

Vyvanuti III

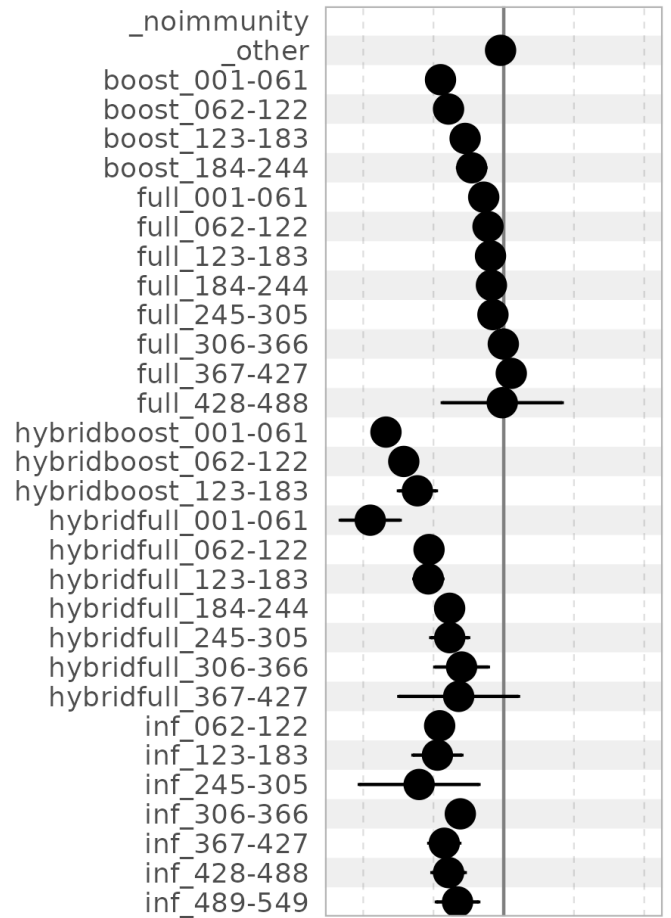
Results of Statistical Estimation

July 3, 2023

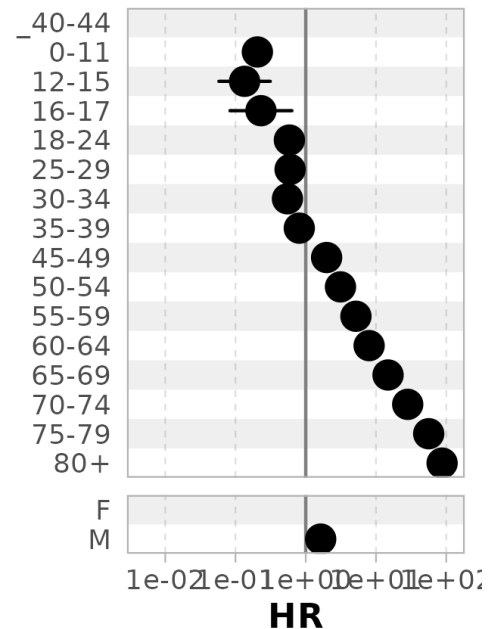
1 Serious Course BA12

Characteristic	N = 43,154,538 ¹
SeriousCovidProxy	7,656 (<0.1%)
Immunity	
_noimmunity	2,867,553 (6.6%)
_other	732,962 (1.7%)
boost_001-061	3,350,025 (7.8%)
boost_062-122	3,264,147 (7.6%)
boost_123-183	3,049,848 (7.1%)
boost_184-244	2,338,205 (5.4%)
full_001-061	610,276 (1.4%)
full_062-122	976,872 (2.3%)
full_123-183	2,866,169 (6.6%)
full_184-244	2,163,706 (5.0%)
full_245-305	1,137,393 (2.6%)
full_306-366	856,990 (2.0%)
full_367-427	268,250 (0.6%)
full_428-488	40,985 (<0.1%)
hybridboost_001-061	2,152,926 (5.0%)
hybridboost_062-122	2,073,520 (4.8%)
hybridboost_123-183	1,558,849 (3.6%)
hybridfull_001-061	1,854,771 (4.3%)
hybridfull_062-122	2,132,577 (4.9%)
hybridfull_123-183	2,445,060 (5.7%)
hybridfull_184-244	1,351,132 (3.1%)
hybridfull_245-305	610,400 (1.4%)
hybridfull_306-366	324,500 (0.8%)
hybridfull_367-427	75,490 (0.2%)
inf_062-122	1,190,450 (2.8%)
inf_123-183	1,106,986 (2.6%)
inf_245-305	343,688 (0.8%)
inf_306-366	318,216 (0.7%)
inf_367-427	371,936 (0.9%)
inf_428-488	403,641 (0.9%)
inf_489-549	317,015 (0.7%)
Sex	
F	22,046,730 (51%)
M	21,107,808 (49%)
¹ n (%)	

