Seroprevalence trends of anti-SARS-CoV-2 antibodies and associated risk factors: a population-based study

Submitted to "Infection"

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Supplementary Information

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Figure S1. Geographic location of the population-based seroprevalence studies used for this analysis, Corona Immunitas study, Switzerland, May 2020 - September 2021
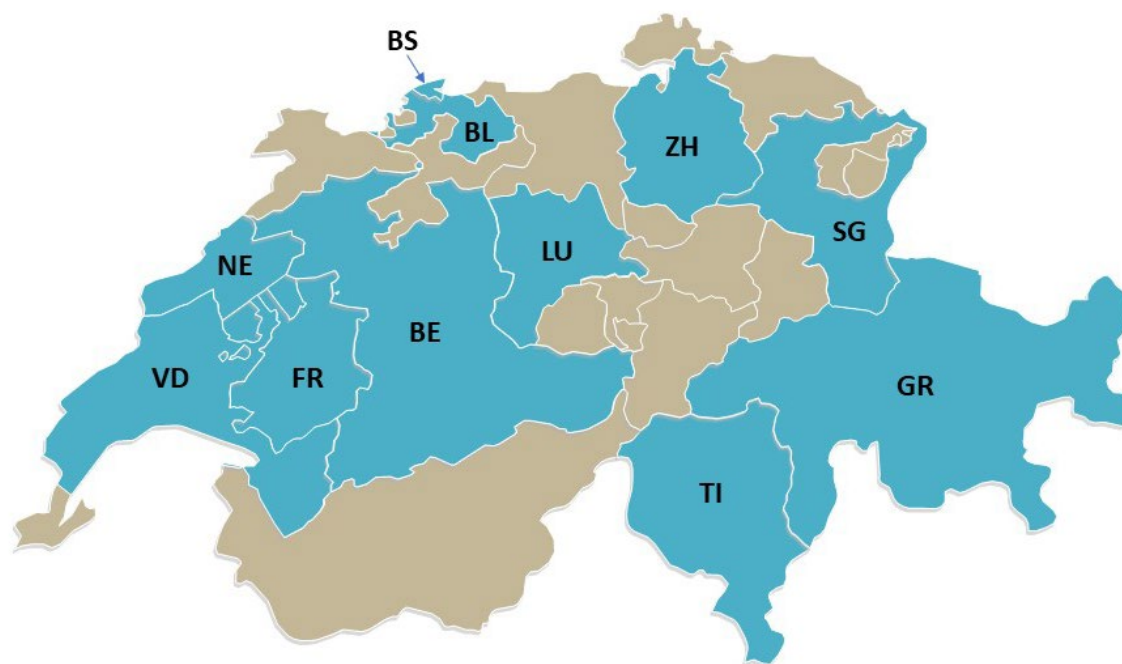
Note: Cantons in blue are the cantons included in this study

Abbreviations: BL= Basel-Landschaft; BS= Basel-Stadt; BE= Bern; FR= Fribourg; GR= Grisons; LU= Lucerne; NE= Neuchâtel; SG= Saint Gallen; TI= Ticino; VD= Vaud; ZU= Zürich

Figure S2. Flow chart of participants included in the analysis of seroprevalence trends (objective 1) and in the analysis for risk factors (objective 2), Corona Immunitas study, Switzerland, May 2020 - September 2021
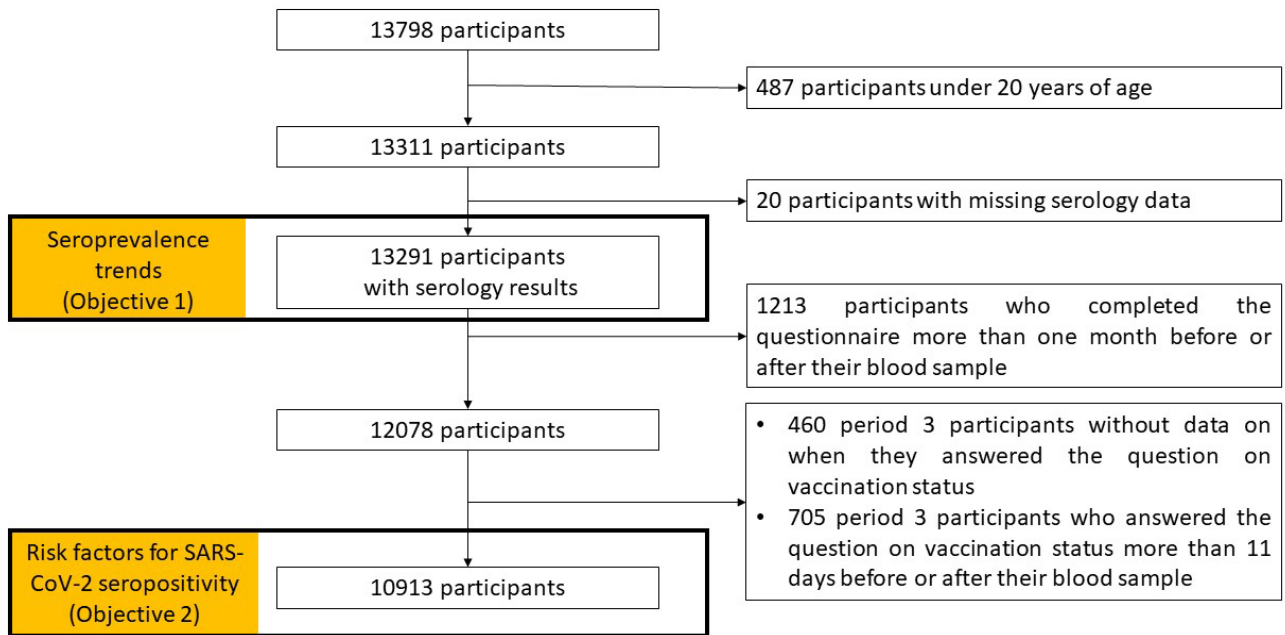
Note: 65500 participants were invited to participate (response rate around 21%)

