4	Lazio	Possible Contact	49
Abruzzo	Possible Contact	51	Lazio	Possible-probable contact	217
Basilicata	Close Contact	67	Liguria	Close Contact	187
Basilicata	Concluded	87	Liguria	Concluded	318
Basilicata	Confirmed	16	Liguria	Confirmed	79
Basilicata	Negative	3	Liguria	Negative	2
Basilicata	Possible Contact	9	Liguria	Possible Contact	4
Calabria	Close Contact	71	Liguria	Possible-probable contact	82
Calabria	Concluded	108	Lombardia	Close Contact	3,300
Calabria	Confirmed	33	Lombardia	Concluded	5,337
Calabria	Negative	1	Lombardia	Confirmed	1,347
Calabria	Possible Contact	15	Lombardia	Negative	3
Campania	Close Contact	1,237	Lombardia	Possible Contact	340
Campania	Concluded	1,581	Lombardia	Possible-probable contact	1,281
Campania	Confirmed	337	Marche	Close Contact	174
Campania	Negative	6	Marche	Concluded	301
Campania	Possible Contact	52	Marche	Confirmed	90
Campania	Possible-probable contact	193	Marche	Negative	1
Emilia-Romagna	Close Contact	648	Marche	Possible Contact	3
Emilia-Romagna	Concluded	1,115			
Emilia-Romagna	Confirmed	365			
Emilia-Romagna	Negative	5			
Emilia-Romagna	Possible Contact	41			

<b>Variable and category</b>	<b>Status</b>	<b>8/31/21</b>	<b>Variable and category</b>	<b>Status</b>	<b>8/31/21</b>
Marche	Possible-probable contact	74	Sicilia	Possible Contact	26
Molise	Close Contact	31	Sicilia	Possible-probable contact	53
Molise	Concluded	42	Toscana	Close Contact	628
Molise	Confirmed	6	Toscana	Concluded	1,042
Molise	Negative	0	Toscana	Confirmed	363
Molise	Possible Contact	9	Toscana	Negative	4
P.A. Bolzano	Close Contact	34	Toscana	Possible Contact	18
P.A. Bolzano	Concluded	52	Toscana	Possible-probable contact	215
P.A. Bolzano	Confirmed	18	Umbria	Close Contact	84
P.A. Bolzano	Negative	1	Umbria	Concluded	162
P.A. Bolzano	Possible Contact	15	Umbria	Confirmed	70
P.A. Trento	Close Contact	64	Umbria	Negative	1
P.A. Trento	Concluded	105	Umbria	Possible Contact	5
P.A. Trento	Confirmed	28	Umbria	Possible-probable contact	24
P.A. Trento	Negative	2	Valle d'Aosta	Close Contact	47
P.A. Trento	Possible Contact	11	Valle d'Aosta	Concluded	63
P.A. Trento	Possible-probable contact	38	Valle d'Aosta	Confirmed	13
Piemonte	Close Contact	1,308	Valle d'Aosta	Negative	1
Piemonte	Concluded	2,296	Valle d'Aosta	Possible Contact	14
Piemonte	Confirmed	609	Valle d'Aosta	Possible-probable contact	9
Piemonte	Negative	12	Veneto	Close Contact	1,566
Piemonte	Possible Contact	309	Veneto	Concluded	2,399
Piemonte	Possible-probable contact	494	Veneto	Confirmed	593
Puglia	Close Contact	605	Veneto	Negative	18
Puglia	Concluded	830	Veneto	Possible Contact	172
Puglia	Confirmed	180	Veneto	Possible-probable contact	512
Puglia	Negative	2	Total	Close Contact	11,637
Puglia	Possible Contact	53	Total	Concluded	18,304
Puglia	Possible-probable contact	113	Total	Confirmed	4,764
Sardegna	Close Contact	138	Total	Negative	60
Sardegna	Concluded	228	Total	Possible Contact	1,210
Sardegna	Confirmed	51	Total	Possible-probable contact	3,809
Sardegna	Negative	41			
Sardegna	Possible Contact	43			
Sicilia	Close Contact	302			
Sicilia	Concluded	412			
Sicilia	Confirmed	76			
Sicilia	Negative	1			

**Supplementary Table 2.** Odds ratio<sup>a</sup> (ORs) of each status for each Italian region, and the corresponding 95% Confidence Intervals (minimum and maximum), for three time periods.