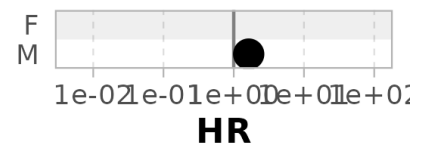
Immunity



AgeGr



Sex



	beta	lower	upper	HR	lower	upper	eff	upper	lower
Immunity_other	-0.10	-0.28	0.07	0.90	0.76	1.08	0.10	0.24	-0.08
Immunityboost_001-061	-2.07	-2.17	-1.97	0.13	0.11	0.14	0.87	0.89	0.86
Immunityboost_062-122	-1.81	-1.87	-1.74	0.16	0.15	0.17	0.84	0.85	0.83
Immunityboost_123-183	-1.27	-1.36	-1.17	0.28	0.26	0.31	0.72	0.74	0.69
Immunityboost_184-244	-1.05	-1.51	-0.58	0.35	0.22	0.56	0.65	0.78	0.44
Immunityfull_001-061	-0.66	-0.84	-0.47	0.52	0.43	0.62	0.48	0.57	0.38
Immunityfull_062-122	-0.51	-0.67	-0.36	0.60	0.51	0.70	0.40	0.49	0.30
Immunityfull_123-183	-0.43	-0.58	-0.29	0.65	0.56	0.75	0.35	0.44	0.25
Immunityfull_184-244	-0.40	-0.50	-0.31	0.67	0.61	0.74	0.33	0.39	0.26
Immunityfull_245-305	-0.35	-0.47	-0.24	0.70	0.63	0.78	0.30	0.37	0.22
Immunityfull_306-366	-0.01	-0.16	0.13	0.99	0.85	1.14	0.01	0.15	-0.14
Immunityfull_367-427	0.25	-0.05	0.54	1.28	0.95	1.72	-0.28	0.05	-0.72
Immunityfull_428-488	-0.05	-2.01	1.92	0.95	0.13	6.80	0.05	0.87	-5.80
Immunityhybridboost_001-061	-3.86	-4.27	-3.45	0.02	0.01	0.03	0.98	0.99	0.97
Immunityhybridboost_062-122	-3.28	-3.61	-2.94	0.04	0.03	0.05	0.96	0.97	0.95
Immunityhybridboost_123-183	-2.83	-3.45	-2.21	0.06	0.03	0.11	0.94	0.97	0.89
Immunityhybridfull_001-061	-4.38	-5.36	-3.39	0.01	0.00	0.03	0.99	1.00	0.97
Immunityhybridfull_062-122	-2.45	-2.78	-2.12	0.09	0.06	0.12	0.91	0.94	0.88
Immunityhybridfull_123-183	-2.47	-2.95	-1.99	0.08	0.05	0.14	0.92	0.95	0.86
Immunityhybridfull_184-244	-1.77	-2.18	-1.36	0.17	0.11	0.26	0.83	0.89	0.74
Immunityhybridfull_245-305	-1.77	-2.39	-1.15	0.17	0.09	0.32	0.83	0.91	0.68
Immunityhybridfull_306-366	-1.38	-2.26	-0.50	0.25	0.10	0.60	0.75	0.90	0.40
Immunityhybridfull_367-427	-1.48	-3.44	0.48	0.23	0.03	1.62	0.77	0.97	-0.62
Immunityinf_062-122	-2.10	-2.50	-1.70	0.12	0.08	0.18	0.88	0.92	0.82
Immunityinf_123-183	-2.17	-2.97	-1.37	0.11	0.05	0.25	0.89	0.95	0.75
Immunityinf_245-305	-2.77	-4.73	-0.81	0.06	0.01	0.44	0.94	0.99	0.56
Immunityinf_306-366	-1.42	-1.83	-1.01	0.24	0.16	0.36	0.76	0.84	0.64
Immunityinf_367-427	-1.95	-2.46	-1.44	0.14	0.09	0.24	0.86	0.91	0.76
Immunityinf_428-488	-1.81	-2.35	-1.26	0.16	0.10	0.28	0.84	0.90	0.72
Immunityinf_489-549	-1.51	-2.21	-0.82	0.22	0.11	0.44	0.78	0.89	0.56
AgeGr0-11	-1.58	-1.96	-1.21	0.20	0.14	0.30	0.80	0.86	0.70
AgeGr12-15	-2.00	-2.84	-1.17	0.13	0.06	0.31	0.87	0.94	0.69
AgeGr16-17	-1.47	-2.48	-0.46	0.23	0.08	0.63	0.77	0.92	0.37
AgeGr18-24	-0.54	-0.94	-0.13	0.58	0.39	0.88	0.42	0.61	0.12
AgeGr25-29	-0.51	-0.92	-0.11	0.60	0.40	0.90	0.40	0.60	0.10
AgeGr30-34	-0.60	-1.01	-0.19	0.55	0.37	0.82	0.45	0.63	0.18
AgeGr35-39	-0.21	-0.57	0.15	0.81	0.56	1.16	0.19	0.44	-0.16
AgeGr45-49	0.68	0.39	0.98	1.98	1.48	2.66	-0.98	-0.48	-1.66
AgeGr50-54	1.14	0.86	1.42	3.12	2.35	4.14	-2.12	-1.35	-3.14
AgeGr55-59	1.65	1.38	1.91	5.18	3.98	6.76	-4.18	-2.98	-5.76
AgeGr60-64	2.08	1.82	2.33	7.98	6.18	10.31	-6.98	-5.18	-9.31
AgeGr65-69	2.70	2.45	2.94	14.84	11.60	18.99	-13.84	-10.60	-17.99
AgeGr70-74	3.34	3.10	3.58	28.28	22.21	36.02	-27.28	-21.21	-35.02
AgeGr75-79	4.03	3.79	4.27	56.26	44.21	71.58	-55.26	-43.21	-70.58
AgeGr80+	4.47	4.23	4.71	87.32	68.82	110.79	-86.32	-67.82	-109.79
SexM	0.49	0.44	0.54	1.63	1.56	1.71	-0.63	-0.56	-0.71

Table 1: Cox model summary

	immunities	deltas	lower_of_deltas	upper_of_deltas
2	Immunityfull	0.03	0.02	0.04
3	Immunityboost	0.03	0.02	0.04
4	Immunitysecboost			
5	Immunitysecbnew			
6	Immunityinf	0.00	-0.00	0.01
7	Immunityhybridfull	0.02	0.02	0.03
8	Immunityhybridboost	0.01	0.00	0.02

Table 2: Monthly percentage decrease of effectiveness/protection

	1	2	3	4	5	6	7
1		39.16%			57.74%	52.85%	54.73%
2	-39.16%				6.90%	11.30%	12.01%
3							
4							
5	-57.74%	-6.90%				1.99%	7.84%
6	-52.85%	-11.30%			-1.99%		0.35%
7	-54.73%	-12.01%			-7.84%	-0.35%	

