Online appendix

The different effects of Covid on children with parents in teleworkable and non-teleworkable occupations

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Table 1: Descriptive statistics

Variable	Mean	Std. dev.	Min.	Max.	N
Male	0.505	0.5	0	1	876450
Immigrant child	0.013	0.114	0	1	876450
Father from EU	0.022	0.147	0	1	876450
Father from Europe but non-EU	0.018	0.131	0	1	876450
Father from outside Europe	0.026	0.159	0	1	876450
Mother from EU	0.03	0.171	0	1	876450
Mother from Europe but non-EU	0.021	0.143	0	1	876450
Mother from outside Europe	0.029	0.169	0	1	876450
Father elementary school degree	0.008	0.089	0	1	876450
Father middle school degree	0.246	0.431	0	1	876450
Father 3 years vocational school degree	0.087	0.282	0	1	876450
Father high-school degree	0.417	0.493	0	1	876450
Father musics or arts high-school degree	0.019	0.136	0	1	876450
Father university degree	0.222	0.416	0	1	876450
Mother elementary school degree	0.004	0.063	0	1	876450
Mother middle school degree	0.138	0.344	0	1	876450
Mother 3 years vocational school degree	0.069	0.254	0	1	876450
Mother high-school degree	0.444	0.497	0	1	876450
Mother musics or arts high-school degree	0.029	0.167	0	1	876450
Mother university degree	0.316	0.465	0	1	876450

Notes: Data is from INVALSI for the years 2016-2017, 2017-2018, 2018-2019, and 2020-2021. This table presents averages, standard deviations, minimum, and maximum values for the sample included in the main estimation.

Table 2: Descriptive statistics: High vs. low closure days

	High closure days		Low closure days		High - low closure days	
Variable	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	**Diff.**	**P-value**
Male	0.506	0.5	0.504	0.5	0.002	0.145
Immigrant child	0.013	0.114	0.013	0.114	0.000	0.410
Father from EU	0.02	0.141	0.025	0.155	-0.005	0.651
Father from Europe but non-EU	0.017	0.13	0.018	0.133	-0.001	0.447
Father from outside Europe	0.027	0.162	0.025	0.155	0.002	0.394
Mother from EU	0.028	0.165	0.033	0.18	-0.005	0.379
Mother from Europe but non-EU	0.021	0.143	0.021	0.142	0.000	0.570
Mother from outside Europe	0.031	0.172	0.028	0.164	0.003	0.289
Father middle school degree	0.253	0.435	0.237	0.425	0.016	0.874
Father 3 years vocational school degree	0.089	0.284	0.085	0.279	0.004	0.391
Father high-school degree	0.409	0.492	0.43	0.495	-0.021	0.638
Father musics or arts high-school degree	0.02	0.139	0.018	0.133	-0.002	0.429
Father university degree	0.221	0.415	0.223	0.417	-0.002	0.424
Mother middle school degree	0.144	0.351	0.128	0.335	0.016	0.372
Mother 3 years vocational school degree	0.074	0.262	0.063	0.243	0.011	0.552
Mother high-school degree	0.434	0.496	0.457	0.498	-0.023	0.146
Mother musics or arts high-school degree	0.03	0.172	0.027	0.161	0.003	0.581
Mother university degree	0.313	0.464	0.321	0.467	-0.008	0.487

Notes: Data is from INVALSI for the years 2016-2017, 2017-2018, 2018-2019, and 2020-2021. This table presents averages, standard deviations, minimum, and maximum values for the subsamples of regions where the number of school closure days is higher and lower than the median, respectively.

