

**Supplementary Table 1. IgG and TAb response in all groups according to gender and age.**

		Median Ab		Interquartile range (IQR)		95% Confidence Interval (CI)	
		IgG (AU)	TAbs (AU)	IgG (AU)	TAbs (AU)	IgG (AU)	TAbs (AU)
Total Population (N=1005)							
Gender	Male (N=781, 77.71%)	28469	86413	11930-58987	40555-126230	39875.16-46291.90	80141.85-87310.14
	Female (N=224, 22.29%)	23394	64552	3530-53988	12075-112997	30869.04-42048.97	58532.53-72575.96
Age	≥60 (N=91, 9.11%)	26216	74307	6534-59668	19867-110243	33086.22-51589.69	61152.25-82116.51
	<60 (N=908, 90.89%)	27689	82810	9674-58320	32515-124311	38638.55-44527.90	77021.23-83830.04
Vaccinated (N=808, 80.4%)							
Gender	Male (N=663, 82.05%)	33837	99290	16586-66402	56829-131923	44531.76-51638.03	89850.08-96935.48
	Female (N=145, 17.95%)	31187	93293	16700-65187	45657-122928	41012.67-55855.91	77660.78-93982.52
Age	≥60 (N=52, 6.48%)	45237	101619	16166-102248	59164-130835	45968.52-73337.14	80696.57-107275.19
	<60 (N=751, 93.52%)	33257	95834	16651-64294	55101-130224	44137.84-50745.54	88565.50-95317.05
Unvaccinated (N=111, 11.04%)							
Gender	Male (N=71, 63.96%)	1882	3095	743-7125	953.5-17455	3785.7-15621.43	9710.7-25061.9
	Female (N=40, 36.04%)	2197	8532	791.8-3907.8	1437-14133	1303.92-6889.83	5021.67-19075.77
Age	≥60 (N=13, 11.71%)	3140	10361	1547-14582	899-22168	-2052.597-30404.289	1648.59-40118.33
	<60 (N=98, 88.29%)	1988	4996	717-4620	1010-14576	2840.092-10803.622	8965.39-20522.17
Naturally Infected (N=86, 8.56%)							
Gender	Male (N=47, 54.65%)	14368	33939	1737-32702	5362-85145	15256.25-30658.48	34402.52-60753.36
	Female (N=39, 45.35%)	10252	28926	1785-33415	9208-74820	15028.09-35226.79	31266.16-58890.92
Age	≥60 (N=26, 30.59%)	17111	64030	4316-28245	20067-80268	14184.07-29394.46	38208.66-66405.04
	<60 (N=59, 69.41%)	7866	25589	934-35609	2093-77134	16401.36-33100.85	30761.39-55126.38

**Supplementary Table 2. IgG and TAb response in all groups according to individual comorbidities.**

		Median Ab		Interquartile range (IQR)		95% Confidence Interval (CI)	
		IgG (AU)	TAbs (AU)	IgG (AU)	TAbs (AU)	IgG (AU)	TAbs (AU)
Total Population (N= 583)							
Comorbidities	Diabetes (N=168, 28.82%)	36740	99589	16362-83980	50281-132896	44663.48-58420.47	83202.46-98981.78
	Hypertension (N=193, 33.1%)	36228	91944	12970-87097	28715-127379	45210.23-58972.12	74443.09-89772.91
	Heart Disease (N=44, 7.55%)	29926	91834	14841-60167	27077-113206	33278.43-58952.15	62347.61-93951.64
	Kidney Disease (N=94, 16.12%)	24965	69083	3830-57878	6932-114628	30828.59-49242.65	54985.84-78149.56
	Cancer (N=3, 0.51%)	11930	62868	6252-50252	31556-87190	-85212.25-152597.58	-80356.80-196772.13
	Autoimmune Disease (N=81, 13.9%)	25970	87142	9224-58390	32038-115311	28036.92-62638.91	68909.83-92563.38
Vaccinated (N=437)							
Comorbidities	Diabetes (N=133, 30.43%)	47659	111963	23266-93726	72859-138125	52109.62-67757.42	96503.78-112469.14
	Hypertension (N=150, 34.32%)	49725	109940	24781-99318	66528-133748	54636.9-70087.68	90694.79-106035.47
	Heart Disease (N=34, 7.78%)	38423	100640	18544-90366	51017-123913	37974-69159	74339.78-108332.28
	Kidney Disease (N=55, 12.59%)	54111	109940	25493-94549	75176-136194	47732.25-71218.15	90629.71-114118.72
	Cancer (N=2, 0.46%)	50252	87190	31091-69412	75029-99350	-436669.3-537172.3	-221844.5-396223.5
	Autoimmune Disease (N=63, 14.42%)	29323	98054	13278-59370	54673-127013	31365.13-74659.47	80965.20-104747.82
Unvaccinated (N=77)							