Table 3: Effectiveness/protection differences

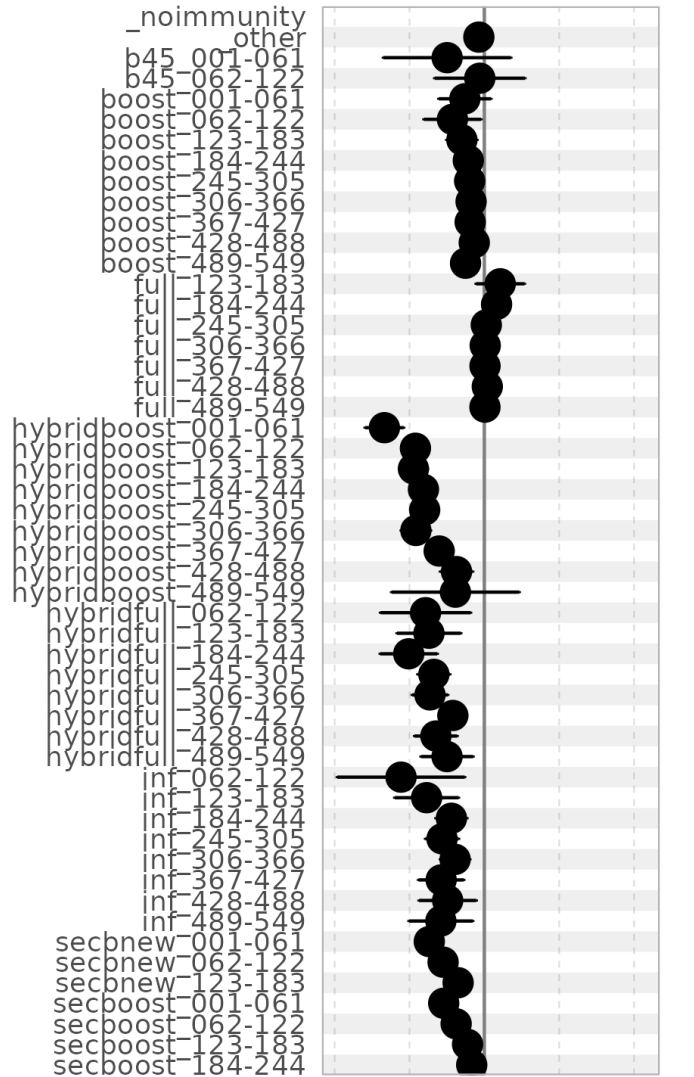
	1	2	3	4	5	6	7
		14.11			16.84	21.64	18.32
	-14.11				3.06	15.22	21.22
	-16.84	-3.06				0.85	3.40
	-21.64	-15.22			-0.85		0.53
	-18.32	-21.22			-3.40	-0.53	

Table 4: Z-scores of effectiveness/protection differences

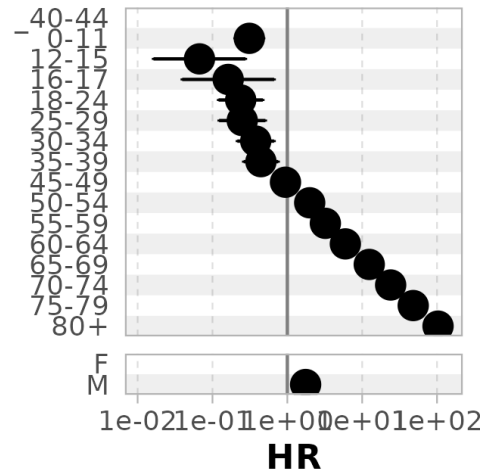
2 Serious Course BA45+

Characteristic	N = 60,571,840 ¹
SeriousCovidProxy	5,723 (<0.1%)
Immunity	
_noimmunity	2,185,667 (3.6%)
_other	2,440,451 (4.0%)
b45_001-061	14,703 (<0.1%)
b45_062-122	14,560 (<0.1%)
boost_001-061	84,727 (0.1%)
boost_062-122	180,625 (0.3%)
boost_123-183	1,441,355 (2.4%)
boost_184-244	3,034,282 (5.0%)
boost_245-305	3,005,127 (5.0%)
boost_306-366	2,689,731 (4.4%)
boost_367-427	2,359,454 (3.9%)
boost_428-488	2,233,916 (3.7%)
boost_489-549	1,822,356 (3.0%)
full_123-183	212,984 (0.4%)
full_184-244	491,602 (0.8%)
full_245-305	731,367 (1.2%)
full_306-366	1,262,491 (2.1%)
full_367-427	1,327,804 (2.2%)
full_428-488	1,319,693 (2.2%)
full_489-549	1,228,309 (2.0%)
hybridboost_001-061	938,244 (1.5%)
hybridboost_062-122	1,209,048 (2.0%)
hybridboost_123-183	2,085,452 (3.4%)
hybridboost_184-244	2,344,181 (3.9%)
hybridboost_245-305	1,778,898 (2.9%)
hybridboost_306-366	1,389,158 (2.3%)
hybridboost_367-427	1,218,779 (2.0%)
hybridboost_428-488	965,090 (1.6%)
hybridboost_489-549	407,175 (0.7%)
hybridfull_062-122	359,431 (0.6%)
hybridfull_123-183	1,148,541 (1.9%)
hybridfull_184-244	1,711,626 (2.8%)
hybridfull_245-305	1,817,766 (3.0%)
hybridfull_306-366	1,843,201 (3.0%)
hybridfull_367-427	1,575,104 (2.6%)
hybridfull_428-488	1,169,470 (1.9%)
hybridfull_489-549	674,096 (1.1%)
inf_062-122	224,787 (0.4%)
inf_123-183	762,636 (1.3%)
inf_184-244	1,175,370 (1.9%)
inf_245-305	1,193,948 (2.0%)
inf_306-366	1,142,528 (1.9%)
inf_367-427	1,128,669 (1.9%)
inf_428-488	1,205,640 (2.0%)
inf_489-549	913,725 (1.5%)
secbnew_001-061	287,528 (0.5%)
secbnew_062-122	285,494 (0.5%)
secbnew_123-183	278,665 (0.5%)
secboost_001-061	323,798 (0.5%)
secboost_062-122	318,766 (0.5%)
secboost_123-183	313,666 (0.5%)
secboost_184-244	300,156 (0.5%)
Sex	
F	31,150,951 (51%)
M	29,420,889 (49%)
¹ n (%)	