Variable and category	Status	April 2020			November 2020			August 2021		
		OR	Min CI	Max CI	OR	Min CI	Max CI	OR	Min CI	Max CI
Sex (M)	Close Contact	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Sex (F)	Close Contact	1.05	0.95	1.15	1.07	1.01	1.14	1.09	1.05	1.14
Age (< 45)	Close Contact	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Age (45-49)	Close Contact	1.22	1.05	1.41	1.13	1.03	1.23	1.14	1.07	1.22
Age (50-54)	Close Contact	1.36	1.20	1.55	1.14	1.05	1.23	1.18	1.11	1.25
Age (55+)	Close Contact	1.30	1.15	1.47	1.07	1.00	1.15	1.06	1.00	1.12
Site (Bank Central Site)	Close Contact	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Site (Bank Branch)	Close Contact	4.26	3.77	4.81	4.66	4.32	5.02	5.38	5.09	5.69
Region (Veneto)	Close Contact	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Region (Abruzzo)	Close Contact	0.36	0.18	0.74	1.04	0.81	1.34	0.71	0.58	0.87
Region (Basilicata)	Close Contact	0.56	0.23	1.37	2.02	1.47	2.76	0.95	0.71	1.26
Region (Calabria)	Close Contact	-	-	-	0.07	0.03	0.16	0.32	0.25	0.41
Region (Campania)	Close Contact	1.30	1.04	1.63	2.63	2.34	2.94	1.77	1.61	1.94
Region (Emilia-Romagna)	Close Contact	2.20	1.80	2.69	1.10	0.96	1.26	0.79	0.71	0.87
Region (Friuli-Venezia Giulia)	Close Contact	2.71	2.09	3.51	1.71	1.43	2.04	1.46	1.27	1.68
Region (Lazio)	Close Contact	0.40	0.28	0.56	0.69	0.59	0.80	0.74	0.66	0.82
Region (Liguria)	Close Contact	0.42	0.24	0.73	0.63	0.49	0.82	0.70	0.59	0.83
Region (Lombardia)	Close Contact	2.53	2.15	2.97	1.66	1.51	1.83	1.20	1.12	1.29
Region (Marche)	Close Contact	0.68	0.44	1.04	0.75	0.60	0.95	0.55	0.46	0.65
Region (Molise)	Close Contact	7.56	4.65	12.29	2.09	1.30	3.34	1.07	0.70	1.64
Region (P.A. Bolzano)	Close Contact	0.95	0.35	2.60	1.72	1.08	2.72	0.98	0.66	1.46
Region (P.A. Trento)	Close Contact	1.97	1.10	3.52	1.58	1.08	2.30	1.25	0.92	1.69
Region (Piemonte)	Close Contact	1.36	1.11	1.66	1.50	1.34	1.67	1.04	0.95	1.13
Region (Puglia)	Close Contact	0.30	0.19	0.46	0.77	0.65	0.91	1.08	0.97	1.21
Region (Sardegna)	Close Contact	0.20	0.09	0.46	0.58	0.44	0.77	0.52	0.43	0.63
Region (Sicilia)	Close Contact	0.19	0.10	0.35	0.53	0.43	0.66	0.59	0.51	0.68
Region (Toscana)	Close Contact	0.32	0.23	0.46	0.51	0.44	0.60	0.63	0.56	0.69
Region (Umbria)	Close Contact	0.17	0.06	0.45	0.14	0.08	0.24	0.37	0.29	0.46
Region (Valle d'Aosta)	Close Contact	6.39	3.80	10.72	2.71	1.74	4.21	2.06	1.40	3.04
Sex (M)	Confirmed	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Sex (F)	Confirmed	0.84	0.59	1.19	0.91	0.78	1.05	1.00	0.94	1.07
Age (< 45)	Confirmed	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Age (45-49)	Confirmed	0.73	0.40	1.34	1.02	0.81	1.28	1.07	0.98	1.17
Age (50-54)	Confirmed	0.95	0.57	1.58	1.01	0.82	1.24	1.05	0.97	1.14
Age (55+)	Confirmed	1.49	0.97	2.30	1.11	0.92	1.34	1.03	0.95	1.12

Variable and category	Status	April 2020			November 2020			August 2021		
		OR	Min CI	Max CI	OR	Min CI	Max CI	OR	Min CI	Max CI
Site (Bank Central Site)	Confirmed	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Site (Bank Branch)	Confirmed	2.05	1.38	3.04	1.72	1.46	2.03	1.92	1.79	2.05
Region (Veneto)	Confirmed	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Region (Abruzzo)	Confirmed	0.83	0.19	3.56	1.66	0.89	3.08	0.77	0.57	1.05
Region (Basilicata)	Confirmed	0.99	0.13	7.44	1.05	0.33	3.36	0.66	0.39	1.09
Region (Calabria)	Confirmed	0.42	0.06	3.16	0.28	0.07	1.13	0.52	0.36	0.75
Region (Campania)	Confirmed	0.43	0.16	1.14	2.32	1.68	3.20	1.12	0.97	1.29
Region (Emilia-Romagna)	Confirmed	1.15	0.56	2.34	1.09	0.73	1.62	1.25	1.09	1.44
Region (Friuli-Venezia Giulia)	Confirmed	2.12	0.93	4.81	1.02	0.55	1.88	1.60	1.32	1.93
Region (Lazio)	Confirmed	0.48	0.19	1.20	1.50	1.05	2.13	0.91	0.79	1.06
Region (Liguria)	Confirmed	0.32	0.04	2.36	1.55	0.88	2.73	0.95	0.75	1.22
Region (Lombardia)	Confirmed	0.97	0.57	1.64	1.50	1.15	1.97	1.13	1.02	1.25
Region (Marche)	Confirmed	1.63	0.66	4.07	1.48	0.87	2.52	0.91	0.73	1.15
Region (Molise)	Confirmed	10.60	3.54	31.71	4.55	1.80	11.54	0.60	0.26	1.37
Region (P.A. Bolzano)	Confirmed	-	-	-	2.25	0.70	7.26	1.68	1.01	2.79
Region (P.A. Trento)	Confirmed	1.37	0.18	10.28	0.88	0.21	3.61	1.53	1.02	2.30
Region (Piemonte)	Confirmed	0.81	0.42	1.58	1.49	1.09	2.04	1.17	1.04	1.31
Region (Puglia)	Confirmed	0.12	0.02	0.92	0.75	0.44	1.26	0.89	0.75	1.06
Region (Sardegna)	Confirmed	-	-	-	1.27	0.68	2.35	0.62	0.46	0.83
Region (Sicilia)	Confirmed	0.33	0.08	1.41	0.73	0.41	1.30	0.45	0.35	0.58
Region (Toscana)	Confirmed	0.25	0.08	0.85	1.71	1.21	2.40	1.14	1.00	1.31
Region (Umbria)	Confirmed	0.80	0.19	3.41	0.91	0.42	2.00	1.09	0.84	1.41
Region (Valle d'Aosta)	Confirmed	3.12	0.41	23.56	0.92	0.13	6.68	1.40	0.78	2.53
Sex (F)	Possible-probable contact	1.60	1.14	2.24	1.23	1.11	1.36	1.11	1.04	1.19
Age (45-49)	Possible-probable contact	1.13	0.71	1.80	1.02	0.89	1.18	0.97	0.88	1.07
Age (50-54)	Possible-probable contact	0.93	0.60	1.44	0.89	0.79	1.02	0.88	0.81	0.96
Age (55+)	Possible-probable contact	1.24	0.83	1.85	0.80	0.70	0.91	0.74	0.68	0.81
Site (Bank Branch)	Possible-probable contact	8.40	5.05	13.98	3.15	2.80	3.55	2.82	2.60	3.06
Region (Veneto)	Possible-probable contact	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-	1 <sup>b</sup>	-	-
Region (Abruzzo)	Possible-probable contact	0.74	0.10	5.71	0.92	0.57	1.48	0.97	0.72	1.30
Region (Basilicata)	Possible-probable contact	-	-	-	0.36	0.12	1.15	0.42	0.22	0.83