Table S1: Characteristics of participants across study periods, Corona Immunitas study, Switzerland, May 2020 – September 2021

	Overall	Period 1	Period 2	Period 3
Time window	01/05/2020-31/09/2021	01/05/2020-31/10/2020	01/11/2020-15/05/2021	16/05/2021-31/09/2021
	n (%)	n (%)	n (%)	n (%)
	13291 (100)	3402 (26)	5611 (42)	4278(32)
Canton				
Basel-Landschaft	1187 (9)	308 (26)	577 (49)	302 (25)
Basel-Stadt	1255 (9)	373 (30)	515 (41)	367 (29)
Bern	1038 (8)	NA	400 (39)	638 (61)
Fribourg	1473 (11)	416 (28)	551 (37)	506 (34)
Grisons	591 (4)	NA	301 (51)	290 (49)
Lucerne	1045 (8)	NA	438 (42)	607 (58)
Neuchâtel	1504 (11)	382 (25)	560 (37)	562 (37)
Saint Gallen	569 (4)	NA	259 (46)	310 (54)
Ticino	1062 (18)	643 (61)	419 (39)	NA
Vaud	1362 (10)	412 (30)	950 (70)	NA
Zürich	2205 (17)	868 (39)	641 (29)	696 (32)
Sociodemographic characteristics				
Sex [n=13279]				
Female	6997 (53)	1801 (53)	2922 (52)	2274 (53)
Male	6282 (47)	1597 (47)	2686 (48)	1999 (47)
Age group [n=13290]				
≥ 65	5240 (39)	1097 (32)	2450 (44)	1693 (40)
20-64	8050 (61)	2305 (68)	3160 (56)	2585 (60)
Children in the household [n=13110]				
No children	10050 (77)	2488 (74)	4335 (78)	3227 (77)
One child	1240 (9)	392 (12)	503 (9)	345 (8)
More than one child	1820 (14)	488 (14)	711 (13)	621 (15)
Socioeconomic characteristics				
Educational level[a] [n=12816]				
Tertiary	5855 (46)	1419 (47)	2548 (46)	1888 (45)
Secondary	6193 (48)	1460 (48)	2656 (48)	2077 (49)
Primary	768 (6)	152 (5)	359 (6)	257 (6)
Household income [n=11821]				
> CHF 9'000	4072 (34)	1000 (37)	1775 (34)	1297 (33)
CHF>6'000- 9'000	3261 (28)	764 (28)	1460 (28)	1037 (26)
CHF>3'000- 6'000	3326 (28)	722 (27)	1413 (27)	1191 (30)
CHF≤ 3'000	1162 (10)	229 (8)	499 (10)	434 (11)
Employment status [n=12944]				
Retired	4875 (37)	1134 (35)	2040 (37)	1701 (41)
Outside the labour force[b]	1265 (10)	269 (8)	771 (14)	225 (5)
Self employed	1320 (10)	623 (19)	394 (7)	303 (7)
Employed	5484 (42)	1248 (38)	2295 (42)	1941 (47)
Health status characteristics				
Body Mass Index [n=13059]				
<18.5	347 (3)	90 (3)	140 (3)	117 (3)
18.5 – 24.9	6837 (52)	1768 (53)	2896 (52)	2173 (52)
25 – 29.9	4308 (33)	1069 (32)	1836 (33)	1403 (34)
≥ 30	1567 (12)	423 (13)	654 (12)	490 (12)

Comorbiditiy score [c] [n=12722]				
0	6730 (53)	1597 (54)	2883 (52)	2250 (53)
1	4054 (32)	923 (31)	1785 (32)	1346 (32)
≥2	1938 (15)	448 (15)	876 (16)	614 (15)
Smoking [n=12790]				
Non-smoker	10789 (84)	2448 (82)	4739 (85)	3602 (85)
Smoker	2001 (16)	528 (18)	843 (15)	630 (15)
Preventive behaviours				
Physical distancing during previous 7 days [n=12096]				
Frequently	11034 (91)	2496 (91)	4914 (95)	3624 (86)
Occasionally	687 (6)	162 (6)	147 (3)	378 (9)
Rarely	375 (3)	73 (3)	86 (2)	216 (5)
Staying at home during previous 7 days [n=11703]				
Frequently	8051 (69)	1290 (55)	4188 (81)	2573 (61)
Occasionally	1950 (17)	475 (20)	599 (12)	876 (21)
Rarely	1702 (14)	572 (24)	360 (7)	770 (18)
Wearing mask during previous 7 days [n=11929]				
Frequently	9898 (83)	1237 (48)	4900 (95)	3761 (89)
Occasionally	1240 (10)	668 (26)	208 (4)	364 (9)
Rarely	791 (7)	664 (26)	34 (1)	93 (2)
Hygiene measures during previous 7 days [n=12108]				
Frequently	11355 (94)	2643 (97)	4947 (96)	3765 (89)
Occasionally/rarely	752 (6)	93 (4)	202 (4)	458 (11)

[a] International Standard Classification of Education (ISCED)

[b] Outside the labour force includes participants in training/studying and not employed participants

[c] Comorbidity score goes from 0 to ≥2 and was calculated using the following possible answers: cancer; immunological diseases; cardiovascular diseases or diabetes or hypertension; respiratory diseases; allergies

