

# Corona Immunitas: a nationwide program of antibody studies of SARS-CoV-2 in the Swiss population

<b>Submission date</b> 09/07/2020	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 13/07/2020	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 29/08/2023	<b>Condition category</b> Infections and Infestations	<input checked="" type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

The increasing number of persons diagnosed with a SARS-CoV-2 infection in February and March 2020 and the subsequent Swiss Federal Council's measures had major implications for public life and for the economy. For guidance after these measures have lifted and for future policy decisions on how to minimize the disease and societal burden of SARS-CoV-2 reliable epidemiological data is needed. The knowledge of the nation-wide prevalence of SARS-CoV-2 infection at the level of the population, in different geographical areas and of specific age groups is required. This knowledge will also help prepare future outbreak responses and is important to inform future vaccination strategies.

In a number of Swiss Cantons, studies on the seroprevalence of SARS-CoV-2 antibodies and the extent and duration of immunity are planned or have already started. The interest for such epidemiological studies comes from both Cantonal authorities and scientists who want to learn about the seroprevalence of SARS-CoV-2 antibodies, both in the general population (across age ranges) and in specific groups of persons (e.g. nursing home residents, working in specific sectors of economy, from citizens, etc.).

The scientists of the Swiss School of Public Health (SSPH+) have agreed to coordinate their effort in order to make their data as comparable as possible, to create synergies and reduce redundancies. The goal is to make the studies informative for policy makers on the national and Cantonal level while fully respecting the autonomy of the Cantons and scientists involved. SSPH+ is committed to shed light on the extent of the spread of SARS-CoV-2, as quickly as possible, in Switzerland, and has launched an initiative with the aim of acquiring funding from public and private sources (<https://www.corona-immunitas.ch/>).

The aim of this study is to determine the extent and nature of infection with SARS-CoV-2 in the general population and in specific subgroup in different Cantons of Switzerland, after the first major wave and in further epidemic phases of SARS-CoV-2, and to contribute to consistent estimates in the Swiss population.

### Who can participate?

All persons who are invited to participate in the study (randomly selected participants from the general population and specific sub-populations).

### What does the study involve?

Study participation includes 1) the completion of the baseline questionnaire; 2) the collection of a peripheral blood sample by venipuncture for determination of SARS-CoV-2 antibodies at a study center, a mobile unit or the participant's home; and 3) the invitation to fill-in a weekly and monthly digital follow-up questionnaire for the next 6 to 12 months.

Specific sub-populations of participants will be re-invited for repeated blood collection for SARS-CoV-2 antibody tests, where the same procedures will be used.

### What are the possible benefits and risks of participation?

The primary benefit of the study is indirect. The evaluation of the SARS-Cov-2 seroprevalence in the general population and specific subgroups is essential to understand what phase of the epidemic we are currently in, to be able to make predictions for the continuation of the epidemic and to put in place adequate public health measures. It will also provide information on the proportion of oligo- and asymptomatic cases. The publication of these results as open access will be useful to the entire international scientific community as well as other stakeholders including guideline developers, policy makers and physicians.

The risk associated with the collection of blood samples is very low. Possible complications are minor and include a hematoma at the puncture site, infection, or vagal discomfort during blood collection. All safety measures will be taken to prevent these complications from occurring by adopting standard collection rules and working with registered nurses. There is also a risk of SARS-CoV-2 infection on the way from participants' homes to the study centers and during contact at the study site. We have tried to minimize this risk; during all interactions, study staff will follow current standard hygiene procedures (hand washing and disinfection procedures, wearing masks and gloves) and participants will wear a mask, provided by the study staff. The mobile investigation teams who travel to conduct the study visit at the participants' home will follow the same procedures.

### Where is the study run from?

Swiss School of Public Health (SSPH+), an inter-university faculty that unites twelve Swiss universities, coordinates nationwide the seroprevalence studies. The responsible study centers in the participating Swiss Cantons run the studies.

### When is the study starting and how long is it expected to run for?

March 2020 to April 2023

### Who is funding the study?

Corona Immunitas is funded by several sources: All: by fundraising of SSPH+ that includes funds of the Federal Office of Public Health and private funders (foundations, companies and private donations; ethical guidelines for funding stated by SSPH+ will be respected); center specific by funds of the Cantons, by institutional funds of the Universities and by other center-specific sources.