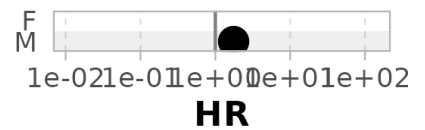
Immunity



AgeGr



Sex



	beta	lower	upper	HR	lower	upper	eff	upper	lower
Immunity_other	-0.17	-0.31	-0.03	0.85	0.74	0.97	0.15	0.26	0.03
Immunityb45.001-061	-1.14	-3.11	0.82	0.32	0.04	2.26	0.68	0.96	-1.26
Immunityb45.062-122	-0.14	-1.53	1.25	0.87	0.22	3.49	0.13	0.78	-2.49
Immunityboost.001-061	-0.60	-1.40	0.20	0.55	0.25	1.23	0.45	0.75	-0.23
Immunityboost.062-122	-0.98	-1.86	-0.10	0.38	0.16	0.90	0.62	0.84	0.10
Immunityboost.123-183	-0.69	-1.16	-0.22	0.50	0.31	0.80	0.50	0.69	0.20
Immunityboost.184-244	-0.49	-0.63	-0.35	0.61	0.53	0.70	0.39	0.47	0.30
Immunityboost.245-305	-0.45	-0.54	-0.36	0.64	0.58	0.70	0.36	0.42	0.30
Immunityboost.306-366	-0.41	-0.50	-0.31	0.67	0.61	0.73	0.33	0.39	0.27
Immunityboost.367-427	-0.44	-0.56	-0.32	0.65	0.57	0.73	0.35	0.43	0.27
Immunityboost.428-488	-0.31	-0.46	-0.16	0.73	0.63	0.85	0.27	0.37	0.15
Immunityboost.489-549	-0.58	-1.00	-0.15	0.56	0.37	0.86	0.44	0.63	0.14
Immunityfull.123-183	0.49	-0.25	1.23	1.63	0.78	3.44	-0.63	0.22	-2.44
Immunityfull.184-244	0.38	0.06	0.69	1.46	1.06	2.00	-0.46	-0.06	-1.00
Immunityfull.245-305	0.06	-0.20	0.32	1.06	0.82	1.38	-0.06	0.18	-0.38
Immunityfull.306-366	0.03	-0.23	0.28	1.03	0.80	1.33	-0.03	0.20	-0.33
Immunityfull.367-427	0.02	-0.17	0.21	1.02	0.85	1.23	-0.02	0.15	-0.23
Immunityfull.428-488	0.09	-0.07	0.26	1.10	0.93	1.29	-0.10	0.07	-0.29
Immunityfull.489-549	0.02	-0.17	0.21	1.02	0.84	1.23	-0.02	0.16	-0.23
Immunityhybridboost.001-061	-3.07	-3.67	-2.48	0.05	0.03	0.08	0.95	0.97	0.92
Immunityhybridboost.062-122	-2.12	-2.54	-1.70	0.12	0.08	0.18	0.88	0.92	0.82
Immunityhybridboost.123-183	-2.18	-2.61	-1.75	0.11	0.07	0.17	0.89	0.93	0.83
Immunityhybridboost.184-244	-1.87	-2.21	-1.54	0.15	0.11	0.22	0.85	0.89	0.78
Immunityhybridboost.245-305	-1.84	-2.15	-1.52	0.16	0.12	0.22	0.84	0.88	0.78
Immunityhybridboost.306-366	-2.11	-2.56	-1.65	0.12	0.08	0.19	0.88	0.92	0.81
Immunityhybridboost.367-427	-1.39	-1.81	-0.97	0.25	0.16	0.38	0.75	0.84	0.62
Immunityhybridboost.428-488	-0.86	-1.35	-0.36	0.42	0.26	0.70	0.58	0.74	0.30
Immunityhybridboost.489-549	-0.89	-2.85	1.07	0.41	0.06	2.93	0.59	0.94	-1.93
Immunityhybridfull.062-122	-1.81	-3.20	-0.42	0.16	0.04	0.66	0.84	0.96	0.34
Immunityhybridfull.123-183	-1.70	-2.69	-0.72	0.18	0.07	0.49	0.82	0.93	0.51
Immunityhybridfull.184-244	-2.33	-3.20	-1.45	0.10	0.04	0.24	0.90	0.96	0.76
Immunityhybridfull.245-305	-1.55	-2.05	-1.06	0.21	0.13	0.35	0.79	0.87	0.65
Immunityhybridfull.306-366	-1.67	-2.22	-1.13	0.19	0.11	0.32	0.81	0.89	0.68
Immunityhybridfull.367-427	-0.97	-1.39	-0.55	0.38	0.25	0.58	0.62	0.75	0.42
Immunityhybridfull.428-488	-1.49	-2.15	-0.83	0.23	0.12	0.43	0.77	0.88	0.57
Immunityhybridfull.489-549	-1.15	-1.95	-0.34	0.32	0.14	0.71	0.68	0.86	0.29
Immunityinf.062-122	-2.56	-4.52	-0.60	0.08	0.01	0.55	0.92	0.99	0.45
Immunityinf.123-183	-1.78	-2.76	-0.79	0.17	0.06	0.45	0.83	0.94	0.55
Immunityinf.184-244	-1.01	-1.49	-0.53	0.36	0.23	0.59	0.64	0.77	0.41
Immunityinf.245-305	-1.30	-1.81	-0.79	0.27	0.16	0.45	0.73	0.84	0.55
Immunityinf.306-366	-0.90	-1.35	-0.45	0.41	0.26	0.64	0.59	0.74	0.36
Immunityinf.367-427	-1.33	-2.02	-0.63	0.26	0.13	0.53	0.74	0.87	0.47
Immunityinf.428-488	-1.13	-2.01	-0.25	0.32	0.13	0.78	0.68	0.87	0.22
Immunityinf.489-549	-1.34	-2.32	-0.35	0.26	0.10	0.70	0.74	0.90	0.30
Immunitysecbnew.001-061	-1.69	-2.04	-1.35	0.18	0.13	0.26	0.82	0.87	0.74
Immunitysecbnew.062-122	-1.27	-1.59	-0.94	0.28	0.20	0.39	0.72	0.80	0.61
Immunitysecbnew.123-183	-0.81	-1.19	-0.42	0.45	0.30	0.66	0.55	0.70	0.34
Immunitysecboost.001-061	-1.25	-1.45	-1.05	0.29	0.23	0.35	0.71	0.77	0.65
Immunitysecboost.062-122	-0.87	-1.07	-0.66	0.42	0.34	0.52	0.58	0.66	0.48
Immunitysecboost.123-183	-0.52	-0.72	-0.31	0.60	0.48	0.74	0.40	0.52	0.26
Immunitysecboost.184-244	-0.39	-0.69	-0.08	0.68	0.50	0.92	0.32	0.50	0.08
AgeGr0-11	-1.17	-1.61	-0.73	0.31	0.20	0.48	0.69	0.80	0.52
AgeGr12-15	-2.70	-4.12	-1.29	0.07	0.02	0.28	0.93	0.98	0.72
AgeGr16-17	-1.82	-3.23	-0.40	0.16	0.04	0.67	0.84	0.96	0.33
AgeGr18-24	-1.43	-2.12	-0.75	0.24	0.12	0.47	0.76	0.88	0.53
AgeGr25-29	-1.39	-2.10	-0.67	0.25	0.12	0.51	0.75	0.88	0.49
AgeGr30-34	-0.97	-1.54	-0.41	0.38	0.21	0.67	0.62	0.79	0.33
AgeGr35-39	-0.81	-1.34	-0.28	0.44	0.26	0.76	0.56	0.74	0.24
AgeGr45-49	-0.06	-0.46	0.34	0.94	0.63	1.41	0.06	0.37	-0.41
AgeGr50-54	0.69	0.33	1.05	1.99	1.39	2.85	-0.99	-0.39	-1.85
AgeGr55-59	1.17	0.84	1.50	3.22	2.31	4.50	-2.22	-1.31	-3.50
AgeGr60-64	1.79	1.47	2.10	5.96	4.35	8.17	-4.96	-3.35	-7.17
AgeGr65-69	2.52	2.22	2.82	12.43	9.23	16.75	-11.43	-8.23	-15.75
AgeGr70-74	3.18	2.89	3.47	24.03	17.94	32.18	-23.03	-16.94	-31.18
AgeGr75-79	3.87	3.58	4.16	48.11	35.99	64.30	-47.11	-34.99	-63.30
AgeGr80-84	4.64	4.25	4.83	102.25	75.47	127.52	-102.25	-75.47	-127.52