Table S2: Characteristics of participants by canton, Corona Immunitas study, Switzerland, May 2020 – September 2021

Click on the links below to go directly to the desired canton:

Basel-Landschaft		n (%)
Sex		
	Female	633 (53)
	Male	554 (47)
Age		
	≥ 65	353(30)
	20-64	834(70)
Children in the household		
	No children	894(76)
	One child	121(10)
	More than one child	165(14)
Educational level		
	Tertiary	552(47)
	Secondary	583(49)
	Primary	49(4)
Household income		
	> CHF 9'000	421(37)
	CHF>6'000- 9'000	333(30)
	CHF>3'000- 6'000	275(24)
	CHF≤ 3'000	100(9)
Employment status		
	Retired	386(33)
	Outside the labour force	111(9)
	Self employed	82(7)
	Employed	598(51)
Body Mass Index		
	<18.5	30(3)
	18.5 – 24.9	602(51)
	25-29.9	375(32)
	≥ 30	171(15)
Comorbidity score		
	0	608(51)
	1	394(33)
	≥2	183(15)
Smoking		
	Non-smoker	1026(87)
	Smoker	160(13)
Physical distancing during previous 7 days		
	Frequently	1089(92)
	Occasionally/rarely	94(8)
Staying at home during previous 7 days		
	Frequently	830(70)
	Occasionally/rarely	354(30)
Wearing mask during previous 7 days		
	Frequently	1028(87)
	Occasionally/rarely	151(13)
Hygiene measures during previous 7 days		
	Frequently	1131(96)
	Occasionally/rarely	53(5)

Basel-Stadt

Sex		
	Female	720(57)
	Male	534(43)

Age		
	≥ 65	332(26)
	20-64	923(74)

Children in the household		
	No children	986(79)
	One child	104(8)
	More than one child	155(12)

Educational level		
	Tertiary	809(65)
	Secondary	407(33)
	Primary	35(3)

Household income		
	> CHF 9'000	479(40)
	CHF>6'000- 9'000	301(25)
	CHF>3'000- 6'000	305(25)
	CHF≤ 3'000	119(10)

Employment status		
	Retired	354(28)
	Outside the labour force	107(9)
	Self employed	126(10)
	Employed	660(53)

Body Mass Index		
	<18.5	29(2)
	18.5 – 24.9	721(58)
	25-29.9	376(30)
	≥ 30	120(10)

Comorbidity score		
	0	636(51)
	1	431(34)
	≥2	182(15)

Smoking		
	Non-smoker	1019(81)
	Smoker	234(19)

Physical distancing during previous 7 days		
	Frequently	1147(92)
	Occasionally/rarely	102(8)

Staying at home during previous 7 days		
	Frequently	791(63)
	Occasionally/rarely	458(37)

Wearing mask during previous 7 days		
	Frequently	1112(89)
	Occasionally/rarely	136(11)

Hygiene measures during previous 7 days		
	Frequently	1190(96)
	Occasionally/rarely	56(5)

Bern

Sex		
	Female	506(50)
	Male	528(50)

Age		
	≥ 65	497(48)
	20-64	541(52)
Children in the household		
	No children	795(80)
	One child	69(7)
	More than one child	125(13)
Educational level		
	Tertiary	401(40)
	Secondary	542(54)
	Primary	56(6)
Household income		
	> CHF 9'000	247(27)
	CHF>6'000- 9'000	262(28)
	CHF>3'000- 6'000	288(31)
	CHF≤ 3'000	126(14)
Employment status		
	Retired	465(47)
	Outside the labour force	38(4)
	Self employed	72(7)
	Employed	411(42)
Body Mass Index		
	<18.5	25(3)
	18.5 – 24.9	500(51)
	25-29.9	325(33)
	≥ 30	131(13)
Comorbidity score		
	0	528(53)
	1	297(30)
	≥2	163(17)
Smoking		
	Non-smoker	856(85)
	Smoker	149(15)
Physical distancing during previous 7 days		
	Frequently	889(89)
	Occasionally/rarely	109(11)
Staying at home during previous 7 days		
	Frequently	651(65)
	Occasionally/rarely	352(35)
Wearing mask during previous 7 days		
	Frequently	903(90)
	Occasionally/rarely	97(10)
Hygiene measures during previous 7 days		
	Frequently	925(92)
	Occasionally/rarely	78(8)
Fribourg		
Sex		
	Female	799(54)
	Male	673(46)
Age		
	≥ 65	673(46)
	20-64	800(54)
Children in the household		

	No children	1071(74)
	One child	142(10)
	More than one child	239(16)
Educational level		
	Tertiary	615(42)
	Secondary	739(50)
	Primary	115(8)
Household income		
	> CHF 9'000	528(37)
	CHF>6'000- 9'000	400(28)
	CHF>3'000- 6'000	388(27)
	CHF≤ 3'000	98(7)
Employment status		
	Retired	694(48)
	Outside the labour force	72(5)
	Self employed	82(6)
	Employed	605(42)
Body Mass Index		
	<18.5	42(3)
	18.5 – 24.9	742(51)
	25-29.9	476(32)
	≥ 30	205(14)
Comorbidity score		
	0	781(54)
	1	442(30)
	≥2	234(16)
Smoking		
	Non-smoker	1270(86)
	Smoker	200(14)
Physical distancing during previous 7 days		
	Frequently	1348(92)
	Occasionally/rarely	119(8)
Staying at home during previous 7 days		
	Frequently	1034(71)
	Occasionally/rarely	430(29)
Wearing mask during previous 7 days		
	Frequently	1122(77)
	Occasionally/rarely	342(23)
Hygiene measures during previous 7 days		
	Frequently	1314(90)
	Occasionally/rarely	148(10)
Grisons		
Sex		
	Female	319(54)
	Male	271(46)
Age		
	≥ 65	NA
	20-64	591(100)
Children in the household		
	No children	373(64)
	One child	76(13)
	More than one child	136(23)
Educational level		