### Who is the main contact?

Prof. Dr. med. et phil. Milo A. Puhan, [miloalan.puhan@uzh.ch](mailto:miloalan.puhan@uzh.ch)

## Contact information

**Type(s)**

Scientific

**Contact name**

Prof Milo Puhan

**ORCID ID**

<https://orcid.org/0000-0003-4721-1879>

**Contact details**

Epidemiology, Biostatistics and Prevention Institute  
University of Zurich  
Hirschengraben 84  
Zurich  
Switzerland  
8001  
+41 44 634 46 10  
miloalan.puhan@uzh.ch

**Type(s)**

Public

**Contact name**

Prof Jan Fehr

**ORCID ID**

<https://orcid.org/0000-0003-1113-9895>

**Contact details**

Epidemiology, Biostatistics and Prevention Institute  
University of Zurich  
Hirschengraben 84  
Zurich  
Switzerland  
8001  
+41 44 634 46 79  
jan.fehr@uzh.ch

**Type(s)**

Scientific

**Contact name**

Dr Anja Frei

**ORCID ID**

<https://orcid.org/0000-0002-7134-1000>

**Contact details**

Epidemiology, Biostatistics and Prevention Institute  
University of Zurich

Hirschengraben 84  
Zurich  
Switzerland  
8001  
+41 44 634 43 60  
anja.frei@uzh.ch

## **Additional identifiers**

## **Study information**

### **Scientific Title**

Seroprevalence of SARS-CoV-2 antibodies and development of immunity in the Swiss population – Multicenter population-based observational studies to inform policy making

### **Acronym**

Corona Immunitas

### **Study objectives**

The main goal of the Corona Immunitas research program is to determine the extent and nature of infection with SARS-CoV-2 in all regions of Switzerland in a highly consistent and comprehensive way in the general Swiss population as well as particularly exposed and vulnerable groups. Specific aims are to: 1) quantify the number of individuals infected with SARS-CoV-2 in the population with or without symptoms at several points in time; 2) compare the seroprevalence between the general population and specific subpopulations; 3) investigate the nature and extent of immunity after infection; 4) assess the association between participant characteristics and behaviors with infection; and 5) quantify the impact of the pandemic on mental and physical health. Most importantly, this evidence-based program aims to provide policy-makers and other decision makers with important evidence for deciding which public health and setting-specific measures to implement or lift for the general population and specific subpopulations at different points in time.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Approved 28/05/2020, Cantonal Ethics Committee Zurich (Stampfenbachstrasse 121, CH-8090 Zurich, Switzerland; +41 43 259 79 70; Info.KEK@kek.zh.ch), ref: 2020-01247

### **Study design**

Cross-sectional and longitudinal studies in the general population and in specific subpopulations with serological testing at baseline and a digital-only or combined digital and serological follow-up

### **Primary study design**

Observational

### **Study type(s)**

Diagnostic

## **Health condition(s) or problem(s) studied**

SARS-CoV2 infection (COVID-19)

## **Interventions**

Potential participants are either randomly selected from the general population or selected from specific sub-population settings. The process of enrollment is organized by each study center and for each population individually. Generally, potential participants are informed and invited to participate in the study by postal mail or email and asked to schedule an appointment for a study visit either at a study center, at a mobile unit (bus) or at their home (vulnerable persons). Before the study visit, participants are provided with the link to an online baseline questionnaire asking demographic questions, symptoms, other tests taken for SARS-CoV-2, preventative measure behaviors and quality of life measures.

After providing informed consent, the study visit is conducted by trained study personnel. The expected duration of the visit is 20-30 minutes in total and data is assessed in three stages:

1. Study staff checks the completeness of the baseline questionnaire and, if incomplete, advises the participant to complete it on a computer, tablet or on paper/pencil.
2. Trained health care staff collects a peripheral blood sample by venipuncture for the determination of SARS-CoV-2 antibodies (quantity varies according to study site). The participants are explained orally and by a leaflet how to interpret a positive serological test result (probability that result is inaccurate) and are instructed to keep on following the recommendations of the public health authorities, regardless of their individual test result. The entire sequence from blood withdrawal to storage and testing follows a Standardized Operating Procedure.
3. Participants are invited to fill in a weekly and monthly digital follow-up questionnaire for the next 6 to 12 months, capturing health status, symptoms and behaviors over time.

Specific groups of participants will be re-invited for repeated blood collection for SARS-CoV-2 antibody testing, once or several times.