	immunities	deltas	lower_of_deltas	upper_of_deltas
2	Immunityfull	-0.02	-0.05	0.02
3	Immunityboost	0.01	-0.00	0.02
4	Immunitysecboost	0.07	0.05	0.10
5	Immunitysecbnew	0.06	0.02	0.10
6	Immunityinf	0.02	0.00	0.03
7	Immunityhybridfull	0.02	0.00	0.03
8	Immunityhybridboost	0.01	0.01	0.02

Table 6: Monthly percentage decrease of effectiveness/protection

	1	2	3	4	5	6	7
1		41.37%	81.49%	118.61%	77.13%	81.76%	83.86%
2	-41.37%		-3.58%	12.93%	32.46%	43.46%	46.89%
3	-81.49%	3.58%		11.80%	36.56%	42.37%	29.79%
4	-118.61%	-12.93%	-11.80%		22.99%	19.02%	16.16%
5	-77.13%	-32.46%	-36.56%	-22.99%		7.62%	9.00%
6	-81.76%	-43.46%	-42.37%	-19.02%	-7.62%		1.89%
7	-83.86%	-46.89%	-29.79%	-16.16%	-9.00%	-1.89%	

Table 7: Effectiveness/protection differences

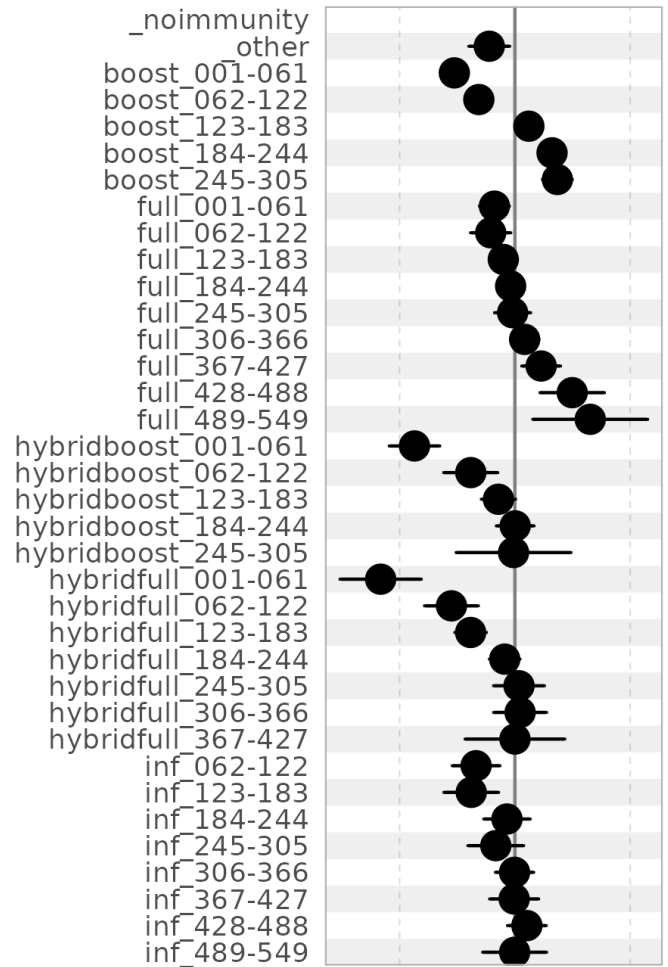
	1	2	3	4	5	6	7
		7.43	3.43	1.90	11.00	12.99	12.59
	-7.43		-0.48	1.28	8.03	14.21	19.51
	-3.43	0.48		3.52	5.90	6.21	11.69
	-1.90	-1.28	-3.52		3.16	2.14	5.78
	-11.00	-8.03	-5.90	-3.16		1.81	2.54
	-12.99	-14.21	-6.21	-2.14	-1.81		0.68
	-12.59	-19.51	-11.69	-5.78	-2.54	-0.68	

