

Supplementary information

Reduction of SARS-CoV-2 household transmission associated with ventilation: results from a case-control study

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Table S1: Index cases reporting household contamination from their child, both overall and restricted to the subpopulation of index cases with a partner participating in this study as a related control

	Index cases with their child as the source case	Index cases with their child as the source case and their partner as a related control
TOTAL	48971	611
Age, median [interquartile range] (years)	42 [38-48]	44 [40-49]
Female	37769 (77.1%)	394 (64.5%)
Education level		
No diploma	889 (1.8%)	8 (1.3%)
Pre-high school diploma	5558 (11.4%)	56 (9.2%)
High-school diploma	8156 (16.7%)	54 (8.8%)
Bachelor's degree	19679 (40.2%)	208 (34.0%)
Master's degree or higher	14689 (30.0%)	285 (46.6%)
Underlying conditions		
Chronic respiratory disease	3987 (8.1%)	33 (5.4%)
Hypertension	3041 (6.2%)	50 (8.1%)
Diabetes mellitus	936 (1.9%)	5 (0.8%)
Coronary artery disease	195 (0.4%)	4 (0.7%)
COVID-19 vaccination status		
Unvaccinated	13705 (28.0%)	181 (29.6%)
1 dose	1124 (2.3%)	15 (2.5%)
2 doses	13992 (28.6%)	195 (31.9%)
3 doses	20059 (41.0%)	219 (35.8%)
4 doses	91 (0.2%)	1 (0.2%)
Symptomatic COVID-19	43614 (89.1%)	530 (86.7%)
Variant		
Original strain	1163 (2.4%)	18 (3.0%)
Alpha	3725 (7.6%)	65 (10.6%)
Beta/Gamma	279 (0.6%)	3 (0.5%)
Delta	5074 (10.4%)	93 (15.2%)
Omicron	6649 (13.6%)	70 (11.5%)
Other	58 (0.1%)	0
Undetermined	32023 (65.4%)	362 (59.2%)
Number of household members (median [IQR])	4 [3-4]	4 [3-4]
SOURCE CASE		
Age, median [interquartile range] (years)	10 [7-16]	11 [8-16]
Female	23078 (47.1%)	274 (44.8%)
Symptomatic	39903 (81.5%)	508 (83.1%)
Isolation from the index case	24459 (50.0%)	347 (56.8%)
Isolation timing		
From symptom onset	7737 (15.8%)	88 (14.4%)
From test results	15586 (31.8%)	242 (39.6%)
Other timing	1136 (2.3%)	17 (2.8%)
Specific mitigation measures		
Ventilation (10-15 min at least twice/day)	22696 (46.4%)	321 (52.5%)
Mask-wearing	20076 (41.0%)	305 (49.9%)
Surface disinfection	18508 (37.8%)	258 (42.2%)
Separate bathrooms	9713 (19.8%)	165 (27.0%)
Separate meals	18160 (37.1%)	274 (44.8%)

Legend: Doses of COVID-19 vaccine were counted if they occurred at least 14 days before symptom onset (or testing if asymptomatic) for the first dose or at least 7 days before symptom onset or testing (if asymptomatic) for the second, third or fourth dose.

Table S2: Sensitivity analysis including in the study population the households other than parental pairs exposed to the same infected child and exposures associated with the risk of SARS-CoV-2 infection

	Index cases	Related controls	Univariable analysis		Multivariable analysis					
					Model with variable selection including isolation overall only		Model with variable selection including specific mitigation measures		Model without variable selection and including specific mitigation measures	
	Cases	Controls	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
	n=758	n=758								
Age. median (IQR)	45 (40-51)	44 (38-49)								
18-39 years	182 (24.0%)	251 (33.1%)	1		1		1		1	
40-59 years	541 (71.4%)	464 (61.2%)	2.5	1.8-3.4	1.4	0.9-2.3	1.4	0.8-2.3	1.4	0.9-2.3
≥ 60 years	35 (4.6%)	43 (5.7%)	1.2	0.6-2.4	1.2	0.5-3.0	1.2	0.5-3.0	1.2	0.5-3.0
Female	510 (67.3%)	321 (42.3%)	1.8	1.5-2.1	1.8	1.5-2.2	1.8	1.5-2.2	1.9	1.6-2.2
Vaccination status										
Unvaccinated	253 (33.4%)	244 (32.2%)	1		1		1		1	
1 dose	18 (2.4%)	25 (3.3%)	0.4	0.2-1.1	0.6	0.2-1.8	0.6	0.2-1.8	0.6	0.2-1.7
2 doses	226 (29.8%)	185 (24.4%)	0.7	0.3-1.4	0.6	0.2-1.4	0.6	0.2-1.4	0.6	0.2-1.4
3-4 doses	261 (34.4%)	304 (40.1%)	0.2	0.1-0.6	0.1	0.04-0.4	0.1	0.04-0.3	0.1	0.04-0.3
History of prior SARS-CoV-2 infection	30 (4.0%)	64 (8.4%)	0.2	0.1-0.5	0.1	0.1-0.3	0.1	0.1-0.3	0.1	0.1-0.3
Underlying conditions										
Chronic respiratory disease	41 (5.4%)	46 (6.1%)	0.9	0.6-1.4		-		-	0.8	0.5-1.4
Diabetes mellitus	12 (1.6%)	20 (2.6%)	0.6	0.3-1.2		-		-	0.5	0.2-1.2
Hypertension	63 (8.3%)	54 (7.1%)	1.2	0.8-1.8		-		-	1.5	0.9-2.4
Coronary artery disease	5 (0.7%)	4 (0.5%)	1.3	0.3-4.7		-		-	1.7	0.4-7.4
Mitigation measures from the source case										
Overall isolation	455 (60.0%)	504 (66.5%)	0.5	0.3-0.7	0.6	0.4-0.8				
Mitigation measures										
Ventilation of indoor areas	421 (55.5%)	459 (60.6%)	0.6	0.4-0.8		-	0.6	0.4-0.9	0.6	0.4-1.0
Mask-wearing	403 (53.2%)	425 (56.1%)	0.7	0.5-1.0		-		-	1.0	0.6-1.7
Surface disinfection	339 (44.7%)	344 (45.4%)	0.9	0.7-1.3		-	1.4	0.9-2.1	1.4	0.9-2.2
Separate meals	367 (48.4%)	390 (51.5%)	0.6	0.4-0.9		-		-	0.9	0.5-1.6
Separate bathroom	212 (28.0%)	242 (31.9%)	0.7	0.5-0.9		-		-	0.9	0.6-1.4
Source case is participant's...										
Sibling	11 (1.5%)	26 (3.4%)	1		1		1		1	
Partner	65 (8.6%)	4 (0.5%)	24.1	3.0-194.2	14.9	1.8-124.2	17.4	2.1-147.0	13.5	1.5-121.0

Parent	16 (2.1%)	67 (8.8%)	1.6	0.2-10.8	1.0	0.1-7.2	1.1	0.2-8.1	0.9	0.1-6.9
Child	646 (85.2%)	615 (81.1%)	2.5	1.2-5.3	2.5	1.0-6.2	2.6	1.0-6.6	2.4	1.0-6.3
Other	20 (2.6%)	46 (6.1%)	0.6	0.2-1.9	0.9	0.3-3.1	0.9	0.3-3.3	0.8	0.2-3

Legend: Case-control study conducted online in France between October 2020 and May 2022. Index cases were offered the possibility to invite a non-infected member of their household to participate, preferably their partner. Both the index cases and the related control shared the household with a source case (not included in the study). Conditional logistic regression univariable and multivariable models were matched on households.