Table 3: Descriptive statistics: Parents in teleworkable vs. non-teleworkable occupations

	Teleworkable		Non-teleworkable	
Variable	**Mean**	**Std. dev.**	**Mean**	**Std. Dev.**
Male	0.507	0.5	0.504	0.5
Immigrant child	0.01	0.1	0.017	0.131
Father from EU	0.013	0.111	0.035	0.184
Father from Europe but non-EU	0.008	0.09	0.03	0.171
Father from outside Europe	0.012	0.107	0.046	0.208
Mother from EU	0.018	0.132	0.047	0.212
Mother from Europe but non-EU	0.01	0.099	0.035	0.185
Mother from outside Europe	0.013	0.114	0.051	0.221
Father elementary school degree	0.003	0.053	0.015	0.122
Father middle school degree	0.167	0.373	0.354	0.478
Father 3 years vocational school degree	0.071	0.257	0.109	0.311
Father high-school degree	0.478	0.5	0.335	0.472
Father musics or arts high-school degree	0.019	0.136	0.019	0.137
Father university degree	0.262	0.44	0.168	0.374
Mother elementary school degree	0.001	0.029	0.008	0.091
Mother middle school degree	0.051	0.219	0.256	0.436
Mother 3 years vocational school degree	0.046	0.21	0.101	0.301
Mother high-school degree	0.505	0.5	0.36	0.48
Mother musics or arts high-school degree	0.028	0.165	0.03	0.171
Mother university degree	0.369	0.482	0.245	0.43

Notes: Data is from INVALSI for the years 2016-2017, 2017-2018, 2018-2019, and 2020-2021. This table presents averages, standard deviations, minimum, and maximum values for the subsamples of children with at least one parent in a teleworkable occupation and the rest of the children, respectively.

Table 4: Parental teleworkability and students' performance after school closures. All coefficients

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*Teleworkable parent	0.003	0.003	0.021	0.024
	(0.004)	(0.004)	(0.004)***	(0.005)***
Male	0.106	0.106	-.144	-.144
	(0.002)***	(0.002)***	(0.002)***	(0.002)***
Immigrant child	-.144	-.144	-.175	-.175
	(0.007)***	(0.007)***	(0.007)***	(0.007)***
Father from EU	0.004	0.003	-.011	-.011
	(0.006)	(0.006)	(0.006)*	(0.006)*
Father from Europe but non-EU	-.022	-.022	-.040	-.040
	(0.007)***	(0.007)***	(0.007)***	(0.007)***
Father from outside Europe	-.024	-.024	-.061	-.061
	(0.006)***	(0.006)***	(0.006)***	(0.006)***
Mother from EU	0.008	0.008	-.006	-.006
	(0.005)	(0.005)	(0.005)	(0.005)
Mother from Europe but non-EU	-.011	-.011	-.031	-.031
	(0.007)*	(0.007)*	(0.007)***	(0.007)***
Mother from outside Europe	-.009	-.009	-.051	-.051
	(0.006)	(0.006)	(0.006)***	(0.006)***
Father secondary school degree	0.059	0.059	0.095	0.095
	(0.009)***	(0.009)***	(0.009)***	(0.009)***
Father 3 years vocational school degree	0.092	0.092	0.133	0.133
	(0.009)***	(0.009)***	(0.01)***	(0.01)***
Father high-school degree	0.143	0.143	0.2	0.2
	(0.009)***	(0.009)***	(0.009)***	(0.009)***
Father musics or arts high-school degree	0.137	0.137	0.211	0.211
	(0.011)***	(0.011)***	(0.011)***	(0.011)***
Father university degree	0.214	0.214	0.278	0.278
	(0.009)***	(0.009)***	(0.01)***	(0.01)***
Father manager / professor	0.055	0.055	0.059	0.059
	(0.005)***	(0.005)***	(0.005)***	(0.005)***
Father employer	0.029	0.029	0.022	0.022
	(0.004)***	(0.004)***	(0.004)***	(0.004)***
Father high-rank employee or doctor	0.033	0.033	0.044	0.044
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Father self-employed	0.031	0.031	0.032	0.032
	(0.002)***	(0.002)***	(0.003)***	(0.003)***
Father teacher or low-rank employee	0.044	0.044	0.051	0.051
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Mother secondary school degree	0.023	0.023	0.062	0.062
	(0.013)*	(0.013)*	(0.013)***	(0.013)***
Mother 3 years vocational school degree	0.032	0.032	0.097	0.097
	(0.013)**	(0.013)**	(0.013)***	(0.013)***
Mother high-school degree	0.106	0.106	0.174	0.174
	(0.013)***	(0.013)***	(0.013)***	(0.013)***
Mother musics or arts high-school degree	0.118	0.118	0.194	0.194
	(0.013)***	(0.013)***	(0.014)***	(0.014)***
Mother university degree	0.182	0.182	0.268	0.268
	(0.013)***	(0.013)***	(0.013)***	(0.013)***
Mother manager / professor	0.079	0.079	0.088	0.088
	(0.006)***	(0.006)***	(0.006)***	(0.006)***
Mother employer	0.03	0.03	0.028	0.028
	(0.005)***	(0.005)***	(0.005)***	(0.005)***
Mother high-rank employee or doctor	0.049	0.049	0.058	0.058
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Mother self-employed	0.029	0.029	0.029	0.029
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Mother teacher or low-rank employee	0.062	0.062	0.067	0.067
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
Obs.	879,780	879,780	876,450	876,450
R^2	0.349	0.349	0.314	0.314
F statistic	4071.665	4071.664	3477.187	3477.187