Table 8: Z-scores of effectiveness/protection differences

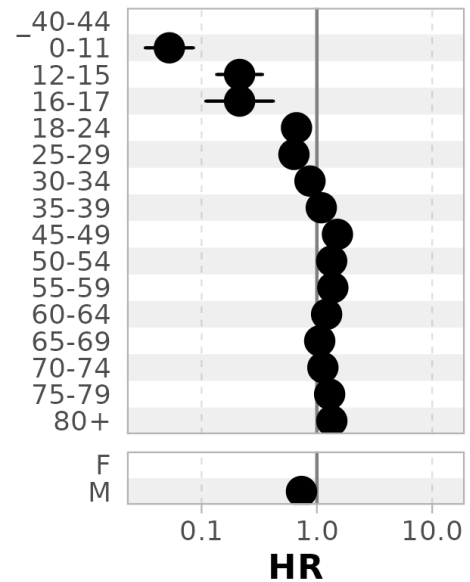
3 Long Covid BA12 - Population

Characteristic	N = 61,304,667 ¹
LongCovid	2,327 (<0.1%)
Immunity	
_noimmunity	3,281,891 (5.4%)
_other	1,281,884 (2.1%)
boost_001-061	3,506,779 (5.7%)
boost_062-122	3,299,721 (5.4%)
boost_123-183	3,126,434 (5.1%)
boost_184-244	3,011,757 (4.9%)
boost_245-305	2,539,278 (4.1%)
full_001-061	715,316 (1.2%)
full_062-122	1,916,412 (3.1%)
full_123-183	4,375,148 (7.1%)
full_184-244	2,714,601 (4.4%)
full_245-305	1,569,481 (2.6%)
full_306-366	1,037,004 (1.7%)
full_367-427	844,648 (1.4%)
full_428-488	350,035 (0.6%)
full_489-549	42,791 (<0.1%)
hybridboost_001-061	2,574,232 (4.2%)
hybridboost_062-122	2,246,133 (3.7%)
hybridboost_123-183	1,964,995 (3.2%)
hybridboost_184-244	1,467,947 (2.4%)
hybridboost_245-305	589,526 (1.0%)
hybridfull_001-061	2,163,498 (3.5%)
hybridfull_062-122	2,526,025 (4.1%)
hybridfull_123-183	3,161,701 (5.2%)
hybridfull_184-244	2,387,658 (3.9%)
hybridfull_245-305	1,297,612 (2.1%)
hybridfull_306-366	560,338 (0.9%)
hybridfull_367-427	284,975 (0.5%)
inf_062-122	1,217,970 (2.0%)
inf_123-183	1,169,042 (1.9%)
inf_184-244	1,174,522 (1.9%)
inf_245-305	997,272 (1.6%)
inf_306-366	653,581 (1.1%)
inf_367-427	455,952 (0.7%)
inf_428-488	416,115 (0.7%)
inf_489-549	382,393 (0.6%)
Sex	
F	31,408,185 (51%)
M	29,896,482 (49%)
¹ n (%)	

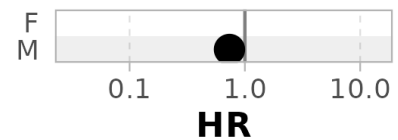
Immunity



AgeGr



Sex



	beta	lower	upper	HR	lower	upper	eff	upper	lower
Immunity_other	-0.51	-0.91	-0.11	0.60	0.40	0.90	0.40	0.60	0.10
Immunityboost_001-061	-1.21	-1.39	-1.03	0.30	0.25	0.36	0.70	0.75	0.64
Immunityboost_062-122	-0.72	-0.99	-0.46	0.49	0.37	0.63	0.51	0.63	0.37
Immunityboost_123-183	0.28	0.06	0.50	1.32	1.06	1.64	-0.32	-0.06	-0.64
Immunityboost_184-244	0.74	0.56	0.92	2.10	1.76	2.51	-1.10	-0.76	-1.51
Immunityboost_245-305	0.85	0.56	1.14	2.34	1.74	3.13	-1.34	-0.74	-2.13
Immunityfull_001-061	-0.41	-0.70	-0.11	0.66	0.50	0.89	0.34	0.50	0.11
Immunityfull_062-122	-0.48	-0.88	-0.09	0.62	0.41	0.92	0.38	0.59	0.08
Immunityfull_123-183	-0.23	-0.40	-0.06	0.79	0.67	0.94	0.21	0.33	0.06
Immunityfull_184-244	-0.08	-0.27	0.10	0.92	0.77	1.10	0.08	0.23	-0.10
Immunityfull_245-305	-0.05	-0.40	0.31	0.96	0.67	1.36	0.04	0.33	-0.36
Immunityfull_306-366	0.19	-0.09	0.48	1.22	0.92	1.61	-0.22	0.08	-0.61
Immunityfull_367-427	0.52	0.14	0.91	1.69	1.15	2.47	-0.69	-0.15	-1.47
Immunityfull_428-488	1.14	0.51	1.78	3.14	1.66	5.95	-2.14	-0.66	-4.95
Immunityfull_489-549	1.50	0.36	2.65	4.50	1.44	14.10	-3.50	-0.44	-13.10
Immunityhybridboost_001-061	-2.01	-2.50	-1.51	0.13	0.08	0.22	0.87	0.92	0.78
Immunityhybridboost_062-122	-0.88	-1.42	-0.35	0.41	0.24	0.71	0.59	0.76	0.29
Immunityhybridboost_123-183	-0.33	-0.66	0.01	0.72	0.51	1.01	0.28	0.49	-0.01
Immunityhybridboost_184-244	0.01	-0.36	0.38	1.01	0.69	1.46	-0.01	0.31	-0.46
Immunityhybridboost_245-305	-0.03	-1.17	1.12	0.97	0.31	3.05	0.03	0.69	-2.05
Immunityhybridfull_001-061	-2.68	-3.49	-1.88	0.07	0.03	0.15	0.93	0.97	0.85
Immunityhybridfull_062-122	-1.27	-1.80	-0.74	0.28	0.17	0.48	0.72	0.83	0.52
Immunityhybridfull_123-183	-0.88	-1.19	-0.57	0.41	0.30	0.56	0.59	0.70	0.44
Immunityhybridfull_184-244	-0.20	-0.50	0.10	0.82	0.61	1.10	0.18	0.39	-0.10
Immunityhybridfull_245-305	0.08	-0.42	0.59	1.09	0.66	1.80	-0.09	0.34	-0.80
Immunityhybridfull_306-366	0.10	-0.42	0.63	1.11	0.66	1.87	-0.11	0.34	-0.87
Immunityhybridfull_367-427	0.00	-0.99	0.99	1.00	0.37	2.70	-0.00	0.63	-1.70
Immunityinf_062-122	-0.77	-1.25	-0.30	0.46	0.29	0.74	0.54	0.71	0.26
Immunityinf_123-183	-0.87	-1.41	-0.33	0.42	0.24	0.72	0.58	0.76	0.28
Immunityinf_184-244	-0.16	-0.62	0.30	0.85	0.54	1.35	0.15	0.46	-0.35
Immunityinf_245-305	-0.38	-0.93	0.17	0.68	0.39	1.19	0.32	0.61	-0.19
Immunityinf_306-366	-0.01	-0.38	0.37	0.99	0.68	1.45	0.01	0.32	-0.45
Immunityinf_367-427	-0.01	-0.50	0.47	0.99	0.61	1.60	0.01	0.39	-0.60
Immunityinf_428-488	0.24	-0.14	0.62	1.27	0.87	1.86	-0.27	0.13	-0.86
Immunityinf_489-549	-0.00	-0.64	0.63	1.00	0.53	1.87	0.00	0.47	-0.87
AgeGr0-11	-2.95	-3.42	-2.47	0.05	0.03	0.08	0.95	0.97	0.92
AgeGr12-15	-1.54	-2.00	-1.09	0.21	0.14	0.34	0.79	0.86	0.66
AgeGr16-17	-1.54	-2.21	-0.87	0.21	0.11	0.42	0.79	0.89	0.58
AgeGr18-24	-0.41	-0.65	-0.16	0.67	0.52	0.85	0.33	0.48	0.15
AgeGr25-29	-0.46	-0.71	-0.20	0.63	0.49	0.82	0.37	0.51	0.18
AgeGr30-34	-0.14	-0.36	0.08	0.87	0.70	1.09	0.13	0.30	-0.09
AgeGr35-39	0.09	-0.12	0.29	1.09	0.89	1.34	-0.09	0.11	-0.34
AgeGr45-49	0.41	0.23	0.59	1.51	1.26	1.81	-0.51	-0.26	-0.81
AgeGr50-54	0.29	0.10	0.49	1.34	1.10	1.63	-0.34	-0.10	-0.63
AgeGr55-59	0.32	0.12	0.51	1.38	1.13	1.67	-0.38	-0.13	-0.67
AgeGr60-64	0.19	-0.01	0.40	1.21	0.99	1.49	-0.21	0.01	-0.49
AgeGr65-69	0.06	-0.15	0.26	1.06	0.86	1.30	-0.06	0.14	-0.30
AgeGr70-74	0.12	-0.09	0.33	1.13	0.91	1.39	-0.13	0.09	-0.39
AgeGr75-79	0.25	0.03	0.48	1.29	1.03	1.61	-0.29	-0.03	-0.61
AgeGr80+	0.30	0.09	0.51	1.35	1.09	1.66	-0.35	-0.09	-0.66
SexM	-0.31	-0.39	-0.22	0.73	0.68	0.80	0.27	0.32	0.20