	Tertiary	244(42)
	Secondary	306(52)
	Primary	37(6)
Household income		
	> CHF 9'000	157(29)
	CHF>6'000- 9'000	146(27)
	CHF>3'000- 6'000	167(31)
	CHF≤ 3'000	70(13)
Employment status		
	Retired	14(2)
	Outside the labour force	46(8)
	Self employed	77(13)
	Employed	438(76)
Body Mass Index		
	<18.5	14(2)
	18.5 – 24.9	331(57)
	25-29.9	187(32)
	≥ 30	50(9)
Comorbidity score		
	0	391(67)
	1	159(27)
	≥2	38(6)
Smoking		
	Non-smoker	484(82)
	Smoker	104(18)
Physical distancing during previous 7 days		
	Frequently	519(88)
	Occasionally/rarely	68(12)
Staying at home during previous 7 days		
	Frequently	400(68)
	Occasionally/rarely	185(32)
Wearing mask during previous 7 days		
	Frequently	526(90)
	Occasionally/rarely	59(10)
Hygiene measures during previous 7 days		
	Frequently	535(92)
	Occasionally/rarely	49(8)
Lucerne		
Sex		
	Female	514(49)
	Male	530(51)
Age		
	≥ 65	507(49)
	20-64	537(51)
Children in the household		
	No children	798(79)
	One child	81(8)
	More than one child	136(13)
Educational level		
	Tertiary	407(40)
	Secondary	554(54)
	Primary	63(6)
Household income		

	> CHF 9'000	254(27)
	CHF>6'000- 9'000	270(28)
	CHF>3'000- 6'000	301(32)
	CHF≤ 3'000	129(14)
Employment status		
	Retired	495(48)
	Outside the labour force	45(4)
	Self employed	70(7)
	Employed	411(40)
Body Mass Index		
	<18.5	29(3)
	18.5 – 24.9	503(50)
	25-29.9	358(35)
	≥ 30	125(12)
Comorbidity score		
	0	547(53)
	1	307(30)
	≥2	169(17)
Smoking		
	Non-smoker	891(86)
	Smoker	139(14)
Physical distancing during previous 7 days		
	Frequently	927(91)
	Occasionally/rarely	92(9)
Staying at home during previous 7 days		
	Frequently	818(80)
	Occasionally/rarely	206(20)
Wearing mask during previous 7 days		
	Frequently	960(94)
	Occasionally/rarely	61(6)
Hygiene measures during previous 7 days		
	Frequently	955(93)
	Occasionally/rarely	71(7)
Neuchâtel		
Sex		
	Female	797(53)
	Male	707(47)
Age		
	≥ 65	718(48)
	20-64	786(52)
Children in the household		
	No children	1160(77)
	One child	140(9)
	More than one child	197(13)
Educational level		
	Tertiary	655(44)
	Secondary	720(48)
	Primary	122(8)
Household income		
	> CHF 9'000	486(34)
	CHF>6'000- 9'000	382(27)
	CHF>3'000- 6'000	442(31)
	CHF≤ 3'000	117(8)

Employment status		
	Retired	740(51)
	Outside the labour force	84(6)
	Self employed	86(6)
	Employed	549(38)
Body Mass Index		
	<18.5	41(3)
	18.5 – 24.9	730(49)
	25-29.9	508(34)
	≥ 30	206(14)
Comorbidity score		
	0	789(53)
	1	466(31)
	≥2	243(16)
Smoking		
	Non-smoker	1269(85)
	Smoker	230(15)
Physical distancing during previous 7 days		
	Frequently	1355(90)
	Occasionally/rarely	144(10)
Staying at home during previous 7 days		
	Frequently	927(62)
	Occasionally/rarely	572(38)
Wearing mask during previous 7 days		
	Frequently	1227(82)
	Occasionally/rarely	271(18)
Hygiene measures during previous 7 days		
	Frequently	1437(96)
	Occasionally/rarely	61(4)
Saint Gallen		
Sex		
	Female	312 (55)
	Male	255(45)
Age		
	≥ 65	NA
	20-64	569(100)
Children in the household		
	No children	362(64)
	One child	75(13)
	More than one child	128(23)
Educational level		
	Tertiary	258(46)
	Secondary	280(50)
	Primary	25(4)
Household income		
	> CHF 9'000	170(33)
	CHF>6'000- 9'000	143(28)
	CHF>3'000- 6'000	150(29)
	CHF≤ 3'000	48(9)
Employment status		
	Retired	15(3)
	Outside the labour force	54(10)
	Self employed	9(48)

