

Supplementary Table 1 – Definition of history of chronic diseases included in the analysis (reproduced with permission from the open access paper: Vokó et al. *Front. Immunol.* 13:919408. doi: 10.3389/fimmu.2022.919408)

Disease	ICD codes*	Other elements of the definition
Acute myocardial infarction	I2100, I2110, I2120, I2130, I2140, I2190, I2191, I2200, I2210, I2280, I2290, I2300, I2310, I2320, I2330, I2340, I2350, I2360, I2380, I2400, I2490	
Angina	I20	
Chronic heart failure	I50, I42, I110, J81	
Peripheral arterial disease	I70	
Stroke	I61, I6290, I63, I64, I74	
Asthma bronchiale	J40-44, J47	the time lag between the first and second occurrences 30-365 days
COPD	J45, 46	the time lag between the first and second occurrences 30-365 days
Diabetes mellitus	a) E10-14 or b) not required and polycystic ovary syndrome (E282) or gestational diabetes (O24)	at least 1 prescription of antidiabetic treatment (ATC A10) at least 2 prescriptions of antidiabetic treatment (ATC A10)
Type 1		only insulin or maximum 3 oral antidiabetic prescriptions together with insulin prescriptions in the first half year of treatment
Type 2		not Type 1 diabetes
Chronic kidney disease	N02, N03, N04, N05, N06, N07, N08, N11, N12, N14, N15, N16, N18, N19, N26, N27, N28, N29	
Neoplasms	All ICD codes starting with C	
Transplantation	All patients from registry of transplantation	
Immunosuppression	D5900, D5910, D6920, D8690, E05, E0630, G61, G70, I73, K50, K51, K52, K7430, K90,	

L10, L40, L9590, M0690, M30, M31, M32,
M33, M35, M36

COPD: chronic obstructive pulmonary disease; ICD: International Classification of Diseases; ATC: Anatomical Therapeutic Chemical

* Two occurrences of ICD-10 codes in outpatient or inpatient claims data since 1 January 2013

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Supplementary Table 2. Incidence and adjusted effectiveness of vaccine combinations against *COVID-19* related death during the Delta wave in the 65-100 years old Hungarian healthy and T2DM population

Vaccination	Group	Number of cases	Average population size (1000 persons)	Incidence rate (per 100 000 person-days) (95% CI)	Adjusted vaccine efficacy (%) (95% CI)	P-value comparing to unvaccinated	P-value for waning	P-value T2DM vs. Control
Unvaccinated	Control	1 545	174.04	8.07 (7.67; 8.48)	reference			
Unvaccinated	T2DM	962	40.44	21.63 (20.28; 23.04)	reference			
Pfizer-BionTech								
primary 14-120 days	Control	30	21.87	1.25 (0.84; 1.78)	75.4 (64.6; 82.9)	<0.001	reference	reference
primary 14-120 days	T2DM	25	10.00	2.27 (1.47; 3.35)	84.8 (77.3; 89.8)	<0.001	reference	0.08
primary 121-180 days	Control	66	77.39	0.78 (0.60; 0.99)	75.9 (68.9; 81.3)	<0.001	0.93	reference
primary 121-180 days	T2DM	66	41.29	1.45 (1.12; 1.85)	84.4 (79.8; 87.9)	<0.001	0.91	0.02
primary 181-240 days	Control	153	66.34	2.10 (1.78; 2.46)	75.2 (70.6; 79.1)	<0.001	0.97	reference
primary 181-240 days	T2DM	262	37.45	6.36 (5.61; 7.18)	74.1 (70.3; 77.4)	<0.001	0.013	0.71
Pfizer booster 14-120 days	Control	42	92.50	0.41 (0.30; 0.56)	96.3 (94.9; 97.3)	<0.001	<0.001	reference
Pfizer booster 14-120 days	T2DM	94	61.47	1.39 (1.12; 1.70)	95.6 (94.5; 96.4)	<0.001	<0.001	0.38
Moderna								
primary 181-240 days	Control	17	10.61	1.46 (0.85; 2.33)	83.0 (72.5; 89.5)	<0.001		reference
primary 181-240 days	T2DM	30	5.72	4.76 (3.21; 6.80)	80.2 (71.6; 86.3)	<0.001		0.63
Sputnik								
primary 181-240 days	Control	35	25.12	1.27 (0.88; 1.76)	80.6 (72.7; 86.2)	<0.001		reference
primary 181-240 days	T2DM	28	6.45	3.95 (2.62; 5.70)	82.5 (74.5; 88.0)	<0.001		0.70
Astra-Zeneca								
primary 121-180 days	Control	40	25.91	1.40 (1.00; 1.91)	78.5 (70.4; 84.3)	<0.001		reference
primary 121-180 days	T2DM	66	11.83	5.07 (3.92; 6.45)	74.2 (66.9; 80.0)	<0.001		0.38
primary 181-240 days	Control	22	4.72	4.24 (2.66; 6.42)	66.2 (48.4; 77.9)	<0.001		reference
primary 181-240 days	T2DM	30	2.11	12.9 (8.71; 18.42)	64.0 (48.1; 75.0)	<0.001		0.84
Sinopharm								