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**Supplementary Table 2.** Odds ratio<sup>a</sup> (ORs) of each status for each Italian region, and the corresponding 95% Confidence Intervals (minimum and maximum), for three time periods. *(continued)*

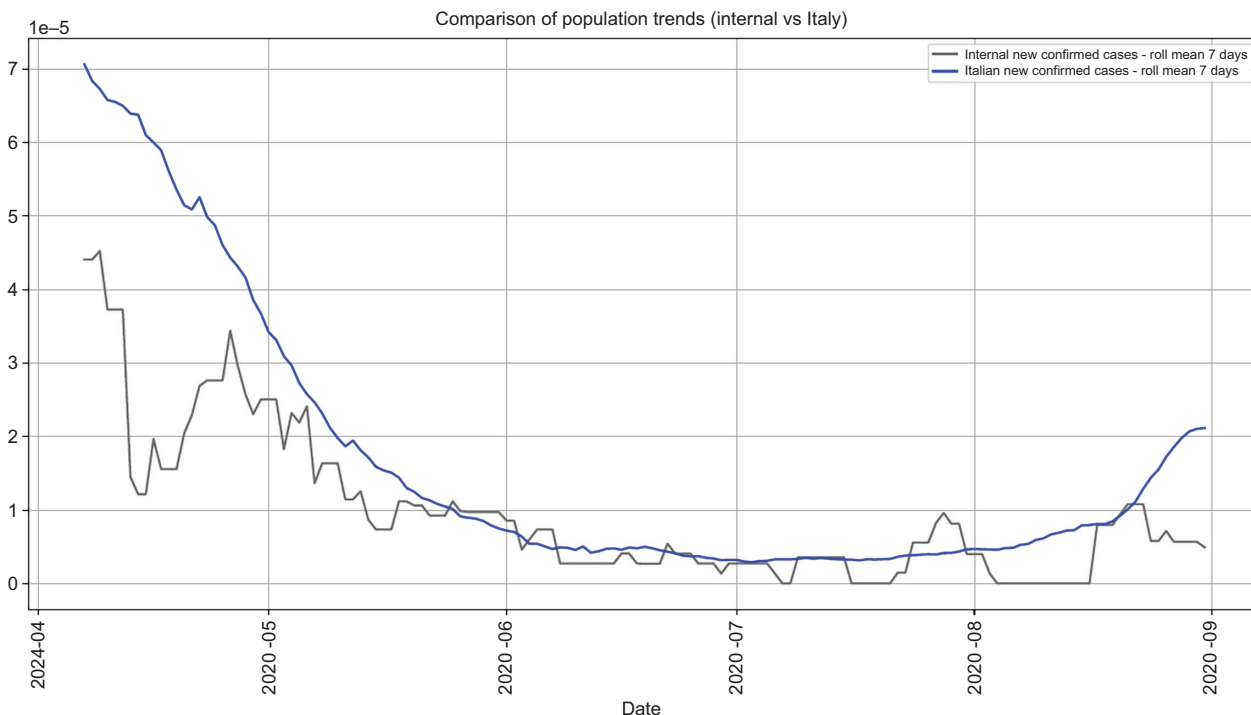
Variable and category	Status	April 2020			November 2020			August 2021		
		OR	Min CI	Max CI	OR	Min CI	Max CI	OR	Min CI	Max CI
Region (Calabria)	Possible-probable contact	-	-	-	0.23	0.09	0.55	0.26	0.15	0.44
Region (Campania)	Possible-probable contact	0.46	0.13	1.64	0.96	0.75	1.22	0.71	0.60	0.85
Region (Emilia-Romagna)	Possible-probable contact	1.83	0.80	4.14	1.27	1.01	1.59	0.97	0.83	1.14
Region (Friuli-Venezia Giulia)	Possible-probable contact	0.46	0.06	3.52	0.83	0.56	1.24	1.40	1.13	1.74
Region (Lazio)	Possible-probable contact	0.32	0.07	1.41	1.01	0.79	1.28	0.82	0.70	0.97
Region (Liguria)	Possible-probable contact	2.55	0.89	7.26	1.16	0.80	1.68	1.12	0.88	1.43
Region (Lombardia)	Possible-probable contact	4.79	2.63	8.74	1.84	1.56	2.16	1.34	1.20	1.49
Region (Marche)	Possible-probable contact	1.36	0.38	4.84	1.23	0.87	1.74	0.86	0.67	1.11
Region (Molise)	Possible-probable contact	4.07	0.52	31.64	0.58	0.14	2.36	1.07	0.54	2.14
Region (P.A. Bolzano)	Possible-probable contact	3.85	0.50	29.92	2.00	0.96	4.16	1.48	0.86	2.56
Region (P.A. Trento)	Possible-probable contact	-	-	-	1.54	0.80	2.96	2.55	1.78	3.67
Region _Piemonte	Possible-probable contact	1.99	0.97	4.12	1.29	1.06	1.57	1.13	0.99	1.28
Region _Puglia	Possible-probable contact	0.23	0.03	1.74	0.70	0.51	0.97	0.64	0.52	0.79
Region (Sardegna)	Possible-probable contact	-	-	-	0.39	0.21	0.71	0.59	0.43	0.81
Region (Sicilia)	Possible-probable contact	0.29	0.04	2.20	0.41	0.26	0.63	0.35	0.27	0.47
Region (Toscana)	Possible-probable contact	0.41	0.12	1.47	0.97	0.76	1.23	0.75	0.63	0.88
Region (Umbria)	Possible-probable contact	-	-	-	0.51	0.28	0.92	0.40	0.26	0.60
Region (Valle d'Aosta)	Possible-probable contact	-	-	-	1.33	0.53	3.29	0.94	0.47	1.88