	Employed	438(79)
Body Mass Index		
	<18.5	14(2)
	18.5 – 24.9	308(55)
	25-29.9	191(34)
	≥ 30	50(9)
Comorbidity score		
	0	362(64)
	1	165(29)
	≥2	39(7)
Smoking		
	Non-smoker	460(81)
	Smoker	106(19)
Physical distancing during previous 7 days		
	Frequently	491(87)
	Occasionally/rarely	73(13)
Staying at home during previous 7 days		
	Frequently	351(62)
	Occasionally/rarely	212(38)
Wearing mask during previous 7 days		
	Frequently	492(87)
	Occasionally/rarely	74(13)
Hygiene measures during previous 7 days		
	Frequently	508(90)
	Occasionally/rarely	58(10)
Ticino		
Sex		
	Female	592(56)
	Male	468(44)
Age		
	≥ 65	421(40)
	20-64	641(60)
Children in the household		
	No children	818(78)
	One child	110(11)
	More than one child	118(11)
Educational level		
	Tertiary	361(34)
	Secondary	613(58)
	Primary	74(7)
Household income		
	> CHF 9'000	274(33)
	CHF>6'000- 9'000	252(30)
	CHF>3'000- 6'000	253(30)
	CHF≤ 3'000	62(7)
Employment status		
	Retired	43(4)
	Outside the labour force	491(50)
	Self employed	426(43)
	Employed	27(3)
Body Mass Index		
	<18.5	29(3)
	18.5 – 24.9	548(52)

	25-29.9	357(34)
	≥ 30	112(11)
Comorbidity score		
	0	578(56)
	1	339(33)
	≥2	121(12)
Smoking		
	Non-smoker	858(82)
	Smoker	192(18)
Physical distancing during previous 7 days		
	Frequently	NA
	Occasionally/rarely	NA
Staying at home during previous 7 days		
	Frequently	NA
	Occasionally/rarely	NA
Wearing mask during previous 7 days		
	Frequently	NA
	Occasionally/rarely	NA
Hygiene measures during previous 7 days		
	Frequently	NA
	Occasionally/rarely	NA
Vaud		
Sex		
	Female	704(52)
	Male	658(48)
Age		
	≥ 65	599(44)
	20-64	763(56)
Children in the household		
	No children	1009(74)
	One child	152(11)
	More than one child	196(14)
Educational level		
	Tertiary	493(49)
	Secondary	439(43)
	Primary	84(8)
Household income		
	> CHF 9'000	324(38)
	CHF>6'000- 9'000	255(28)
	CHF>3'000- 6'000	199(23)
	CHF≤ 3'000	78(9)
Employment status		
	Retired	587(44)
	Outside the labour force	114(9)
	Self employed	90(7)
	Employed	531(40)
Body Mass Index		
	<18.5	42(3)
	18.5 – 24.9	696(52)
	25-29.9	442(33)
	≥ 30	169(13)
Comorbidity score		
	0	491(52)

	1	288(30)
	≥2	169(18)
Smoking		
	Non-smoker	796(84)
	Smoker	153(16)
Physical distancing during previous 7 days		
	Frequently	1292(97)
	Occasionally/rarely	45(3)
Staying at home during previous 7 days		
	Frequently	757(80)
	Occasionally/rarely	186(20)
Wearing mask during previous 7 days		
	Frequently	929(79)
	Occasionally/rarely	251(21)
Hygiene measures during previous 7 days		
	Frequently	1324(98)
	Occasionally/rarely	28(2)
Zurich		
Sex		
	Female	1101(50)
	Male	1104(50)
Age		
	≥ 65	1138(52)
	20-64	1067(48)
Children in the household		
	No children	1784(82)
	One child	170(8)
	More than one child	225(10)
Educational level		
	Tertiary	1060(49)
	Secondary	1010(46)
	Primary	108(5)
Household income		
	> CHF 9'000	732(36)
	CHF>6'000- 9'000	517(26)
	CHF>3'000- 6'000	558(28)
	CHF≤ 3'000	215(11)
Employment status		
	Retired	1082(50)
	Outside the labour force	103(5)
	Self employed	161(7)
	Employed	816(38)
Body Mass Index		
	<18.5	50(2)
	18.5 – 24.9	1157(54)
	25-29.9	713(33)
	≥ 30	229(11)
Comorbidity score		
	0	1019(47)
	1	766(35)
	≥2	397(18)
Smoking		
	Non-smoker	1860(85)

	Smoker	334(15)
Physical distancing during previous 7 days		
	Frequently	1977(90)
	Occasionally/rarely	216(10)
Staying at home during previous 7 days		
	Frequently	1492(68)
	Occasionally/rarely	697(32)
Wearing mask during previous 7 days		
	Frequently	1599(73)
	Occasionally/rarely	589(27)
Hygiene measures during previous 7 days		
	Frequently	2036(93)
	Occasionally/rarely	151(7)

Note: NA=not available; preventive behaviors data from Ticino and data from Vaud period 1 were not reported because not harmonizable with data from other sites

Table S3: Weighted seroprevalence (IgG antispike) by study period, stratified by sex and age, Corona Immunitas study, Switzerland, May 2020 – September 2021