Comorbidities	Diabetes (N=12, 15.59%)	3478	14861	1522-8790	1762- 23395	1995.05- 8859.11	2714.814- 43946.686
	Hypertension (N=20, 25.97%)	2761	1814.5	574.2-5963	401.2- 10976	-4219.77- 30634.77	1102.058- 22283.942
	Heart Disease (N=4, 5.19%)	4888	6726	875-14768	2337- 14540	-13426.46- 34935.46	-9075.21- 29376.21
	Kidney Disease (N=33, 42.86%)	2819	2027	575-6923	494-16901	1197.442- 24622.134	5508.264- 23510.342
	Cancer (N=1, 1.3%)	575	244	575-575	244-244	NA	NA
	Autoimmune Disease (N=7, 9.09%)	1838	5408	819-5644	1734- 24493	-13892.32- 41424.9	-28059.8- 97783.8
Naturally Infected (N=70)							
Comorbidities	Diabetes (N=23, 32.86%)	17182	34637	2916- 32542	24858- 79862	14916.59- 38507.49	32293.92- 64524.6
	Hypertension (N=23, 32.86%)	13452	28926	1682- 27239	4391- 66534	8816.09- 28125.81	21254.15- 51959.5
	Heart Disease (N=7, 10%)	26236	61572	7694- 46149	4840- 96245	3282.56- 56977.15	8068.93- 97847.06
	Kidney Disease (N=6, 8.57%)	3498	17395	807-21214	2608- 33139	-3840.64- 25903.64	-6278.58- 55603.58
	Autoimmune Disease (N=11, 15.71%)	6465	25546	667-35201	698.5- 76834	896.26- 42055	9665.94- 71365.14

**Supplementary Table 3. IgG and TAb response in vaccinated-group over definite time points (months).**

Months	Population (N=743)	Median Ab		Interquartile range (IQR)		95% Confidence Interval (CI)	
		IgG (AU)	TAbs (AU)	IgG (AU)	TAbs (AU)	IgG (AU)	TAbs (AU)
<1	N=54, 7.27%	44197	99281	20772-93737	47502-141030	44954.45-71360.67	78108.81-107278.93
1	N=232, 31.22%	42716	113427	25275-78536	67218-141126	49235.16-59528.89	97541.64-109255.95
2	N=153, 20.6%	34697	95685	16339-58623	56385-125939	38395.44-50555.9	83855.52-98410.26
3	N=87, 11.71%	30356	90811	17291-62824	59878-115464	38124.48-71692.64	77749.84-95834.97
4	N=120, 16.15%	29252	95962	12568-75280	50097-130489	39299.26-54833.02	79254.66-96488.19
5	N=82, 11.04%	22845	77115	9654-37453	45566-113798	23275.43-34955.23	74852.92-96808.83
6	N=6, 0.81%	22862	76113	14386-30840	44231-119679	8105.921-35335.413	22271.22-139635.45
7	N=3, 0.40%	6901	25893	5426-16980	25176-55498	-18606.23-43879.56	-40814.04-131116.71
8	N=4, 0.54%	10656	45332	5573-20553	34179-63768	-7283.813-38223.313	3014.142-102215.858

**Supplementary Table 4. Hierarchical cluster analysis and calculated Z-scores for IgG and TAb in patients with Diabetes.**