Table 9: Cox model summary

	immunities	deltas	lower_of_deltas	upper_of_deltas
2	Immunityfull	0.06	0.03	0.09
3	Immunityboost	0.20	0.16	0.25
4	Immunitysecboost			
5	Immunitysecbnew			
6	Immunityinf	0.06	0.03	0.09
7	Immunityhybridfull	0.10	0.08	0.13
8	Immunityhybridboost	0.14	0.10	0.19

Table 10: Monthly percentage decrease of effectiveness/protection

	1	2	3	4	5	6	7
1		3.41%			27.91%	36.96%	29.43%
2	-3.41%				45.37%	26.66%	20.05%
3							
4							
5	-27.91%	-45.37%				4.05%	-13.13%
6	-36.96%	-26.66%			-4.05%		-9.37%
7	-29.43%	-20.05%			13.13%	9.37%	

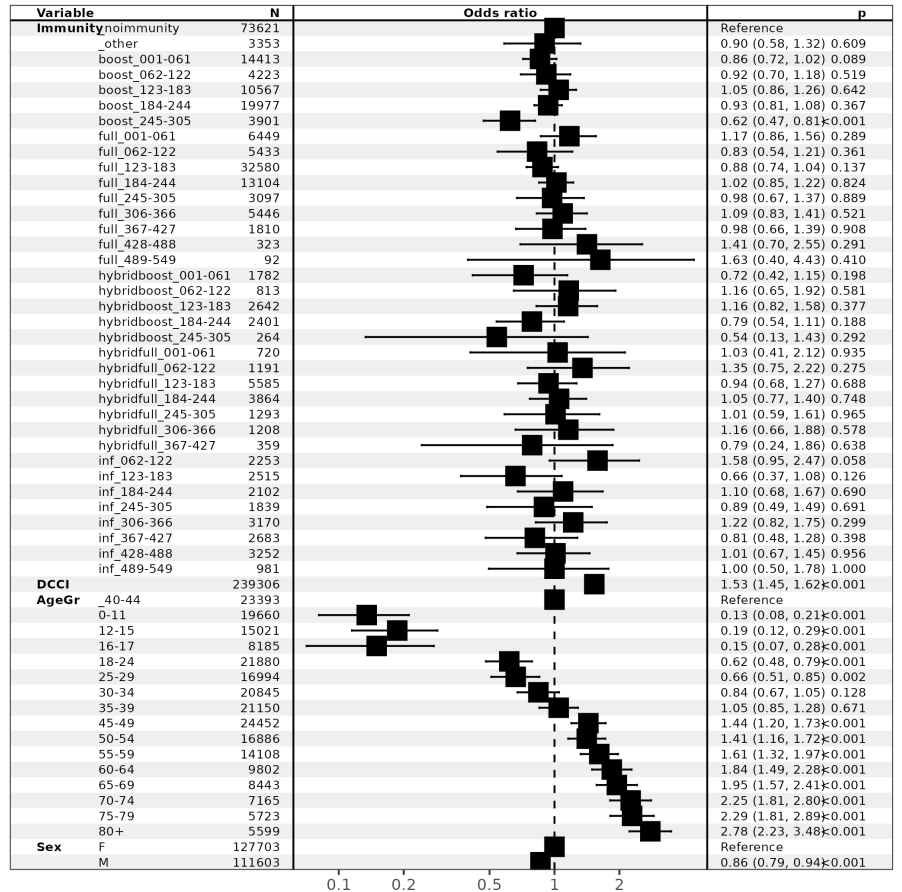
Table 11: Effectiveness/protection differences

1	2	3	4	5	6	7
	0.48			3.53	6.54	4.00
-0.48				4.73	7.56	5.22
-3.53	-4.73				0.51	-1.28
-6.54	-7.56			-0.51		-2.38
-4.00	-5.22			1.28	2.38	