## **Intervention Type**

Other

## **Primary outcome(s)**

Seroprevalence of SARS-CoV-2 antibodies measured using peripheral blood sample by venipuncture in the general population and in specific subpopulations at repeated time points during the epidemic in Switzerland

## **Key secondary outcome(s)**

1. Presence of symptoms suggestive of a common cold, influenza and similar upper respiratory tract infections prior to the first study visit. Measured by baseline questionnaire (at baseline)
2. Potential risk factors and preventive measures for SARS-CoV-2 infection (exposure, socio-economic factors, adherence to general hygiene and physical distancing rules, utilization of mask and gloves). Measured by baseline questionnaire (at baseline)
3. Incidence of self-reported symptoms and SARS-CoV-2 infections after the first study visit in initially seropositive individuals (extent and duration of immunity after infection with SARS-CoV-2). Measured by digital follow-up questionnaire (weekly)
4. Proportion of seronegative individuals of the first investigation wave who will self-report symptoms and infection with SARS-CoV-2. Measured by digital follow-up questionnaire (weekly)
5. Course over time in access to health care, health care renunciation, going outside (frequency, reason, physical activity), preventive measures with respect to COVID-19. Measured by digital

follow-up questionnaire (weekly and monthly)

6. Course over time in mental well-being, specifically stress, anxiety and depression. Measured by digital follow-up questionnaire (monthly)

**Completion date**

31/03/2023

## Eligibility

**Key inclusion criteria**

1. No acute SARS-CoV-2 infection: no presence of symptoms for at least 48 hours
2. In case of a SARS-CoV-2 infection verified by a RT-PCR test, the earliest inclusion is 21 days after the test date

**Participant type(s)**

All

**Healthy volunteers allowed**

No

**Age group**

All

**Sex**

Not Specified

**Total final enrolment**

28000

**Key exclusion criteria**

1. No informed consent
2. Suspicion of acute COVID-19 infection

**Date of first enrolment**

01/04/2020

**Date of final enrolment**

31/12/2022

## Locations

**Countries of recruitment**

Switzerland

**Study participating centre**

University of Zurich

Epidemiology, Biostatistics and Prevention Institute  
Hirschengraben 84

Zurich  
Switzerland  
8001

**Study participating centre**  
**University of Fribourg**  
Population Health Laboratory  
Department of Community Health  
Faculty of Science and Medicine  
Route des Arsenaux 41  
Fribourg  
Switzerland  
1700

**Study participating centre**  
**Università della Svizzera Italiana**  
Institute of Public Health  
Via G. Buffi 13  
Lugano  
Switzerland  
6900

**Study participating centre**  
**Unisanté Lausanne**  
Department of Health and Social Action  
Avenue des Casernes 2  
Lausanne  
Switzerland  
1014

**Study participating centre**  
**Geneva University Hospitals**  
Division of Primary Care  
Rue Gabrielle-Perret-Gentil 4  
Geneva  
Switzerland  
1205

**Study participating centre**  
**Swiss Tropical and Public Health Institute**  
Department of Epidemiology and Public Health

Socinstrasse 57  
Basel  
Switzerland  
4051

**Study participating centre**  
**Service cantonal de la Santé Publique de Neuchâtel**  
Beaux-Arts 13  
Neuchâtel  
Switzerland  
2000

**Study participating centre**  
**Zürcher Hochschule für Angewandte Wissenschaften (ZHAW)**  
Departement Gesundheit  
Forschungsstelle Gesundheitswissenschaften  
Katharina-Sulzer-Platz 9  
Winterthur  
Switzerland  
8400

**Study participating centre**  
**Kantonsspital St. Gallen**  
Klinik für Infektiologie und Spitalhygiene  
Rorschacherstrasse 95  
St. Gallen  
Switzerland  
9007

**Study participating centre**  
**Kantonsspital Graubünden**  
Loestrasse 170  
Chur  
Switzerland  
7000

**Study participating centre**  
**Universität Bern**  
Berner Institut für Hausarztmedizin  
Mittelstrasse 43  
Bern

Switzerland  
3012

**Study participating centre**  
**University of Fribourg**  
Institute of Family Medicine  
Route des Arsenaux 41  
Fribourg  
Switzerland  
1700

**Study participating centre**  
**University of Lucerne**  
Department of Health Sciences and Medicine  
Frohburgstrasse 3  
Luzern  
Switzerland  
6002