Patients ID	IgG Z-score				TAb Z-score			
	Cluster	t1	t2	t3	Cluster	t1	t2	t3
140	Cluster-3	0.55096	-1.1543	0.603344	Cluster-3	1.15324	-0.526313	-0.626925
275	Cluster-1	1.15467	-0.58492	-0.56975	Cluster-3	1.13103	-0.766968	-0.364059
281	Cluster-3	-0.27587	-0.8331	1.10898	Cluster-3	1.15348	-0.622654	-0.530829
297	Cluster-1	1.15461	-0.58999	-0.56461	Cluster-3	1.12763	-0.779075	-0.348556
300	Cluster-1	1.13356	-0.3763	-0.75726	Cluster-3	0.802854	0.317301	-1.12015
324	Cluster-1	1.14891	-0.4744	-0.67451	Cluster-3	1.09242	-0.870181	-0.222244
376	Cluster-1	1.1378	-0.39846	-0.73935	Cluster-3	0.963053	0.0701951	-1.03325
470	Cluster-2	-1.15342	0.529643	0.623778	Cluster-1	-0.673081	-0.476	1.14908
482	Cluster-3	-0.02108	-0.98929	1.01037	Cluster-1	0.101893	-1.04705	0.945152
550	Cluster-1	1.15461	-0.565	-0.58961	Cluster-3	1.1111	-0.827749	-0.283351
620	Cluster-1	1.15419	-0.54745	-0.60674	Cluster-3	1.15236	-0.639881	-0.512474
764	Cluster-1	1.15337	-0.62469	-0.52868	Cluster-3	1.12763	-0.779093	-0.348533
853	Cluster-3	-0.37311	-0.75981	1.13291	Cluster-1	-0.489992	-0.660504	1.1505

860	Cluster-1	1.13979	-0.40973	-0.73006	Cluster-3	1.15386	-0.538667	-0.615188
914	Cluster-3	-0.46263	-0.68492	1.14755	Cluster-1	-0.347945	-0.779548	1.12749
935	Cluster-2	-1.02574	0.053632	0.972105	Cluster-1	-1.0906	0.873838	0.216766
974	Cluster-1	1.15404	-0.61088	-0.54316	Cluster-3	0.894334	-1.07972	0.185387
976	Cluster-3	-0.03464	-0.98223	1.01687	Cluster-1	-0.146065	-0.918935	1.065
984	Cluster-1	1.14337	-0.71145	-0.43192	Cluster-3	1.1547	-0.579837	-0.57486
992	Cluster-2	-1.11715	0.811509	0.305646	Cluster-3	1.11638	-0.813663	-0.302721
1015	Cluster-2	-1.14944	0.670083	0.479355	Cluster-1	-1.14233	0.425179	0.717151
1066	Cluster-3	-0.7078	-0.4362	1.144	Cluster-2	0.492762	0.657991	-1.15075
1091	Cluster-1	1.15121	-0.6533	-0.49791	Cluster-3	1.15384	-0.615507	-0.538334
1105	Cluster-3	-0.42087	-0.72078	1.14164	Cluster-1	-0.731921	-0.407485	1.13941
1106	Cluster-1	1.10432	-0.84433	-0.25999	Cluster-3	1.10679	-0.268346	-0.838448
1118	Cluster-1	1.0732	-0.90563	-0.16757	Cluster-1	-0.049337	-0.974418	1.02376
1122	Cluster-1	1.01491	-0.03051	-0.9844	Cluster-3	1.14432	-0.705918	-0.438406
1136	Cluster-3	0.144653	-1.06445	0.919796	Cluster-3	1.08533	-0.884042	-0.201293
1138	Cluster-2	-1.1518	0.505111	0.646693	Cluster-1	-0.218865	-0.87244	1.09131
1158	Cluster-1	1.11983	-0.31603	-0.80381	Cluster-3	1.11098	-0.282914	-0.828064
1176	Cluster-1	0.66721	0.482559	-1.14977	Cluster-3	1.13227	-0.369966	-0.762299
1178	Cluster-1	0.361851	0.768705	-1.13056	Cluster-2	-0.44762	1.14562	-0.697996
11111	Cluster-2	-1.08921	0.876594	0.212615	Cluster-3	1.00804	-0.016276	-0.991763

**Supplementary Table 5. Hierarchical cluster analysis and calculated Z-scores for IgG and TAB in patients with Kidney Disease.**