<sup>a</sup> Obtained from logistic regression models.

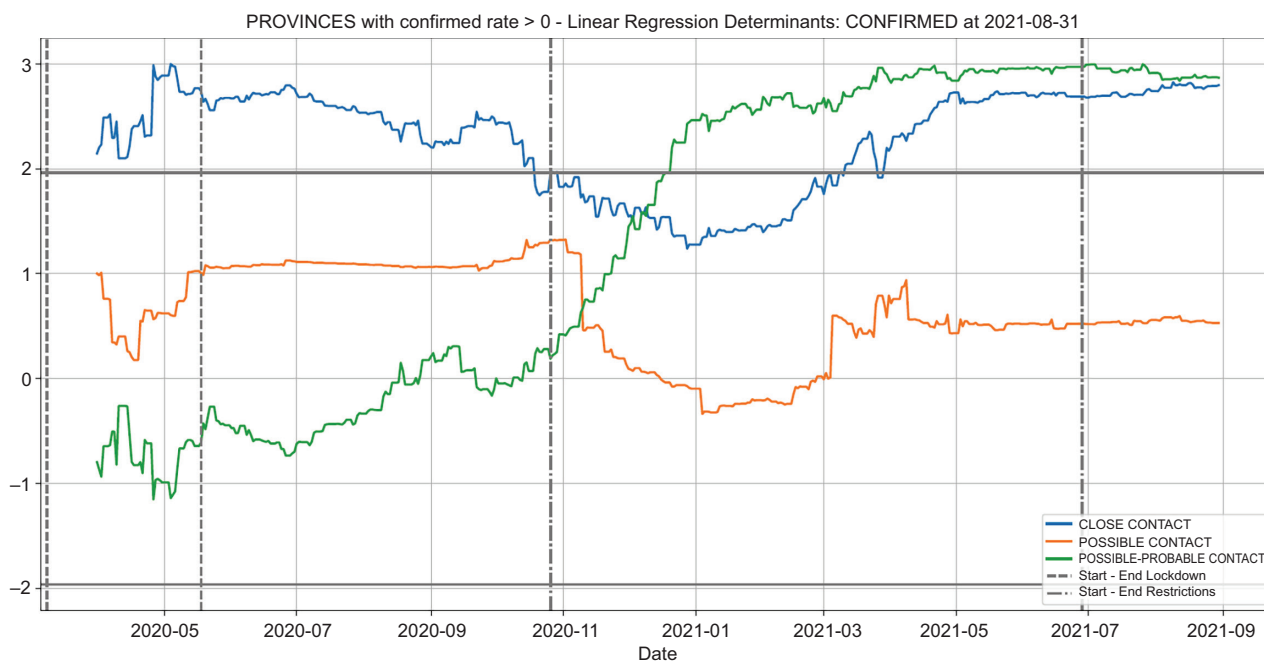
<sup>b</sup> Reference category.

**Supplementary Table 3.** Transition probability matrix  $q_{rs}$  with 15 lag days, for three time points: March 30, 2020; November 1, 2020; and August 1/2021.