primary 121-180 days	Control	33	28.57	1.05 (0.72; 1.47)	58.5 (41.0; 70.8)	<0.001	reference
primary 121-180 days	T2DM	23	11.36	1.84 (1.17; 2.76)	73.7 (59.9; 82.7)	<0.001	0.10
primary 181-240 days	Control	130	37.05	3.19 (2.67; 3.79)	47.5 (36.7; 56.4)	<0.001	reference
primary 181-240 days	T2DM	156	14.24	9.96 (8.46; 11.65)	47.2 (37.3; 55.5)	<0.001	0.97
Pfizer booster 14-120 days	Control	42	118.56	0.32 (0.23; 0.44)	95.8 (94.3; 96.9)	<0.001	reference
Pfizer booster 14-120 days	T2DM	66	55.83	1.07 (0.83; 1.37)	95.4 (94.1; 96.4)	<0.001	0.66

Supplementary Table 3. Incidence and adjusted effectiveness of vaccine combinations against registered *SARS-CoV-2* infection during the Delta wave in the 65-100 years old Hungarian healthy and T2DM population

Vaccination	Group	Number of cases	Average population size (1000 persons)	Incidence rate (per 100 000 person-days) (95% CI)	Adjusted vaccine efficacy (%) (95% CI)	P-value comparing to unvaccinated	P-value for waning	P-value T2DM vs. Control
Unvaccinated	Control	7 779	165.48	42.74 (41.79; 43.70)	reference			
Unvaccinated	T2DM	3 357	36.25	84.18 (81.36; 87.08)	reference			
Pfizer-BionTech								
primary 14-120 days	Control	204	17.88	10.37 (9.00; 11.90)	64.5 (59.2; 69.2)	<0.001	reference	reference
primary 14-120 days	T2DM	136	7.38	16.75 (14.06; 19.82)	71.6 (66.3; 76.1)	<0.001	reference	0.049
primary 121-180 days	Control	864	72.74	10.80 (10.09; 11.54)	54.8 (51.3; 58.1)	<0.001	0.003	reference
primary 121-180 days	T2DM	696	37.97	16.66 (15.45; 17.95)	60.9 (57.4; 64.1)	<0.001	0.001	0.013
primary 181-240 days	Control	2 260	63.57	32.32 (31.00; 33.68)	38.8 (35.5; 41.9)	<0.001	<0.001	reference
primary 181-240 days	T2DM	2 002	35.30	51.56 (49.33; 53.87)	50.1 (47.2; 52.9)	<0.001	<0.001	<0.001
Pfizer booster 14-120 days	Control	656	87.56	6.81 (6.30; 7.35)	86.9 (85.8; 88.0)	<0.001	<0.001	reference
Pfizer booster 14-120 days	T2DM	730	57.54	11.53 (10.71; 12.40)	89.1 (88.1; 89.9)	<0.001	<0.001	0.002
Moderna								
primary 181-240 days	Control	219	10.17	19.57 (17.07; 22.35)	62.1 (56.6; 66.9)	<0.001		reference
primary 181-240 days	T2DM	174	5.40	29.28 (25.09; 33.97)	70.8 (66.0; 74.9)	<0.001		0.012
Sputnik								
primary 181-240 days	Control	1 045	24.37	38.98 (36.65; 41.41)	29.0 (23.9; 33.9)	<0.001		reference
primary 181-240 days	T2DM	375	6.18	55.18 (49.74; 61.06)	51.9 (46.4; 56.9)	<0.001		<0.001
Astra-Zeneca								
primary 121-180 days	Control	743	25.08	26.93 (25.03; 28.94)	45.0 (40.5; 49.2)	<0.001		reference
primary 121-180 days	T2DM	558	11.24	45.14 (41.47; 49.04)	52.6 (48.0; 56.7)	<0.001		0.016
primary 181-240 days	Control	200	4.45	40.89 (35.42; 46.97)	32.6 (22.2; 41.5)	<0.001		reference
primary 181-240 days	T2DM	152	1.92	71.89 (60.91; 84.27)	40.7 (30.1; 49.7)	<0.001		0.25
Sinopharm								