Patients ID	IgG Z-score				TAB Z-score			
	Cluster	t1	t2	t3	Cluster	t1	t2	t3
217	Cluster-1	0.973223	0.051559	-1.02478	Cluster-3	-0.978896	1.01985	-0.0409502
219	Cluster-3	-1.14946	0.669894	0.479566	Cluster-3	-1.15357	0.621053	0.532515
466	Cluster-1	1.15457	-0.56254	-0.59203	Cluster-1	1.1402	-0.41213	-0.728072
474	Cluster-2	-0.22982	-0.86509	1.0949	Cluster-3	0.132726	-1.05973	0.927009
477	Cluster-1	1.15468	-0.57069	-0.58398	Cluster-1	1.12341	-0.330492	-0.79292
568	Cluster-1	1.11615	-0.30183	-0.81431	Cluster-1	1.10021	-0.246541	-0.85367
572	Cluster-3	-0.87296	1.09104	-0.21808	Cluster-1	1.00059	-0.0011873	-0.999406
647	Cluster-3	-1.15047	0.489724	0.660747	Cluster-3	-1.15383	0.537996	0.61583
654	Cluster-3	-1.1547	0.577826	0.576875	Cluster-3	-1.15468	0.583617	0.571061
657	Cluster-3	-1.14315	0.712651	0.430501	Cluster-3	-1.15361	0.620286	0.533322
659	Cluster-2	-0.89098	-0.1906	1.08158	Cluster-3	-1.04856	0.105487	0.943075
660	Cluster-3	-0.96678	1.0302	-0.06342	Cluster-3	-1.02893	0.96831	0.0606211
662	Cluster-3	-1.14302	0.713401	0.429616	Cluster-1	1.1547	-0.57735	-0.57735
663	Cluster-3	-1.13193	0.76359	0.368336	Cluster-3	-1.15423	0.605677	0.548552
668	Cluster-3	-1.15468	0.572115	0.58257	Cluster-3	-1.15454	0.56039	0.594146
669	Cluster-1	1.08853	-0.21061	-0.87792	Cluster-1	1.11596	-0.30114	-0.814824

670	Cluster-3	-1.15393	0.613544	0.540384	Cluster-3	-1.15304	0.522893	0.630146
673	Cluster-1	1.14302	-0.42966	-0.71337	Cluster-1	1.11573	-0.300248	-0.815478
674	Cluster-1	0.539623	0.614273	-1.1539	Cluster-1	0.739574	0.39818	-1.13775
678	Cluster-3	-1.12765	0.779013	0.348636	Cluster-3	-1.14733	0.686465	0.460866
915	Cluster-3	-0.97779	1.02082	-0.04304	Cluster-1	1.08763	-0.207953	-0.879673
944	Cluster-1	1.13472	-0.38214	-0.75258	Cluster-2	-0.37245	1.13278	-0.760327
1004	Cluster-1	1.12971	-0.35794	-0.77177	Cluster-1	0.877131	0.211805	-1.08894
1006	Cluster-1	1.1075	-0.27076	-0.83674	Cluster-3	-1.02831	0.0592449	0.96906
1008	Cluster-2	-0.57735	-0.57735	1.1547	Cluster-3	-0.57735	-0.57735	1.1547
1010	Cluster-1	1.09623	-0.23394	-0.86229	Cluster-2	-0.0977554	1.04529	-0.947532
1011	Cluster-3	-0.94351	1.04825	-0.10474	Cluster-3	-0.271907	-0.835926	1.10783
1013	Cluster-2	-0.43165	-0.71168	1.14333	Cluster-3	-0.265998	-0.840106	1.1061
1016	Cluster-2	-0.5366	-0.61716	1.15376	Cluster-3	-0.781797	-0.345033	1.12683
1017	Cluster-3	-1.15033	0.662052	0.488282	Cluster-3	-1.15385	0.615196	0.538659
1018	Cluster-1	1.10262	-0.25438	-0.84824	Cluster-1	0.851439	0.249772	-1.10121
1019	Cluster-1	1.11355	-0.29219	-0.82136	Cluster-1	0.775051	0.353739	-1.12879
1020	Cluster-2	-0.60553	-0.5487	1.15423	Cluster-3	-0.71042	-0.433129	1.14355
1021	Cluster-2	-1.07039	0.160084	0.910301	Cluster-3	-1.12347	0.330736	0.792734
1022	Cluster-3	-1.08713	0.880632	0.206496	Cluster-1	0.706591	0.43762	-1.14421
1023	Cluster-1	0.879139	-1.0879	0.208763	Cluster-2	-0.444091	1.14513	-0.70104
1024	Cluster-1	0.442163	0.702698	-1.14486	Cluster-3	-1.15083	0.657179	0.493656
1025	Cluster-3	-1.14031	0.412779	0.727532	Cluster-3	0.229676	-1.09486	0.865181
1026	Cluster-1	1.13607	-0.38913	-0.74695	Cluster-1	1.06685	-0.150826	-0.91602

