Supplementary appendix

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Supplementary Appendix

Initial protection against SARS-CoV-2 omicron lineage infection in children and adolescents by BNT162b2 in Israel: an observational study

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Contents

Supplementary Methods - Database

The analysis is based on the Israel Ministry of Health's database, as described in our previous studies. Israel began a vaccination campaign with the BNT162b2 vaccine on December 20, 2020, initially to people aged 60 or older and gradually to younger populations. Starting June 2, 2021, adolescents aged 12-15 were offered the vaccine. Following the FDA approval for children vaccination, children 5-11 year old were eligible to vaccinate starting November 23, 2021. Individuals 12-15 were later allowed to receive a third booster dose starting August 29, 2021, if 5 months passed since the complete 2-dose vaccination. Later the threshold was reduced to 3 months following the complete 2-dose vaccination.

The testing policy during most of the study period (until January 6th, 2022), was that children and adolescents who were experiencing symptoms or were exposed to an infected individual were required to take a state-regulated test. People who returned from abroad were also required to take an institutional test. In addition, the "green pass" requirements for attending various events and entering indoor places such as museums, restaurants etc. required either a vaccine or a negative test result. Starting January 7th, vaccinated individuals were allowed to test at home following exposure to an infected individual and were not required to isolate if the test result was negative, while unvaccinated individuals were required to take a state-regulated test and were also required to isolate for 7 days.

Israel has a centralized health system of four health maintenance organizations (HMOs), where each resident can choose to enroll in one of them. Polymerase Chain Reaction (PCR) tests and Institutional Antigen tests for SARS-CoV-2 infections as well as vaccination against the virus are provided free of charge in designated centers and their results are directly reported to the Ministry of Health (MoH). The MoH established a centralized Covid-19 national database containing regularly updated information on all PCR and state-regulated Antigen tests and results, vaccination dates, and follow-up data on all infected individuals, including the severity of disease and mortality. The MoH database also includes basic demographic information, such as sex, age, place of residency, population sector (General Jewish, Jewish ultra-Orthodox, and Arab) and socioeconomic status (low, medium, high). The population section and socioeconomic status are determined by the Israel Central Bureau of Statistics based on the statistical area of residence (similar to a census block). Specifically, the Central Bureau of Statistic classified municipalities into 10 clusters of socioeconomic status based on information such as demographics, education and employment. Our analysis considers the bottom 3 clusters as "Low", clusters 4-6 as "Medium" and clusters 7-10 as "High". The MoH tests dataset specifies whether a test was done upon returning from abroad. Persons were considered to be abroad 10 days before traveling until 10 days after their return to Israel. In order to exclude persons who were abroad during the study period, we used information regarding tests of individuals upon returning to Israel. Persons were considered to be abroad 10 days before traveling until 10 days after their return to Israel.

Figure S1 - Vaccination rates in the study populations.

Vaccination status (percentages) in the 5-10 and 12-15 age groups since becoming eligible to receive the vaccine (June 2, 2021 for the 12-15 age group and November 23, 2021 for the 5-10 age group), and the booster dose (Aug 29, 2021). Vertical dashed lines represent the study period.
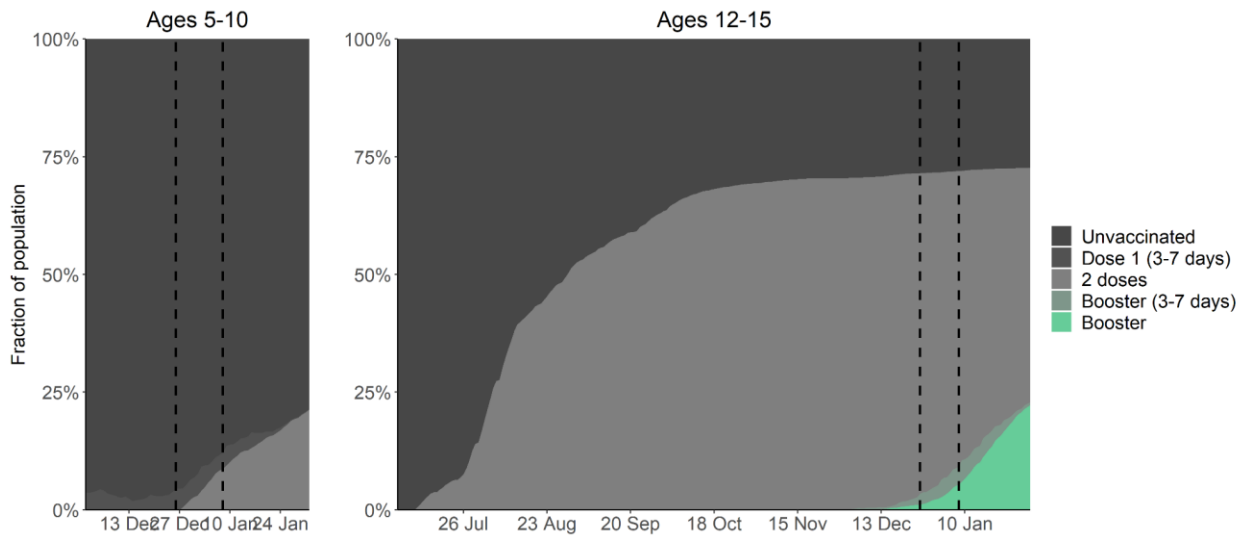
Figure S2 - Testing rates in the study populations.