**Study participating centre**  
**Observatoire valaisan de la santé**  
Av. Grand-Champsec 64  
Sion  
Switzerland  
1950

## **Sponsor information**

**Organisation**  
Swiss School of Public Health

**ROR**  
<https://ror.org/01czqbr06>

## **Funder(s)**

**Funder type**  
Government

## Funder Name

Fundraising of SSPH+ that includes funds of the Bundesamt für Gesundheit (Federal Office of Public Health, Switzerland)

## Funder Name

Fundraising of SSPH+ that includes funds of private funders (ethical guidelines for funding stated by SSPH+ are respected)

## Funder Name

Center specific: Institutional funds and funds provided by the Cantons (public funds)

# Results and Publications

## Individual participant data (IPD) sharing plan

The de-identified individual participant data generated during the current study are available upon request. Data access guidelines, database documentation and description are provided in Zenodo:

1. Corona Immunitas Phases 1 to 4 - Central Database: <https://zenodo.org/record/7520050>
2. Corona Immunitas Phases 5 and 6 - Central Database: <https://zenodo.org/record/7520125>

## IPD sharing plan summary

Stored in publicly available repository

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	early results	01/08/2020	09/07/2020	Yes	No
<a href="#">Results article</a>	Seroprevalence and attitudes of care home and in-home care staff	16/03/2022	18/03/2022	Yes	No
<a href="#">Results article</a>	Results from the Swiss national seroprevalence study Corona Immunitas	20/06/2022	21/06/2022	Yes	No
<a href="#">Results article</a>	Association of plasma zinc levels with anti-SARS-CoV-2 IgG and IgA seropositivity in the general population: A case-control study	18/04/2023	03/05/2023	Yes	No
<a href="#">Results article</a>	Recovery and symptom trajectories up to 2 years after SARS-CoV-2 infection	31/05/2023	01/06/2023	Yes	No
<a href="#">Results article</a>	Association between serologically confirmed COVID-19 infection and cognitive functioning in community dwelling older adults	21/03/2023	29/08/2023	Yes	No
<a href="#">Results article</a>	Changes in socioeconomic resources and mental health after the second COVID-19 wave	23/03/2023	29/08/2023	Yes	No
<a href="#">Results article</a>	Functional immunity against SARS-CoV-2 in the general population after a booster campaign and the Delta and Omicron waves	01/08/2022	29/08/2023	Yes	No

<a href="#">Results article</a>	Impact of screen time and green time on mental health in children and adolescents during the COVID-19 pandemic	01/08 /2022	29/08 /2023	Yes	No
<a href="#">Results article</a>	Longitudinal humoral and cell-mediated immune responses	01/08 /2023	29/08 /2023	Yes	No
<a href="#">Results article</a>	Prevalence and association of frailty with SARS-CoV-2 infection in older adults	12/01 /2023	29/08 /2023	Yes	No
<a href="#">Results article</a>	SARS-CoV-2 infection among employees working from home and on site	16/09 /2022	29/08 /2023	Yes	No
<a href="#">Results article</a>	SARS-CoV-2 seroprevalence and COVID-19 disease among people on opioid agonist treatment	12/01 /2022	29/08 /2023	Yes	No
<a href="#">Results article</a>	Seroprevalence trends of anti-SARS-CoV-2 antibodies and associated risk factors	04/03 /2023	29/08 /2023	Yes	No
<a href="#">Results article</a>	Trajectories of depression, anxiety and stress during the pandemic	01/05 /2022	29/08 /2023	Yes	No
<a href="#">Results article</a>	Vaccination intention, beliefs, attitudes, and trust	23/03 /2022	29/08 /2023	Yes	No
<a href="#">Protocol article</a>	protocol	01/12 /2020	26/10 /2020	Yes	No
<a href="#">Dataset</a>	Corona Immunitas Phases 1 to 4 - Central Database	26/04 /2023	29/08 /2023	No	No
<a href="#">Dataset</a>	Corona Immunitas Phases 5 and 6 - Central Database	26/04 /2023	29/08 /2023	No	No
<a href="#">Other publications</a>	Protocol and initial results of Corona Immunitas Digital Follow-Up eCohort	28/02 /2022	29/08 /2023	Yes	No
<a href="#">Participant information sheet</a>	version v4	11/06 /2020	07/08 /2020	No	Yes
<a href="#">Study website</a>	Study website	11/11 /2025	11/11 /2025	No	Yes