	Period 1 (01/05/2020-31/10/2020)	Period 2 (01/11/2020- 15/05/2021)	Period 3 (16/05/2021-31/09/2021)
	% (95%CI)	% (95%CI)	% (95%CI)
National level			
20-64	4.1(2.5-5.5)	15.8(13.9-17.4)	65.9(63.8-68.1)
+65	2.3(0.7-3.9)	17.1(15.0-19.0)	92.0(90.2-94.2)
F	3.7(2.1-5.1)	15.6(13.6-17.3)	71.6(69.3-73.9)
M	3.8(1.9-5.3)	16.7(14.6-18.5)	72.5(70.1-74.9)
Basel-Landschaft			
20-64	3.1(1.3-5.8)	12.8(9.5-16.6)	79.4(73.2-84.9)
+65	2.2(0.4-7.2)	26.3(19.8-33.3)	92.0(85.7-96.5)
F	3.6(1.4-7.3)	14.8(10.9-19.2)	80.0(73.3-85.7)
M	2.0 (0.5-5.1)	18.3(13.8-23.4)	85.9(78.8-91.8)
Basel-Stadt			
20-64	4.7(2.4-7.8)	14.0(10.4-17.9)	71.6(65.9-77.2)
+65	5.4(1.6-11.7)	37.8(30.0-45.8)	95.2(89.9-98.2)
F	5.4(2.7-9.0)	20.1(15.8-24.7)	77.8(71.8-83.2)
M	4.3(1.5-8.4)	19.2(14.2-24.7)	76.6(69.8-82.9)
Bern			
20-64	NA	11.1(6.9-15.8)	74.5(69.4-79.4)
+65	NA	10.2(5.9-15.4)	88.7(84.3-92.5)
F	NA	12.2(7.9-17.8)	79.6(74.5-84.4)
M	NA	9.1(5.2-14.1)	76.8(71.0-82.0)
Fribourg			
20-64	6.5(3.5-10.5)	19.4(15.0-24.2)	69.2(62.9-75.0)
+65	3.0(0.9-6.4)	34.5(28.5-40.7)	90.5(85.8-94.2)
F	5.5(2.8-9.4)	21.8(17.1-26.8)	71.6(65.7-77.3)
M	6.0(2.5-11.1)	23.2(18.1-29.1)	75.4(67.7-82.5)
Grisons [a]			
F	NA	13.4(8.5-19.3)	43.0(35.2-51.0)
M	NA	17.8(11.9-24.8)	43.4(34.8-52.3)
Lucerne			
20-64	NA	15.9(11.3-21.0)	49.6(43.9-55.6)
+65	NA	14.0(9.2-19.8)	91.0(87.2-94.4)
F	NA	16.8(11.6-22.5)	58.5(53.0-64.4)
M	NA	14.1(9.3-19.6)	59.2(52.4-66.3)
Neuchâtel			
20-64	3.3(1.4-6.1)	19.7(15.3-24.8)	74.8(69.3-80.0)
+65	2.0(0.4-5.1)	17.2(12.6-22.2)	92.9(89.0-96.2)
F	4.1(1.8-7.5)	17.8(13.3-22.9)	76.6(71.0-81.9)
M	1.7(0.4-4.6)	20.4(15.3-26.1)	82.1(75.4-87.6)
Saint Gallen [a]			
F	NA	12.8(7.6-19.2)	62.2(54.6-69.5)
M	NA	10.4(5.5-17.0)	62.5(54.-70.3)
Ticino [b]			
F	7.9(5.2-11.3)	7.6(4.3-11.6)	NA
M	7.4(4.2-11.2)	5.8(2.6-10.0)	NA
Vaud			
20-64	6.7(4.1-9.7)	25.2(21.3-29.3)	NA

+65	6.8(4.2-9.8)	17.9(13.9-22.0)	NA
F	7.6(4.3-11.6)	23.5(19.5-27.8)	NA
M	5.8(2.6-10.0)	23.7(19.3-28.5)	NA
Zurich			
20-64	2.2(1.0-3.9)	9.5(6.1-13.7)	74.7(69.4-79.5))
+65	1.7(0.4-3.6)	10.0(6.8-13.5)	92.2(89.3-95.8)
F	2.2(1.0-4.0)	8.9(5.7-12.9)	76.7(71.4-81.8)
M	2.0(0.5-4.1)	10.4(6.6-15.0)	80.4(74.7-85.7)

Note: F= Females, M= Males

[a] In cantons Grisons and Saint Gallen, only participants aged from 20 to 64 years were tested

[b] In canton Ticino, during period 1, only participants aged from 20 to 64 were tested. During period 2 only people aged 65 years and over were tested

Table S4: Missing data for sociodemographic, socioeconomic and health status variables by study period (objective 2), Corona Immunitas study, Switzerland, May 2020 – September 2021

	Period 1 n=3108	Period 2 n=4969	Period 3 n=2836
Sociodemographic characteristics	n (%)	n (%)	n (%)
Sex	4 (0)	3 (0)	3 (0)
Age group	0 (0)	1 (0)	0 (0)
Children in the household	29 (1)	50 (1)	20 (1)
Socioeconomic characteristics			
Educational level	294 (9)	40 (1)	7 (0)
Household Income	575 (19)	396 (8)	169 (6)
Employment status	119 (4)	91 (2)	45 (2)
Health status			
Body Mass Index	47 (2)	78 (2)	35 (1)
Comorbiditiy score	335 (11)	53 (1)	2 (0)
Smoking	328 (11)	25 (1)	0 (0)

Table S5: Missing data for preventive behaviours variables by study period (objective 2), Corona Immunitas study, Switzerland, May 2020 – September 2021

	Period 1 n=2151	Period 2 n=4969	Period 3 n=2836
Preventive behaviours	n (%)	n (%)	n (%)
Physical distancing during previous 7 days	6 (0)	267 (5)	5 (0)
Staying at home during previous 7 days	9 (0)	267 (5)	6 (0)
Wearing mask during previous 7 days	10 (0)	270 (5)	8 (0)
Hygiene measures during previous 7 days	14 (1)	264 (5)	6 (0)

Table S6: percentages of vaccinated participants (period 3, objective 2), Corona Immunitas study, Switzerland