The number of people who tested at least once in each epidemiological week per 100,000 people in the different cohorts, during the study period - December 26, 2021 and January 8, 2022.
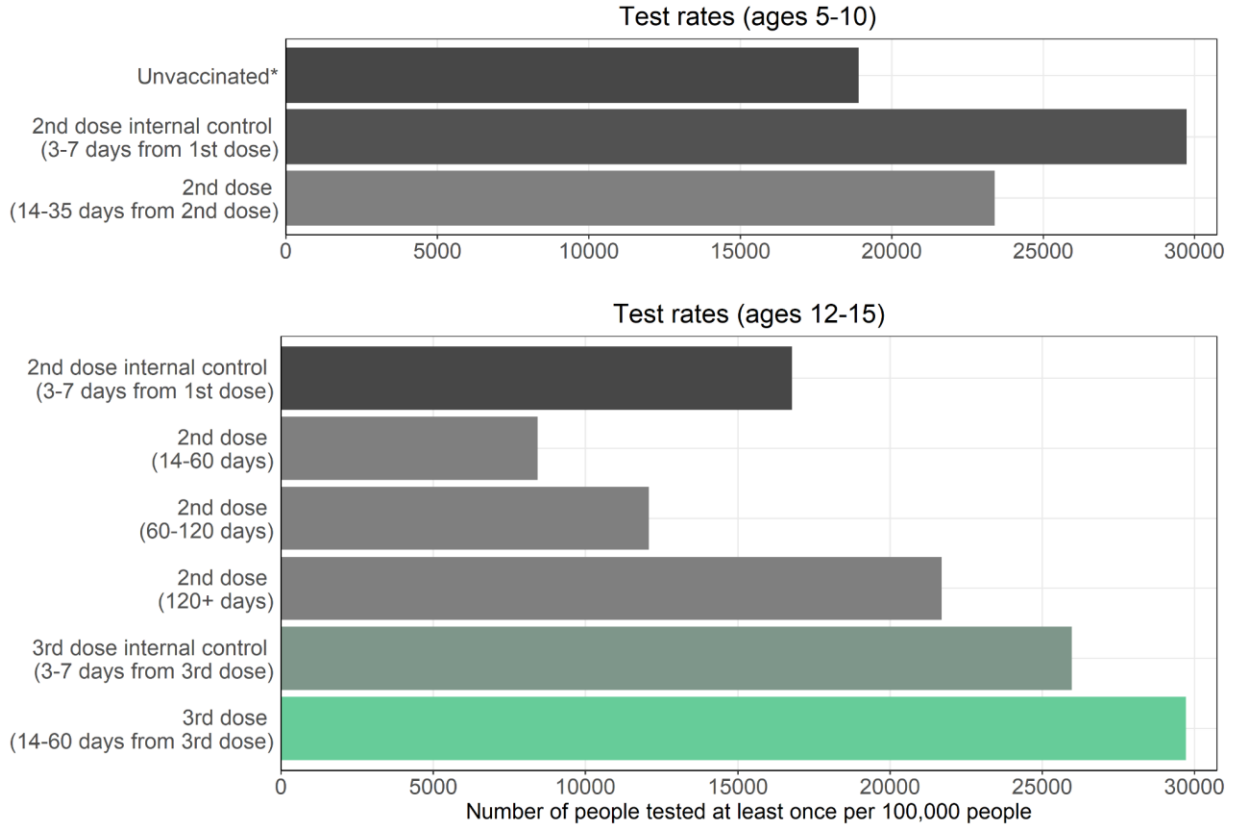
Table S1 - Characteristics of the 5-10 age group study cohorts used in the analysis.

The table presents the proportion of person-days at risk instead of the proportion of individuals. Values are presented for the study period - December 26, 2021 to January 8, 2022.