primary 121-180 days	Control	429	26.88	14.51 (13.17; 15.95)	17.2 (8.3; 25.2)	<0.001	reference
primary 121-180 days	T2DM	219	10.40	19.14 (16.69; 21.85)	34.4 (24.5; 43.0)	<0.001	0.009
primary 181-240 days	Control	1 713	35.74	43.58 (41.54; 45.69)	1.4 (-4.4; 7.0)	0.62	reference
primary 181-240 days	T2DM	1 042	13.47	70.32 (66.12; 74.73)	20.5 (14.6; 26.0)	<0.001	<0.001
Pfizer booster 14-120 days	Control	750	115.57	5.90 (5.48; 6.34)	87.8 (86.8; 88.7)	<0.001	reference
Pfizer booster 14-120 days	T2DM	671	53.76	11.35 (10.50; 12.24)	88.3 (87.2; 89.2)	<0.001	0.48

Supplementary Table 4. Incidence and adjusted effectiveness of vaccine combinations against *COVID-19* related death during the Delta wave in the 45-64 years old Hungarian healthy and T2DM population

Vaccination	Group	Number of cases	Average population size (1000 persons)	Incidence rate (per 100 000 person-days) (95% CI)	Adjusted vaccine efficacy (%) (95% CI)	P-value comparing to unvaccinated	P-value for waning	P-value T2DM vs. Control
Unvaccinated	Control	935	655.79	1.3 (1.21; 1.38)	reference			
Unvaccinated	T2DM	373	43.65	7.77 (7; 8.6)	reference			
Pfizer-BionTech								
primary 14-120 days	Control	9	93.84	0.09 (0.04; 0.17)	88.4 (77.6; 94.0)	<0.001	reference	reference
primary 14-120 days	T2DM	7	10.85	0.59 (0.24; 1.21)	88.7 (76.0; 94.7)	<0.001	reference	0.96
primary 121-180 days	Control	17	193.84	0.08 (0.05; 0.13)	92.1 (87.3; 95.1)	<0.001	0.35	reference
primary 121-180 days	T2DM	23	25.75	0.81 (0.51; 1.22)	86.7 (79.6; 91.3)	<0.001	0.71	0.11
primary 181-240 days	Control	24	99.01	0.22 (0.14; 0.33)	88.3 (82.4; 92.2)	<0.001	0.98	reference
primary 181-240 days	T2DM	43	14.37	2.72 (1.97; 3.66)	77.0 (68.3; 83.3)	<0.001	0.090	0.011
Pfizer booster 14-120 days	Control	7	88.16	0.07 (0.03; 0.15)	96.6 (92.8; 98.4)	<0.001	0.016	reference
Pfizer booster 14-120 days	T2DM	8	16.76	0.43 (0.19; 0.85)	96.4 (92.8; 98.2)	<0.001	0.029	0.91
Moderna								
primary 181-240 days	Control	4	19.57	0.19 (0.05; 0.48)	91.2 (76.6; 96.7)	<0.001		reference
primary 181-240 days	T2DM	9	2.73	2.99 (1.37; 5.68)	75.7 (52.8; 87.5)	<0.001		0.093
Sputnik								
primary 181-240 days	Control	36	110.71	0.30 (0.21; 0.41)	85.0 (79.0; 89.2)	<0.001		reference
primary 181-240 days	T2DM	18	8.09	2.02 (1.20; 3.20)	81.8 (70.6; 88.7)	<0.001		0.52
Astra-Zeneca								
primary 121-180 days	Control	17	75.04	0.21 (0.12; 0.33)	86.6 (78.3; 91.7)	<0.001		reference
primary 121-180 days	T2DM	18	14.90	1.10 (0.65; 1.74)	85.3 (76.4; 90.9)	<0.001		0.79
primary 181-240 days	Control	13	21.61	0.55 (0.29; 0.94)	64.9 (39.3; 79.7)	<0.001		reference
primary 181-240 days	T2DM	19	9.11	1.90 (1.14; 2.96)	70.5 (53.1; 81.4)	<0.001		0.63
Sinopharm								

primary 121-180 days	Control	19	64.90	0.27 (0.16; 0.42)	73.0 (57.4; 82.9)	<0.001	reference
primary 121-180 days	T2DM	19	6.68	2.58 (1.56; 4.04)	51.7 (22.8; 69.8)	<0.001	0.082
primary 181-240 days	Control	33	36.73	0.82 (0.56; 1.15)	60.2 (43.7; 71.9)	<0.001	reference
primary 181-240 days	T2DM	23	5.29	3.95 (2.51; 5.93)	60.0 (38.8; 73.8)	<0.001	0.99
Pfizer booster 14-120 days	Control	5	51.15	0.09 (0.03; 0.21)	96.3 (91.0; 98.4)	<0.001	reference
Pfizer booster 14-120 days	T2DM	6	12.50	0.44 (0.16; 0.95)	96.1 (91.1; 98.2)	<0.001	0.93