**Supplementary Table 6. Patient-specific temporal variation of IgG and TAb levels in patients with Diabetes and Kidney Disease.**

Statistical Parameters		Diabetic patients (N=33)			Kidney Disease patients (N= 39)		
		Cluster-1 (C1)	Cluster-2 (C2)	Cluster-3 (C3)	Cluster-1 (C1)	Cluster-2 (C2)	Cluster-3 (C3)
Median Ab (t1)	IgG (AU)	1.14	-1.133	-0.27587	1.1105	-0.5774	-1.142
	TAb (AU)	-0.419	0.02257	1.1276	1.0772	-0.37245	-1.086
Interquartile range (IQR) (t1)	IgG (AU)	1.1082–1.1539	-1.151 – -1.096	-0.42087 – -0.02108	1.0597–1.1351	-0.7483 – -0.4841	-1.15 – -1.06
	TAb (AU)	-0.7172 – -0.1643	-0.21252 – 0.25767	1.0924–1.1524	0.8579–1.1159	-0.40827 – -0.23510	-1.1536 – -0.7283
95% Confidence Interval (CI) (t1)	IgG (AU)	0.96–1.17	-1.16 – -1.06	-0.47 – 0.11	0.9–1.14	-0.87 – -0.36	-1.14 – -1.04
	TAb (AU)	-0.78 – -0.17	-5.95 – 5.99	1.04–1.13	0.89–1.08	-0.75 – 0.15	-1.05 – -0.67
Median Ab (t2)	IgG (AU)	-0.5562	0.59986	-0.8331	-0.297	-0.5774	0.713
	TAb (AU)	-0.72	0.9018	-0.6227	-0.17939	1.133	0.5304
Interquartile range (IQR) (t2)	IgG (AU)	-0.6212 – -0.3818	0.51124–0.77615	-0.9893 – -0.7208	-0.3993 – -0.2281	-0.6644 – -0.3696	0.6046–0.9157
	TAb (AU)	-0.9073 – -0.4246	0.7799–1.0237	-0.7791 – -0.3700	-0.30092 – 0.24028	1.089–1.139	-0.4111 – 0.6190

95% Confidence Interval (CI) (t2)	IgG (AU)	-0.62 – -0.19	0.26–0.88	-1.01 – -0.68	-0.47 – -0.02	-0.8 – -0.15	0.64–0.86
	TAb (AU)	-0.94 – -0.02	-2.19 – 3.99	-0.71 – -0.39	-0.25 – 0.13	0.97–1.24	-0.14 – 0.45
Median Ab (t3)	IgG (AU)	-0.5982	0.5516	1.109	-0.8178	1.1433	0.4301
	TAb (AU)	1.0782	-0.9244	-0.5308	-0.8978	-0.7603	0.62299
Interquartile range (IQR) (t3)	IgG (AU)	-0.7528 – -0.5323	0.3491–0.6410	1.0104–1.1416	-0.8662 – -0.7386	1.0882–1.1540	0.1441–0.549
	TAb (AU)	0.9648–1.1364	-1.0376 – -0.8112	-0.7623 – -0.3485	-1.0981 – -0.8150	-0.8539 – -0.7307	0.53466–0.96256
95% Confidence Interval (CI) (t3)	IgG (AU)	-0.78 – -0.52	0.25–0.83	0.89–1.16	-0.93 – -0.60	1.02–1.18	0.18–0.49
	TAb (AU)	0.75–1.17	-3.8 – 1.95	-0.68 – -0.39	-1.02 – -0.82	-1.12 – -0.48	0.56–0.86