	N	Vaccinated
Sociodemographic factors		
Sex	2826	69%
Female		68%
Male		71%
Age groups	2829	69%
≥ 65		91%
20-64		59%
Children in the household	2809	69%
No children		74%
One child		58%
More than one child		52%
Socioeconomic characteristics		
Educational level	2822	69%
Tertiary		74%
Secondary		66%
Primary		61%
Income	2663	69%
> CHF 9'000		77%
CHF>6'000- 9'000		68%
CHF>3'000- 6'000		65%
CHF≤ 3'000		57%
Employment status	2784	69%
Retired		91%
Outside the labour force[b]		54%
Self employed		55%
Employed		60%
Health status		
Body Mass Index	2795	69%
18.5 – 24.9		63%
<18.5		67%
25-29.9		72%
≥ 30		74%
Comorbiditiy score[c]	2827	69%
0		63%
1		73%
≥2		86%
Smoking	2829	69%
Non-smoker		71%
Smoker		59%
Preventive behaviors		
Physical distancing during previous 7 days	2824	69%
Frequently		73%
Occasionally		52%
Rarely		47%
Staying at home during previous 7 days[a]	2823	69%
Frequently		75%
Occasionally		64%
Rarely		58%
Wearing mask during previous 7 days	2821	69%
Frequently		72%
Occasionally		51%

Rarely		31%
Hygiene measures during previous 7 days	2823	69%
Frequently		72%
Occasionally		45%
Rarely		52%

Note: for this table, the third answer option to the vaccination status question ("I don't want to answer") was excluded

[a] International Standard Classification of Education (ISCED)

[b] Outside the labour force includes participants in training/studying and not employed participants

[c] Comorbidity score goes from 0 to ≥2 and was calculated using the following possible answers: cancer; immunological diseases; cardiovascular diseases or diabetes or hypertension; respiratory diseases; allergies

Sensitivity analysis

Sensitivity analyses including participants who had completed the baseline questionnaire more than 60 days before and after their blood sampling gave similar results as the main analyses (Tables S7-S8). Including a third age category (20-34 years; Table S9), we found a higher prevalence of seropositivity in people aged 20-34 compared to older people (PR= 2.87, 95% CI 1.23-6.71) during period 1 and a lower prevalence of seropositivity during period 3 (PR= 0.64, 95% CI 0.57-0.63). This last difference tended however to disappear after adjustment for vaccination status. We re-ran the models using a preventive behaviour score (Table S10). The lower the adherence to preventive behaviours, the lower the prevalence of seropositivity in period 3 (PR in people who rarely/occasionally adhered to all preventive behaviours VS people who frequently adhered to all of them = 0.64, 95% CI 0.50-0.81) . These differences disappeared upon adjustment for vaccination status.

Table S7: Association of sociodemographic, socioeconomic factors and health status with SARS-CoV-2 seropositivity across study periods; sensitivity analysis including participants who replied to the questionnaire more than 60 days before and after their blood sample, Corona Immunitas study, Switzerland, May 2020 – September 2021

Factor	Period 1, n=3280 (01/05/2020-31/10/2020)	Period 2, n=5248 (01/11/2020-15/05/2021)	Period 3[b], n=2840 (16/05/2021-31/09/2021)	
	Model 1 [a], PR (95% CI)	Model 1 [a], PR (95% CI)	Model 1[a], PR (95% CI)	Model 2 [b], PR (95% CI)
Sex				
Female	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Male	1.16 (0.84 - 1.61)	1.04 (0.92 - 1.19)	0.93 (0.89 – 0.98)	0.97 (0.94 - 1.00)
Age groups				
≥ 65	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
20-64	2.12 (0.99 - 4.60)	1.18 (0.94 -1.49)	0.85 (0.78-0.93)	0.94 (0.89 - 0.99)
Children in the household				
No children	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
One child	0.67 (0.38 – 1.16)	1.21 (0.98 - 1.50)	0.90 (0.81 – 1.00)	0.97 (0.90 - 1.04)
More than one child	1.06 (0.69 - 1.63)	1.12 (0.92 - 1.36)	0.92 (0.85 -1.00)	1.06 (0.99 - 1.12)
Educational level				
Tertiary	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Secondary	1.67 (1.17 - 2.38)	0.86 (0.75 - 0.98)	0.95 (0.91 – 0.99)	1.01 (0.98 - 1.04)
Primary	1.41 (0.53 - 3.73)	1.13 (0.87 - 1.46)	0.92 (0.82 - 1.03)	1.01 (0.93 - 1.10)
Household income				
> CHF 9'000	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
CHF 6'000 - 9'000	0.66 (0.41 - 1.04)	1.04 (0.88 - 1.23)	0.88 (0.83 – 0.93)	0.99 (0.95 - 1.03)
CHF 3'000 - 6'000	0.80 (0.50 - 1.30)	1.23 (1.03 - 1.47)	0.83 (0.78 - 0.88)	0.97 (0.94 - 1.01)
< CHF 3'000	0.75 (0.36 - 1.55)	0.91 (0.69 - 1.20)	0.75 (0.68 - 0.82)	0.94 (0.89 - 1.00)
Employment status				
Retired	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Outside the labour force[c]	1.07 (0.46 – 2.51)	0.67 (0.53 – 0.85)	0.84 (0.72 – 0.97)	1.00 (0.90 – 1.10)
Self employed	1.15 (0.54 - 2.45)	0.70 (0.51 - 0.97)	0.78 (0.70 - 0.88)	0.98 (0.90 - 1.06)
Employed	0.63 (0.29 - 1.37)	0.83 (0.65 - 1.07)	0.84 (0.77 - 0.93)	1.00 (0.95 - 1.06)
Body Mass Index				
18.5 – 24.9	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
<18.5	0.68 (0.22 - 2.13)	1.05 (0.70 - 1.58)	0.99(0.86 - 1.14)	1.04 (0.93 - 1.16)