<b>Status</b>	<b>Con- cluded</b>	<b>Con- firmed</b>	<b>Close contact</b>	<b>Possible contact</b>	<b>Possible Probable</b>	<b>No- Covid</b>	<b>Min Date</b>	<b>Max Date</b>
Concluded	0.78	0.19	0.04	0.00	0.00	0.00	3/30/20	4/30/20
Confirmed	0.00	0.96	0.00	0.00	0.02	0.02	3/30/20	4/30/20
Close contact	0.00	0.00	0.98	0.00	0.01	0.01	3/30/20	4/30/20
Possible contact	0.00	0.00	0.00	1.00	0.00	0.00	3/30/20	4/30/20
Possible Probable	0.00	0.01	0.01	0.00	0.94	0.04	3/30/20	4/30/20
No-Covid	0.00	0.00	0.02	0.00	0.00	0.98	3/30/20	4/30/20
Concluded	0.95	0.05	0.00	0.00	0.00	0.00	11/1/20	11/30/20
Confirmed	0.52	0.48	0.00	0.00	0.00	0.00	11/1/20	11/30/20
Close contact	0.01	0.05	0.32	0.00	0.01	0.60	11/1/20	11/30/20
Possible contact	0.00	0.02	0.04	0.61	0.00	0.33	11/1/20	11/30/20
Possible Probable	0.04	0.21	0.00	0.00	0.30	0.44	11/1/20	11/30/20
No-Covid	0.00	0.01	0.01	0.00	0.01	0.97	11/1/20	11/30/20
Concluded	1.00	0.00	0.00	0.00	0.00	0.00	8/1/21	8/31/21
Confirmed	0.55	0.45	0.00	0.00	0.00	0.00	8/1/21	8/31/21
Close contact	0.01	0.04	0.12	0.00	0.00	0.83	8/1/21	8/31/21
Possible contact	0.00	0.00	0.00	0.12	0.00	0.88	8/1/21	8/31/21
Possible Probable	0.02	0.04	0.00	0.00	0.15	0.80	8/1/21	8/31/21
No-Covid	0.00	0.00	0.00	0.00	0.00	1.00	8/1/21	8/31/21



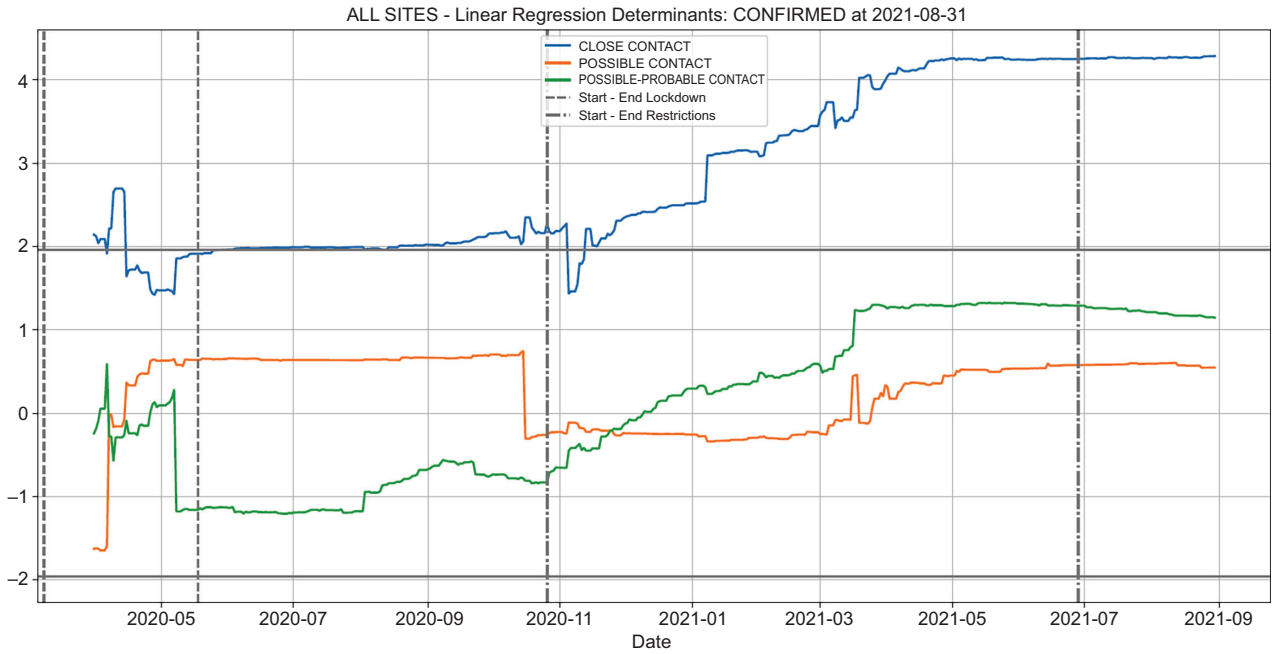
**Supplementary Figure 1.** Comparison of the 7 days rolling mean infection rate of new confirmed cases between Italian population and bank (internal) population standardized over Italian population.