Group	Unvaccinated* Person-days at risk = 6,922,188		2nd dose internal control (3-7 days from 1st dose) Person-days at risk = 367,168		2nd dose (14-35 days from 2nd dose) Person-days at risk = 366,364	
	% person days at risk	# infections	% person days at risk	# infections	% person days at risk	# infections
Female	44.30%	6,395	48.5%	411	48.3%	287
Male	55.70%	5,659	51.5%	411	51.7%	315
General Jewish	63.90%	10,048	86.7%	743	94.9%	576
Ultra-Orthodox	13.40%	1,328	6.6%	69	3.2%	21
Arabs	22.80%	678	6.7%	10	1.8%	5
SES - Low	39.3%	2,423	14.9%	83	7.0%	31
SES - Medium	29.5%	4,578	23.1%	220	22.1%	119
SES -High	31.2%	5,053	62.0%	519	70.9%	452

Table S2 - Characteristics of the 12-15 age group study cohorts used in the analysis.

The table presents the proportion of person-days at risk instead of the proportion of individuals. Values are presented for the study period - December 26, 2021 to January 8, 2022.

Group	Unvaccinated* Person-days at risk = 1,397,210		2nd dose (14-60 days from 2nd dose) Person-days at risk = 231,950		2nd dose (60-120 days from 2nd dose) Person-days at risk = 1,417,282		2nd dose (120+ days from 2nd dose) Person-days at risk = 2,364,056		3rd dose internal control (3-7 days from 3rd dose) Person-days at risk = 190,139		3rd dose (14-60 days from 3rd dose) Person-days at risk = 178,780	
	% person days at risk	# infections	% person days at risk	# infections	% person days at risk	# infections	% person days at risk	# infections	% person days at risk	# infections	% person days at risk	# infections
Female	44.5%	2,023	51.0%	102	50.4%	1,240	49.1%	3,616	48.4%	265	48.9%	99
Male	55.5%	1,435	49.0%	80	49.6%	1,086	50.9%	3,019	51.6%	253	51.1%	80
General Jewish	59.7%	2,684	49.7%	153	57.5%	1,999	84.7%	5,983	94.7%	494	95.8%	166
Ultra-Orthodox	19.6%	627	7.6%	11	8.2%	217	6.5%	524	3.1%	20	2.7%	13
Arabs	20.7%	147	42.7%	18	34.3%	110	8.8%	128	2.1%	4	1.5%	0
SES - Low	44.2%	932	54.9%	34	44.1%	395	17.1%	731	6.6%	36	5.3%	13

Ages 12-15
3rd dose effect

SES - Medium	30.3%	1,307	23.5%	61	26.5%	808	25.7%	1,785	20.1%	107	18.6%	28
SES -High	25.5%	1,219	21.6%	87	29.4%	1,123	57.2%	4,119	73.3%	375	76.1%	138

Table S3 - Regression coefficients of the 5-10 age group Poisson regression model

Poisson regression results for the analysis of confirmed infection rate in children in ages 5-10.

term	estimate	std.error
(Intercept)	-8.99	0.119
Epiweek 2	0.11	0.026
Gender: male	-0.23	0.019
Incidence group: (0.453,1.57]	1.07	0.111
Incidence group: (1.57,3.88]	1.55	0.126
Incidence group: (3.88,7.71]	1.94	0.108
Incidence group: (7.71,124]	2.42	0.107
Socioeconomic status: Medium	2.94	0.108
Socioeconomic status: High	0.33	0.039
Age: 6	0.24	0.038
Age: 7	0.32	0.037
Age: 8	0.57	0.036
Age: 9	0.63	0.036
Age: 10	0.74	0.035
Cohort: Unvaccinated	0.81	0.035
Cohort: Vaccinated (14-35)	0.02	0.038

Table S4 - Regression coefficients of the 12-15 age group Poisson regression model

Poisson regression results for the analysis of confirmed infection rate in adolescents in ages 12-15.

term	estimate	std.error
(Intercept)	-8.95	0.093
Epiweek 2	0.44	0.026
Gender: male	-0.24	0.019
Incidence group: (0.453,1.57]	1.81	0.072
Incidence group: (1.57,3.88]	2.45	0.072
Incidence group: (3.88,7.71]	2.71	0.073
Incidence group: (7.71,124]	3.19	0.075
Socioeconomic status: Medium	0.33	0.044
Socioeconomic status: High	0.35	0.043
Age: 13	0.10	0.027
Age: 14	0.26	0.027
Age: 15	0.30	0.027
Cohort: Unvaccinated	0.41	0.049
Cohort: 2nd dose (14-60)	-0.40	0.093
Cohort: 2nd dose (60-120)	0.14	0.051
Cohort: 2nd dose (120+)	0.23	0.047
Cohort: Booster (14-60)	-1.20	0.090