Supplementary Table 5. Incidence and adjusted effectiveness of vaccine combinations against registered *SARS-CoV-2* infection during the Delta wave in the 45-64 years old Hungarian healthy and T2DM population

Vaccination	Group	Number of cases	Average population size (1000 persons)	Incidence rate (per 100 000 person-days) (95% CI)	Adjusted vaccine efficacy (%) (95% CI)	P-value comparing to unvaccinated	P-value for waning	P-value T2DM vs. Control
Unvaccinated	Control	40 050	590.55	61.65 (61.05; 62.26)	reference			
Unvaccinated	T2DM	4 142	36.61	102.84 (99.74; 106.02)	reference			
Pfizer-BionTech								
primary 14-120 days	Control	760	69.53	9.94 (9.24; 10.67)	71.2 (69.0; 73.2)	<0.001	reference	reference
primary 14-120 days	T2DM	123	7.64	14.64 (12.17; 17.47)	75.7 (70.9; 79.7)	<0.001	reference	0.086
primary 121-180 days	Control	5 692	165.13	31.34 (30.53; 32.16)	46.8 (45.0; 48.5)	<0.001	<0.001	reference
primary 121-180 days	T2DM	782	22.07	32.22 (30.00; 34.55)	59.9 (56.6; 63.0)	<0.001	<0.001	<0.001
primary 181-240 days	Control	6 558	84.83	70.28 (68.59; 72.00)	17.7 (15.0; 20.4)	<0.001	<0.001	reference
primary 181-240 days	T2DM	1 061	12.51	77.12 (72.55; 81.90)	45.9 (41.8; 49.7)	<0.001	<0.001	<0.001
Pfizer booster 14-120 days	Control	1 053	77.34	12.38 (11.64; 13.15)	82.8 (81.6; 83.8)	<0.001	<0.001	reference
Pfizer booster 14-120 days	T2DM	188	14.81	11.54 (9.95; 13.31)	90.4 (88.9; 91.7)	<0.001	<0.001	<0.001
Moderna								
primary 181-240 days	Control	927	17.48	48.20 (45.15; 51.41)	48.6 (44.9; 51.9)	<0.001		reference
primary 181-240 days	T2DM	159	2.43	59.40 (50.52; 69.38)	61.1 (54.3; 66.8)	<0.001		0.002
Sputnik								
primary 181-240 days	Control	9 936	101.91	88.63 (86.90; 90.39)	7.9 (5.2; 10.5)	<0.001		reference
primary 181-240 days	T2DM	729	7.42	89.25 (82.89; 95.97)	40.8 (35.7; 45.5)	<0.001		<0.001
Astra-Zeneca								
primary 121-180 days	Control	4 580	69.20	60.17 (58.44; 61.94)	26.0 (23.3; 28.6)	<0.001		reference
primary 121-180 days	T2DM	912	13.35	62.10 (58.13; 66.26)	48.0 (43.8; 51.8)	<0.001		<0.001
primary 181-240 days	Control	1 490	19.46	69.62 (66.13; 73.25)	-14.1 (-20.5; -8.1)	<0.001		reference
primary 181-240 days	T2DM	596	8.25	65.68 (60.51; 71.17)	26.8 (20.0; 33.0)	<0.001		<0.001
Sinopharm								

primary 121-180 days	Control	3 610	59.24	55.40 (53.60; 57.23)	7.8 (4.1; 11.3)	<0.001	reference
primary 121-180 days	T2DM	346	5.899	53.32 (47.85; 59.25)	30.1 (21.8; 37.6)	<0.001	<0.001
primary 181-240 days	Control	2 924	33.34	79.73 (76.87; 82.68)	-10.4 (-15.2; -5.9)	<0.001	reference
primary 181-240 days	T2DM	488	4.79	92.68 (84.64; 101.28)	20.5 (12.3; 27.8)	<0.001	<0.001
Pfizer booster 14-120 days	Control	396	48.22	7.47 (6.75; 8.24)	88.3 (87.1; 89.5)	<0.001	reference
Pfizer booster 14-120 days	T2DM	148	11.72	11.48 (9.71; 13.49)	89.5 (87.6; 91.1)	<0.001	0.28