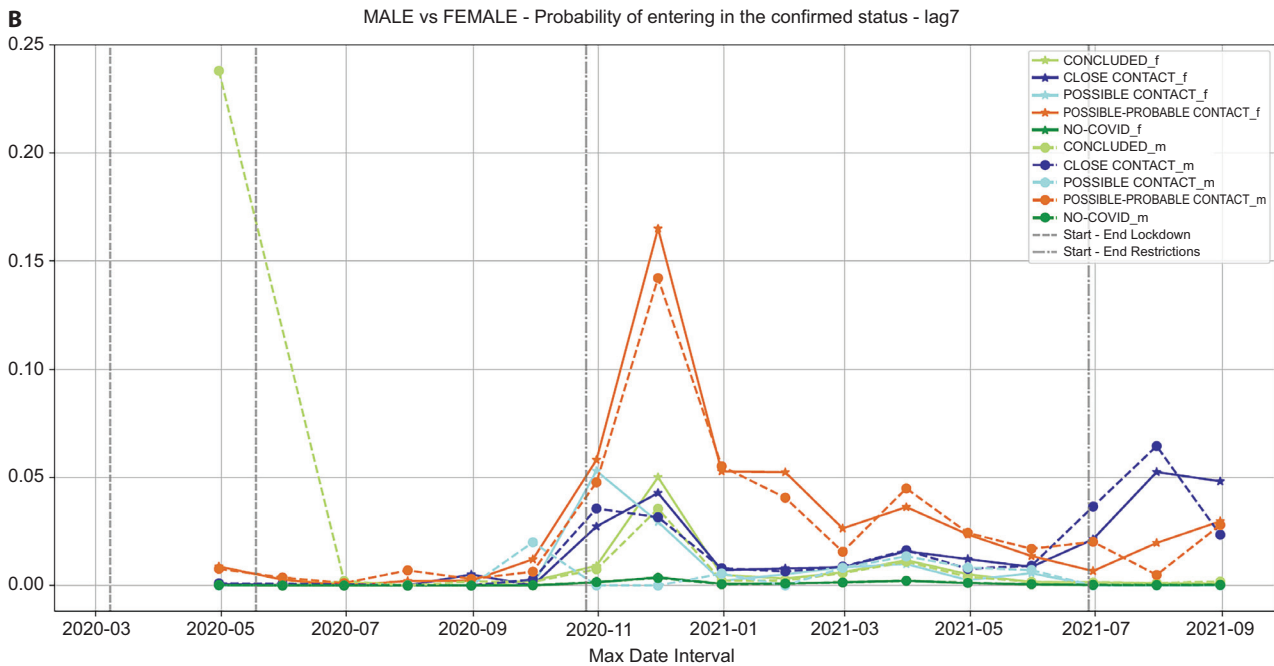
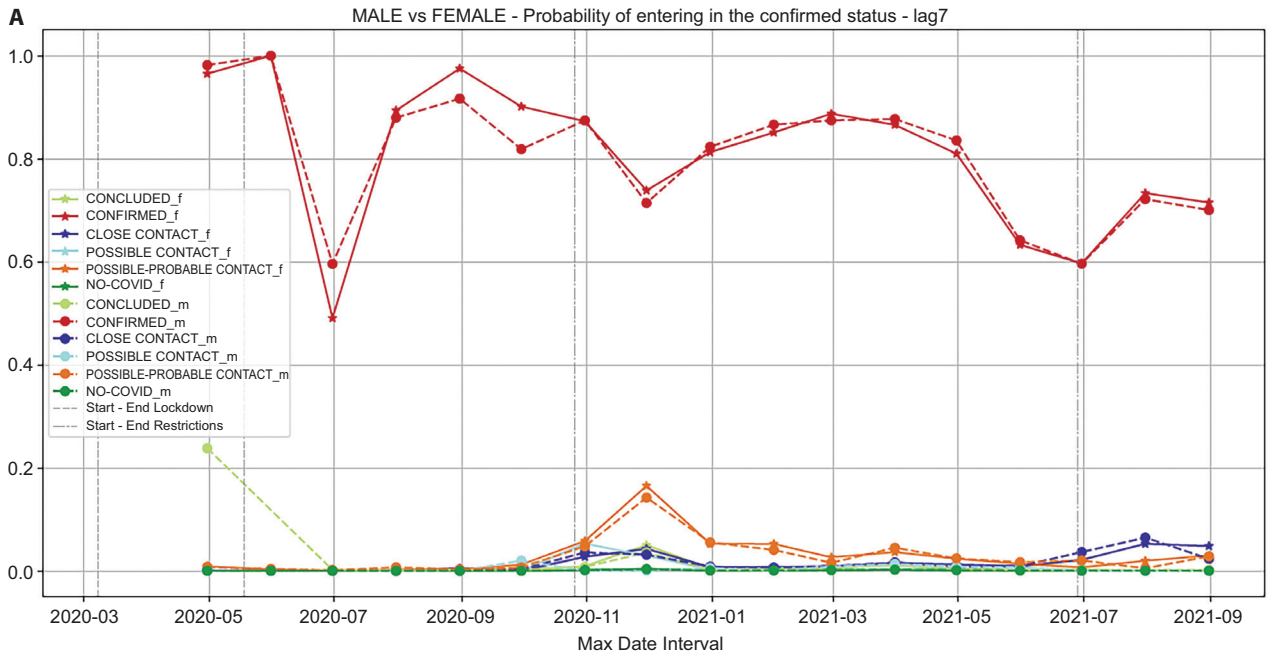
**Supplementary Figure 2.** Z-scores of the correlation between prevalence of possible contact, possible-probable contact, and close contact between 31 March 2020 and 31 August 2021 and prevalence of confirmed cases on 31 August 2021. Unit of observation: province.

Horizontal line indicates  $z=\pm 1.96$ ; vertical lines indicate dates of lock-down strategies in Italy. Provinces with no confirmed cases on 31 August 2021 are excluded.