Table 12: Z-scores of effectiveness/protection differences

4 Long Covid BA12 - Infected

Characteristic	N = 239,306 ¹
LongCovid	2,327 (1.0%)
Immunity	
_noimmunity	73,621 (31%)
_other	3,353 (1.4%)
boost_001-061	14,413 (6.0%)
boost_062-122	4,223 (1.8%)
boost_123-183	10,567 (4.4%)
boost_184-244	19,977 (8.3%)
boost_245-305	3,901 (1.6%)
full_001-061	6,449 (2.7%)
full_062-122	5,433 (2.3%)
full_123-183	32,580 (14%)
full_184-244	13,104 (5.5%)
full_245-305	3,097 (1.3%)
full_306-366	5,446 (2.3%)
full_367-427	1,810 (0.8%)
full_428-488	323 (0.1%)
full_489-549	92 (<0.1%)
hybridboost_001-061	1,782 (0.7%)
hybridboost_062-122	813 (0.3%)
hybridboost_123-183	2,642 (1.1%)
hybridboost_184-244	2,401 (1.0%)
hybridboost_245-305	264 (0.1%)
hybridfull_001-061	720 (0.3%)
hybridfull_062-122	1,191 (0.5%)
hybridfull_123-183	5,585 (2.3%)
hybridfull_184-244	3,864 (1.6%)
hybridfull_245-305	1,293 (0.5%)
hybridfull_306-366	1,208 (0.5%)
hybridfull_367-427	359 (0.2%)
inf_062-122	2,253 (0.9%)
inf_123-183	2,515 (1.1%)
inf_184-244	2,102 (0.9%)
inf_245-305	1,839 (0.8%)
inf_306-366	3,170 (1.3%)
inf_367-427	2,683 (1.1%)
inf_428-488	3,252 (1.4%)
inf_489-549	981 (0.4%)
Sex	
F	127,703 (53%)
M	111,603 (47%)
¹ n (%)	



	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-4.9448	0.0866	-57.09	0.0000
Immunity_other	-0.1057	0.2066	-0.51	0.6090
Immunityboost_001-061	-0.1547	0.0909	-1.70	0.0887
Immunityboost_062-122	-0.0869	0.1347	-0.64	0.5189
Immunityboost_123-183	0.0448	0.0966	0.46	0.6425
Immunityboost_184-244	-0.0677	0.0752	-0.90	0.3674
Immunityboost_245-305	-0.4743	0.1403	-3.38	0.0007
Immunityfull_001-061	0.1592	0.1500	1.06	0.2888
Immunityfull_062-122	-0.1855	0.2029	-0.91	0.3607
Immunityfull_123-183	-0.1283	0.0862	-1.49	0.1366
Immunityfull_184-244	0.0207	0.0931	0.22	0.8237
Immunityfull_245-305	-0.0253	0.1817	-0.14	0.8892
Immunityfull_306-366	0.0874	0.1363	0.64	0.5214
Immunityfull_367-427	-0.0218	0.1887	-0.12	0.9082
Immunityfull_428-488	0.3466	0.3281	1.06	0.2909
Immunityfull_489-549	0.4895	0.5946	0.82	0.4103
Immunityhybridboost_001-061	-0.3295	0.2560	-1.29	0.1980
Immunityhybridboost_062-122	0.1518	0.2749	0.55	0.5808
Immunityhybridboost_123-183	0.1457	0.1650	0.88	0.3772
Immunityhybridboost_184-244	-0.2409	0.1829	-1.32	0.1879
Immunityhybridboost_245-305	-0.6158	0.5845	-1.05	0.2921
Immunityhybridfull_001-061	0.0335	0.4135	0.08	0.9354
Immunityhybridfull_062-122	0.2987	0.2738	1.09	0.2752
Immunityhybridfull_123-183	-0.0638	0.1588	-0.40	0.6881
Immunityhybridfull_184-244	0.0491	0.1531	0.32	0.7485
Immunityhybridfull_245-305	0.0111	0.2566	0.04	0.9654
Immunityhybridfull_306-366	0.1474	0.2647	0.56	0.5777
Immunityhybridfull_367-427	-0.2384	0.5061	-0.47	0.6376
Immunityinf_062-122	0.4595	0.2425	1.89	0.0582
Immunityinf_123-183	-0.4166	0.2724	-1.53	0.1262
Immunityinf_184-244	0.0917	0.2300	0.40	0.6901
Immunityinf_245-305	-0.1123	0.2828	-0.40	0.6914
Immunityinf_306-366	0.2000	0.1928	1.04	0.2995
Immunityinf_367-427	-0.2096	0.2482	-0.84	0.3983
Immunityinf_428-488	0.0108	0.1959	0.05	0.9562
Immunityinf_489-549	0.0001	0.3223	0.00	0.9997
DCCI	0.4250	0.0279	15.21	0.0000
AgeGr0-11	-2.0046	0.2434	-8.24	0.0000
AgeGr12-15	-1.6785	0.2317	-7.24	0.0000
AgeGr16-17	-1.8985	0.3425	-5.54	0.0000
AgeGr18-24	-0.4827	0.1256	-3.84	0.0001
AgeGr25-29	-0.4139	0.1307	-3.17	0.0015
AgeGr30-34	-0.1718	0.1129	-1.52	0.1281
AgeGr35-39	0.0447	0.1051	0.43	0.6707
AgeGr45-49	0.3617	0.0935	3.87	0.0001
AgeGr50-54	0.3445	0.1010	3.41	0.0006
AgeGr55-59	0.4780	0.1015	4.71	0.0000
AgeGr60-64	0.6120	0.1074	5.70	0.0000
AgeGr65-69	0.6656	0.1101	6.05	0.0000
AgeGr70-74	0.8131	0.1114	7.30	0.0000
AgeGr75-79	0.8285	0.1183	7.00	0.0000
AgeGr80+	1.0230	0.1137	9.00	0.0000
SexM	-0.1500	0.0426	-3.52	0.0004

Table 13: Logistic regression summary

	immunities	deltas	lower_of_deltas	upper_of_deltas
2	Immunityfull	0.01	-0.01	0.04
3	Immunityboost	-0.01	-0.03	0.01
4	Immunitysecboost			
5	Immunitysecbnew			
6	Immunityinf	0.01	-0.03	0.04
7	Immunityhybridfull	-0.01	-0.07	0.06
8	Immunityhybridboost	-0.01	-0.08	0.05

Table 14: Monthly percentage decrease of effectiveness/protection

	1	2	3	4	5	6	7
1		4.62%			4.59%	-5.37%	10.22%
2	-4.62%				-1.05%	-9.79%	5.55%
3							
4							
5	-4.59%	1.05%				-7.99%	0.23%
6	5.37%	9.79%			7.99%		12.70%
7	-10.22%	-5.55%			-0.23%	-12.70%	

Table 15: Effectiveness/protection differences

1	2	3	4	5	6	7
	0.73			0.44	-0.56	1.00
-0.73				-0.08	-0.96	0.60
-0.44	0.08				-0.59	0.01
0.56	0.96			0.59		0.95
-1.00	-0.60			-0.01	-0.95	

Table 16: Z-scores of effectiveness/protection differences