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose parents were employed when children were in second grade. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 5: Parental teleworkability and students' performance after school closures. Omitted controls

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*Teleworkable parent	0.0004	-.0001	0.014	0.015
	(0.004)	(0.004)	(0.004)***	(0.005)***
Obs.	949,941	949,941	946,247	946,247
R^2	0.331	0.331	0.288	0.288
F statistic	5390.685	5390.685	4390.617	4390.598

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose parents were employed when children were in second grade. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Restricted sample: Only children with both parents employed in grades 2 and 5

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*Teleworkable parent	0.002	0.002	0.021	0.024
	(0.004)	(0.004)	(0.004)***	(0.005)***
Obs.	877,884	877,884	829,824	829,824
R^2	0.349	0.349	0.316	0.316
F statistic	4061.872	4061.87	3304.804	3304.809

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose parents were employed when children were in second and fifth grades. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Parental teleworkability and students' performance after school closures. Not controlling for test scores in grade 2

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*Teleworkable parent	-.004	-.005	0.012	0.014
	(0.005)	(0.005)	(0.005)**	(0.005)***
Obs.	879,780	879,780	876,450	876,450
R^2	0.071	0.071	0.083	0.083
F statistic	583.445	583.446	690.775	690.778

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose parents were employed when children were in second grade. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Mother teleworkability and students' performance after school closures

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*Teleworkable mother	0.004	0.005	0.021	0.023
	(0.004)	(0.004)	(0.004)***	(0.005)***
Obs.	913,236	913,236	909,487	909,487
R^2	0.348	0.348	0.315	0.315
F statistic	4148.728	4148.731	3553.932	3553.912

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose mothers were employed when children were in second grade. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Father teleworkability and students' performance after school closures

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*Teleworkable father	0.009	0.009	0.023	0.026
	(0.004)***	(0.004)**	(0.004)***	(0.004)***
Obs.	1,371,976	1,371,976	1,367,006	1,367,006
R^2	0.327	0.327	0.305	0.305
F statistic	5899.651	5899.624	5319.295	5319.252

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose fathers were employed when children were in second grade. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Number of teleworkable parents and students' performance after school closures

	Maths		Language	
	Covid	Closure days	Covid	Closure days
	(1)	(2)	(3)	(4)
Closure*One teleworkable parent	-.002	-.004	0.006	0.006
	(0.004)	(0.004)	(0.004)	(0.004)
Closure*Two teleworkable parents	0.005	0.003	0.026	0.028
	(0.005)	(0.005)	(0.005)***	(0.005)***
Obs.	1,453,118	1,453,118	1,447,556	1,447,556
R^2	0.324	0.324	0.304	0.304
F statistic	5842.068	5842.068	5318.29	5318.227

Notes: Data is from INVALSI for the years 2016-2019 and 2021-2022. The dependent variable is standardized test scores in grade 5. The sample comprises all children whose parents were employed when children were in second grade. The variable Closure days is divided by one hundred to improve the readability of the coefficients. *** p<0.01, ** p<0.05, * p<0.1.