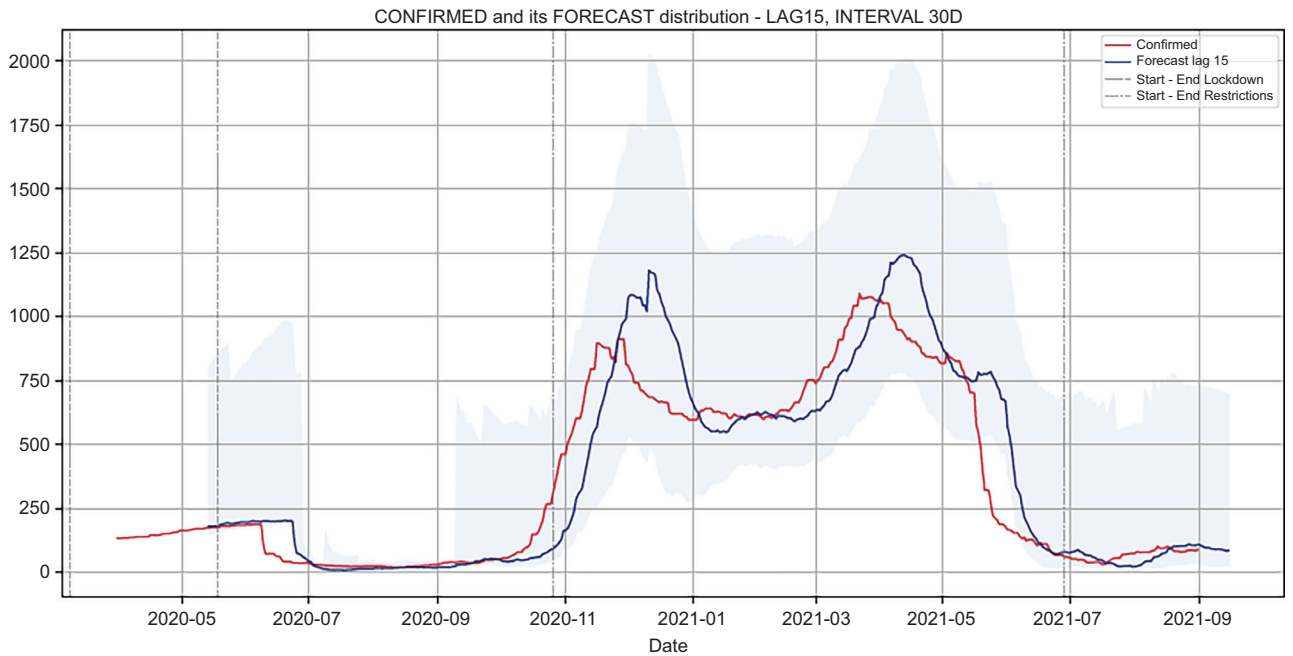




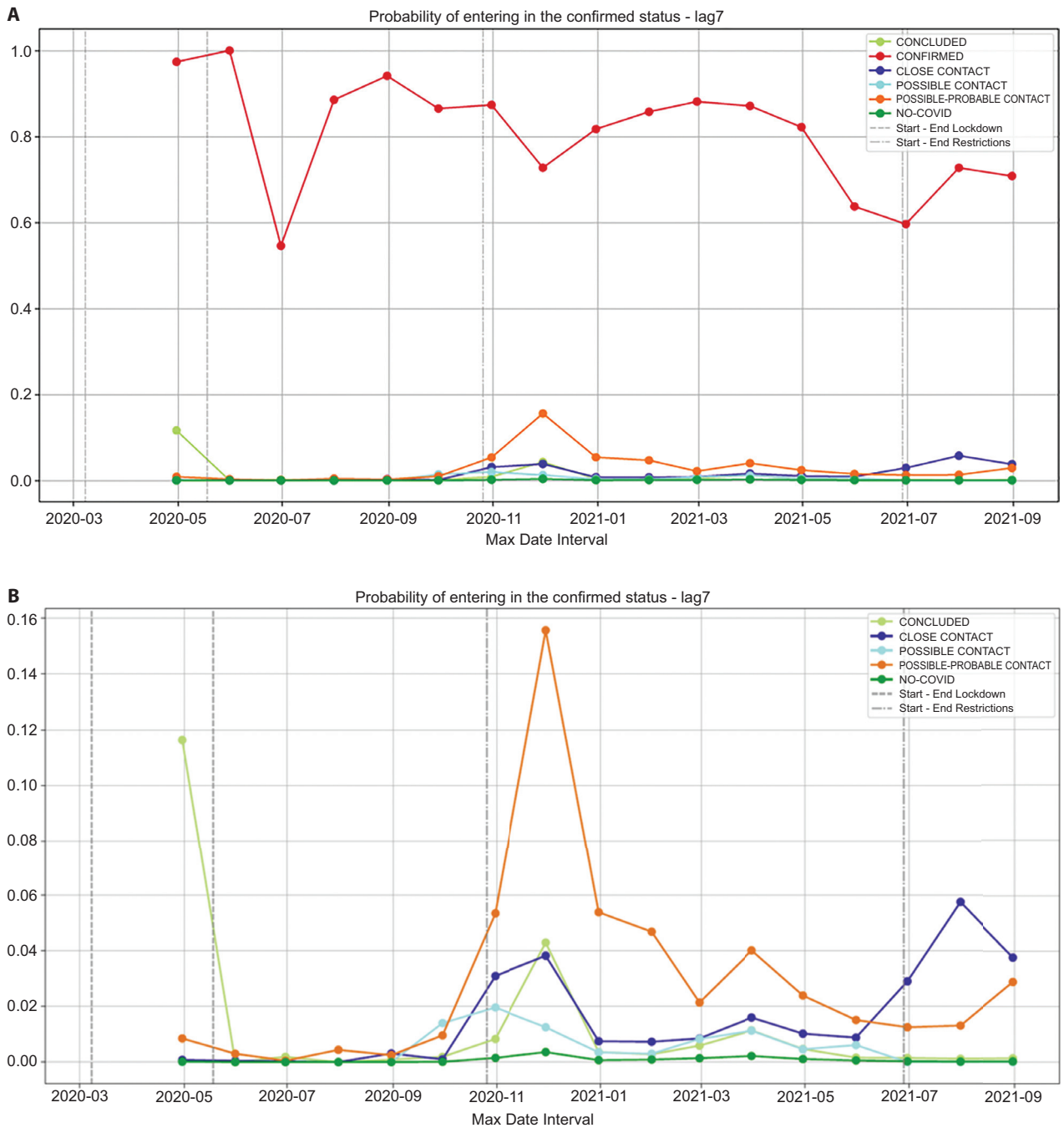
**Supplementary Figure 3.** Geographic analysis of determinants of prevalence of infections and contacts. The dashed grey lines represent the three lock-down strategies adopted in Italy.