25 – 29.9	0.78 (0.54 - 1.13)	1.12 (0.97 - 1.29)	1.08(1.03 - 1.13)	1.04 (1.00 - 1.07)
≥ 30	0.70 (0.42 - 1.18)	1.16 (0.95 - 1.40)	1.12(1.04 - 1.19)	1.04 (1.00 - 1.09)
Comorbiditiy score[d]				
0	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
1	1.11 (0.76 - 1.63)	0.94 (0.82 - 1.09)	1.08(1.03 - 1.13)	1.01 (0.98 - 1.04)
≥2	1.14 (0.68 - 1.93)	1.22 (1.03 - 1.45)	1.12(1.06 - 1.18)	1.00 (0.97 - 1.03)
Smoking habit				
Non-smoker	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Smoker	0.77 (0.48 - 1.22)	0.83 (0.68 - 1.00)	0.93 (0.86 - 1.00)	0.97 (0.92 - 1.01)

[a] Model adjusted for: sex, age, educational level, body mass index, income, employment status, children in the household, comorbidity score and smoking habit

[b] Model additionally adjusted for vaccination status

[c] Outside the labour force includes participants in training/studying and not employed participants

[d] Comorbidity score goes from 0 to >2 and was calculated using the following possible answers: cancer; immunological diseases; cardiovascular diseases or diabetes or hypertension; respiratory diseases; allergies

Table S8: Association of recommended preventive behaviours with SARS-CoV-2 seropositivity across study periods, sensitivity analysis including participants who reply to the questionnaire more than 60 days before and after their blood sample, Corona Immunitas study, Switzerland, May 2020 – September 2021

Factor	Period 1, n=2318 (01/05/2020-31/10/2020)	Period 2, n=5248 (01/11/2020-15/05/2021)	Period 3, n=2839 (16/05/2021-31/09/2021)	
	Model 1 [a], PR (95% CI)	Model 1 [a], PR (95% CI)	Model 1 [a], PR (95% CI)	Model 2 [b], PR (95% CI)
Physical distancing during previous 7 days				
Frequently	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Occasionally/rarely	1.23 (0.62 - 2.44)	1.54 (1.21 - 1.97)	0.81 (0.75 - 0.88)	0.97 (0.92-1.02)
Staying at home during previous 7 days				
Frequently	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Occasionally/rarely	1.60 (0.99 - 2.55)	1.16 (1.00 - 1.36)	0.94 (0.90 - 0.98)	1.02 (0.99-1.5)
Wearing mask during previous 7 days				
Frequently	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Occasionally/rarely	0.76 (0.48 - 1.20)	1.03 (0.76 - 1.38)	0.76 (0.70 - 0.84)	0.96 (0.91-1.02)
Hygiene measures during previous 7 days				
Frequently	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Occasionally/rarely	1.14(0.43 - 3.04)	0.97 (0.70 - 1.35)	0.79 (0.72 - 0 .87)	1.01 (0.94-1.08)

Note: data from Ticino period 1 and data from Vaud period 1 were not included because not harmonizable with data from other sites

[a] Model adjusted for sex, age, educational level, body mass index, income, employment status, children in the household, comorbidity score and smoking habit

[b] Model additionally adjusted for vaccination status

Table S9: Sensitivity analysis including 20-34 age category, Corona Immunitas study, Switzerland, May 2020 – September 2021

Factor	Period 1, n=3108 (01/05/2020-31/10/2020)	Period 2, n=4969 (01/11/2020-15/05/2021)	Period 3[b], n=2836 (16/05/2021-31/09/2021)	
	Model 1 [a], PR (95% CI)	Model 1 [a], PR (95% CI)	Model 1 [a], PR (95% CI)	Model 2 [b], PR (95% CI)
Age groups				
≥ 65	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
35-64	2.04 (0.92 - 4.48)	1.13 (0.89 - 1.44)	0.87 (0.80-0.94)	0.94 (0.89 - 0.99)
20-34	2.87 (1.23 - 6.71)	1.60 (1.20 - 2.12)	0.64 (0.57-0.73)	0.88 (0.81-0.96)

[a] Model adjusted for: sex, age, educational level, body mass index, income, employment status, children in the household, comorbidities and smoking habit

[b] Model additionally adjusted for vaccination status

Table S10: Sensitivity analysis including preventive behaviours score, Corona Immunitas study, Switzerland, May 2020 – September 2021

Factor	Period 1, n=2151 (01/05/2020-31/10/2020)	Period 2, n=4969 (01/11/2020-15/05/2021)	Period 3[b], n=2836 (16/05/2021-31/09/2021)	
	Model 1 [a], PR (95%)	Model 1 [a], PR (95%)	Model 1 [a], PR (95%)	Model 2 [b], PR (95%)
Preventive behaviours score[c]				
0	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
1	0.77 (0.44 – 1.36)	1.15 (0.99 – 1.35)	0.99 (0.94 – 1.03)	1.02 (0.99 – 1.05)
2	0.82 (0.42 - 1.61)	1.07 (0.76 – 1.50)	0.92 (0.85 – 1.00)	1.01 (0.95- 1.06)
3	1.07 (0.40 – 2.82)	1.23 (0.68 – 2.20)	0.69 (0.59 – 0.81)	0.96 (0.87 – 1.07)
4	1.77 (0.45 – 7.01)	1.61 (0.73 – 3.54)	0.64 (0.50 – 0.81)	0.99 (0.85 – 1.17)

[a] Model adjusted for: sex, age, educational level, body mass index, income, employment status, children in the household, comorbidities and smoking habit

[b] Model additionally adjusted for vaccination status

[c] Preventive behaviours score goes from 0 to 4; a score=0 means that participants frequently adhered to all the preventive behaviours, a score=4 means that participants occasionally/rarely adhered to all the preventive behaviours