**Supplementary Figure 4.a)** Probability of being confirmed for males and female for all the statuses, lag of 7 days, observation period 03/2020 – 09/2021. **Supplementary Figure 4.b)** Probability of being confirmed for males and female for all the statuses excluding the confirmed status itself, lag of 7 days, observation period 03/2020 – 09/2021.

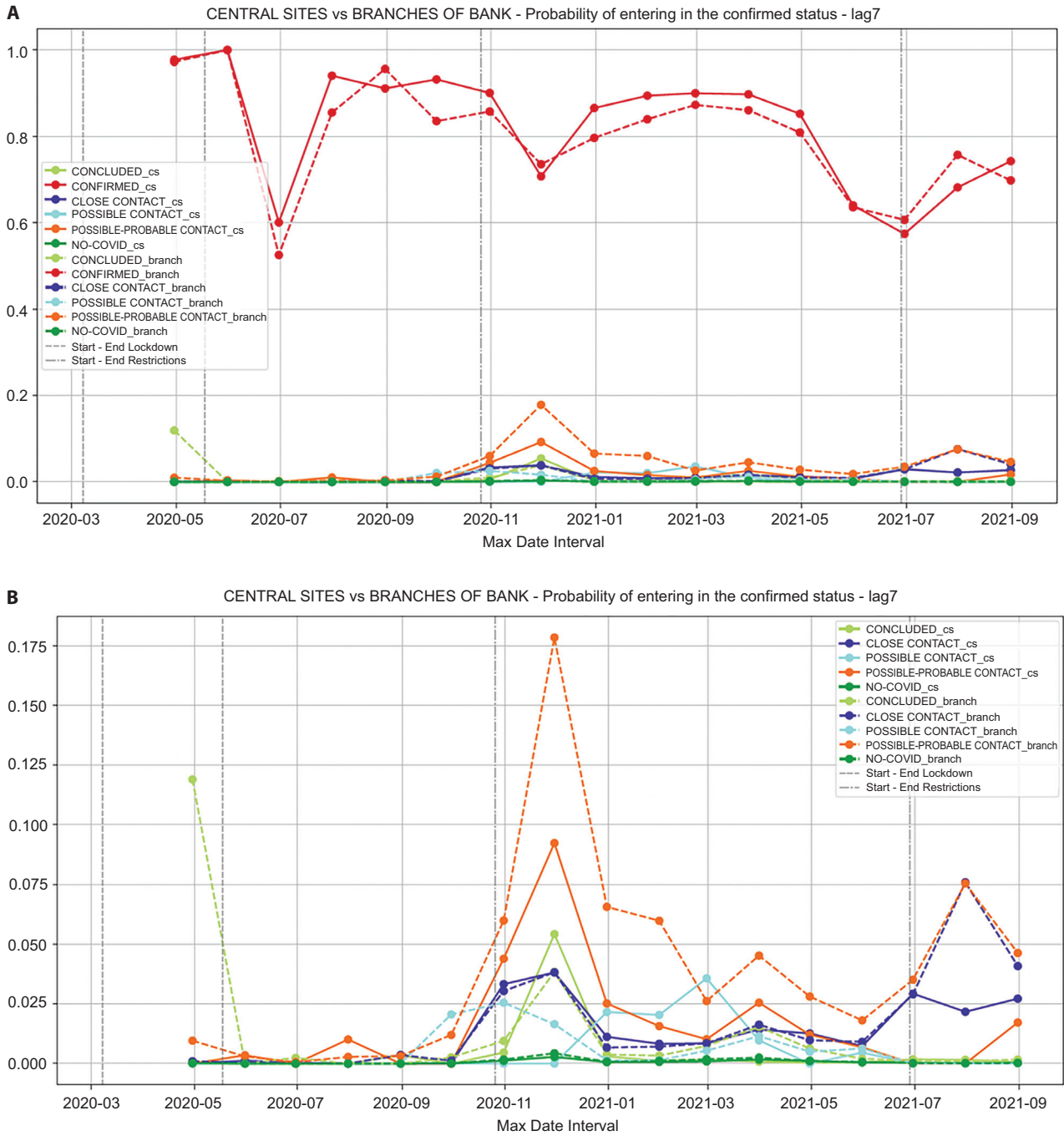


**Supplementary Figure 5.** Distribution of the confirmed cases (red line) and the estimated confirmed cases with prediction of 15 days (blue line), for a lag of 15 days. The grey intervals represent the confidence intervals for our estimates. The vertical dashed grey line represents the two lock-down strategies adopted in Italy.



**Supplementary Figure 6.** Probability of transition from to confirmed case with 7-day lag, by month. All statuses (A), and excluding confirmed cases (B).

*Vertical lines indicate dates of lock-down strategies in Italy.*



**Supplementary Figure 7.** Probability of transition from to confirmed case with 7-day lag, by month and type of employment. All statuses (A), and excluding confirmed cases (B).

*Vertical lines indicate dates of lock-down strategies in Italy.*